Practicability Report:

Pressurized Cylinders

9/17/25

Report Summary

Oregon Administrative Rule (OAR) 340-090-0630(3) defines the list of materials that the Producer Responsibility Organization (PRO) is obligated to collect and ensure delivery to Responsible End Markets (REMs). This includes pressurized cylinders such as single-use propane canisters (as defined by OAR 340-090-0630(1)(k)). During the development of the program plan, Circular Action Alliance Oregon, LLC (CAA Oregon), acting as the PRO, identified constraints that will make CAA Oregon's collection of pressurized cylinders impracticable, exceeding the calculated societal benefit described in OAR 340-90-0670(5)(c). Pressurized cylinders remain unacceptable for inclusion in curbside recycling due to their hazards and risks, and will not be considered by CAA Oregon for the Uniform Statewide Collection List (USCL).

Pressurized cylinders are currently to be disposed of by residents at appropriately permitted sites such as Household Hazardous Waste (HHW) facilities or related HHW Collection Events. CAA Oregon emphasizes that it is not feasible, as the PRO, to perform activities to certify or treat pressurized cylinders without handling them as hazardous waste as defined in 40 CFR 260.10 and consistent with HHW practices from DEQ and local governments. Under the U.S. Department of Transportation's (DOT) hazardous materials regulations (49 CFR 171–180), cylinders that contain any residual pressure or flammable gas remain regulated as Class 2.1 dangerous goods, and venting or puncturing is prohibited except at permitted facilities. Oregon's hazardous waste management standards, OAR 340-102-0011, reinforce these restrictions, meaning such practices to treat pressurized cylinders are outside the scope of CAA Oregon's authority as the PRO. CAA Oregon anticipates that handling this category of material across all PRO collection sites involves acceptance of intact, non-reusable cylinders and transportation will be to a permitted Treatment, Storage, and Disposal (TSD) facility per the performance standards.

Within these boundaries, and with the requirements of OAR 340-090-0650 applied, CAA Oregon concludes that the conditions and costs to manage pressurized cylinders exceed DEQ's societal benefit benchmark. The DOT's dangerous goods classification of these materials, which requires special handling, is a significant driver of the impracticable conditions. The costs incurred from transportation alone create conditions that exceed the societal benefit benchmark across PRO material management scenarios. CAA Oregon believes this specific transportation requirement for hazardous materials, which is out of CAA Oregon's control, qualifies as a demonstration that "an action is not practicable" and demonstrates "costs that are not justified given the resulting societal benefits," per the rule.

CAA Oregon raised the cost-to-manage concerns with DEQ during rulemaking, resulting in the PRO's management obligation being delayed until January 1, 2028 (OAR 340-090-0630(3)(a)), giving CAA Oregon time to explore all management options and related costs. The following sections of this report lay out the practicability test for pressurized cylinders.

Primary Practicability Considerations:

- → The cost for CAA Oregon to manage non-empty pressurized cylinders exceeds the societal benefit benchmark, pursuant to OAR: 340-090-0670 (5)(c).
- → The classification of pressurized cylinders as dangerous goods in the DOT regulation requiring special handling, and in accordance with OAR 340-090-0650 (3)(b)(C) and ORS 459A.896(1), are primary drivers of the cost beyond the societal benefit threshold.

In this report, the following is also prepared related to practicability:

- → CAA Oregon will address the transactional costs to the extent possible for solutions against the benchmark for pressurized cylinders in accordance with OAR 340-090-0670 (5)(c)(A) and in accordance with requirements for the PRO established in ORS 459A.869.

Practicability Study for Pressurized Cylinders

Definition

OAR 340-090-0630(1)(k) defines a pressurized cylinder as any packaging containing flammable pressurized gas, helium or carbon dioxide, including, but not limited to, seamless cylinders and tubes, welded cylinders and insulated cylinders intended to contain helium, carbon dioxide or flammable materials such as propane, butane or other flammable compressed gases. "Pressurized cylinder" *does not include*:

(A) any cylinder, tube or container intended to deliver a product that is not a compressed gas;
(B) liquified petroleum gas containers that are designed to be refilled;
(C) any other cylinder, tube or container that is designed to be refilled and which has an active and functioning exchange system that normally causes the cylinder, tube or container to be refilled, reused, or refurbished, unless the cylinder, tube or container is damaged and not appropriate to be subsequently refilled, reused, or refurbished;
(D) any cylinder, tube or container that contains pure oxygen or hydrogen;
(E) fire extinguishers;
(F) aerosol cans; or
(G) a storage tank that is permanently fixed in location.

