FINAL

COLONIE FUSRAP SITE
VICINITY PROPERTY OPERABLE UNIT
RECORD OF DECISION

Colonie FUSRAP Site

September 2017

U. S. Army Corps Of Engineers
New York District Office

Formerly Utilized Sites Remedial Action Program

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ACRONYMS AND ABBREVIATIONS

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
cm^2	square centimeters
CSX	CSX Corporation
DOE	U.S. Department of Energy
dpm	disintegrations per minute
DU	depleted uranium
EPA	U.S. Environmental Protection Agency
^oF	degrees Fahrenheit
FUSRAP	Formerly Utilized Sites Remedial Action Program
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
m^2	square meter(s)
Max	maximum
MDA	minimum detectable activity
MDC	minimum detectable concentration
mrad/h	millirad per hour
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NiMo	Niagara Mohawk
NL	National Lead Industries
NRC	Nuclear Regulatory Commission
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
pCi/g	picocuries per gram
RI	remedial investigation
ROD	Record of Decision
SD	standard deviation
USACE	U. S. Army Corps of Engineers
USC	United States Code

I. DECLARATION

A. Site Name and Location

Vicinity Property Operable Unit
Colonie FUSRAP Site
1130 Central Avenue (New York State Route 5) (Main Site)
Town of Colonie, Albany County, New York

B. Statement of Basis and Purpose

This decision document presents the final determinations for the management of soil and dust contamination located on private properties (known as Vicinity Properties) adjacent to the Colonie Formerly Utilized Sites Remedial Action Program (FUSRAP) Main Site. Table 1 lists each of the Vicinity Properties addressed in this Record of Decision (ROD). One of these Vicinity Properties (i.e., The Town of Colonie Vicinity Property) was previously addressed in a separate ROD document titled the *Colonie FUSRAP Site Colonie Main Site Soils Record of Decision* (U.S. Army Corps of Engineers [USACE], 2015).

The final determinations for the Vicinity Properties were chosen in accordance with the requirements of the *Comprehensive Environmental Response, Compensation and Liability Act* (CERCLA) as amended by *Superfund Amendments and Reauthorization Act*, 42 United States Code (USC) §9601-9675 (USC, 1980), and the *National Oil and Hazardous Substances Pollution Contingency Plan* (NCP), as amended, 40 Code of Federal Regulations Part 300 (U.S. Environmental Protection Agency [EPA], 1990). The decisions are based on information contained in the Administrative Record File for the Colonie FUSRAP Site and have been made by the USACE in conjunction with the New York State Department of Environmental Conservation (NYSDEC), and the New York State Department of Health (NYSDOH). Comments on the *Proposed Plan* for the Colonie Vicinity Property Operable Unit were received from the State and local community and were considered during the decision-making process. These comments, and associated responses, are documented in Section III – Responsiveness Summary. The NYSDEC, in consultation with the NYSDOH, has concurred with the Selected Remedy.

C. Description of Selected Remedy

The final determination for the soil media is No Further Action and the final determination for dust media at the Vicinity Properties is No Action as determined by separate processes and separate actions. Based on the results of the investigations and the remedial actions completed, these final decisions for the soil and dust media are appropriate under CERCLA for the Colonie FUSRAP Site Vicinity Property Operable Unit.

D. Statutory Determinations

Previous removal actions conducted for the Vicinity Property soils have proved to be protective of human health and the environment and have eliminated the need to conduct additional remedial action to allow for unrestricted release. Therefore, the final determination for the Colonie FUSRAP Site Vicinity Property soils is No Further Action.

Similarly, current conditions in structures at representative residential and commercial properties in the vicinity of the Colonie FUSRAP Site have been characterized. The results demonstrate that dust containing concentrations of uranium found in various areas of the structures poses no

unacceptable risk to inhabitants. Therefore, No Action for dust at the Colonie FUSRAP Site Vicinity Properties is also considered protective of human health and the environment.

As no remedy is being implemented, a five-year review is not required in response to this decision.

F. Authorizing Signature

David J. Leach, SES
Director, Programs Directorate
North Atlantic Division, USACE

20 Sep 17
Date

II. DECISION SUMMARY

This section presents a summary of the USACE decisions regarding contaminated soils and dust at the Colonie FUSRAP Site Vicinity Properties, and presents the supporting rationale for these actions. Table 1 lists the Vicinity Properties that are addressed in this ROD. The U.S. Department of Energy (DOE) and the USACE have investigated the Vicinity Properties and the USACE has determined that No Further Action is appropriate for soils and No Action is appropriate for dust. The state of New York has concurred with this decision.

A. Site Name, Location, and Description

The Colonie FUSRAP Site comprises the 11.2-acre Main Site Property and 56 Vicinity Properties. The Colonie Main Site is located at 1130 Central Avenue (New York State Route 5) in the Town of Colonie, Albany County, New York (Figure 1). The Vicinity Properties are adjacent or in close proximity to the Main Site and are owned by private landowners and commercial businesses. The Vicinity Properties are mainly located along Central Avenue and Yardboro Avenue as shown on Figure 2. These properties are located in both the Town of Colonie and the City of Albany, New York.

The USACE-New York District is conducting the environmental restoration of the Colonie FUSRAP Site, consisting of the Main Site Operable Unit, Groundwater Operable Unit, and Vicinity Property Operable Unit. The USACE-Baltimore District is providing technical support to the New York District for the Main Site, Groundwater, and Vicinity Property Operable Unit restorations. The USACE is utilizing the administrative, procedural, and regulatory provisions of CERCLA and the NCP to guide the remediation process at the Colonie FUSRAP Site as required by Public Laws 105-245 and 106-60.

The Colonie Main Site was owned and operated by National Lead Industries (NL) from 1937 to 1984. NL historic manufacturing operations at the Main Site not only resulted in contaminated soil and surfaces at the Main Site but also impacted several properties (i.e., the Vicinity Properties) in close proximity to the Site. Authority for remediating the Colonie FUSRAP Site was assigned to the DOE by Congress through the *Energy and Water Development Appropriations Act* of 1984. In October 1997, authority for executing FUSRAP remediation activities was transferred from the DOE to the USACE by further Congressional action. The DOE Office of Legacy Management is the current owner of record of the Main Site.

All of the Vicinity Properties with the exception of one (i.e., The Town of Colonie Vicinity Property) are addressed by this ROD. Previous removal actions have been completed for soils on the Main Site and that action included removal of soils on the Town of Colonie Vicinity Property. In addition, a remedy for groundwater at the Main Site is being implemented.

This ROD addresses the soil and dust media present at the Colonie FUSRAP Site Vicinity Properties. A separate ROD for the Colonie Main Site soils, *Colonie FUSRAP Site Colonie Main Site Soils Record of Decision* (USACE, 2015), was published prior to this ROD. The final remedy for site groundwater was documented in the *Colonie FUSRAP Site Record of Decision Colonie Site Groundwater* (USACE, 2010a).

B. Site History and Enforcement Activities

B.1 Site History

The Vicinity Properties have been impacted by contaminants related to the industrial operations at the Colonie Main Site. These operations began in 1923 and have included the manufacture of wood products, toys and railroad components. In the late 1950s, NL began manufacturing items from uranium and thorium under a license issued by the Atomic Energy Commission. Although NL primarily used depleted uranium (DU) in their processes, the plant handled enriched uranium from 1960 to 1972; and during that time, NL held several contracts to manufacture fuel from enriched uranium for use in experimental nuclear reactors. The plant was closed in 1984 by the state of New York due to environmental concerns. At that time, DOE assumed ownership and responsibility for the property.

From 1984 to fall 1997, the DOE investigated the Main Site and 56 Vicinity Properties, and initiated the restoration process. Vicinity Properties had been impacted by radiological contaminants from historical airborne releases during manufacturing and by erosional processes from the Main Site. The property at 50 Yardboro Avenue was also contaminated by historical discharge from a storm water outfall that ran below the CSX Corporation (CSX) Vicinity Property. The outfall is no longer present.

The DOE performed cleanup actions at 53 of the 56 Vicinity Properties, and demolished all NL buildings. The soil removal activities for the 53 Vicinity Properties were documented in the *Certification Docket for the Remedial Action Performed at the Colonie Interim Storage Site Vicinity Properties in Colonie and Albany, NY in 1984 and 1985* (DOE, 1989), and the *Certification Docket for the Remedial Action Performed at the Colonie Interim Storage Site Vicinity Properties in Colonie and Albany, NY in 1988* (DOE, 1990a).

Of the three Vicinity Properties (i.e., the Town of Colonie Vicinity Property, the CSX Vicinity Property, and the Niagara Mohawk [NiMo] Electrical Power Substation Vicinity Property) remaining at the time of DOE transfer to USACE, the Town of Colonie and CSX Vicinity Properties were cleaned up during removal actions conducted by the USACE during the Main Site soil removal and groundwater remedial actions. Based on radiological survey results following the DOE cleanup action, the NiMo Vicinity Property did not require further remediation by the USACE.

In 1997, the USACE assumed control of the Colonie FUSRAP Site including responsibility for the cleanup of the Main Site, Groundwater, and Vicinity Property Operable Units. By the end of 2007, the USACE had completed the removal of contaminated soils at the Main Site and the remaining three Vicinity Properties as well as at 1118 Central Avenue. Small-scale soil removal was also performed at 50 Yardboro Avenue in 2013/2014. In addition, dust sampling at the Vicinity Property Operable Unit took place in 2011 and in 2014. The results of the aforementioned soil removals, dust sampling investigation results, and associated data evaluations and informational analysis were all used in final decisions of No Further Action and No Action, respectively, for soil and dust at the Colonie FUSRAP Site Vicinity Property Operable Unit. The next sections summarize completed investigative and remedial actions as required for unrestricted use at Vicinity Properties.

B.2 Previous Removal Actions for the Vicinity Property Soils

B.2.1 DOE Remedial Actions for 53 Vicinity Properties

In the 1980s, the DOE conducted removal actions at 53 Vicinity Properties using the following cleanup criteria (USACE 2010b):

- Uranium-238 – 35 picocuries per gram (pCi/g) averaged over an area of 100 square meters (m^2) and 5 centimeters (2 inches) in depth
- Uranium-238 – 100 pCi/g maximum at a spot one m^2 that contains more than 35 pCi/g Uranium-238 in the soil.

The locations of the Vicinity Properties are presented on Figure 2. Table 2 summarizes the Vicinity Property remediation completed by DOE.

The USACE performed the NYSDEC-approved *Technical Memorandum Vicinity Property Assessment* (USACE, 2010b) to compare the post-remedial status of the Vicinity Properties remediated by the DOE to the current soil cleanup criteria.

B.2.2 Removal Action for the CSX Vicinity Property

USACE conducted a removal action for soils on the 6.5-acre CSX Vicinity Property. Cleanup objectives and criterion are documented in the *CSX Vicinity Property Action Memorandum* (USACE, 2006). USACE selected Alternative 4, Removal and Off-Site Disposal of Soil, With No Impact to the High-Speed Rail Line or the Utility Rail Spur. This alternative included the removal of soils with ^{238}U concentrations greater than 96 pCi/g, as long as removal did not impact the structural integrity of the high-speed rail line or the utility rail spur. The USACE derived the cleanup criterion for this Vicinity Property through the use of risk-based radiological modeling based on a "residential encroachment upon industrial land use" exposure scenario.

