



**US Army Corps
of Engineers®**
St. Louis District

Data Summary

SOIL SAMPLES AT JANA ELEMENTARY



The U.S. Army Corps of Engineers (USACE) is providing the results of soil sampling at Jana Elementary School. The 790 pieces of data being summarized is a combination of validated and unvalidated laboratory results. Experience shows that the validation process does not have a material impact on a set of soil sampling data. This summary is for soil sample data that is outside of the remediation areas within the creek banks. **The soil sample data demonstrate that surface and subsurface soil are far below – less than 10% on average – the cleanup goals stated in the Record of Decision (ROD) for the North St. Louis County Formerly Utilized Sites Remedial Action Program (FUSRAP) Sites.**

Gamma Walkover Survey

The gamma walkover survey (GWS) results are shown on Figure 1 which includes 305,101 GWS data points with coordinates logged by a global positioning system. The gamma emissions from the ground were measured using a 2-inch-by-2-inch sodium iodide gamma scintillation detector coupled to a scaler/rate meter. An area represented by blue or green on Figure 1 would be indicative of background levels, other colors may indicate an area of interest requiring further investigation. Further investigation could include collection of additional GWS measurements,

collecting soil samples for laboratory analysis, or identification of material with higher natural radioactivity, such as brick and granite. An initial GWS was performed on the grassy area within the 10-year floodplain from January 25 to February 2, 2017. USACE performed additional GWS of the wooded areas within the 10-year floodplain in 2019 and 2020. USACE completed a GWS of the remainder of the Jana Elementary School campus outside the 10-year floodplain from October 27, 2022, to November 4, 2022. Three GWS-based sample locations were identified and sampled in 2022 and are included in the sampling statistics in Table 1.

