

SITE INVESTIGATION COMPLETION REPORT

FORMER ALBANY LANDFILL (ALBANY BULB)

End of Buchanan Street Albany, California 94706

Prepared for:

CITY OF ALBANY

1000 San Pablo Avenue Albany, California 94706

Prepared by:

GSI ENVIRONMENTAL INC.

2000 Powell Street, Suite 820 Emeryville, California 94608 510.463.8484

www.gsienv.com

CABRERA SERVICES INC.

Job No.: 10008

Issued: September 2, 2025



SITE INVESTIGATION COMPLETION REPORT

Former Albany Landfill (Albany Bulb) **End of Buchanan Street** Albany, California 94706

This Site Investigation Completion Report was prepared by the staff of GSI Environmental Inc. and Cabrera Services Inc., under the supervision of the Engineer(s) and/or Geologist(s) whose signatures appear hereon.

The findings, recommendations, specifications, or professional opinions were prepared in accordance with generally accepted professional engineering and/or geologic practice. No warranty is expressed or implied.

No. 10173

Issued: September 2, 2025

Kevin Almestad, PG

Project Geologist GSI Environmental, Inc.

Principal Engineer

GSI Environmental, Inc.

Brian Naidus

Brian Naidus Project Manager Cabrera Services Inc.

Scott Hay

Health Physicist

Cabrera Services, Inc.



SITE INVESTIGATION COMPLETION REPORT Former Albany Landfill (Albany Bulb) End of Buchanan Street

Albany, California

TABLE OF CONTENTS

1.0	INTRODUCTION	1
2.0	SITE DESCRIPTION AND BACKGROUND	2
	Historical Review Summary Gamma Walkover Survey Results Summary Cell 4 – Additional Historical Data Review	4
3.0	FIELD INVESTIGATION ACTIVITIES	6
	3.1 Pre-Field Activities 3.2 Surface Radiation Survey 3.3 Test Pits and Soil Sampling 3.4 Drilling and Soil Sampling 3.5 Additional Radiation Measurements 3.6 Laboratory Sample Analysis 3.7 Investigation-Derived Waste	
4.0	INVESTIGATION RESULTS	11
	 4.1 Surface Radiation Screening Results	12
	4.3.1 Radionuclides and Radioactivity Discussion	15
	4.4 Dose Assessment	16
5.0	CONCLUSIONS AND RECOMMENDATIONS	16
6.0	REFERENCES	18
EXH	HIBITS	
Exh Exh Exh	nibit 1. Gamma Radiation Walkover Survey Investigation Level Exceedances Static Measurement Results (Cabrera, 2024) nibit 2. SPIR-Ace Surface Measurement Results nibit 3. Test Pit Gamma Radiation Survey nibit 4. Soil Sample Analytical Result Summary nibit 5. Typical Average Concentrations of Terrestrial Radionuclides	5 12 13

i



SITE INVESTIGATION COMPLETION REPORT Former Albany Landfill (Albany Bulb) End of Buchanan Street

Albany, California

TABLE OF CONTENTS

TABLES

Radiological Soil Analytical Results Table 1.

FIGURES

Figure 1.	Former Albany Landfill Location Map
Figure 2.	Former Albany Landfill Layout and Nomenclature
Figure 3.	Gamma Walkover Survey Investigation Level Exceedance Locations
Figure 4.	Former Albany Landfill Investigation Areas
Figure 5.	Background Radiological Measurement Location

APPENDICES	
Appendix A.	Photographic Log
Appendix B.	Permits
Appendix C.	Test Pit and Soil Boring Logs
Appendix D.	Radiation Survey Instrumentation Quality Control
Appendix E.	Incoming and Outgoing Radiation Survey
Appendix F.	Radiological Air Monitoring Data
Appendix G.	SPIR-Ace Measurement Data
Appendix H.	Soil Core Radiation Scan Log
Appendix I.	Laboratory Analytical Report
Appendix J.	RESRAD Model Results



SITE INVESTIGATION COMPLETION REPORT Former Albany Landfill (Albany Bulb)

End of Buchanan Street Albany, California

1.0 INTRODUCTION

GSI Environmental Inc. (GSI) prepared this Site Investigation Completion Report (Report) on behalf of the City of Albany (City) for the City-owned portion of the former Albany Landfill (currently referred to as the Albany Bulb) located at the western end of Buchanan Street on the east shore of the San Francisco Bay in Albany, California (the Site). The Site location is shown on Figure 1.

GSI prepared this Report in response to the San Francisco Bay Regional Water Quality Control Board (Water Board) letter *Albany Landfill, Albany, Alameda County – Requirements for Technical Reports Pursuant to Water Code Section 13267* dated January 18, 2024 (Water Board, 2024a), requesting a one-time, representative sampling of soil and groundwater at the Site. The Order included a March 28, 1980 letter from Stauffer Chemical Company to the Department of Health Services which contained a reference to the Albany Landfill Co. and the possible delivery of waste material by Stauffer to the Landfill between 1960 and 1971. The Order required the City to investigate whether such material was in fact delivered to the Site.

GSI prepared a Site Investigation Work Plan (Work Plan) in response to the Water Board's Order dated April 1, 2024 (GSI, 2024a). GSI proposed a stepwise investigation approach with initial activities consisting of: (1) historical document and aerial photograph review for the subject Site to identify areas within the subject Site that might have been available to potentially receive Stauffer Richmond Plant (Stauffer; later known as Zeneca) waste streams (and thus potential alum mud) and (2) a gamma radiation walk-over survey (GWS) of the subject Site to identify potential near-surface radiation sources that may indicate the presence of alum mud. The Water Board issued a letter on May 14, 2024, concurring with the initial activities (Water Board, 2024b).

The findings of the historical document and aerial photograph review and GWS were presented in the November 6, 2024, Historical Review and Gamma Radiation Survey Report (GSI, 2024b). Based on the findings of the historical and aerial photograph review, GSI opined that it is unlikely that Stauffer waste was disposed of at the subject Site, and that any potential Stauffer waste disposal at the former Albany Landfill was more likely to have occurred on the privately owned, Santa Fe Land Improvement Company portion of the landfill, which is not owned by the City. The GWS, performed by Cabrera Services, Inc. (Cabrera), identified 10 locations that had statistically higher gamma count rate measurements, but noted that that the results of the GWS were generally consistent with what might be expected at a landfill that contains soils and construction debris from various sources. Of these ten locations identified, only three of the locations were considered potentially consistent with the disposal of alum mud. Cabrera recommended that these three locations be included as part of future investigation into the potential presence of alum mud at the subject Site.

In line with Cabrera's recommendation, GSI recommended conducting shallow trenching and soil sampling for radionuclides in these three locations to assess the possible presence of alum mud and collect additional data to evaluate the dose/exposure rate in these areas. Additional surface scanning at all ten locations that exhibited statistically higher gamma count rate measurements was also recommended to evaluate the dose/exposure rates. Given the results of the historical review and finding that it is unlikely that much alum mud, if any, was disposed of at the subject Site, GSI did not recommend any additional investigation activities beyond those described above

1



at this time. The Water Board provided concurrence with the proposed approach in a letter dated November 25, 2024 (Water Board, 2024c).

GSI prepared a Soil Sampling and Analysis Plan (SAP) (GSI, 2025) in conjunction with Cabrera to describe the field and analytical methodologies for the proposed additional investigation which included:

- Collecting additional surface and subsurface radiological measurements and soil samples
 at the three locations identified during the GWS that were considered potentially consistent
 with the disposal of alum mud to assess the potential presence of alum mud and estimate
 potential exposure to radioactivity by members of the public utilizing the site for
 recreational purposes.
- Collecting surface radiological measurements at all ten of the locations identified with statistically elevated gamma count rates to evaluate radiological conditions near the ground surface within these areas and estimate potential exposure to radioactivity by members of the public utilizing the site for recreational purposes.

An initial version of the SAP was submitted to the Water Board on December 30, 2024. Based on comments and subsequent discussion with the Water Board and additional information provided to them by the California Department of Toxic Substances Control (DTSC), the SAP was revised to include:

- Collecting surface radiological measurements at an eleventh location (in Cell 4 of the former landfill).
- Advancement of a soil boring to observe the lithology and collect subsurface radiological measurements.

This Report was prepared to document the implementation and results of the revised SAP.

2.0 SITE DESCRIPTION AND BACKGROUND

The subject Site is approximately 40.8 acres and is a closed, unlined, Class III landfill. The subject Site is the City-owned portion of the former Albany Landfill, which included land to the east of the site, currently owned by East Bay Regional Parks District (EBRPD) and State of California. According to the Waste Discharge Requirements (WDR) Order 99-068, the subject Site received approximately 2,000,000 tons of waste from 19631 until December 1983. The landfill waste has an average depth of 40 feet. Landfill operations involved constructing waste cells by forming dikes composed of concrete rubble, soil and steel-mill slag and infilling these cells with waste. The subject Site contains four waste cells (Cells 1 through 4) that were constructed and filled. Reportedly a fifth waste cell (now the tidal lagoon on the west side of the subject Site) was constructed, but never filled (Ninyo & Moore, 2020). The waste placed in these cells consisted primarily of construction and demolition wastes. Prior to 1975, some non-hazardous solid waste, such as wood and vegetable solid waste, was disposed of at the subject Site. The WDR focused on groundwater and surface water quality with respect to their potential impact to San Francisco Bay, should these media be impacted from landfill wastes. WDR Order 99-068 states that the landfill does not pose a water quality threat to San Francisco Bay. The landfill remains undeveloped and is used as public recreational area. The subject Site layout and approximate

¹ The January 18, 2024 Water Board Order indicates the landfill operated intermittently beginning in the 1940s.



locations of the waste cells, as well as the adjacent portions of the former Albany Landfill consisting of the Albany Neck, Albany Sliver, and Albany Plateau, currently owned by the EBRPD, and Albany Beach, currently owned by the State of California, are shown in Figure 2.

In its January 18, 2024 Order, the Water Board states that it had recently discovered a letter that indicated industrial waste from Stauffer was potentially disposed of at the Albany Landfill from 1960 to 1971. The Water Board Order included a March 28, 1980, letter from Stauffer, identifying the Albany Landfill Co. site, owned by the Santa Fe Land & Improvement Co., as one recipient of the Stauffer process waste (Stauffer, 1980). The Water Board Order states that the process waste may have included "alum mud," a waste product generated from the processing of aluminum from bauxite ore. The primary constituents in alum mud include heavy and trace metals including iron, manganese, magnesium, zinc, cadmium, copper, trivalent chromium, and lead. Alum mud also typically contains certain radionuclides, referred to as "technologically enhanced naturally occurring radioactive material" (TENORM). Similar waste was disposed of at Blair Southern Pacific Landfill in Richmond, California. The Water Board Order indicated that radioisotopes associated with TENORM and pesticides that were produced at the Stauffer Richmond facility have been detected at the Blair Southern Pacific landfill. The March 1980 letter was the only evidence of potential Stauffer waste disposal provided or referenced in the Water Board Order.

It should be noted that the Water Board Order indicates the landfill is approximately 75 acres and operated intermittently beginning in the 1940s. This information is inconsistent with the description found in WDR Order 99-068, which states the City of Albany landfill occupies 40.8 acres and began filling operation in 1963. The Order appears to refer to the larger area that includes the former landfill currently owned by EBRPD and formerly referred to as the "Albany Dump" and "Santa Fe Pacific Landfill" that was historically owned by the Santa Fe Land Improvement Company.

2.1 Historical Review Summary

A review of historical ownership documentation for the Albany Bulb indicates that the subject Site was owned by the State of California until 1963, when the land was granted by the State Lands Division to the City of Albany. The ownership history shows that the subject Site has remained under public ownership since before its development as a landfill. A Waste Disposal Site Survey prepared in 1979 by the United States House of Representatives Subcommittee on Oversight and Investigations of the Interstate and Foreign Commercial Committee (U.S. House Subcommittee, 1979) includes the survey form provided in the Water Board Order and is the basis of the Water Board's inquiry. The Waste Disposal Site Survey states that Stauffer waste was sent to a landfill owned by the "Santa Fe Land & Improvement Co." and noted that the ownership at the time of disposal was "private but not company ownership." The information provided in this survey form is inconsistent with the historical and current ownership of the subject Site, which has never been owned by a private entity or by Santa Fe Land & Development Company.

Additionally, the Waste Disposal Site Survey indicates that the period of potential Stauffer waste disposal at the former Albany Landfill occurred from 1960 to 1971; however, a review of historical aerial photographs shows that the subject Site did not exist until sometime between 1965 and 1968; thus, for nearly half of the time period that Stauffer waste disposal reportedly occurred, the subject Site was an unfilled portion of the San Francisco Bay. Additionally, the 1983 letter from Stauffer to the California DHS stated that alum mud from Stauffer was hauled to a Class II landfill, which is inconsistent with WDR Order No. 99-068 for the subject Site that states that the Cityowned portion of the former Albany Landfill was a Class III landfill.



Based on the information gathered above, it appears unlikely that Stauffer waste was disposed of at the subject Site, and that any potential Stauffer waste disposal at the former Albany Landfill was more likely to have occurred on the privately owned, Santa Fe Land Improvement Company portion of the landfill.

2.2 Gamma Walkover Survey Results Summary

GSI contracted with Cabrera Services Inc. (Cabrera) to conduct a GWS between June 17, 2024, and June 21, 2024, to evaluate surface radiological conditions at the subject Site. The purpose of the GWS was to identify potential areas of elevated surface gamma radiation that may be indicative of alum mud disposal. The GWS was performed using a Ludlum Model 44-10 2-inch by 2-inch (2x2) sodium iodide (NaI) detector connected to a Ludlum Model 3000 digital survey reader to log the gamma count rate from each measurement. Cabrera technicians surveyed 100% of the accessible ground surface within the former Albany Landfill.

A total of 71,581 gamma count rate measurements were collected at the Site. Summary statistics were calculated that included the mean (5,919 counts per minute [cpm]) and standard deviation (1,346 cpm) for the data set. The Investigation Level (IL) was calculated as the mean plus three standard deviations (9,956 cpm). For a normal distribution, 99.7% of detection values are expected to fall within three standard deviations of the mean value. Therefore, the IL was designed to identify areas with statistically high gamma count rate measurements. The GWS revealed ten areas where at least one gamma count rate detection exceeded the IL. At eight of the ten locations static gamma count rate measurements were collected after completing the initial walk-over portion of the GWS. The ten areas with elevated gamma count rate measurements are shown in Figure 3.

Cabrera concluded that the results of the GWS and static measurements were consistent with levels of naturally occurring radioactivity associated with soils and construction debris. The factor of 17.7 between the minimum and maximum GWS results is within the expected range of natural occurring radiation, given the potential range of terrestrial radionuclides in the materials present in the landfill. The presence of small areas of slightly elevated gamma radiation is expected as a result of deposition of varying materials at different locations within the landfill.

Cabrera reviewed the measurement data and analyzed the data with respect to three criteria to determine if the ten locations with elevated gamma count rates could be consistent with potential disposal of alum mud. These criteria included: 1) whether the locations were located within the footprint of a disposal cell; 2) whether locations had significantly higher static gamma count rate measurements as compared to the walk-over survey measurements, which would indicate a subsurface source of gamma radiation; and 3) whether the area was large enough to represent at least several cubic yards of material as would be expected with wastes historically transported by truck.

Based on these criteria, three of the ten locations identified were considered to be potentially consistent with the disposal of alum mud waste, including Location 2, Location 5, and Location 8 as shown on Exhibit 1.



Exhibit 1. Gamma Radiation Walkover Survey Investigation Level Exceedances and Static Measurement Results (Cabrera, 2024)

			Deter	mination Crit	eria	
Survey Location	Maximum GWS Result (cpm)	Static Measurement (cpm)	Inside Former Disposal Cell?	Subsurface Potential?	Area of Elevated Readings (square feet)	Consistent with Alum Mud Disposal?
1	25,440	25,000	No	No	5,000	Unlikely
2	18,540	27,200	Yes	Yes	1,900	Possible
3	18,180	18,100	No	No	2,400	Unlikely
4	12,480	11,000	No	No	3,000	Unlikely
5	11,820	45,100	Yes	Yes	20	Possible
6	11,400	9,170	Yes	No	10	Unlikely
7	11,220	12,400	Yes	No	10	Unlikely
8	10,380	24,100	Yes	Yes	10	Possible
9	9,960	N/A	Yes	No	10	Unlikely
10	9,960	N/A	Yes	No	10	Unlikely

GWS investigation level (mean+3σ) = 9,956 cpm

GWS = gamma walkover survey

cpm = counts per minute

Based on the criteria described above, Location 2 appeared to be the most consistent with potential disposal of alum mud. This location is an approximately 1,900-square-feet area of elevated gamma radiation within the footprint of a waste disposal cell that had significantly higher static measurements as compared to the walk-over survey measurements. Location 5 and 8 were much smaller areas (20 and 10 square feet, respectively). They are located within the footprint of a waste disposal cell and had significantly higher static measurements as compared to the GWS measurements, which is consistent with potential alum mud disposal. However, based on the small area and the decrease in gamma radiation readings as the detector was moved farther from the source, the results could also indicate a small, buried radioactive object.

Cabrera concluded that the other seven locations with elevated gamma count readings appear to be unlikely to be associated with alum mud disposal because they are either outside the boundary of a waste disposal cell or have consistent static and GWS measurements, indicating that any potential radiological source would likely be located at or near the surface.

2.3 Cell 4 – Additional Historical Data Review

After their review of the initial SAP submittal, the Water Board provided verbal comments on the SAP during a January 15, 2025 conference call with the City of Albany and GSI. The Water Board reviewed the proposed scope of work in coordination with the DTSC, who noted that a 1974 aerial photograph of the Albany Bulb depicted several piles of light-colored stockpiles in Cell 4 that appear visually similar to piles of light-colored stockpiles observed in a 1971 aerial photograph from the Former Southern Pacific Blair Landfill (Blair Landfill). The Blair Landfill is a known Stauffer waste and Alum Mud disposal site located in Richmond, California. Although Cell 4 did not appear to have been infilled during the period from 1960 to 1971 (when Stauffer waste was reportedly disposed of at the Albany Landfill) and no measurements exceeded the IL during the



gamma walkover survey, the Water Board requested that additional investigation be conducted in Cell 4 within the footprint of the light-colored stockpiles observed in the 1974 aerial photograph.

GSI reviewed test pit logs² from a previous investigation conducted at Albany Landfill in 1988 excavated within the footprint of the light-colored stockpiles to determine if any subsurface material was consistent with the description of Alum Mud originating from the Stauffer facility.³ One test pit log (P-2) described a light gray clayey silt mixed with landfill debris, including plastic sheets, shredded rubber, and wood, from 12 to 15 feet below ground surface (bgs). "Light gray clayey silt" is similar to the description of alum mud material from the Stauffer facility. The location of P-2 is shown in Figure 4.

Based on our review of this additional information, GSI proposed drilling a soil boring in the vicinity of P-2 up to a depth of at least 20 feet bgs in order to conduct a radiological survey of subsurface materials and visually identify Alum Mud, if present.

3.0 FIELD INVESTIGATION ACTIVITIES

The purpose of this field investigation was to: (1) assess the potential presence of alum mud, (2) collect radiological data to assess the radionuclides present and dose/exposure rate of surface material to estimate potential exposure to radioactivity by members of the public utilizing the site for recreational purposes, and (3) collect radiological data to evaluate the radionuclide concentrations and dose/exposure rate of the subsurface material.

GSI completed the following activities:

- Collected surface radiological measurements at all ten locations that exceeded the IL
 during the GWS, including those where the presence of alum mud was determined to be
 unlikely, and one location in Cell 4 where material resembling the description of alum mud
 was observed during a previous investigation (Section 2.3). Data collected included:
 - Field measurements to identify the radionuclides present near the ground surface;
 and
 - Dose/exposure rate field measurements to assess potential exposure to radioactivity near the ground surface.
- Excavated shallow test pits in the three areas identified during the GWS as potentially consistent with the disposal of alum mud waste to evaluate if alum mud is present. Data collected included:
 - Lithologic observations for evidence of alum mud;
 - Field measurements to identify the potential presence of elevated radioactivity in subsurface material;
 - Dose/exposure rate field measurements to assess potential exposure to radioactivity near the ground surface and/or in subsurface material;

² Test pit logs were provided in Appendix A of the Landfill Characterization Report prepared by EMCON Associates for the City of Albany (EMCON, 1988).

³ Alum mud originating from Stauffer Richmond Plant observed at the Blair Southern Pacific Landfill site located in Richmond, California, has been described as having a silty to clayey texture and white to very light grey color (Terraphase, 2024).



- Field measurements to identify the specific radionuclides present in subsurface material to assess potential presence of alum mud material (only if elevated radioactivity was observed);
- Laboratory analysis of soil samples for radionuclides of concern to confirm their presence and concentrations in subsurface material.
- Advanced one soil boring (P2-SB) in Cell 4 in the vicinity of previous subsurface soil observations resembling alum mud material. Data collected included:
 - o Lithologic observations for evidence of alum mud
 - Field measurements to identify the potential presence of elevated radioactivity in subsurface material:
 - Dose/exposure rate field measurements to assess potential exposure to radioactivity near ground surface and/or in subsurface material;
 - Field measurements to identify the specific radionuclides present in subsurface material to assess potential presence of alum mud material (only if elevated radioactivity is observed);
 - Laboratory analysis of a discrete soil sample for radionuclides confirm their presence and concentrations in subsurface material.

The field activities conducted at the Albany Bulb are described in more detail in Section 3.1 to 3.7. A photographic log of field activities is provided in Appendix A.

3.1 Pre-Field Activities

Prior to any subsurface field activities, GSI completed the following tasks:

- Obtained an encroachment permit from the City of Albany Community Development Department A;
- Obtained a drilling permit from the Alameda County Public Works Agency (ACPWA);
- Notified Alameda County (Local Enforcement Agency);
- Marked proposed trenching locations and notified Underground Service Alert (USA) two full working days head of proposed subsurface work;
- Prepared a site-specific health and safety plan; and
- Completed a subsurface geophysical survey via ground penetrating radar and electromagnetic induction methods at the three proposed test pit locations to clear the locations of subsurface obstruction. The geophysical survey, did not identify any utilities or subsurface obstructions at the proposed boring or test pit locations.

Copies of the encroachment and drilling permits are provided in Appendix B.

Cabrera notified California Department of Public Health (CDPH) that California Agreement State Radioactive Material License (CARML) 7958-34 was implemented to control any radioactive material encountered during the field investigation.



3.2 Surface Radiation Survey

GSI contracted with Cabrera to conduct surface radiological measurements at each of the ten locations that were identified during the GWS that exceeded the IL, as well as the proposed boring location (P2-SB) near historical test pit P-2 in Cell 4 of the Site.

The ten GWS locations that exceeded the IL were identified using a Global Position System (GPS). These locations and boring location P2-SB were scanned using a SPIR-Ace radioisotope identification device with a lanthanum bromide (LaBr₃) detector installed. The initial SPIR-Ace scan results were used to identify the area with the highest gamma count rate within each GWS location and at the proposed boring location P2-SB in Cell 4. At the area with the highest gamma count rate within each of these locations, a biased static measurement was collected. To perform each static measurement, Cabrera's radiological control technician (RCT) positioned the SPIR-Ace so that the detector pointed downwards towards the ground surface, the axis of the detector was perpendicular to the ground, the front face of the detector was parallel to the ground, and the front face of the detector as approximately 12 inches (30 cm) above the ground surface. The gamma spectrum was recorded for a minimum of 5 minutes (300 seconds) to identify individual radionuclides.

One background measurement was performed using the SPIR-ace prior to the investigation activities. The background location was located within the staging area near the parking lot for the Albany Bulb, approximately 0.5 miles east of the Site, and outside of the boundaries of the former Albany Landfill. The off-Site background measurement location is shown on Figure 5.

3.3 Test Pits and Soil Sampling

From April 28 to 29, 2025, GSI retained Innovative Construction Solutions (ICS) of Concord, California, to excavate test pits at Locations 2, 5, and 8, which were identified as potentially consistent with alum mud disposal based on the GWS results (Figure 4). Test pits were excavated within each scan area where the highest surface gamma count rate was identified with the SPIRace. Each test pit was excavated to a total depth of 5 feet below ground surface (bgs) using a mini excavator. The test pit at Location 2 (L2-TP) measured approximately 2 feet in width by 9 feet in length, while the test pit at Location 5 (L5-TP) measured approximately 2.5 feet in width and 10 feet in length. At Location 8 (L8-TP), the test pit surface dimensions were approximately 4 feet wide by 15 feet long, due to the presence of a buried concrete slab encountered at 2 feet bgs that was not identified during the geophysical survey. During trenching activities, excavated material was removed in 1-foot lifts and spread evenly on polyethylene sheeting to allow for visual observation, radiological screening, and soil sampling. Test pits were logged for lithologic information in accordance with the American Society of Testing Materials Standard Practice for the Description and Identification of Soils, Visual Manual Procedure (ASTM D2488) by a California-licensed Professional Geologist. Saturated soil conditions were not observed in any of the test pits. The test pit logs are provided in Appendix C.

Radiological scans were performed on excavated soil and debris to identify photon-emitting radiation sources. Each 1-foot lift of excavated material was screened for radioactivity by the RCT using a Ludlum Model 44-10 2x2 Nal detector connected to a Ludlum Model 2221 ratemeter/scaler. Following the scan with the Nal detector, the SPIR-ace was used to identify individual radionuclides associated with any gamma count rates that were measured above the GWS IL.



The RCT collected three soil samples from each test pit for radioisotope laboratory analysis. One four-point composite soil sample was collected from depth intervals of: 0-1 feet , 2-3 feet and 4-5 feet bgs. Samples consisted of at least 500 grams of excavated material and were placed inside laboratory-provided sample containers. Each container was labelled with the location and sample identification, the sample date and time, and the initials of the technician collecting the sample. The labelled sample containers were placed into a cooler for sample shipment. No sample preservation was required for the radiological analyses.

Following test pit radiological scanning and sampling activities, each test pit was backfilled with the excavated soil and debris in a "last out, first in" manner and then compacted by using the excavator in 1-foot lifts until level with the surrounding ground surface.

3.4 Drilling and Soil Sampling

On May 1, 2025, GSI retained Cascade Drilling (Cascade) of Richmond, California, to advance one soil boring within Cell 4 in the vicinity of historical test pit P-2 (Figure 4). The soil boring was advanced using a sonic drilling rig equipped with a 6-inch outer-diameter core barrel to a total depth of 25 feet bgs. Soil retrieved from the core barrel was collected into plastic liners for a continuous core from the ground surface to the total boring depth. The soil cores retrieved were observed by GSI and Cabrera field staff to record lithology and/or waste composition, identify visual evidence of potential alum mud, and conduct a radiological screening of subsurface materials. The soil boring was logged for lithologic information in accordance with the American Society of Testing Materials Standard Practice for the Description and Identification of Soils, Visual Manual Procedure (ASTM D2488) by a California-licensed Professional Geologist. Saturated soil conditions were not observed in soil boring P2-SB. The soil boring log is provided in Appendix C.

The soil core retrieved from the soil boring was scanned to identify photon-emitting radiation sources. The soil core was screened for radioactivity by an RCT in 1-foot intervals with the same instrumentation and techniques described in Section 3.3.

During drilling activities, an approximately 0.5-foot interval of white, clayey silt material was observed to be intermixed with surrounding soil at approximately 21 feet bgs in the soil core. The RCT screened the clayey material with the Nal detector but did not observe any elevated gamma count rates nor did the gamma count rates exceed the IL. Although the Nal detector measurements did not indicate the presence of alum mud, a discrete soil sample was collected for radiological laboratory analysis to confirm the concentrations of radionuclides present.

Following the completion of drilling activities, the boring was backfilled with neat cement grout from the bottom of the borehole to the ground surface emplaced via a tremie pipe under the supervision of an ACPWA representative. The drilling rig and supporting equipment were scanned by the RCT with the NAI detector and cleared for unrestricted release by Cabrera's Authorized User.

3.5 Additional Radiation Measurements

Operational checks (including daily background checks to prevent cross-contamination) and daily source checks were implemented to ensure proper operation of instruments. Operational checks also included inspections for dirt or damage. The results of the daily operational checks are included in Appendix D.



Heavy equipment (backhoe excavator and sonic drill rig) were surveyed prior to accessing the site to prevent introducing radioactive material from other projects to the Site. The heavy equipment was also surveyed prior to exiting the site; these outgoing surveys verified that radioactive material was not removed from the site. In addition, soil sample shipping containers were surveyed prior to leaving the site to ensure packages could be handled safely during transport. Results of incoming and outgoing surveys are provided in Appendix E.

Air samples were collected during test pitting activities to ensure airborne radioactivity was not released during the investigation. The air monitoring results are provided in Appendix F.

Radiological controls were in place throughout site investigation activities. Personnel and equipment were screened for radiation before exiting the site. No radioactive contamination was identified on project personnel or equipment during the site investigation.

3.6 Laboratory Sample Analysis

Composite and discrete soil samples collected for radioisotope analysis were analyzed by Eurofins Environment Testing of St. Louis, Missouri⁴, a California Environmental Laboratory Accreditation Program (California ELAP), Department of Energy (DOE), and National Environmental Laboratory Accreditation Program (NELAP) certified laboratory. Soil samples were analyzed for naturally occurring photon-emitting radioisotopes following a 21-day ingrowth period for radon decay products via gamma spectroscopy (DOE Method GA-01-R). The full list of radioisotopes analyzed for includes:

- Thorium-232 (and decay products radium-228, actinium-228, lead-212, bismuth-212, and thallium-208)
- Uranium-238 (and decay products thorium-234, radium-226, lead-214, bismuth-214, and lead-210)
- Uranium-235 (and decay products protactinium-231 and actinium-227)
- Potassium-40
- Cesium-137
- Cobalt-60
- Europium-152, -154 and -155

The laboratory provided standard quality control analyses including one laboratory method blank, one laboratory control sample and one laboratory control sample duplicate for each batch of samples.

