

**EXH. DJL-3 (Apx. O)
DOCKETS UE-240004/UG-240005
2024 PSE GENERAL RATE CASE
WITNESS: DAVID J. LANDERS**

**BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION**

**WASHINGTON UTILITIES AND
TRANSPORTATION COMMISSION,**

Complainant,

v.

PUGET SOUND ENERGY,

Respondent.

**Docket UE-240004
Docket UG-240005**

**APPENDIX O (NONCONFIDENTIAL) TO THE SECOND EXHIBIT TO THE
PREFILED DIRECT TESTIMONY OF**

DAVID J. LANDERS

ON BEHALF OF PUGET SOUND ENERGY

FEBRUARY 15, 2024



Pipeline Mod: Enhanced Methane Emissions Reduction
Corporate Spending Authorization (CSA)

Date Created:	Friday, February 10, 2023
Discretionary/ Non-Discretionary:	Discretionary
Multi Year Rate Plan:	Programmatic
Equity Impact:	Yes
Strategic Alignment:	Evolve the Business-Clean
Estimated In-Service Date:	Friday, December 31, 2027
Current State (Business Need):	<p>Methane emissions are 84x that of carbon dioxide, damaging the environment and a focus of PSE objectives as well as numerous regulations include Carbon Commitment Act, PHMSA 2020 Pipes Act, and the US Methane Emissions Reduction Action Plan. PSE has unplanned methane releases when pipelines failure most often for PSE as a result of damage by third party dig ins and planned methane releases during construction to blow down pipelines to tie in services or other pipelines. Regulation several years ago required PSE to calculate the metric tons of methane released, a different calculation than EPA's measurement which is based on national average leakage by material type. PSE release X metric tons of methane as a result of leaks. PSE evaluated over 30 methane reduction ideas, documented them in the 2021 Pipeline Replacement Plan (PRP) submitted to the UTC. PSE implemented 6 of those ideas, several included in the 2021 PRP. PSE can no longer afford the intentionally or unintentionally release methane as it is an environmental safety hazard.</p>



Pipeline Mod: Enhanced Methane Emissions Reduction

Corporate Spending Authorization (CSA)

Desired State (Proposed Solution):

PSE will complete the evaluation of the 24 ideas and aggressively implement changes to practices associated with leak prevention and management, damage prevention, intentional release, emergency release, and engineering design and standards. Immediate focus areas include advanced Leak detection technology, reduce locate related damages, review purging practices and changes in design to eliminate this need, continued refinement of purging procedures and use of nitrogen, recompression and methane capture tools, and pipeline replacement construction practices. Many of these will require a change in design philosophy and additional infrastructure and capital tools to avoid the need to intentionally release methane. PSE estimates advanced leak detection, recompression technology, and tools to improve locating will avoid release of 4300 metric tons of CO₂e annually.



Pipeline Mod: Enhanced Methane Emissions Reduction

Corporate Spending Authorization (CSA)

Outcome/Results
(What are the
anticipated benefits):

The primary benefit is the reduction of methane emissions from PSE's system, construction, and operations.



Pipeline Mod: Enhanced Methane Emissions Reduction
Corporate Spending Authorization (CSA)

Dependencies:

Dependencies comment:

Escalation Included:

Total Estimated Costs:

Estimated Five Year Allocation:

Funds Type	ID	Line Item Description	Previous Years Actuals	Fiscal 2024 Requested	Fiscal 2025 Requested	Fiscal 2026 Requested	Fiscal 2027 Requested	Fiscal 2028 Requested
Capital	W_R.10015.08.01.02	Enhanced Methane Emissions Reduction	\$ -	\$ 2,000,000	\$ 2,750,000	\$ 2,700,000	\$ 2,800,000	\$ -

Incremental O&M:

Qualitative Benefits:

Quantitative Benefits:

Quantitative Benefits	Benefit Type	Previous Years	Fiscal 2024	Fiscal 2025	Fiscal 2026	Fiscal 2027	Fiscal 2028	Fiscal 2029	Remaining Costs	Life Total
Health and Safety / Environment	Other	\$ -	\$ 9,600,000	\$ 9,600,000	\$ 9,600,000	\$ 9,600,000	\$ -	\$ -	\$ -	\$ 38,400,000