Background Information

CAA Oregon's approved program plan notes that Phase II rules delay the addition of aerosol containers and pressurized cylinders to the PRO's accepted list of materials until 2028. CAA Oregon is not pursuing collection of pressurized cylinders at the PRO material collection points during the first program plan. This report is aimed solely at addressing the practicability of managing the pressurized cylinder category as part of the PRO Acceptance List.

While commercial collection programs exist for certain pressurized cylinders, including camping propane canisters, these services are optional, geographically limited, targeted toward residential generators, and are not designed to provide the statewide access required under the PRO's statutory framework. Pursuant to ORS 459A.869 and OAR 340-090-0630, CAA Oregon's obligations do not extend to the hazardous waste acceptance requirements of verifying emptiness, managing residues, or assuming the regulatory and safety risks inherent in such processes.

To address this category, there are currently Household Hazardous Waste (HHW) programs operating throughout the state that collect this material. HHW operations currently span a combination of dedicated facilities and collection events in numerous counties - Baker, Benton, Clackamas, Clatsop, Columbia, Coos, Crook, Curry, Deschutes, Douglas, Gilliam, Hood River, Jackson, Josephine, Lane, Lincoln, Linn, Marion, Morrow, Multnomah, Polk, Sherman, Tillamook, Union, Wallowa, Wasco, Washington and Yamhill counties.

Special Handling

The management of pressurized cylinders by the PRO is to be aligned with federal hazardous materials transportation requirements and state-adopted hazardous waste regulations. These requirements are consistent with HHW management practices administered by DEQ and local governments. Per performance standards, PRO collection points are required to send accumulated material directly to TSD sites for processing, which excludes the option for CAA Oregon to transfer pressurized cylinders to HHW collection programs and is outside the intended use of HHW programs. Pressurized cylinders, whether full, partially full, or containing residual gases, remain regulated as Class 2 hazardous materials during transport under 49 CFR 171–180.

- → Verifying can emptiness to bypass this requirement involves a minimum of puncturing, draining, or depressurizing cylinders at a collection site which constitutes hazardous waste treatment under 40 CFR 260.10.
- → Additional considerations for the material include handling and compliance with 40 CFR 261.7, which does not automatically exempt a pressurized cylinder deemed empty due to the potential for residues or residual volumes.
- → In order to meet PRO compliance requirements through delivery to a TSD facility, pressurized cylinders received by CAA Oregon must be packaged in single-use, DOT- and/or UN-certified containers before transport and incur related costs.

Material Performance Standards

Under OAR 340-090-0650(3)(b)(C), PRO sites are required to collect, transport, and deliver designated materials to both a permitted TSD facility and Responsible End Market (REM) while preserving the container's integrity, ensuring safety, and accounting for a recoverable yield. For pressurized cylinders, TSD facility processing available within the region renders metal components unrecoverable.

Outside of the yield and end disposition requirements, pressurized cylinders present the challenge that their contents are inherently hazardous and highly flammable. Compliance with Consumer Product Safety Commission (CPSC) and DOT labeling is legally enforceable and can include details like temperature limitations for cylinders.

Pressurized Cylinder Practicability Assessment

Environmental and Safety Impact

The environmental benefits of recycling pressurized cylinders are limited even when evaluated at full shipping capacity.

- → The incremental environmental impact of transporting cylinders to specialized recycling facilities (including fuel use, emissions, and potential safety risks) can be comparable to services offered by the current HHW collection system. This further reduces the net environmental benefit.
- → When considering the per-ton management cost alongside these factors, the environmental benefit of metal recovery from pressurized cylinders does not justify the additional expenses and operational complexity for the addition of hazardous waste to CAA Oregon's collection and recycling.

The management of pressurized cylinders presents significant environmental, health, and safety risks. Pressurized cylinders are regulated under OAR 340-102-0011 and federal DOT hazardous materials regulations (49 CFR 171–180). Pressurized cylinders received by CAA Oregon are not guaranteed or verifiable as empty and may retain residues, which aligns with the rationale for their exclusion from the USCL list and curbside solid waste. These conditions also create multiple hazards at PRO collection sites, including flammability and explosion, as well as exposure risks to workers and other persons on site during acceptance and handling.

Additionally, there is added liability for mishandling (such as accidental discharge) or otherwise causing damage to a cylinder on site. The nature of the contents in pressurized cylinders creates the potential for physical injury or exposure to a range of concentrated gases. Emptying or verifying emptiness would require specialized hazardous waste equipment, trained personnel, and facility

permitting, while introducing additional environmental, health, and safety risks. Furthermore, under 40 CFR 261.7, cylinders are not automatically exempt from hazardous waste requirements even if considered "empty" due to the potential for retained residue.

