United States
Environmental Protection
Agency

EPA/540/M5-88/002
April 1989

EPA

SITE
SUPERFUND INNOVATIVE
TECHNOLOGY EVALUATION

Demonstration Bulletin

Electric Infrared Incineration

Shirco Infrared Systems, Inc.

TECHNOLOGY DESCRIPTION: The electric infrared incineration technology is a mobile thermal processing system which uses electrically powered silicon carbide rods to bring the organic waste to combustion temperatures and then, to incinerate any remaining combustibles in an afterburner. The mobile system is comprised of four components: the electric-powered infrared primary chamber, a gas-fired secondary combustion chamber, an emission control system, and a process management and monitoring control center.

Waste is fed into the primary chamber on a wire mesh conveyor belt and exposed (at temperatures of up to 1850°F) to infrared radiant heat provided by the horizontal rows of electrically-powered silicon carbide rods above the belt (Figure 1). A blower provides air at selected locations along the belt and can be used to control the burning rate of the waste feed and its location while burning on the belt.

The ash material which drops off the belt in the primary chamber is quenched by water sprays utilizing scrubber effluent. The ash is held until the PCB content is determined to be less than 1 ppm.

Gaseous volatiles from the primary chamber are destroyed in the fired secondary chamber. Gases are ducted through the emissions control system, which consists of a venturi scrubber for particulate matter and a packed tower to neutralize acid vapor. An induced draft blower draws the cleaned gases from the scrubber into the free standing exhaust stack.

The scrubber liquid effluent then flows into a clarifier where scrubber sludge settles out for disposal. Finally, the scrubber effluent flows to an effluent tank, through an activated carbon filter for reuse, or to a POTW tank for disposal.

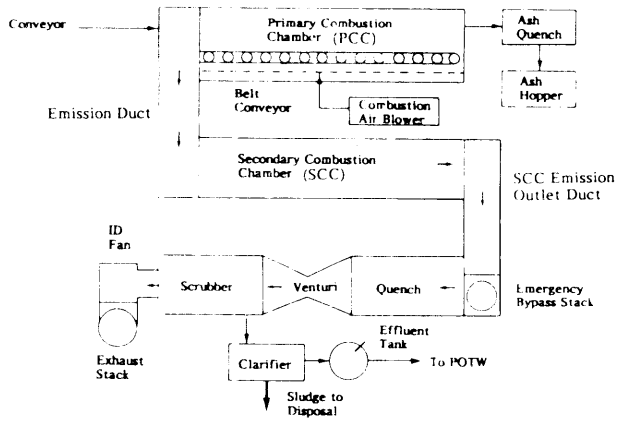

Figure 1. Peak oil Incineration unit process diagram.

WASTE APPLICABILITY: This technology is suitable for organic wastes contained in soils or sediments. Liquid organic wastes can also be handled once they are mixed with sand or soil.

DEMONSTRATION RESULTS: Demonstration of the electric furnace was carried out at full-scale at an oil refinery site near Tampa, Florida, from August 1 to 4, 1987. As part of the removal operation by EPA Region IV, a nominal 100-ton per day Shirco

United States
Environmental Protection
Agency

EPA/540/M5-88/002
April 1989

SITE
SUPERFUND INNOVATIVE
TECHNOLOGY EVALUATION

Demonstration Bulletin

Electric Infrared Incineration

Shirco Infrared Systems, Inc.

TECHNOLOGY DESCRIPTION: The electric infrared incineration technology is a mobile thermal processing system which uses electrically powered silicon carbide rods to bring the organic waste to combustion temperatures and then, to incinerate any remaining combustibles in an afterburner. The mobile system is comprised of four components: the electric-powered infrared primary chamber, a gas-fired secondary combustion chamber, an emission control system, and a process management and monitoring control center.

Waste is fed into the primary chamber on a wire mesh conveyor belt and exposed (at temperatures of up to 1850°F) to infrared radiant heat provided by the horizontal rows of electrically-powered silicon carbide rods above the belt (Figure 1). A blower provides air at selected locations along the belt and can be used to control the burning rate of the waste feed and its location while burning on the belt.

The ash material which drops off the belt in the primary chamber is quenched by water sprays utilizing scrubber effluent. The ash is held until the PCB content is determined to be less than 1 ppm.

Gaseous volatiles from the primary chamber are destroyed in the fired secondary chamber. Gases are ducted through the emissions control system, which consists of a venturi scrubber for particulate matter and a packed tower to neutralize acid vapor. An induced draft blower draws the cleaned gases from the scrubber into the free standing exhaust stack.

The scrubber liquid effluent then flows into a clarifier where scrubber sludge settles out for disposal. Finally, the scrubber effluent flows to an effluent tank, through an activated carbon filter for reuse, or to a POTW tank for disposal.

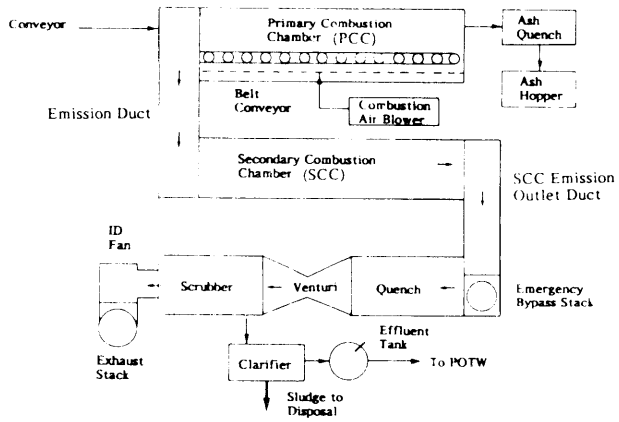

Figure 1. Peak oil Incineration unit process diagram.

WASTE APPLICABILITY: This technology is suitable for organic wastes contained in soils or sediments. Liquid organic wastes can also be handled once they are mixed with sand or soil.

DEMONSTRATION RESULTS: Demonstration of the electric furnace was carried out at full-scale at an oil refinery site near Tampa, Florida, from August 1 to 4, 1987. As part of the removal operation by EPA Region IV, a nominal 100-ton per day Shirco