Risk Summary:



Pipeline Mod: Enhanced Methane Emissions Reduction

Corporate Spending Authorization (CSA)

Change Summary:

Planning Cycle	Change Summary	Last Update Date
2022 Baseline Cycle	This CSA has been migrated into the EPPM tool at go-live as part of the Phase 1 EPPM implementation effort. The projects in this CSA were previously approved for the 2023-2027 capital plan. Please refer to the original CSA document for additional information (if available.)	2/10/2023
2023 Cycle 1	Updated based on last business plan	4/1/2023



Pipeline Mod: Enhanced Methane Emissions Reduction

Corporate Spending Authorization (CSA)

Approval History:

Approved By	Date Approved
Approved by Cost Center Owner: Weatherby , Niece	4/5/2023
Approved by Director Sponsor: Landers , David	4/7/2023
Approved by Executive Sponsor: Jacobs , Josh	4/8/2023
CSA Status changed to Approved	4/8/2023
Approved by Cost Center Owner: Shrum , Bailey	12/4/2023
Approved by Director Sponsor: Shrum , Bailey	12/4/2023
Approved by Executive Sponsor: Shrum , Bailey	12/4/2023
CSA Status changed to Approved	12/4/2023
Approved by Cost Center Owner: Weatherby , Niece	1/29/2024
Approved by Director Sponsor: Landers , David	1/29/2024
Approved by Executive Sponsor: Jacobs , Josh	2/2/2024
CSA Status changed to Approved	2/2/2024



Pipeline Replacement Plan - Methane Reduction Plan
Corporate Spending Authorization (CSA)

Date Created:	Friday, February 10, 2023
Discretionary/ Non-Discretionary:	Discretionary
Multi Year Rate Plan:	Programmatic
Equity Impact:	Yes
Strategic Alignment:	Evolve the Business-Clean
Estimated In-Service Date:	Sunday, December 31, 2028
Current State (Business Need):	<p>Methane emissions are 84x that of carbon dioxide, damaging the environment and a focus of PSE objectives as well as numerous regulations include Carbon Commitment Act, PHMSA 2020 Pipes Act, and the US Methane Emissions Reduction Action Plan. PSE has unplanned methane releases when pipelines failure most often for PSE as a result of damage by third party dig ins and planned methane releases during construction to blow down pipelines to tie in services or other pipelines. House Bill 2518 passed in 2020 added to RCW 80.28.420, which is the cost recovery statute for elevated pipeline risk, to include equipment and facilities, projects and changes to operational practices, that aid in the reduction of methane emissions. This House Bill also required annual reporting of leaks and the CO₂e of methane released as a result of them. This measurement is different calculation than EPA's measurement which is based on national average leakage by material type. PSE releases X metric tons of methane as a result of leaks. PSE evaluated over 30 methane reduction ideas, documented them in the 2021 Pipeline Replacement Plan (PRP) submitted to the UTC. PSE specifically included mitigation plans for cost recovery in the 2021 Pipeline Replacement Plan. PSE can no longer afford the intentionally or unintentionally release methane as it is an environmental safety hazard.</p> <p>Damage to gas facilities by third party contractors is PSE's leading pipeline risk resulting in 769 main breaks in 2021, generally 800-900 damages annually and over 12,000 metric tons of CO₂e in 2020. Contractors account for 56% of the damages, and homeowners account for 20%. PSE has deployed damage prevention representatives to oversee contractors, but staff levels are sufficient to visit only 25% of the dig tickets that are flagged as high risk. Mapping accuracy is one contributor to damage and the timeliness of as-built information key to locating facilities so that contractors can avoid damaging PSE facilities. As of 2021, PSE has over 5000 projects not mapped.</p> <p>Aboveground meter set leaks contribute to methane emissions as well. As of 2021, there were almost 27,000 known aboveground meter set leaks, which are non-hazardous and historically not remediated, but produce sizeable methane emissions.</p> <p>PSE's non-hazardous below ground leaks are also a source of methane emissions. PSE had eliminated over a 3000 Grade C leaks since 2014. Regulations deem that Grade B leaks must be repaired within 15 months and Grade C leaks just monitored indefinitely. PSE experiences about 400 of these Grade B and C leaks annually. The result is small leaks that leak for a long time, resulting in methane emissions unacceptable in today's environment.</p> <p>For background on the PRP, after San Bruno explosion, Regulators came under scrutiny regarding policies that dis-incented investments in pipeline safety. The UTC issued policy associated with RCW 80.28.420 requiring utilities to develop a plan to address elevated pipeline safety risks, submit them for approval by the Commission, and then, if necessary, seek cost recovery mechanism (CRM) that ensured utilities would stay focused, resourced, and committed to resolving these risks. This CRM is now included in the MYRP, but the reporting and review by the Commission will still be an on-going process and scrutiny as plans are approved. The 2021 PRP set master plan included elements, with a 2-year implementation plan for 2022-2023. PSE will submit the 2024/2025 plan on June 1, 2023 which will continue the work defined in the first two years of the longer master plan.</p>