By August 2007, the USACE removed a total of 2,871 cubic yards of contaminated soil from the CSX Vicinity Property. Soils were not removed from underneath the utility rail spur because they were considered inaccessible and part of the active rail line. There were three discrete locations along the rail spur in which ^{238}U concentrations exceeded 96 pCi/g. A clay pipe extended from the Main Site to the CSX Vicinity Property at a depth of eight feet. Due to its proximity to the active rail line, a remedial action was not performed on the CSX portion of the pipe. While a sediment sample obtained from the CSX portion did not exceed the Vicinity Property cleanup criterion for ^{238}U, the actual extent, integrity, and direction of the pipe could not be verified. Detailed information regarding CSX Vicinity Property soil excavation activities is presented in the *Final Colonie FUSRAP Site CSX Vicinity Property Report* (USACE, 2008).

During the removal action program, NYSDEC conducted reviews of USACE confirmation soil sampling data packages and collected split samples of USACE soil confirmation samples. The results of NYSDEC's data reviews and analysis of split samples revealed that all soil confirmation samples met the NYSDEC cleanup criterion of 35 pCi/g. Those locations that did not initially achieve compliance required additional excavation and confirmatory sampling before meeting the cleanup goal. Following the completion of the soil removal work, NYSDEC conducted 100 percent coverage walkover radiological surveys of the entire area and no elevated radiation levels were found above the NYSDEC cleanup criterion of 35 pCi/g.

B.2.3 Limited Removal Action for Unnamed Tributary

In 2003, USACE conducted a site investigation of additional properties (i.e., in addition to the 56 named Vicinity Properties) including Patroon Creek, an Unnamed Tributary of Patroon Creek, and Three Mile Reservoir. Three Mile Reservoir is an offsite surface feature located downstream of the Main Site. Patroon Creek flows through Three Mile Reservoir prior to reaching the Hudson River. The objective of the investigation was to determine if radiological contamination potentially resulting from past activities conducted at the Colonie FUSRAP Site had contaminated the sediments within each surface water body. Sediment sample results from Patroon Creek and Three Mile Reservoir were less than the radiological cleanup criteria of 35 pCi/g for ^{238}U and required no further action. However, two sample locations within the Unnamed Tributary exhibited elevated levels of Uranium-238. Detailed information regarding this investigation is presented in the *Site Investigation Report for the Unnamed Tributary of Patroon Creek, Patroon Creek and the Three Mile Reservoir* (USACE, 2004).

During the subsequent survey and sampling phase of the CSX Vicinity Property, USACE discovered evidence suggesting that radiological contamination may have migrated off the steep southern slope and deposited in the Unnamed Tributary. The USACE determined that a limited removal action in the Unnamed Tributary was warranted. During March and April 2007 approximately 393 cubic yards of contaminated sediments were removed from the bed of the Unnamed Tributary. USACE designated the remediated area as a Multi-Agency Radiation Site Survey and Investigation Manual (MARSSIM) Class 1 Survey Unit, and the analytical data associated with the Unnamed Tributary indicated full compliance with the radiological cleanup criterion of 35 pCi/g for ^{238}U. The average ^{238}U concentration for the eleven Final Status Survey samples was 5.1 pCi/g, with a data range of 0.5 pCi/g to 14.1 pCi/g. This limited removal action is documented in the *Final CSX Vicinity Property Report* (USACE, 2008). Based on the completion of the CSX Vicinity Property remediation, the limited removal action, and the results of the 2003 investigation (USACE, 2004), USACE has determined that further action is not required in the Unnamed Tributary, Patroon Creek, or the Three Mile Reservoir.

B.2.4 Vicinity Property Data Gap Investigation Results

As a follow-up to the actions previously taken at the Vicinity Properties, the USACE reviewed cleanup results relative to current standards for 53 of the 56 Vicinity Properties that were originally addressed through cleanup by DOE. Based on this review, the USACE identified two Vicinity Properties addressed by the DOE as requiring additional investigation (USACE, 2010b). These were at 50 Yardboro Avenue and 1118 Central Avenue.

The DOE results indicated that the property at 50 Yardboro Avenue contained elevated uranium in the back portion of the property along the south-facing railbed outslope, most likely from a drainage line beneath the CSX Rail Vicinity Property that discharged at the 50 Yardboro Avenue property boundary (USACE, 2010b). The property at 1118 Central Avenue was identified by the DOE as containing elevated gross gamma readings using field instrumentation. Under approval of the NYSDEC, the USACE conducted a data gap investigation of these two Vicinity Properties in August 2011. The results are documented in the *Investigation of Two Colonie FUSRAP Site Vicinity Properties* (USACE, 2012a) and are summarized below.

50 Yardboro Avenue Vicinity Property

The objective of the investigation at the 50 Yardboro Avenue Vicinity Property was to assess residual radioactivity concentrations at the location of the former drainage line outfall and determine if it met the cleanup criterion of 35 pCi/g ^{238}U. A total of 11 cubic yards of soil was removed and 22 confirmation soil samples collected. Four of the samples had ^{238}U concentrations greater than 35 pCi/g (ranging from 37.6 pCi/g to 60.4 pCi/g). Based on these results, the USACE concluded that the 50 Yardboro Avenue Vicinity Property was not eligible for unrestricted release and further remediation was required (USACE, 2013b).

In June 2013, an additional 10 cubic yards of soil were removed from this location and a new drainage line was installed at the base of the railbed slope. Soil removal from the railbed slope was successfully completed as demonstrated by achievement of the remedial action objective of 35 pCi/g of ^{238}U for all confirmation soil samples (USACE, 2013b). As such, the USACE has determined with NYSDEC concurrence that the 50 Yardboro Vicinity Property is eligible for unrestricted release.

1118 Central Avenue Vicinity Property

The investigation objectives for the 1118 Central Avenue Vicinity Property were to confirm that: (1) the DOE's finding that the source of elevated radioactivity in the asphalt surface that surrounds the building is natural radioactivity in bedding materials, and (2) the property is suitable for release for unrestricted use.

Samples were collected from both the asphalt/roadbed and soils beneath. The analytical results for the asphalt/roadbed material indicated that the uranium was naturally occurring in roadbed materials. The results also showed that soils were likely impacted by Site uranium; however, the levels were below cleanup criteria. The cleanup criterion of 35 pCi/g was not exceeded in any sample. Therefore, the USACE has determined with NYSDEC concurrence that this Vicinity Property is eligible for unrestricted release.

B.2.5 Confirmation Dust Sampling Results

In 2011, the USACE performed a Site Investigation involving confirmation sampling at four Vicinity Property locations to verify the findings of an independent study performed in 2009 known as the Lloyd Study (Lloyd, et. al., 2009). Results of the Lloyd Study indicated that residual uranium was detected at concentrations ranging from non-detectable to 1,065 milligram per kilogram (i.e., 426 pCi total uranium activity per gram of dust) in dust samples collected at the four Vicinity Properties in non-living, uninhabited areas such as basements, attics, and garages. The objective of the confirmation dust sampling project was to confirm the 2009 Lloyd assessment of uranium concentrations in non-living areas of the following Vicinity Properties:

- 1144 Central Avenue
- 1144A Central Avenue
- 1148 Central Avenue
- 78 Yardboro Avenue.

The locations of the Vicinity Properties are shown on Figure 2. The field work was performed on August 11 through 19, 2011. As documented in the *Confirmation Dust Sampling Report* (USACE, 2012b), dust samples were collected from four non-living areas in separate locations at the individual Vicinity Properties. Table 3 summarizes the confirmation dust sample analytical

results. The 2011 USACE confirmation dust sampling data confirmed that select Vicinity Properties have low levels of radiologically-impacted dust located in the uninhabited areas. The analytical data confirmed the results of the 2009 Lloyd Study (Lloyd, et. al., 2009).

Additional actions were performed at select Vicinity Properties since that time and the NYSDEC has approved the cleanup of all Vicinity Properties. The additional actions and other completed removal actions are summarized in Sections B.2.1 through B.2.5.

B.2.6 2014-2015 Vicinity Property Operable Unit Remedial Investigation Dust Results

A remedial investigation (RI) was performed in 2014 - 2015 to further evaluate levels of DU in dust at select representative residential and commercial Vicinity Properties.

USACE performed additional dust sampling for the presence of DU at 12 Vicinity Property locations (including eight residential, three commercial, and one mixed residential/commercial use property) and one background sample as a part of the RI to assess current conditions of selected Vicinity Properties. The specialized sampling methodology, data results, and baseline risk assessment are presented in the *Vicinity Property Operable Unit Remedial Investigation Report* (USACE, 2016). This report is a part of the Colonie FUSRAP Site Administrative Record and is available to the public.

The purpose of the RI was to: 1) collect and evaluate data reflecting the current conditions of dust at representative Vicinity Properties (i.e., individually owned residential and commercial properties that surround the Colonie Main Site), 2) prepare a baseline risk assessment based on the data collected, and 3) provide an evaluation of the properties previously cleaned up by DOE (specifically at the Vicinity Property Operable Unit) to determine compliance with the *Colonie FUSRAP Site Colonie Main Site Soils Record of Decision* (USACE, 2015). Regarding the dust medium, the information gathered during the RI was intended to describe the current nature and extent of uranium dust in sufficient detail to determine risk and aid in the development and evaluation of alternatives consistent with the CERCLA process, if needed. Table 4 provides a listing of the residential and commercial Vicinity Properties sampled during this effort. At the individual Vicinity Properties, the basic sampling strategy was to collect dust for uranium analysis from living and non-living areas of the residential Vicinity Properties and from limited- and high-use areas of the commercial Vicinity Properties.

The dust sampling data as summarized in Table 4 showed that the highest concentrations observed were all in non-living areas (e.g., attics, basements, garages, etc.); furthermore, non-living areas contained the highest concentrations within each of the properties sampled regardless of whether that property was commercial or residential. As presented in the *Vicinity Property Operable Unit Remedial Investigation Report* (USACE, 2016), the baseline risk assessment concluded that the uranium concentrations do not pose an unacceptable risk in accordance with CERCLA and the NCP. Additional conclusions supporting this assertion were presented in the *Vicinity Property Operable Unit Remedial Investigation Report* (USACE, 2016) as follows:

- Uranium was detected in dust samples at residential and commercial Vicinity Properties above background concentrations. The concentrations do not pose an unacceptable risk in accordance with CERCLA and the NCP.

- Though not all Vicinity Properties were sampled, those that were sampled (i.e., 12 Vicinity Property locations including eight residential, three commercial, and one mixed residential/commercial use property) are representative of all Vicinity Properties.
- Analysis of the DOE and USACE cleanup actions at Vicinity Properties indicates that all properties are in compliance with the *Colonie FUSRAP Site Colonie Main Site Soils Record of Decision* (USACE, 2015).
- Based on the available information, the USACE recommends "No Action" for dust at all Vicinity Properties.

The NYSDEC, in consultation with the NYSDOH, has concurred with the Selected Remedy.

