
Date: November 23, 2009

To: Environmental Quality Commission

From: Dick Pedersen, Director

Subject: Agenda item C, informational item: Best available technology for the treatment of spent carbon at the Umatilla Chemical Agent Disposal Facility
December 10-11, 2009 EQC meeting

Purpose of item This item provides information describing the Department of Environmental Quality's activities to determine the best available technology for treatment of spent carbon, including spent sulfur-impregnated carbon used to capture mercury emissions, at the Umatilla Chemical Agent Disposal Facility. The commission will be asked to make this determination in early 2010.

Background Oregon state law requires the Umatilla Chemical Agent Disposal Facility to use disposal methods that are the best available technology. To do so, EQC must determine that any proposed method is the best available technology to meet all regulatory criteria and protective of public health and the environment. In 1997, DEQ determined that the best available technology for disposal of chemical agent and munitions at the Umatilla facility was the Army's baseline incineration system, which met all applicable regulatory criteria. Following DEQ's determination, the EQC found that incineration was the best available technology.

In the final judgment in *GASP, et al, v. EQC, et al*, Case No. 9708-06159, known as GASP IV, the judge remanded to the EQC three findings on the best available technology for the Umatilla facility. One of the remanded determinations is "the destruction of hazardous waste originally intended for the dunnage incinerator." The Umatilla facility's hazardous waste permit requires on-site treatment of all agent-contaminated wastes.

In evaluating the determination for the destruction of hazardous waste originally intended for the dunnage incinerator, EQC determined, in September 2007, that the best available technology for treatment of secondary wastes was incineration in the metal parts furnace and deactivation furnace system with micronization for treatment of spent carbon. In September 2008, the commission determined that mercury-contaminated spent carbon must remain in storage at the Umatilla Chemical Agent Disposal Facility until a best available technology determination addresses its disposition.

The use of the deactivation furnace system, along with a pretreatment

micronization process, was determined to be the best available technology for agent-contaminated spent carbon. As the chemical demilitarization program has matured, new evidence indicates that DEQ and EQC should reevaluate the best available technology for agent-contaminated carbon.

Four factors prompt reconsideration of BAT for spent carbon:

1. The quantities of agent-contaminated carbon requiring treatment are projected to be much less than originally estimated, lessening the need for a large-capacity treatment operation. Of the 720,000 pounds of spent carbon to be generated over the life of the facility, only 48,000 pounds are expected to be agent-contaminated and require treatment.
2. Operational experience at Johnston Atoll Chemical Agent Disposal System has revealed significant drawbacks associated with the micronization system, such as the risk of explosion due to the creation of carbon dust.
3. New information indicates that transport of secondary waste to offsite commercial facilities can be achieved safely.
4. New technologies for treatment of secondary wastes have been developed and tested.

Based on these factors, DEQ reevaluated the disposal technologies for agent-contaminated carbon. Much of the spent carbon generated at the Umatilla facility is expected to meet permit compliance concentration limits that establish levels at which the spent carbon is considered agent-free. No on-site treatment is required for agent-free spent carbon; therefore, no best available technology determination is required.

DEQ has not addressed sulfur-impregnated carbon, a subcategory of agent-free spent carbon, in a best available technology determination. The sulfur-impregnated carbon filters are in the pollution abatement system filter system, where no agent contamination is expected. The Army will sample the filters to verify they are not contaminated, and compare the sampling results to the permit compliance concentration limits. The filters, however, may contain mercury at levels requiring treatment, consistent with Resource Conservation and Recovery Act criteria, prior to disposal as hazardous waste. If the filters are agent-free, they may be shipped offsite as routine hazardous waste.

Key issues

There are two key issues:

1. What is the best available technology for treatment of agent-contaminated spent carbon? DEQ is proposing a reevaluation of the secondary waste best available technology determination for spent carbon.

Based on the limited amount of agent-contaminated carbon requiring on-

site treatment, and additional information obtained on treatment technologies, DEQ will ask EQC during its February 2010 meeting to reconsider the best available technology for agent-contaminated spent carbon. In order to determine the best available technology for the agent-contaminated spent carbon, DEQ is exploring five demonstrated technologies:

- Offsite disposal in a commercial Resource Conservation and Recovery Act-permitted incinerator.
- Deactivation furnace system with carbon micronization, a treatment process in which the carbon is pulverized to a powdery consistency prior to being fed to the furnace.
- Metal parts furnace, a three-zone incinerator that uses a conveyor to transport waste through the zones and which is currently used to treat mustard ton containers and secondary waste.
- Autoclave, a treatment apparatus that uses high-pressure steam at an elevated temperature to destroy agent.
- Plasma energy pyrolysis system, a process that uses high-temperature plasma induced by electrical discharge to convert organic materials to a gas, resulting in the decomposition of the organic materials into elemental components.

2. What is the appropriate disposition of agent-free, mercury-contaminated spent carbon? DEQ is not investigating technologies for this material, because the waste should be free of agent contamination. DEQ is proposing that, upon confirmation of agent-free status, this waste stream is managed as routine hazardous waste and transported offsite, for treatment of mercury as needed, and then disposal.

Next steps DEQ will hold a public comment period to solicit information and opinions on the available treatment technologies. DEQ will present its recommendation as an action item at the February 2010 EQC meeting for a determination on the best available technology for treatment of agent-contaminated spent carbon and mercury-contaminated spent carbon.

Attachments A. GASP IV, Case No. 9708-06159, Judgment (DEQ Item No. 07- 227)
B. EQC, September 4, 2008, "Final Order Determining Best Available Technology for Mustard Agent Containing Higher than Anticipated Levels of Mercury" (DEQ Item 08-0994)

Available upon request 1. US Army Chemical Materials Agency (CMA), 2009, "Umatilla Chemical Agent Disposal Facility, Best Available Technology Evaluation for Agent Contaminated Carbon, Final Draft," dated August 24, 2009 (DEQ Item 09-0893)
2. CMA, 2008, "Bounding Transportation Risk Assessment for >1 Vapor

Screening Level (VSL) Waste,” September (DEQ Item 09-1117) CMA, 2008, “Addendum to the Bounding TRA: Assessment of Risk from Offsite Shipment of Spent Carbon,” Final, June (DEQ Item 09-1119)

3. National Research Council, Committee to Examine the Disposal of Activated Carbon from the Heating, Ventilation, and Air Conditioning Systems at Chemical Agent Disposal Facilities, 2009, “Disposal of Activated Carbon from Chemical Agent Disposal Facilities,” Washington, D.C. (DEQ Item 09-1040)

4. URS, 2009, “Carbon Treatability Study Report, Umatilla Chemical Agent Disposal Facility,” February 16 (DEQ Item 09-1064)

5. Continental Research and Engineering, LLC, 2008, “Autoclave Evaluation Test Report,” April 21 (DEQ Item 09-1120)

6. CMA, 2005, “Secondary & Closure Waste Treatment—Evaluation of Plasma Energy Pyrolysis System (PEPS),” June, Draft (redacted to remove financial information) (DEQ Item 09-1121)

Approved:

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