Pipeline Replacement Plan - Methane Reduction Plan

Corporate Spending Authorization (CSA)

Desired State (Proposed Solution):

The solution to reducing methane from PSE's pipelines operations is to address damage prevention aggressively, repair aboveground meter set leaks, and repair leaks upon finding them. PSE's 2021 PRP included the addition of 5 damage prevention representatives, enhancements to PSE's locating risk prioritization tool, adding mapping staff to identify process improvements to ensure timely mapping, repairing 7,300 aboveground meter set leaks, and changing operating practices to repair non-hazardous leaks faster than 4 months. PSE did not execute on some of these solutions in 2022 and where did it started very late in the year putting pressure on 2023 to meet the plan approved by the UTC. The funding request reflects the need to continue to focus into the next PRP plan for 2024/2025.



Pipeline Replacement Plan - Methane Reduction Plan

Corporate Spending Authorization (CSA)

Outcome/Results
(What are the
anticipated benefits):

The primary benefit of the program is the reduction of methane emissions. PSE estimates an avoided 6,916 metrics tons of CO₂e from enhancing the damage prevention activities over 5 years along with avoiding 494 damages, an avoided 6,773 metric tons of CO₂e from repairing 1,875 non-hazardous below ground leaks faster, and an avoided 4,000 metric tons of CO₂e from repairing 7,300 aboveground meter set leaks over 5 years.

Estimated quantitative benefits of methane emissions avoided = 17,689 MTons CO₂e * \$87/MTon (UTC Social Cost of Carbon for 2025 in 2021\$) <https://www.utc.wa.gov/regulated-industries/utilities/energy/conservation-and-renewable-energy-overview/clean-energy-transformation-act/social-cost-carbon>



Pipeline Replacement Plan - Methane Reduction Plan
Corporate Spending Authorization (CSA)

Dependencies: No

Dependencies comment: None.

Escalation Included: No, escalation has not been included.

Total Estimated Costs: \$35,711,261

Estimated Five Year Allocation:

Funds Type	ID	Line Item Description	Previous Years Actuals	Fiscal 2024 Requested	Fiscal 2025 Requested	Fiscal 2026 Requested	Fiscal 2027 Requested	Fiscal 2028 Requested
Capital	W_R.10015.04.01.13	G Nonhaz Service Repair Methane PRP	\$ -	\$ 492,560	\$ 507,330	\$ 522,550	\$ 535,500	\$ 550,000
Capital	W_R.10015.04.01.12	G Nonhaz Main Repair Methane PRP	\$ -	\$ 1,398,510	\$ 1,440,490	\$ 1,483,730	\$ 1,528,240	\$ 2,100,000

Incremental O&M: Both

Qualitative Benefits: In addition to methane reduction, this program reduces reputational risk by staying compliant with the Commission approved PRP plan. There are public and employee safety benefits to driving down damages as well especially in light of the workforce experience level.

Quantitative Benefits:

Quantitative Benefits	Benefit Type	Previous Years	Fiscal 2024	Fiscal 2025	Fiscal 2026	Fiscal 2027	Fiscal 2028	Fiscal 2029	Remaining Costs	Life Total
Methane Emissions Reduction - MTon CO2e * Social Cost of Carbon (LTC)	Other	\$ -	\$ 1,538,943	\$ 1,538,943	\$ 1,538,943	\$ 1,538,943	\$ -	\$ -	\$ -	\$ 6,155,772

Risk Summary: Project Risk is challenged by O&M funding constraints despite the plan approval by the Commission.