3.7 Investigation-Derived Waste

GSI generated one drum of soil cuttings from drilling activities. No IDW was generated from test pitting activities. IDW was stored on-Site in labeled, DOT-approved drum pending characterization

⁴ Radiological soil sample results were reported by Eurofins Calscience of Tustin, California. Laboratory analysis of radiological soil samples was performed by Eurofins Environment Testing of St Louis, Missouri.



for disposal. The drum was labeled and stored in a secure on-Site location in the staging area, prior to transport and disposal activities.

IDW was screened for radioactivity and cleared for unrestricted release by Cabrera's Authorized User. Following unrestricted release, the waste was sampled and profiled as non-hazardous waste for off-site disposal and an appropriate disposal facility.

4.0 INVESTIGATION RESULTS

The results of the investigation activities described above are presented in this Section. Field and laboratory data were reviewed and evaluated by Cabrera.

4.1 Surface Radiation Screening Results

As described in Section 3.2, the SPIR-ace was utilized to identify areas with the highest gamma count rates within each of the ten locations identified as having surface gamma levels exceeding the IL during the GWS and at boring location P2-SB near historical test pit P-2 in Cell 4. After identifying the point with the highest gamma count rate within each location and near boring P2-SB, the SPIR-Ace was used to conduct a static measurement at that point. The SPIR-Ace reported consistent count rates across each of Locations 2, 6, 7, 8, 9, and 10; therefore, the static measurements were taken near the center of each of these locations. No surface gamma levels exceeding the GWS IL were found around boring location P2-SB.

The SPIR-Ace provided dose rates at each location and identified individual radionuclides. The gamma ray spectra were reviewed by Cabrera's experienced gamma spectroscopist. SPIR-Ace measurement data is provided in Appendix G. Exhibit 2 shows the dose rate at each location, the radionuclides identified, and comments from Cabrera's gamma spectroscopist.



Exhibit 2. SPIR-Ace Surface Measurement Results

Location	Dose Rate (μR/hour)	Radionuclides Detected by SPIR- Ace	Spectroscopist Comments / Other Radionuclide Detections
1	17	K-40, U-nat, Th-nat	Th-234, Pb-214, Bi-214, Tl-208 identified
2	11	K-40	No other discernable peaks
3	17	U-nat, Th-nat	Pb-214, Tl-208 identified
4	13	K-40, U-nat, Th-nat	Pb-214, Tl-208 large uncertainty*
5	35	K-40, U-nat, Th-nat	Pb-214, Bi-214, Tl-208 large uncertainty*
6	15	K-40	No other discernable peaks
7	9	K-40, U-nat	Bi-214 identified, large uncertainty*
8	8	K-40	No other discernable peaks
9	7	K-40, U-nat	Low number of total counts in spectrum, Bi-214 identified, large uncertainty*
10	10	K-40, U-nat	Bi-214, Pb-214 identified, large uncertainty*
P2-SB	7	K-40	Low number of total counts in spectrum, large uncertainty
Background	7	Not measured	Not measured

Notes:

 μR /hour = microroentgens per hour

K-40 = potassium-40

Bi-214 = bismuth-214

Pb-214 = lead-214

TI-208 = thallium-218

Th-234 = thorium-234

U-nat = natural uranium (Th-234, Bi-214, Pb-214)

Th-nat = natural thorium (TI-208)

All gamma ray spectra were consistent with naturally occurring radioactive material (NORM). All radionuclides identified were either potassium-40 or members of the uranium and thorium natural decay series. The two locations in disposal Cell 4 (Location 9 and P2-SB) had the lowest dose rate and the fewest number of counts in the gamma ray spectrum.

4.2 Test Pits and Soil Boring Radiation Screening Results

As described above, the initial GWS results identified Location 2, Location 5, and Location 8 as potentially consistent with the possible disposal of alum mud waste. These three locations were

^{*}Large uncertainties can occur using the SPIR-Ace in assigning boundaries to peaks with low numbers of counts, asymmetric peak shapes, or unusual spectrum patterns. These factors reduce the overall confidence in the decision that a peak is actually present.



investigated by digging shallow test pits to an approximate depth of 5 feet, measuring gamma radiation levels for each 1-foot layer of soil removed, and collecting composite soil samples. Composite soil samples were collected from each test pit in three 1-foot layers: 0 to 1 foot, 2 to 3 feet, and 4 to 5 feet. Additionally, historical test pit location P-2 in Cell 4 was investigated by advancing one soil boring (P2-SB) in the vicinity of P-2, measuring gamma radiation levels for each 1-foot interval in the soil core, and collecting a discrete soil sample from 21 to 21.5 feet bgs.

Gamma radiation measurements in the test pits and soil boring were performed using the Nal detector. Exhibit 3 lists the minimum and maximum gamma count rate for each layer of soil removed from each of the three test pits.

Exhibit 3. Test Pit Gamma Radiation Survey

Location	Depth (feet)	Minimum (cpm)	Maximum (cpm)	Material Observations
	0 to 1	8,300	16,800	Brick
2	2 to 3	6,000	13,000	Brick and metal
	4 to 5	5,900	8,000	Soil Only
	0 to 1	11,000	58,000	Rock
5	2 to 3	7,400	25,000	Rock
	4 to 5	5,500	8,300	Soil Only
	0 to 1	4,900	7,100	Soil Only
8	2 to 3	5,200	7,100	Soil Only
	4 to 5	5,100	10,500	Brick

cpm = counts per minute

The gamma survey results in the test pits are generally consistent with the measurements collected during the initial GWS. The measurements exceeded the IL at the 0-1 foot bgs and 2-3 feet bgs intervals at Locations 2 and 5 and at the 4-5 feet bgs interval at Location 8. Brick, metal, or rock were observed at all locations with measurements exceeding the IL, whereas only soil was observed at locations with measurements below the IL.

Two rocks with gamma count rates that exceeded the IL were found at Location 5. One rock was removed for additional scanning with the SPIR-ace, while a similar, larger rock was left buried at the Site. Photo 5 and Photo 6 of the photolog (Appendix A), show the rock remaining at the Site and the removed rock, respectively.

The SPIR-Ace was used to identify radionuclides associated with these rocks. The mass of the removed rock was measured, and the concentrations of radionuclides were determined with the SPIR-Ace. The radionuclides identified were K-40 or associated with natural uranium (Bi-214, Pb-214, Pa-234m) and natural thorium (Ac-228, Tl-228). The concentrations of K-40 (~8 pCi/g) and natural thorium (~2 pCi/g) were similar to other soils and debris present at the Site. The



natural uranium concentration for the removed rock was higher than most soil and debris at the Site at approximately 4 pCi/g, but still within the range expected for NORM. The removed rock was added to a drum with the soil cuttings from the soil boring investigation and disposed of off-Site.

In soil boring P2-SB, the gamma count rate measurements were consistent with background and were all below the GWS IL. The soil core radiation scan log is provided in Appendix H.

4.3 Laboratory Analytical Results

The soil samples collected from the test pits and soil boring were sent to Eurofins Environment Testing of St. Louis, Missouri⁵ for analysis by gamma spectroscopy as described in Section 3.5. The samples were dried and sealed in containers for at least 21 days to establish secular equilibrium prior to counting. Exhibit 4 lists a representative subset of the analytical lab results of the soil sampling. The case narrative provided in the laboratory report lists the radionuclides that were detected as well as radionuclides that are inferred from other radionuclides. Only radionuclides detected by the laboratory are listed in Exhibit 4. Laboratory analytical data, including inferred radionuclides, is summarized and presented in Table 1. The laboratory analytical report (including the Case Narrative) is provided in Appendix I.

Exhibit 4. Soil Sample Analytical Result Summary

		K-40	Na	atural Uraniu	ım	Natural '	Thorium
Location	Depth (feet)	10	Th-234	Bi-214	Pb-214	Ac-228	TI-208
				pC	i/g		
	0 to 1	8.44	1.38	1.30	1.69	ND	0.268
2	2 to 3	10.5	0.785	0.573	0.671	0.494	0.191
	4 to 5	8.87	1.51	0.457	0.558	0.518	0.208
	0 to 1	4.14	1.57	2.43	2.65	1.01	0.401
5	2 to 3	9.02	1.51	1.28	1.18	0.741	0.257
	4 to 5	10.5	ND	0.701	0.641	0.558	0.233
	0 to 1	10.9	ND	0.609	0.825	ND	0.215
8	2 to 3	11.8	ND	0.511	0.502	0.494	0.225
	4 to 5	9.04	ND	0.391	0.497	0.518	0.224
P2-SB	21.0 to 21.5	12.3	ND	ND	0.563	0.908	0.240

⁵ Radiological soil sample results were reported by Eurofins Calscience of Tustin, California. Laboratory analysis of radiological soil samples was performed by Eurofins Environment Testing of St Louis, Missouri.

Former Albany Landfill



Abbreviations: pCi/g = picocuries per gram ND= non-detect

One other radionuclide was identified at Location 5 in the sample collected 4 to 5 feet bgs, europium-152 (Eu-152) at 0.225 ± 0.142 pCi/g with a detection limit of 0.194 pCi/g. This specific radionuclide is discussed in more detail in Section 4.3.1.

4.3.1 Radionuclides and Radioactivity Discussion

Many radionuclides occur naturally, and all but one of the radionuclides identified during the radiological site investigation are considered naturally occurring. The naturally occurring radionuclides identified include potassium, uranium, and thorium.

The Multi-Agency Radiation Survey and Assessment of Materials and Equipment (MARSAME) supplement to the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) (United States Department of Defense et al., 2000) discusses ranges of background concentrations for naturally occurring radionuclides in soil and building materials. Exhibit 5 lists the range of concentrations for each radionuclide in soil and provides a maximum concentration in building materials including concrete, concrete block, and brick.

Exhibit 5. Typical Average Concentrations of Terrestrial Radionuclides

Radionuclide	Detection Range for Site (pCi/g)	Range in U.S. Soil (pCi/g)	Maximum in Building Materials (pCi/g)
K-40	4.14 to 12.3	2.7 to 19	32
Natural Uranium (Th-234, Pa-234m, Bi-214, Pb-214)	ND to 2.65	0.1 to 4	21
Natural Thorium (Ac-228, Tl-208*)	ND to 1.01	0.1 to 3.5	4

^{* 36%} of natural thorium decay includes TI-208 pCi/g = picocuries per gram ND= not detected

All K-40, natural uranium, and natural thorium concentrations that were identified and reported by the analytical laboratory are within the range of soil concentrations expected in the United States. The concentration of natural uranium in the rocks at Location 5 measured in the field using the SPIR-Ace was 4 pCi/g, which is higher than any of the laboratory results. While this is at the upper end of what is expected for soil, it is well below the maximum concentration expected in building materials.

The only radionuclide not considered naturally occurring identified during the radiological site investigation was Eu-152 with a large uncertainty (63%) and a concentration (0.225 pCi/g) slightly above the minimum detectable concentration (0.194 pCi/g). Eu-152 is not associated with the presence of alum mud, however potential impacts to the public are addressed by conservatively including Eu-152 within the dose assessment in Section 4.4.



4.4 Dose Assessment

A dose assessment was performed to evaluate the potential risk to members of the public visiting the Site. The highest dose rate measured at the site was 77 microroentgen/hour (μ R/hour) on contact with the rock remaining at Location 5. The dose rate at 30 centimeters (1 foot) from the rock reported readings of less than 20 μ R/hour. A person sitting on the rock for one hour each week (50 hours per year) could receive a dose of 4 millirem in a year (mrem/yr). The same person sitting 30 centimeters away from this rock for the same amount of time could receive a dose of 1 mrem/yr.

RESRAD-Onsite Version 7.2 was used to estimate the dose to an individual at Location 5. Location 5 was selected as the location with the highest soil concentrations. It is also the only location where a radionuclide that is not naturally occurring (Eu-152) was identified. Conservative assumptions within the model were made to the radionuclide readings collected from Location 5. The area was increased from 20 square feet to 100 square meters. The thickness of the contaminated zone was set to 1 meter instead of the 1-foot layers that were sampled. The radionuclide concentrations for all members of the uranium natural decay series were set to the maximum reported value for any member of the decay series (2.65 pCi/g for Pb-214 from 0 to 1 foot deep). The radionuclide concentrations for all members of the thorium natural decay series were set to the maximum value for any member of the decay series (1.01 pCi/q for Ac-228 from 0 to 1 foot deep). The Eu-152 concentration was set to the maximum reported concentration (0.225 pCi/q from 4 to 5 feet deep). External exposure was the only exposure pathway ran in the model, due to realistic potential exposure scenarios. This model output assumed recreationally spending 1 hour per week outdoors in the vicinity of Location 5 for a total of 50 hours per year. The modeled dose for this recreational scenario is 1.14 mrem/year. The results of the RESRAD model calculations are provided in Appendix J.

For context, a dose rate of 1 mrem/year is equivalent to flying 200 miles in a commercial jet (cosmic radiation), living inside a house made of stone or brick building materials (natural uranium and thorium), or wearing a luminous watch (tritium) during the same one-year duration.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The majority of radionuclides and radioactivity identified during the radiological site investigation are naturally occurring. The concentrations of naturally occurring radionuclides at the Site are consistent with soil and building material backgrounds. The variability in radionuclide concentrations is consistent with a disposal site receiving soils and construction debris from multiple sources. The maximum radionuclide concentrations observed are associated with rocks and are not of the silty clay or clayey silt texture associated with alum mud. The only visual observation of possible alum mud was identified in soil boring P2-SB from a depth interval of 21 to 21.5 feet bgs. A discrete sample collected from this material identified thorium and potassium nuclides consistent with natural background and not associated with alum mud.

Based on modeling results, the potential for exposure to radioactive material at the Former Albany Landfill is very low, with potential maximum dose rates on the order of 1 mrem/year using conservative exposure assumptions. For context, a dose rate of 1 mrem/year is equivalent to flying 200 miles in a commercial jet (cosmic radiation), living inside a house made of stone or brick building materials (natural uranium and thorium), or wearing a luminous watch (tritium) during the same one-year duration.



Based on the results of this investigation, radioactivity that would be associated with the disposal of alum mud was not identified at the Former Albany Landfill. Additionally, results of this radiological site investigation do not suggest the need for use or access restrictions at the Site. Based on the findings of the historical review and GWS (GSI, 2024b), and the Site investigation reported herein, no additional investigation activities related to the potential disposal of Alum Mud at the City-owned portion of the former Albany Landfill are proposed.



6.0 REFERENCES

- Cabrera Services Inc. 2024. Gamma Walkover Survey Report, Final, Former Albany Landfill (Albany Bulb), End of Buchanan Street, Albany, California 94706. October 24.
- California Regional Water Quality Control Board, San Francisco Bay Region (Water Board). 1999. Order 99-068, Updated Waste Discharge Requirements and Recission of Order No. 84-089 for, City of Albany, Albany Landfill Albany, Alameda County, California. September 15.
- Water Board. 2024a. Albany Landfill, Albany, Alameda County Requirements for Technical Reports Pursuant to Water Code Section 13267. January 18. California Regional Water Quality Control Board, San Francisco Bay Region (Water Board). 2024b. Concurrence with Site Investigation Work Plan at Albany Landfill, Alameda County. May 14.
- Water Board. 2024c. Concurrence with Gamma Walkover Survey Results and Recommendations for Additional Investigation at Albany Landfill, Alameda County. November 25.
- EMCON Associates (EMCON). 1988. Landfill Characterization Study, Albany Landfill, Albany, California. September.
- GSI Environmental Inc. (GSI). 2024a. Site Investigation Work Plan, Former Albany Landfill (Albany Bulb), End of Buchanan Street, Albany, California 94706. April 1.
- GSI. 2024b. Historical Review and Gamma Radiation Survey Report, Former Albany Landfill (Albany Bulb), End of Buchanan Street, Albany, California 94706. November 6.
- GSI. 2025. Soil Sampling and Analysis Plan, Former Albany Landfill (Albany Bulb), End of Buchanan Street, Albany, California 94706. March 3.
- United States Department of Defense (DOD), United State Department of Energy (DOE), United States Environmental Protection Agency (EPA), United States Nuclear Regulatory Commission (NRC). 2000. Multi-Agency Radiation Survey and Site Investigation Manual (Revision 1), Nuclear Regulatory Commission NUREG-1575 Rev. 1, EPA 402-R-97-016 Rev. 1, DOE/EH-0624 Rev. 1. August.
- Ninyo & Moore. 2020. Limited Historical Study, Albany Landfill, Western Area of Buchanan Street, Albany, California, SWIS No. 01-AA-011. 7 April.
- Terraphase Engineering (Terraphase), 2024. Work Plan for Determining Background Concentrations of Radionuclides. January 1.

GSI Job No.: 10008



SITE INVESTIGATION COMPLETION REPORT Former Albany Landfill (Albany Bulb)

End of Buchanan Street Albany, CA

TABLES

Table 1. Radiological Soil Analytical Results



TABLE 1 - RADIOLOGICAL SOIL ANALYTICAL RESULTS¹

Former Albany Landfill (Albany Bulb)

End of Buchanan Street, Albany, California 94706

				Uranium-238 Decay Series					Uranium-235 Decay Series				
Sample Location	Sample Name	Sample Type	Date Collected	Sample Depth Interval	Uranium-238	Thorium-234	Radium-226	Lead-214	Bismuth-214	Lead-210	Uranium- 235	Actinium- 227	Protactinium- 231
				(feet bgs)					pCi/g				
	L2-TP-0-1-COMP	4 Deint	4/29/2025	0-1	1.38	1.38	1.3	1.69	1.3	1.98	<1.01	<0.948	<5.83
Location 2	L2-TP-2-3-COMP	4-Point Composite	4/29/2025	2-3	0.785	0.785	0.573	0.671	0.573	<2.27	<0.819	<0.709	<4.32
	L2-TP-4-5-COMP	Composite	4/29/2025	4-5	1.51	1.51	0.524	0.558	0.524	<2.33	<0.622	<0.857	<4.55
	L5-TP-0-1-COMP	4/2	4/29/2025	0-1	1.57	1.57	2.43	2.65	2.43	<1.62	<0.343	<1.02	<6.56
Location 5	L5-TP-2-3-COMP	4-Point Composite	4/29/2025	2-3	1.51	1.51	1.28	1.18	1.28	<2.09	<0.762	<1.06	<6.15
	L5-TP-4-5-COMP	Composite	4/29/2025	4-5	<0.726	<0.726	0.701	0.641	0.701	<1.98	<0.658	<0.923	<4.98
	L8-TP-0-1-COMP	4 Delat	4/29/2025	0-1	<1.95	<1.95	0.609	0.825	0.609	<3.36	<1.17	<1.11	<6.95
Location 8	L8-TP-2-3-COMP	4-Point Composite	4/29/2025	2-3	<0.702	<0.702	0.511	0.502	0.511	<1.76	<0.674	<0.806	<4.71
	L8-TP-4-5-COMP	Composite	4/29/2025	4-5	<0.847	<0.847	0.391	0.497	0.391	<2.34	<0.644	<0.901	<6.27
P-2	P2-SB-21	Grab Sample	5/1/2025	21 - 21.5	<2.28	<2.28	<0.501	0.563	<0.501	<2.82	<0.980	<1.61	<7.77



TABLE 1 - RADIOLOGICAL SOIL ANALYTICAL RESULTS¹

Former Albany Landfill (albany Bulb)

End of Buchanan Street, Albany, California 94706

							Thorium-232 Dec	ay Series		
Sample Location	Sample Name	Sample Type	Date Collected	Sample Depth Interval	Thorium-232	Radium-228	Actinium-228	Lead-212	Bismuth-212	Thallium-208
				(feet bgs)			pCi/g			
	L2-TP-0-1-COMP	4 Delina	4/29/2025	0-1	0.879	0.879	0.879	0.84	0.63	0.268
Location 2	L2-TP-2-3-COMP	4-Point Composite	4/29/2025	2-3	0.668	0.668	0.668	0.618	<0.818	0.191
	L2-TP-4-5-COMP		4/29/2025	4-5	0.457	0.457	0.457	0.618	<0.888	0.208
	L5-TP-0-1-COMP	45	4/29/2025	0-1	1.01	1.01	1.01	1.16	<0.887	0.401
Location 5	L5-TP-2-3-COMP	4-Point Composite	4/29/2025	2-3	0.741	0.741	0.741	0.759	<0.951	0.257
	L5-TP-4-5-COMP	Composite	4/29/2025	4-5	0.558	0.558	0.558	0.601	<0.848	0.233
	L8-TP-0-1-COMP	4-Point Composite	4/29/2025	0-1	<0.696	<0.696	<0.696	0.591	<1.01	0.215
Location 8	L8-TP-2-3-COMP		4/29/2025	2-3	0.494	0.494	0.495	0.564	<0.704	0.225
	L8-TP-4-5-COMP	Composite	4/29/2025	4-5	0.518	0.518	0.518	0.511	<0.999	0.224
P-2	P2-SB-21	Grab Sample	5/1/2025	21 - 21.5	0.908	0.908	0.908	0.777	<1.49	0.24



TABLE 1 - RADIOLOGICAL SOIL ANALYTICAL RESULTS¹

Former Albany Landfill (albany Bulb)

End of Buchanan Street, Albany, California 94706

Sample Location	Sample Name	Sample Type	Date Collected	Sample Depth Interval (feet bgs)	Potassium-40	Cesium-137	Cobalt-60	Europium-152	Europium-154	Europium-155
	L2-TP-0-1-COMP		4/29/2025	0-1	8.44	<0.0441	<0.0757	<0.202	<0.137	<0.449
Location 2	L2-TP-2-3-COMP	4-Point Composite	4/29/2025	2-3	10.5	<0.0918	<0.0791	<0.160	<0.112	<0.294
	L2-TP-4-5-COMP	Composite	4/29/2025	4-5	8.87	<0.119	<0.0467	<0.199	<0.129	<0.339
	L5-TP-0-1-COMP	4.5.4	4/29/2025	0-1	4.14	<0.108	<0.0879	<0.252	<0.158	<0.422
Location 5	L5-TP-2-3-COMP	4-Point Composite	4/29/2025	2-3	9.02	<0.147	<0.136	<0.231	<0.168	<0.526
	L5-TP-4-5-COMP	Composite	4/29/2025	4-5	10.5	<0.112	<0.127	0.255	<0.131	<0.377
	L8-TP-0-1-COMP	4 Delet	4/29/2025	0-1	10.9	<0.176	<0.120	<0.264	<0.159	<0.458
Location 8	L8-TP-2-3-COMP	4-Point Composite	4/29/2025	2-3	11.8	<0.0882	<0.0666	<0.174	<0.127	<0.350
	L8-TP-4-5-COMP		4/29/2025	4-5	9.04	<0.144	<0.129	<0.193	<0.127	<0.296
P-2	P2-SB-21	Grab Sample	5/1/2025	21 - 21.5	12.3	<0.198	<0.204	<0.299	<0.203	<0.431

Notes:

1. Soil samples were analyzed by Eurofins Environment Testingof St. Louis, Missouri, for naturally occurring photon-emitting radioisotopes following a 21-day ingrowth period for radon decay products by gamma spectroscopy (Department of Energy Method GA-01-R).

Abbreviations:

- < = analyte not detected above the laboratory reporting limit shown
- -- = not analyzed

bgs = below ground surface

bold = analyte detected at a concentration greater than the reporting/detection limit

pCi/g = picocuries per gram

GSI Job No.: 10008



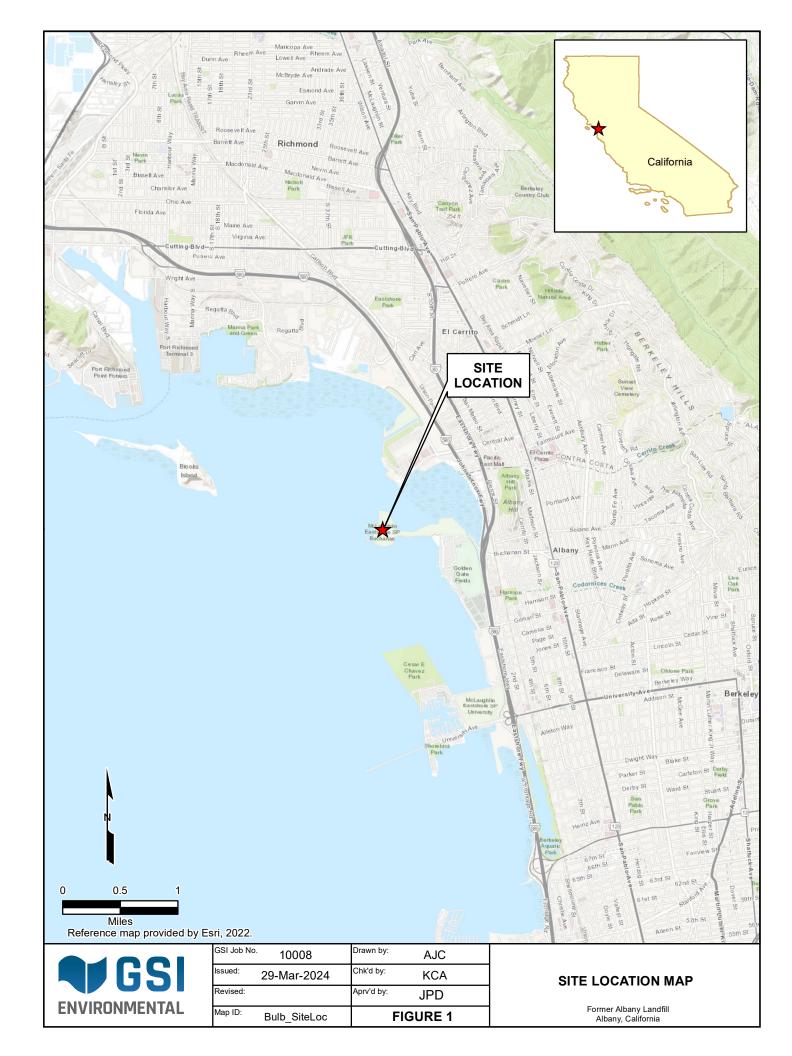
SITE INVESTIGATION COMPLETION REPORT

Former Albany Landfill (Albany Bulb)

End of Buchanan Street
Albany, CA

FIGURES

igure 1.	Former Albany Landfill Location Map
•	•
Figure 2.	Former Albany Landfill Layout and Nomenclature
Figure 3.	Gamma Walkover Survey Investigation Level Exceedance Locations
Figure 4.	Former Albany Landfill Investigation Areas
Figure 5.	Background Radiological Measurement Location







LEGEND

Former Landfill Areas

Waste Containment Cell

Imagery provided by Esri ArcGIS Online, September 2021.

Projected Coordinate System Datum: NAD 83 State Plane California Zone III Units: Feet

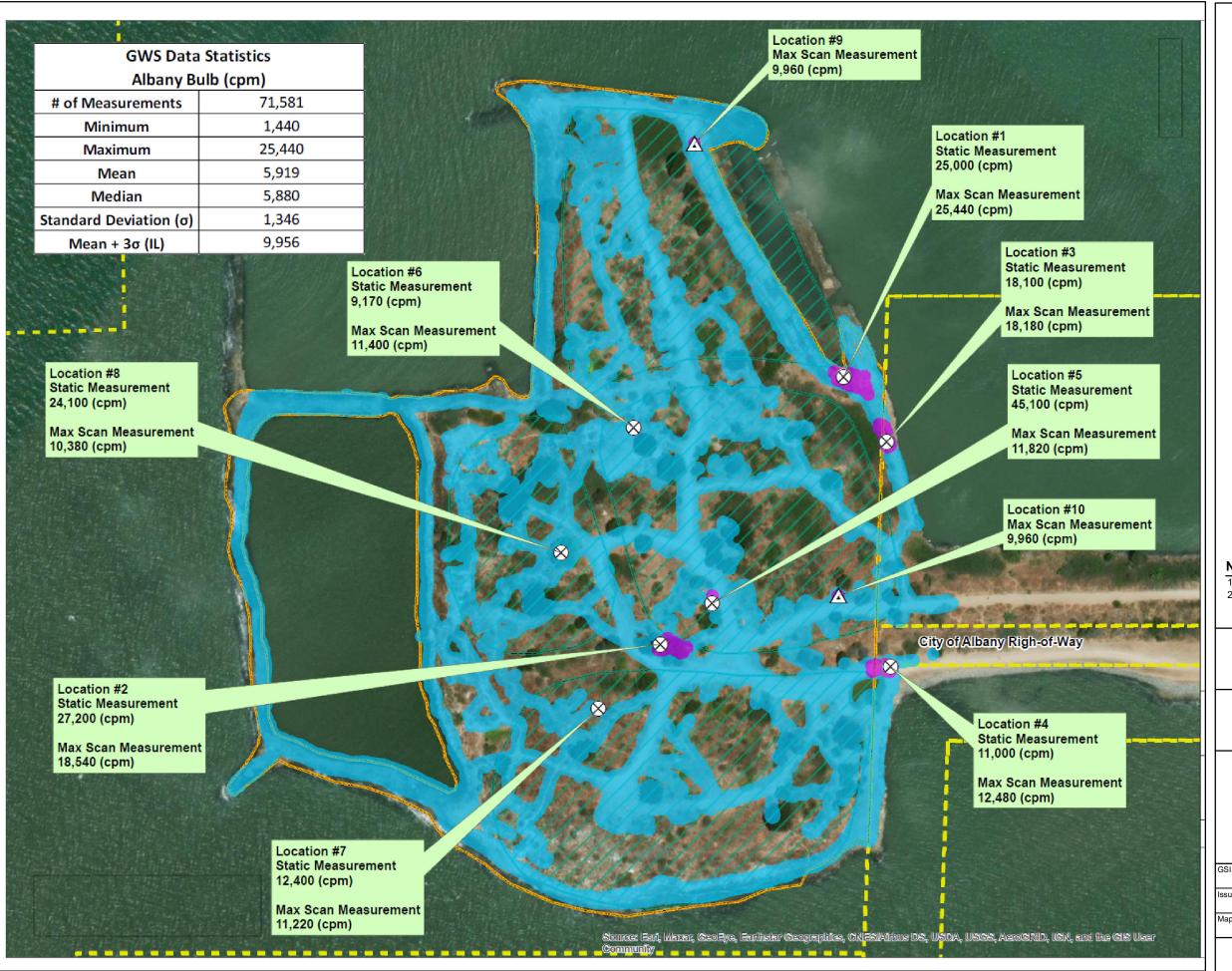


FORMER ALBANY LANDFILL LAYOUT AND NOMENCLATURE

Former Albany Landfill Albany, California

GSI Job No.	10008	Drawn By: AJC
Issued:	8-Oct-2024	Chk'd By: KCA
Map ID:	Bulb_Areas	Appv'd By: JPD

FIGURE 2





LEGEND

IL Exceedances

Static Measurement

Max Scan Measurement



Survey Boundary



Containment Cells



Property Boundary

GWS Results

(Z-Score)

-3.3 - 2.9



3.0 - 14.5

Notes: Survey performed with Ludlum 44-10 (2x2 Nal)/ 2221

GWS = Gamma Walkover Survey IL = Investigation Level cpm = counts per minute

Note

- 1) Imagery provided by Esri ArcGIS Online, September 2021.
- 2) Source: Cabrera Services Inc., 2024, Gamma Walkover Survey Report, Final, Former Albany Landfill (Albany Bulb), End of Buchanan Street, Albany, California 94706.



