

# CASE STUDY 4

## THE SILVAN DISINFECTION PLANT

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### PURAFIL ESD PREVENTS ACCIDENTAL CHLORINE RELEASES 4 THE SILVAN DISINFECTION PLANT



#### ABOUT THE SILVAN DISINFECTION PLANT

Located in the mountains outside Melbourne, the Silvan Disinfection Plant was classified under state government legislation as a major hazard facility.

#### THE PROBLEM

According to plant project manager Stephen Answerth, "Melbourne Water was required to reduce the risk of a chlorine release 'so far as practicable.'"

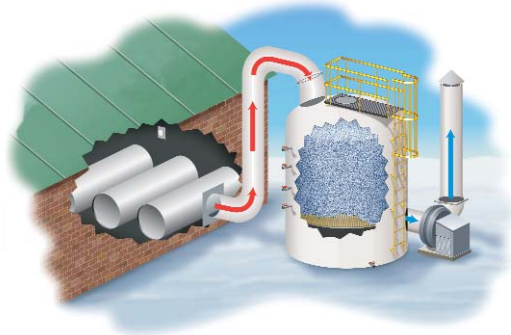
Plant representatives considered using wet scrubbers, which were less expensive but required more maintenance and could harm humans, wildlife, and the environment.

#### PURAFIL PROVIDES THE SOLUTION

To prevent accidental chlorine ( $\text{Cl}_2$ ) releases, Silvan opted to use a Purafil Emergency Gas Scrubber (EGS) that measured 10 feet in diameter by 15 feet tall and held 25,000 pounds of CSO™ media. Local Purafil representative James McIntosh (Airepure Australia) facilitated their request.

In the event of an unintentional  $\text{Cl}_2$  emission, the EGS follows these steps to eliminate the gas from the air:

- 1) Released  $\text{Cl}_2$  is drawn into the scrubber through a blower and contacts dry-scrubbing media.
- 2) Media react with  $\text{Cl}_2$  and permanently convert the gas to non-toxic solids.
- 3) Clean air is discharged to the outdoors with a  $\text{Cl}_2$  concentration of less than 5 parts per billion.



PURAFIL® EMERGENCY GAS SCRUBBER

The EGS requires significantly less maintenance than a wet scrubber. It does not need heaters for outdoor applications, and it has just one moving part—a blower. Instead of using liquid caustic, the EGS neutralizes  $\text{Cl}_2$  with dry-scrubbing media, which are highly porous, spherical pellets that permanently transform the gas into harmless solids. As long as media do not react with  $\text{Cl}_2$ , they do not need to be replaced; they only require occasional testing to determine remaining life and to project change-out dates. Non-toxic and non-hazardous, media do not require special handling and can be disposed in landfills.

"The dry scrubber was selected because it is a simpler system and does not involve having liquid caustic soda on-site," Answerth said.

#### ABOUT PURAFIL ESD

For more than 15 years, Purafil ESD has been the premier single-source provider of clean air to over 100 North American and European clients. A division of Purafil, Inc., Purafil ESD manufactures a broad range of dry-scrubbing media and systems that remove odorous, toxic, and corrosive gases at water and wastewater applications.

Purafil ESD's Emergency Gas Scrubber (EGS) removes the contents of a fully-loaded chlorine ( $\text{Cl}_2$ ) or sulfur dioxide ( $\text{SO}_2$ ) cylinder in a worst-case release scenario and discharges less than 5 parts per billion. The EGS works in temperatures ranging from -40 degrees to 200 degrees Fahrenheit.

In the event of a release, the EGS draws  $\text{Cl}_2/\text{SO}_2$ -laden air through a bed of dry-scrubbing media. The gases react irreversibly with the media's chemical impregnant, and the products of this reaction are solid salts that can be disposed of in common landfills.