Benefit risk is minimized as it is realized when the aboveground and below ground leaks are repaired. PSE has had good success with deploying the damage prevention activities, but just not sufficient staffing and so it is anticipated that the benefit of reduced damages will be realized, but there can be varying factors not always in PSE's control.

System risk exists if PSE does enhance the focus on damage prevention as it presents a safety risk to the public and employees, sometimes requiring customers to be shut off in order to make repairs.



Pipeline Replacement Plan - Methane Reduction Plan
Corporate Spending Authorization (CSA)

Change Summary:

Planning Cycle	Change Summary	Last Update Date
2022 Baseline Cycle	This CSA has been migrated into the EPPM tool at go-live as part of the Phase 1 EPPM implementation effort. The projects in this CSA were previously approved for the 2023-2027 capital plan. Please refer to the original CSA document for additional information (if available.)	2/10/2023
2023 Cycle 1	Updated based on 2021 PRP.	4/3/2023



Pipeline Replacement Plan - Methane Reduction Plan
Corporate Spending Authorization (CSA)

Approval History:

Approved By	Date Approved
Approved by Cost Center Owner: Weatherby , Niece	4/5/2023
Approved by Director Sponsor: Landers , David	4/7/2023
Approved by Executive Sponsor: Jacobs , Josh	4/8/2023
CSA Status changed to Approved	4/8/2023
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Approved by Cost Center Owner: Weatherby , Niece	1/29/2024
Approved by Director Sponsor: Landers , David	1/29/2024
Approved by Executive Sponsor: Jacobs , Josh	2/2/2024
CSA Status changed to Approved	2/2/2024

ENHANCED METHANE EMISSION REDUCTION

ENERGY TYPE: GAS

1. SHORT DESCRIPTION

The Enhanced Methane Emission Reduction plan will investigate new technologies and operating procedures to further reduce methane emissions. This plan addresses PSE’s approach to reducing methane emissions from the delivery system. The plan includes active leak repair, advanced leak detection, recompression technology, elimination of non-hazardous aboveground releases of gas (NARGs), and other operational improvements.

2. BACKGROUND

PSE has been working to reduce active nonhazardous natural gas leaks by repairing the oldest leaks first to reduce the population being monitored. Utilizing PSE’s Distribution Integrity Management Program (DIMP), those assets that have been identified as a risk due to leaking are scheduled for replacement to minimize any future leaks.

By repairing nonhazardous leaks more quickly, PSE has learned how to better identify non-pipeline gas sources and been able to pinpoint and repair very small leaks on the system. Those small leak repairs help to educate and feed into PSE’s DIMP by informing how the system is aging and what components are beginning to leak.

PSE is also focusing on the things that produce the most emissions like third party excavation damages to the distribution system. These are preventable actions that PSE is working to reduce by incorporating new computer risk modeling to help prioritize locate tickets. In addition, PSE will hire new damage prevention field representatives to monitor digging by contractors that damage PSE’s facilities the most.

PSE evaluated its practices and over 30 methane reduction ideas. Items that prioritized safety and were ready to implement were identified and some were directly implemented as Standards updates. Items that were new technology or needed to be further analyzed are included in this Enhanced Methane Emission Reduction plan. The remaining tactics have been evaluated and may be incorporated in the future.

Table 1 – Opportunities for Methane Emission Reduction

	Tactic	Status
	Leak prevention and management	
1	Leak repair methodology - Repair leak upon discovery	2021 PRP – Now Enhanced Methane Emissions Reduction
2	Leak survey frequency change based on pipe type; geographic location; year installed, etc.	Preliminary evaluation

