From: [redacted]
To: Fusrap, LRB
Subject: [EXTERNAL] Input RE Further Evidence of IWCS Leakage/Field Sampling Plan, Investigation to Refine the Extent of Soil Contamination
Date: Monday, November 04, 2013 7:58:02 PM
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[redacted]

Please find attached comments, as requested.

Thanks,

[redacted]

[redacted]

November 4, 2013

[redacted],
U.S. Army Corps of Engineers, Buffalo District
FUSRAP,
1776 Niagara Street
Buffalo, NY 14207

RE: Further Evidence of IWCS Leakage /Request for Public Input regarding, "The Field Sampling and Analysis Plan for the Niagara Falls Storage Site Balance of Plant Operable Unit, Investigation to Refine the Extent of Soil Contamination, October 2013."

Dear [redacted],

On October 22, 2013 the US Army Corps of Engineers announced its findings with respect to the investigation of elevated uranium in groundwater, south and east of the Niagara Falls Storage Site (NFSS) Interim Waste Containment Structure (IWCS) and posted " The Field Investigation Report for the NFSS Balance of Plant Operable Unit, August 2013" on the USACE website.

The Corps informed the public *that "The Balance of Plant Field Investigation Report strongly suggests that uranium contamination in groundwater south of the IWCS and in the vicinity of groundwater monitoring well OW-11B is due to historic storage of tailings and waste piles in that location. Further, the IWCS is performing as designed and remains protective of human health and the environment."*

However, detailed review of the Balance of Plant (BOP) report reveals that the report findings do not support the Corps of Engineers position. Indeed, the opposite is true:

Uranium contamination in groundwater south of the IWCS is not consistent with residual groundwater contamination from past surface storage of wastes and tailings, because the levels of uranium in groundwater are still increasing, suggestive of a point source, such as leakage from the IWCS.

The discovery of groundwater, heavily contaminated with uranium, migrating along sewer pipes and water pipes supports the view that pipelines are acting as preferential pathways for groundwater migration. The current IWCS groundwater monitoring has likely been compromised allowing IWCS leakage to go undetected.

In providing a summary of BOP investigation results for the public, the Corps makes no mention of the variation in magnitude of uranium levels, detected in UWBZ groundwater around the IWCS, classifying all uranium detections as above or below the drinking water standard of 30ug/L. Historically, past AEC and DOE operations at the NFSS have resulted in observed UWBZ groundwater concentrations of up to 250ug/L. The majority of the groundwater well samples analyzed in the course of the BOP investigation fall in this category, varying between 24.7 ug/L and 286 ug/L of total uranium. However, several samples, from wells, MW-951, MW-

953, MW-957 and MW-960 are an order of magnitude higher, varying between 1,010 ug/L and 2,100 ug/L. These atypical levels of uranium are also found in groundwater seeping along abandoned sewers and water pipelines in two of the excavations east of the IWCS.
Groundwater seeping into excavation IE7, along water lines measured 7,080 ug/l and groundwater migrating along the outside of the sanitary sewer in excavation IE8 measured 1,870 ug/L.

Residual uranium contamination of the UWBZ groundwater by past AEC and DOE storage practices does not account for the increasing levels of uranium in groundwater detected south and east of the IWCS. IWCS leakage does.

In 2003, the Remedial Investigation found uranium in groundwater south of the IWCS to be 958ug/l (temporary well TWP 833)
In 2012, the BOP investigation found uranium in groundwater south of the IWCS to be 2,090ug/L (well MW 951 installed in the location of former temporary well TWP 833)
The increase in uranium levels south of the IWCS, from 958 to 2,090 ug/L, a significant increase in uranium groundwater concentrations over a ten year period.

Well OW-11B, east of the IWCS, has also been identified as showing increasing concentrations of uranium. USACE review of soil and groundwater data collected near this well, prior to the BOP investigation, did not identify a source for this uranium in groundwater. However, USACE suspected several areas, including a decontamination pad and associated grit chamber, a former railroad bed and several pipelines. A total of eight investigative trenches were dug for the BOP investigation, six of which targeted the decontamination pad and grit chamber. One trench investigated water and sanitary sewer lines and one trench investigated a former railroad bed and sanitary sewer. The results from the decontamination pad and grit chamber investigative trenches are unremarkable, showing limited uranium contamination in soils and expected concentrations of uranium in groundwater. The results from trenches to investigate the sanitary sewer and water lines showed the same atypical uranium levels found south of the IWCS. It can be concluded that the decontamination pad and grit chamber are not the source of increasing uranium concentrations in well OW-11B, but the sanitary sewer and water lines are implicated in the migration of contaminated groundwater.