C. Community Participation

Community participation activities provide the public with an opportunity to express its views on preferred remedial actions. The USACE, in consultation with the NYSDEC and the NYSDOH, considered public input from community participation activities conducted during the public comment period for the *Proposed Plan* for Colonie FUSRAP Site Vicinity Property soils and dust.

The *Colonie FUSRAP Site Vicinity Property Operable Unit Proposed Plan* (USACE, 2017) for Colonie Vicinity Property soils and dust was made available to the public in the Administrative Record maintained at the William K. Sanford Town Library, 629 Albany Shaker Road, Loudonville, New York 12211. A notice of availability was published in *The Albany Times Union* and *The Colonie Spotlight* on January 11, 2017. The required public comment period was held from January 12, 2017 to February 13, 2017. USACE subsequently granted a 30-day comment period extension to March 15, 2017 at the request of interested stakeholders. In addition, a public meeting was held on February 1, 2017 at the West Albany Fire Company Number 2 in Colonie, New York. At this meeting, representatives from the USACE provided information and answered questions regarding soil and dust contamination at the Colonie FUSRAP Site Vicinity Properties and the No Further Action and No Action decisions for soil and dust, respectively. A response to the comments received during the comment period is included in the *Responsiveness Summary*, which is Section III of this ROD. A transcript of the public meeting is available to the public in the Administrative Record file.

A community relations plan, available in the Administrative Record file, has been prepared and implemented to keep the public informed of site activities and to invite community input. Under the plan, the USACE has produced progress update fact sheets maintained the Administrative Record files, published press releases and legal notices, and maintained a project mailing list.

D. Scope and Role of Remedial Action

The overall goal is to achieve unrestricted release for each of the 56 Vicinity Properties, as well as the Unnamed Tributary to Patroon Creek and associated water bodies.

Fifty-five of the 56 Vicinity Properties meet the unrestricted release criterion with No Further Action. The remaining Vicinity Property (i.e., the CSX Vicinity Property) meets the restricted release criterion with No Further Action provided that current land use (high speed rail) remains in place. Therefore, the USACE considers No Further Action protective of human health and the environment under current conditions for the Colonie FUSRAP Site Vicinity Property soils.

In addition, the current conditions at representative residential and commercial properties in the vicinity of the Colonie FUSRAP Site have been characterized; the results demonstrate that dust containing concentrations of uranium found in various areas of the structures poses no unacceptable risk to inhabitants (USACE, 2016). Therefore, the USACE considers No Action protective of human health and the environment for dust.

E. Vicinity Property Characteristics

The Vicinity Properties currently include a variety of residential and active commercial properties, including the high-speed rail line associated with the CSX Vicinity Property. The Vicinity Properties have been impacted by radiological contaminants from historical airborne releases during manufacturing and erosional processes from the Main Site. The property at 50 Yardboro Avenue was also contaminated by historical discharge from a storm water outfall that ran below the CSX Vicinity Property. The outfall is no longer present.

Based on the results of previous removal actions, the remedial action objectives have been met for unrestricted release of the properties. The NYSDEC concurs with this conclusion as stated in their July 22, 2016 correspondence (NYSDEC, 2016).

The Vicinity Property Operable Unit RI (USACE, 2016) concluded that dust present in representative residential and commercial properties surrounding the Colonie FUSRAP Site contains concentrations of uranium; however those concentrations pose no unacceptable risk to the inhabitants.

E.1 *Physical Characteristics of the Study Area*

The land that comprises the Vicinity Property Operable Unit is relatively flat and slopes gently from the northwest to the south-southeast. An Unnamed Tributary of Patroon Creek discharges into Patroon Creek south of the Colonie Main Site in the area of the Vicinity Properties located on Yardboro Avenue. Patroon Creek is a perennial stream that drains an area of approximately 13 square miles in the Town of Colonie and the City of Albany. The drainage basin is mostly urban with commercial and residential properties. Patroon Creek is approximately seven miles long, from its headwaters to its discharge into the Hudson River.

E.2 Geologic Setting

The primary geologic feature in the vicinity of the Vicinity Property Operable Unit is the Colonie Channel, which is a buried, glacially-scoured valley that occupies the Hudson-Champlain Lowlands of east-central New York. Like the Hudson River Valley of today, the Colonie Channel was the main artery of the river system draining the lowlands of eastern New York during pre-glacial times. Most of the unconsolidated sediments above the bedrock present at the Vicinity Property Operable Unit were deposited in glacial Lake Albany created during continental glacier advances and retreats in the Hudson Valley.

E.3 Groundwater Hydrology

The Upper Silt soil layer forms the shallow water-bearing zone at the Vicinity Property Operable Unit and is referred to as the upper groundwater zone. The Lower Silt forms the lower groundwater zone at the Vicinity Property Operable Unit. The Upper Clay separates the upper and the lower groundwater zones. As the Vicinity Property Operable Unit did not need investigations of groundwater, no data was collected for this media. However, the Main Site

groundwater was thoroughly investigated and descriptions of that along with decisions reached are presented in the *Colonie FUSRAP Site Record of Decision Colonie Site Groundwater* (USACE, 2010a).

E.4 Meteorology

The climate at the Vicinity Property Operable Unit is typical of upstate New York. The average annual daily maximum temperature is 57.8 degrees Fahrenheit (˚F), and the average daily minimum is 38.6˚F. The highest average monthly temperature is 82˚F (July), and the lowest is 15˚F (January). Average annual precipitation is 39.4 inches, with an average annual snowfall of 59 inches (U.S. Climate Data, 2017). Winds in the area blow predominantly out of the south-southeast to south sector and west to west north-west sector. The mean wind speed from these sectors is 10 miles per hour (BNI, 1992).

F. Current and Potential Future Land Uses

F.1 Current Land Use

The Vicinity Property Operable Unit is situated in an urban area consisting of both residential and commercial properties. Current land use is somewhat more residential as the Town of Colonie is the most populous suburb in Albany County with a population of over 83,000 (Town of Colonie, 2016). Figure 3 depicts land use at and around the Colonie FUSRAP Site.

F.2 Future Land Use

The most probable future land use at the Vicinity Property Operable Unit is considered to be urban residential. In accordance with the EPA guidance for projecting a site's potential future land use, current use, site setting, zoning laws/maps, and comprehensive community master plans were examined. The Town of Colonie master plan projects future commercial use for the Central Avenue strip, and the many residential Vicinity Properties located off Central Avenue will most likely remain residential. Future projected use will result in concentrated mixed use development with high population characteristics of an urban residential scheme.

G. Summary of Site Risks

Under CERCLA, if no unacceptable risks to human health or the environment are identified, then No Further Action/No Action is appropriate.

G.1 Soils Risk Assessment Summary

The assessment of risk potentially posed by soils remaining in place after completion of removal actions at the various Vicinity Properties (as summarized in Sections B.2.1 through B.2.4) was evaluated by comparing the confirmation soil sampling results to the risk-based cleanup levels. This assessment determined that all of the Vicinity Properties (with the exception of one) met the risk-based cleanup criteria.

The exception was the 6.5-acre CSX Vicinity Property where the removal action conducted by the USACE involved excavating a total of 2,871 cubic yards of soil with ^{238}U concentrations greater than site-specific cleanup criterion of 96 pCi/g (USACE, 2008). This work was performed under the constraint of preserving the structural integrity of the high speed rail line and the utility rail spur. As such, soils were not removed from beneath the utility rail spur, because the soils were considered inaccessible and part of the active rail line. The potential for

human contact with the subsurface soils beneath the active railroad tracks is considered to be extremely low, and therefore, risk to human receptors is also considered to be very low under the current and anticipated future land use.

The removal actions conducted by the DOE and the USACE for the Vicinity Properties have proved to be protective of human health and the environment, and have eliminated the need to conduct additional remedial action. The USACE has determined that soil removal actions conducted to date at the Vicinity Properties allow for the properties' unrestricted release, (i.e., cleanup action complete and property suitable for reuse with no requirements for land use restrictions or controls). The NYSDEC has concurred with this assessment in correspondence dated July 22, 2016.

G.2 Dust Risk Assessment Summary

A quantitative human health risk assessment was performed using dust sampling results for the Vicinity Property Operable Unit in accordance with the EPA's *Risk Assessment Guidance for Superfund: Volume 1, Human Health Evaluation Manual (Part A)*, and *Risk Assessment Guidance for Superfund: Volume 1, Human Health Evaluation Manual (Part D, Standardized Planning, Reporting, and Review of Superfund Risk Assessments)* (EPA, 1989 and 2001).

The human health risk assessment evaluated potential current or future human noncancer health hazards from exposure to DU in indoor dust in the selected residential and commercial Vicinity Properties as well as one off-site background property in Slingerlands, New York.

The receptor types evaluated included both residential (child and adult), adolescent garage user, and worker receptors. Four to eight indoor dust samples were collected from each property and were analyzed for DU. For each property the dust sample having the maximum DU concentration was used to estimate potential receptor exposure and calculate potential human health risks and hazards.

The non-cancer hazard was evaluated for potential uranium exposures found in dust and the hazard quotients were all found to be below 1.0 and thus do not pose a risk either now or in the future for all 13 Vicinity Properties. This means that uranium in indoor dust is not a contaminant of concern now or in the future at all evaluated Vicinity Properties. When carcinogenicity was considered for the combined child/adult receptor, the values were all within the EPA carcinogenic risk range of 10^{-6} to 10^{-4}, and therefore, do not pose an unacceptable CERCLA risk.

The adolescent garage user at 1148 Central Avenue exhibited a non-cancer hazard index of 0.65 which is below the action level of 1.0 and not a health concern. Likewise, when the carcinogenic risk was evaluated, the calculated risk was on the low end of the carcinogenic risk range of 10^{-6} to 10^{-4} and did not pose an unacceptable CERCLA risk to this receptor.

The non-cancer hazard quotients for the adult workers exposed to uranium in indoor dust at the three commercial Vicinity Properties were all far less than 1.0. This means that uranium in indoor dust is not a contaminant of concern for current and future adult workers at all three evaluated commercial properties.

The NYSDEC, in consultation with the NYSDOH, has concurred with the Selected Remedy.

As no remedy is being implemented, a five-year review is not required in response to this decision.

III. RESPONSIVENESS SUMMARY

A. Overview

The Vicinity Property OU PP for the Colonie FUSRAP Site was distributed to the site mailing list on January 6, 2017 and made available for general public review in the Site Administrative Record maintained at the William K. Sanford Town Library on January 11, 2017. The initial public comment period on the PP was from January 12, 2017 through February 13, 2017. Display advertisements notifying the public of the availability of the PP and the public comment period were placed in the *Albany Times Union* and the *Colonie Spotlight* newspapers on January 11, 2017. Similar public notices were posted on the community calendar pages of the *Times Union* and *Spotlight* websites.

A public meeting on the Vicinity Property OU Proposed Plan was held on February 1, 2017, during which USACE presented the preferred alternative and took questions and comments from the public. Oral comments from the public meeting are documented in the meeting transcript that has been placed in the Administrative Record for the Site. Written comments were received during the comment period from the City of Albany Department of Water and Water Supply and the Community Concerned About NL Industries (CCNL) and are attached to this Responsiveness Summary. USACE subsequently received a request from the public to extend the public comment period. In response, the public comment period was extended by 30 days, until March 15, 2017. A display advertisement on the public comment period extension was published in the *Albany Times Union* on February 16, 2017.

