# Chem-Nuclear Site
## ANNUAL UPDATE
# 2014

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*The Chem-Nuclear Site has a routine groundwater and surface water monitoring program. Four times each year, groundwater samples are collected from monitoring wells and from locations in Mary's Branch Creek. The information gathered is used to help understand changes in contaminant concentrations within the groundwater plume. The most recent results for tritium are from samples collected during the second quarter of 2014 (April to June). The highest concentration of tritium continues to be found on site at monitoring well WM-0110 where it was 15,200,000 pCi/L (April). The concentration where the groundwater plume enters Mary's Branch Creek (WC- 0002) was 368,000 pCi/L (April).*

## Surface Water

The surface water "point of compliance" is the point where regulatory limits apply. For the Chem-Nuclear Site this is location WC-0008, measured at Mary's Branch Creek. In April, the level of tritium measured at WC-0008 was 121,000 pCi/L. This is less than the regulatory limit of 500,000 pCi/L and slightly higher than the level measured in April 2013 (81,200 pCi/L). A map showing WC-0008 is provided on the back page. Additional maps are available at **www.scdhec.gov/radwaste**.

The most recent quarterly sampling results (July 2014) indicates the presence of five volatile organic compounds (VOC) present in the creek. Chloroform (7.62 µg/L), 1,1-dichloroethane (2.43 µg/L ), 1,2-dichloroethane (1.24 µg/L), 1,1,2,2-tetrachloroethene (1.16 µg/L) and 1,4-dioxane (456 µg/L) were detected at the concentrations indicated. The concentrations of 1,4-dioxane at WC-002 and WC-008 are slightly higher than concentrations in 2013 and are similar to those measured in previous years. The regulatory limit for chloroform is 80 µg/L. The regulatory limit for 1,2-dichloroethane is 5 µg/L. Regulatory limits have not been established for 1,1-dichloroethane, 1,1,2,2-tetrachloroethene or 1,4-dioxane.

## Trends in Ground Water and Surface Water Data

Chem-Nuclear Site submits an annual trending report by September each year discussing changes in tritium concentrations in groundwater and surface water and changes to the size and shape of the groundwater plume. DHEC reviews the report for accuracy and completeness. In the 2014 annual trending report, 27 monitoring locations (both groundwater and surface water) were evaluated for changes in tritium concentrations. The tritium data indicate that 10 monitoring locations show no evidence of a trend either up or down, four locations show an upward trend, and 13 locations show a downward trend over the most recent five-year period (third quarter 2009 to second quarter 2014).

Data collected from monitoring well WM-0110, the most contaminated well discussed above, show that tritium concentrations have not changed significantly over the last five years. Previous annual reports confirm that concentrations in WM-0110 have remained stable for the last 10 years. Although concentrations in individual monitoring wells change, the overall size and shape (footprint) of the groundwater plume remains stable.

Tritium concentrations at WC-0008 (the surface water point of compliance on Mary's Branch Creek) increased slightly from the same time last year. Data shows, however, that the overall trend in tritium concentrations at WC-0008 has decreased over the five year period. The 2014 annual trending data is available at **www.scdhec.gov/radwaste**.

## Waste Volumes

Since July 2008, the Chem-Nuclear Site only accepts waste from the three member states of the Atlantic Compact – Connecticut, New Jersey and South Carolina. The monthly waste volume received between July 2008 and October 2014 ranged from 0.0 cubic feet for July 2011 to 27,631.70 cubic feet for March 2010. The table below shows the total waste volume for each fiscal year disposed of from the Atlantic Compact member states since the institution of the Atlantic Compact Act. The Act established the limits on waste volume and allowed for the receipt of the out-of-compact wastes only through July 2008.

| FISCAL YEAR | VOLUME ($FT^3$) |
|---|---|
| 2008-2009 | 12,865.57 |
| 2009-2010 | 34,458.36 |
| 2010-2011 | 11,333.01 |
| 2011-2012 | 10,277.64 |
| 2012-2013 | 8737.25 |
| 2013-2014 | 8319.89 |
| 2014-2015 (July 2014 to October 2014) | 3640.64 |

