



## CleanWay<sup>®</sup> Metals Removal Media

### Features & Benefits

- Targets heavy metals including zinc, copper, lead and more
- Carefully tested specialized media addresses site-specific pollutants and reduces effluent concentrations
- Highly adsorptive media prevents release of pollutants once adsorbed
- Handles high flow rates

### Applications

- Stormwater
- Industrial and commercial facilities
- Industrial stormwater permit holders
- Metal, coating and plating facilities
- Buildings with metal roofs
- Potable water filtration plants
- Auto dismantling
- Port facilities
- Harbor sediment and dredging
- Ship bilge water or dry dock facility
- Groundwater remediation
- Waste handling and transport
- Municipal sewage
- Mining operations
- Bioreactor sediment
- Filter cakes
- Lime-generated precipitates
- Drilling muds
- Soil

For highly effective removal of metals from stormwater, industrial and wastewater discharge, CleanWay<sup>®</sup> offers a proven, proprietary medium that efficiently removes heavy metals through ion adsorption and filtration processes.

CleanWay provides Metals Removal Media products with FORAGER<sup>®</sup> Sponge for various applications, including:

- stormwater filtration devices to replace or augment existing media
- removal of dissolved metals in industrial and wastewater sewer discharge, cooling tower blow down water, ship bilge water, waste streams and any effluent that contains metals
- capturing high levels of dissolved metals and reducing insoluble components

To address site-specific water quality requirements, we work with you to determine the right media blend.

### Targeted Metals

CleanWay metals removal media reduces and removes zinc, copper, lead and other heavy metals commonly found in stormwater and industrial process water discharge. With high ion adsorption capabilities and quick and aggressive kinetics, dissolved metals are captured and held in the media so they won't leach out – and runoff or discharge runs clear.

### Retrofits and New Sites

These products work in standard catch basins, filter vaults and downspout filtration units, in both retrofits and new sites.

For commercial, industrial and residential sites, our customized media can be deployed in:

1. New installations with the media blend incorporated into CleanWay catch basin filtration systems
2. Retrofits for other manufacturers' structural BMPs—by safely and simply replacing the filtration system's current media
3. Custom fabricated pressure or gravity fed systems for addressing specific considerations at industrial sites
4. Adsorption booms

***Learn more about effective metals removal for In Situ/Passive and Solids/Sludge applications on page 2.***

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[www.cleanwayusa.com/metals-removal-media.php](http://www.cleanwayusa.com/metals-removal-media.php)

CleanWay Environmental Partners, Inc.  
PO Box 30087  
10620 NE Marx Street  
Portland, Oregon 97294

Toll free 800-723-1373  
Tel 503-280-5102  
Fax 503-288-3658

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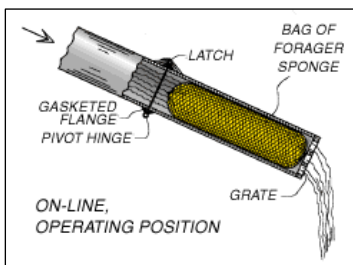
## CleanWay Metals Removal Products for In Situ and Passive Applications

CleanWay offers the ideal solution for reduction of heavy metals from industrial effluents, landfill leachates, stormwater and

other types of non-point source pollution where unattended gravity flow occurs.

Available exclusively from CleanWay®, FORAGER Sponge consists of a multitude of highly adsorbent half inch cubes combined in a conduit—sized for the flow volume at each location—with connecting fittings. Or, sponge cubes can be combined in elongated fishnet bags as adsorption units that can be easily used within a conduit. Sponge cubes confined in a conduit offer little impedance to water flowing through the conduit, and are not clogged by suspended solids.

