



Department of Toxic Substances Control



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Community Protection and Hazardous Waste Reduction Initiative Pilot Project Proposal Form

Instructions

This form contains fillable fields. Mouseover each field for additional instructions. Not all fields need to be completed for submission, and general responses are acceptable if more specific responses have not been developed.

1.0 Pilot Project Summary

Identify the primary components of this pilot project.

| | |
|----------------------|---|
| Waste Stream: | portable gas cylinders/cannisters- cannister recyclers |
| Industry: | camping, outdoor sports, outdoor cooking, propane fueled lamps |
| Geography: | CA, US, international |
| Stakeholders: | parks, landfills, parks preservationists |
| Government: | Calrecycle, CGI, EPA, CALEPA, DTSC, Air District, product stewardship |

2.0 Pilot Project Details

Describe this pilot project and how it fits with the overall goals and objectives of the CPHWR Initiative. Characterize the waste(s) to be reduced and the implications.

It is estimated that the US generates 40 million 1 lb propane bottles every year, occupying 3.3 million cf of landfill space each year. The highgrade steel needs to be recycled, but cannot unless the container is clearly purged and crushed to ensure no other gases are in the container.

Yellowstone National Park sponsored the design of a portable unit that would work in parks- purges and captures the propane which goes into a chamber that stores for fueling the unit (on-site reuse/recycling) and the empty cylinders are crushed flat and can go directly to metals recyclers.

Since these units are mobile, they can be commissioned to go to the cylinder collection locations and treat in place

Per CA HW treatment rules- HW TAG is reviewing (has reviewed), assessing if authorized. Propane is reused as a fuel, clear recycling operation.

Would help reduce these from illegally being disposed of in recycling and solid waste stream only to be dealt with at recycling plants and landfills.

Landfill reps concerned since these bottles can be refilled with other gases by illegal drug manufacturers.



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3.0 **Pilot Project Characteristics**

Identify any applicable characteristics of this pilot project.

Source reduction or elimination
 Provides a permanent solution

Minimizes or avoids disposal
 Avoids media shifting

Long term reductions
 Replicable

Short term reductions
 Scalable

Decreases high volume waste
 Decreases toxicity of waste

Decreases high toxicity waste
 Reduces waste treatment impacts

Economically beneficial
 Stakeholders willing to participate

Represents a viable alternative
 Benefits EJ community

Other:

Describe how this pilot project addresses the characteristics identified above.

Since these bottles are not being treated now, this would prevent them from going untreated to the landfills. Precious metals and fossil fuels need to be re-purposed and recycled.

Consumers will continued to use these containers for camping, hiking, picnics, field activities.....One time use is a problem.

Alternative- design these containers to be refilled and reused.

Brings the treatment to the source of generation.

Parks can make souvenirs from the re-purposed materials.

Recovered propane gets used vs just emitted to atmosphere.

Technology could be scaled to larger containers, but not likely since those containers get refilled already.



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4.0 **Pilot Project Considerations**

Identify resources, tools and/or experts which can be used to gather information in support of this pilot project.

Yellowstone National Park Propane Bottler Recycler model. Find out if other models exist. Proprietary technology?

Identify other agencies that may have jurisdiction where this pilot project will be implemented.

DTSC, CalRecycle, Product Stewardship Council

Identify areas of potential competing considerations and objectives (including technical, legal, environmental, social, and economic factors).

None

Discuss other possible benefits in addition to decreasing the volume and toxicity of hazardous waste.

Re-purposing the contents and container, keeps out of landfills completely

What are other key items to consider in completing this pilot project?

State/EPA approval for the technology

Identify the various approaches to implementing this pilot project.

Learn from Yellowstone model.

