

Additional Human Health Risk Screening of Leasing Parcel A Surface Soil and Subsurface Soil (Rev. 1)

1.0 Introduction

Leasing Parcel A surface and subsurface soils were evaluated for human health risks in the *Leasing Data Package for Leasing Parcel A, Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-2522&D2, (Leasing Parcel A data package) under site worker exposure scenarios (DOE 2025). Based on the U.S. Department of Energy's (DOE's) review of existing information presented in the leasing data package, the environmental conditions are such that leasing the property is consistent with safety and the protection of public health and the environment (DOE 2025). The findings were based on review of information, site data, and a risk evaluation for future industrial use. This paper provides a supplemental human health risk evaluation of chemicals or radionuclides of potential concern (COPCs) identified in the leasing data package for Leasing Parcel A soils under the possible, but unlikely to occur, residential and recreational use exposure scenarios.

The residential and recreational use exposure scenarios are described in the *Methods for Conducting Risk Assessments and Risk Evaluations at the Paducah Gaseous Diffusion Plant Paducah, Kentucky Volume 1. Human Health*, DOE/LX/07-0107&D2/R15/V1, (RMD) (DOE 2024). The current evaluation includes both Leasing Parcel A surface soil and subsurface soil. The methodology used for the human health screening evaluation of Leasing Parcel A soils is described in Section 7.4.1 of the Leasing Parcel A data package (DOE 2025). It includes the comparison of exposure point concentrations (EPCs) of site surface and subsurface soil to the no action levels (NALs). The same approach was taken in this current evaluation, except the risk associated with the resident and recreator exposure pathways, using resident and recreator NALs, are evaluated herein rather than the worker scenarios that were evaluated previously in the data package. Therefore, Section 7.4.1 of the Leasing Parcel A data package is a reference for the current evaluation.

As described in the RMD, resident cancer-based NALs were derived assuming a 26-year combination of child (6 years) and adult (20 years) exposure. Separate noncancer child and adult resident NALs were derived as described in the RMD. Similarly, a 26-year combined child/teen/adult resident exposure was used to derive the cancer-based recreator NALs, and separate child (6 years), teen (10 years), and adult (10 years) noncancer-based NALs were derived for the recreator. The most conservative respective noncancer-based NALs were used in this evaluation for screening the resident (i.e., child or adult resident NAL) and the recreator (i.e., child, teen, or adult recreator NAL).

Risk-based NALs were updated in May 2025 after completion of the Leasing Parcel A data package (DOE 2025). The updated NALs were used for this evaluation. The NALs were updated using the PGDP-specific input and the Oak Ridge National Laboratory Risk Assessment Information System (RAIS) preliminary remediation goal calculators. The updated NALs were mostly related to changes in toxicity values. Updated NALs were also used to evaluate risk in the *Leasing Data Package for Leasing Parcel B, Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-2527&D2/R1, (Leasing Parcel B data package) (DOE 2026).

Authorized Limits for unrestricted release of property to ensure protectiveness under DOE Order 458.1 Chg 4 (LtdChg) (DOE 2016b) was evaluated in the Leasing Parcel A data package (DOE 2025). No further evaluation has been performed; however, results from the data package are summarized in Section 4.

2.0 Surface Soil Risks—Resident and Recreator

The COPCs previously identified for Leasing Parcel A surface soil (DOE 2025) are the following: cadmium, chromium, manganese, and uranium-238. The following paragraphs present an evaluation of chemical and radiological cancer risks and noncancer hazards for these COPCs as applicable for both the resident (Section 2.1) and the recreator (Section 2.2).