## DEFINITIONS

**Groundwater** – The water found beneath the Earth's surface, usually in aquifers, which supply wells and springs.

**Picocuries Per Liter (pCi/L)** – A unit of measure of radioactivity.

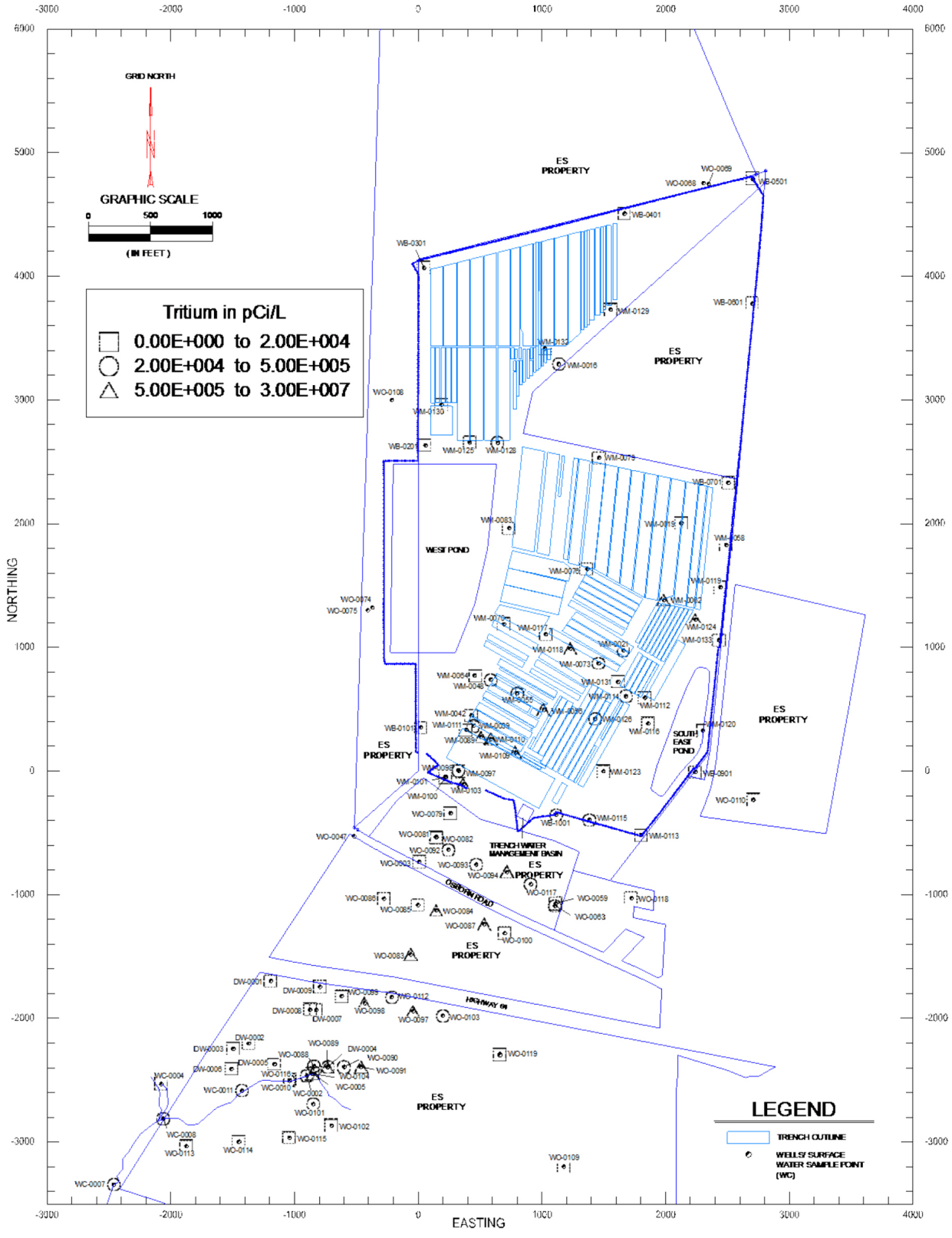
**Plume** – An area where contamination is detected (or is measurable).

**µg/L** – A unit of measure for one millionth of a gram per liter or one part per billion (ppb).

**Volatile Organic Compounds (or Chemicals) (VOCs)** – Chemicals that evaporate readily when exposed to air and are widely used to clean things.

# TRITIUM CONCENTRATION MEASURED IN ZONE 2 AND MARY'S BRANCH CREEK

## Second Quarter 2014

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