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# CASE STUDY 4 THE DETROIT WATER TREATMENT PLANT



## PURAFIL ESD PREVENTS ACCIDENTAL CHLORINE RELEASES

4 THE DETROIT WATER TREATMENT PLANT



### ABOUT THE SPRINGWELLS WATER TREATMENT PLANT

Springwells Water Treatment Plant is a 540 million gallon per day (mgd) surface water treatment plant located in a mixed residential and light industrial area on the west side of Detroit. The largest freshwater treatment plant in Michigan, Springwells draws water from the Detroit River, disinfects it with chlorine, coagulates it with alum, and filters it through high-rate dual-media rapid sand filters. Plant output feeds a distribution system serving approximately 125 communities and 4.3 million consumers. Built in 1931, the original plant was a combined treatment plant and pumping station of 340 mgd capacity. An additional 200 mgd capacity was added in 1958 for a total design capacity of 540 mgd.

### THE PROBLEM

Because source waters are low in organic content, Springwells disinfects the water with liquid chlorine, which is stored in one-ton containers. The plant previously used a sodium hydroxide wet-scrubbing system to neutralize chlorine gas in the event of an accidental release. However, this system contained a messy, highly corrosive lye solution that was hazardous to system operators and attacked piping, valves, and pump seals. Keeping the wet scrubber operational required extensive maintenance, and the system ultimately fell into disrepair, with only the fans working in its last days.

### PURAFIL ESD PROVIDES THE SOLUTION

When Springwells replaced their entire chlorine storage and feed facility, they purchased a Purafil ESD Emergency Gas Scrubber (EGS) from local representative Ryan Forbes (Hi-Tech Environments). The EGS "dwarfed the former wet scrubbing system," said Richard Pernal, filtration supervisor. "With nearly a tenfold increase in storage and feed capacity, special emphasis was given to reliability and safety. A sister plant in our system had upgraded to a Purafil dry scrubber earlier with favorable results. With our system upgrade, the same Purafil scrubber was specified."

The EGS requires significantly less maintenance than

a wet scrubber. It does not need heaters for outdoor applications, and it has just one moving part – a blower. Instead of using liquid caustic, the EGS neutralizes chlorine with dry-scrubbing media, which are highly porous, spherical pellets that permanently transform the gas into harmless solids. As long as media do not react with chlorine, they do not need to be replaced; they only require occasional testing to determine remaining life and to project change-out dates. Non-toxic and non-hazardous, media do not require special handling and can be disposed in landfills.

According to Pernal, "The Purafil EGS has been especially trouble free. There are no corrosive liquids to handle, no valves to foul, no spills to contain. The scrubber's operation is checked on a weekly basis by testing our chlorine detectors with a calibration gas. Our local Purafil representative periodically visits to sample the dry-scrubbing media for analysis."

Pernal has nothing but praise for the dry scrubber. "Our system looks and performs today as well as day one, with virtually no maintenance. The maintenance savings are great, and operations have a system that is not dangerous to operate. We're very happy with our EGS."



## ABOUT THE EGS

Purafil ESD's Emergency Gas Scrubber (EGS) removes the contents of a fully-loaded chlorine ( $\text{Cl}_2$ ) or sulfur dioxide ( $\text{SO}_2$ ) cylinder in a worst-case release scenario and discharges less than 5 parts per billion. The EGS works in temperatures ranging from -40 degrees to 200 degrees Fahrenheit.



PURAFIL® CHLOROSORB MEDIA

In the event of a release, the EGS draws  $\text{Cl}_2/\text{SO}_2$ -laden air through a bed of dry-scrubbing media. The gases react irreversibly with the media's chemical impregnant, and the products of this reaction are solid salts that can be disposed in common landfills.

## PURAFIL ESD DRY-SCRUBBING MEDIA

- System media are UL Classified Class 2 as non- flammable.
- System media are immediately available for instantaneous reaction.
- Spent media are landfill acceptable before and after use.

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Call Purafil ESD at 1-800-222-6367 for assistance with your air quality concerns or visit our Web site at [www.purafil.com](http://www.purafil.com).

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