Research Methodology

The inputs for the practicability assessment draw on direct rates obtained from service providers, supplemented by related estimates to reflect the costs associated with managing pressurized cylinders. Weights and estimates are built from using 1 lb. propane camping cylinders as a basis, recognizing that pressurized cylinders come in a variety of shapes and sizes. These costs are based on the required use of common DOT-approved containers appropriate for the site conditions, and only include post-collection handling, transportation, and processing or disposal at permitted TSD facilities. Detailed cost tables and supporting information are provided in Appendix A and Appendix B.

Costs

Costs for common DOT-approved containers appropriate to the sites and waste collected are listed below to demonstrate the expenses associated with meeting end-disposition and TSD requirements. Metal recycling is not possible post-TSD and does not significantly contribute to the societal benefits of handling this category. It is also not feasible to consider the range of TSD facilities available. With responsibility for pressurized cylinders, CAA Oregon would expect costs in the following categories individually and compared as an aggregated cost on a per-ton basis to the societal benefit threshold. The costs below are organized across subsections 1 (post collection), 2 (transportation), and 3 (processing/disposal) to provide the total per ton. Additional cost details are included in the appendix. PRO Depot capital equipment costs and operational costs including staffing of the recycling centers have not been included in the post-collection cost calculations.

Table 1: All handling disposition cost scenarios with a range of container sizes.

Disposition	Container	Cylinders/ Container	Unit of Measure	1: Post Collection	2: Transportation	3: Disposal/ Recycle	Price/ Container	$/ Cylinder	$/ton
TSD	5 Gallon Pail	8	1lb propane cylinder	$19.99	$101.00	$192.05	$313.04	$39.13	**$78,258.86**
TSD	30 Gallon Drum	48	1lb propane cylinder	$84.30	$185.00	$452.43	$721.73	$15.04	**$30,072.17**
TSD	55 Gallon Drum	84	1lb propane cylinder	$96.30	$177.00	$584.15	$857.45	$10.21	**$20,415.58**

Societal Benefit

CAA Oregon has prepared the per-ton transactional costs in this section to demonstrate the practicability of managing pressurized cylinders. With adjustment to the consumer price index from final year-over-year data, the Average Societal Benefit yields $2,317.38 as the current benchmark for evaluating practicability. A per-ton cost higher than the per-ton societal benefit value is not practicable.

Table 2: Annual Societal Benefit Calculation using CPI-U Data (Per OAR 340-090-0670(5)(c))

Year	Starting Cost	CPI-U Increase	Adjusted Cost
2021 – Baseline	$2,017.00	Baseline	$2017.00
2022	$2,017.00	5.4% [July '21-July '22]	$2,124.92
2023	$2,124.92	3.2%: [July '22- July '23]	$2,191.98
2024	$2,191.98	2.9% [July '23 - July '24]	$2,256.05
2025	$2,256.05	2.7% [July '24 - July '25]	**$2,317.38**

The summarized findings are presented below as the total costs per ton and societal benefits compared to societal costs, factoring post-collection needs, transportation, and through to end disposition. All of these costs create conditions that are fully above the societal benefit threshold for each category as a management scenario. This is outlined to summarize the societal benefits and societal costs resulting from handling the material.

Table 3: Societal Benefit by category as total calculated costs to manage compared to Societal Benefit threshold of $2,317.38 (Table B) pursuant to OAR 340-090-0670(5)(c).

Container	Cost/ton	Societal Benefit (CPI-U adjusted)	Practicable to threshold?	Factor Beyond Practicability (rounded)
5 Gallon Pail	$78,258.86	$2,317.38	No	33.8
30 Gallon Drum	$30,072.17	$2,317.38	No	13.0
55 Gallon Drum	$20,415.58	$2,317.38	No	8.8

Table 4: Societal Benefits Considerations

Location / Scenario	Societal Benefit	Societal Cost / Tradeoff
CAA Oregon manages cans by transporting them intact to a TSD facility per Performance Requirements.	Expanded footprint of collection sites for the category.	Does not meet OAR 340-090-0670(5)(c) practicability standard on the basis of added transportation impacts and in total. The incremental environmental impact is comparable to the services provided by the HHW system, dedicated to the safe handling of such material. TSD processing, as required, leaves metal unrecoverable.