2.1 Resident Surface Soil Risks

The resident total excess lifetime cancer risk (ELCR) of the chemical COPCs in surface soil is 1.77E-5 (Table 1), which is within the CERCLA acceptable risk range but exceeds the Kentucky target risk of 1E-6 (the Kentucky target risk is provided as a point of reference). This total ELCR is essentially based entirely on chromium, which is identified in Section 7.2.4 of the Leasing Parcel A data package (DOE 2025) as being within the background range [i.e., while there were 3 exceedances of Paducah site-specific background out of the 15 sample results, the chromium results met all three of the *Kentucky Guidance for Ambient Background Assessment* (KDEP 2004) criteria]. The criteria for applying KDEP ambient background values, used previously at PGDP for soil piles, are discussed in Section 7.2.4.1 of the Leasing Parcel A data package (DOE 2025). Also, chromium is assumed to be present as 100% chromium VI [Cr(VI)], which is not a likely realistic assumption. Typically, Cr(VI) is a minor component of chromium in soil. Given the location and history of the Leasing Parcel A area, it is likely that trivalent chromium is the predominant form. This is because 1) there is no history or record of chromated water use or release in the Leasing Parcel A area, and 2) the parcel is located generally upwind (south-southwest) of the cooling towers. Without consideration of the chromium, the site-related total ELCR of COPCs in Leasing Parcel A surface soil of 1.16E-9 for the resident is less than the Kentucky target risk level and the CERCLA acceptable risk range. As noted in Table 1, if all chromium within Parcel A is hexavalent chromium, which is an overly protective assumption, and a background comparison is not considered, the total chemical related ELCR is 1.77E-05 which is still within the CERCLA acceptable risk range.

Table 1. Cancer Risk Evaluation of Surface Soil Chemical COPCs to the Resident

COPC	Units	95% UCL ^a	Resident Cancer NAL	Background Related? ^b	ELCR
Cadmium	mg/kg	2.46	2.12E+03	No	1.16E-09
Chromium as Cr(VI) ^c	mg/kg	16.79	9.5E-01	Yes	1.77E-05
Chromium as Cr(III) ^d	mg/kg	16.79	N/A ^e	Yes	N/A
Manganese	mg/kg	1,694	N/A ^d	Yes	N/A
Total ELCR					1.77E-05
Total ELCR excluding background					1.16E-09

mg/kg = milligram per kilogram

^a 95% upper confidence limit on the arithmetic mean (UCL). Calculated using ProUCL Version 5.2.

^b Based on evaluation presented in Section 7.2.4 of the Leasing Parcel A data package (DOE 2025).

^c NALs for Cr(VI) are used in Total ELCR calculations.

^d NALs for Chromium III [Cr(III)] are presented for additional information.

^e There is no cancer-based NAL.

The resident radiological ELCR values based on the secular equilibrium (SE) assumption and the 1,000-year peak risk (PR) assumption are 1.18E-4 and 1.82E-6, respectively (Table 2). The SE value is within the CERCLA acceptable risk range when rounded to one significant figure, as recommended by EPA (1989), and exceeds the Kentucky target risk of 1E-6. As described in Section 7.4.1 of the Leasing Parcel A data package, the SE-based values are regarded as unrealistic with respect to future exposure to uranium-238 in soil. Therefore, the 1,000-yr PR NALs are used as a more appropriate alternative screening value for the evaluation of uranium-238 in site soils.

Table 2. Cancer Risk Evaluation of Surface Soil Radiological COPCs to the Resident

COPC	Units	95% UCL ^a	Resident Cancer NAL—SE ^b	Resident Cancer NAL—1,000-year PR	Background Related? ^b	ELCR—SE	ELCR—1,000-year PR
Uranium-238	pCi/g	1.29	1.09E-02	7.09E-01	No	1.18E-04	1.82E-06
Total ELCR						1.18E-04	1.82E-06

pCi/g = picocuries per gram

^a Calculated using ProUCL Version 5.2.^b Based on evaluation presented in Section 7.3.5 of the Leasing Parcel A data package (DOE 2025).