Projected Coordinate System Datum: NAD 83 State Plane California Zone III Units: Feet

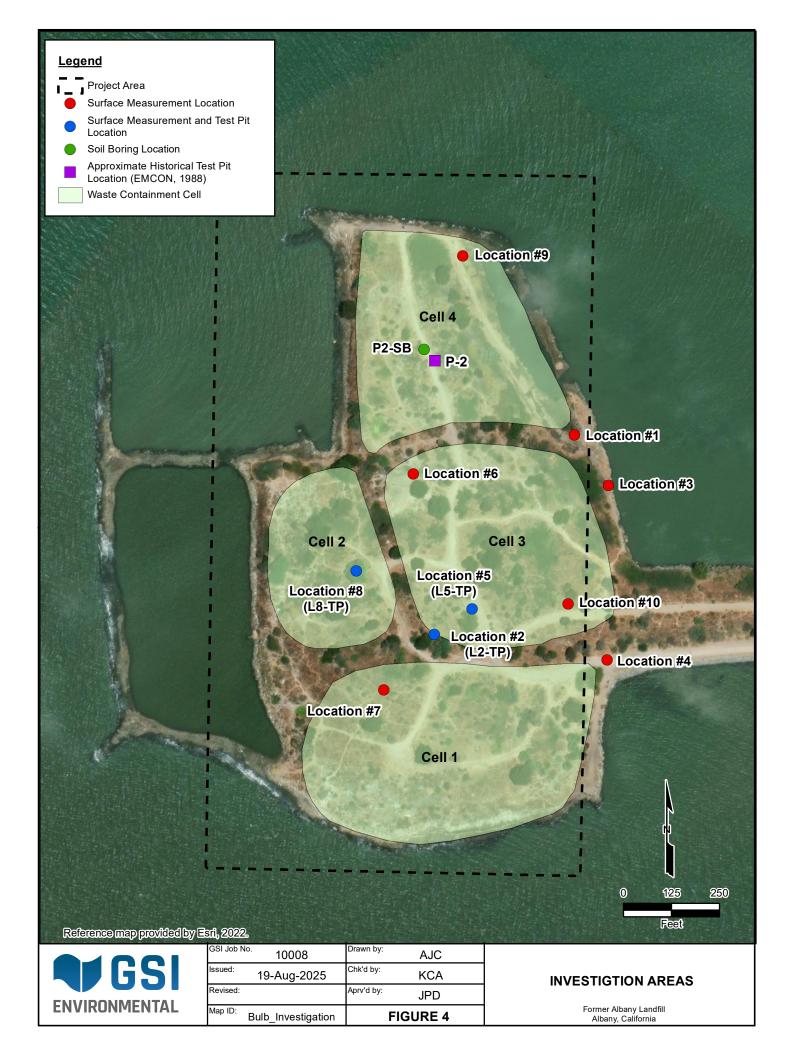


GAMMA WALKOVER SURVEY INVESTIGATION LEVEL EXCEEDANCE LOCATIONS

Former Albany Landfill Albany, California

GSI Job No.	10008	Drawn By:	AJC
Issued:	8-Oct-2024	Chk'd By:	KCA
Map ID:	Bulb_F4	Appv'd By:	JPD

FIGURE 3







LEGEND

Background Radiological Measurement Location

Waste Containment Cell

Imagery provided by Esri ArcGIS Online, September 2021.

Projected Coordinate System Datum: NAD 83 State Plane California Zone III Units: Feet



BACKGROUND RADIOLOGICAL MEASUREMENT LOCATION

Former Albany Landfill Albany, California

Issued:	10008 28-Aug-2025	Chk'd By:	AJC KCA
Map ID:	Bulb_BGRML	Appv'd By:	JPD

FIGURE 5

GSI Job No.: 10008



SITE INVESTIGATION COMPLETION REPORT

Former Albany Landfill (Albany Bulb)

End of Buchanan Street
Albany, CA

APPENDICES

Appendix A. Photographic Log

Appendix B. Permits

Appendix C. Test Pit and Soil Boring Logs

Appendix D. Radiation Survey Instrumentation Quality Control

Appendix E. Incoming and Outgoing Radiation Survey

Appendix F. Radiological Air Monitoring Data
Appendix G. SPIR-Ace Measurement Data
Appendix H. Soil Core Radiation Scan Log
Appendix I. Laboratory Analytical Report
Appendix J. RESRAD Model Results

GSI Job No.: 10008



SITE INVESTIGATION COMPLETION REPORT Former Albany Landfill (Albany Bulb)

End of Buchanan Street Albany, CA

APPENDIX A

Photographic Log

PHOTOGRAPHIC LOG

Photo 1

Description: A view of Location 1, as shown in Figure 1.



Photo 2

Description: A view of Location 2, as shown in Figure 1. Containment was in process of setting up.



IAAAP Photographic Log

Page 1 of 9

PHOTOGRAPHIC LOG

Photo 3

Description: A view of Location 3, as shown in Figure 1.



Photo 4

Description: A view of Location 4, as shown in Figure 1.



IAAAP Photographic Log

Page 2 of 9

PHOTOGRAPHIC LOG Photo 5 **Description:** A rock that was identified in Location 5. This rock remained in place during radiological surveys. Photo 6 **Description:** A rock that was identified in Location 5. This rock was removed and surveyed by radiation control technicians. Location 5 4/29/2025 1351

IAAAP Photographic Log Page 3 of 9

Photo 7

Description: A view of Location 6, as shown in Figure 1.



Photo 8

Description: A view of Location 7, as shown in Figure 1.



IAAAP Photographic Log Page 4 of 9

Photo 9

Description: A view of Location 8, as shown in Figure 1.



Photo 10

Description: A view of Location 9, as shown in Figure 1.



IAAAP Photographic Log Page 5 of 9

Photo 11

Description: A view of Location 10, as shown in Figure 1.



Photo 12

Description: A view of the containment area set up for each test pit. A CAT excavator prepares to begin a test pit excavation and soil sampling.



IAAAP Photographic Log

Page 6 of 9

Photo 13

Description: Surface soils from a test pit excavation are segregated separately and radiologically scanned by an onsite radiological control technician (RCT).



Photo 14

Description: A cross-section view of a test pit excavation. Soils are removed and radiologically scanned by field personnel. Samples were collected and sent by GSI Environmental for offsite laboratory analysis.



IAAAP Photographic Log Page 7 of 9

Photo 15

Description: A LV-1 air monitoring station is set up upwind of test pit activities. An additional unit is set up downwind and out of the containment area.



Photo 16

Description: A view of the exclusion zone set up to keep visitors safely out of the way of heavy equipment. Poly sheeting is set up to avoid crosscontamination and return excavated soils to the test pit after activities are complete.



IAAAP Photographic Log Page 8 of 9

Photo 17

Description: Cascade Drilling prepares to set up their drill rig for the soil boring at location P-2.

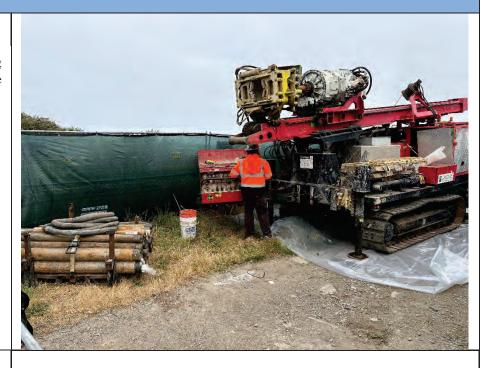


Photo 18

Description: Soil cores were collected in four-foot intervals to 25-ft bgs. Each core was scanned by an RCT using a Ludlum 2221 with a 44-10 probe and logged by an onsite geologist. A sample was collected at the '21-21.5 ft' interval and sent for offsite analytical testing.



IAAAP Photographic Log Page 9 of 9

GSI Job No.: 10008



SITE INVESTIGATION COMPLETION REPORT Former Albany Landfill (Albany Bulb)

End of Buchanan Street Albany, CA

APPENDIX B

Permits

PERMIT NUMBER

PW2025-040

Issue Date: 04/22/2025 Expiration Date: 10/19/2025

ALBANY CALIFORNIA

CITY OF ALBANY



Permit Type: PUBLIC WORKS PROJECT/CITY JOB

Street Address
ALBANY BULB

Applicant Info	ormation	Contractor Infor	rmation
Company:	GSI ENVIRONMENTAL INC	Company:	CASCADE DRILLING & INNOVATIVE
Name:	KEVIN ALMESTAD	Address:	CONSTRUCTION SOLUTIONS
Address:	2000 POWELL ST, STE 820		
	EMERYVILLE, CA 94608		
Phone:	925-330-9267	Phone:	
Email:	KCALMESTAD@GSIENV.COM	Email:	
		CSLB #:	1058336 & 764815
		CSLB Lic Type:	C-57 & A-HAZ
		CSLB Exp Date:	09/30/2025 & 06/30/2025

Project Description: PUBLIC WORKS PROJECT/CITY JOB

250395

Scope of Work:

GSI; SOIL SAMPLING AT ALBANY BULB

Permit Details:

Application Number:

SEE ATTACHED CONDITIONS OF APPROVAL

FOR CITY USE ONLY	
Saleight	Date: 04/22/2025
Signature of Approving Official	

TOTAL FEES:

0.00

City of Albany

Date: 4/21/2025

CONDITIONS OF APPROVAL

Permit No PW2025-040

Encroachment Permit to GSI for soil sampling located at Albany Bulb

SPECIAL CONDITIONS

- 1. Permit Coordinator is David Lam and may be contacted at 510-559-4270 or dlam@albanyca.org.
- 2. All work shall be within the City of Albany-owned portion of the Albany Bulb.
- 3. Written notification of work shall be provided to East Bay Regional Parks District at least 72 hours prior to start of work.
- 4. Hours of construction may be extended Monday through Friday from 7:00 AM through 7:00 PM with prior approval from the City.
- 5. Test pits shall not be left unattended while open and uncovered.
- 6. The Albany Bulb is a publically accessible open space. Care should be taken to accommodate public access to the surrounding trails.
- 7. Investigation-derived waste shall be disposed of in accordance with applicable local, state, and federal laws and regulations.

STANDARD CONDITIONS

SAFETY

- 1. All construction personnel must wear appropriate and approved personal protective equipment pursuant to Caltrans Safety Manual.
- 2. Permittee shall provide for traffic control and pedestrian safety and lane closures per Caltrans California Manual on Uniform Traffic Control Device (MUTCD) Part 6.
- 3. The permittee shall take all necessary precautions to allow emergency vehicles to pass through the construction zones without delays. Roadway closures or access restrictions affecting emergency vehicles shall be reported to the City of Albany Police Department dispatch at (510) 525-7300.
- 4. No open excavations or manholes shall be left unsupervised. All excavations shall be back filled or covered at the end of the working day.
- 5. Permittee is responsible for identifying all underground facilities and utilities before any excavation. Contact Underground Service Alert (USA) and/or pothole (i.e. prospect for and locate the existing sewer lateral by hand excavation which will not be located by USA) in advance.

WORK LIMITATIONS

- 6. Construction hours on the City of Albany are 8:00 AM to 6:00 PM Monday through Saturday; and 10:00 AM to 5:00 PM Sunday and Holidays. No startup of heavy equipment is allowed prior to 8:00 AM.
- 7. Lane closures are limited to 9:00 AM to 3:00 PM only on San Pablo Avenue, Buchanan Street, Marin Avenue and Solano Avenue. Permittee is required to consult with AC Transit if transit service will be impacted by construction.

PUBLIC ACCESS

- 8. Permittee shall maintain public access to all areas in the vicinity of the of work in the public right-of-way and provide necessary temporary sidewalks and bicycle access. Permittee must furnish proximity actuated audible signs for construction closures per PROWAG R303.
- 9. Permittee is responsible for maintaining access to public transit stops. Permittee is required to contact relevant transit agencies (e.g., AC Transit, Golden Gate Transit) in advance of any limitations to their normal operations.
- 10. Permittee shall maintain at all times access to private property, driveways, and businesses. If necessary, provide alternate/temporary access. Permittee shall notify property owners and occupants of all properties subject to service interruption and/or disruption.
- 11. Permittee shall take all necessary steps to allow Waste Management of Alameda County access for scheduled pick-up. Contact Waste Management in the event access to property will be restricted.

PUBLIC STREET PARKING

- 12. Parking restriction signs must be obtained from the City and posted in advance per City requirements. Posting shall be a minimum of **72 hours** in advance of construction.
- 13. Please note that street parking is in high demand. Please minimize limitations on street parking. Permittee shall to pull up traffic control devices on a phased basis once work is completed in order to allow access to public street parking.

STREET TREES

- 14. Permit does not authorize tree removal or trimming without express prior permission.
- 15. For all street trees that have a drip line within the area of construction
 - a. No excavation shall be permitted on site until arborist has approved the proposed staging area(s). No tree pruning, removal of root-cutting shall occur without the arborist direction, recommendation, or approval. All trenching within the dripping line of existing trees shall be by hand with care taken not to damage roots over 2" diameter.
 - b. For trees located on a neighboring property that have roots or branches that cross construction area, the permittee has a responsibility for reasonable care of the tree and for providing the neighboring property owner adequate notice of the start of construction.
 - c. During construction, the permittee shall be responsible for management of drainage and irrigation systems, avoidance of vehicle movements near tree roots, and avoidance of stockpiling of materials near tree roots.

d. In the event of unexpected damage, the permittee shall contact the City's arborist (510-559-4275) for consultation.

SITE RESTORATION

- 16. Permittee is responsible for any damage or disruption to existing facilities and/or utilities. Construction must conform to City Standard Details for curb, gutter, sidewalk, and street repairs. Exceptions must be approved by the City Engineer. Refer to Albany City Website for City Standard Details http://www.albanyca.org/index.aspx?page=987.
- 17. Conform to the requirements of the City's Monument Preservation Plan. Any survey monument encountered shall be referenced and preserved or restored per State Law. Refer to Albany City Website for City's Monument Preservation Plan http://www.albanyca.org/index.aspx?page=987.
- 18. Permittee will be responsible for repairing any irrigation and landscaping at public right of way in kind.
- 19. Permittee is required to spray clean all the utility location pavement markings after completion of work.
- 20. Permittee is required to restore street light to existing location. If change in location of type of street light is required, contact Public Works at (510) 524-9543 for consultation. **Permittee may not change the luminaire type/model without consultation with Public Works.**
- 21. Permittee is required to restore all damaged street striping & signage to conform to current State and Federal requirements.
- 22. Restoration of concrete curb ramps shall conform to current State, Federal, and PROWAG accessibility requirements. Separate permit required may be required if restoration is not detailed on approved plans.
- 23. Permittee is required to provide certification of compaction testing to City's Inspector before paving.
- 24. Permittee is required to replace slurry seal or any newly sealed streets with black aggregate slurry as directed by the City Engineer.

INSPECTIONS

25. Contact the City's Inspector at 510-528-5760 to schedule inspection a minimum of 72 hours in advance of excavating. if any questions or need to schedule an inspection.

ENVIRONMENTAL REGULATIONS

- 26. Dust shall be controlled at all times and adjoining street and private drives shall be kept clean of project dirt, mud, materials and debris, to the satisfaction of the City Inspector.
- 27. Erosion and sediment control measures shall be in place on or before October 15 and maintained continuously through April 15.
- 28. Permittee shall be responsible for full compliance with the City's Storm Water program and the Alameda County NPDES permit requirements. For additional information, visit the Alameda Countywide Clean Water Program at http://www.cleanwaterprogram.org
- 29. Permittee is required to collect and remove all trash and materials generated by permitted work. No stockpiling of soil, materials, or equipment is allowed on City right-of-way without express City permission.



April 15, 2025

City of Albany Community Development Department 1000 San Pablo Avenue Albany, CA 94706

RE: Application for Encroachment Permit – Description of Work

To Whom it May Concern:

The project area is located on the City of Albany-owned portion of the former Albany Landfill located at 1 Buchanan Street, Albany, California (referred to as the Albany Bulb). The scope of work will consist of the excavation of three test pits and advancement of one soil boring for environmental sampling purposes. The work is planned to take place from 4/28/2025 to 5/2/2025 with work hours of 7 a.m. to 5 p.m.

Each test pit will be excavated to a maximum depth of 5 feet below ground surface. The anticipated lateral dimensions of each test pit will be approximately 5 to 6 feet in width and approximately 5 to 10 feet in length, depending on soil stability or other subsurface conditions encountered (e.g., large concrete slabs). The test pits will be backfilled with the excavated material in a "last out, first in" manner and compacted in approximately 1-foot lifts to match the existing grade.

One 6-inch diameter soil boring will be advanced to a depth of 20 feet below ground surface via the sonic drilling method. This soil boring may be extended to a maximum depth of 50 feet below ground surface depending on the subsurface conditions observed. A continuous soil core will be retrieved from the drilling core barrel from the ground surface to the total boring depth. All soil and liquid waste will be placed into DOT-approved 55-gallon drums pending analysis for off-site disposal. Upon completion of the soil boring, the boring will be backfilled with a neat cement grout emplaced via tremie pipe from the total boring depth to the ground surface.

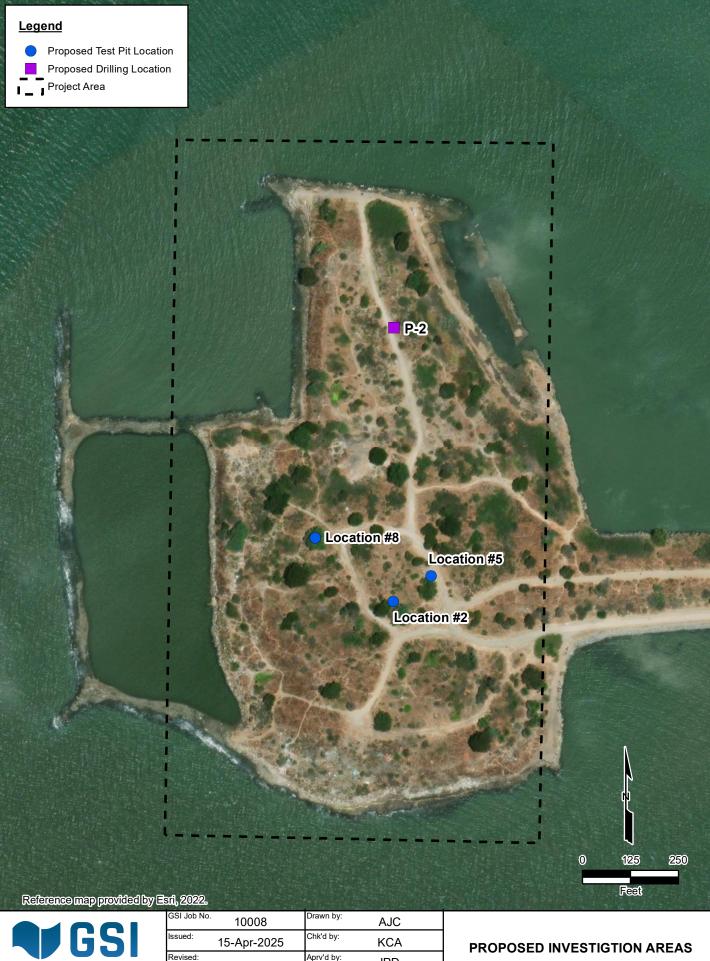
All drilling and test pit locations will be surrounded with temporary chain-link fencing to restrict access to the work areas. Although not anticipated, any excavation that needs to be left open overnight will be covered and secured prior to demobilizing from the Site for the day.

Additionally, the on-site contractors will utilize a grassy area between the Albany Waterfront Trail and Buchanan Street Extension Parking Area as an equipment and vehicle staging area beginning on 4/24/2025. A storage container will be placed in this area, and it will be secured within a chain-link fence. This area will be utilized until the investigation-derived waste can be characterized and off-hauled. It is anticipated that the equipment storage area will be removed by 7/1/2025.

The attached figures show the proposed test pit locations, drilling locations and staging area. Should you have any questions regarding this description of work, please contact me at 925-330-9267.

Sincerely,

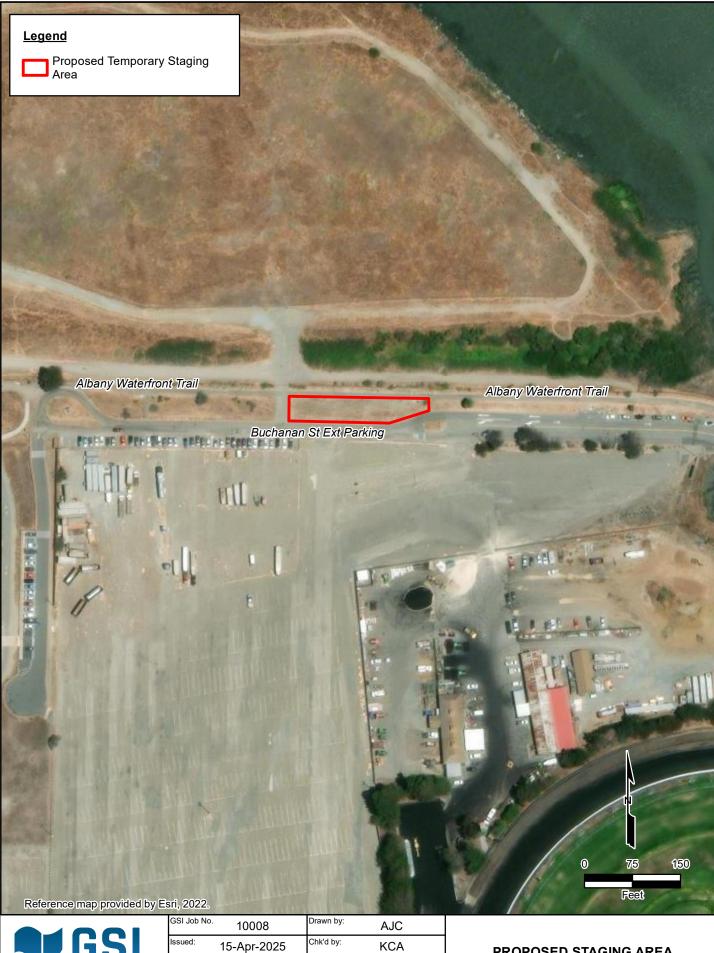
Kevin Almestad. PG



ENVIRONMENTAL

GSI Job No.	10008	Drawn by:	AJC
Issued:	15-Apr-2025	Chk'd by:	KCA
Revised:		Aprv'd by:	JPD
Map ID:	Bulb Permit		

Former Albany Landfill Albany, California





GSI Job No	10008	Drawn by:	AJC	
Issued:	15-Apr-2025	Chk'd by:	KCA	
Revised:		Aprv'd by:	JPD	
Map ID:	Bulb_Staging			

PROPOSED STAGING AREA

Former Albany Landfill Albany, California



APPLICATION FOR ENCROACHMENT PERMIT

FOR TEMPORARY OR PERMANENT CONSTRUCTION ACTIVITY IN THE PUBLIC RIGHT-OF-WAY

Permit #:	Munis #		
ocation of Work:			
Applicant Company Name:			
CSLB License Type:			
Company Address:			
Name of Person Submitting Application:			
Contact phone:	Contact email:		
Owner/Client Address:			
Contact phone:	Contact email:		
<u>0</u>	ESCRIPTION OF WORK		
STAFF USE:			\Box
Permit fees calculate	ed per Master Fee Schedule Permit Fees Total:		-
Permit Approved By:		Date:	_
Permit Issued By:		Date:	-
Permit Expiration Date: Not to exceed 180 days from date of issuance			
Rough Inspection:		Date:	
Final Inspection:		Date:	



CONDITIONS OF APPROVAL

ACCEPTANCE OF CONDITIONS

I, the undersigned authorized agent of the applicant herein described, hereby make application for approval of the project described in this application in accordance with the provisions of the City's ordinances, and I hereby certify that the information given is true and correct to the best of my knowledge and belief.

The applicant shall hold harmless, defend, and indemnify the City, and its officers, agents and employees, from and against any and all liability, loss, damage, or expense, including without limitation reasonable attorney's fees which the City may suffer or incur as a result of any claims arising from the issuance of the encroachment permit or the design, installation, operation, maintenance or removal of the encroachment, excepting those claims arising from the City's sole negligence, willful misconduct, or active negligence. The prevailing party in any action to enforce this provision shall be entitled to an award of reasonable attorney's fees.

Applic	cant Signature: Date:	
	Name:AL CONDITIONS	
1.	All work per City Standard Details; any sidewalk concrete removed must be repla	aced within 14 days.

STANDARD CONDITIONS

SAFETY

- 1. All construction personnel must wear personal protective equipment pursuant to Caltrans safety standards.
- 2. Permittee shall provide for traffic control and pedestrian safety and lane closures per Caltrans California Manual on Uniform Traffic Control Device (MUTCD) Part 6.
- 3. The permittee shall take all necessary precautions to allow emergency vehicles to pass through the construction zones without delays Roadway closures or access restrictions affecting emergency vehicles shall be reported to the City of Albany Police Department dispatch at 510-525-7300.
- 4. No open excavations shall be left unsupervised. All excavations shall be back filled or covered at the end of the working day.
- 5. Permittee is responsible for identifying all underground facilities and utilities before any excavation. Contact Underground Service Alert (USA) and/or pothole (i.e. prospect for and locate the existing sewer lateral by hand excavation which will not be located by USA) in advance.



6. Large high-pressure natural gas transmission line is located on portions of Jackson Street, Castro Street, and Adams Street. PG&E personnel must be on site while working near this facility.

CONSTRUCTION STANDARDS

- 7. All work and activities shall be in accordance with the California Building Standards code, City Standard Specifications and Drawings approved by the City Engineer, Greenbook Standard Specifications for Public Works Construction, Albany Municipal Code, and application Federal, State and regional government agency regulations.
- 8. No change may be made in the location, dimensions, character, or duration of approved activity without written approval of the City.
- 9. Unless expressly waived in writing, all work in the City right-of-way shall be inspected by the City. Inspections by the City must be requested in advance of the work to be performed.
- 10. Permits shall only be issued only to the permittee making application and may not be assigned to person or contractor.

PROVISIONS OF PERMIT

- 11. The permittee shall begin the work or use authorized by a permit issued pursuant to this chapter within 180 days from the date of the issuance unless a different period is stated in the permit, or an extension of time is granted by the City. If the work or use is not begun accordingly, the permit shall become void.
- 12. This encroachment permit may be revoked at any time whenever: (1) the permitted work, whether because of changed conditions or otherwise, interferes with adequate or safe public use of the right-of-way involved; or (2) The permittee fails to comply with or violates any applicable government standard or condition of the issuance of the permit.
- 13. Upon revocation of the permit, the permittee shall immediately restore the public right-of-way to a condition as required by City. If the restoration is not completed within the time specified by the City, City may take any and all necessary enforcement action so required to restore the right-of-way. Any and all costs incurred by the City will be deducted from any deposits posted by the permittee and if necessary, recovered by legal action.
- 14. If the Enforcement Official of the City of Albany has determined there exists condition(s) or activities, which constitutes an imminent threat of serious injury or harm to any persons or property, the City will describe actions required to correct the violation. If permittee does not take action within the prescribed time, the City will take all actions deemed necessary to remove, repair, or isolate such dangerous conditions, utilizing the City's own forces or private contract, or any combination thereof. The costs incurred by the City may be recovered by the City pursuant to applicable provisions of City Codes.

CONSTRUCTION HOURS AND LANE CLOSURE LIMITATIONS

- 15. Construction hours on the City of Albany are 8:00AM to 6:00PM Monday through Saturday; and 10:00AM to 5:00PM Sunday and Holidays. No startup of heavy equipment is allowed prior to 8:00 AM. No exceptions without express prior permission by the Director of Public Works.
- 16. Lane closures limited to 9:00 am to 3:00 pm on San Pablo Avenue, Buchanan Street, Marin Avenue and Solano Avenue. Permittee is required to consult with AC Transit if transit service will be impacted by construction.



PUBLIC ACCESS

- 17. Permittee shall maintain public access to all areas in the vicinity of the of work in the public right-of-way and provide necessary temporary sidewalks and bicycle access. Permittee must furnish proximity actuated audible signs for construction closures per PROWAG R303.
- 18. Permittee is responsible for maintaining access to public transit stops. Permittee is required to contact relevant transit agencies (e.g., AC Transit, Golden Gate Transit) in advance of any limitations to their normal operations.
- 19. Permittee shall maintain at all times access to private property, driveways, and businesses. If necessary, provide alternate/temporary access. Permittee shall notify property owners and occupants of all properties subject to service interruption and/or disruption.
- 20. Permittee shall take all necessary steps to allow Waste Management of Alameda County access for scheduled pick-up. Contact Waste Management in the event access to property will be restricted.
- 21. Permittee shall contact the City of Albany Public Works Department at 510-524-5700 in the event permitted work will conflict with posted street cleaning days.