The USACE's preferred alternative for the Vicinity Property OU as presented in the PP and at the public meeting was No Further Action for soils and No Action for dust. Based on the comments received, some members of the public preferred additional action to remove dust at seven properties investigated during the dust remedial investigation. The NYSDEC, in consultation with the NYSDOH, has concurred with the Selected Remedy.

B. Background on Community Involvement

Public concern related to uranium releases from the NL plant arose even before the Site was assigned to DOE under FUSRAP as citizen groups called for attention to the issue. During the history of public involvement at the Site under FUSRAP, the DOE and then the USACE have utilized a variety of methods to engage and inform the public, including answering media inquiries and conducting media tours, issuing news releases and newsletters, and holding public meetings.

Below is a chronology of significant community involvement events:

- A public meeting in Albany, New York on February 14, 1984 to discuss plans for the Site.
- A public meeting in Colonie, New York on July 2, 1984 to discuss remedial action plans with affected property owners and to answer questions from the public.
- Personal contacts with owners of residential and commercial properties remediated in 1984, 1985 and 1988.
- An October 1987 onsite meeting between DOE staff, representatives of the Superfund Monitoring Project and a former NL employee who pointed out areas of suspected

buried contamination. Members of the media also attended.

- In April 1988, DOE published a Notice of Intent (a NEPA term for an Environmental Impact Statement [EIS]) in the Federal Register to publicly announce that an EIS was being initiated; the EIS would culminate in a ROD on how the Site should be remediated.
- A public meeting on April 25, 1988 to solicit public comments and concerns related to the Site. At the time, the Colonie FUSRAP Site was part of a combined environmental review process that included three other FUSRAP sites. As a result of public comment, DOE agreed to manage the Colonie FUSRAP Site as a separate action. Due to this change, DOE determined that an Environmental Assessment (EA) rather than an EIS would be required for the Site.
- DOE held several meetings in December 1988 with Town of Colonie officials, district congressional staff, and concerned citizens. These meetings captured public concerns and communicated DOE progress on the site. Between 1984 and 1988 DOE remediated 53 Vicinity Properties. From 1992 to 1996 DOE demolished all remaining NL buildings.
- DOE prepared an EE/CA in 1995 to determine the best cleanup approach for site contaminants. The recommended alternative was 3-B, which included: 1) excavation and off-site disposal of material containing Uranium-238 above 100 picocuries per gram and thorium above 15 picocuries per gram; 2) on-site consolidation of material between 35 picocuries per gram and 100 picocuries per gram under an engineered 18-inch gravel and earthen cap. Public input on the EE/CA remedy selection process was obtained during a public comment period.
- USACE conducted 31 community interviews from November 15-20, 1999 with residents, local business owners, elected officials, media representatives, representatives of public agencies and representatives of environmental activist groups.
- An August 24, 2000 Open House was held to update the community.
- USACE prepared a public involvement plan in October 2000 to identify local community concerns and set forth a strategy for on-going, two-way communication between USACE and the community.
- Due to physical constraints of the Site and negative public reaction regarding the proposal to store encapsulated radioactive waste onsite (e.g., alternative 3-B), USACE reevaluated the EE/CA alternatives and recommended alternative 2-B: Large scale excavation and off-site disposal with no on-site storage of contaminated material. A public meeting was held July 11, 2001 regarding this proposal.
- During the removal action (2000 – 2007), fact sheets were mailed semi-annually or as circumstances warranted to a community mailing list and made available in the Information Repository at the William K. Sanford Town Library and on the project website. In addition, periodic open houses were held to share information and gather community feedback.

- The Groundwater OU Proposed Plan was released to the public in July 2009. A public comment period was held from July 9 through August 31, 2009. A public meeting was held on July 30, 2009. The Groundwater OU ROD was issued in April 2010.
- The Main Site Soils Proposed Plan was released to the public in July 2014. A public comment period was held from July 24, 2014 through September 22, 2014. A public meeting was held on August 6, 2014. The Main Site Soils OU ROD was issued in March 2015. Fact sheets summarizing the PP and providing a general update on Colonie FUSRAP Site activities were made available to the public at this time.

C. Summary of Public Comments and Agency Responses

In accordance with CERCLA guidance for Responsiveness Summaries, the comments received have been grouped by commenter and are presented below.

Mr. Joseph E. Coffey, Jr., P.E., Commissioner, City of Albany Department of Water and Water Supply - excerpt from the letter dated February 13, 2017

Comment:

The City of Albany requests that you reconsider the work plan as it relates to the Three Mile Reservoir. The City is interested in potentially decommissioning the reservoir which would include removing the dam. Removing the dam and improving the upstream channel of the Patroon Creek may be beneficial for mitigation of flooding in the City and surrounding areas. Not taking the potential reservoir decommissioning and dam removal into account during the planning of NL Industries FUSRAP Site would create a future issue regarding the quality of the sediment behind the dam and the potential that the sediment would migrate downstream, along with any of the historical contaminants that may be present from the former NL site. The City of Albany is currently undertaking a project to daylight the Patroon Creek in the Tivoli Lake Preserve to help mitigate flooding and create additional recreation areas. Albany residents who wish to use the preserve are concerned with the water quality of the Patroon Creek due to past contamination from NL and MERECO, and the City hopes to ensure the mitigation of any future contamination.

Response:

In 2003, USACE conducted a site investigation of Patroon Creek, an Unnamed Tributary of Patroon Creek, and Three Mile Reservoir to determine whether radiological contamination had impacted the sediment within each surface water body. Sample results from Patroon Creek and Three Mile Reservoir were less than the radiological cleanup criteria and required no further action, with the exception of two sample locations within the Unnamed Tributary that exhibited elevated levels of Uranium-238.

To address these contaminated sediments, USACE performed a limited removal action in the Unnamed Tributary during March and April 2007. Approximately 393 cubic yards of contaminated sediment was removed from the bed of the Unnamed Tributary during this action. Analytical results for confirmation samples associated with the Unnamed Tributary indicated full compliance with the radiological cleanup criterion.

Based on the results of the 2003 investigation and the Unnamed Tributary sediment removal action and confirmation sampling results, USACE determined that further FUSRAP action in the Unnamed Tributary, Patroon Creek, or the Three Mile Reservoir was not required. The NYSDEC agreed that the sediment removal action met the cleanup criteria. With the FUSRAP-related contamination addressed our work is complete, and any remaining non-radiological contamination related to the NL site is the responsibility of the previous landowner.

Ms. Anne Rabe, Chairperson, Board of Directors, Community Concerned About NL Industries (CCNL) - excerpt from the letter via email dated March 12, 2017)

Comment:

We respectfully request that the Army Corps of Engineers complete the cleanup of NL's pollution by doing remedial vacuuming of the seven properties with dust in excess of 35 picocuries per gram. Contaminated dust is a much more accessible pathway of exposure to people compared to soil in front or back yards. As families grow in these seven homes, they may renovate an attic, basement or garage (now seen as in limited use by residents) into a bedroom or work area and thus be exposed to radioactive dust. Some of the properties will also be sold and new owners or tenants would likely have no knowledge that radioactive particles are in their basement, attic or garage.

Response:

In response to concerns raised by CCNL and others regarding the presence of radiological contamination in dust in Vicinity Properties, the USACE performed a remedial investigation (RI) to evaluate potential human health risks to current or future building occupants. USACE executed this investigation under FUSRAP, which is performed in accordance with the provisions of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Contingency Plan (NCP). Under CERCLA, remedial actions are taken when site conditions pose risks to identified receptors. Uranium concentrations in indoor dust at sampled Vicinity Properties were found to pose no unacceptable cancer risk to current and future residents and workers as the risks were all within the U.S. Environmental Protection Agency (EPA)-identified target risk range of 10^{-6} to 10^{-4} for all exposure units. The non-cancer hazard was also evaluated due to uranium exposures found in dust. The hazard quotients (HQ) were all found to be below one and thus do not pose a risk to identified receptors either now or in the future. Therefore, the concentrations detected the investigated properties do not pose an unacceptable risk in accordance with CERCLA and the NCP, and thus no action will be taken at these properties. While not related to the Colonie FUSRAP Site CERCLA cleanup (as no action is authorized because there is no unacceptable risk), USACE is considering implementation of a dust collection pilot test at the affected properties to support FUSRAP remedial/removal design at a different FUSRAP site. It should be noted that implementation of such a program would be contingent on funding, justification of need for the information, and approval of the property owners to conduct the effort.

Public Comments – oral comments received during the Vicinity Property Operable Unit Proposed Plan Public Meeting held February 1, 2017

Comment 1:
The first commenter questioned why the NCP risk range (i.e., 10^{-4} to 10^{-6}) was followed rather than the state of New York 10^{-6} standard.

Response:

The NCP risk range of 10^{-4} to 10^{-6} is the federal guideline used on the Colonie FUSRAP Site which is a federal site. Further discussion took place on this issue in the meeting's aftermath and the commenter was satisfied that her concerns had been addressed.

Comment 2:
A commenter recalled a "red line" associated with the Colonie FUSRAP Site which precluded owners of commercial property from selling their properties until a site remedy was in place. He placed the timing of this as the mid-1990s. He asked if this is true and if so, if the restriction has been lifted?

Response:

USACE is not aware of any such restriction on private property transactions. Prospective sellers and buyers can refer to the Colonie FUSRAP Site Administrative Record file for information on FUSRAP actions and status for specific properties.

Comment 3:

What will become of the Main Site property and will there be any land use restrictions on the property?

Response:

USACE is the government agency executing the cleanup of the Colonie FUSRAP Site, including the Main Site property. The Main Site property is owned by the U.S. Department of Energy Office of Legacy Management (LM). USACE, as the executing agent and in coordination with New York State authorities, will notify LM when this Vicinity Property Operable Unit (OU) Record of Decision (ROD) is in place. The Vicinity Property OU ROD is the final such document for the Colonie FUSRAP Site; RODs for the two other OUs at the site, the Main Site Soils and Groundwater OUs, are already in place. Once that ROD notification is made, LM will undertake its administrative procedures for managing completed government-owned properties at FUSRAP sites. To USACE's understanding, this can include the sale of such properties in coordination with the U.S. General Services Administration.

An environmental easement on the property will be recorded to prohibit contact with lead and arsenic in soil at three specific locations at the Main Site where subsurface soil remaining in place had concentrations just above the residential standard.

Comment 4:

Were dust samples collected at residential properties analyzed for total uranium and enriched uranium or only for depleted uranium? The reason that I'm asking that is because as your presentation made clear and as we all know that NL used enriched

uranium for many years. I don't know how much they used, but I imagined that some of it got to the atmosphere as well.