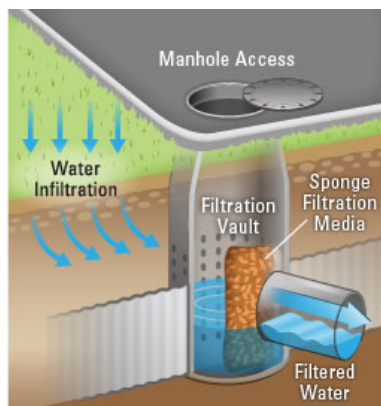
*The remediation of ground water using FORAGER® Sponge is described in EPA Superfund Innovative Technology Evaluation Report EPA/540/R-94/522.*



This typical example shows a gravity-flow installation for treating an industrial discharge, where a pivoted section of pipe with a downstream retaining grate holds an adsorption unit. This installation is well suited for polishing an

effluent stream to remove pollutants that have survived conventional upstream remediation treatments.

Because ambient water pressure is adequate to cause penetration of the confined bed of Sponge, these installations can be employed in remote or unattended locations, and even monitored by radio-transmitting sensors. Fishnet installations can be periodically retrieved and replaced with fresh units. In situ remediation of ground water is achievable by positioning fishnet containers of Sponge vertically at the gate of a barrier wall funnel system.



### How long do they last?

Operational lifetime of an adsorption unit depends on various factors such as unit size, cumulative flow volume, concentration of absorbable pollutants, and adsorption efficiency of the unit within a specific treatment system.

For example, a cubic foot of Type M FORAGER Sponge can hold about 190 grams of lead at saturation. If the water to be treated contains 1 ppm of lead, the unit is achieving 100% lead removal and not absorbing anything else, one cubic foot of Sponge can treat 50,160 gallons of water. At an average flow rate of 1000 gal/week, one cubic foot will last almost a year.

## FORAGER® Sponge for Solids/Sludge Applications

FORAGER Sponge is highly effective for treatment of solids, sludge and slurries derived from:

|                      |                              |
|----------------------|------------------------------|
| Municipal Sewage     | Harbor Sediment and Dredging |
| Mine Tailings        | Lime-Generated Precipitates  |
| Bioreactor Sediments | Filter Cakes                 |
| Incinerator Ash      | Soil                         |
| Drilling Muds        |                              |

Sponge pores are self-filtering to prevent total occlusion of the active polymer component. In a typical application, the substrate to be remediated is adequately diluted with water to produce pourable, thin slurry. Sponge cubes are added in proportion of 1 to 10 cubic feet of cubes to 200 cubic feet of slurry. The mixture is agitated gently for 2 to 24

hours, preferably using a rotary or tumbling mode. Agitation can be achieved in drums, tanks, tunnels and concrete delivery trucks - preferably rotating in the range of 0.5 to 2 rpm. Once



treated, mixture is poured through a .25 to 40 inch mesh screen, retaining the cubes while allowing passage of the dispersion.

In some applications, elevated temperatures shorten the treatment time. Solvating agents may be added to the slurry to expedite transfer of the metal from the suspended particles to the Sponge. For example, citric or acetic acids might be employed in certain metal-removing applications.

### How long does it last?

The duration of treatment depends upon several factors:

- Amount of pollutant to be removed
- Desired removal efficiency
- Nature of bonding forces which cause the pollutant to be attached to the suspended particles
- Consistency of the slurry
- Average size of suspended particles
- Affinity of the Sponge for the targeted pollutants

### Maintenance & Disposal Options

FORAGER® Sponge is non-toxic, bio-degradable, and non-hazardous prior to use, and does not contain materials that require special handling or pose any threat to human health or the environment. After the sponge has adsorbed metal ions, metal is bound to the sponge and will not be released without special chemical treatment. The metals are now in a solid waste form.

1. CleanWay recommends that used sponge be disposed of at an approved solid waste disposal facility. Disposal regulations vary greatly by state and even from one disposal facility to another. Consult your local waste disposal authority for details.
2. Saturated sponge may be disposed of by compaction. If the sponge has been exposed to potentially toxic metals (mercury or lead), analysis may be needed.
3. Used sponge can also be blended into feed stock at a plywood factory.
4. Fishnet installations can be periodically retrieved and replaced with fresh units.
5. While certain metals (i.e. copper) will alter the color of the sponge, others will not present a visual indicator of media saturation. Periodic analysis of effluent will be required to determine when sponge should be replaced.