

GROUNDWATER AT CITY PARK GOLF COURSE MYTHS VERSUS FACTS

MYTH	FACT
Groundwater flows in underground caverns and rivers.	Groundwater flows through cracks and pores between soil and rock particles.
MYTH	FACT
Groundwater is always pure because soil filters out all impurities.	Bacteria in water can be filtered out by soil, but many dissolved minerals and chemicals are not changed and remain in the water.
MYTH	FACT
If groundwater is stained it must be polluted.	Stained water doesn't necessarily mean that it's unsafe.
MYTH	FACT
The composition of groundwater is always the same.	All groundwater has different composition of constituents through natural variations within the aquifer. Virtually all groundwater comes from precipitation that soaks into the soil and passes down to the aquifer. Rainwater has a slightly acidic pH, therefore it tends to dissolve solid minerals in the soil and in the aquifer. Different rocks, e.g., sandstone, limestone and basalt all have different minerals and groundwater in contact with these materials will have different compositions. Some of the constituents found in groundwater, however, are not abundant in common rocks and minerals, for example, chloride (Cl) and sulfate (SO ₄). The longer the groundwater is in contact with the minerals, the greater the extent of its reaction with those minerals and the higher will be the content of dissolved minerals. This is why the groundwater is tested prior to dewatering operations of a construction site.
MYTH	FACT
The City and County of Denver did not know about the groundwater or expect it to be a problem.	During early planning, an early subsurface conditions study was completed and the City and County of Denver. This study provided information about the groundwater. All respondents to the request for design-build proposals were given the report from the study. The testing of groundwater is standard operating procedure for construction projects of this size; and what was found in the groundwater at this location is common throughout the city.
MYTH	FACT
The groundwater at the City Park Golf Course project is an isolated contamination event.	Numerous construction sites across the Denver metro area encounter groundwater, depending on the depth of the digging. It is a standard practice to test and filter all groundwater from construction site prior to discharge into the storm sewer system. This is a requirement by the Colorado Department of Public Health and Environment.
MYTH	FACT
The City and County of Denver and Saunders Construction are covering up the contamination of the groundwater at City Park Golf Course.	We've done everything we are supposed to do related to the handling of groundwater and are in full compliance with state and federal regulations. The groundwater has no public health impact, no impact to the final construction completion date, no traffic-related impacts, and no impacts that push us beyond our program budget. The testing of groundwater is standard operating procedure for construction projects of this size; and what was found in the groundwater at this location is common throughout the city.
MYTH	FACT
Saunders Construction dumped thousands of gallons of contaminated water into the storm sewer.	Saunders Construction did not dump groundwater into the sewers before filtering it. The groundwater was tested before pumping it and regular testing is occurring, as required by the discharge permit issued by Colorado Department of Public Health and Environment.
MYTH	FACT
The Uranium found in the groundwater is toxic and/or radioactive, and harmful to health of humans and wildlife.	Uranium was deposited on land by volcanic action over geologic time and is dissolved by rainfall and carried into underground aquifers. It is a common element in the earth's crust (soil, rock) and in groundwater and seawater. The levels of uranium found were below what's allowed in drinking water and below the levels that require filtration.
MYTH	FACT
The Manganese found in the groundwater is toxic and harmful to health of humans and wildlife.	Manganese occurs naturally in surface water and groundwater, especially in oxygen depleted or anaerobic systems. The concentrations of manganese in groundwaters are dependent upon a number of factors such as rainfall chemistry, aquifer lithology, geochemical environment, groundwater flow paths and residence time. Some of these factors can be highly variable over relatively small spatial and temporal scales. Manganese can be leached from overlying soils and minerals in underlying rocks as well as from the minerals of the aquifer itself. Overall, the detection frequency of manganese in groundwater in the U.S. is high (approximately 70% of sites) due to the ubiquity of manganese in soil and rock, but the levels detected in groundwater are generally below levels of public health concern (USEPA, 2002). Similarly, manganese is detected in about 97% of surface water sites (at levels far below those likely to cause health effects) and universally in sediments and tissues of aquatic biota (at levels that suggest that manganese does not bioaccumulate) (USEPA, 2002).