



PH Arkema AR

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Environmental Cleanup Office

May 18, 2006

Mr. Matt McClincy
Department of Environmental Quality
2020 S.W. 4th Avenue, Suite 400
Portland, OR 97201-4987

Dear Mr. McClincy

This letter has been prepared in response to the Department's letter dated April 18, 2006 inquiring about the potential generation of dioxins and/or furans from former processes at the Arkema site. Specifically, you requested:

1. *Identification of the manufacturing processes conducted at the site that could potentially form dioxins and furans.*

A literature review regarding dioxin/furan generation from chlorine cells indicates that these materials have been associated with chlorine production from some cells using graphite anodes. Arkema's Portland plant started chlorine production in 1946 with cells using graphite anodes. These cells were operated in an area of the plant that later became the Maintenance Shop. (See Figure 1). These chlorine cells were operated from 1946 to 1971 when they were shut down and replaced by a new chlorine cell room located plant north of the old cell room. It is unknown if Arkema's older chlorine cells had the potential for generating dioxin/furan materials. Arkema's newer chlorine cell room was initially started in 1962 and expanded over the years until plant shut-down in the spring of 2001. The new cell room used metal (titanium) anodes.

Arkema has also reviewed the Technical Support Document referenced in the Department's letter dated April 18, 2006. That document concludes that dioxins have been detected in chlorine gas condensates and in treated waste effluents from the chlor-alkali manufacturing processes. The document does not provide specifics regarding the type of chlorine cells used at each facility nor the type of anodes within the cells.

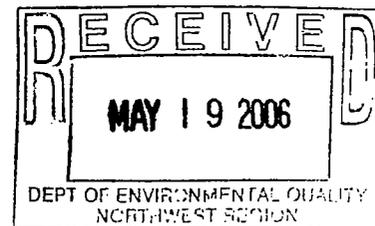
2. *Identification of the products or wastes that could have contained dioxins and furans.*

USEPA SF



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Legacy Site Services LLC
468 Thomas Jones Way
Exton, PA 19341-2528
Tel: 610 594-4421





If Arkema's older chlorine cells that used graphite anodes had the potential to generate dioxins/furans, these materials could have been contained in the chlorine product, wash water, or solid wastes generated from rebuilding the cells. The chlorine produced in these cells was liquefied on site and shipped via railcars, trucks, and cylinders to customers located throughout the west coast.

Based on information from former employees, approximately once each year these chlorine cells needed to be rebuilt. The process involved dismantling the cell and placing the spent cell components into open metal containers. The metal containers were transported to the bank area along the river where the contents of the containers were used as fill material. The components consisted of spent graphite anodes, spent concrete cell heads, various steel parts and possibly asbestos materials. Wash water used during the cell dismantling process was discharged through a pipe to the Willamette River just north of the No. 1 Dock. (See Figure 1). It is possible that some asbestos material could have been disposed of off-site with plant trash. No asbestos from the older graphite anode chlorine cells was placed into the disposal trenches on Lots 1 and 2 that were subsequently excavated.

Chlorine condensate from the old chlorine cell room flowed through an acid stripper where hydrochloric acid was used to strip chlorine from the liquid condensate. The condensate was then discharged to the river through the outfall pipe described above.

Chlorine condensate from the new chlorine cell room was also treated in an acid stripper located on the south side of the new cell room. The stripper used hydrochloric acid to remove the chlorine from the condensate and the chlorine was fed back into the main chlorine header. The stripped condensate was conveyed to a tank-based wastewater treatment system for neutralization of pH and any remaining chlorine residual. Final effluent from the wastewater treatment system was conveyed to the river through current Outfall 004 or another former outfall in the same area.

3. Identification of product and waste management activity at the facility that could have resulted in releases of dioxins and furans to the environment.

As indicated previously, the chlorine produced in the older graphite anode cells was sold throughout the Northwest. It is not known if the chlorine product contained dioxin impurities. It is not believed that chlorine from the newer cell room contained dioxins. The equipment and tanks used to process and store the chlorine from both cell room processes were sold as scrap metal during the plant demolition process.

As indicated in paragraph #2 above, spent chlorine cells from the graphite anode based process were dismantled and washed to clean the cells during the cell rebuilding process. The wash water was discharged directly to the river through a former outfall located just north of the No. 1 Dock. If these chlorine cells had the potential of generating dioxin like materials, most if not all of these constituents would have been washed to the river. The discharge location is in the middle of the in-water sediment area that is under study through an Engineering Evaluation/Cost



Analysis (EE/CA) effort with oversight from both EPA and DEQ. Recent agreements with EPA call for testing some of the sediment samples for dioxin like constituents.

The solid material used as fill along the riverbank does contain spent graphite anodes and possibly asbestos, but it is not believed these materials could contain any dioxin like constituents. When the anodes and asbestos were in use, they were submerged in a salt brine solution and not exposed to chlorine gas.

The stripped chlorine condensate either entered the river directly through an outfall pipe or was first mixed with other waste waters and was neutralized in the waste treatment system prior to discharge. In either case, these water streams would have mixed with river water and dispersed in the river system.

