

## Closing in on Closure

# K Basins Closure Project grouts KW Basin discharge chute

The K Basins Closure (KBC) Project has completed filling the discharge chute of the KW Basin with grout, permanently sealing the approximately 10,000-cubic foot area that formerly joined the basin with the K West Reactor. The grout, a specially formulated cement mixture, was poured into the trapezoid-shaped chute in an accelerated effort in late September.

According to KW Basin Closure Director Jim Mathews, grouting the discharge chute has several benefits. "Although there is no history of this basin's leaking," he said, "it has passed its design life, and therefore, had the potential to leak. Now the possibility of a leak from the construction joint in this area has been totally removed. Also, grouting isolated the basin from the adjacent reactor, thus meeting a major end point necessary for turning over the 100-K Area to the River Corridor contractor."

In addition, to pour in the grout, approximately 105,000 gallons of contaminated water – 10-percent of the total volume of water in the KW Basin – were permanently removed. This action satisfied Tri-Party Agreement (TPA) milestone M-34-21-T01 more than three months early. The milestone calls for beginning to permanently remove water from the KW Basin by Dec. 31, 2005.

"Polar tanker" trucks, each capable of holding 4,500 gallons, began dewatering the basin in mid-August at the rate of three loads every two days. The water was taken to the 200 Area Effluent Treatment Facility (ETF), where it will be treated and disposed.

Before it was grouted, the KW Basin discharge chute was cleaned of its fuel and sludge, and some pieces of discarded equipment were removed. However, some low-level debris remained, including several fuel racks formerly used to hold the canisters of irradiated fuel. This debris – or solid nuclear waste – was allowed to remain in the chute and be grouted in place.

During historical plutonium-production operations, irradiated (spent) fuel elements were pushed from the reactor into the spent fuel basin through the discharge chute. On the reactor side, the chute has sloping walls, and was lined with a metal "trampoline" that served to blunt the impact of the spent fuel elements as they fell from tube ends at the reactor's rear face. The chute was filled with approximately 17 feet of water and still held this level of water until the recent de-watering and grouting.

Richard Maurer, KBC project manager for the grouting effort, explained that the grouting of KW Basin discharge chute was done somewhat differently from that of the KE Basin, which was finished a year ago. "Lessons learned from the K East work last year were applied," he said. The biggest difference was that the discharge chute

was completely dewatered before the grout pours were made. Then, the four pours occurred in rapid sequence in five days. In the K East Basin, the three grout pours were made over a period of about six weeks.

"In the K East Basin work," Maurer said, "we decided to be extra slow and cautious, since we hadn't performed this work before in the unique K Basins' environment. At that time, we directed the vendor to add quite a lot of retardant to the grout mixture, to assure that it dried slowly and that temperatures remained within acceptable bounds. This time, using the experience we gained, we added less retardant and let the grout harden more quickly, thus assuring an efficient and safe job."

Performing the work quickly brought several added advantages, including the chance to capitalize on availability of the vendor and key materials such as cement and fly ash. A nationwide shortage of cement this year, Maurer said, "is now likely to be exacerbated by re-building needs in the South due to Hurricane Katrina. So we're extremely happy we planned to get this job done in September."

The grouting vendor used a long lance to inject the grout beginning at the bottom of the chute. The company installed a temporary grout plant and wash-out area just outside the KW Basin, and delivered the materials into the chute via a thick hose. KBC operators, radiological control technicians, engineers and others supported the installation.

Mathews and Maurer both praised the professionalism and efficiency of the vendor and Site workers. They especially credit the KBC nuclear chemical operators, radiological control technicians, and drivers with the smooth progression of work.

"Everyone cooperated," said Maurer, "and success was absolutely due to teamwork. Once again, our workers have shown that they can perform safely and efficiently."

Next steps in KBC Project

work include continuing to retrieve and contain sludge in both basins, and installing the Hose-in-Hose transfer system (see Sept. 19 issue of *FYI*). To date, 83 percent of the 42 cubic meters of sludge in the KE Basin have been contained. Debris removal also continues in both basins. Eventually, both of the K Basins will be encapsulated with grout, and then cut up into blocks for disposal at Hanford's Environmental Restoration Disposal Facility. Fluor Hanford's "grout and remove" strategy was approved by the Department of Energy's Richland Operations Office as a safe and innovative method to remediate the highly contaminated basins.

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KBC



The first pour of grout in September hardens (both photos) after the KW Basin discharge chute was filled from the bottom up to the nine-foot level. Susequent pours raised the level to 17 feet.