PUBLIC STREET PARKING

- 22. "No Parking" restriction signs must be obtained from the City a minimum of 48 hours in advance of work.
- 23. Please note that street parking is in high demand. Minimize use of street parking and release parking restrictions once work is completed in order to allow access to public street parking.

STREET TREES

- 24. Permit does not authorize tree removal or trimming without express prior permission by the Public Works Director.
- 25. For all street trees that have a drip line within the area of construction
 - a. No excavation shall be permitted on site until arborist has approved the proposed staging area(s). No tree pruning, removal, or root pruning/cutting shall occur without the arborist direction, recommendation, or approval. All trenching within the dripping line of existing trees shall be by hand with care taken not to damage roots over 2" diameter.
 - b. For trees located on a neighboring property that have roots or branches that cross construction area, the permittee has a responsibility for reasonable care of the tree and for providing the neighboring property owner adequate notice of the start of construction.
 - c. During construction, the permittee shall be responsible for management of drainage and irrigation systems, avoidance of vehicle movements near tree roots, and avoidance of stockpiling of materials near tree roots.
 - d. In the event of unexpected damage, the permittee shall contact the City's arborist (510-559-4275) for consultation.



SITE RESTORATION

- 26. Permittee is responsible for any damage or disruption to existing facilities and/or utilities. Construction must conform to City Standard Details for curb, gutter, sidewalk, and street repairs (
 http://www.albanyca.org/index.aspx?page=1400). Exceptions must be approved by the City Engineer.
- 27. Survey monuments destroyed or displaced during the progress of the work shall be replaced by the permittee at no expense to the City of Albany.
- 28. Permittee will be responsible for repairing any irrigation and landscaping at public right of way in kind.
- 29. Permittee is required to spray clean all the utility location pavement markings after completion of work.
- 30. Permittee is required to restore street lights. If change in location of type of street light is required, contact the Public Works Department at 510-524-5700. **Permittee may not change the luminaire type/model without consultation with Public Works**.
- 31. Permittee is required to restore all damaged street stripping & signage to conform to current State and Federal requirements.
- 32. Restoration of concrete curb ramps shall conform to current State and Federal accessibility requirements. Separate permit required may be required if restoration is not detailed on approved plans.
- 33. Permittee is required to provide certification of compaction testing to City's Inspector before paving.
- 34. Permittee is required to replace slurry seal or any newly sealed streets with black aggregate slurry as directed by the City Engineer.

INSPECTIONS

35. Contact the City's Inspector at 510-528-5760 to schedule inspection a minimum of 48 hours in advance of excavating.

ENVIRONMENTAL REGULATIONS

- 36. Dust shall be controlled at all times and adjoining street and private drives shall be kept clean of project dirt, mud, materials and debris.
- 37. Erosion and sediment control measures shall be in place on or before October 15 and maintained continuously through April 15.
- 38. Permittee shall be responsible for full compliance with the City's Storm Water program and the Alameda County NPDES permit requirements. For additional information, visit the Alameda Countywide Clean Water Program at http://www.cleanwaterprogram.org
- 39. Permittee is required to collect and remove all trash and materials generated by permitted work. No stockpiling of soil, materials, or equipment is allowed on City right-of-way without express City permission.

Alameda County Public Works Agency - Water Resources Well Permit



399 Elmhurst Street Hayward, CA 94544-1395 Telephone: (510)670-6633 Fax:(510)782-1939

Application Approved on: 04/11/2025 By Eneyew

Permit Numbers: W2025-0178 Permits Valid from 04/28/2025 to 05/02/2025

Phone: 510-362-5240

Phone: 510-559-4270

Phone: 925-330-9267

Application Id: 1744400507110 City of Project Site: Albany

Site Location: Albany Bulb, Buchanan St, Albany, CA 94710, USA (near 1 Buchanan St, Albany, CA

94706) (Former landfill)

Project Start Date: 04/28/2025 Completion Date:05/02/2025

Agency Representative: Contact Alaco Engineering at (510) 200-8414 or wells@alaco.us

Applicant: GSI Environmental - Skyler Bowersmith

2000 Powell Street Suit 820, Emeryville, CA 94609

Property Owner: City of Albany Public Works_ David Lam 540 Cleveland Ave., Albany, CA 94710

Client: Kevin Almestad

2000 Powell Street Suit 820, Emeryville, CA 94608

Contact: Kevin Almestad Phone: 925-330-9267

Cell: 925-330-9267

 Total Due:
 \$445.00

 5 Total Amount Paid:
 \$445.00

Receipt Number: WR2025-0125 Total Amount Paid: \$445.00
Payer Name: Skyler Bowersmith Paid By: MC PAID IN FULL

Works Requesting Permits:

Borehole(s) for Investigation-Soil and water only-Environmental/Monitorinig Study - 1 Boreholes

Driller: Cascade Drilling - Lic #: 1058336 - Method: other Work Total: \$445.00

Specifications

 Permit
 Issued Dt
 Expire Dt
 #
 Hole Diam
 Max Depth

 Number
 Boreholes

 W2025 04/11/2025
 07/27/2025
 1
 6.00 in.
 50.00 ft

0178

Specific Work Permit Conditions

- 1. Backfill bore hole by tremie with cement grout or cement grout/sand mixture. Upper two-three feet replaced in kind or with compacted cuttings. All cuttings remaining or unused shall be containerized and hauled off site. The containers shall be clearly labeled to the ownership of the container and labeled hazardous or non-hazardous.
- 2. Boreholes shall not be left open for a period of more than 24 hours. All boreholes left open more than 24 hours will need approval from Alameda County Public Works Agency, Water Resources Section. All boreholes shall be backfilled according to permit destruction requirements and all concrete material and asphalt material shall be to Caltrans Spec or County/City Codes. No borehole(s) shall be left in a manner to act as a conduit at any time.
- 3. Permittee shall assume entire responsibility for all activities and uses under this permit and shall indemnify, defend and save the Alameda County Public Works Agency, its officers, agents, and employees free and harmless from any and all expense, cost, liability in connection with or resulting from the exercise of this Permit including, but not limited to, properly damage, personal injury and wrongful death.
- 4. Applicant shall contact assigned inspector listed on the top of the permit at least five (5) working days prior to starting, once the permit has been approved. Confirm the scheduled date(s) at least 24 hours prior to drilling.
- 5. All borehole destruction work requires inspection by ACPWA; Except for special circumstances, all work that requires inspection must be performed during the work hours of 9:00 a.m. to 3:30 p.m., Monday through Friday, except holidays.

Alameda County Public Works Agency - Water Resources Well Permit

- 6. Copy of approved drilling permit must be on site at all times. Failure to present or show proof of the approved permit application on site shall result in a fine of \$500.00.
- 7. Electronic Reporting Regulations (Chapter 30, Division 3 of Title 23 & Division 3 of Title 27, CCR) require electronic submission of any report or data required by a regulatory agency from a cleanup site. Submission dates are set by a Regional Water Board or by a regulatory agency. Once a report/data is successfully uploaded, as required, you have met the reporting requirement (i.e. the compliance measure for electronic submittals is the actual upload itself). The upload date should be on or prior to the regulatory due date.

8. NOTE:

Under California laws, the owner/operator are responsible for reporting the contamination to the governmental regulatory agencies under Section 25295(a). The owner/operator is liable for civil penalties under Section 25299(a)(4) and criminal penalties under Section 25299(d) for failure to report a leak. The owner/operator is liable for civil penalties under Section 25299(b)(4) for knowing failure to ensure compliance with the law by the operator. These penalty provisions do not apply to a potential buyer.

- 9. Prior to any drilling activities onto any public right-of-ways, it shall be the applicants responsibilities to contact and coordinate a Underground Service Alert (USA), obtain encroachment permit(s), excavation permit(s) or any other permits required for that City or to the County and follow all City or County Ordinances. It shall also be the applicants responsibilities to provide to the Cities or to Alameda County a Traffic Safety Plan for any lane closures or detours planned. No work shall begin until all the permits and requirements have been approved or obtained. Provide copies of all approved permits obtained to County inspector prior to starting drilling.
- 10. Permit is valid only for the purpose specified herein. No changes in construction procedures, as described on this permit application. Boreholes shall not be converted to monitoring wells, without a permit application process.

GSI Job No.: 10008



SITE INVESTIGATION COMPLETION REPORT Former Albany Landfill (Albany Bulb)

End of Buchanan Street Albany, CA

APPENDIX C

Test Pit and Soil Boring Logs

	GSI Environmental, Inc. 2000 Powell Street, Suite 820 Emeryville, CA 94608 Telephone: 510-463-8484	Log of Soil Boring: P2-SB
	NT _City of Albany	
	OB NUMBER 10008	
DATE	E STARTED May 1, 2025 COMPLETED May 1, 2025	
DRIL	LING CONTRACTOR Cascade Drilling	TOP OF CASING ELEVATION N/A DATUM
DRIL	LING METHOD Sonic	LATITUDE N/A LONGITUDE N/A
DRIL	LING EQUIPMENT Sonic Core	
GRO	UND SURFACE Soil BORING DIAMETER (in) 6	
Depth (ft bgs)	Soil Description	Lithology USCS Sample Type Blows/ 6 inches Recovery Lab Sample PID (ppm) Water Level
GPJ		
T/BORING LOGS	GROUND SURFACE SILTY SAND WITH GRAVEL (SM): brown (10YR 4/3), dry, ~50% fine sand, ~30% fine to coarse gravel, ~20% nonplastic fines, loose	SM
FIEL D-AND-DATA/GIN	Concrete debris	
0008 CITY OF ALBANY-ALBANY LANDHILLY, FIELD-AND-DA IAGIN IBORING LOGS GFU 1	SANDY SILT (ML): very dark gray (10YR 2/2), dry, ~50% fines, ~40% fine sand, ~10% fine gravel, nonplastic	ML ML
- 10 -	SILT WITH SAND (ML): black (10YR 2/1), moist, ~70% fines, ~15% fine sand, ~15% fine gravel, nonplastic, approximately 50% plastic and wood debris	ML ML
10050/10008 CITY	SILTY SAND WITH GRAVEL (SM): black (10YR 2/1), moist, ~50% fine sand, ~30% nonplastic fines, ~20% fine gravel, loose, approximately 70% concrete, wood and plastic debris.	SM
BORING - IRV HIS IEMPLAIE.GD - 8/28/22 14:01 - 8/26/AI-DCADBS/10000-10030/1	SILTY SAND WITH GRAVEL (SM): dark grayish brown (10YR 3/2), moist, ~70% fine sand, ~15% nonplastic fines, ~15% fine gravel, loose, approximately 60% concrete, wood and plastic debris	SM
01 - \\SOCAL-	SANDY SILT WITH GRAVEL (ML): dark grayish brown (10YR 3/2), moist, ~50% fines, ~30% fine sand, ~20% fine gravel, nonplastic, approximately 50% concrete, wood and plastic debris	ML CL
8/28/25 14: - 20 -	SILTY CLAY (CL): black (10YR 2/1), moist, ~90% fines, ~10% fine to coarse sand, low plasticity, approximately 60% plastic and wood debris	
E.GDI -	SILTY CLAY (CL): white (7.5YR 8/1), moist, ~90% fines, ~10% fine sand, low plasticity, very soft	CL Soil sample P2-SB-21 collected at 11:00
THISTEMPLA -	SANDY CLAY AND CLAYEY SAND (CL): black (10YR 2/1), moist, ~70% fines, ~30% fine sand, low plasticity, approximately 90% wood and plastic debris	
⊱ 25 -	Total Dowll - OF Office	
BORING -	Total Depth = 25.0 feet.	

CLIENT:	City of Alban	У			
-		10000			

 DATE STARTED:
 4/29/2025
 COMPLETED:
 4/29/2025

 EXCAVATION CONTRACTOR:
 Innovative Construction Solutions, Inc.

EXCAVATION EQUIPMENT: Caterpillar 303.5 Mini Excavator

EXCAVATION SIZE: 10ft (L) \times 2.5ft (W) \times 5ft (D) = 125 cuft (V)

PROJECT NAME: Former Albany Landfill (Albany Bulb)

PROJECT LOCATION: End of Buchanan Street, Albany, California

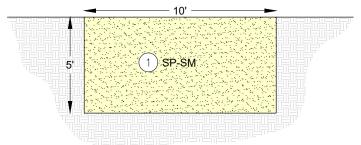
GROUND ELEVATION: __n/a _____ DATUM: __n/a

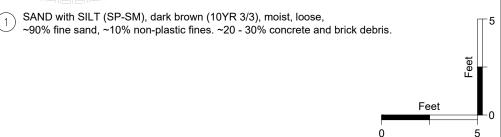
LATITUDE: n/a LONGITUDE: n/a

LOGGED BY: K. Almestad, PG REVIEWED BY: J. Duffield, PE

PLAN L2-TP 2.5' x 10'

PROFILE







CLIENT: City of Albany

GSI JOB NUMBER: 10008

DATE STARTED: 4/29/2025 COMPLETED: 4/29/2025

EXCAVATION CONTRACTOR: Innovative Construction Solutions, Inc.

EXCAVATION EQUIPMENT: Caterpillar 303.5 Mini Excavator

EXCAVATION SIZE: 9ft (L) x 2ft (W) x 5ft (D) = 168 cuft (V)

 PROJECT NAME:
 _ Former Albany Landfill (Albany Bulb)

 PROJECT LOCATION:
 _ End of Buchanan Street, Albany, California

 GROUND ELEVATION:
 _ n/a
 _ DATUM: _ n/a

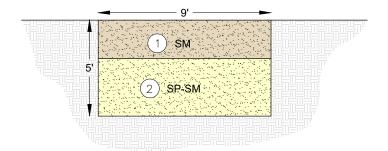
 LATITUDE:
 _ n/a
 _ LONGITUDE: _ n/a

 LOGGED BY:
 _ K. Almestad, PG
 _ REVIEWED BY: _ J. Duffield, PE

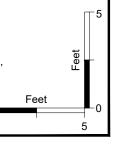
PLAN

L5-TP
2' x 9'

PROFILE



- SILTY SAND (SM), brown (10YR 4/3), moist, loose, ~70% fine sand, ~30% non-plastic fines. ~30% concrete, ceramic, metal slag and brick debris.
- SAND with SILT (SP-SM), brown (10YR 4/3), moist, loose, ~85-90% fine sand, ~10 15% non-plastic fines. ~30% concrete, ceramic, metal slag and brick debris.



CLIENT: City of Albany

GSI JOB NUMBER: 10008

DATE STARTED: 4/29/2025 COMPLETED: 4/29/2025

EXCAVATION CONTRACTOR: __Innovative Construction Solutions, Inc.

EXCAVATION EQUIPMENT: __Caterpillar 303.5 Mini Excavator

EXCAVATION SIZE: __15ft ___ (L) x __4ft ___ (W) x __2 to 5ft __ (D) = __168 cuft __ (V)

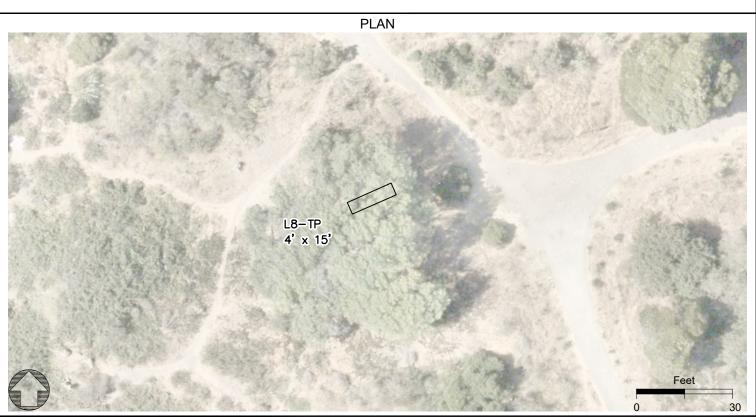
 PROJECT NAME: _Former Albany Landfill (Albany Bulb)

 PROJECT LOCATION: _End of Buchanan Street, Albany, California

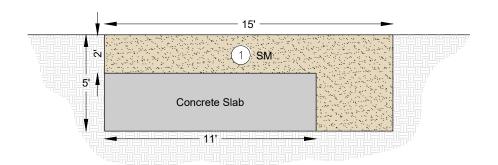
 GROUND ELEVATION: _n/a
 DATUM: _n/a

 LATITUDE: _n/a
 LONGITUDE: _n/a

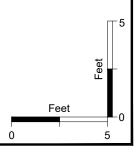
 LOGGED BY: _K. Almestad, PG
 REVIEWED BY: _J. Duffield, PE



PROFILE



SILTY SAND (SM), brown (10YR 4/3), moist, loose, ~70-80% fine sand, ~20%-30% non-plastic fines. ~40% concrete, brick and asphalt debris.



GSI Job No.: 10008



SITE INVESTIGATION COMPLETION REPORT Former Albany Landfill (Albany Bulb)

End of Buchanan Street Albany, CA

APPENDIX D

Radiation Survey Instrumentation Quality Control



CERTIFICATE OF CALIBRATION

	Electroplated	Alpha Standard		
			S.O.#	7008
			P.O.#	10-0260
escription of Standard:				
Model No. DNS-11	Serial No	7102-10	Isotope	Th-230
lectroplated on polished_	SS disc	0.79	mm	thick.
otal diameter of 4.77	cm and	an active diame	eter of <u>4.45</u>	cm.
The radioactive material is any covering over the activ		d to the disc	by heat treatm	ent without
Measurement Method:				
The 2pi alpha emission rate chamber. Absolute counting active surface was verified the calibration is traceable N 75322-201	g of alpha particl d by counting abov	es emitted in re, below, and	the hemisphere at the operati	above the ve voltage.
Discretification of the section of the Contract of the Standard		a conservation series		
	es emitted from th	e surface of t	he disc per mi	nute (cpm) on
the calibration date was:	es emitted from the		he disc per mi	nute (cpm) on
the calibration date was: 8,850 The total disintegration ra	± 2	65	V . W. 2016 . A . A	
The total disintegration ra the surface of the disc, wa	± 2	65 1.5% backscat	ter of alpha p	articles from
The uncertainty of the measerror at the 99% confidence		65 1 1.5% backscat 23 %, which is	ter of alpha p (0.00785	articles from μ Ci)
the calibration date was: 8,850 The total disintegration rathe surface of the disc, was 17,400 The uncertainty of the mease rror at the 99% confidence in this measurement.	± 2 ate (dpm) assuming as: ± 5 surement is 3 e level, and the e	65 1 1.5% backscat 23 %, which is	ter of alpha p (0.00785	articles from μ Ci)
the calibration date was: 8,850 The total disintegration rathe surface of the disc, was	± 2 ate (dpm) assuming as: ± 5 surement is 3 e level, and the e	1.5% backscat 23 %, which is estimated upper	ter of alpha p (0.00785	articles from μ Ci)



CERTIFICATE OF CALIBRATION

	Electroplat	ed Beta Star	ndard		
				s.o.#_7	096
				P.O.#	11-0181
Description of Standard:					
Model No. DNS-2	Serial No	7139-10	Isotope	SrY-90	
Electroplated on polished	Ni	disc,	0.79	,	mm thick.
Total diameter of 3.1	8 cm a	nd an active	e diameter of	2.54	cm.
The radioactive material is covering over the active su		fixed to the	disc by heat tr	eatment w	ithout any
Measurement Method:					
The 2pi beta emission rate of Absolute counting of beta pass verified by counting abtraceable to NIST by refere	particles emit ove, below, an	ted in the l d at the ope	nemisphere above rative voltage.	the acti	ve surface bration is
Measurement Result:					
The observed beta count recalibration date was:	ate from the	surface of	the disc per m	inute (c)	om) on the
5,710	±	171	-		
The total disintegration ra the surface of the disc, wa	The state of the s	ning <u>40</u>	& backscatter of	beta part	cicles from
8,170	±	244	(0.00	368	μCi)
The uncertainty of the meas at the 99% confidence level measurement.					
Calibrated by:ART REUS	ST	Reviewed by	: Malo		-
Calibration Technician:	Int feer	Ø.A.	Manager:	all Mc	Cutch?
Calibration Date:4-04	1-2011	Revie	ewed Date:	4-4-11	



Environmental Restoration Group, Inc. 8809 Washington St NE, Suite #150 Albuquerque, NM 87113 (505) 298-4224 www.ERGoffice.com

Certificate of Calibration



Meter Calibration

Calibration performed	in accordance with FR	RG SOP Meter	FC 101 B1 2/6/2022	B was a substitute of the subs	E. al Dallacte Inc.
Meter Manufactur Detector Manufactur	er: Ludlum	Model Number		Serial Number:	R2 2/6/2023 125457
Barometric Pressure: Pulser: Ludlum 500-1	25.07 inches Hg	Temperature: 73	°F Relative I	Serial Number: Humidity: 35 % Length: ✓ 39-inch ☐ 60-in	PR391728
 ✓ Mechanical Check ✓ Audio Check ✓ Meter Zero Check ✓ Meter Reset Check 	✓ Battery Check✓ THR/WIN O✓ F/S Response✓ Geotropism	peration 🔽 500	k: V		outer.
The contract of the contract o					
Source Distance: Co	w in OUT mode: ✓ / Set Threshold erance (+/- 10% on Tentact ✓ 6 inches	d: 10 mV Windo HR/WIN values and Me Other:		d +/-2.5% on HV values):	✓ Yes □ No
Calibrated with Windon Set Voltage: 750 V Instrument Within Tol Source Distance: □Con Source Geometry: ✓ Sie	w in OUT mode: / Set Threshold erance (+/- 10% on Tentact 6 inches de Below	d: 10 mV Windo HR/WIN values and Me Other: Other:	ter Reading counts, and		
Calibrated with Windon Set Voltage: 750 V Instrument Within Tol Source Distance: □Con Source Geometry: ☑ Sin Range/Multiplier Re	w in OUT mode: / Set Threshold erance (+/- 10% on T ntact 6 inches de Below eference Setting	d; 10 mV Windo HR/WIN values and Me Other: Other: "As Found Reading"	ter Reading counts, and	Integrated 1-Min. Count	Log Scale Cou
Calibrated with Windo Set Voltage: 750 V Instrument Within Tol Source Distance: □Col Source Geometry: ☑ Sid Range/Multiplier Re x 1000	w in OUT mode: ✓ / Set Threshold erance (+/- 10% on Tentact ✓ 6 inches □ de □ Below □ eference Setting	d: 10 mV Windo HR/WIN values and Me Other: Other: "As Found Reading"	Meter Reading 400		Log Scale Cour
Calibrated with Windo Set Voltage: 750 V Instrument Within Tol Source Distance: □Cor Source Geometry: ☑ Sic Range/Multiplier Re x 1000 x 1000	w in OUT mode: ✓ / Set Threshold erance (+/- 10% on Tentact ✓ 6 inches ☐ de ☐ Below ☐ eference Setting 400 100	d: 10 mV Windo HR/WIN values and Me Other: Other: "As Found Reading" 400 100	Meter Reading 400	Integrated 1-Min. Count	Log Scale Cour 400 100
Calibrated with Windon Set Voltage: 750 V Instrument Within Tol Source Distance: □Con Source Geometry: ☑ Sid Range/Multiplier Ref x 1000 x 1000 x 1000	w in OUT mode: ✓ / Set Threshold erance (+/- 10% on Tentact ✓ 6 inches □ de □ Below □ eference Setting	d: 10 mV Windo HR/WIN values and Me Other: Other: "As Found Reading"	Meter Reading 400	Integrated 1-Min. Count	Log Scale Cou
Calibrated with Windo Set Voltage: 750 V Instrument Within Tol Source Distance: □Cor Source Geometry: ☑ Sic Range/Multiplier Re x 1000 x 1000	w in OUT mode: / Set Threshold erance (+/- 10% on Tentact 6 inches de Below deference Setting 400 100 400	d: 10 mV Windo HR/WIN values and Me Other: Other: "As Found Reading" 400 100 400	Meter Reading 400 100 400	Integrated 1-Min. Count	Log Scale Cou 400 100 400
Calibrated with Windon Set Voltage: 750 V Instrument Within Tol Source Distance: □Col Source Geometry: ☑ Sid Range/Multiplier Ref x 1000 x 1000 x 1000 x 1000 x 1000	w in OUT mode: ✓ Set Threshold erance (+/- 10% on Tentact ✓ 6 inches □ de □ Below □ eference Setting 400 100 400 100	d: 10 mV Windo HR/WIN values and Me Other: Other: "As Found Reading" 400 100 400 100	Meter Reading 400 100 400 100	Integrated 1-Min. Count 400052 40009	Log Scale Cou 400 100 400 100
Calibrated with Windon Set Voltage: 750 V Instrument Within Tol Source Distance: □Cor Source Geometry: ☑ Sid Range/Multiplier Ref x 1000	w in OUT mode: / Set Threshold erance (+/- 10% on Tentact 6 inches de Below 100 400 100 400 400 400	d: 10 mV Windo HR/WIN values and Me Other: Other: "As Found Reading" 400 100 400 100 400	Meter Reading 400 100 400 100 400 400	Integrated 1-Min. Count 400052 40009	Log Scale Cour 400 100 400 100 400

Notes: Multimeter uncertainty within 1.1% of reading (volts, amps). Count rate uncertainty is within 3% of reading. Measurement results represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2. The calibration results presented on this ERG Calibration Certificate relate only to the items calibrated by ERG. ERG certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology (NIST) or to the calibration facilities of other International Standards Organization members, or have been derived from accepted values of natural physical constants or have been derived

by the ratio type of calibration techniques. The calibration system conforms to the requirements of ANSI N323A-1997 and ISO/IEC 17025:2017.

DECISION RULE: Measurements from the meter, adjusted for the measurement uncertainty, must be within tolerance limits as stated in the Comments or Compliance Statement section. Otherwise the calibration is rejected.