The 1,000-year PR resident ELCR for uranium-238 is within the CERCLA acceptable risk range and exceeds the Kentucky target risk of 1E-6. Because the site-related ELCR of chemical COPCs is negligible, the combined ELCR of chemical and radiological COPCs is within the CERCLA acceptable risk range and exceeds the Kentucky target risk of 1E-6. Note that the gamma shielding factor used for the May 2025 NAL updates for radionuclides incorrectly applied a gamma shielding factor of 0.2 rather than 0.4 for the resident. This means the resulting risk for uranium-238 shown in Table 2 is estimated to be 1.3 times greater than the value shown, but still within the acceptable risk range. A draft updated uranium-238 resident NAL for the 1,000-year peak risk scenario is 5.39E-01 pCi/g rather than the 7.09E-01 pCi/g value shown in Table 2 which results in a total ELCR of 2.39E-06.

The noncancer total hazard index (THI) for the resident of 1.63 exceeds the target value of 1. However, over 70 percent of this THI value is associated with background-related chromium and manganese (Table 3). As noted in Section 7.2.4.1 of the Leasing Parcel A data package (DOE 2025), the manganese results met all three of the KDEP ambient background criteria. Because the THI excluding background of 0.5 is less than the target values of 1, adverse noncancer health effects from site-related COPCs are regarded as unlikely.

Table 3. Noncancer Risk Evaluation of Surface Soil COPCs to the Resident

COPC	Units	95% UCL ^a	Resident Noncancer NAL	Background Related? ^b	HI
Cadmium	mg/kg	2.46	5.30E-01	No	4.64E-01
Chromium as Cr(VI) ^c	mg/kg	16.79	7.03E+00	Yes	2.39E-01
Chromium as Cr(III) ^d	mg/kg	16.79	1.17E+04	Yes	1.44E-04
Manganese	mg/kg	1,694	1.83E+02	Yes	9.26E-01
THI [assuming all chromium is Cr(VI)]^e					1.63
THI excluding background					0.5

^a Calculated using ProUCL Version 5.2.^b Based on evaluation presented in Sections 7.2.4 and 7.3.5 of the Leasing Parcel A data package (DOE 2025).^c NALs for Cr(VI) are used in THI calculations.^d NALs for Cr(III) are presented for additional information.^e This is a protective assumption used for evaluation; there is no history or record of chromated water use or release in the Leasing Parcel A area.

2.2 Recreator Surface Soil Risks

The recreator total ELCR of the chemical COPCs in surface soil is 7.18E-6 (Table 4), which is within the CERCLA acceptable risk range but exceeds the Kentucky target risk of 1E-6. Virtually all this ELCR is associated with chromium, which is identified in Section 7.2.4 of the Leasing Parcel A data package (DOE 2025) as background-related. If background contributions of chromium are excluded, the resulting total ELCR of chemical contaminants is 8.72E-11, which is less than the CERCLA acceptable risk range and the Kentucky target risk of 1E-6. It is also noted that the chromium ELCR assumes that chromium is present

as 100% Cr(VI), an overly protective assumption because Cr(VI) is typically a minor component of chromium in soils.

Table 4. Cancer Risk Evaluation of Surface Soil Chemical COPCs to the Recreator

COPC	Units	95% UCL^a	Recreator Cancer NAL	Background Related?^b	ELCR
Cadmium	mg/kg	2.46	2.82E+04	No	8.72E-11
Chromium as Cr(VI) ^c	mg/kg	16.79	2.34E+00	Yes	7.18E-06
Chromium as Cr(III) ^d	mg/kg	16.79	N/A ^e	Yes	N/A
Manganese	mg/kg	1,694	N/A ^e	Yes	N/A
Total ELCR					7.18E-06
Total ELCR excluding background					8.72E-11

^a Calculated using ProUCL Version 5.2.

^b Based on evaluation presented in Section 7.2.4 of the Leasing Parcel A data package (DOE 2025).

^c NALs for Cr(VI) are used in Total ELCR calculations.

^d NALs for Cr(III) are presented for additional information.

^e There is no cancer-based NAL.

