

# **Plains Midstream Canada Red Deer River Oil Spill Interim Water Quality Report (July 13, 2012)**

## **Executive Summary**

Petroleum hydrocarbon and polycyclic aromatic hydrocarbon (PAH) data collected since June 16, 2012 by Alberta Environment and Sustainable Resource Development and Plains Midstream Canada have largely been below analytical detection limit at all sites and on all dates. Exceptions were found at nearshore sampling locations near the Carefree and Glennifer Lake resort marinas where peaks in petroleum hydrocarbons were detected. However, these peaks were short-term in nature and highly localized as evidenced by non-detectable concentrations of petroleum hydrocarbons at nearby sites. Concentrations of both petroleum hydrocarbons and PAHs were below detection limits on all dates sampled for both resort drinking water plants and the downstream Anthony Henday and Red Deer plants.

As a result of continuing trend of non-detectable concentrations of hydrocarbons, it is recommended that the program be further reduced in frequency and number of locations with the caveat that any new spill or other operational activity within the river or reservoir may require additional enhanced monitoring.

## **Introduction**

The following brief report provides an update to the previously released interim water quality report available on Alberta Environment and Sustainable Resource Development's (ESRD) website at

[Plains Midstream Spill - Water Quality Report and Data June 2012](#)

The following discussion focuses on data collected by ESRD and Plains Midstream Canada (Plains) since June 16, 2012. As with the previous report, all data collected by ESRD and Plains are either included within this interim report or as separate data files available for download.

On behalf of Plains, Matrix Solutions Inc. (Matrix) continued collecting twice daily water quality samples from a number of surface water stations and drinking water facilities until July 2, 2012 when sample collection was reduced to once daily at most sites. The decision to reduce monitoring intensity was supported by ESRD and was based on a continuing trend of low or no detection of dissolved hydrocarbons at virtually all sites. For the same reasons, the sampling at the Anthony Henday and Red Deer drinking water treatment plants ceased on July 4, 2012 under approval by ESRD and Alberta Health Services (AHS) staff. Sampling has continued to date at nearby sites on the Red Deer River (see "Plains Water Sample Locations.pdf" file for Plains/Matrix sampling location). Samples for polycyclic aromatic hydrocarbons (PAHs) were collected by Matrix on June 21, 29 and July 2 at most sites.

ESRD staff continued with weekly sampling, specifically collecting samples from the river and reservoir on June 21, 28 and July 6. This included samples for both petroleum

hydrocarbons and PAHs. Sample locations are available in the previous interim report. One exception was on July 6, samples for the reservoir were collected from nearshore locations due to a boat malfunction that prevented accessing previous sites. Locations of these nearshore sites are indicated in the data files.

## **Results**

### **Petroleum Hydrocarbons**

Results for petroleum hydrocarbons are available as separate files from this report. For ESRD sampled sites, hydrocarbon concentrations were below analytical detection limits on all sampling dates since June 16, 2012. Matrix sampled sites showed a similar pattern of non-detects at the majority of sites since June 16 with one exception on June 17, when seven sites showed low level concentrations of xylenes (sites SW21, SW15, SW34, SW13, SW16, SW38, and SW18). One of the field blanks collected on June 17 had detectable concentrations of benzene, toluene and total xylenes present, so it may be that these results were due to potential field contamination. This was confirmed with Plains and Matrix and corrective actions were taken to avoid future potential contamination of samples. Concentrations were well below the drinking water guideline of 0.3mg/L.

All other sites sampled by Matrix had petroleum hydrocarbon concentrations below detection limits on virtually all dates since June 16 with the exception of SW5 and SW3. SW5 showed a peak in petroleum hydrocarbon concentrations beginning on June 24, peaking on June 26 and dropping back to below detection limits by June 28 (Figure 1). Concentrations exceeded the drinking water guideline of 0.005mg/L for benzene (June 26 afternoon), 0.0024mg/L for ethylbenzene (June 26 afternoon, June 27 morning) and the protection of aquatic life guideline of 0.002mg/L for toluene (all samples collected June 26 and 27).