9/25/24



Certificate of Calibration

Voltage Plateau

Customer: Enviro	onmental Restoration	on Group, Inc.	See address ab	ove. Calibra	tion Report	No.: 530	50		
Voltage Plateau p	erformed in accord	ance with ERG SO	P Meter:	ITC.101.R1	2/6/2023	Detec	tor:	ITC.102.R2	2/6/2023
Meter Manuf	facturer: Lu	dlum Me	odel Number:	2221	r	Serial Nun	nber:	12545	7
Detector Manuf	facturer: Lu	dlum Me	odel Number:	44-10)	Serial Nun	iber:	PR3917	728
Voltage Plateau C	alibration Cable Lo	ength: 39-inch	✓ 60-inch	Other:					
Threshold: 10	mV Win	dow:							
Source Distance: Source Geometry: Count Time (min)	✓ Side ☐ Be								
High Voltage	Source Counts	Background Counts	Net Counts				Voltage Plateau		
500	31890	2621	29269		.ectses				
550	49045	5948	43097		100000 -				*
600	54857	8524	46333		80000 -				/
650	56990	8872	48118		60000 -	•	-	• • •	-
700	58357	8979	49378		40000 -	1			
750	58525	9213	49312		20000 -				
800	59085	9386	49699		0 -	, ,	, ,		
850	60102	9757	50345			500 550 60) 650	700 750 800 8	50 900
900	87549	11956	75593		-				
Recommended H	IV: 750 V								
Source 1: Cs-137	sn:4097-03 5.2μCi	(1/4/12) button		T	otal Efficie	ency: n/a	4	π Efficiency:	n/a
Source 2:				Т	otal Efficie	ency: n/a	4	π Efficiency:	n/a
Instrument Efficiency i radionuclide specific as purposes only and are r	s calculated as net cour nd are calculated using	ated per ISO-7503/NUR ats ÷ source 2π emission source counts and back user efficiency calculation	rate. The 4π effic ground counts at the count on method or results.	iency is calculated he recommended lts.	as net count operating HV.	s ÷ source 4π ac The provided of	etivity. The	he provided efficie	ncies are information
Calibrated By:	ANT	my	Canb	ration Date:	-1-	T Call	nation	Due. 1740	-10
Reviewed By:	1924		Date:	7/1	5/24				

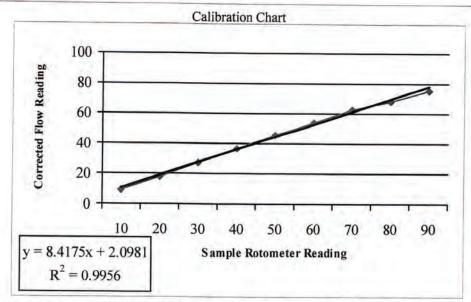
Certificate of Calibration

Air Sampler Calibration Form

Environmental Restoration Group, Inc. 8809 Washington St NE, Suite #150 Albuquerque, NM 87113 (505) 298-4224 www.ERGoffice.com

Sampler: Manufacturer: F&J Model Number: LV-1D Serial Number: 4669 Warm up Time 15 min Temperature: 71 °F Relative Humidity 21 % Barometric Pressure: 24.86 in. Hg Correction Factor: 0.910000

Sampler Rotometer	Calibrator Flow Meter	Corrected Flow	
10	10	9.100004	
20	20	18.20001	
30	30	27.30001	
40	40	36.40002	
50	50	45.50002	
60	60	54.60002	
70	69	62.79003	
80	75	68.25003	
90	83	75.53003	



 $Correction\ Factor = (A*B)^{0.5}$ $Corrected\ Flow = Calibrated\ Flow\ Meter*Correction\ Factor$

$$A = \frac{Barometric\ Pressure\ in\ inches\ of\ Hg.}{29.92} \qquad B = \frac{529.67}{459.67 + {}^{\circ}F} * \frac{181.8}{\mu_{gir}}$$

$$\mu_{air} = \frac{14.58 \left(\frac{459.67 + {}^{\circ}\mathrm{F}}{1.8}\right)^{^{3/2}}}{110.4 + \left(\frac{459.67 + {}^{\circ}\mathrm{F}}{1.8}\right)}$$

Comments: Comments:

Reference Instrument:

Air Flow Calibrator:

AFC-85L sn: 6042

Calibrated By:

Calibration Date: 3/13/25

Calibration Due: 3/13/26

Reviewed By:

Date:

ERG Form ITC. 106.A



Environmental Restoration Group, Inc. 8809 Washington St NE, Suite #150 Albuquerque, NM 87113 (505) 298-4224 www.ERGoffice.com

Certificate of Calibration

Meter Calibration



alibration performed in a	accordance with ERG Se	OP Meter I	TC.101.R2	9/12/2024	D	Detector ITC.102	2.R2 2/6/2023
Meter: Manufacturer:	Ludlum	Model Nu	umber:	12	Sei	rial Number:	274087
Detector: Manufacturer:	Ludlum	Model Nu	umber:	44-9	Ser	rial Number:	PR112194
arometric Pressure: 25.	.01 inches Hg T	emperature:	71 °F	Relative	e Humidity	/: 22 %	
ulser Ludlum 500-1 sn	347243 Multimeter	n	/a	Calibration (Cable Leng	gth: 🔽 39-inch	☐ 60-inch ☐ Other
Mechanical Check	✓ Battery Check	HV	/ Check:				
Audio Check	▼ THR/WIN Operat	tion 🔽	500 V				
Meter Zero Check	▼ F/S Response Che	eck 🗸	1000 V				
Meter Reset Check	Geotropism	V	1500 V				
Comments or Complian	nce Statement(s):						
Additional Comments:				-			
				-			
Meter Firmware Version				-			
Meter Firmware Version Calibrated with Window Set Voltage 900 V Do	in OUT mode: C Set Threshold:	40 mV					
Meter Firmware Version Calibrated with Window Set Voltage 900 V Do	in OUT mode: C Set Threshold:			ading counts, Meter Re		Integrated): ✓ Yes ☐
Meter Firmware Version Calibrated with Window Set Voltage 900 V De Instrument Within Tolera	in OUT mode: C Set Threshold: ance (+/- 10% on THR/	WIN values a	Reading"	Meter Re	eading		Log Scale Count
Meter Firmware Version Calibrated with Window Set Voltage 900 V De Instrument Within Tolera Range/Multiplier	in OUT mode: C Set Threshold: ance (+/- 10% on THR/	WIN values a	Reading"		eading	Integrated	Log Scale Count
Meter Firmware Version Calibrated with Window Set Voltage 900 V De Instrument Within Tolera Range/Multiplier x 1000	in OUT mode: C Set Threshold: ance (+/- 10% on THR/ Reference Setting 400	"As Found	Reading"	Meter Re	kcpm kcpm	Integrated	Log Scale Count kcpm
Meter Firmware Version Calibrated with Window Set Voltage 900 V De Instrument Within Tolera Range/Multiplier x 1000 x 1000	in OUT mode: C Set Threshold: Annce (+/- 10% on THR/ Reference Setting 400 100	"As Found 400	Reading" kcpm kcpm kcpm	Meter Re 400 100	kcpm kcpm kcpm	Integrated	Log Scale Count kcpm kcpm
Meter Firmware Version Calibrated with Window Set Voltage 900 V De Instrument Within Tolera Range/Multiplier x 1000 x 1000 x 1000	in OUT mode: C Set Threshold: Annce (+/- 10% on THR/ Reference Setting 400 100 400	"As Found 400 100 400	Reading" kcpm kcpm	Meter Re 400 100 400	kcpm kcpm kcpm kcpm	Integrated	Log Scale Count kcpm kcpm kcpm
Meter Firmware Version Calibrated with Window Set Voltage 900 V De Instrument Within Tolera Range/Multiplier x 1000 x 1000 x 1000 x 1000 x 1000	in OUT mode: C Set Threshold: Ance (+/- 10% on THR/ Reference Setting 400 100 400 100	"As Found 100 400 100	Reading" kcpm kcpm kcpm kcpm	Meter Re 400 100 400 100	kcpm kcpm kcpm	Integrated	Log Scale Count kcpm kcpm kcpm
Meter Firmware Version Calibrated with Window Set Voltage 900 V De Instrument Within Tolera Range/Multiplier x 1000	in OUT mode: C Set Threshold: Annce (+/- 10% on THR/ Reference Setting 400 100 400 100 400 400	"As Found 400 100 400 100 400	Reading" kcpm kcpm kcpm kcpm	Meter Re 400 100 400 100 400	kepm kepm kepm kepm kepm	Integrated	Log Scale Count kcpm kcpm kcpm
Meter Firmware Version Calibrated with Window Set Voltage 900 V De Instrument Within Tolera Range/Multiplier x 1000 x 1000 x 100	in OUT mode: C Set Threshold: Annce (+/- 10% on THR/ Reference Setting 400 100 400 100 400 100	"As Found 400 100 400 100 100	Reading" kcpm kcpm kcpm kcpm kcpm	Meter Re 400 100 400 100 400 100	kepm kepm kepm kepm kepm kepm	Integrated	Log Scale Count kcpm kcpm kcpm kcpm kcpm cpm
Meter Firmware Version Calibrated with Window Set Voltage 900 V De Instrument Within Tolera Range/Multiplier x 1000 x 1000 x 100 x 10	in OUT mode: C Set Threshold: Annce (+/- 10% on THR/ Reference Setting 400 100 400 100 400 100 400 100 400	"As Found 100 400 100 400 100 400 400 400 400 400	Reading" kcpm kcpm kcpm kcpm kcpm cpm	Meter Re 400 100 400 100 400 100 400	kepm kepm kepm kepm kepm kepm	Integrated	Log Scale Count kcpm kcpm kcpm kcpm kcpm cpm
Range/Multiplier x 1000 x 1000 x 1000 x 1000 x 100 x 100 x 100 x 100 x 10 x 1	in OUT mode:	"As Found 100 400 100 400 100 400 100 100 100 100	Reading" kcpm kcpm kcpm kcpm cpm	Meter Re 400 100 400 100 400 100 400 100	kepm kepm kepm kepm kepm kepm cpm	Integrated 1-Min. Count	Log Scale Count kepn kepn kepn kepn kepn cepm

alibrated By:

leviewed By:

Calibration Date:

Calibration Due: 4/21/26

Date: 4/21/29



Certificate of Calibration

Detector Voltage Plateau

Customer: Environmental Restoration	Group, Inc. See address	above. Calibration	Report No.:	5497		
Voltage plateau performed in accordant	nce with ERG SOP Meter	ITC.101.R2 9/12/2	2024	Detector IT	C.102.R2 2/6	5/2023
Meter: Manufacturer: Ludl	um Model Number:	12	Seri	al Number:	27408	7
Detector: Manufacturer: Ludl	um Model Number:	44-9	Seri	al Number:	PR1121	94
Voltage Plateau Calibration Cable Lenger Recommended Operating HV (V DC Source Distance: ▼Contact □ 6 inc Source Geometry: □ Side ▼ Belo	C) 900 Threshes Other:	-	Window:			
Count Time (min): 1.0 Background Counts 60			Gross Counts	Net Counts	Total Efficiency	4π Efficiency
ource 1 Tc-99 sn:U9-060 16,817dpr	m/9,250cpm (4/11/22) 47 mm	disk	2200	2140	0.058	0.127
ource 2					n/a	n/a
OTE: The total efficiency provided is calculated fficiency is calculated as net counts ÷ source 2 pecific and are calculated using source counts and are not intended to replace user efficiency calculated By:	π emission rate. The 4π efficiency is and background counts at the recommalculation method or results.	mended operating HV. The	+ source 4π active provided efficient	ity. The provided encies are for gen	efficiencies are ra	dionuclide urposes only

Count Rate Meter and Detector Calibration Certificate



		(Owner Informa	ation			
Name:	Energy S	olutions - Sacrar		Contact:	Bachir Badaoui		
Address 1:		55 Myrtle Ave Sui		PO Number:		k 0001 Dept 12480	
Address 2:	-	lighlands, Califor		Calibration Fro	12 months		
			rk Order Infor		,	12 1110118110	
Calibration WO Number		24-4889	Calibrat	ion Date:	01/13/25		
Calibration Procedure		CP-IN-WI-219	Calibration	Due Date:		13/26	
			Meter Informa	tion			
Manufactu	rer & Model	Serial Number		# of Ranges:	Low Range:	Meter Span:	
Ludlum	1 2224-1	227246		4	X1	1000	
Scaler Ca	alibration?	Yes	HV	Display Calibrati	ion?	Yes	
		D	etector Inform	ation			
Monufactu	rer & Model	Detector ID	Nu	mber of Efficience	cies	Uniformity	
wanuractu	rer & Wodel	Detector in	Alpha	Beta	Gamma	Test?	
Ludlur	n 43-93	244549	1	1	0	Yes	
	M&TE Ir	formation		Enviro	onmental Con	ditions	
Desc	ription	Serial Num	Due Date	Parameter		Result	
Thermomet	er/Barometer	A070146	08/05/25	Temperature (C):		20.7	
Humic	lity Pen	A070146	08/05/25	Pressure (mmHg):		744	
Pulser/Meter		151067	07/23/25	Humidity (%):		28.8	
Digital Volt Meter		94710023	07/03/25				
HV Probe	or Divider	258311	04/15/25				
		S	ource Informa	ation			
Nuclide	Source ID	V&V	Original 2π	Original 4π	Current 2π	Current 4π	
		Due Date	Activity (epm)	Activity (dpm)	Activity (epm)	Activity (dpm)	
Pu-239	071601	06/03/25	1.206E+04	2.389E+04	1.206E+04	2.388E+04	
Th-230	051301	05/29/25	1.045E+04	2.069E+04	1.045E+04	2.069E+04	
Tc-99	051304	05/28/25	1.338E+04	2.433E+04	1.338E+04	2.433E+04	
			esting for Sources	` '			
			spection and	Function Test	S		
As Received Ph (check all that a	nysical Condition apply)	i: Excellent/N	New Worn/Used	Damaged	✓ Functional	Inoperable	
Received Calib	ration Condition:	IN TOLERA	NCE Return	ed Calibration Co	ndition: IN	TOLERANCE	
Mech Zero	Sat	Battery Check	Sat	Audio	Sat		
Geotropism			Sat	Over Range	Sat		
F/S Response	N/A	Sensitivity	N/A	HV Display	Sat	All Applicable Tests As	
Alarm	N/A	Display/Light	Sat	Low Bat Set	N/A	Left = SAT	
Digital Zero	N/A	Hold	N/A	Window	N/A		
Count	Sat	Audio Divide	N/A	Lamp	N/A		

Energy Solutions Services, Inc., 1570 Bear Creek Rd, Oak Ridge, TN 37830 Phone: (865) 220-1545, Fax: (865) 220-1346, http://instruments.energysolutions.com/

Count Rate Meter and Detector Calibration Certificate



	High	Voltage Disp	lay Calibratio	n (All Values	in VDC)	
HV Setting	As Found	As Found Tolerance (±20%)		As Left	As Left Tole	rance (±5%)
500	499	400-600		499	475-525	
1000	998	800-1200		998	950-1050	
1500	1502	1200-1800		1502	1425	-1575
		Detec	tor Setup Info	ormation		
Manufact	urer/Model	Serial Number	As Found Calibration Constant	As Left Calibration Constant	As Found Dead Time (μs)	As Left Dead Time (μs)
Ludlun	n 43-93	244549	N/A	N/A	N/A	N/A
		Detector Se	etup Informat	on Continue	d	4.1
Serial Number	As Found β Threshold (mV)	As Left β Threshold (mV)	As Found β Window (mV)	As Left β Window (mV)	As Found	As Left α Threshold (mV)
244549	3.5	3.5	28	30	112	120
		Meter Cali	bration (all va	lues in cpm)		
Pa	nge	Calibration	As Found (Tol	erance ±20%)	As Left (Tole	rance ±10%)
1\a	ilge	Value	Value	Variance	Value	Variance
		200	190	-5.0%	190	-5.0%
×	(1	500	500	0.0%	500	0.0%
		800	810	1.3%	810	1.3%
		2,000	1,900	-5.0%	1,900	-5.0%
X	10	5,000	5,000	0.0%	5,000	0.0%
		8,000	8,100	1.3%	8,100	1.3%
		20,000	19,000	-5.0%	19,000	-5.0%
X1	00	50,000	50,000	0.0%	50,000	0.0%
		80,000	81,000	1.3%	81,000	1.3%
		200,000	190,000	-5.0%	190,000	-5.0%
X.	1K	500,000	500,000	0.0%	500,000	0.0%
		800,000	810,000	1.3%	810,000	1.3%
		Precision Te	st (Criteria ±1	0% of Avera	ge)	
recision Test	Reading 1	Reading 2	Reading 3	Mean	Precision T	est Result
cpm cnts	5,194	5,234	5,058	5,162	Pas	SS S

Count Rate Meter and Detector Calibration Certificate



Calib	ration	bration (As F	_		lerance				olerance	+20/	
	(cpm)	(min)		lue	-	ance		lue	Variance		
	000	5	39939		-0.2%		39939		-0.2%		
	00	2		978		1%		978	0.2270		
	00	1	_	90		1%		990	-	-0.1%	
	00	0.5		95		1%		95	-	1%	
	-		or High				38	990	-0.	170	
		Detect	-	ed HV		rance	Ao F	ound	T A-1	- 64	
Detec	tor ID	HV Plateau?	(VI			DC)		ouna DC)		Left DC)	
244	549	Yes	76	50	Per P	lateau	7	74	76	30	
		Detecto	or Cros	s Talk	Evalua	tion					
Det Model/ID	Ludlum 43-93	244549	α Sou	rce ID	071	601	β Sou	rce ID	051	304	
High Voltage	Backgro	und CPM	a Source	ce CPM	β Sour	ce CPM	4π Eff	iciency	Cros	stalk	
riigii voitage	α Channel	β Channel	Alpha	Beta	Alpha	Beta	Alpha	Beta	α to β	βto	
700	2	79	4305	387	4	2113	18.0%	8.4%	6.68%	0.109	
725	1	124	4842	469	6	2726	20.3%	10.7%	6.65%	0.199	
750	2	154	5086	665	7	3387	21.3%	13.3%	9.13%	0.15%	
760	1	164	5194	685	3	3405	21.7%	13.3%	9.12%	0.069	
775	0	198	5169	750	8	3800	21.6%	14.8%	9.65%	0.229	
800	4	201	5332	1590	4	4216	22.3%	16.5%	20.68%	0.00%	
		Detector Alp	ha Effic	iency	Calibra	tion Da	ata				
Detector ID	Range	Source ID	Gross	CPM	BKG	CPM	2π Eff	4π Eff	Geon	netry	
244549	N/A	051301	3,9				38.0%	19.2%	1/16" s	pacing	
		Detector Be			Calibra	tion Da	ta				
Detector ID	Range	Source ID	Gross	CPM	BKG	СРМ	2π Eff	4π Eff	Geon	netry	
244549	N/A	051304	3,4		2	64	24.2%	13.3%	1/16" s	pacing	
	Li	ght Leak Tes	sting Fo	or Scin	tillation	Detec	tors				
Detecto	r Model	Serial	Number				Leak Te	st Resul	t		
Ludlum	43-93	24	4549				S	at			
		l	Jniform	ity Tes	ting						
Detector ID	Source ID	Reading 1	Read	ing 2	Read	ing 3		Ave	rage		
244549	071601	5,069	5,1			276	5,180				
Uniformity	y Test Results (Individual Readi	ngs Withi	n 10% of	f Average	e)	Un	iformity	Test Pass	ed	

Count Rate Meter and Detector Calibration Certificate



CP-IN-WI-219-F1, Rev 2

		Comments	
Replaced broke	en range switch knob, low batteri	es and a bad 3ft o	able.
Replaced mylar	due to multiple pin-holes and fa	iled light leak test	as found. As left leak test SAT.
		Attachment	S
✓ None	Plateau Data	Plateau/Cross-Tal	k Other:
	State	ement of Cert	fication
	and EnergySolutions procedure	CP-IN-WI-219. \	ccordance with manufacturer's specifications, ANSI Ve further certify our calibration measurements are ards and Technology (NIST).
Performed By:	J. Manue	Reviewed By:	Jeff Dukenso 1/13/25





EnergySoltuions Instrument Services 1570 Bear Creek Road Oak Ridge, TN 37830 Phone: (877) 462-4873

Email: ISFStaff@energysolutions.com

		This Certifica	te will be accompan	nied by Ca	libration	Chart	s or Readings where applic	able			
	Custo	omer Informat	tion		Instrument Information						
Customer Nar	ne: Energy So	olutions - Sacr	amento Office		Manufacturer: Ludlum						
Address: 335	5 Myrtle Ave S	Suite 210 Nor	th Highlands, CA	95660	Model: 3030E Serial Number			ber: 217611			
Contact Name	: Bachir Bad	aoui			Probe:	43-10-	1 Serial Numb	er: 232046			
Project # R2-00	14.04 Task 000	1 Dept 12480	Work Order Number: 25-48		Calibration Method: Electronic And Source						
		and the second second	Instrum	ent Calib	ration I	nform	ation		and the same		
M&	TE	ID Number	Calibr	ation Due	e Date		Environ	mental Conditio	ons		
Thermomete	r/Barometer	A070146	11	08/05/25			Temperature (PC)	20.8		
Hum	idity	A070146		08/05/25			Pressure (mmI	Ig)	744		
Pulse Ge	enerator	151067		07/23/25			Humidity (%)	31.3		
DV	M	94710023		07/03/25			Calibrated in accordan	ce with OEM te	chnical manu		
Isot	ope	Source ID	4Pi A	activity (d	lpm)		2Pi Emissions (EPN	1) Source	e Cert. Date		
Pu-239 (See	e printout)	071601		23,887			12,060	0	8/01/16		
Tc-99 (See	printout)	051304		24,330			13,380		05/15/13		
Th-230 (Se	(See page 2) 051301 20,694				10,450	0	5/15/13				
N/.	A	N/A		N/A			N/A		N/A		
The Factor			F	requency	Calibra	tion					
Input ((cpm)	Time Base (minutes)	Tolerances (cpr	m ± 2%)	Scale	r Resp	ponse (cpm) As Found	Scaler Respons	e (cpm) As Le		
400,	000	0.1	39,200 - 40,	,800			39,885	39,885			
400,	000	0.5	196,000 - 204	4,000			199,515	199,515			
400,	000	1.0	392,000 - 40	8,000			399,137	399,	137		
	Sensitivity		Instru	ment Che	cks		High Vo	Itage Verification	n		
Threshold	As Found	As Left	Overload: SAT	Audio:	SAT		3030E High Voltage	DVM Rea	ading (Vdc)		
a Threshold	119 mV	119 mV	Alarms: SAT	Batt Ch	eck: SA	T	Set Point (Vdc)	As Found	As Left		
β Threshold	4.1 mV	4.1 mV	Internal Battery 13.	Voltage 42 Volts	(>12 vol	ts) =	500 (± 5%)	500	500		
β Window	49.7 mV	49.7 mV	Firmwa	re: 39013	3N41		800 (± 2vdc)	800	800		
]	HV (As found)	= 650 Volts	HV (As Left) =	650 Volts			1,500 (± 5%)	1,437	1,437		
			Sta	tement of	Certific	ation					
pecifications.	We further cert	ify that our Cal	ras calibrated and in ibration Measurement or use of this in	ents are tra	aceable to	ipment the N	t and that it met all the Ma Vational Institute of Standa	nufacturers publiced and Technological and Techn	shed operating gy. (We are no		
nstrument Calibrated By:	O O	M.Davis		Reviewe		X	Mikinso	Date:	1/28/25		
Calibration Da	ite: 01/27/202	5			29	Calif	pration Due (6 mo.): 07/2	27/2025			

^{*} Calibration due date is dependent on users regulatory requirements.

* Calibration Due (12 mo.): 01/27/2026

Instrument ID: 217611

		BACKGROUND	INFORMATION			
Background count tin	ne: (10 min)	As Found	Alpha: 0.3 cpm	As Found Bet	a: 57.1 cpm	
Background count tin	ne: (10 min)	As Left	Alpha: 0.3 cpm	As Left Beta	: 57.9 cpm	
Alpha S	ource: Pu-239 #0716	01	Beta S	ource: Tc-99 #051304		
Parameter and Tolerance	Alpha As Found	Alpha As Left	Parameter and Tolerance	Beta As Found	Beta As Left	
Source Count, Cs	37,915	See As Left Printout	Source Count, Cs	28,106	See As Left Printout	
Time, Ts (min)	5	See As Left Printout	Time, T _s (min)	5	See As Left Printout	
Rate, Rs (cpm)	Net $\mathbf{R}_{s[\alpha]} = 7,582.7$	See As Left Printout	Rate, R _s (cpm)	Net $R_{s[\beta]} = 5,564.1$	See As Left Printout	
4pi EFF (% c/dpm)	31.7 %	See As Left Printout	4pi EFF (% c/d)	22.9 %	See As Left Printout	
2pi EFF (% c/emission)	62.9 %	61.9 %	2pi EFF (% c/emission)	41.6 %	41.2 %	
Alpha S	ource: Th-230 #0513	01	Source: N/A			
Parameter and Tolerance	Alpha As Found	Alpha As Left	Parameter and Tolerance	N/A	N/A	
Source Count, Cs	29,767	30,084	Source Count, Cs	N/A	N/A	
Time, Ts (min)	5	5	Time, Ts (min)	N/A	N/A	
Rate, Rs (cpm)	Net $R_{s[\alpha]} = 5,953.1$	Net $R_{s[\alpha]} = 6,016.5$	Rate, Rs (cpm)	N/A	N/A	
4pi EFF (% c/dpm)	28.8 %	29.1 %	4pi EFF (% c/d)	N/A	N/A	
2pi EFF (% c/emission)	57.0 %	57.6 %	2pi EFF (% c/emission)	N/A	N/A	
		Com	ments		A POPULATION	
Found" report are input from	used to determine As I om when the previous data for Pu-239,#0716	Found efficiencies for to calibration was perfor 01, & Tc-99, #051304,	this sheet. The As Found effic			
Com cen voitage - 5.0777						

BURDAUS

responsible for damage incurred during shipment or use of this instrument).

Instrument

Calibrated By:

Calibration Date: 01/27/2025

Reviewed By:

* Calibration Due (6 mo.): 07/27/2025

* Calibration Due (12 mo.): 01/27/2026

^{*} Calibration due date is dependent on users regulatory requirements.

As Found &M. Davis

Model 3030 Parameters 1/27/2025 11:34:40 AM Header 1: 217611 Header 2: PR232046 Header 3: Header 4: Header 5: More Comments? Header 6: More Comments? Calibration Due Date: 5/15/2025 Model 3030 Date: 1/1/1980 Model 3030 Time: 12:00:00 AM Count Time Switch (min): 1.0 User PC Time (min): 20.0 Alpha Alarm: 999999 Beta Alarm: 999999 Alpha + Beta Alarm: 999999 High Voltage (VDC): 650 Loss of Count Time (min): 30.0 Count Mode: SCALER Alpha Efficiency %: 31.9 Beta Efficiency %: 22.5 Background Subtract: OFF Alpha Background: 1.0 Beta Background: 63.0 Crosstalk Correction: OFF Alpha to Beta Crosstalk %: 2.2 Beta to Alpha Crosstalk %: 0.0 Show Parameters during startup: Enabled Daily QC Check: OFF Update Efficiency/Background Subtract from QC: ON Override QC Count Time: Last Alpha Efficiency %: 41.9 Last Beta Efficiency %: 35.1 Standard Alpha Efficiency %: 55 Standard Beta Efficiency %: 32 Allowable Alpha QC Efficiency ± %: 15 Allowable Beta QC Efficiency ± %: 15 Alpha Source Size (dpm): 24900 Alpha Source Size (Bq): 415.00 Alpha Source Size (µCi): 0.01121621622 Beta Source Size (dpm): 93200 Beta Source Size (Bq): 1553.33 Beta Source Size ($\mu \bar{\text{Ci}}$): 0.04198198198 Alpha QC Count Time (min): 1666.7 Beta QC Count Time (min): 1.0 Background QC Count Time (min): 1.0 Last Alpha QC Background: 99999.9 Last Beta QC Background: 99999.9 Alpha Background Upper Limit (cpm): 3.5 Alpha Background Lower Limit (cpm): 0.0

Next Sample Number: 0001 User-defined Comment: Logging Mode: Off Recycle Mode: OFF Printer Mode: OFF

Beta Background Upper Limit (cpm): 80.0 Beta Background Lower Limit (cpm): 99999.

Ludlum Measurements, Inc. Model 3030 Parameters

As Left Classaus _____ 1/27/2025

1:04:35 PM

Header 1: 217611 Header 2: PR232046

Header 3: Header 4:

Header 5: More Comments? Header 6: More Comments?

Calibration Due Date: 1/27/2026

Model 3030 Date: 1/27/2025 Model 3030 Time: 1:04:30 PM

Count Time Switch (min): 1.0 User PC Time (min): 20.0

Alpha Alarm: 999999 Beta Alarm: 999999

Alpha + Beta Alarm: 999999

High Voltage (VDC): 650

Loss of Count Time (min): 30.0

Count Mode: SCALER

Alpha Efficiency %: 31.3 Beta Efficiency %: 22.6

Background Subtract: OFF Alpha Background: 0.0 Beta Background: 68.0

Crosstalk Correction: OFF Alpha to Beta Crosstalk %: 2.3 Beta to Alpha Crosstalk %: 0.0

Show Parameters during startup: Enabled

Daily QC Check: OFF Update Efficiency/Background Subtract from QC: ON Override QC Count Time: ON

Last Alpha Efficiency %: 41.9 Last Beta Efficiency %: 35.1

Standard Alpha Efficiency %: 55 Standard Beta Efficiency %: 32

Allowable Alpha QC Efficiency ± %: 15 Allowable Beta QC Efficiency ± %: 15

Alpha Source Size (dpm): 24900 Alpha Source Size (Bq): 415.00 Alpha Source Size (μ Ci): 0.01121621622

Beta Source Size (dpm): 93200 Beta Source Size (Bq): 1553.33 Beta Source Size (µCi): 0.04198198198

Alpha QC Count Time (min): 1666.7 Beta QC Count Time (min): 1.0 Background QC Count Time (min): 1.0

Last Alpha QC Background: 999999.9 Last Beta QC Background: 99999.9

Alpha Background Upper Limit (cpm): 3.5 Alpha Background Lower Limit (cpm): 0.0 Beta Background Upper Limit (cpm): 80.0 Beta Background Lower Limit (cpm): 99999.

Next Sample Number: 0001 User-defined Comment: Logging Mode: Off Recycle Mode: OFF Printer Mode: OFF

Ludlum Measurements, Inc. Model 3030 Plateau Data

1/27/2025 1:00:54 PM

Header 1: 217611 Header 2: PR232046

Header 3: Header 4:

Header 5: More Comments? Header 6: More Comments?