Response:

Available records indicate that NL largely procured depleted uranium and fabricated it to make armor-piercing rounds for tanks. The records also show that for a period of approximately 12 years, NL handled small amounts of enriched uranium for experimental reactors. The results of testing that was performed during the site investigations identified Uranium-234, Uranium-235 and Uranium-238, all of which are components of depleted uranium, enriched uranium, and natural uranium. The results were indicative of depleted uranium in all cases. No indication of enriched uranium was found in the test results.

Comment 5:

A commenter noted his understanding that Site Inspection action levels were developed using risk assessment precedents, i.e., starting with toxicology numbers, working through scenarios and developing these numbers. How did the assumptions change the risk assessment when USACE looked at the final results?

Response:

The output of the risk assessment is a quantitative expression of both the carcinogenic risks and noncarcinogenic hazards from uranium. This output, termed the "risk characterization" is a combination of the toxicity assessment and exposure assessment. The toxicity assessment uses values that are supplied by the U.S. Environmental Protection Agency (EPA) and the exposure assessment uses quantitative assumptions for durations and times exposed by a receptor type (e.g., "child resident") that are a combination of research supplied values generated by the EPA and those derived through professional judgement. All of the assumptions, explanation and risk values can be found in the risk assessment that is presented in the Remedial Investigation (RI) report. In answer to the question, the assumptions that went into the derivation of risk did not change after the risk results were derived.

Comment 6:

What was the highest concentration of uranium found in dust samples collected in living spaces at residential properties?

Response:

The highest concentration was 4.2 picocuries per gram total uranium.

Comment 7:

Of the 56 Colonie FUSRAP Site Vicinity Properties, how many of them were in the pool for selective statistics sampling?

Response:

Of the 56 Vicinity Properties, 30 were identified as residential, and 26 were considered commercial. The sampling effort focused primarily on residential properties because residents have the greatest potential for exposure to dust due to a number of factors, including exposure duration and the higher potential for the presence of children. Of the 30 residential properties, the target was to sample 14 properties; however, only 10

properties were ultimately sampled due to the reluctance of some property owners to permit USACE access to their properties for sampling purposes. Of the 26 commercial properties, the target was to sample two properties; however, three commercial properties were ultimately sampled to provide additional data considering the reduced number of residential properties that granted sampling access.

Comment 8:

The meeting presentation stated that letters sent to the owners of properties where dust was sampled suggested potential methods for removing the dust and for future renovation. Will similar letters be sent to all 56 property owners?

Response:

No. Letters were only sent to property owners who granted access for dust sampling and where sampling actually occurred.

Comment 9:

Regarding the point made by the USACE that there was not much uranium mass in the dust, regardless of where it was collected or the magnitude of the observed concentration, one person asked to see a comparison of 5 pounds of dust in an attic and basement versus 100 pounds of soil in a residential yard and how each would relate to the 35 pCi/g cleanup standard.

Response:

The USACE advised that they would get her such analysis. The USACE sent an email to the commenter that, in summary, provided the following information: An average dust areal density of 1.75 grams per square foot was calculated for the limited-use locations by dividing the sample mass by the area over which the sample was collected. The approximate area of the detached garage attic where the highest uranium was observed is 1,104 square feet. This represents about 1,902 grams of dust across the horizontal areal extent. If all this dust was assumed to be contaminated at the highest concentration observed (i.e., 630 pCi/g), the total inventory of uranium in the detached garage loft would be 1.2 million pCi or about 3 grams of uranium.

So how does this amount of uranium in dust (3 grams) compare to the amount of uranium that we agreed was safe to leave in Site soils? One cubic foot of soil weighs about 100 pounds (45,359 grams). At the 35 pCi/g limit applied during cleanup, this represents about 1.6 million pCi or about 4 grams of uranium. Thus, there are likely more grams of uranium in a single cubic foot of soil at the safe cleanup level than are present in the entire attic containing the highest concentration of uranium.

February 13, 2017 letter from the City of Albany, New York Department of Water &Water Supply

CITY OF ALBANY DEPARTMENT OF WATER & WATER SUPPLY
10 NORTH ENTERPRISE DRIVE
ALBANY, NY 12204
TELEPHONE (518) 434-5300

February 13, 2017

James T. Moore, FUSRAP Project Manager
Department of the Army
New York District, Corps of Engineers
Jacob Javits Federal Building
New York, NY 10278-0090

Re: Town of Colonie, NL Industries FUSRAP Site
Proposed Plan to Address the Vicinity Properties

Dear Mr. Moore:

The City of Albany requests that you reconsider the work plan as it relates to the Three Mile Reservoir. The City is interested in potentially decommissioning the reservoir which would include removing the dam. Removing the dam and improving the upstream channel of the Patroon Creek may be beneficial for mitigation of flooding in the City and surrounding areas. Not taking the potential reservoir decommissioning and dam removal into account during the planning of NL Industries FUSRAP Site would create a future issue regarding the quality of the sediment behind the dam and the potential that the sediment would migrate downstream, along with any of the historical contaminants that may be present from the former NL Industries site. The City of Albany is currently undertaking a project to daylight the Patroon Creek in the Tivoli Lake Preserve to help mitigate flooding and create additional recreation areas. Albany residents who wish to use the preserve are concerned with the water quality of the Patroon Creek due to past contamination from NL Industries and MERECO, and the City hopes to ensure the mitigation of any future contamination.

Sincerely,

Joseph E. Coffey, Jr., P.E.
Commissioner

Cc: Mayor Kathy Sheehan

March 12, 2017 Letter from the Community Concerned About NL Industries

From: Anne Louise Rabe Redacted - Privacy Act
Sent: Sunday, March 12, 2017 6:21 PM
To: Moore, James T CIV USARMY CENAN (US)
Cc: maureen.schuck@health.ny.gov; jeabunaw@gw.dec.state.ny.us; William.Kollar@CBIFederalServices.com; Dellacamera, Phyllis A CIV USARMY CENAB (US); Watters, David J CIV USARMY CENAB (US); Opdyke, Clifford A CIV USARMY CENAB (US)
Subject: [EXTERNAL] Comments on proposal regarding NL CISS Site

James Moore, CENAN-PP-E

Project Manager

U.S. Army Corps of Engineers

New York District

26 Federal Plaza, Room 1811

New York, New York 10278-0090

Re: Final Colonie FUSRAP Site Vicinity Property Operable Unit Proposed Plan

Dear Mr. Moore:

We write to provide comments on the above referenced document. We represent many of the impacted residents of Colonie and Albany, as well as concerned environmental and civic leaders and policymakers. In addition, we represent Community Concerned About NL Industries (CCNL), a community group that has advocated for and monitored the cleanup of the former NL Industries property and surrounding neighborhood for over thirty years.

First, we thank the Army Corps of Engineers for remediating the unnamed tributary area on Yardboro Avenue, as well as remediating 50 Yardboro Avenue and testing 1118 Central Avenue.

Second, we thank the Army Corps of Engineers for testing 17 residential and commercial properties for radioactive dust. We greatly appreciate that your agency took this extra step to fully investigate off-site contamination.

We received your email to Anne Rabe of February 3, 2017 in which the Army Corps of Engineers provided numerical information about concentrations of uranium in soil and dust, specifically in relation to the 35 picocuries per gram site cleanup standard. This information is very helpful.

We respectfully request that the Army Corps of Engineers complete the cleanup of NL's pollution by doing remedial vacuuming of the seven properties with dust in excess of 35 picocuries per gram. Contaminated dust is a much more accessible pathway of exposure to people compared to soil in front or back yards. As families grow in these seven homes, they may renovate an attic, basement or garage (now seen as in limited use by residents) into a bedroom or work area and thus be exposed to radioactive dust. Some of the properties will also be sold and new owners or tenants would likely have no knowledge that radioactive particles are in their basement, attic or garage.

As you know, uranium is a radioactive heavy metal that can cause cancer, kidney dysfunction and other health problems. Inhaling uranium particles attached to the dust is an especially high risk pathway of exposure. In addition, unlike the dust, most of the radioactive particles that NL Industries deposited in the neighborhood soil have, over time, due to rain and snow, sunk several inches into the soil and thus are less accessible.

The Army Corps should finish the job completely by cleaning up the contaminated dust in seven properties. It is our understanding that some staff at the NYS Department of Health would be supportive of this protective remedial measure. By vacuuming the contaminated dust, your agency will eliminate this health risk. This request is based on two well-established principles. First, there is no safe level of exposure to radiation. Second, uranium is a carcinogen and any increased exposure to a carcinogen increases the risk of getting cancer.

Specifically, we strongly recommend the following seven properties be remediated for contaminated dust in excess of the 35 picocuries per gram.

* Res-002, Res-003 and Res-010 from the 2011 testing listed on page 17 of the February 1, 2017 Army Corps power point slide.

* Residential 02, Residential 03, Residential 09 and Residential 10 from the 2014/2015 testing listed on page 25 of the February 1, 2017 Army Corps power point slide.

As we recall, you and your staff stated at the February 1st public meeting that remediating the contaminated dust could be done with a HEPA vacuum cleaner. The result of vacuuming seven properties is well worth the cost—providing residents with a much safer home by eliminating a radioactive hazard, which is especially harmful to young children and the elderly.

Thank you for considering our recommendations. We sincerely hope the Army Corps of Engineers will take protective action for our community and complete the cleanup.

Sincerely,

Anne Rabe

Chairperson

Board of Directors

Community Concerned About NL Industries

Tom Ellis

Secretary

Board of Directors

Community Concerned About NL Industries

Joe Lito

CCNL

Formerly Yardboro Ave.

Albany, NY

Claudia Ramundo

CCNL

Formerly Central Avenue

Albany, NY

Joan Sheehan

CCNL

Formerly Central Avenue

Albany, NY

Nancy Snow

CCNL

Formerly Osborne Ave.

Albany, NY

Pat McGrath

CCNL

Central Ave.

Albany, NY

Lorna Joseph

CCNL

Yardboro Ave.