In response to the initial detection and confirmation of the presence of hydrocarbons at SW5, Plains implemented sampling at two additional stations (SW52 and SW53) located approximately 100m upstream and downstream of SW5. Concentrations of all petroleum hydrocarbons were found to be below detection limit at both sites, indicating that the detection of hydrocarbons at SW5 was a localized temporary issue. SW5 is a nearshore site located outside of the Carefree Resort marina. At the time of the peak, this area was undergoing decommissioning and had been cleaned of visible oil product from the shoreline but was not yet open to recreational boating. While investigation into the potential cause of the peak has been conducted, no plausible explanation as to the source of this peak has been established and thus cause remains speculative at best.

Site SW3 showed a small peak in petroleum hydrocarbons on July 2, 2012 (Figure 2). Concentrations were below relevant protection of aquatic life (PAL) and drinking water guidelines with the exception of toluene which exceeded the PAL guideline of 0.002mg/L but not the drinking water guideline. SW3 is located near the marine for the Glennifer Lake Resort and this peak corresponded to the Canada Day long weekend when the reservoir was re-opened to recreational boating activity. Whether additional

boating activity was the cause of this peak remains unknown. However, as with SW5 this peak was short-term in nature and was not present at any other site.

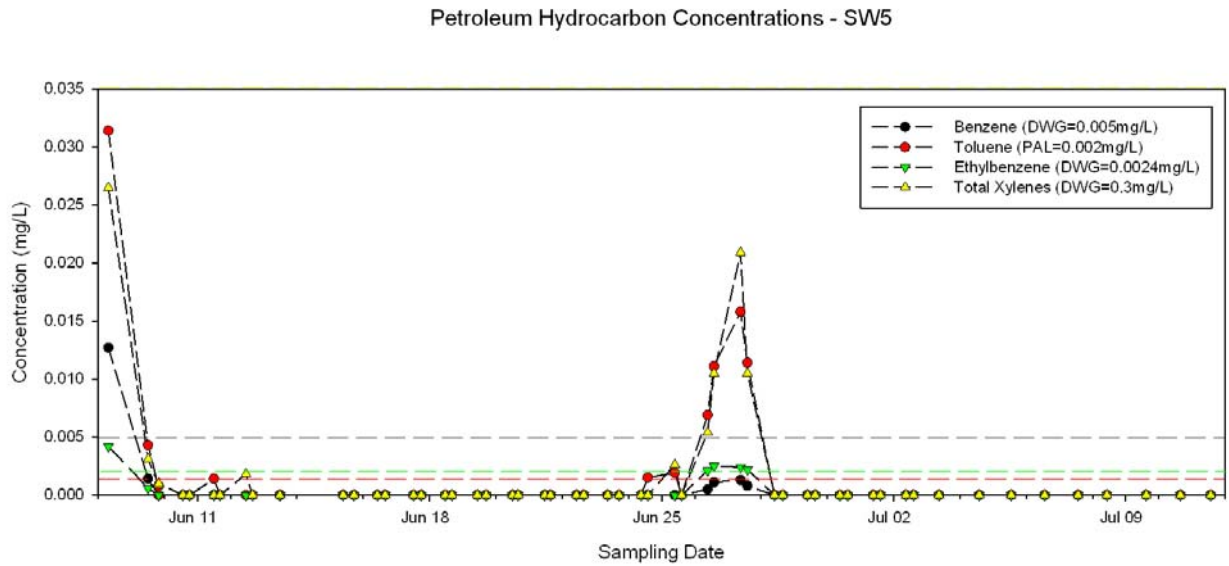


Figure 1 – Petroleum Hydrocarbon Concentrations at SW5

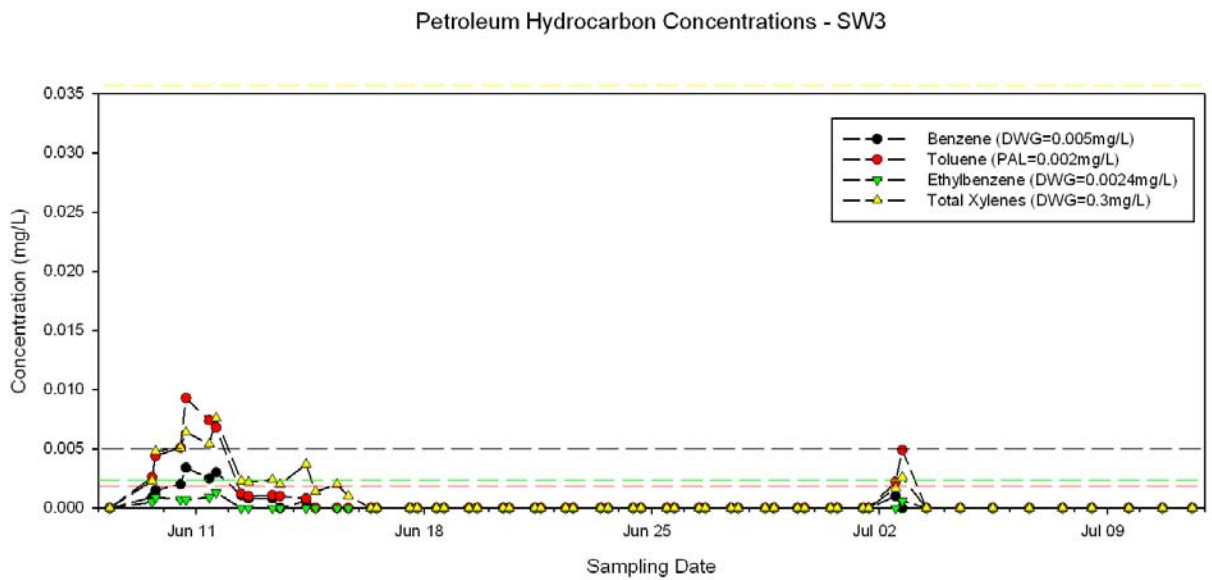


Figure 2 – Petroleum Hydrocarbon Concentrations at SW3

## **Polycyclic Aromatic Hydrocarbons**

Samples for polycyclic aromatic hydrocarbons (PAHs) were collected along with petroleum hydrocarbons for all sites by ESRD on all sampling dates and by Matrix staff for the Plains sites on June 21, 29 and July 2 at the majority of sites. Since June 16, ESRD data did not show detectable concentrations of any PAHs at the sites sampled. Matrix samples sites were similarly below detection limits the majority of the time. Occasional detects of minor levels of PAHs were found, however these were highly random in nature and did not suggest any pattern related to the initial spill similar to that observed in samples collected prior to June 16.