Calibration Due Date: 1/27/2026

Model 3030 Date: 1/27/2025 Model 3030 Time: 12:09:46 PM

User PC Time: 20.0

Alpha Isotope: Pu239 #071601 08/01/16 Alpha Source Size (dpm): 23887 Alpha Source Size (Bq): 398.12 Alpha Source Size (μ Ci): 0.01075991

Beta Isotope: Tc99 #051304 05/15/13 Beta Source Size (dpm): 24330 Beta Source Size (Bq): 405.5 Beta Source Size (μCi): 0.010959459

Starting High Voltage: 550 Starting High Voltage: 750 High Voltage Increment: 25

Plateau Count Mode: SCALER Source Count Time (min): 1.0 Background Count Time (min): 1.0

HV	Source	(Beta)	ALPHA Background	Eff	CrossTalk	Source	(Alpha)	BETA Background	Eff	Crosstalk
550	7322	(189)	2	30.6%	2.1%	3287	(0)	37	13.4%	0.0%
575	7430	(179)	0	31.1%	1.9%	4128	(0)	41	16.8%	0.0%
600	7476	(215)	0	31.3%	2.3%	4826	(1)	41	19.7%	0.0%
625	7559	(223)	0	31.6%	2.4%	5294	(0)	41	21.6%	0.0%
650	7470	(243)	0	31.3%	2.3%	5577	(0)	68	22.6%	0.0%
675	7628	(291)	0	31.9%	3.0%	5540	(0)	63	22.5%	0.0%
700	7458	(409)	1	31.2%	4.5%	5350	(2)	76	21.7%	0.0%
725	7691	(653)	2	32.2%	7.3%	5373	(45)	88	21.7%	0.8%
750	7682		4	32.1%	15.4%	5462	(220)	102	22.0%	4.0%

MDavis

Computer Equivalent of Form IN-WI-235-F1

Alpha Source Chi-Square Test

Ludlum Model 3030E	Serial Number:	217611	Source Nuclide Pu-239	Source ID 071601
Count Number (N)	Source Count (x)	_x-Mean_		(x-Mean)2
1	7652	136.75		18700.56
2	7438	-77.25		5967.56
3	7513	-2.25		5.06
4	7517	1.75		3.06
5	7497	-18.25		333.06
6	7421	-94.25		8883.06
7	7596	80.75		6520.56
8	7676	160.75		25840.56
9	7508	-7.25		52.56
10	7505	-10.25		105.06
11	7552	36.75		1350.56
12	7433	-82.25		6765.06
13	7629	113.75		12939.06
14	7477	-38.25		1463.06
15	7327	-188.25		35438.06
16	7499	-16.25		264.06
17	7578	62.75		3937.56
18	7598	82.75		6847.56
19	7406	-109.25		11935.56
20	7483	-32.25	_	1040.06
Σ	= 150305	(x-Mean) ²	=	148391.75
Mean	= 7515.25	Chi ² =	19.75	
σ=	= 88.37	2σ=	176.749451	
		1.039233 3σ= 3	265.12	

Computer Equivalent of Form IN-WI-235-F1

Beta Source Chi-Square Test

Ludium Model 3030E	Serial Number:	217611	Tc-99 051304
Count Number (N)	Source Count (x)	_x-Mean_	(x-Mean)2
1	5730	89.65	8037.12
2	5698	57.65	3323.52
3	5583	-57.35	3289.02
4	5674	33.65	1132.32
5	5510	-130.35	16991.12
6	5751	110.65	12243.42
7	5557	-83.35	6947.22
8	5550	-90.35	8163.12
9	5580	-60.35	3642.12
10	5681	40.65	1652.42
11	5663	22.65	513.02
12	5534	-106.35	11310.32
13	5775	134.65	18130.62
14	5624	-16.35	267.32
15	5703	62.65	3925.02
16	5632	-8.35	69.72
17	5594	-46.35	2148.32
18	5631	-9.35	87.42
19	5617	-23.35	545.22
20	5720	79.65	6344.12
Σ	C= 112807	(x-Mean) ² =	108762.55
Mean	= 5640.35	Chi ² = 19	0.28
σ	= 75.66	2σ= 1	51.3188
	e Chi Square= ed Chi Pass/Fail=	1.014892 3σ= 22 PASS	26.98

CABRERA ALPHA-BETA COUNTING INSTRUMENT (Rev 6)

Co	unting Inst	rument:	3	030E	Detector:	43-1	0-1	Calil	bration Date:	1/27/2025						
	(Serial #:	2′	17611	Serial #:	2320	046	12 month o	calibration:	OK						
	Detec	tor Activ	e Area or A	rea Covered b	y Smear (cm²):	100										
	Efficiency (fraction)	Source Nuclide	Source Number	Original Source Activity (DPM)	Source Creation Date	T _{1/2} (yr)	Source Decayed Activity	Required MDA (DPM/100cm²)	Control Chart & Daily Bkg Count Time	Control Chart & Daily Source- Sample Count Time	Control Chart bkg Average α/β cpm	Control Chart bkg 1 sigma, cpm	Control Chart Source-bkg Average α/β cpm	Control Chart source 1 sigma, cpm		
Alpha	0.1464	Th-230	7102-10	17,400	6/16/2010	7.54E+04	17,398	20	10	1	0.27	0.13	5183.0	121.78		
Beta	0.1081	Sr-90	7139-10	8,170	4/4/2011	2.88E+01	5,822	200	10	1	51.68	3.00	1241.8	40.76		
Date	Daily Bkg	Counts	Daily Check	Source Counts	Daily Bkg Ra	te (cpm)	Net Daily S	ource Rate (cpm)	Bkg QC I	Pass/Fail	Source QC	Pass/Fail			H.P.	Technician
Date	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	MDA α (dpm)	MDA β (dpm)	Technician	Initials
4/28/2025	1	489	5107	1308	0.1	48.9	5106.9	1259.1	PASS	PASS	PASS	PASS	27.95	251	BB	BB
4/29/2025	1	517	5054	1282	0.1	51.7	5053.9	1230.3	PASS	PASS	PASS	PASS	27.95	257	BB	BB
4/30/2025	2	488	5119	1332	0.2	48.8	5118.8	1283.2	PASS	PASS	PASS	PASS	31.03	251	BB	BB
5/1/2025	2	491	5082	1283	0.2	49.1	5081.8	1233.9	PASS	PASS	PASS	PASS	31.03	251	BB	BB
5/12/2025	2	511	5110	1321	0.2	51.1	5109.8	1269.9	PASS	PASS	PASS	PASS	31.03	256	BB	BB

CABRERA ALPHA-BETA COUNTING INSTRUMENT

			(D _{ov}	6)					
			(Rev	U)					
		Instrument/Detector	3030E/43-10-1						
		Serial # / Serial#	217611/232046						
		Initial Background		nts for Co					
		Initial bkg c	ounts		Initial	source p	lus bkg	counts	
#	Alpha	срт	Beta	cpm	Alpha	cpm	Beta	cpm	
1	4	0.4	522	52.2	4945	4945	1271	1271	
2	3	0.3	588	58.8	5163	5163	1339	1339	
3	1	0.1	507	50.7	5128	5128	1290	1290	
4	2	0.2	482	48.2	5409	5409	1260	1260	
5	3	0.3	523	52.3	5075	5075	1315	1315	
6	3	0.3	534	53.4	5182	5182	1351	1351	
7	5	0.5	491	49.1	5211	5211	1235	1235	
8	3	0.3	523	52.3	5245	5245	1257	1257	
9	1	0.1	498	49.8	5238	5238	1267	1267	
10	2	0.2	500	50	5237	5237	1350	1350	
Mean		0.27		51.7		5183.3		1293.5	
		0.27		3.00		121.74			
S _(n-1)								42.33	
-3 sigma		-0.11		42.69		4818.09		1166.50	
+3 sigma		0.65		60.67		5548.51		1420.50	
-2 sigma		0.02		45.69		4939.83		1208.83	
+2 sigma		0.52		57.67	Mean-bkg	5426.77 5183.0		1378.17 1241.8	
					S _(n-1)	121.78		40.76	
				Moon bloo	` ′	4817.69		1119.53	
				Mean-bkg	+3 sigma	4817.69 5548.37		1364.11	
					-2 sigma	4939.47		1160.30	
				Mean-bkg	+2 sigma	5426.59		1323.34	

Equipment Chi-Square Distribution Worksheet

<u>X</u> i	X_m-X_i	$(X_m-X_i)^2$		
4945	237.85	56572.62	Instrument/Detector	3030E/43-10-1
5163	19.85	394.0225	Serial # / Serial#	217611/232046
5128	54.85	3008.523	Date Performed	28-Apr-25
5409	-226.15	51143.82	Count time interval (minutes)	1 min
5075	107.85	11631.62	Source Used	Th-230
5182	0.85	0.7225	Source ID	7102-10
5211	-28.15	792.4225	Source Half-life	7.54E+04
5245	-62.15	3862.622	Source Reference Date	6/16/2020
5238	-55.15	3041.522	Surface emission rate (α/min)	8850
5237	-54.15	2932.222	Surface efficiency	0.25
5178	4.85	23.5225	Instrument Efficiency	0.5856
5272	-89.15	7947.722	Total Efficiency	0.1464
5179	3.85	14.8225		
5183	-0.15	0.0225		
5221	-38.15	1455.422		
5120	62.85	3950.123		
5117	65.85	4336.223		
5153	29.85	891.0225		
5182	0.85	0.7225		
	4945 5163 5128 5409 5075 5182 5211 5245 5238 5237 5178 5272 5179 5183 5221 5120 5117 5153	4945 237.85 5163 19.85 5128 54.85 5409 -226.15 5075 107.85 5182 0.85 5211 -28.15 5245 -62.15 5238 -55.15 5237 -54.15 5178 4.85 5272 -89.15 5183 -0.15 5221 -38.15 5120 62.85 5117 65.85 5153 29.85	4945 237.85 56572.62 5163 19.85 394.0225 5128 54.85 3008.523 5409 -226.15 51143.82 5075 107.85 11631.62 5182 0.85 0.7225 5211 -28.15 792.4225 5245 -62.15 3862.622 5238 -55.15 3041.522 5237 -54.15 2932.222 5178 4.85 23.5225 5272 -89.15 7947.722 5183 -0.15 0.0225 5221 -38.15 1455.422 5120 62.85 3950.123 5117 65.85 4336.223 5153 29.85 891.0225	4945 237.85 56572.62 Instrument/Detector 5163 19.85 394.0225 Serial # / Serial# 5128 54.85 3008.523 Date Performed 5409 -226.15 51143.82 Count time interval (minutes) 5075 107.85 11631.62 Source Used 5182 0.85 0.7225 Source ID 5211 -28.15 792.4225 Source Half-life 5245 -62.15 3862.622 Source Reference Date 5238 -55.15 3041.522 Surface emission rate (α/min) 5237 -54.15 2932.222 Surface efficiency 5178 4.85 23.5225 Instrument Efficiency 5179 3.85 14.8225 5183 -0.15 0.0225 5221 -38.15 1455.422 5120 62.85 3950.123 5117 65.85 4336.223 5153 29.85 891.0225

20 5219 -36.15 1306.822 Sum total 103657 153306.6

 X_m 5182.85

 $X^2 = 29.58$

Note: Accept χ^2 if between 8.91 and 32.8

Equipment Chi-Square Distribution Worksheet

Count No.	<u>X</u> i	X _m -X _i	$(X_m-X_i)^2$		
1	1271	15.65	244.9225	Instrument/Detector	3030E/43-10-1
2	1339	-52.35	2740.522	Serial # / Serial#	217611/232046
3	1290	-3.35	11.2225	Date Performed	28-Apr-25
4	1260	26.65	710.2225	Count time interval (minutes)	1 min
5	1315	-28.35	803.7225	Source Used	Sr-90
6	1351	-64.35	4140.922	Source ID	7139-10
7	1235	51.65	2667.723	Source Half-life	2.88E+01
8	1257	29.65	879.1225	Source Reference Date	4/4/2011
9	1267	19.65	386.1225	Surface emission rate (β/min)	5,710
10	1350	-63.35	4013.222	Surface efficiency	0.5
11	1288	-1.35	1.8225	Instrument Efficiency	0.2163
12	1241	45.65	2083.923	Total Efficiency	0.1081
13	1294	-7.35	54.0225		
14	1288	-1.35	1.8225		
15	1310	-23.35	545.2225		
16	1277	9.65	93.1225		
17	1292	-5.35	28.6225		
18	1302	-15.35	235.6225		
19	1259	27.65	764.5225		

Sum total 25733 X_m 1286.65

20

1247

 $X^2 = 17.08$

39.65

21978.55

Note: Accep $\overline{\chi^2}$ if between 8.91 and 32.8

CABRERA ALPHA-BETA COUNTING INSTRUMENT (Rev 6)

Co	ounting Inst	trument:	Luldu	m 2224-1	Detector:	43-	63	Cali	bration Date:	1/13/2025				
	,	Serial #:	22	27246	Serial #:	2445	549	12 month of	calibration:	OK				
	Detec	tor Activ	e Area or A	rea Covered b	y Smear (cm²):	100								
	Efficiency (fraction)	Source Nuclide	Source Number	Original Source Activity (DPM)	Source Creation Date	T _{1/2} (yr)	Source Decayed Activity	Required MDA (DPM/100cm²)	Control Chart & Daily Bkg Count Time	Control Chart & Daily Source- Sample Count Time	Control Chart bkg Average α/β cpm	Control Chart bkg 1 sigma, cpm		
Alpha	0.0861	Th-230	7102-10	17,400	6/16/2010	7.54E+04	17,398	100	1	1	1.80	1.14		
Beta	0.0798	Sr-90	7139-10	8,170	4/4/2011	2.88E+01	5,822	1000	1	1	166.40	10.37		
											*			
Date	Daily Bkg	Counts	Daily Check	Source Counts	Daily Bkg Ra	ite (cpm)	Net Daily S	ource Rate (cpm)	Bkg QC I	Pass/Fail	Source QC	Pass/Fail	H.P.	Technician
Date	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	Technician	Initials
4/28/2025	0	160	3044	1136	0.0	160.0	3044.0	976.0	PASS	PASS	PASS	PASS	BB	BB
4/29/2025	1	156	3011	1088	1.0	156.0	3010.0	932.0	PASS	PASS	PASS	PASS	BB	BB
4/30/2025	2	174	3111	1121	2.0	174.0	3109.0	947.0	PASS	PASS	PASS	PASS	BB	BB
5/1/2025	2	166	3054	1096	2.0	166.0	3052.0	930.0	PASS	PASS	PASS	PASS	BB	BB

CABRERA ALPHA-BETA COUNTING INSTRUMENT (Rev 6)

									—
		Instrument/Detector	2224-1/43-93						
		Serial # / Serial#	202461/PR286563						
		Initial Backgroun	d and Source Cou	nts for Co	ontrol Ch	art			
		Initial bkg	counts		Initial	source p	lus bkg	counts	
#	Alpha	cpm	Beta	cpm	Alpha	cpm	Beta	cpm	
1	2	2	164	164	3092	3092	1055	1055	
2	0	0	160	160	3044	3044	1137	1137	
3	1	1	155	155	3155	3155	1041	1041	
4	1	1	177	177	2952	2952	1102	1102	
5	3	3	167	167	3122	3122	1092	1092	
6	1	1	152	152	3020	3020	1118	1118	
7	2	2	157	157	2968	2968	1049	1049	
8	4	4	174	174	3089	3089	1098	1098	
9	2	2	181	181	3011	3011	1075	1075	
10	2	2	177	177	3076	3076	1131	1131	
Maria		4.00		100.1		0050.0		1000.0	
Mean		1.80		166.4		3052.9		1089.8	
S _(n-1)		1.14		10.37		65.72		34.02	
-3 sigma		-1.61		135.28		2855.74		987.73	
+3 sigma		5.21		197.52		3250.06		1191.87	
-2 sigma		-0.47		145.65		2921.46		1021.76	
+2 sigma		4.07		187.15	Mean-bkg	3184.34 3051.1		1157.84 923.4	
				Marian Island	S _(n-1)	65.41		33.21	
				Mean-bkg		2854.88		823.76	
				Mean-bkg		3247.32		1023.04	
				Mean-bkg		2920.29 3181.91		856.97 989.83	
				iviean-bkg	+2 sigma	3181.91		989.83	

Equipment Chi-Square Distribution Worksheet

Count No.	V	V V	(V V) ²		
Count No.	<u>X</u> i	X _m -X _i	$(X_m-X_i)^2$		
1	3092	-42.2	1780.84	Instrument/Detector	2224-1/43-93
2	3044	5.8	33.64	Serial # / Serial#	202461/PR286563
3	3155	-105.2	11067.04	Date Performed	28-Apr-25
4	2952	97.8	9564.84	Count time interval (minutes)	1 min
5	3122	-72.2	5212.84	Source Used	Th-230
6	3020	29.8	888.04	Source ID	7102-10
7	2968	81.8	6691.24	Source Half-life	7.54E+04
8	3089	-39.2	1536.64	Source Reference Date	6/16/2020
9	3011	38.8	1505.44	Surface emission rate (α/min)	8850
10	3076	-26.2	686.44	Surface efficiency	0.25
11	2987	62.8	3943.84	Instrument Efficiency	0.3444
12	3099	-49.2	2420.64	Total Efficiency	0.0861
13	2955	94.8	8987.04		
14	3081	-31.2	973.44		
15	3051	-1.2	1.44		
16	3076	-26.2	686.44		
17	2966	83.8	7022.44		
18	3163	-113.2	12814.24		

20 3008 41.8 1747.24 Sum total 60996 78537.2 X_m 3049.8

-31.2

973.44

 $X^2 = 25.75$

Note: Accept χ^2 if between 8.91 and 32.8

3081

19

Equipment Chi-Square Distribution Worksheet

Count No.	<u>X</u> i	X_m-X_i	$(X_m-X_i)^2$		
1	1055	23.25	540.5625	Instrument/Detector	2224-1/43-93
2	1137	-58.75	3451.563	Serial # / Serial#	202461/PR286563
3	1041	37.25	1387.563	Date Performed	28-Apr-25
4	1102	-23.75	564.0625	Count time interval (minutes)	1 min
5	1092	-13.75	189.0625	Source Used	Sr-90
6	1118	-39.75	1580.063	Source ID	7139-10
7	1049	29.25	855.5625	Source Half-life	2.88E+01
8	1098	-19.75	390.0625	Source Reference Date	4/4/2011
9	1075	3.25	10.5625	Surface emission rate (α /min)	5710
10	1131	-52.75	2782.563	Surface efficiency	0.5
11	1109	-30.75	945.5625	Instrument Efficiency	0.1597
12	1015	63.25	4000.563	Total Efficiency	0.0798
13	1113	-34.75	1207.563		
14	1078	0.25	0.0625		
15	1024	54.25	2943.063		
16	1078	0.25	0.0625		
17	1093	-14.75	217.5625		
18	1019	59.25	3510.563		

Sum total 21565 X_m 1078.25

19

20

 $X^2 = 22.96$

7.25

11.25

52.5625

24755.75

Note: Accept χ^2 if between 8.91 and 32.8

1071

1067

Inst.# 125457					
	QC Daily Source				
Date	Result (cpm)	P/F			
4/28/2025	4397	Pass			
4/29/2025	4437	Pass			
4/30/2025	4329	Pass			
5/1/2025	4481	Pass			

Inst	:# 125457	Source Ser. #	Bkg
Initial So	urce Readings	Nuclide	Bkg
Date	Result (cpm)		
4/28/2025	4446	1	
4/28/2025	4407		
4/28/2025	4502		
4/28/2025	4396	Model 2221r#	125457
4/28/2025	4480	Ludlum 44-10 #	PR391728
4/28/2025	4374		
4/28/2025	4299]	
4/28/2025	4379]	
4/28/2025	4360]	
4/28/2025	4441]	
	Average]	
	4408]	

Inst.# 125457							
	QC Daily Source						
Date	Result (cpm)	P/F					
4/28/2025	35541	Pass					
4/29/2025	36758	Pass					
4/30/2025	35612	Pass					
5/1/2025	39721	Pass					

Inst	:.# 125457	Source Ser. #	1134
Initial So	urce Readings	Nuclide	Cs-137
Date	Result (cpm)		
4/28/2025	35359		
4/28/2025	35754		
4/28/2025	36479	Model 2221r#	125457
4/28/2025	35012	Ludlum 44-10 #	PR391728
4/28/2025	33187		_
4/28/2025	36081		
4/28/2025	37548		
4/28/2025	36861		
4/28/2025	36014		
4/28/2025	35920		
	Average		
	35822		

Inst.# 274087					
	QC Daily Source				
Date	Result (cpm)	P/F			
4/28/2025	50	Pass			
4/29/2025	45	Pass			
4/30/2025	40	Pass			
5/1/2025	40	Pass			

Inst	.# 274087	Source Ser. #	Bkg
Initial So	urce Readings	Nuclide	Bkg
Date	Result (cpm)		
4/28/2025	40		
4/28/2025	50		
4/28/2025	40	Model 12 #	274087
4/28/2025	40	Ludlum 44-9 #	PR112194
4/28/2025	50		
4/28/2025	40		
4/28/2025	45		
4/28/2025	50		
4/28/2025	45		
4/28/2025	40		
	Average		
	44		

	Inst.# 274087				
	QC Daily Source				
Date	Result (cpm)	P/F			
4/28/2025	1100	Pass			
4/29/2025	1200	Pass			
4/30/2025	1200	Pass			
5/1/2025	1100	Pass			

Inst	:.# 274087	Source Ser. #	7139-10
Initial So	urce Readings	Nuclide	Sr-90
Date	Result (cpm)		
4/28/2025	1100	1	
4/28/2025	1200		
4/28/2025	1000	Model 12 #	274087
4/28/2025	1200	Ludlum 44-9 #	PR112194
4/28/2025	1000		
4/28/2025	1200		
4/28/2025	1100		
4/28/2025	1000		
4/28/2025	1100]	
4/28/2025	1100]	
	Average]	
	1100]	

GSI Job No.: 10008



SITE INVESTIGATION COMPLETION REPORT Former Albany Landfill (Albany Bulb)

End of Buchanan Street Albany, CA

APPENDIX E

Incoming and Outgoing Radiation Survey

Loca	otion: EO	DMED ALE	A NIV I	ANDELLI	_ (ALBANY E	DIII D\ D\A\D#				I Cum rour				Cum ou T	/n.o.i			
	ation: FOI : Albany, (SANYI	LANDFILL	L (ALBANY E	BULB) RWP#		04282025-01		Survey	Albany-I	NC-001		Survey T	/pe: Incomino	1		pg. <u>1</u> of _1_
			_	0		,				•								
No.	Static	β	No.	Smears	β													
1	0	135	1	1	53							100	350					
2	0	139	2	0	44	100					L							
3	0	128	3	0	58		9 Bre				r				200			
4	3	123	4	0	42		10 Ca	b)						1				
5	1	116	5	0	48	VALUE					100			4	國			
6	0	134	6	0	51			1										
7	0	140	7	0	44	THE LEADING			4		1,			1-1				
8	0	127	8	0	48				1. 1.00	-63		1/2						
9	2	114	9	0	66	14	111	41	MAK		-	3	(555)	11				
10	0	124	10	0	44			3			LAT	D		Y.		(
11	> <	$\supset \subset$	11	> <	> <			2										
12	> <	$\supset <$	12	> <	$>\!\!<$	(1.1		1			The last				6			
13	$>\!\!<$	$\supset <$	13	$>\!\!<$	\times	J. A.		1	W>				آ ک	1				
14	><	$\supset <$	14	$>\!\!<$	\times		7 Inside						No.	5				
15	$\geq \leq$	$>\!\!<$	15	$>\!\!<$	\searrow		Bucket							1				
		DPM	/100cr	m²		8	STATE OF THE PARTY							4		r		
	Static		L	Smears							7/1-4		43.9.1	4.3/				
No.	α	β	No.	α	β						1	交				Š		
1	-12	25	1	6.1	38		11.74			アスもの	2 1/1							
2	-12	75	2	-0.7	-45							XX - 75	4167	1				
3	-12	-63	3	-0.7	84													
4	23	-125	4	-0.7	-64													
5	0	-213	5	-0.7	-8													
6	-12	13	6	-0.7	19													
7	-12	88	7	-0.7	-45					1	1	ı	ı					
8	-12	-75	8	-0.7	-8	Surveyed By:	Date:	Instrument	Serial #	α Eff.	β Eff.	α Bkg.	β Bkg	γ Bkg	Cal. Due			Key
9	12	-238	9	-0.7	158	Eric McCdonald	28-Apr-25	Model 2224-1	227246	0.0961	0.0700	,	122	NIA	12 100 00			
10	-12	-113	10	-0.7	-45			43-93	244549	0.0861	0.0798	1	133	NA	13-Jan-26			A/S Location
11	> <	$\supset <$	11	> <	> <			3030E	217611	0.1464	0.1081	0.1	48.9	NA	27-Jan-26		*_*	Boundary
12	> <	$\supset \subset$	12	> <	$\supset \subset$			43-10-1	232046	0.1404	0.1081	0.1	48.9	INA	21-Jan-20		0	Smear
13	> <	$\supset $		> <														Dose Rate/hr
14	\supset	\supset		\supset	$\supset \subset$												*	Direct Reading CPM/direct frisk
\dashv	$ \leftarrow ot$	*		\leftarrow	\sim					t								

Direct and smears taken from the same location.

Direct and smears are 1 minute counts.

Background taken metal

Serial Number: PTO1263

Reviewed By: B.Badaoui

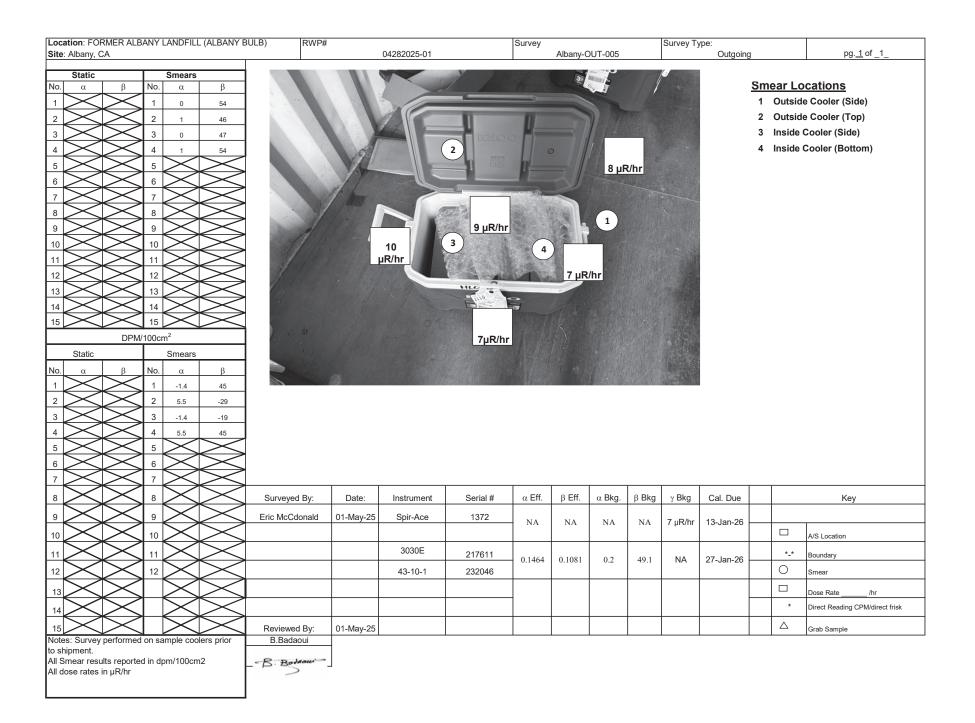
B. Bolaous

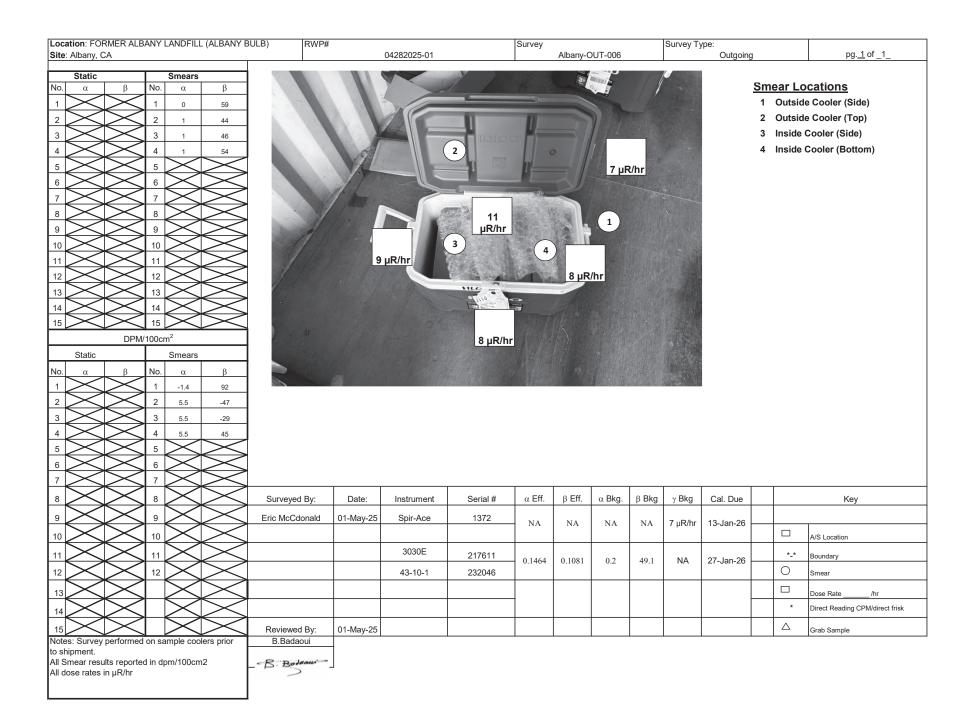
28-Apr-25

	RMER ALB CA	SANY LA	ANDFILL (ALBANY E	BULB) RWP#		04282025-01		Survey	Albany-O	UT-002		Survey T	/pe: Outgoing			pg. <u>1</u> of _1_
Static			Smears														
α	β	No.	α	β													
1	141	1	2	46							- The same	30					
0	131	2	0	55	MA					b							
0	116	3	0	39	and the	9 Bre								30.			
2	144	4	0	49		10 Ca	ıb)						1				
2	128	5	1	47	VERVS					1000			4-8				
1	133	6	0	51						1	A N	Till by		1000			
0	129	7	0	43	Tol.				-10-				≈1_ 01				
1	119	8	0	55		1	The Lan	1. 1 5 35			110	1	THE P				
1	123	9	1	49	1	711		THE		0	18	888	19,				
0	128	10	1	40		6 11	3							The second of			
$\geq \leq$	\geqslant	11	$\geq \downarrow$	$\geq \leq$			2		10					6			
$\geq \leq$	>>	12	$\geq \downarrow$	$\geq \leq$	6:1		1			J. Mary							
$\geq \leq$	>>	13	$\geq \leq$	$\geq \leq$					- Corne	(he		الم	5				
$ \ge $	>>	14	$\geq >$	$\geq \leq$		7 Inside				表			3				
\simeq		15	\geq	\sim	4 8	Bucket			× 10			10 12 -					
	DPM/	/100cm ²			8	Z. Market							4				
Static	Т		Smears														
α	β	No.	α	β				*						·			
12	150	1	12.3	-26			K Palls And A		1730		kg/ 1						
	25	2	4.4							13 14 1	J. 18 6		EXTREME DE				
0			-1.4	57								U-X OPPOSED ZOO	RES. NO EVOLUTIONS				
0	-163	3	-1.4	-91									ens ar or				
0 23	-163 188	3 4	-1.4	-91 2													
0 23 23	-163 188 -13	3 4 5	-1.4 -1.4 5.5	-91 2 -17													
0 23 23 12	-163 188 -13 50	3 4 5 6	-1.4 -1.4 5.5 -1.4	-91 2 -17 20													
0 23 23 12 0	-163 188 -13 50	3 4 5 6 7	-1.4 -1.4 5.5 -1.4 -1.4	-91 2 -17 20 -54	Supposed Pr	Dete	Instrument	Sprint #	۲#	0.5#	Dleg	0 Pkg	Diec	Cal Dus			May
0 23 23 12 0	-163 188 -13 50 0 -125	3 4 5 6 7 8	-1.4 -1.4 5.5 -1.4 -1.4	-91 2 -17 20 -54	Surveyed By:	Date:	Instrument	Serial#	α Eff.	β Eff.	α Bkg.	βBkg	γ Bkg	Cal. Due			Key
0 23 23 12 0	-163 188 -13 50	3 4 5 6 7 8	-1.4 -1.4 5.5 -1.4 -1.4	-91 2 -17 20 -54	Surveyed By: Eric McCdonald	Date: 30-Apr-25	Instrument Model 2224-1	Serial # 227246	α Eff.	β Eff.	α Bkg.	β Bkg 129	γ Bkg NA	Cal. Due			Key
0 23 23 12 0	-163 188 -13 50 0 -125	3 4 5 6 7 8	-1.4 -1.4 5.5 -1.4 -1.4	-91 2 -17 20 -54			Model 2224-1 43-93			·							Key A/S Location
0 23 23 12 0 12	-163 188 -13 50 0 -125	3 4 5 6 7 8	-1.4 -1.4 5.5 -1.4 -1.4 -1.4 5.5	-91 2 -17 20 -54 57			Model 2224-1	227246	0.0861	0.0798	0	129	NA	13-Jan-26 -		*_*	
0 23 23 12 0 12	-163 188 -13 50 0 -125	3 4 5 6 7 8 9	-1.4 -1.4 5.5 -1.4 -1.4 -1.4 5.5	-91 2 -17 20 -54 57			Model 2224-1 43-93	227246 244549		·							A/S Location
0 23 23 12 0 12	-163 188 -13 50 0 -125	3 4 5 6 7 8 9	-1.4 -1.4 5.5 -1.4 -1.4 -1.4 5.5	-91 2 -17 20 -54 57			Model 2224-1 43-93 3030E	227246 244549 217611	0.0861	0.0798	0	129	NA	13-Jan-26 -	(*_*	A/S Location Boundary Smear
0 23 23 12 0 12	-163 188 -13 50 0 -125	3 4 5 6 7 8 9	-1.4 -1.4 5.5 -1.4 -1.4 -1.4 5.5	-91 2 -17 20 -54 57			Model 2224-1 43-93 3030E	227246 244549 217611	0.0861	0.0798	0	129	NA	13-Jan-26 -	(* <u>-</u> *	A/S Location Boundary Smear Dose Rate/hr
0 23 23 12 0 12	-163 188 -13 50 0 -125	3 4 5 6 7 8 9	-1.4 -1.4 5.5 -1.4 -1.4 -1.4 5.5	-91 2 -17 20 -54 57			Model 2224-1 43-93 3030E	227246 244549 217611	0.0861	0.0798	0	129	NA	13-Jan-26 -	(* <u>.</u> *	A/S Location Boundary Smear
0 23 23 12 0 12 12 0	-163 188 -13 50 0 -125	3 4 5 6 7 8 9 10 11 12	-1.4 -1.4 -5.5 -1.4 -1.4 -1.4 -5.5 -5.5	-91 2 -17 20 -54 -57 2 -81	Eric McCdonald	30-Apr-25	Model 2224-1 43-93 3030E	227246 244549 217611	0.0861	0.0798	0	129	NA	13-Jan-26 -	(* <u>*</u> *	A/S Location Boundary Smear Dose Rate/hr Direct Reading CPM/direct frish