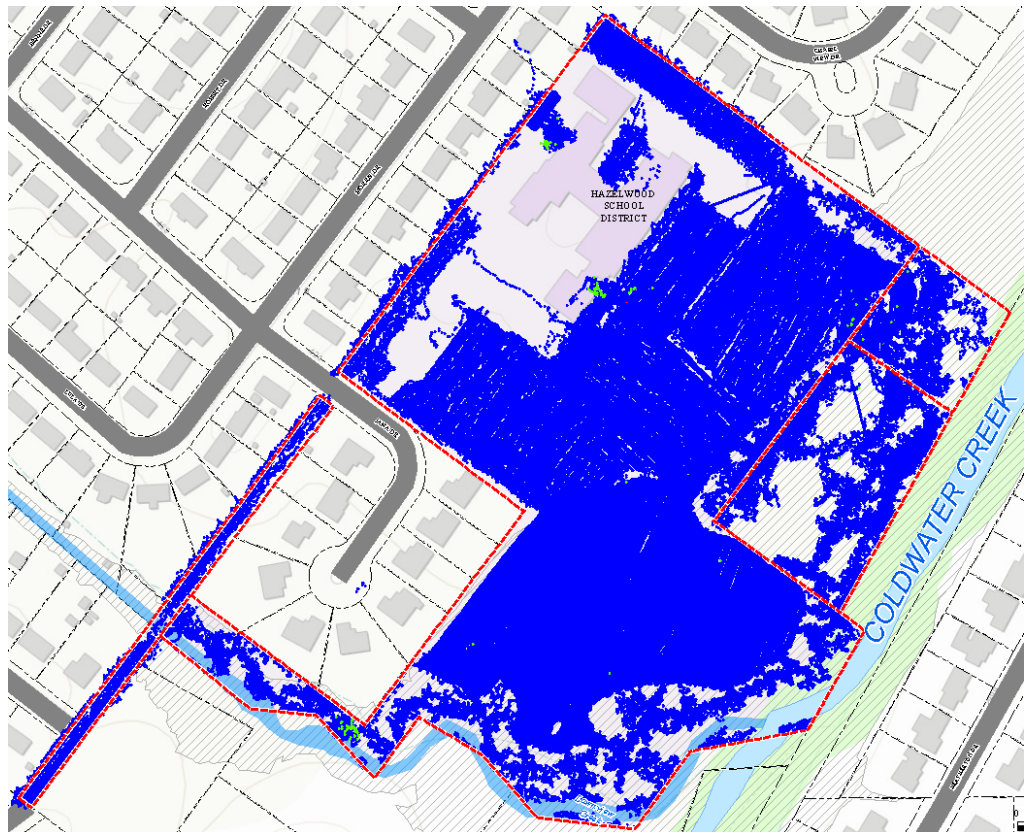


Figure 1 – GWS of Jana Elementary School Campus

Surface and Subsurface Soil Investigations

USACE collected soil samples on Jana Elementary property within the creek banks and within the 10-year flood plain in August, September and October 2018. The samples were collected using a drill rig in grassy areas of the property. In the fall of 2018, soil sampling was performed in wooded areas of the property using hand augers to collect samples. Additional samples were collected in the summer of 2019, using hand augers along the creek bank to confirm if areas were impacted by Manhattan Engineer District/Atomic Energy Commission materials and determine the relative size of the area, with follow-up in June 2021 involving additional samples at deeper depths. An additional soil investigation was performed on the school grounds in October and November 2022. This investigation included soils beyond the 500-year floodplain and included soils surrounding and adjacent to the school building. The sample locations are shown on

Figure 2 and the results are summarized in Table 1. The net sum-of-the-ratios (SOR_N) is a calculation that compares each sample result to the ROD criteria; areas requiring remediation have locations where the average SOR_N results exceed 1.

The soil sample data demonstrate that surface and subsurface soil are far below, less than 10% on average, the cleanup goals stated in the ROD.

Figure 2 – Sample Locations outside the Construction Zone

- Bold red ovals:** remediations areas on school parcels
- Yellow line:** school parcel borders
- Purple dots:** systematic locations
- Teal stars:** biased locations
- Light red ovals:** remediation areas not on school parcels



Soil Lithology Review

The soil borings used to collect the samples were examined by a geologist for changes in soil conditions that are representative of fill. No evidence of fill was identified in the soil on the hill plateau where the structures are built. These results are consistent with a review of historical documentation that the hill plateau existed prior to the structures being built. Seven boring locations with evidence of fill material were all within or southwest of the soccer field area behind the school. The fill is up to 5 ft thick and was sampled. Results were consistent for fill and native soil.

Table 1. Soil Sample Data Summary				
	Number of Samples	Mean	Maximum	Remediation Goals
Surface Soil (0-0.5 ft)				
Radium-226 (pCi/g)	111	1.18	1.67	5
Thorium-230 (pCi/g)	111	1.75	4.05	14
Uranium-238 (pCi/g)	111	1.05	3.29	50
SOR_N	111	0.08	0.29	1
Subsurface Soil (0.5 ft to 6 ft)				
Radium-226 (pCi/g)	302	1.27	2.05	15
Thorium-230 (pCi/g)	302	1.89	9.65	15
Uranium-238 (pCi/g)	302	1.11	1.70	50
SOR_N	302	0.03	0.55	1
Subsurface Soil (deeper than 6 ft)				
Radium-226 (pCi/g)	338	1.07	1.97	15
Thorium-230 (pCi/g)	338	1.61	3.12	15
Uranium-238 (pCi/g)	338	1.02	1.98	50
SOR_N	338	0.01	0.09	1
Remediation Area Soil on School Parcel (all depths)				
Radium-226 (pCi/g)	39	1.71	3.01	Remediation goals based on depth were applied as described above.
Thorium-230 (pCi/g)	39	9.13	34.3	
Uranium-238 (pCi/g)	39	1.11	1.47	
SOR_N	39	0.56	2.29	
Notes: The reported maximum is the greatest detected result. Background concentrations are subtracted in the SOR_N calculation and for comparison to remediation goals.				