The radiological ELCR values for the recreator exposed to surface soil, based on the SE assumption and the 1,000-year PR assumption are 2.13E-5 and 3.51E-7, respectively (Table 5). The SE value for the recreator is within the CERCLA acceptable risk range and exceeds the Kentucky target risk of 1E-6. As mentioned above, the SE-based values are regarded as unrealistic with respect to future soil exposure of uranium-238, whereas the 1,000-yr PR NAL values are regarded as more appropriate.

Table 5. Cancer Risk Evaluation of Surface Soil Radiological COPCs to the Recreator

COPC	Units	95% UCL^a	Recreator Cancer NAL—SE^b	Recreator Cancer NAL—1,000-year PR	Background Related?^b	ELCR—SE	ELCR—1,000-year PR
Uranium-238	pCi/g	1.29	6.07E-02	3.67E+00	No	2.13E-05	3.51E-07
Total ELCR						2.13E-05	3.51E-07

^a Calculated using ProUCL Version 5.2.

^b Based on evaluation presented in Section 7.3.5 of the Leasing Parcel A data package (DOE 2025).

The 1,000-year PR ELCR for the uranium-238 is less than both the CERCLA acceptable risk range and the Kentucky target risk of 1E-6. When combined with the site-related chemical ELCR (8.72E-11), the resulting recreator ELCR of 3.51E-7 is unchanged and is less than the CERCLA acceptable risk range and the Kentucky target level.

The noncancer THI for the recreator exposed to surface soil is 0.6, assuming 100% of chromium is present as Cr(VI) (Table 6). This THI is less than the target HI of 1, indicating that adverse noncancer health effects are unlikely for a recreator exposed to surface soil. Note that the assumption of chromium as 100% Cr(VI) is unrealistic, because Cr(VI) is generally a minor component of chromium in soils. Further, chromium and manganese are identified as background-related in Section 7.2.4 of the Leasing Parcel A data package. If the background-related contributions of chromium and manganese are excluded, the site-related THI of 0.2 indicates likewise that recreator exposure to site surface soil is unlikely to result adverse noncancer site-related health effects.

Table 6. Noncancer Risk Evaluation of Surface Soil COPCs to the Recreator

COPC	Units	95% UCL ^a	Recreator NAL	Background Related? ^b	HI
Cadmium	mg/kg	2.46	1.33E+00	No	1.85E-01
Chromium as Cr(VI) ^c	mg/kg	16.79	1.76E+01	Yes	9.54E-02
Chromium as Cr(III) ^d	mg/kg	16.79	2.93E+04	Yes	5.73E-05
Manganese	mg/kg	1,694	4.67E+02	Yes	3.63E-01
THI [assuming all chromium is Cr(VI)]					0.6
THI excluding background					0.2

^a Calculated using ProUCL Version 5.2.

^b Based on evaluation presented in Section 7.3.5 of the Leasing Parcel A data package (DOE 2025).

^c NALs for Cr(VI) are used in THI calculations.

^d NALs for Cr(III) are presented for additional information.

3.0 Subsurface Soil Risks—Resident and Recreator

The COPCs previously identified for Leasing Parcel A subsurface soil (DOE 2025) are the following: arsenic and polychlorinated biphenyls (PCBs). The following paragraphs present an evaluation of chemical cancer risks and noncancer hazards for these COPCs as applicable for both the resident (Section 3.1) and the recreator (Section 3.2).

3.1 Resident Subsurface Soil Risks

The resident total ELCR of the chemical COPCs in subsurface soil is 3.85E-4 (Table 7). This total ELCR value exceeds both the CERCLA acceptable risk range and the Kentucky target risk of 1E-6. Because arsenic was identified as background-related in Section 7.2.4 of the Leasing Parcel A data package (arsenic results met all three of the KDEP ambient background criteria), the site-related total ELCR of 1.64E-6 was calculated by excluding arsenic. The site-related ELCR is within the CERCLA acceptable risk range and exceeds the Kentucky target risk of 1E-6.