	CA)/((1 L/	HINDFILL	(ALBANY E	BULB) RWP#		04282025-01		Survey	Albany-II	NC-003		Survey Ty	/pe: Incoming		pg. <u>1</u> of _1_
Static		1 5	Smears											13		15
ο. α	β	No.	α	β	a											
1	135	1	0	42	•						1	KINSHIN MARKET		(HO) HO)		
3	135	2	0	39	4	1	6 0 1						-	110		
0	124	3	0	51	4	N. C.		200					- 19			3 1 5
1	136	4	1	44	3											
2	134	5	0	49	- CA	AVE	10	96			المات ساله				WW.	
1	154	6	0	48			10	a planty		120			1		and a	4
2	153	7	1	48	is off	1	2	1,8,6			a version	3		Shut 0		2/4
3	144	8	1	55								(4	100	T.	
4	123	9	0	40		9								5		Same of the same o
0	164	10	0	47								W W				
$\geq \leq$		11	$> \!\!< \!\!<$	$\geq \leq$											V	
$\geq \leq$		12	$> \!\!< \!\!<$	$\geq <$					1	100		/				
$\geq \leq$	\geq	13	$\geq \!\!\! <$	$>\!\!<$				A . J.	1 5			1 / Ly				
$\geq \leq$	\geq	14	$\geq \!\!\! <$	$>\!\!<$				Y T	R. T	7700		4				
$\geq \leq$	><	15	$> \!\!<$	><				CAUTION &	1	斯)。15	a)					
	DPM	/100cm ²	2					FERGUS					ll-ma			
Static			Smears					4(1))	-	1		Marie II	7	A CANADA		
α	β	No.	α	β						್ಗೌ	1 6		8			
	-50	1 1							Wiles	- (100	60000000			
-12	-50		-1.4	-66				100	PERMIT PRODUCTS	Water Company of the				-		
-12 12	-50	2	-1.4	-66 -93												
								1								
12	-50	2	-1.4	-93				H			6					
12 -23	-50 -188	2	-1.4 -1.4	-93 18							6					
12 -23 -12	-50 -188 -38	2 3 4 5 6	-1.4 -1.4 5.5	-93 18 -47							6					
12 -23 -12 0	-50 -188 -38 -63	2 3 4 5	-1.4 -1.4 5.5 -1.4	-93 18 -47 -1							6					
12 -23 -12 0 -12	-50 -188 -38 -63 188	2 3 4 5 6	-1.4 -1.4 5.5 -1.4 -1.4	-93 18 -47 -1	Surveyed By:	Date:	Instrument	Serial #	α Eff.	β Eff.	6 α Bkg.	βBkg	γ Bkg	Cal. Due		Key
12 -23 -12 0 -12	-50 -188 -38 -63 188 175	2 3 4 5 6 7	-1.4 -1.4 5.5 -1.4 -1.4 5.5	-93 18 -47 -1 -10	Surveyed By: Eric McCdonald	Date: 01-May-25		Serial # 227246		,		, ,				Key
12 -23 -12 0 -12 0	-50 -188 -38 -63 188 175 63	2 3 4 5 6 7 8	-1.4 -1.4 5.5 -1.4 -1.4 5.5 5.5	-93 18 -47 -1 -10 -10 55					α Eff 0.0861	β Eff. 0.0798	α Bkg.	β Bkg 139	γ Bkg NA	Cal. Due		Key A/S Location
12 -23 -12 0 -12 0 12	-50 -188 -38 -63 188 175 63 -201	2 3 4 5 6 7 8	-1.4 -1.4 5.5 -1.4 -1.4 5.5 5.5 -1.4	-93 18 -47 -1 -10 -10 -55			Model 2224-1	227246	0.0861	0.0798	2	139	NA	13-Jan-26 —		
12 -23 -12 0 -12 0 12	-50 -188 -38 -63 188 175 63 -201	2 3 4 5 6 7 8 9	-1.4 -1.4 5.5 -1.4 -1.4 5.5 5.5 -1.4	-93 18 -47 -1 -10 -10 -55			Model 2224-1 43-93	227246 244549		,		, ,				A/S Location
12 -23 -12 0 -12 0 12	-50 -188 -38 -63 188 175 63 -201	2 3 4 5 6 7 8 9	-1.4 -1.4 5.5 -1.4 -1.4 5.5 5.5 -1.4	-93 18 -47 -1 -10 -10 -55			Model 2224-1 43-93 3030E	227246 244549 217611	0.0861	0.0798	2	139	NA	13-Jan-26 —	*_*	A/S Location Boundary Smear
12 -23 -12 0 -12 0 12	-50 -188 -38 -63 188 175 63 -201	2 3 4 5 6 7 8 9	-1.4 -1.4 5.5 -1.4 -1.4 5.5 5.5 -1.4	-93 18 -47 -1 -10 -10 -55			Model 2224-1 43-93 3030E	227246 244549 217611	0.0861	0.0798	2	139	NA	13-Jan-26 —	*_*	A/S Location Boundary Smear Dose Rate/hr
12 -23 -12 0 -12 0 12	-50 -188 -38 -63 188 175 63 -201	2 3 4 5 6 7 8 9	-1.4 -1.4 5.5 -1.4 -1.4 5.5 5.5 -1.4	-93 18 -47 -1 -10 -10 -55			Model 2224-1 43-93 3030E 43-10-1	227246 244549 217611	0.0861	0.0798	2	139	NA	13-Jan-26 —	* <u>*</u> *	A/S Location Boundary Smear
12 -23 -12 0 -12 0 12 23 -23	-50 -188 -38 -63 188 175 63 -201	2 3 4 5 6 7 8 9 10	-1.4 -1.4 -1.4 -1.4 -1.4 -1.4 -1.4 -1.4	-93 18 -47 -1 -10 -10 55 -84 -19	Eric McCdonald	01-May-25	Model 2224-1 43-93 3030E 43-10-1	227246 244549 217611	0.0861	0.0798	2	139	NA	13-Jan-26 —	* <u>*</u> *	A/S Location Boundary Smear Dose Rate/hr Direct Reading CPM/direct frish

Location: FORMER ALBANY LANDFILL (ALBANY Site: Albany, CA					BULB) RWP#		04282025-01		Survey	Albany-C	OUT-004		Survey T	ype: Outgoing		pg. <u>1</u> of _1_
Otatia		I 0.			A		The second	erentific.				1	102		100	
Static	β	No.	mears α	β	A Comment					ANNINGTON	servicent environment	Peranerant				
1 3	139	1	1	51	710						1		10		10	
2 3	140	2	1	49		1				F. (1)	0 = 0	10.0			$I = I^{c}$	
3 3	116	3	0	49	F/6	1				-			A 145			
1 1	117	4	0	48	7	y wi				9 9	10010	100				
5 3	127	5	0	43	- All	MARINE	10	96	17 S					一	1	
3	127	6	0	50	A SOUTH		AVIION A	Bany			-					
, 0	131	7	1	50	12		2			3	4	·	Shut Off			
4	135	8	0	43												
) 2	135	9	0	37		9				N. I. W.		X (
0 1		10	2	47								5		N N		
	149	11		4/		THE LONDON	or a state of the					多三人	2011			
2	\Longrightarrow	12		>												
3	\Longrightarrow	13	\geq	>				2	-							
	\Longrightarrow	14	\geq	>					0	- 170°A	- $=$ i					
	\Longrightarrow	15	\geq	>				CAUTION	D			34	17			
	DPM/	100cm ²						THE COLUMN	,任意	11/16	17.1					
Static			mears						4	147	111			-		
ο. α	β	No.	α	β								5	0			
1 12	0	1	5.5	18					Viet Trans							
! 12	13	2	5.5	-1								1	2			
12	-288	3	-1.4	-47				1			1		7			
-12	-276	4	-1.4	-10					1	7	6	A				
12	-150	5	-1.4	-56							7/	9				
12	-150	6	-1.4	8								7				
-23	-100	7	5.5	8												
23	-50	8	-1.4	-56	Surveyed By:	Date:	Instrument	Serial #	α Eff.	β Eff.	α Bkg.	βBkg	γ Bkg	Cal. Due		Key
0	63	9	-1.4	-112	Eric McCdonald	01-May-25	Model 2224-1	227246	0.0861	0.0798	2	139	NA	13-Jan-26 –		
0 -12	125	10	12.3	-19			43-93	244549								A/S Location
	\geq	11	$\times\!\!\!<$	$>\!\!<$			3030E	217611	0.1464	0.1081	0.2	49.1	NA	27-Jan-26	*_*	Boundary
\geq	$\geq <$	12	$\times\!$	$>\!\!<$			43-10-1	232046	0.1704	0.1001	0.2	77.1	14/-3	21-0011-20	0	Smear
3	$\supset \subset$		\times	> <												Dose Rate/hr
4	\supset		\times	> <											*	Direct Reading CPM/direct frisk
5	$\supset <$		\times	><	Reviewed By:	01-May-25									Δ	Grab Sample
irect and sme				location.	B.Badaoui			•								•
irect and sme ackground ta erial Number	aken metal		ounts.		B. Boldow											





GSI Job No.: 10008



SITE INVESTIGATION COMPLETION REPORT Former Albany Landfill (Albany Bulb)

End of Buchanan Street Albany, CA

APPENDIX F

Radiological Air Monitoring Data

GENERAL/EFFLUENT AIRBORNE CONCENTRATION LOG (Rev 7)

Co	unting Inst	rument:	303	30E	Detector:	43-	10-1		Cal. Date:	1/27/2025										
		Serial #:	217611		Serial #: 232		232046 Cal. C		ue Date OK?	OK										
Radiation Type	Counting Efficiency (fraction)		Source Number	Original Source Activity (DPM)	Source Creation Date	T _{1/2} (yr)	Source Decayed Activity	Sample Count time (min)	Background Count time (min)		_	Alpha Isotope Concern		Limiti	ng Beta Iso Concern					
Alpha	0.1464	Th-230	7102-10	17,400	6/16/2010	7.54E+04	15698	10	10		Isotope	1	10CFR20 Occupational DAC /Effluent		10CFR20 Occupational DAC pe /Effluent					
Beta	0.1081	Sr-90	7139-10	8,170	4/4/2011	2.88E+01	17699	10	10		Ra226	9.00	E-13	Ra226	9.00	E-13				
Mover	onitored ar Serial #/Bar	Code	Air Sample Start Date/Time	Air Sample End Date/Time	Count Date	Run Time (min)	Flow Rate (Ipm)	Sample Gross Alpha (Counts)	Sample Gross Beta (Counts)	Alpha Bkg (cpm)	(cpm)	Filter Efficiency (fraction)	Sample Alpha Activity (dpm)	Sample Beta Activity (dpm)	Alpha Count Concen. (uCi/cc)	Beta Count Concen. (uCi/cc)	Fraction Occup or Effluent Limit Alpha	Fraction Occup or Effluent Limit Beta	Alpha MDA (uCi/cc)	Beta MDA (uCi/cc)
04292025	-LV Downwi	ind	4/29/25 0:00	4/29/25 0:00	05/01/25	360	60.0	3	512	0.20	49.10	1.00	1	19	2.71E-14	4.05E-13	0.03	0.45	1.32E-13	2.04E-12
04292025	-LV Upwind		4/29/25 0:00	4/29/25 0:00	05/01/25	365	60.0	7	522	0.20	49.10	1.00	5	29	9.98E-14	5.90E-13	0.11	0.66	1.31E-13	2.01E-12

GSI Job No.: 10008



SITE INVESTIGATION COMPLETION REPORT Former Albany Landfill (Albany Bulb)

End of Buchanan Street Albany, CA

APPENDIX G

SPIR-Ace Measurement Data

Activities are reported in picocuries. Bold values indicate a detection. Plaintext values indicate non-detect, in which case MDA is reported instead.

* Ambient background dose rate = 7 microR/hr

Dose Rate 238H early progeny 232Th progeny 226Ra

		Dose Rate		238U early progeny		232Th progeny		226Ra	orogeny	
ID	Date	(uR/hr)	40K	234Th	234Pa(m)	228Ac	208TI	214Bi		Cabrera Gamma Spectroscopist Comments
Location 1	4/28/2025	17	4.65E+06	1.06E+06	3.54E+07	1.47E+06	1.74E+06	7.06E+05	7.52E+05	N/A
Location 2	4/28/2025	11	4.72E+06	1.30E+08	3.54E+07	1.25E+06	1.15E+06	5.54E+05	5.62E+05	N/A
										Peaks are barely discernible, very large uncertainties on Bi &
Location 3	4/28/2025	17	4.75E+06	1.42E+08	3.86E+07	1.38E+06	1.40E+06	1.80E+05	9.41E+05	Pb activities
										Peaks are barely discernible, very large uncertainty on Pb
Location 4	4/28/2025	13	7.04E+06	1.17E+08	3.49E+07	1.31E+06	1.58E+06	5.67E+05	3.60E+05	activity
Location 5	4/28/2025	35	2.87E+06	5.42E+07	2.23E+07	8.03E+05	5.02E+05	4.54E+05	3.49E+05	N/A
Location 6	4/28/2025	15	4.85E+06	1.51E+08	3.63E+07	1.38E+06	1.28E+06	6.81E+05	6.38E+05	N/A
Location 7	4/28/2025	9	4.65E+06	1.03E+08	3.05E+07	1.25E+06	1.18E+06	4.43E+05	4.38E+05	N/A
Location 8	4/28/2025	8	4.68E+06	1.01E+08	3.22E+07	1.17E+06	1.07E+06	4.69E+05	4.91E+05	N/A
										Noticeably fewer counts in this spectrum than in most of the
Location 9	4/28/2025	7	9.34E+04	1.02E+06	3.54E+05	1.54E+04	1.66E+04	5.71E+03	4.94E+03	other spectraindoor vs outdoor?
										Peaks are barely discernible, very large uncertainties on Bi &
Location 10	4/28/2025	10	4.83E+06	1.06E+08	3.72E+07	1.30E+06	1.28E+06	5.40E+05	5.07E+05	Pb activities
										Noticeably fewer counts in this spectrum than in most of the
Location P2	4/28/2025	7	5.79E+04	1.10E+06	4.16E+05	1.49E+04	1.75E+04	5.54E+03	5.26E+03	other spectraindoor vs outdoor?
Loc 2 Re-shot	4/29/2025		3.30E+06	9.09E+07	2.22E+07	8.66E+05	9.49E+05	8.15E+04	6.58E+05	N/A
Loc 5 Re-shot	4/29/2025		3.36E+06	1.08E+08	2.97E+07	1.03E+06	9.18E+05	9.08E+05	7.20E+05	N/A
Loc 8 Re-shot	4/29/2025		3.58E+06	6.74E+07	2.22E+07	7.80E+05	9.10E+05	2.99E+05	2.96E+05	N/A
Loc 5 Removed Object	4/29/2025	41	3.76E+04	2.61E+05	1.73E+05	6.92E+03	7.47E+03	1.75E+04	1.71E+04	N/A
Loc 5 Non-removed Object	4/29/2025	77	6.14E+06	6.36E+07	2.12E+07	7.96E+05	8.51E+05	2.91E+05	2.57E+05	No really noticeable peaks other than 40K.
Loc 2 Re-shot	4/30/2025									Spectrum acquired for only 22 seconds, no usable data
Loc 2 - Center	4/30/2025		5.57E+06	6.76E+07	2.20E+07	8.15E+05	7.82E+05	3.11E+05		No really noticeable peaks other than 40K.
Loc 4 Re-shot	4/30/2025		8.40E+06	8.44E+07	2.43E+07	9.61E+05	9.51E+05	3.53E+05	3.64E+05	No really noticeable peaks other than 40K.
Loc 6 Re-shot	4/30/2025									Spectrum acquired for only 46 seconds, no usable data
Loc 7 Re-shot	4/30/2025		1.85E+07	6.71E+07	2 215+07	7.98E+05	7 055+05	3 105105		208Tl peak barely discernible, very large uncertainy on 208Tl activity. Prominent 40K peak visible in spectrum, but G2K Pk Srch failed to locate it, had to force peak locate for K.
	<u> </u>									
Loc 10 Re-shot	4/30/2025		7.74E+06		2.41E+07	8.30E+05				No really noticeable peaks other than 40K.
Loc 5 Rem Obj Front	4/30/2025		3.76E+04	2.61E+05	1.73E+05	6.92E+03	7.47E+03	1.75E+04		
Las E Davis Obi Davis	4/20/2025		2 205 . 24	2 505 . 25	4 675.05	C 445.00	F 725.02	4 005 . 04		G2K Pk Srch failed to locate 40K peak, had to force peak locate
Loc 5 Rem Obj Back	4/30/2025		2.28E+04				5.72E+03			
Loc 5 Rem Obj Left	4/30/2025		2.20E+04		1.90E+05					•
Loc 5 Rem Obj Right	4/30/2025		1.93E+04	2.44E+05	1.66E+05	6.06E+03	6.41E+03	1.16E+04	1.47E+04	N/A

Activities are reported in picocuries. Bold values indicate a detection. Plaintext values indicate non-detect, in which case MDA is reported instead.

* Ambient background dose rate = 7 microR/hr

Dose Rate 238U early progeny 232Th progeny 226Ra

		Dose Rate		238U early progeny		232Th progeny		226Ra j	progeny	
ID	Date	(uR/hr)	40K	234Th	234Pa(m)	228Ac	208TI	214Bi	214Pb	Cabrera Gamma Spectroscopist Comments
										As sent, loaded eff cal was "Groundpatch 30cm". I re-
										analyzed with "SmallObject_OC" to be consistent with the
Loc 5 Non-rem Obj Front	4/30/2025		3.38E+04	1.62E+05	9.27E+04	3.40E+03	4.64E+03	1.15E+03	8.73E+02	other "object" shots
Loc 5 Non-rem Obj Back	4/30/2025		2.25E+04	4.06E+05	2.22E+05	8.13E+03	6.74E+03	2.31E+04	2.89E+04	N/A
Loc 5 Non-rem Obj Left	4/30/2025		2.43E+04	4.00E+05	1.11E+05	2.67E+03	1.02E+04	3.21E+04	3.80E+04	N/A
Loc 5 Non-rem Obj Right	4/30/2025		2.43E+04	3.71E+05	2.17E+05	1.18E+04	1.23E+04	2.75E+04	3.22E+04	N/A
Location 1 - Center	5/1/2025		3.31E+06	9.82E+07	2.52E+07	1.01E+06	1.07E+06	4.89E+05	4.99E+05	N/A
Location 1 Recount	5/1/2025		3.19E+06	1.03E+08	2.87E+07	1.03E+06	9.01E+05	7.62E+05	7.29E+05	N/A
Location 3 - Center	5/1/2025		3.27E+06	1.01E+08	2.74E+07	1.05E+06	1.02E+06	4.76E+05	8.44E+05	N/A
Location 3 Recount	5/1/2025		3.21E+06	8.41E+07	2.20E+07	9.81E+05	9.60E+05	4.15E+05	9.06E+05	N/A
										As sent, loaded eff cal was "temp". I re-analyzed with
										"Groundpatch 30cm" to be consistent with the other Center
Location 4 - Center	5/1/2025		8.44E+06	8.27E+07	2.44E+07	9.13E+05	8.63E+05	3.64E+05	3.65E+05	shots
Location 6	5/1/2025		6.14E+06	7.61E+07	2.23E+07	8.94E+05	8.91E+05	3.40E+05	3.32E+05	No really noticeable peaks other than 40K.
										No really noticeable peaks other than 40K, very large
Location 9 Recount	5/1/2025		6.82E+06	6.58E+07	2.19E+07	8.11E+05	8.62E+05	3.67E+05	2.82E+05	uncertainty on the Bi activity.
Location P2 Recount	5/1/2025		7.03E+06	6.42E+07	2.24E+07	7.71E+05	8.21E+05	3.08E+05	3.16E+05	No really noticeable peaks other than 40K.

GSI Job No.: 10008



SITE INVESTIGATION COMPLETION REPORT Former Albany Landfill (Albany Bulb)

End of Buchanan Street Albany, CA

APPENDIX H

Soil Core Radiation Scan Log



Soil Core Scan Log 5/1/2025 Project: Former Albany Landfill Date/Time: Instr. Model / SN: Model 2221r/44-10 125457/PR391728 Project #: R6-0069.01 Sample ID: Location 9/25/2025 Cal Due: Total Depth: 25' bas Ambient Bkg: 20 cpm BB/EM Technician Init: Sleeve # Depth Range **Excavated Soil Scan Info** Bottom Top 0' - 4' 5320 4796 5184 5081 Core Scan Results (cpm): 4' - 8' 5097 4812 4954 5123 Core Scan Results (cpm): 3 8 - 12' 4727 5135 4704 4600 Core Scan Results (cpm): 12' - 16' 5197 4942 4885 4786 Core Scan Results (cpm): 16' - 20' 5 4622 5039 4994 5001 Core Scan Results (cpm): (Record any drilling or sampling issues, e.g., refusal, groundwater, poor recovery, etc. here) Comments: Ludlum 2221



Soil Core Scan Log Date/Time: 5/1/2025 Project: Former Albany Landfill Instr. Model / SN: Model 2221r/44-10 125457/PR391728 Project #: R6-0069.01 9/25/2025 Sample ID: Location Cal Due: Total Depth: 25 bgc cpm Ambient Bkg: Technician Init: BB/EM Page: **Excavated Soil Scan Info** Sleeve # Depth Range Bottom 5026 Core Scan Results (cpm): Core Scan Results (cpm): 3 Core Scan Results (cpm): 12-16 Core Scan Results (cpm): NA NA Core Scan Results (cpm): (Record any drilling or sampling issues, e.g., refusal, groundwater, poor recovery, etc. here) Comments: Simple was taken from the 211-21,51 interval.

GSI Job No.: 10008



SITE INVESTIGATION COMPLETION REPORT Former Albany Landfill (Albany Bulb)

End of Buchanan Street Albany, CA

APPENDIX I

Laboratory Analytical Report

PREPARED FOR

Attn: Mr. Kevin Almestad GSI Environmental Inc 2000 Powell Street Suite 820 Emeryville, California 94608

Generated 6/26/2025 2:43:30 PM Revision 1

JOB DESCRIPTION

10008 - Former Albany Landfill Site Inve

JOB NUMBER

570-229049-1

Eurofins Calscience 2841 Dow Avenue, Suite 100 Tustin CA 92780

Eurofins Calscience

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Calscience Project Manager.

Authorization

Generated 6/26/2025 2:43:30 PM Revision 1

Authorized for release by Janice Hsu, Project Manager I Janice.Hsu@et.eurofinsus.com (657)210-6359

1.

Eurofins Calscience is a laboratory within Eurofins Environment Testing Southwest, LLC, a company within Eurofins Environment Testing Group of Companies

Page 2 of 28

6/26/2025 (Rev. 1)

Table of Contents

Cover Page	1
Table of Contents	3
Definitions/Glossary	4
Case Narrative	5
Client Sample Results	7
QC Sample Results	13
QC Association Summary	15
Lab Chronicle	16
Certification Summary	18
Method Summary	19
Sample Summary	20
Chain of Custody	21
Racaint Chacklists	27

4

5

7

9

10

12

13

Definitions/Glossary

Client: GSI Environmental Inc Job ID: 570-229049-1

Project/Site: 10008 - Former Albany Landfill Site Inve

Qualifiers

1	₹	а	М	
	•	ч	ч	

Qualifier	Qualifier Description
F	Duplicate RPD exceeds the control limit
U	Result is less than the sample detection limit.

Glossary

Glossary	
Abbreviation	These commonly used abbreviations may or may not be present in this report.
*	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)

MDC Minimum Detectable Concentration (Radiochemistry)
MDL Method Detection Limit
ML Minimum Level (Dioxin)
MPN Most Probable Number
MQL Method Quantitation Limit

NC Not Calculated

ND Not Detected at the reporting limit (or MDL or EDL if shown)

 NEG
 Negative / Absent

 POS
 Positive / Present

 PQL
 Practical Quantitation Limit

PRES Presumptive
QC Quality Control

RER Relative Error Ratio (Radiochemistry)

RL Reporting Limit or Requested Limit (Radiochemistry)

RPD Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin)
TEQ Toxicity Equivalent Quotient (Dioxin)

TNTC Too Numerous To Count

Case Narrative

Client: GSI Environmental Inc Job ID: 570-229049-1

Project: 10008 - Former Albany Landfill Site Inve

Eurofins Calscience Job ID: 570-229049-1

> Job Narrative 570-229049-1

REVISION

The report being provided is a revision of the original report sent on 6/6/2025. The report (revision 1) is being revised to remove detection summary page that is not needed.

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers and/or narrative comments are included to explain any exceptions, if applicable.

- Matrix QC may not be reported if insufficient sample is provided or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

The samples were received on 5/2/2025 9:40 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 14.8°C.