Albany, NY

Doug Bullock

Legislator, 7th District

Albany County Legislature

Albany, NY

Darrell Duncan

Legislator, 38th District

Albany County Legislature

Albany, NY

Andrew Joyce

Legislator, 9th District

Albany County Legislature

Albany, NY

Raymond Joyce

Legislator, 13th District

Albany County Legislature

Albany, NY

Alison McLean Lane

Legislator, 14th District

Albany County Legislature

Albany, NY

Mark Grimm

Legislator, 29th District

Albany County Legislature

Albany, NY

Judith Enck

Visiting Scholar

Elizabeth Haub School of Law at Pace University

Former EPA Region 2 Administrator
Poestenkill, NY

Roger Downs
Conservation Director
Sierra Club Atlantic Chapter

Albany, NY

Dr. David Carpenter

Executive Director

Institute for Health & the Environment

Rensselaer, NY

Howard A. Freed, M.D.
Former Director
Center for Environmental Health
NYS Department of Health

Washington DC

Barbara Warren, RN, MS

Director

Citizens' Environmental Coalition
Albany, NY

Ann Kistler

Solidarity Committee of the Capital District

Delmar, NY

Renato Sanges

Sandra Fonda

Rainbow Alliance for a Clean Environment

Gloversville, NY

Redacted - Privacy Act

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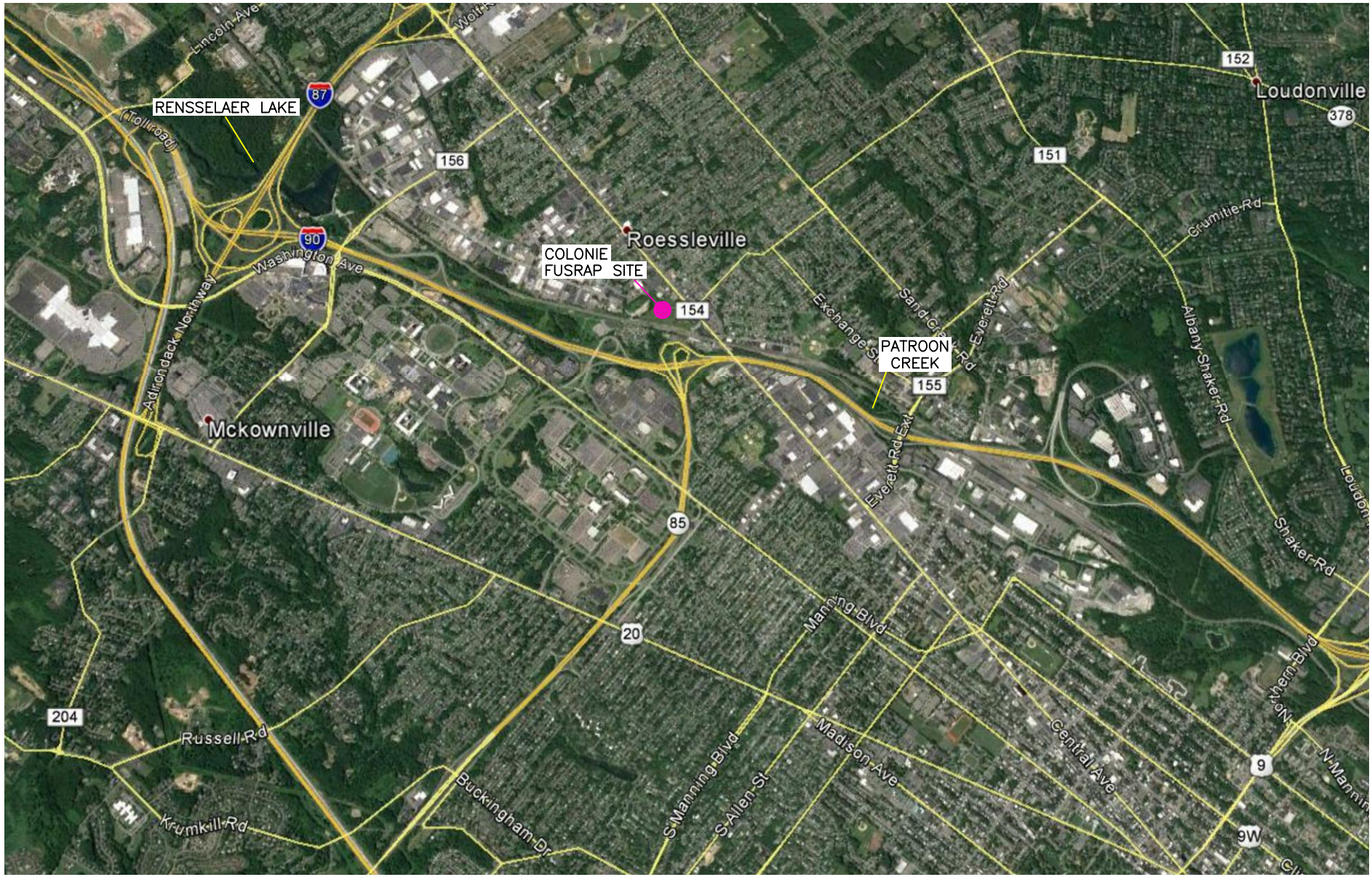
FIGURES

Figure 1: Location Map – Colonie FUSRAP Site



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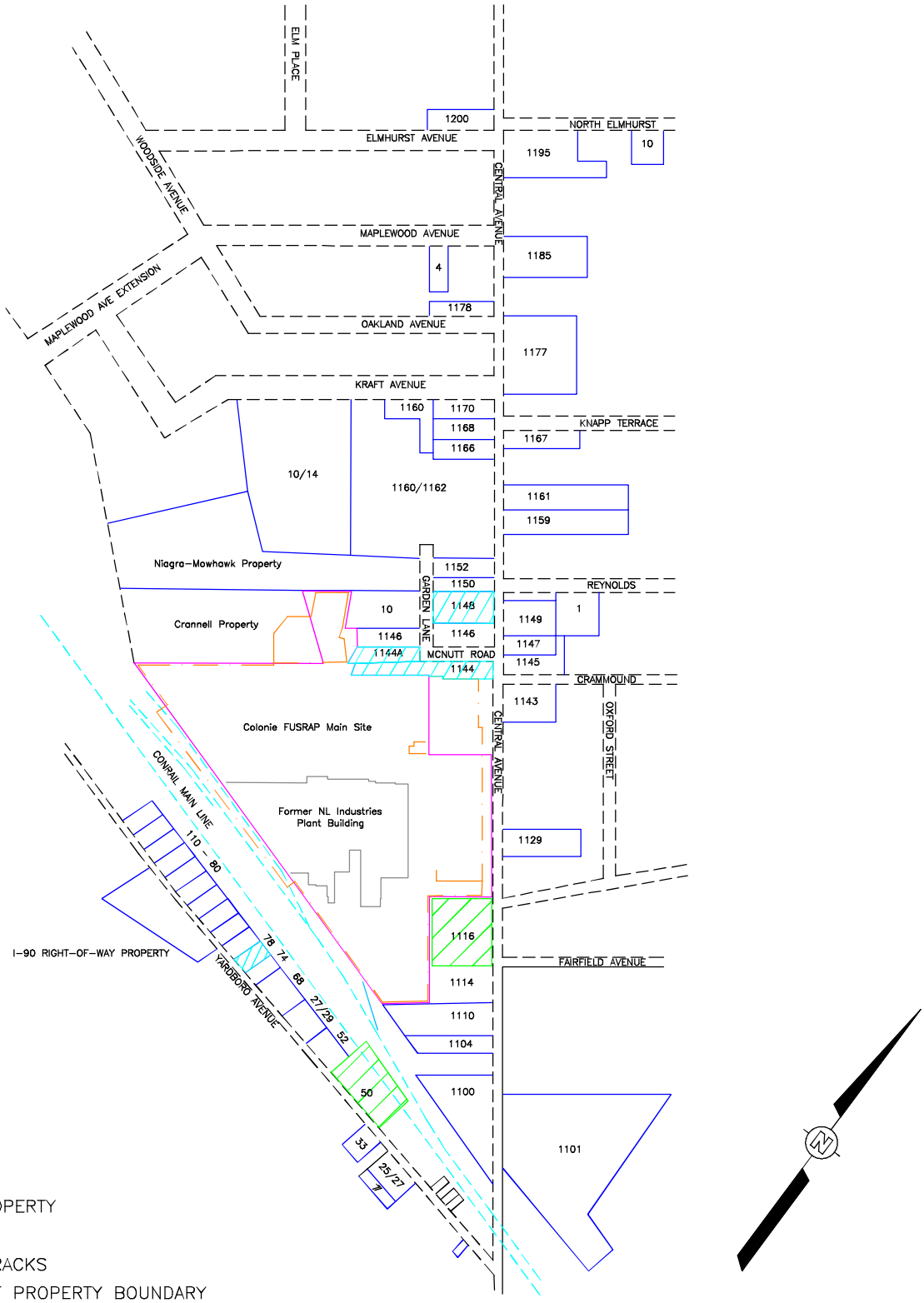
SCALE IN MILES

N

	U.S. ARMY CORPS OF ENGINEERS FORMERLY UTILIZED SITES REMEDIAL ACTION PROGRAM		
	FIGURE 1 LOCATION MAP – COLONIE FUSRAP SITE		
US Army Corps of Engineers	COLONIE FUSRAP SITE 1130 CENTRAL AVENUE, ALBANY, NY 12205		
Cabrera Services	DRAWING NO.	SHEET NO. 1 OF 1	REVISION NO.

Figure 2: Current Vicinity Property Locations



LEGEND

- VICINITY PROPERTY
- ROADS
- RAILROAD TRACKS
- GOVERNMENT PROPERTY BOUNDARY
- EXISTING FENCE
- VICINITY PROPERTIES DATA GAP INVESTIGATION 2011
- CONFIRMATION DUST SAMPLING 2011

REFERENCE: TECHNICAL MEMORANDUM
VICINITY PROPERTY ASSESSMENT
COLONIE FUSRAP SITE, USACE 2010
CONFIRMATION DUST SAMPLING REPORT
FOR COLONIE FUSRAP SITE VPs USACE 2012

DRAWING NOT TO SCALE
PROPERTY LOCATIONS ARE APPROXIMATE

	U.S. ARMY CORPS OF ENGINEERS FORMERLY UTILIZED SITES REMEDIAL ACTION PROGRAM
	FIGURE 2 CURRENT VICINITY PROPERTY LOCATIONS
US Army Corps of Engineers	COLONIE FUSRAP SITE 1130 CENTRAL AVENUE, ALBANY, NY 12205
	DRAWING NO. / SHEET NO. 1 OF 1 / REVISION NO.

Figure 3: Land Use Map

U.S. ARMY CORPS OF ENGINEERS
FORMERLY UTILIZED SITES
REMEDIAL ACTION PROGRAM

FIGURE 3
LAND USE MAP

COLONIE FUSRAP SITE
1130 CENTRAL AVENUE, ALBANY, NY 12205

DRAWING NO.	SHEET NO.	REVISION NO.
837935D92	1 OF 1	

TABLES

Table 1. List of Colonie FUSRAP Site Vicinity Properties Included in this Record of Decision

Vicinity Properties	Property Address/Street Nos.	Agency Responsible for Cleanup
Properties along Central Avenue	Nos. 1100; 1101; 1104; 1110; 1114; **1118;** 1129; 1143; **1144/1144A**; 1145; 1146; 1147; **1148**; 1149; 1150; 1152; 1159; 1160; 1161; 1160/1162; 1166; 1167; 1168; 1170; 1177; 1178; 1185; 1195; 1200	DOE USACE (supplemental cleanup for properties listed in **boldface print**)
Properties along Yardboro Avenue	Nos. 5; 16; 20; 24; 25/27; 27/29; **50**; 52; 68; 74; **78**; 80; 80-110	DOE USACE (supplemental cleanup for properties listed in **boldface print**)
Railroad Avenue	Crannell Property (no permanent structures observed in 2013 visit) Niagara Mohawk (NiMo) Property	DOE USACE*
Palmer Avenue	Nos. 7; 33	DOE
Elmhurst Avenue	10 North Elmhurst Avenue	DOE
Reynolds Avenue	1 Reynolds Avenue	DOE
	Exit 4, Interstate 90 Right of Way Property	DOE
Garden Lane	10 Garden Lane	DOE
Kraft Avenue	10/14 Kraft Avenue	DOE
Maplewood Avenue	4 Maplewood Avenue	DOE
CSX Rail	Adjacent to southern portion of the Colonie Main Site	USACE DOE