Table 7. Cancer Risk Evaluation of Subsurface Soil COPCs to the Resident

COPC	Units	95% UCL ^a	Resident Cancer NAL	Background Related? ^b	ELCR
Arsenic	mg/kg	6.395	1.67E-02	Yes	3.83E-04
PCBs	mg/kg	0.129	7.88E-02	No	1.64E-06
Total ELCR					3.85E-04
Total ELCR excluding background					1.64E-06

^a Calculated using ProUCL Version 5.2.

^b Based on evaluation presented in Section 7.2.4 of the Leasing Parcel A data package (DOE 2025).

The noncancer THI for the resident exposed to subsurface soil is 1.52, over 85% of which is associated with arsenic. Arsenic is identified as background-related in Section 7.2.4 of the Leasing Parcel A data package. Excluding background-related arsenic, the THI is 0.2 (Table 8) which is less than the target HI value of 1. Thus, adverse noncancer effects are unlikely for the resident exposed to Leasing Parcel A subsurface soil.

Table 8. Noncancer Risk Evaluation of Subsurface Soil COPCs to the Resident

COPC	Units	95% UCL ^a	Resident Noncancer NAL	Background Related? ^b	HI
Arsenic	mg/kg	6.395	4.91E-01	Yes	1.30E+00
PCBs ^c	mg/kg	0.129	5.88E-02	No	2.19E-01
THI					1.52
THI excluding background					0.2

^a Calculated using ProUCL Version 5.2.

^b Based on evaluation presented in Section 7.3.5 of the Leasing Parcel A data package (DOE 2025).

^c Noncancer NAL for PCB-1254 was used for PCBs. It is the most protective of human health of the two aroclors provided in the RMD (DOE 2024).

3.2 Recreator Subsurface Soil Risks

The recreator total ELCR of the chemical COPCs in subsurface soil is 1.70E-4 (Table 9). This value exceeds the CERCLA acceptable risk range and the Kentucky target risk of 1E-6. Virtually all this ELCR value is associated with arsenic, which is identified as background-related in Section 7.2.4 of the Leasing Parcel A data package. The site-related total ELCR, which excludes arsenic, is 7.21E-7. This value is less than the Kentucky target risk and the CERCLA acceptable risk range and is thus regarded as negligible.

Table 9. Cancer Risk Evaluation of Subsurface Soil COPCs to the Recreator

COPC	Units	95% UCL ^a	Recreator Cancer NAL	Background Related? ^b	ELCR
Arsenic	mg/kg	6.395	3.79E-02	Yes	1.69E-04
PCBs ^c	mg/kg	0.129	1.79E-01	No	7.21E-07
Total ELCR					1.70E-04
Total ELCR excluding background					7.21E-07

^a Calculated using ProUCL Version 5.2.

^b Based on evaluation presented in Section 7.2.4 of the Leasing Parcel A data package (DOE 2025).

The noncancer THI for the recreator exposed to subsurface soil is 0.6 (Table 10). This THI value is less than the target HI value of 1, indicating that adverse noncancer effects are unlikely for a recreator exposed to Leasing Parcel A subsurface soil. It is also noted that 85% of the THI value is associated with arsenic which was previously identified as related to background soil conditions. Thus, the background-related THI is 0.09 and is likewise unlikely to be associated with adverse health effects to an exposed recreator.

Table 10. Noncancer Risk Evaluation of Subsurface Soil COPCs to the Recreator

COPC	Units	95% UCL ^a	Recreator Noncancer NAL	Background Related? ^b	HI
Arsenic	mg/kg	6.395	1.23E+00	Yes	5.20E-01
PCBs ^c	mg/kg	0.129	1.47E-01	No	8.78E-02
THI					0.6
THI excluding background					0.09

^a Calculated using ProUCL Version 5.2.

^b Based on evaluation presented in Section 7.3.5 of the Leasing Parcel A data package (DOE 2025).