	Tactic	Status
3	Nonhazardous release of gas (NARGS) management	2021 PRP – Now Enhanced Methane Emissions Reduction
4	Advanced Leak detection technology	Enhanced Methane Emission Reduction
5	Evaluate results from Material Failure Analysis lab -Proactively Replace Bolt-On Tees	Preliminary evaluation
6	Evaluate results from Material Failure Analysis lab -Proactively Replace Caps	Implemented
7	Evaluate results from Material Failure Analysis lab -Use new Continental Punch Tee retirement cap	Implemented
8	Leverage AMI (methane sensor in module; real-time monitoring)	Preliminary evaluation
Damage Prevention		
9	Reduce locate related damages	Preliminary evaluation
10	Reduce homeowner damages through advertising	Preliminary evaluation
11	Expand damage prevention team to reduce 3rd party contractor damages	2021 PRP – Now DIMP Accelerated Action
12	Improve accuracy and timeliness of maps used in locating	Preliminary evaluation
Intentional Release of Gas		
13	Meter change out purging practices	Preliminary evaluation
14	Review purging practices; continued refinement of purging procedures, use of nitrogen	Implemented
15	Evaluate flaring and recompression for methane impact; methane capture tools	Enhanced Methane Emission Reduction
16	Pipeline replacement construction practices	Enhanced Methane Emission Reduction
17	Partner with Williams on their purging procedures	Implemented
Emergency Release of Gas		
18	Expand valve inspections and accessibility for shut-down in lieu of dig up and squeeze (e.g., emergency section valves that shut off too many customers, redefining “critical” so more valves are inspected)	Preliminary evaluation
19	Dynamically scheduled valve inspections - ID valves on either side of third party excavations and create work orders to inspect them prior to construction, so we can shut breaks down more efficiently	Preliminary evaluation
20	Emergency response process that considers reducing broken and blowing time	Preliminary evaluation
21	Equipment we should install for shut down processes; e.g., retrofitting services with EFVs	Preliminary evaluation
22	Adding valve locations to material tracking and traceability, GPS coordinates for valve locations, proactive approach to newly installed; add installed locations during scheduled asphalt restoration, at site visits	Preliminary evaluation
Engineering Design and Standards		
23	Valve requirements (install more valves)	Preliminary evaluation

	Tactic	Status
24	Meter change out philosophy (when to replace a meter during pipeline replacement)	Preliminary evaluation
25	Meter philosophy of SAP improvements, meter replacements/maintenance, avoid unnecessary meter change-outs	Preliminary evaluation
26	Risers, soil to air interface (SAI): to replace or to repair in the field	Preliminary evaluation
27	Replace threaded fittings with flanges on MSA	Preliminary evaluation
28	Evaluate IMO Design to replace relief and minimize leakage points	Implemented
29	Evaluate RS design to minimize leakage points and prove relief has minimal leakage	Preliminary evaluation
30	Evaluate current commodities for methane release potential over time and phase them out	Preliminary evaluation
31	Atmospheric corrosion SAI inspection process (soil to air interface on steel risers)	Preliminary evaluation
32	Riser designs	Preliminary evaluation

The Enhanced Methane Emission Reduction plan includes changing procedures and processes to reduce the amount of methane emissions during normal operations. The methods include using active leak repair, advanced leak detection equipment, utilizing recompression to capture methane during field operations, elimination of NARGs, and other operational improvements.

Table 2 - Enhanced Methane Emission Reduction Plan

Strategy	Description
Active Leak Repair	Targeted repair of non-hazardous B and C leaks
Advanced Leak Detection	Emerging technologies used to identify leaks faster than existing methods.
Recompression / Vacuum Technologies	Devices that capture methane releases that would otherwise be vented into the atmosphere through normal operations. This includes purging and flaring during pipeline replacement.
NARGs	Targeted repair of non-hazardous aboveground releases of gas at meter sets.
Other operational improvements	Emerging tools, technologies and methods to reduce intentional methane releases during operations or to identify leaks. Includes meter exchanges and AMI leak notification.

3. STATEMENT OF NEED

The Enhanced Methane Emission Reduction plan was initiated in response both PSE's Beyond Net Zero Carbon pledge and to new legislation requiring pipeline operators to prioritize identifying and eliminating leaks and operational releases of methane to reduce impact on the environment. PSE is addressing this need through DIMP Accelerated Actions, and the Enhanced Methane Emission Reduction plan.