Notes:

* Niagara Mohawk (NiMo) Vicinity Property did not require remediation

The Town of Colonie Vicinity Property is addressed as part of the Colonie Main Site Soils ROD (USACE, 2015).
DOE = U.S. Department of Energy
USACE = U.S. Army Corps of Engineers

Table 2. Summary of the DOE Vicinity Property Remediation

Vicinity Property ID	Property	Remedial Actions	Approximate Area Remediated (m^2)	Max Uranium Concentration (pCi/g) or Avg Dose Rate (mrad/h)	No. of Samples/ Measurements	Sample Density (m^2/ample)
AL084	1100 Central Avenue	Crushed stone removed (3-inch depth) and replaced	25.35	32.6 pCi/g	5	5.07
	1101 Central Avenue	Grass/gravel removed and replaced	85.54	18.0	5	17.10
	1104 Central Avenue	Crushed stone removed and replaced	119.86	38.3 pCi/g** (next highest 27.7 ± 5.5)	10	11.99
		Grass removed (3-in depth) and replaced	13.86	N/A	None	N/A
AL215	1110 Central Avenue	N/A	N/A	N/A	N/A	N/A
	1114 Central Avenue	Asphalt scabbled	17.95	0.1 mrad/h	156 *	0.12
		Rocks/dirt on top of asphalt excavated-asphalt scabbled	28.90	0.1 mrad/h	120 *	0.24
		Tar paper roof removed	77.96	0.1 mrad/h	330 *	0.24
		Small grass strip removed (3-in depth) and replaced	3.73	5.0 pCi/g	4	0.93
	1118 Central Avenue	Grass removed 3-in depth) and replaced	111.75	N/A	None	N/A
		Crushed Stone removed and replaced	86.99			
		Asphalt scabbled	51.18	0. 09 mrad/h	305 *	0.17
	1129 Central Avenue	Grass removed (3-in.depth) and replaced	41.86	1.1 pCi/g	4	10.46
AL098	1143 Central Avenue		N/A	N/A	N/A	N/A
	1144/1144A Central Avenue	Blacktop scabbled	33.03	0.2 mrad/h	50 *	0.66
		Grass/gravel removed and replaced	1983.01	16.3 pCi/g	105	18.89
AL100	1145 Central Avenue	N/A	N/A	N/A	N/A	N/A
	1146 Central Avenue	Crushed stone/grass removed and replaced	88.15	19.6 pCi/g	7	12.59
	1147 Central Avenue	Grass removed and replaced	35.09	3.1 pCi/g	5	7.02
	1148 Central Avenue	Grass removed and replaced	181.67	23.6 pCi/g	12	15.14
AL102	1149 Central Avenue	N//A	N/A	N/A	N/A	N/A
	1150 Central Avenue	Grass/gravel removed and replaced	163.69	20.8 pCi/g	8	20.46
	1152 Central Avenue	Grass/gravel removed and replaced	243.86	33.3 pCi/g	11	22.17
	1159 Central Avenue	Grass removed (3-in depth) /replaced	185.71	14.7 pCi/g	28	6.63

Table 2. Summary of the DOE Vicinity Property Remediation (continued)

Vicinity Property ID	Property	Remedial Actions	Approximate Area Remediated (m^2)	Max Uranium Concentration (pCi/g) or Avg Dose Rate (mrad/h)	No. of Samples/ Measurements	Sample Density (m^2/Sample)
AL021	1160 Central Avenue	Grass removed (3-in depth) and replaced	45.01	18.5 pCi/g	4	11.25
	1161 Central Avenue	Grass/gravel removed and replaced	85.65	21.3 pCi/g	11	7.79
AL020	1160/1162 Central Avenue	Grass/gravel removed and replaced	157.27	17.8 pCi/g	7	22.47
		Asphalt scabbled	58.59	0. 07 mrad/h	315	0.19
	1166 Central Avenue	Grass removed and replaced	163.13	28.5 pCi/g	11	14.83
	1167 Central Avenue	Grass removed (3-in.depth) and replaced	42.15	4.4 pCi/g	5	8.43
	1168 Central Avenue	Grass removed and replaced	257.42	14.7pCi/g	13	19.80
	1170 Central Avenue	Grass/gravel removed (3-in depth) and replaced	84.08	15.4 pCi/g	9	9.34
AL130	1177 Central Avenue	N/A	N/A	N/A	N/A	N/A
AL105	1178 Central Avenue					
	1185 Central Avenue	Grass removed (3-in depth) and replaced	43.30	2.2 pCi/g	5	8.66
	1195 Central Avenue	Grass removed (3-in depth) and replaced	20.81	7.8 pCi/g	4	5.20
AL106	1200 Central Avenue	N/A	N/A	N/A	N/A	N/A
AL217	Crannell Property, Railroad Avenue	N/A	N/A	N/A	N/A	N/A
AL068	10 N. Elmhurst Avenue	N/A	N/A	N/A	N/A	N/A
AL212	Exit 4, 190 Right of Way Property	N/A	N/A	N/A	N/A	N/A
	10 Garden Lane	Crushed stone removed and replaced	199.08	26.1 pCi/g	8	24.89
AL148	10/14 Kraft Avenue	N/A	N/A	N/A	N/A	N/A
AL143	4 Maplewood Avenue	N/A	N/A	N/A	N/A	N/A
AL218	Niagara Mohawk (NiMo) Property, Railroad Avenue	N/A	N/A	N/A	N/A	N/A
	7 Palmer Avenue	Grass removed (3-in depth) and replaced	26.07	9.0 pCi/g	4	6.52

Table 2. Summary of the DOE Vicinity Property Remediation (continued)

Vicinity Property ID	Property	Remedial Actions	Approximate Area Remediated (m^2)	Max Uranium Concentration (pCi/g) or Avg Dose Rate (mrad/h)	No. of Samples/ Measurements	Sample Density (m2/Sample)
AL218	33 Palmer Avenue	Grass removed (3-in depth) and replaced	150.90	8.2 pCi/g	8	18.86
AL033	1 Reynolds Avenue	N/A	N/A	N/A	N/A	N/A
	5 Yardboro Avenue	Grass removed (3-in depth) and replaced	2.91	2.5 pCi/g	4	0.73
AL137	16 Yardboro Avenue	N/A	N/A	N/A	N/A	N/A
AL136	20 Yardboro Avenue	N/A	N/A	N/A	N/A	N/A
	24 Yardboro Avenue	Grass removed (3-in depth) and replaced	3.23	15.2 pCi/g	4	0.81
	25/27 Yardboro Avenue	Grass removed (3-in depth) and replaced	5.40	5.7 pCi/g	3	1.80
	27/29 Yardboro Avenue	Grass removed (3-in.depth) and replaced	132.38	14.0pCi/g	11	12.03
	50 Yardboro Avenue	Grass removed and replaced	45.19	7.8 pCi/g	8	5.65
	52 Yardboro Avenue	Grass removed (3-in.depth) and replaced	217.62	8.7 pCi/g	24	9.07
	68 Yardboro Avenue	Grass removed (3-in.depth) and replaced	313.78	5.0 pCi/g	16	19.61
	74 Yardboro Avenue	Grass/gravel removed (3-in.depth) and replaced	44.29	15.0 pCi/g	13	3.41
	78 Yardboro Avenue	Grass removed (3-in.depth) and replaced	11.54	3.1 pCi/g	4	2.89
		Stone driveway removed, replaced with concrete	43.31	3.0 pCi/g	4	10.83
	80 Yardboro Avenue	Grass removed (3-in.depth) and replaced	111.34	11.0 pCi/g	8	13.92
AL151	80-110 Yardboro Avenue	N/A	N/A	N/A	N/A	N/A

Notes:

*Measurements taken at a minimum of each intersection of a 1-m grid up to measurements taken at the four corners and in the center of the grid block.
** Sample met 35-pCi/g guideline when averaged over a 100 m^2 area.
Avg = average m^2 = square meters N/A = not applicable Max = maximum mrad/h = millirad per hour pCi/g = picocuries per gram
Table reference: *Technical Memorandum, Vicinity Property Assessment, Colonie FUSRAP Site* (USACE, 2010b)

Table 3. Confirmation Dust Sample Analytical Results

Address	Measurement Location	Sample ID	Mass-Corrected Sample Results (pCi/g DU)
1144 Central Avenue	Attic	60811-003	23.8
	Attic	60811-004*	9.9
	Attic	60811-005**	15.3
	Attic	60811-006	9.3
	Attic	60811-007	8.6
		*Mean****	*12.9*
		*SD****	*7.3*
		*Max****	*23.8*
1144A Central Avenue	Attic	60811-008	88.7
	1st Floor Ceiling	60811-009*	8.4
	1st Floor Ceiling	60811-010**	22.1
	Garage	60811-011	79.0
	Garage	60811-012	145.2
		*Mean****	*80.4*
		*SD****	*56.1*
		*Max****	*145.2*
1148 Central Avenue	Basement	60811-013	9.2
	Attic Crawl Space	60811-014	6.4
	Garage	60811-015*	477.4
	Garage	60811-016**	237.6
	Garage	60811-017	631.6
		*Mean****	*221.1*
		*SD****	*294.1*
		*Max****	*631.3*
78 Yardboro Avenue	Basement	60811-018	21.2
	Attic	60811-019	70.7
	Attic	60811-020*	10.6
	Attic	60811-021**	12.3
	Attic	60811-022	7.1
		*Mean****	*27.8*
		*SD****	*29.2*
		*Max****	*70.7*

Notes:

* Indicates sample has a duplicate sample ** Indicates duplicate sample of the sample designated by an asterisk
*** Indicates duplicate sample excluded from calculation

DU = depleted uranium
Max = maximum
pCi/g = picocuries per gram
SD = standard deviation