Discussion of Other BOP Findings
a) The BOP investigation found that uranium contamination is present only in surface soils or those soils close to the surface. Uranium is absent in deeper soils, south and east of the IWCS.
"The low permeability of the soil seems to have limited migration of uranium impacts in the soil column." Page 5-1 para 7
This finding would also seem to contradict the USACE theory that past storage practices are responsible for the highly elevated levels of uranium in the UWBZ.

b) Although the 10 inch water line was found to be contaminant free, the highest total uranium concentration in groundwater, 7,080 ug/L, was found in groundwater seeping along water pipelines at a depth of 4.5 feet into excavation IE7.(Note: these water pipelines were not opened or sampled, even though the migrating groundwater is approximately 230 times greater than the drinking water standard of 30ug/L.)

The detection of highly elevated uranium in groundwater immediately outside water pipelines contradicts the USACE news release which states:

"There was no radiological contamination detected in soil surrounding or water sampled for any of the water pipelines included in this field investigation except for two water samples taken from the 24 to 36-inch pipeline at two locations located in the NE corner of the site. These samples exhibited radium-226 (4-5 pCi/L) slightly above the drinking water criteria."

In addition to the highly elevated uranium concentrations found around the water lines in IE 7, groundwater seeping into the EI8 excavation along the top of the sanitary sewer was found to have a concentration of 1,870 ug/L of total uranium. This is further evidence of that abandoned utility lines are acting as preferential pathways for uranium contaminated groundwater.

c) Subsurface disturbance of soils has resulted in increased permeability of the soils and, consequently, increased groundwater movement. Given this finding, will the theoretical transport times for uranium to migrate off site be revised by USACE?

d) Uranium in groundwater samples does not correlate with uranium in the surrounding soils. Table 46 in the BOP report compares monitoring well soil and groundwater samples.

The concentration of total uranium in groundwater in well MW-951, south of the IWCS, was found to be 2,090 ug/L with uranium in the 951 soil boring ranging from 2.18mg/kg to 4.21 mg/kg

The concentration of total uranium in groundwater in well MW-953, near well OW-11B, was found to be 1,970 ug/L with uranium in the 953 soil boring ranging from 18.5 mg/kg to 54.4 mg/kg

In direct contradiction of this data, the BOP report summary states that *"The groundwater concentrations are consistent with the soil detections in the area south of the IWCS and near OW 11B."* Page 6-1, para 3. Here we have two wells showing almost identical unexpectedly high concentrations of uranium in groundwater, but with very different levels of uranium in soil.

Groundwater concentrations of uranium are not consistent with the uranium soil detections, south and east of the IWCS.

Having eliminated the decomposition pad and grit chamber as a point source of highly elevated uranium in groundwater east of the IWCS, it appears that, rather than consider IWCS leakage as the source of the elevated uranium in groundwater, the results of the BOP investigation are being incorrectly interpreted to arrive at erroneous conclusions.

On October 23, 2013, the Corps announced a subsequent field sampling plan, "Sampling and Analysis Plan, Final, Balance of Plant Operable Unit, Investigation to Refine the Extent of Soil Contamination, Niagara Falls Storage Site, Lewiston, New York" October 2013, designed to refine the extent of soil contamination was now available on the USACE web site and requested public input on the plan within 12 days. Please accept the following comments.

1) Review of the October 2013 plan reveals that the Corps has changed its position and now believes the source of elevated uranium in groundwater at well OW-11B is likely uranium in the soil that resulted from former activities in the area. However, there is no basis for considering uranium in soil to be the source of the highly elevated uranium detections currently being found in groundwater. The extremely short timeframe allowed for public review, does not allow for

immediate submission of the extensive data to support this statement, but simple review of the BOP soil and groundwater data in Tables 46 and 47 should suffice to make this point.

2) The plan does not include investigation of the water lines in IE7, where the highest concentration of uranium in groundwater (7,080ug/L) was detected during the BOP investigation. It is not clear why the detection of highly elevated groundwater around the water lines did not trigger immediate investigation of these water lines during the BOP investigation, but given that the opportunity was lost, investigation of these water lines should be incorporated into the planned sewer excavations.

3). The plan calls for the removal of manhole MH06, which has been found to contain uranium-impacted water. According to the plan (page 2-1, 2.2.2) although the manhole was plugged, water continues to accumulate in it.
The Remedial Investigation Report records the plugging of the sanitary sewer at this point, but also documents the observation of a pipe heading west from this manhole towards what is now the IWCS. See RIR 2007, Table 3-20.
"The lower section of this manhole was filled with concrete. No sediment present. Water in this manhole is murky brown. A pipe was observed heading west from this manhole towards the former fresh water treatment plant for the LOOW (now included in the IWCS)"

Figure 11 in the plan does not show any lateral pipes at MH06. Is this pipeline still in existence and if so has it been investigated ?

4) The plan calls for a geophysical survey of the area south of the IWCS to delineate building foundations, water and sewer lines etc. How will non-metallic utility lines such as sewers be identified, given that the geophysical survey was unable to locate the concrete encased sanitary sewer in the course of the BOP investigation last year?

Sincerely,

[redacted].