3.1. NEED DRIVERS

- **Protecting our Infrastructure of Pipelines and Enhancing Safety (PIPES Act) of 2020:** On December 27, 2020, the President signed into law pipeline safety reauthorization legislation "Protecting our Infrastructure of Pipelines and Enhancing Safety (PIPES Act) of 2020". Included within this act are new mandates for PHMSA to require leak detection and repair programs to consider the environment, the use of advanced leak detection practices and technologies, and for operators to be able to locate and categorize all leaks that are hazardous to human safety, the environment, or can become hazardous.
- **Beyond Net Zero Carbon pledge:** On January 21, 2021, PSE announced its Beyond Net Zero Carbon pledge, setting an aspirational goal to reach net zero carbon emissions for natural gas sales by 2045, with an interim target of a 30% emissions reduction by 2030. As part of that goal, PSE aspires to transform its natural gas distribution business to reduce carbon emissions for natural gas use in customer homes and businesses, through a combination of energy efficiency, use of low carbon fuel sources and blending (renewable natural gas and hydrogen), among other things and to reduce emissions from PSE's gas and electric operations and supply with focus on leak reduction.

3.2. EQUITY

PSE evaluates equity in the planning process with consideration of the four core tenets of energy justice: Recognition Justice, Procedural Justice, Distributional Justice, and Restorative Justice in various steps of the process.

As specific studies are performed and projects proposed to further a business plan, planners review system, customers, and now equity data to recognize the specific customer burdens, whether there are highly impacted or vulnerable customers that are or will be affected by addressing the specific business need. Planners must prioritize where to focus their study each year, thus the full understanding of the historic and ongoing inequities for the business plan is extrapolated at this time, and will mature over time with greater tools and data.

PSE is building process and tools to enable procedural inclusion in defining the need and solutions through engagement with specific communities and community based organizations, increasing understanding of local needs and consequences to inform specific study development as well as options to address need. Maturity in where and how this occurs will increase over the next several years. Business plans will be updated

as informed by this collective engagement to reflect broader equity benefits and burdens as engagement increases over time.

As specific projects are proposed, PSE’s investment decision optimization tool captures equity benefits. An optimized portfolio of projects across many business plans ensures the distribution of benefits and burdens are spread across all segments of the community and aims to ensure that marginalized and vulnerable communities do not receive an inordinate share of burdens or are denied access to benefits. As an initial step, PSE leverages Customer Benefit Indicators (“CBI”) and information established as part of the 2021 Clean Energy Implementation Plan (“CEIP”) to identify an equity framework to evaluate system projects. The CBI approach was developed through an iterative process that was coordinated with the Equity Advisory Group. These CBI span the core tenets of energy justice and provide a framework to evaluate the comparative equity benefit of each solution alternative considered. Refer to Table 3 for a brief description of the CBIs that address equity and the applicable benefits for the Enhanced Methane Emission Reduction program. PSE will continue to adjust and refine equity consideration in projects when necessary as the process continues to mature.

Projects will be evaluated on each CBI category and a total equity benefit score will be provided.

Table 3: Equity Applicable Benefits

Customer Benefit Indicator	Description	Program Applicable Benefit
Customer Energy Savings	Solutions that lead customers to use less energy, which leads to less energy that must be purchased and potentially a reduction in planned system upgrades.	No
Greenhouse Gas Emissions	Solutions that lead to a reduction of greenhouse gas emissions, either directly or indirectly	Yes
Enables Cleaner Energy	Solutions that either directly integrate DER on the system or enable the grid to more readily accommodate future DER.	No
Air Quality	Solutions that either directly eliminate the source of a common pollutant or reduce the risk that could cause a common pollutant to increase, such as enabling Electric Vehicle or DER adoption	No
Resilience	Solutions that address major event outages or harden critical facilities to prevent catastrophic events from creating long duration outages.	No
Cost Reduction	Solutions that identify least cost alternatives and therefore reduce costs for all customers	No
Clean Energy Jobs	Solutions that increase clean energy jobs by furthering clean energy technology application, as described in the CEIP	No

Home Comfort	Solutions that deploy residential energy efficiency in either a targeted solution area or by leveraging load reduction from system wide energy efficiency installations	No
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The program attempts to annually address the reduction in methane emissions and is programmatically optimized based on total benefit value to cost. Specific program projects are identified based total benefit to cost with named communities receiving additional scored benefit based on vulnerable population designation and highly impacted community characteristics, ensuring investments are distributed appropriately to named communities.