We believe the field sampling activities required in the EE/CA will properly determine the extent of any dioxin issues related to wastes from the former chlorine production processes.

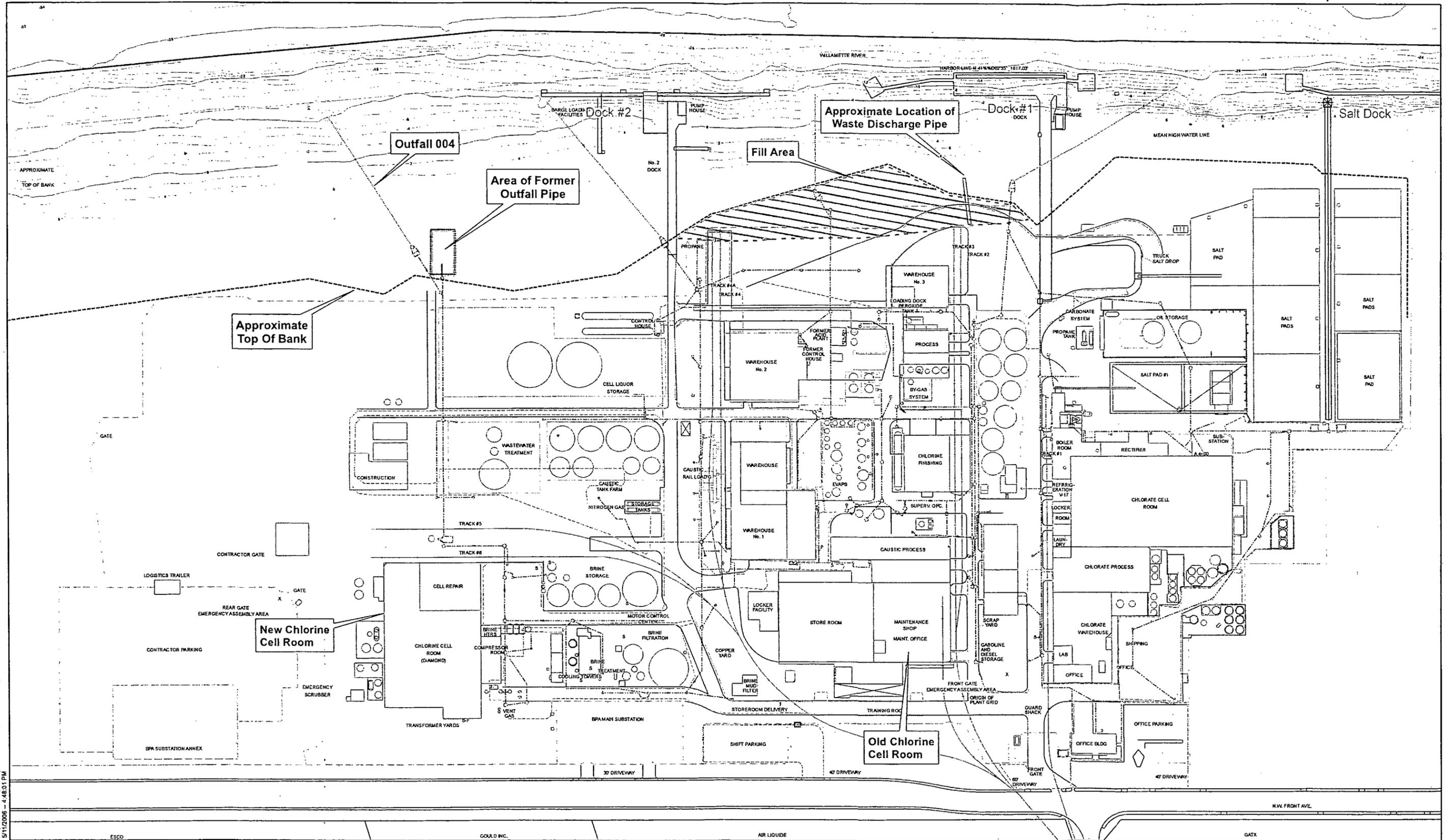
If you have any questions, please feel free to contact me at 1-610-804-0506.

Sincerely,

A handwritten signature in black ink, appearing to read "Todd Slater", followed by the word "for" in a smaller, less legible script.

Todd Slater
Legacy Site Services LLC

Wd:dfdeq



Map Document: (C:\Projects\A\kema-Oil\MXD\A\kema_Historical_Users_Oil_RLN_200605.D.mxd) 5/11/2006 4:48:01 PM



0 50 100 200 Feet



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|----------------------|----------------|--------------|-----------------|--------------|-----------|
| --- Storm Drain | CAD Line Layer | — Concrete | --- Impervious | --- Platform | --- Sewer |
| □ Navigation Channel | — Property | — Curb | --- Fence | --- Railroad | --- Tanks |
| | — Building | — Dock | --- Top of Bank | --- Roads | --- Tanks |
| | — Building | — Foundation | --- Pond Waste | --- Roads | |

Note: Most buildings and structures have been demolished or removed.

Figure 1
Facility Map