^c Noncancer NAL for PCB-1254 was used for PCBs. It is the most protective of human health of the two aroclors provided in the RMD (DOE 2024).

4.0 Conclusions and Discussion

Table 11 summarizes the results of the risk evaluation for the resident and recreator exposed to COPCs in Leasing Parcel A soils. The radiological ELCRs in Table 11 reflect the risks discussed above, revised to

consider the draft updated 1,000-year peak risk NAL values for the resident scenario, plus the addition of uranium-235/236 and americium-241 as COPCs which are further discussed below. In each case, the site-related ELCR and THI, excluding background, do not exceed the CERCLA acceptable risk range or the target THI of 1. The only exceedances of the CERCLA acceptable risk range are resultant from the contribution of background arsenic in subsurface soil. Similarly, the only exceedances of the THI target value of 1 are associated with background arsenic (subsurface soil) and background manganese and chromium (surface soil). Note that all site-related ELCRs are less than the upper end of the CERCLA acceptable range (i.e., 1E-4) by more than a factor of 30. Each of the site-related THI values is less than the target THI of 1 by at least a factor of two; note that the noncancer effects of chemicals are additive only if they affect the same target organs or have otherwise been shown as additive.

The intermixing of surface soil with subsurface soil may bring the accuracy of the 95% UCL on the arithmetic mean, used as EPC, into question, especially regarding appropriateness of the EPCs. However, these potential concerns are alleviated because the COPCs identified for surface soil were not present at high enough concentrations in subsurface soils to be identified as subsurface soil COPCs. Likewise, the subsurface soil COPCs were not present at high enough concentrations in surface soil to be identified as surface soil COPCs. In summary, the EPCs for surface soil COPCs would be conservative estimates for subsurface soil and vice versa. If the surface and subsurface soil data sets were combined to mimic intermixed surface/subsurface soil and 95% UCLs recalculated on the mixed surface/subsurface data sets, this would result in lower (i.e., less conservative) EPCs.

Table 11. Leasing Parcel A Soil Site-related Risk Evaluation Results Summary for the Resident and Recreator

Receptor	Surface Soil	Subsurface Soil
<i>Resident</i>		
Cancer: Chemical ELCR	1.16E-09	1.64E-06
Cancer: Radiological ELCR	2.97E-06	8.15E-08
Noncancer THI	0.5	0.2
<i>Recreator</i>		
Cancer: Chemical ELCR	8.72E-11	7.21E-07
Cancer: Radiological ELCR	4.24E-07	1.60E-08
Noncancer THI	0.2	0.09

ELCR = excess lifetime cancer risk; THI = noncancer total hazard index

Bolding indicates exceedance of Kentucky target cancer risk of 1E-6. Note that no values exceed the CERCLA acceptable risk range (1E-6 to 1E-4) or the target THI of 1.

Additionally, it is noted that the resident and recreator screening evaluations above are based on the worker COPCs; no new screening of the data set itself was initially performed as part of this supplemental evaluation. It is possible that if the surface soil and subsurface soil data sets were screened against resident and recreator NALs, additional COPCs would be identified. Only three metals were detected that exceeded both Paducah site-specific background and KDEP ambient background criteria (barium, cadmium, and silver). The only radionuclides detected above Paducah site-specific background in surface and subsurface soil were uranium-235/236 and uranium-238 (americium-241 was detected in one of 29 subsurface samples at 0.141 pCi/g; there is no background value for americium-241). PCBs and a few other organic compounds were infrequently detected in the surface/subsurface soil. Besides PCBs, the only other organic compounds detected in soil were low levels of phthalate compounds [bis(2-ethylhexyl)phthalate and di-n-butyl phthalate were detected] and acetone. Phthalates and acetone did not exceed resident/recreator screening NALs and these analytes are often considered potential laboratory contaminants. The only COPCs in

Leasing Parcel A soil, based on comparison to background, are barium, cadmium, silver, uranium-235/236, and uranium-238 (silver did not exceed the resident or recreator NALs). Americium-241 and PCBs (which do not have a site background) were also identified as COPCs for Leasing Parcel A.