Business plans in isolation do not address restorative justice, but continued planning process improvements which include considerations of data, tools, and documentation as well as operational practices will help to restore equity over time.

4. PLAN DETAIL

4.1. PLAN SIZE/POPULATION

The population for the Enhanced Methane Emission Reduction plan includes all aspects of operating the natural gas system, excluding DIMP Accelerated Action or tactics in the Pipeline Replacement Plan.

4.2. PROPOSED COMPLETION DATE

The current target is to implement all elements of the Enhanced Methane Emission Reduction plan by 2026. There continue to be advances in emission reduction technology and after 2026 additional methane tactics may be prioritized for completion as needed and outlined in a revised plan.

4.3. SUMMARY OF PLAN BENEFITS

- **Methane Reduction:** Environmental safety benefits relative to methane emission reduction is measured by converting methane to a carbon dioxide equivalent (CO₂e). The plan reduces CO₂e emissions by an estimated 4,300 metric tons each year, and will increase as other tactics are adopted and incorporated.

Table 3 - CO₂e Emission Reduction

Strategy	Estimated Annual Emission Reduction (metric tons CO2e)
Active Leak Repair	590
Advanced Leak Detection	960
Recompression / Vacuum Technologies	30
NARGs	156
Other operational improvements	Evaluate as implemented

- **Stakeholder Relationships:** The plan demonstrates our commitment to environmental safety to stakeholder groups such as UTC, cities, and customers through efforts to replace pipe with an elevated risk of methane emissions
- **Safety:** A secondary benefit of the Enhanced Methane Emission Reduction plan is improvement to pipeline safety by reducing leaks from damages.

4.4. PRIMARY IDOT CATEGORIES

PSE employs an Investment Decision Optimization Tool (iDOT) to evaluate benefits of projects and optimize the annual portfolios for construction. The top primary iDOT Categories this plan addresses are:

- Health and Safety
- Environment
- Stakeholders

Table 4 – iDOT Benefit

2025 Forecast Cost (\$)	2025 iDOT Benefit (\$)	2025 Benefit / Cost Ratio
\$4,895,484 (CAP)	\$19,082,661	3.90
\$2,848,413 (O&M)	\$2,848,413	1

O&M programs cannot be calculated in iDOT. For O&M Benefit/ Cost Ratio it is assumed every dollar spent gives a benefit of the same amount.

4.5. ESTIMATED COSTS

The programmatic cost to complete the Enhanced Methane Emission Reduction plan from 2022 to 2026 is approximately \$10.1 million. The cost is based on estimates from peer utilities and additional research for the identified focus areas. PSE estimates are based on the goal of up to 30% of PSE's construction work leveraging recompression technology by 2025. After 2026, additional funding may be requested as needed to implement additional methane reduction tactics or to implement the technology that has been evaluated.

5. ALTERNATIVES

5.1. SOLUTION ALTERNATIVES

Implement Plan: The selected alternative is to implement the Enhanced Methane Emission Reduction plan to identify and eliminate leaks, reduce operational emissions, and improve locating of buried gas pipe.

Status Quo: The alternative not selected would be to not implement the Enhanced Methane Emission Reduction plan. This would lead to more methane emissions.

5.2. FUNDING ALTERNATIVES

Increased Funding:

With increased funding, PSE would be able to implement additional methane emission reduction tactics.

Decreased Funding:

Decreased funding may prolong the timeline of the plan and PSE may miss goal targets.

6. PLAN DOCUMENT HISTORY

Date	Reason(s) for Update	Summary of Significant Change(s)	Modified By
9/20/2021	Documented existing program strategy.	Initial	Parker Indorf
12/17/2021	Annual Review	Minor word and format changes. Updated benefits	Parker Indorf
9/7/2023	2024 MYRP update	Includes Equity, remove ISP, remove plan budgetary info	Parker Indorf

7. SUPPORTING DOCUMENTATION

Document Name
PIPELINE REPLACEMENT PROGRAM PLAN
PIPELINE MODERNIZATION STRATEGY