Results and Recommendations

The practicability report demonstrates that CAA Oregon's obligation to manage pressurized cylinders incurs costs far exceeding the societal benefit benchmark of $2,317.38 per ton, primarily due to their classification as dangerous goods under DOT regulations. Additionally, no TSD facilities in the region yield metal recovery from treatment to rationalize handling and do not qualify as a REM. CAA Oregon can't treat hazardous waste at PRO collection sites to verify emptiness and handling, transport, storage, and delivery activities must maintain strict adherence to regulatory and safety standards. With the existence of dedicated HHW collection infrastructure and high per-ton management costs, CAA Oregon's collection of pressurized cylinders is not justified based on the additional expense, complexity, or benefits of introducing hazardous waste management across all PRO collection sites.

Practicability Results

- → The cost for CAA Oregon to manage pressurized cylinders exceeds the societal benefit benchmark pursuant to OAR: 340-090-0670 (5)(c). The total costs that far exceed the practicability threshold of $2,317.38 per ton, are demonstrated in this report and range from $20,204.21 to $78,047.49 on a per-ton basis ton across collection scenarios.
- → When factored out over a per-unit price, it is estimated that CAA Oregon's cost to manage these cylinders would range from $10.10 to $39.02 per pressurized cylinder (1lb propane cylinder).

Recommendations

- → The management of pressurized cylinders greatly exceeds the specified societal benefit benchmark because of costs, primarily driven by their classification as dangerous goods in the DOT regulation, and requiring special handling in accordance with OAR 340-090-0650 (3)(c).
- → Based on the findings of the practicability study, it is appropriate for DEQ to remove the PRO's management obligation of pressurized cylinders in the upcoming rulemaking.

Appendix A:
Cost Detail Per Drum
TSD - Containers Transported Intact (1lb Propane Cylinders)

5 Gallon Container

Service	Quantity	UOM	Price	Total
Materials	1	5 gallon pail	$ 18.19	$ 18.19
Labor and Equipment	1	5 gallon pail	$ 24.00	$ 24.00
Labor and Equipment	1	Label-DOT Diamond	$ 1.80	$ 1.80
Transportation to TSD	1	Container	$ 50.00	$ 50.00
Transportation to Disposal		Extra	TBD	
Manifest	1	Emanifest	$ 27.00	$ 27.00
Disposal (Incineration)	1	5 gallon pail	$ 135.00	$ 135.00
Recovery Fee (Fuel Surcharge)	1	16.50%	$ 42.24	$ 42.24
Waste Fee	1	Per job	$ 14.81	$ 14.81
			Total	**$ 313.04**

30 Gallon Container

Service	Quantity	UOM	Price	Total
Materials	1	30 gallon drum	$ 82.50	$ 82.50
Labor and Equipment	1	30 gallon drum	$ 108.00	$ 108.00
Labor and Equipment	1	Label-DOT Diamond	$ 1.80	$ 1.80
Transportation	1	Container	$ 50.00	$ 50.00
Transportation to Disposal		Extra	TBD	
Manifest	1	Emanifest	$ 27.00	$ 27.00
Disposal (Incineration)	1	30 gallon drum	$ 337.50	$ 337.50
Recovery Fee (Fuel Surcharge)	1	16.50%	$ 100.12	$ 100.12
Waste Fee	1	Per job	$ 14.81	$ 14.81
			Total	**$ 721.73**

55 Gallon Container

Service	Quantity	UOM	Price	Total
Materials	1	55 gallon drum	$ 94.50	$ 94.50
Labor and Equipment	1	55 gallon drum	$ 100.00	$ 100.00
Labor and Equipment	1	Label-DOT Diamond	$ 1.80	$ 1.80
Transportation	1	Container	$ 50.00	$ 50.00
Transportation to Disposal		Extra	TBD	
Manifest	1	Emanifest	$ 27.00	$ 27.00
Disposal (Incineration)	1	55 gallon drum	$ 450.00	$ 450.00
Recovery Fee (Fuel Surcharge)	1	16.50%	$ 119.34	$ 119.34
Waste Fee	1	Per job	$ 14.81	$ 14.81
			Total	**$ 857.45**

Summary

Container	Quantity	UOM	Price	$/unit	$/ton
5 Gallon Container	8	1 lb propane cylinders	$ 313.04	$ 39.13	$ 78,258.86
30 Gallon Container	48	1 lb propane cylinders	$ 721.73	$ 15.04	$ 30,072.17
55 Gallon Container	84	1 lb propane cylinders	$ 857.45	$ 10.21	$ 20,415.58