GREENER CLEANUP SELF-DECLARATION AT A LARGE MILITARY FACILITY

SURF Case Study #0015

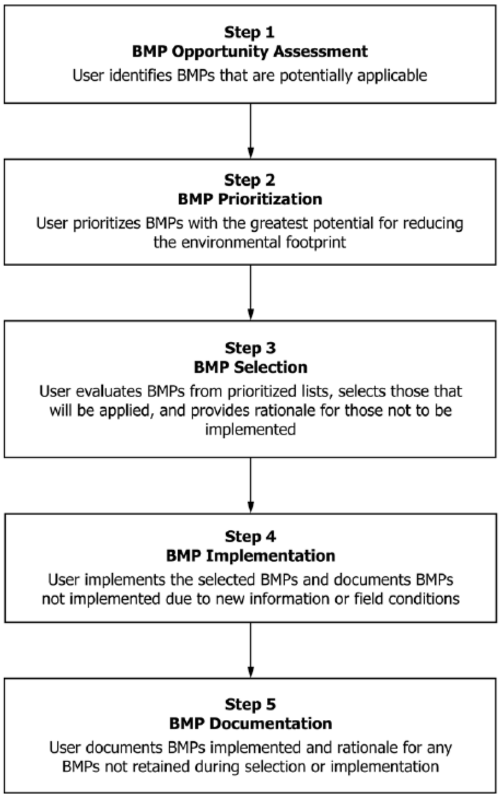
This case study examines how the completion of a Greener Cleanup Self-Declaration documenting previously implemented sustainable practices triggered a virtuous cycle and led to the implementation of additional sustainable practices, while reducing the time, cost, and environmental impact of cleanup.

OVERVIEW: STANDARD GUIDE FOR GREENER CLEANUPS

Although cleaning up sites improves the environment, the cleanup activities themselves use energy, water, and natural resources thereby creating their own environmental footprints. The Standard Guide for Greener Cleanups (ASTM E2893-16) describes a process for identifying, evaluating, and incorporating best management practices (BMPs) into a cleanup to reduce its environmental footprint (see figure below).

IMPLEMENTATION: STANDARD GUIDE FOR GREENER CLEANUPS

A large military installation in the United States includes 42 active Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and 10 Resource Conservation and Recovery Act (RCRA) sites. Since 2009, environmental footprint reductions in energy, air, water, materials and waste, and land and ecosystems were considered during every phase of work at the facility. Despite achieving environmental footprint reductions, a formal process was not followed and results were not consistently documented. Therefore, the standard was applied to the work retroactively to document the BMPs that had been implemented since 2009. The self-declaration statement confirming adherence to the process outlined in the guidance was completed in 2017. Of the 114 BMPs in the standard, 29 were considered potentially applicable. Of these 29, 18 were implemented in addition to two user-defined BMPs.



In addition to implementing the remedies selected in the decision documents for each site at the facility, the team continues to optimize existing remedies, whenever practicable, to reduce the time, cost, and environmental impact of cleanup.

EXAMPLE 1

Estimated Annual Reductions
GHG Emissions (metric tons)
↓ 2.4
Energy Used (MMBTU)
↓ 36
Cost
↓ $32,000

BMP Implemented:
Minimize waste generated.

Action:
Replaced sampling methodology with no-purge technology (including passive diffusion bags, Snap Samplers, and HydraSleeves) of more than 300 wells at 13 sites. These wells are sampled annually as part of the long-term monitoring program.

Associated Impacts:

- About 1,500 gallons of purge water avoided per year
- About 15,000 feet of tubing eliminated per year

EXAMPLE 2

Estimated Annual Reductions
GHG Emissions (metric tons)
↓ 1.1
Energy Used (MMBTU)
↓ 15
Cost
↓ $7,000

BMP Implemented:
Minimize waste generated.

Action:
Worked with regulatory stakeholders to remove a minimum purge volume requirement for groundwater sampling.