There is one analysis for uranium-235/236 in the surface soil with a detection of 0.067 pCi/g. This detection exceeds the draft updated uranium-235 resident screening NAL of 2.97E-02 pCi/g meaning it would be a site COPC (the recreator screening NAL was not exceeded). Using the detected value of uranium-235/236 as the exposure point concentration in surface soil contributes an additional ELCR of 5.78E-07 to the resident risk (the draft uranium-235 resident NAL for the 1,000-year peak risk scenario is 1.16E-01 pCi/g) and 7.28E-08 to the recreator risk. The americium-241 detect also exceeds the draft updated resident screening NAL of 3.39E-02 pCi/g meaning it would also be a site COPC (the recreator screening NAL was not exceeded). Using the detected value of americium-241 as the exposure point concentration in subsurface soil provides an ELCR of 8.15E-08 to the resident risk (the draft americium-241 resident NAL for the 1,000-year peak risk scenario is 1.73 pCi/g) and 1.60E-08 to the recreator risk. These additional risks are reflected in the risk summary provided in Table 11.

This screening risk evaluation for the resident and recreator yields no concerns for risks associated with site-related COPCs. The surface soil EPCs and subsurface soil EPCs are conservative for Leasing Parcel A mixed surface/subsurface soil. Overall, the site-related ELCR values are less than the upper end of the CERCLA acceptable range by a factor of 30, and the THI are one-half or less than the target value.

In addition to comparisons of human health receptor scenarios, and consistent with implementing requirements of DOE Authorized Limits at the Paducah Site, the Leasing Parcel A data package compared radiological soil samples to Authorized Limits for unrestricted release of the property to ensure protectiveness under DOE Order 458.1 Chg 4 (LtdChg) (DOE 2016b). The maximum detected concentration 1.57 pCi/g and the 95% UCL concentration (1.29 pCi/g) of uranium-238 were approximately two orders of magnitude less than the Paducah Authorized Limit for unrestricted use (135 pCi/g).

5.0 Summary

This supplemental risk evaluation found that chemicals and radioactive constituents in the soil at Leasing Parcel A are not expected to create unacceptable health risks for resident or recreator scenarios. Some calculated risk levels were higher than Kentucky's preferred screening level of 1E-06, but they remained within the federal CERCLA acceptable risk range (1E-06 to 1E-04) and were largely driven by chemicals that occur naturally in soil. The analysis also used protective assumptions and exposure concentrations, meaning it was designed to avoid understating possible risks. Overall, the site-related cancer risks are less than the upper end of the CERCLA acceptable range by a factor of 30, and the estimated potential for noncancer health effects was below the applicable target level (see Table 11).

6.0 References

- DOE (U.S. Department of Energy) 2024. *Methods for Conducting Risk Assessments and Risk Evaluations at the Paducah Gaseous Diffusion Plant Paducah, Kentucky Volume 1. Human Health*, DOE/LX/07-0107&D2/R15/V1, U.S. Department of Energy, Paducah, KY, June.
- DOE 2025. *Leasing Data Package for Leasing Parcel A, Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-2522&D2, U.S. Department of Energy, Paducah, Kentucky, June.
- DOE 2026. *Leasing Data Package for Leasing Parcel B, Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-2527&D2/R1, U.S. Department of Energy, Paducah, Kentucky, April.

- EPA (U.S. Environmental Protection Agency) 1989. *Risk Assessment Guidance for Superfund, Volume I Human Health Evaluation Manual (Part A)*, EPA/540/1-89/002, Interim Final, Office of Emergency and Remedial Response, U.S. Environmental Protection Agency, Washington, DC, December.
- KDEP (Kentucky Department for Environmental Protection) 2004. *Kentucky Guidance for Ambient Background Assessment*, Kentucky Department for Environmental Protection, Frankfort, KY, January 8.