Table 4. Summary of Dust Data at Vicinity Properties

Volumetric Sample ID	Property ID	Property Type *	Area Type**	Description	Total Combined Concentration (pCi/g)			
					U-234	U-235	U-238	U-Total
60811-003	1144 Central Avenue	R	L	Attic	N/A			23.8
60811-004	1144 Central Avenue	R	L	Attic	N/A			9.9
60811-005	1144 Central Avenue	R	L	Attic	N/A			15.3
60811-006	1144 Central Avenue	R	L	Attic	N/A			9.3
60811-007	1144 Central Avenue	R	L	Attic	N/A			8.6
60811-008	1144A Central Ave.	R	L	Attic	N/A			88.7
60811-009	1144A Central Ave.	R	L	1st Floor Ceiling	N/A			8.4
60811-010	1144A Central Ave.	R	L	1st Floor Ceiling	N/A			22.1
60811-011	1144A Central Ave.	R	L	Garage	N/A			79.0
60811-012	1144A Central Ave.	R	L	Garage	N/A			145.2
60811-013	1148 Central Avenue	R	L	Basement	N/A			9.2
60811-014	1148 Central Avenue	R	L	Attic Crawl Space	N/A			6.4
60811-015	1148 Central Avenue	R	L	Garage	N/A			477.4
60811-016	1148 Central Avenue	R	L	Garage	N/A			237.6
60811-017	1148 Central Avenue	R	L	Garage	N/A			631.3
CDUS-1214-041	1161 Central Avenue	R	H	Living Room	0.82	0.11	3.26	4.2
CDUS-1214-042	1161 Central Avenue	R	H	2nd Floor bedroom	0.62	0.06	1.96	2.6
CDUS-1214-043	1161 Central Avenue	R	H	Kitchen	0.40	0.05	0.64	1.1
CDUS-1214-044	1161 Central Avenue	R	H	2nd Floor bedroom	0.70	0.11	2.96	3.8
CDUS-1214-045	1161 Central Avenue	R	L	Basement near stairway	0.60	0.03	0.71	1.3
CDUS-1214-046	1161 Central Avenue	R	L	Basement floor and shelves	0.50	0.05	0.86	1.4
CDUS-1214-047	1161 Central Avenue	R	L	Basement floor and shelves	0.56	0.06	0.68	1.3
CDUS-1214-048	1161 Central Avenue	R	L	Basement cement floor, carpet, horizontal surfaces	0.49	0.04	0.64	1.2
CDUS-1214-009	1200 Central Avenue	R	H	Owner office occupied during most working hours	0.35	0.04	0.52	0.9
CDUS-1214-012	1200 Central Avenue	R	H	Viewing room; large area for visitors	0.32	0.00	0.42	0.7
CDUS-1214-014	1200 Central Avenue	R	H	Northwest sitting room	0.58	0.03	0.69	1.3

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					U-234	U-235	U-238	U-Total
CDUS-1214-016	1200 Central Avenue	R	H	Upstairs office; potential future bedroom	0.29	0.03	0.68	1.0
CDUS-1214-010	1200 Central Avenue	R	L	Attic above garage (8 hours per year occupancy)	0.78	0.08	3.67	4.5
CDUS-1214-011	1200 Central Avenue	R	L	Walkway down to service entry; concrete edge	0.47	0.03	0.86	1.4
CDUS-1214-013	1200 Central Avenue	R	L	Attic above house area	1.64	0.15	9.10	10.9
CDUS-1214-015	1200 Central Avenue	R	L	Storage room, occasional shop area (2 hours per year)	0.42	0.04	0.76	1.2
CDUS-0518-066	24 Yardboro Avenue	R	H	2nd Floor front apt child's bedroom	0.31	0.05	0.44	0.8
CDUS-0518-068	24 Yardboro Avenue	R	H	2nd Floor back apt living room – most frequently used room	0.78	0.08	1.36	2.2
CDUS-0518-070	24 Yardboro Avenue	R	H	2nd Floor back apt bedroom	0.56	0.01	0.74	1.3
CDUS-0518-072	24 Yardboro Avenue	R	H	Top floor bedroom, partial finished	0.70	0.12	2.16	3.0
CDUS-0518-065	24 Yardboro Avenue	R	L	Basement shop area	0.59	0.07	0.95	1.6
CDUS-0518-067	24 Yardboro Avenue	R	L	Basement stove area	0.84	0.09	2.97	3.9
CDUS-0518-069	24 Yardboro Avenue	R	L	Back crawl space	1.38	0.20	7.41	9.0
CDUS-0518-071	24 Yardboro Avenue	R	L	Top floor eave on east side	1.48	0.14	5.25	6.9
CDUS-1214-057	33 Palmer Avenue	R	H	Living room	0.41	0.05	0.85	1.3
CDUS-1214-060	33 Palmer Avenue	R	H	Kitchen (carpet and hard floors)	0.35	0.04	0.96	1.4
CDUS-1214-063	33 Palmer Avenue	R	H	2nd Floor bedroom	0.53	0.08	1.36	2.0
CDUS-1214-064	33 Palmer Avenue	R	H	2nd Floor bedroom (periodically occupied by grandchildren)	0.99	0.05	1.73	2.8
CDUS-1214-058	33 Palmer Avenue	R	L	Basement carpeted area	0.41	0.03	0.70	1.1
CDUS-1214-059	33 Palmer Avenue	R	L	Basement cement floor	0.68	0.03	1.07	1.8
CDUS-1214-061	33 Palmer Avenue	R	L	Basement cement floor	0.61	0.03	0.67	1.3
CDUS-1214-062	33 Palmer Avenue	R	L	Basement floor	0.76	0.06	1.00	1.8
CDUS-1214-049	4 Kraft Avenue	R	H	Living room	0.34	0.02	1.02	1.4
CDUS-1214-052	4 Kraft Avenue	R	H	2nd Floor child's bedroom	1.47	0.07	1.92	3.5

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					U-234	U-235	U-238	U-Total
CDUS-1214-055	4 Kraft Avenue	R	H	2nd Floor bedroom	0.96	0.07	2.04	3.1
CDUS-1214-056	4 Kraft Avenue	R	H	Kitchen	0.58	0.03	1.40	2.0
CDUS-1214-050	4 Kraft Avenue	R	L	Attic floor	2.61	0.25	14.61	17.5
CDUS-1214-051	4 Kraft Avenue	R	L	Attic floor	2.33	0.29	11.82	14.4
CDUS-1214-053	4 Kraft Avenue	R	L	Basement floor	0.58	0.09	1.01	1.7
CDUS-1214-054	4 Kraft Avenue	R	L	Basement floor	0.59	0.03	0.87	1.5
CDUS-1214-017	5 Yardboro Avenue	R	H	Living room area; most frequently used room	0.42	0.04	1.23	1.7
CDUS-1214-019	5 Yardboro Avenue	R	H	Office area on 1st floor	0.52	0.04	1.48	2.0
CDUS-1214-021	5 Yardboro Avenue	R	H	Kitchen area; second most frequently used room	0.4	0.0	1.7	2.1
CDUS-1214-023	5 Yardboro Avenue	R	H	Child's room	0.42	0.04	1.77	2.2
CDUS-1214-018	5 Yardboro Avenue	R	L	Basement	0.90	0.10	3.40	4.4
CDUS-1214-020	5 Yardboro Avenue	R	L	Basement	1.04	0.09	3.83	4.9
CDUS-1214-022	5 Yardboro Avenue	R	L	Attic	2.61	0.34	10.87	13.8
CDUS-1214-024	5 Yardboro Avenue	R	L	Attic	5.77	0.74	31.37	37.9
60811-018	78 Yardboro Avenue	R	L	Basement	N/A			21.2
60811-019	78 Yardboro Avenue	R	L	Attic	N/A			70.7
60811-020	78 Yardboro Avenue	R	L	Attic	N/A			10.6
60811-021	78 Yardboro Avenue	R	L	Attic	N/A			12.3
60811-022	78 Yardboro Avenue	R	L	Attic	N/A			7.1
CDUS-1214-033	1118 Central Avenue	C	H	Backroom of bar area	0.28	0.01	0.36	0.7
CDUS-1214-036	1118 Central Avenue	C	H	Kitchen area	0.73	0.05	1.38	2.1
CDUS-1214-038	1118 Central Avenue	C	H	Restaurant entrance area	0.25	0.04	0.31	0.6
CDUS-1214-040	1118 Central Avenue	C	H	Upstairs office	0.34	0.02	0.72	1.1
CDUS-1214-034	1118 Central Avenue	C	L	Basement storage area	0.54	0.05	0.95	1.5
CDUS-1214-035	1118 Central Avenue	C	L	Basement storage area	0.26	0.00	0.24	0.5
CDUS-1214-037	1118 Central Avenue	C	L	Basement storage area	0.76	0.06	2.10	2.9

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					U-234	U-235	U-238	U-Total
CDUS-1214-039	1118 Central Avenue	C	L	Basement storage area	0.81	0.13	1.32	2.3
CDUS-1214-025	1160 Central Avenue	C	H	Behind cash register	0.31	0.04	0.99	1.3
CDUS-1214-027	1160 Central Avenue	C	H	Arcade area	0.38	0.02	0.65	1.0
CDUS-1214-029	1160 Central Avenue	C	H	General public area	0.33	0.02	0.51	0.9
CDUS-1214-031	1160 Central Avenue	C	H	Behind other cash register area	0.29	0.01	0.63	0.9
CDUS-1214-026	1160 Central Avenue	C	L	Attic area above shop	0.47	0.04	1.06	1.6
CDUS-1214-028	1160 Central Avenue	C	L	Pinset machine in new section	0.42	0.02	0.80	1.2
CDUS-1214-030	1160 Central Avenue	C	L	Pinset machine in old section	0.20	0.00	0.72	0.9
CDUS-1214-032	1160 Central Avenue	C	L	Basement storage area beneath lounge	1.02	0.09	4.30	5.4
CDUS-1214-001	1177 Central Avenue	C	H	Front desk area worker side; occupied most working hours	0.51	0.02	0.59	1.1
CDUS-1214-003	1177 Central Avenue	C	H	Auto shop garage area; occupied most working hours	0.51	0.05	0.54	1.1
CDUS-1214-005	1177 Central Avenue	C	H	Customer waiting area	0.50	0.03	0.54	1.1
CDUS-1214-007	1177 Central Avenue	C	H	Rear of garage work area	0.67	0.06	0.70	1.4
CDUS-1214-002	1177 Central Avenue	C	L	Attic storage near top of stairs	0.81	0.08	3.51	4.4
CDUS-1214-004	1177 Central Avenue	C	L	Attic; heavy dust loading near eve	0.83	0.06	3.22	4.1
CDUS-1214-006	1177 Central Avenue	C	L	Storage area/walkway between garage bays	0.37	0.01	0.53	0.9
CDUS-1214-008	1177 Central Avenue	C	L	Attic; heavily loaded support beam	0.91	0.09	4.21	5.2
CDUS-0518-073	Background Sample	R	H	Living room – most frequently used room	0.32	0.12	0.33	0.8
CDUS-0518-075	Background Sample	R	H	Office/den	0.38	0.12	0.34	0.8
CDUS-0518-078	Background Sample	R	H	Basement game room	0.28	0.03	0.24	0.5
CDUS-0518-080	Background Sample	R	H	2nd floor child's bedroom	0.34	0.01	0.30	0.6
CDUS-0518-074	Background Sample	R	L	Basement workshop/utility room	0.41	0.04	0.30	0.8
CDUS-0518-076	Background Sample	R	L	Garage floor front half	0.32	0.02	0.39	0.7
CDUS-0518-077	Background Sample	R	L	Basement under stairs and around furnace	0.22	0.03	0.16	0.4

Table 4. Summary of Dust Data at Vicinity Properties

Volumetric Sample ID	Property ID	Property Type *	Area Type**	Description	Total Combined Concentration (pCi/g)			
					U-234	U-235	U-238	U-Total
CDUS-0518-079	Background Sample	R	L	Garage floor rear half	0.40	0.06	0.40	0.9

Notes:

The high concentration of total uranium at 1148 Central Avenue was used as the "worst case" for estimating risk to non-living spaces.

Key:

* Property Types: R = Residential or C = Commercial

** Area Types: L = Limited or H = High Use

N/A = not applicable

pCi/g = picocuries per gram

U-234 = Uranium-234

U-235 = Uranium-235

U-238 = Uranium-238

U-Total = total uranium