Associated Impacts:

- Applicable to about 20 sites with annual groundwater monitoring requirements
- About 2,000 gallons of purge water avoided per year

EXAMPLE 3

Estimated Annual Reductions
GHG Emissions (metric tons)
↓47
Energy Used (MMBTU)
↓ 600
Cost
↓ $100,000

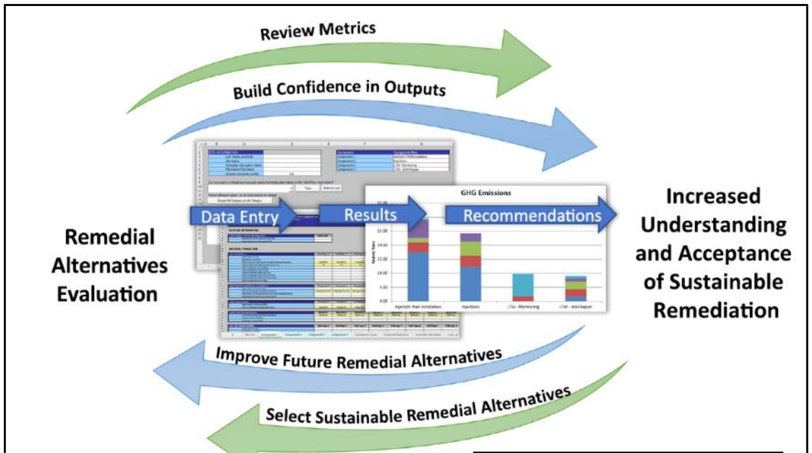
BMP Implemented:
Select local waste disposal facilities to minimize transportation impacts.

Action:
Disposed of aqueous waste in an on-site groundwater treatment plant versus at an off-site facility.

Associated Impacts:

- Avoided 26,000 road miles per year
- Reduced road congestion and traffic through neighborhoods

EXAMPLE 4



Data Feedback Virtuous Cycle
Source: P. Favara et al., 2019. Remediation. 29:5–30. Click **here** to access.

BMP Implemented:
Conduct a qualitative sustainability assessment during remedy evaluation and selection process.

Action:
Completed a SiteWise™ assessment for each remedial alternative, and considered assessment results as part of the short- and long-term effectiveness and permanence criteria during remedy evaluation.

Associated Impacts:
Although the footprint analysis generally did not change the results of the remedy evaluation and selection process, it provided insights into opportunities to reduce the footprint of the remedy during remedial design and triggered the data feedback virtuous cycle (see figure above).

SELF DECLARATION TRIGGERED A VIRTUOUS CYCLE

2017:
SELF DECLARATION

- **Action**
  - Completed self declaration
  - Documented BMPs historically implemented
- **Result**
  - BMPs intentionally reviewed and applied during future project work

2018:
INJECTION PILOT #1

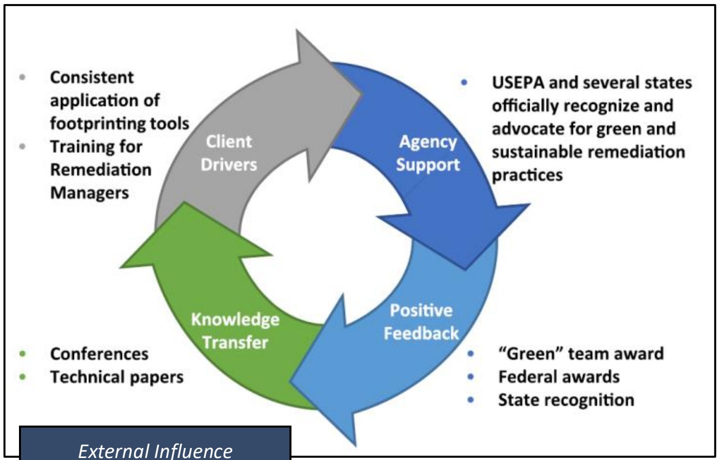
- **Action**
  - Identified new BMP (reduce potable water)
  - Used extracted groundwater instead of water from hydrant for injections
- **Result**
  - Potable water consumption reduced by about 30,000 gallons with no additional cost

2019:
INJECTION PILOT #2

- **Action**
  - Identified challenge (historical injections difficult in this area)
  - Recirculated groundwater as EVO chase water
- **Result**
  - Reduced potable water usage and enhanced distribution of injections

KEY LESSONS LEARNED

- The size of the facility and environmental program allowed small changes to have large impacts on environmental footprint reductions.
- Documenting previously implemented sustainable BMPs triggered the external influence virtuous cycle (see figure to right) and led to more sustainable practices.
- Although ASTM's Standard Guide for Greener Cleanups focuses solely on reducing environmental footprints, implementing these BMPs often also reduced costs and had a positive impact on social footprints (e.g., the reduction of road-miles traveled reduces congestion on roads or traffic through neighborhoods).



External Influence Virtuous Cycle
Source: P. Favara et al., 2019. Remediation. 29:5–30. Click **here** to access.

FOR MORE INFORMATION…

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