## **Drinking Water Plants**

Matrix continued collecting pre and post treated water from the Anthony Henday and Red Deer drinking water plants until July 4, 2012. All samples collected since June 16 showed non-detectable concentrations of petroleum hydrocarbons and PAHs, hence the rationale for stopping monitoring at the treatment plant intakes while continuing to monitor water quality in the river at nearby locations.

Sampling for both pre and post treated water for the Carefree and Glennifer Lake resorts commenced on June 28, 2012 in preparation for the re-opening of these facilities. To date, none of the collected samples have shown detectable concentrations of petroleum hydrocarbons or PAHs. These sites continue to be monitored along with other surface water sites in Glennifer Lake.

## **Conclusions**

Sampling results for petroleum hydrocarbons and PAHs since June 16, 2012 have largely been below detection limits at all sites sampled by both ESRD and Matrix. Occasional detection of low level hydrocarbons have been predominantly random and localized in nature. Exceptions were at SW5 and SW3 where defined peaks in petroleum hydrocarbons occurred after a number of dates of non-detects. Sampling at nearby sites found non-detectable concentrations of these hydrocarbons and concentrations at SW5 and SW3 returned to non-detectable concentrations within a short period of time suggesting the phenomenon was short-lived and highly localized. Plains has been encouraged to investigate these peaks further, but for now the cause remains speculative at best.

Overall, the general continuing trend of non-detectable concentrations of petroleum hydrocarbons and PAHs is positive. In consultation with ESRD, the water quality sampling program implemented by Plains was reduced to once per day sampling on July 2 and a further reduction in the number of sites and frequency along with longer term aquatic effects monitoring is currently under discussion. ESRD will not be collecting further water quality samples until the clean-up process is near completion as the Matrix collected data has, to date, shown very similar results to ESRD collected data. This

cessation of monitoring by ESRD is, of course, subject to continuation of a trend of the majority of sites having concentrations below analytical detection limits.