The Country's First Propane Bottle Recycler

National Park Service Environmental Achievement Award Application

Team Submission



**Xanterra Parks & Resorts
Yellowstone National Park**

ecologix[®]
Xanterra's Environmental Commitment



Abstract of Achievement

The United States alone consumes an estimated 40 million one-pound propane bottles every year, occupying approximately 3.3 million cubic feet of space in landfills every year. The amount of steel from these discarded bottles could produce approximately 8,000 automobiles annually. Visitors to national park campgrounds across the country generate this propane cylinder waste. They are then thrown in the trash where they are placed in a landfill for centuries. This can cause several problems because the cylinders typically are not even emptied of their hazardous material, propane or white gas. And the steel cans don't readily degrade back into the natural environment.

To solve this problem, Yellowstone National Park Service and Xanterra Parks & Resorts' staff worked with a local propane company and then raised funds required to develop a prototype mobile Propane Bottle Recycler (PBR) unit. Now, Yellowstone National Park can recycle all small propane cylinders. The PBR is the first of its kind in the country and was inspired by the realization that an estimated 3,000 propane cylinders annually are discarded in Yellowstone National Park alone.

The PBR is even powered by the very propane and gas it extracts from the cylinders it recycles on site, closing the "fossil fuel loop" and saving yet more resources. The cylinders are then crushed and recycled as scrap metal.



Detailed Project Description

Many visitors to national parks purchase one-pound propane or gas cylinders to fuel such things as camp stoves, lanterns and heaters while visiting the park. After their visit, the cylinders are discarded into trash receptacles, returned to visitor centers or left in campgrounds. The magnitude of this issue was soon realized, not only for Yellowstone, but for many other national parks and other municipalities across the country. Until now, there was no solution but to landfill the steel cylinders.



At the request of and due to the fundraising efforts of Yellowstone and Xanterra Parks & Resorts staffs, WWW Industries and Mountain States Environmental Services, both of Billings, Montana, designed and manufactured this first ever prototype PBR. Mike McCoy, a local Yellowstone NPS staffer, identified this contractor to do the retrofit. Because of the high cost of development of the machine, Xanterra enlisted the financial support of other partners including other concessioners, private businesses and gateway communities. The PBR is owned by the National Park Service for use by Xanterra, the National Park Service and other entities within the Greater Yellowstone area.

This innovation was developed and purchased through contributions by the following organizations: the Yellowstone Park Foundation, Grand Teton Lodge Company, Signal Mountain Lodge Company, Xanterra Parks & Resorts, Yellowstone General Stores, Worthington Cylinders, Mountain States Environmental, REI, Amerigas, WWW Industries, and Grand Teton and Yellowstone National Parks.



The PBR is a mobile unit whose generator is fueled by the same propane that is extracted from the bottles and used to power the entire unit. The bottles are then punctured and flattened into scrap metal that can be redeemed as recycled steel. The unit processes over 1,000 cylinders daily. The storage compartment of the PBR unit has the capacity to hold over 3,000 bottles once they are flattened.

The PBR was developed to recycle one-pound propane cylinders, but can also handle smaller or larger cylinders. In addition, the PBR can recycle cylinders containing other

gases such as isobutene and mat gas. The program also allows local nearby communities the opportunity to recycle their cylinders too. It also now prevents a safety risk at the West Yellowstone compost facility, where before, these cylinders impacted the composting process.

Prior to the PBR development, it would have cost Yellowstone \$3.00 to \$4.00 to recycle each discarded cylinder at an outside facility for a total expense of approximately \$9,000 to \$12,000 annually. Additionally, law prohibits the refilling of one-pound propane cylinders.



Currently, Yellowstone has propane cylinder recycling bins located throughout the park at all major campgrounds, as well as at all general stores. The unit is available to a host of public and private entities throughout the greater Yellowstone area, and demonstrates how this national issue may be resolved.



Hopefully, this program will be a model to prompt other organizations throughout the nation to begin a propane bottle recycling program. We are proud of the team effort it took to bring to light this significant problem and to find a viable solution.



In 2005, over 4,300 discarded propane cylinders were collected within the greater Yellowstone area and processed. It is estimated the recycling unit will pay for itself within 8 years.

