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By Rick Anstey, Denver Infill Blog

caisson [kā-sän] noun. A watertight chamber used in construction work under water or as a foundation.

The pieces of equipment in the photo above are building caissons for the train bridges that will be part of the roof of the bus terminal. (I had to look up the definition of a caisson.) There will be eight sets of tracks (Amtrak, Ski Train, commuter rail) requiring four bridges. As we know, trains can be pretty heavy so the bridges will require deep, sturdy foundations. Therefore, the caissons.

Colorado's tough arsenic limits delaying projects in Denver, agencies say

November 17, 2011

By Jeffrey Leib, The Denver Post

RTD and the Denver Union Station Project Authority pump groundwater this week from the underground bus-station excavation site near Union Station into the South Platte River after they installed filtration equipment to screen for arsenic. (Cyrus McCrimmon, The Denver Post)

Colorado officials' imposition of an unusually stringent standard for arsenic levels allowable in groundwater discharged into the South Platte River has stymied CDOT and RTD projects in ways the agencies say are unworkable.

The limits have forced them to consider options that either failed to meet the standard or proved to be extremely expensive.

The Colorado Department of Transportation, after it could not meet the arsenic standard, had to take the environmentally unfriendly tack of trucking groundwater 7 miles away to dump in another section of the Platte where the arsenic limit was higher.

Projects affected by the arsenic limit include excavation for an underground bus station at Denver's Union Station and CDOT's $37 million highway improvement at Interstate 25 and West Alameda Avenue.

The Regional Transportation District and the Denver Union Station Project Authority are building the bus station as part of the $488 million Union Station redevelopment.

CDOT, RTD and the project authority say the state Water Quality Control Commission has set an arsenic threshold for the central Denver stretch of the Platte that is so low, no tests can measure it.

The transportation agencies and the city of Denver recently asked the water quality commission to raise the level of arsenic permissible in groundwater pumped into the downtown segment of the Platte.

At the I-25/Alameda highway project, CDOT needed to dispose of more than a million gallons of water tainted with arsenic and other chemicals.

Because the agency could not meet the current arsenic standard for discharges into the nearby portion of the river, it transported the water in 4,000-gallon tanker trucks for dumping at the alternate Platte site. That transfer took about 250 trips, said Jim Paulmeno, a CDOT environmental manager on the project.

CDOT also had to replenish the trucked water by pumping a million gallons of city water from a hydrant into the Platte.

The agency argued to the Colorado Department of Public Health and Environment that the trucking option would be expensive and hurt air quality because of extra vehicle emissions within an area already with air-quality challenges.

CDOT spent $1.5 million testing various groundwater-treatment technologies before giving up on the effort to meet the stringent arsenic standard.

Citing a similarly onerous economic weight, the agencies told the water quality commission: "In the Denver Union Station project, RTD estimates that it will have to spend $1.6 million of public money to treat and discharge nearly 200 million gallons of water."

The high water table in the ground west of Union Station, where the "bus box" excavation is underway, requires pumping groundwater from the excavation into the nearby Platte.

CDOT also encountered a high water table at its I-25/Alameda project.

In January 2010, state health officials set the limit for arsenic at 0.02 micrograms per liter of water.

Officials acknowledge, however, that there is no way to scientifically test for such a low presence of arsenic. The lowest recognized level at which arsenic is detectable is about 1 microgram per liter, said Martha Rudolph, director of environmental programs for the health department.

The 0.02-micrograms-per-liter threshold is a "risk-based" health standard set very low because of arsenic's role as a carcinogen, she said, adding that it does not consider economics in its calculation.

The Water Quality Control Commission, at its Dec. 13 meeting, is expected to hear arguments from CDOT, RTD and their partners that the state should adopt another accepted standard to limit arsenic concentrations in discharged water — most likely a 7.6-micrograms-per-liter standard that applies when fish are taken from the river and consumed.

Rudolph noted that the 7.6-microgram "fish standard," which accounts for the danger of the bioaccumulation of arsenic in fish tissue, still is below the 10-micrograms-per-liter standard for arsenic in drinking water the public gets from the tap.

She said the stringent standard of no more than 0.02 micrograms per liter is a "legitimate number," but its inconsistency with the 7.6-microgram fish standard has left state health officials "scratching our heads."

The health department is supportive of altering the arsenic standard to the 7.6-microgram level, Rudolph said.

Union Station authority project manager Bill Mosher said that about six weeks ago officials put their plan to dewater the bus station site on hold while the authority searched for the best way to comply with the 0.02 microgram standard.

He said the Union Station project was able to start discharging at the site about a week ago after installing filtration equipment that shows arsenic levels do not exceed 0.6 micrograms per liter.

If the Water Quality Control Commission allows construction projects to discharge water with higher levels of arsenic, while still meeting state requirements, it could save the Union Station project "a couple hundred thousand dollars," Mosher said, because the authority will be able to return some of its filtration equipment.

In 2009 and 2010, the Union Station project pumped more than 170 million gallons of groundwater from another section of the bus-station site and filtered the water for iron.

Testing for arsenic was not a requirement of the earlier dewatering permit Union Station officials obtained from the health department, and it only surfaced as an issue with the permit for this year's second phase of excavation for the bus station, Mosher said.