Gamma Spectroscopy

Method GA 01 R Ra: Gamma prep batch 160-716958:

The replicate precision for Ac-228/Ra-228/Th-232 does not meet QC criteria. This appears to be random in nature, and limited deviations such as this are statistically expected when larger analyte lists are reported. Such excursions are often caused by fluctuations in Compton background, force-fitting of peaks that are not found by the software peak-search algorithm, and inclusion of inferior peak results by the software in weighted averages. The laboratory SOP allows for such statistical exceedances. (570-229049-A-1-C DU)

Method GA 01 R Ra: Gamma prep batch 160-716958:

Many isotopes requested by gamma spectrometry analysis do not have any gamma emissions, the gamma emissions they do have are very poor, and/or are reported by assuming secular equilibrium with a longer-lived parent (or vice-versa). For example, Th-232 (which does not have a good gamma-ray) is often reported assuming the shorter-lived Ra-228 daughter is in equilibrium with the Th-232 parent. Or, Pb-214 and/or Bi-214, daughters of potentially volatile Rn-222 in the Ra-226 decay chain, may not be in equilibrium with the parent unless sufficient time has been allowed since the break in equilibrium (e.g. 21 days in the case of Ra-226-supported ingrowth). The client should ensure that such inference is acceptable for their sample based upon process knowledge. The following assumptions were made for this report:

Inferred from	Reported to Analyte
Th-234	Pa-234
Th-234	U-238
Pb-210	Po-210
Pb-210	Bi-210
Cs-137	Ba-137m
Pb-212	Po-216
Xe-131m	Xe-131
Sb-125	Te-125m
Ag-108m	Ag-108
Rh-106	Ru-106
Pb-212	Th-228
Pb-212	Ra-224
U-235	Th-231
Ac-228	Th-232
Ac-228	Ra-228
Th-227	Ra-223

Eurofins Calscience

Page 5 of 28

Case Narrative

Client: GSI Environmental Inc Job ID: 570-229049-1

Project: 10008 - Former Albany Landfill Site Inve

Job ID: 570-229049-1 (Continued)

Eurofins Calscience

Ac-227
Bi-211
Pb-211
Ra-226

L8-TP-0-1-COMP (570-229049-1), L8-TP-2-3-COMP (570-229049-2), L8-TP-4-5-COMP (570-229049-3), L2-TP-0-1-COMP (570-229049-4), L2-TP-2-3-COMP (570-229049-5), L2-TP-4-5-COMP (570-229049-6), L5-TP-0-1-COMP (570-229049-7), L5-TP-4-5-COMP (570-229049-9), P2-SB-21 (570-229049-10), (LCS 160-716958/2-A), (MB 160-716958/1-A) and (570-229049-A-1-C DU)

Method GA_01_R_Ra: Gamma Batch 716958

Many isotopes requested by gamma spectrometry analysis do not have any gamma emissions, the gamma emissions they do have are very poor, and/or are reported by assuming secular equilibrium with a longer-lived parent (or vice-versa). For example, Th-232 (which does not have a good gamma-ray) is often reported assuming the shorter-lived Ra-228 daughter is in equilibrium with the Th-232 parent. Or, Pb-214 and/or Bi-214, daughters of potentially volatile Rn-222 in the Ra-226 decay chain, may not be in equilibrium with the parent unless sufficient time has been allowed since the break in equilibrium (e.g. 21 days in the case of Ra-226-supported ingrowth). The client should ensure that such inference is acceptable for their sample based upon process knowledge. The following assumptions were made for this report:

Inferred From Th-234 Th-234 Pb-210 Pb-210 Cs-137 Pb-212 Xe-131m Sb-125 Ag-208m Rh-106 Pb-212	Reported as Analyte Pa-234 U-238 Po-210 Bi-210 Ba-137m Po-216 Xe-131 Te-125m Ag-108 Ru-106 Th-228
Pb-212	Ra-224
U-235	Th-231
Ac-228	Th-232
Ac-228	Ra-228
Th-227	Ra-223
Th-227	Ac-227
Th-227	Bi-211
Th-227	Pb-211
Bi-214	Ra-226

L5-TP-2-3-COMP (570-229049-8)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Eurofins Calscience

2

5

4

5

8

9

1 4

12

13

Client Sample Results

Client: GSI Environmental Inc Job ID: 570-229049-1

Project/Site: 10008 - Former Albany Landfill Site Inve

Method: DOE GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Client Sample ID: L8-TP-0-1-COMP

Date Collected: 04/29/25 08:43

Lab Sample ID: 570-229049-1

Matrix: Solid

Date Received: 05/02/25 09:40

			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium-227	-0.166	U	0.685	0.685		1.11	pCi/g	05/10/25 11:56	06/02/25 14:09	1
Actinium 228	0.145	U	0.0651	0.0666		0.696	pCi/g	05/10/25 11:56	06/02/25 14:09	1
Bismuth-212	0.323	U	0.594	0.595		1.01	pCi/g	05/10/25 11:56	06/02/25 14:09	1
Bismuth-214	0.609		0.168	0.178		0.178	pCi/g	05/10/25 11:56	06/02/25 14:09	1
Lead-210	-0.747	U	1.93	1.93		3.36	pCi/g	05/10/25 11:56	06/02/25 14:09	1
Lead-212	0.591		0.119	0.133		0.127	pCi/g	05/10/25 11:56	06/02/25 14:09	1
Lead-214	0.825		0.185	0.203		0.186	pCi/g	05/10/25 11:56	06/02/25 14:09	1
Potassium-40	10.9		1.69	2.00		0.894	pCi/g	05/10/25 11:56	06/02/25 14:09	1
Protactinium-231	-1.20	U	4.15	4.15		6.95	pCi/g	05/10/25 11:56	06/02/25 14:09	1
Radium-226	0.609		0.168	0.178	1.00	0.178	pCi/g	05/10/25 11:56	06/02/25 14:09	1
Radium-228	0.145	U	0.0651	0.0666		0.696	pCi/g	05/10/25 11:56	06/02/25 14:09	1
Thorium-232	0.145	U	0.0651	0.0666		0.696	pCi/g	05/10/25 11:56	06/02/25 14:09	1
Thorium-234	-0.527	U	1.13	1.14		1.95	pCi/g	05/10/25 11:56	06/02/25 14:09	1
Thallium-208	0.215		0.0740	0.0770		0.0791	pCi/g	05/10/25 11:56	06/02/25 14:09	1
Uranium-235	0.000	U	0.182	0.182		1.17	pCi/g	05/10/25 11:56	06/02/25 14:09	1
Uranium-238	-0.527	U	1.13	1.14		1.95	pCi/g	05/10/25 11:56	06/02/25 14:09	1
Cesium-137	-0.0560	U	0.105	0.105		0.176	pCi/g	05/10/25 11:56	06/02/25 14:09	1
Cobalt-60	0.00151	U	0.00248	0.00248		0.120	pCi/g	05/10/25 11:56	06/02/25 14:09	1
Europium-152	0.0956	U	0.221	0.221		0.264	pCi/g	05/10/25 11:56	06/02/25 14:09	1
Europium-154	0.117	U	0.166	0.166		0.159	pCi/g	05/10/25 11:56	06/02/25 14:09	1
Europium-155	0.00929	U	0.0898	0.0898		0.458	pCi/g	05/10/25 11:56	06/02/25 14:09	1

Client Sample ID: L8-TP-2-3-COMP

Lab Sample ID: 570-229049-2

Date Collected: 04/29/25 09:27

Date Received: 05/02/25 09:40

Matrix: Solid

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium-227	-0.0164	U	0.0715	0.0715		0.806	pCi/g	05/10/25 11:56	06/02/25 15:03	1
Actinium 228	0.494		0.151	0.158		0.160	pCi/g	05/10/25 11:56	06/02/25 15:03	1
Bismuth-212	0.223	U	0.415	0.416		0.704	pCi/g	05/10/25 11:56	06/02/25 15:03	1
Bismuth-214	0.511		0.129	0.138		0.125	pCi/g	05/10/25 11:56	06/02/25 15:03	1
Lead-210	0.880	U	1.14	1.15		1.76	pCi/g	05/10/25 11:56	06/02/25 15:03	1
Lead-212	0.564		0.101	0.116		0.106	pCi/g	05/10/25 11:56	06/02/25 15:03	1
Lead-214	0.502		0.121	0.131		0.152	pCi/g	05/10/25 11:56	06/02/25 15:03	1
Potassium-40	11.8		1.54	1.93		0.922	pCi/g	05/10/25 11:56	06/02/25 15:03	1
Protactinium-231	0.0933	U	1.19	1.19		4.71	pCi/g	05/10/25 11:56	06/02/25 15:03	1
Radium-226	0.511		0.129	0.138	1.00	0.125	pCi/g	05/10/25 11:56	06/02/25 15:03	1
Radium-228	0.494		0.151	0.158		0.160	pCi/g	05/10/25 11:56	06/02/25 15:03	1
Thorium-232	0.494		0.151	0.158		0.160	pCi/g	05/10/25 11:56	06/02/25 15:03	1
Thorium-234	0.648	U	0.476	0.481		0.702	pCi/g	05/10/25 11:56	06/02/25 15:03	1
Thallium-208	0.225		0.0709	0.0743		0.0755	pCi/g	05/10/25 11:56	06/02/25 15:03	1
Uranium-235	0.0571	U	0.398	0.398		0.674	pCi/g	05/10/25 11:56	06/02/25 15:03	1
Uranium-238	0.648	U	0.476	0.481		0.702	pCi/g	05/10/25 11:56	06/02/25 15:03	1
Cesium-137	0.00446	U	0.0492	0.0492		0.0882	pCi/g	05/10/25 11:56	06/02/25 15:03	1
Cobalt-60	0.0400	U	0.0394	0.0396		0.0666	pCi/g	05/10/25 11:56	06/02/25 15:03	1
Europium-152	0.0933	U	0.192	0.192		0.174	pCi/g	05/10/25 11:56	06/02/25 15:03	1
Europium-154	-0.0222	U	0.0747	0.0747		0.127	pCi/g	05/10/25 11:56	06/02/25 15:03	1

Eurofins Calscience

_

4

6

8

10

12

13

6/26/2025 (Rev. 1)

Job ID: 570-229049-1

Method: DOE GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

Client Sample ID: L8-TP-2-3-COMP

Lab Sample ID: 570-229049-2

Date Collected: 04/29/25 09:27

Date Received: 05/02/25 09:40

Matrix: Solid

Count Total Uncert. Uncert. Analyte Result Qualifier $(2\sigma + / -)$ $(2\sigma + / -)$ RL MDC Unit Prepared Analyzed Dil Fac Europium-155 0.0559 U 0.208 0.209 0.350 pCi/g 05/10/25 11:56 06/02/25 15:03

Client Sample ID: L8-TP-4-5-COMP

Lab Sample ID: 570-229049-3

Date Collected: 04/29/25 10:00 Matrix: Solid

Date Received: 05/02/25 09:40

			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium-227	0.145	U	0.324	0.324		0.901	pCi/g	05/10/25 11:56	06/02/25 15:04	1
Actinium 228	0.518		0.220	0.226		0.378	pCi/g	05/10/25 11:56	06/02/25 15:04	1
Bismuth-212	0.285	U	0.583	0.584		0.999	pCi/g	05/10/25 11:56	06/02/25 15:04	1
Bismuth-214	0.391		0.146	0.151		0.175	pCi/g	05/10/25 11:56	06/02/25 15:04	1
Lead-210	0.535	U	1.48	1.48		2.34	pCi/g	05/10/25 11:56	06/02/25 15:04	1
Lead-212	0.511		0.100	0.112		0.0810	pCi/g	05/10/25 11:56	06/02/25 15:04	1
Lead-214	0.497		0.155	0.162		0.171	pCi/g	05/10/25 11:56	06/02/25 15:04	1
Potassium-40	9.04		1.71	1.93		0.740	pCi/g	05/10/25 11:56	06/02/25 15:04	1
Protactinium-231	-0.840	U	3.72	3.72		6.27	pCi/g	05/10/25 11:56	06/02/25 15:04	1
Radium-226	0.391		0.146	0.151	1.00	0.175	pCi/g	05/10/25 11:56	06/02/25 15:04	1
Radium-228	0.518		0.220	0.226		0.378	pCi/g	05/10/25 11:56	06/02/25 15:04	1
Thorium-232	0.518		0.220	0.226		0.378	pCi/g	05/10/25 11:56	06/02/25 15:04	1
Thorium-234	0.545	U	0.580	0.583		0.847	pCi/g	05/10/25 11:56	06/02/25 15:04	1
Thallium-208	0.224		0.0717	0.0751		0.0601	pCi/g	05/10/25 11:56	06/02/25 15:04	1
Uranium-235	0.102	U	0.322	0.323		0.644	pCi/g	05/10/25 11:56	06/02/25 15:04	1
Uranium-238	0.545	U	0.580	0.583		0.847	pCi/g	05/10/25 11:56	06/02/25 15:04	1
Cesium-137	0.0181	U	0.0818	0.0818		0.144	pCi/g	05/10/25 11:56	06/02/25 15:04	1
Cobalt-60	0.000723	U	0.00143	0.00143		0.129	pCi/g	05/10/25 11:56	06/02/25 15:04	1
Europium-152	0.0214	U	0.140	0.140		0.193	pCi/g	05/10/25 11:56	06/02/25 15:04	1
Europium-154	0.0147	U	0.0372	0.0372		0.127	pCi/g	05/10/25 11:56	06/02/25 15:04	1
Europium-155	0.0312	U	0.108	0.108		0.296	pCi/g	05/10/25 11:56	06/02/25 15:04	1

Client Sample ID: L2-TP-0-1-COMP

Date Collected: 04/29/25 11:15

Lab Sample ID: 570-229049-4

Matrix: Solid

Date Received: 05/02/25 09:40

			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium-227	-0.0627	U	0.616	0.616		0.948	pCi/g	05/10/25 11:56	06/02/25 16:42	1
Actinium 228	0.879		0.193	0.211		0.200	pCi/g	05/10/25 11:56	06/02/25 16:42	1
Bismuth-212	0.630		0.341	0.347		0.433	pCi/g	05/10/25 11:56	06/02/25 16:42	1
Bismuth-214	1.30		0.179	0.220		0.139	pCi/g	05/10/25 11:56	06/02/25 16:42	1
Lead-210	1.98		1.05	1.08		1.45	pCi/g	05/10/25 11:56	06/02/25 16:42	1
Lead-212	0.840		0.116	0.142		0.121	pCi/g	05/10/25 11:56	06/02/25 16:42	1
Lead-214	1.69		0.159	0.232		0.159	pCi/g	05/10/25 11:56	06/02/25 16:42	1
Potassium-40	8.44		1.23	1.49		0.790	pCi/g	05/10/25 11:56	06/02/25 16:42	1
Protactinium-231	-0.724	U	3.48	3.49		5.83	pCi/g	05/10/25 11:56	06/02/25 16:42	1
Radium-226	1.30		0.179	0.220	1.00	0.139	pCi/g	05/10/25 11:56	06/02/25 16:42	1
Radium-228	0.879		0.193	0.211		0.200	pCi/g	05/10/25 11:56	06/02/25 16:42	1
Thorium-232	0.879		0.193	0.211		0.200	pCi/g	05/10/25 11:56	06/02/25 16:42	1

Eurofins Calscience

4

5

Q

9

11

12

Client Sample ID: L2-TP-0-1-COMP Lab Sample ID: 570-229049-4

Date Collected: 04/29/25 11:15 **Matrix: Solid** Date Received: 05/02/25 09:40

			Count	Total					
			Uncert.	Uncert.					
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL MI	C Unit	Prepared	Analyzed	Dil Fac
Thorium-234	1.38		0.553	0.573	0.7	75 pCi/g	05/10/25 11:56	06/02/25 16:42	1
Thallium-208	0.268		0.0684	0.0734	0.06	59 pCi/g	05/10/25 11:56	06/02/25 16:42	1
Uranium-235	0.103	U	0.255	0.255	1.	01 pCi/g	05/10/25 11:56	06/02/25 16:42	1
Uranium-238	1.38		0.553	0.573	0.7	75 pCi/g	05/10/25 11:56	06/02/25 16:42	1
Cesium-137	0.0426	U	0.0322	0.0325	0.04	11 pCi/g	05/10/25 11:56	06/02/25 16:42	1
Cobalt-60	0.0469	U	0.0391	0.0393	0.07	57 pCi/g	05/10/25 11:56	06/02/25 16:42	1
Europium-152	0.154	U	0.202	0.203	0.2	02 pCi/g	05/10/25 11:56	06/02/25 16:42	1
Europium-154	0.0209	U	0.0810	0.0810	0.1	37 pCi/g	05/10/25 11:56	06/02/25 16:42	1
Europium-155	0.0243	U	0.185	0.185	0.4	19 pCi/q	05/10/25 11:56	06/02/25 16:42	1

Client Sample ID: L2-TP-2-3-COMP Lab Sample ID: 570-229049-5

Date Collected: 04/29/25 11:28 **Matrix: Solid**

Date Received: 05/02/25 09:40

			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium-227	0.0881	U	0.354	0.354		0.709	pCi/g	05/10/25 11:56	06/02/25 15:02	1
Actinium 228	0.668		0.207	0.217		0.231	pCi/g	05/10/25 11:56	06/02/25 15:02	1
Bismuth-212	0.0165	U	0.466	0.466		0.818	pCi/g	05/10/25 11:56	06/02/25 15:02	1
Bismuth-214	0.573		0.123	0.135		0.110	pCi/g	05/10/25 11:56	06/02/25 15:02	1
Lead-210	0.168	U	1.33	1.33		2.27	pCi/g	05/10/25 11:56	06/02/25 15:02	1
Lead-212	0.618		0.0933	0.112		0.0911	pCi/g	05/10/25 11:56	06/02/25 15:02	1
Lead-214	0.671		0.104	0.123		0.115	pCi/g	05/10/25 11:56	06/02/25 15:02	1
Potassium-40	10.5		1.30	1.66		0.620	pCi/g	05/10/25 11:56	06/02/25 15:02	1
Protactinium-231	-0.00196	U	2.55	2.55		4.32	pCi/g	05/10/25 11:56	06/02/25 15:02	1
Radium-226	0.573		0.123	0.135	1.00	0.110	pCi/g	05/10/25 11:56	06/02/25 15:02	1
Radium-228	0.668		0.207	0.217		0.231	pCi/g	05/10/25 11:56	06/02/25 15:02	1
Thorium-232	0.668		0.207	0.217		0.231	pCi/g	05/10/25 11:56	06/02/25 15:02	1
Thorium-234	0.785		0.412	0.421		0.566	pCi/g	05/10/25 11:56	06/02/25 15:02	1
Thallium-208	0.191		0.0555	0.0586		0.0572	pCi/g	05/10/25 11:56	06/02/25 15:02	1
Uranium-235	0.126	U	0.454	0.454		0.819	pCi/g	05/10/25 11:56	06/02/25 15:02	1
Uranium-238	0.785		0.412	0.421		0.566	pCi/g	05/10/25 11:56	06/02/25 15:02	1
Cesium-137	-0.0285	U	0.0682	0.0682		0.0918	pCi/g	05/10/25 11:56	06/02/25 15:02	1
Cobalt-60	0.0225	U	0.0403	0.0403		0.0791	pCi/g	05/10/25 11:56	06/02/25 15:02	1
Europium-152	0.0552	U	0.131	0.131		0.160	pCi/g	05/10/25 11:56	06/02/25 15:02	1
Europium-154	0.0254	U	0.0909	0.0909		0.112	pCi/g	05/10/25 11:56	06/02/25 15:02	1
Europium-155	0.0263	U	0.0850	0.0850		0.294	pCi/g	05/10/25 11:56	06/02/25 15:02	1

Client Sample ID: L2-TP-4-5-COMP Lab Sample ID: 570-229049-6 Date Collected: 04/29/25 11:50 **Matrix: Solid**

Date Received: 05/02/25 09:40

			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium-227	-0.142	U	0.533	0.533		0.857	pCi/g	05/10/25 11:56	06/02/25 15:03	1
Actinium 228	0.457		0.152	0.159		0.212	pCi/g	05/10/25 11:56	06/02/25 15:03	1
Bismuth-212	0.136	U	0.512	0.512		0.888	pCi/g	05/10/25 11:56	06/02/25 15:03	1
Bismuth-214	0.524		0.158	0.167		0.171	pCi/g	05/10/25 11:56	06/02/25 15:03	1

Eurofins Calscience

6/26/2025 (Rev. 1)

Client: GSI Environmental Inc Job ID: 570-229049-1

Project/Site: 10008 - Former Albany Landfill Site Inve

Method: DOE GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

Client Sample ID: L2-TP-4-5-COMP Date Collected: 04/29/25 11:50 Date Received: 05/02/25 09:40 Lab Sample ID: 570-229049-6

Matrix: Solid

			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Lead-210	0.315	U	1.46	1.46		2.33	pCi/g	05/10/25 11:56	06/02/25 15:03	1
Lead-212	0.618		0.105	0.122		0.102	pCi/g	05/10/25 11:56	06/02/25 15:03	1
Lead-214	0.558		0.119	0.131		0.142	pCi/g	05/10/25 11:56	06/02/25 15:03	1
Potassium-40	8.87		1.39	1.64		0.895	pCi/g	05/10/25 11:56	06/02/25 15:03	1
Protactinium-231	0.563	U	2.03	2.03		4.55	pCi/g	05/10/25 11:56	06/02/25 15:03	1
Radium-226	0.524		0.158	0.167	1.00	0.171	pCi/g	05/10/25 11:56	06/02/25 15:03	1
Radium-228	0.457		0.152	0.159		0.212	pCi/g	05/10/25 11:56	06/02/25 15:03	1
Thorium-232	0.457		0.152	0.159		0.212	pCi/g	05/10/25 11:56	06/02/25 15:03	1
Thorium-234	1.51		0.619	0.641		0.822	pCi/g	05/10/25 11:56	06/02/25 15:03	1
Thallium-208	0.208		0.0552	0.0589		0.0451	pCi/g	05/10/25 11:56	06/02/25 15:03	1
Uranium-235	0.0566	U	0.365	0.365		0.622	pCi/g	05/10/25 11:56	06/02/25 15:03	1
Uranium-238	1.51		0.619	0.641		0.822	pCi/g	05/10/25 11:56	06/02/25 15:03	1
Cesium-137	-0.00861	U	0.0681	0.0681		0.119	pCi/g	05/10/25 11:56	06/02/25 15:03	1
Cobalt-60	0.0169	U	0.0287	0.0288		0.0467	pCi/g	05/10/25 11:56	06/02/25 15:03	1
Europium-152	0.104	U	0.186	0.186		0.199	pCi/g	05/10/25 11:56	06/02/25 15:03	1
Europium-154	0.0473	U	0.0793	0.0795		0.129	pCi/g	05/10/25 11:56	06/02/25 15:03	1

0.199

Total

0.339 pCi/g

0.158

0.422 pCi/g

pCi/g

Client Sample ID: L5-TP-0-1-COMP L
Date Collected: 04/29/25 13:37

Count

0.0949

0.216

0.199

Date Received: 05/02/25 09:40

-0.0143 U

0.0454 U

0.0657 U

Europium-155

Europium-154

Europium-155

Lab Sample ID: 570-229049-7 Matrix: Solid

06/02/25 15:03

05/10/25 11:56

05/10/25 11:56

05/10/25 11:56

Uncert. Uncert. Analyte Result Qualifier $(2\sigma + / -)$ $(2\sigma + / -)$ RL MDC Unit Prepared Analyzed Dil Fac Actinium-227 0.107 U 05/10/25 11:56 06/02/25 15:04 0.181 0.181 1.02 pCi/g 06/02/25 15:04 **Actinium 228** 1.01 0.199 0.221 0.255 pCi/g 05/10/25 11:56 0.529 Bismuth-212 0.286 0.529 0.887 pCi/g 05/10/25 11:56 06/02/25 15:04 0.218 06/02/25 15:04 Bismuth-214 2.43 0.325 0.162 pCi/g 05/10/25 11:56 06/02/25 15:04 Lead-210 1.58 1.04 1.06 1.62 pCi/g 05/10/25 11:56 Lead-212 0 122 0 167 0.114 pCi/g 05/10/25 11:56 06/02/25 15:04 1.16 Lead-214 0.192 0.326 0.169 pCi/g 05/10/25 11:56 06/02/25 15:04 2.65 0.839 0.934 0.617 pCi/g 05/10/25 11:56 06/02/25 15:04 Potassium-40 4.14 Protactinium-231 -0.896 3.93 3.93 6.56 pCi/g 05/10/25 11:56 06/02/25 15:04 Radium-226 2.43 0.218 0.325 1.00 0.162 pCi/g 05/10/25 11:56 06/02/25 15:04 Radium-228 1.01 0.199 0.221 0.255 pCi/g 05/10/25 11:56 06/02/25 15:04 Thorium-232 1.01 0.199 0.221 0.255 pCi/g 05/10/25 11:56 06/02/25 15:04 0.582 Thorium-234 1.57 0.556 0.937 pCi/g 05/10/25 11:56 06/02/25 15:04 Thallium-208 0.401 0.0785 0.0880 0.0766 pCi/g 05/10/25 11:56 06/02/25 15:04 0.198 U 0.323 0.323 Uranium-235 0.343 pCi/g 05/10/25 11:56 06/02/25 15:04 0.556 0.582 05/10/25 11:56 06/02/25 15:04 Uranium-238 1.57 0.937 pCi/g Cesium-137 -0.0244 U 0.0688 0.0688 0.108 pCi/g 05/10/25 11:56 06/02/25 15:04 Cobalt-60 U 0.0310 0.0310 0.0879 pCi/g 05/10/25 11:56 06/02/25 15:04 0.0228 U 0.310 Europium-152 0 142 0.310 0.252 pCi/g 05/10/25 11:56 06/02/25 15:04

Eurofins Calscience

06/02/25 15:04

06/02/25 15:04

0.0950

0.216

2

3

6

8

9

11

12

13

Client Sample Results

Client: GSI Environmental Inc Job ID: 570-229049-1

Project/Site: 10008 - Former Albany Landfill Site Inve

Method: DOE GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Client Sample ID: L5-TP-2-3-COMP

Date Collected: 04/29/25 14:20

Lab Sample ID: 570-229049-8

Matrix: Solid

Date Received: 05/02/25 09:40

			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium-227	-0.308	U	0.287	0.289		1.06	pCi/g	05/10/25 11:56	06/03/25 14:49	1
Actinium 228	0.741		0.185	0.198		0.253	pCi/g	05/10/25 11:56	06/03/25 14:49	1
Bismuth-212	0.0859	U	0.545	0.545		0.951	pCi/g	05/10/25 11:56	06/03/25 14:49	1
Bismuth-214	1.28		0.180	0.220		0.118	pCi/g	05/10/25 11:56	06/03/25 14:49	1
Lead-210	1.39	U	1.43	1.44		2.09	pCi/g	05/10/25 11:56	06/03/25 14:49	1
Lead-212	0.759		0.117	0.139		0.115	pCi/g	05/10/25 11:56	06/03/25 14:49	1
Lead-214	1.18		0.169	0.206		0.147	pCi/g	05/10/25 11:56	06/03/25 14:49	1
Potassium-40	9.02		1.37	1.63		0.809	pCi/g	05/10/25 11:56	06/03/25 14:49	1
Protactinium-231	0.000	U	0.856	0.856		6.15	pCi/g	05/10/25 11:56	06/03/25 14:49	1
Radium-226	1.28		0.180	0.220	1.00	0.118	pCi/g	05/10/25 11:56	06/03/25 14:49	1
Radium-228	0.741		0.185	0.198		0.253	pCi/g	05/10/25 11:56	06/03/25 14:49	1
Thorium-232	0.741		0.185	0.198		0.253	pCi/g	05/10/25 11:56	06/03/25 14:49	1
Thorium-234	1.51		0.615	0.636		0.953	pCi/g	05/10/25 11:56	06/03/25 14:49	1
Thallium-208	0.257		0.0729	0.0772		0.0795	pCi/g	05/10/25 11:56	06/03/25 14:49	1
Uranium-235	0.107	U	0.300	0.300		0.762	pCi/g	05/10/25 11:56	06/03/25 14:49	1
Uranium-238	1.51		0.615	0.636		0.953	pCi/g	05/10/25 11:56	06/03/25 14:49	1
Cesium-137	-0.0206	U	0.0856	0.0857		0.147	pCi/g	05/10/25 11:56	06/03/25 14:49	1
Cobalt-60	-0.0441	U	0.0518	0.0519		0.136	pCi/g	05/10/25 11:56	06/03/25 14:49	1
Europium-152	0.152	U	0.235	0.236		0.231	pCi/g	05/10/25 11:56	06/03/25 14:49	1
Europium-154	0.0555	U	0.111	0.111		0.168	pCi/g	05/10/25 11:56	06/03/25 14:49	1
Europium-155	-0.0994	U	0.179	0.179		0.526	pCi/g	05/10/25 11:56	06/03/25 14:49	1

Client Sample ID: L5-TP-4-5-COMP

Lab Sample ID: 570-229049-9

Date On Part of the Company of th

Date Collected: 04/29/25 14:50

Date Received: 05/02/25 09:40

Matrix: Solid

			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium-227	-0.164	U	0.659	0.659		0.923	pCi/g	05/10/25 11:56	06/02/25 16:35	1
Actinium 228	0.558		0.163	0.172		0.264	pCi/g	05/10/25 11:56	06/02/25 16:35	1
Bismuth-212	0.000	U	0.356	0.356		0.848	pCi/g	05/10/25 11:56	06/02/25 16:35	1
Bismuth-214	0.701		0.142	0.158		0.111	pCi/g	05/10/25 11:56	06/02/25 16:35	1
Lead-210	1.09	U	1.30	1.30		1.98	pCi/g	05/10/25 11:56	06/02/25 16:35	1
Lead-212	0.601		0.102	0.118		0.100	pCi/g	05/10/25 11:56	06/02/25 16:35	1
Lead-214	0.641		0.117	0.133		0.112	pCi/g	05/10/25 11:56	06/02/25 16:35	1
Potassium-40	10.5		1.43	1.77		0.769	pCi/g	05/10/25 11:56	06/02/25 16:35	1
Protactinium-231	0.000	U	1.02	1.02		4.98	pCi/g	05/10/25 11:56	06/02/25 16:35	1
Radium-226	0.701		0.142	0.158	1.00	0.111	pCi/g	05/10/25 11:56	06/02/25 16:35	1
Radium-228	0.558		0.163	0.172		0.264	pCi/g	05/10/25 11:56	06/02/25 16:35	1
Thorium-232	0.558		0.163	0.172		0.264	pCi/g	05/10/25 11:56	06/02/25 16:35	1
Thorium-234	0.628	U	0.464	0.469		0.726	pCi/g	05/10/25 11:56	06/02/25 16:35	1
Thallium-208	0.233		0.0676	0.0715		0.0667	pCi/g	05/10/25 11:56	06/02/25 16:35	1
Uranium-235	-0.0516	U	0.120	0.120		0.658	pCi/g	05/10/25 11:56	06/02/25 16:35	1
Uranium-238	0.628	U	0.464	0.469		0.726	pCi/g	05/10/25 11:56	06/02/25 16:35	1
Cesium-137	-0.0116	U	0.0643	0.0643		0.112	pCi/g	05/10/25 11:56	06/02/25 16:35	1
Cobalt-60	-0.0233	U	0.0567	0.0568		0.127	pCi/g	05/10/25 11:56	06/02/25 16:35	1
Europium-152	0.225		0.140	0.142		0.194	pCi/g	05/10/25 11:56	06/02/25 16:35	1
Europium-154	0.0797	U	0.120	0.120		0.131	pCi/g	05/10/25 11:56	06/02/25 16:35	1

Eurofins Calscience

8

10

11

Client Sample Results

Client: GSI Environmental Inc Job ID: 570-229049-1

Project/Site: 10008 - Former Albany Landfill Site Inve

Method: DOE GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

Client Sample ID: L5-TP-4-5-COMP

Lab Sample ID: 570-229049-9

Date Collected: 04/29/25 14:50

Date Received: 05/02/25 09:40

Matrix: Solid

Count Total Uncert. Uncert. Dil Fac Analyte Result Qualifier $(2\sigma + / -)$ (2σ+/-) RLMDC Unit Prepared Analyzed Europium-155 0.0638 U 0.224 0.225 0.377 pCi/g 05/10/25 11:56 06/02/25 16:35

Client Sample ID: P2-SB-21

Date Collected: 05/01/25 11:00

Lab Sample ID: 570-229049-10

Matrix: Solid

Date Received: 05/02/25 09:40

			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium-227	0.000502	U	0.000792	0.000793		1.61	pCi/g	05/10/25 11:56	06/02/25 16:36	1
Actinium 228	0.908		0.287	0.300		0.253	pCi/g	05/10/25 11:56	06/02/25 16:36	1
Bismuth-212	0.335	U	0.854	0.855		1.49	pCi/g	05/10/25 11:56	06/02/25 16:36	1
Bismuth-214	0.366	U	0.231	0.234		0.501	pCi/g	05/10/25 11:56	06/02/25 16:36	1
Lead-210	0.864	U	1.74	1.74		2.82	pCi/g	05/10/25 11:56	06/02/25 16:36	1
Lead-212	0.777		0.158	0.176		0.136	pCi/g	05/10/25 11:56	06/02/25 16:36	1
Lead-214	0.563		0.171	0.180		0.233	pCi/g	05/10/25 11:56	06/02/25 16:36	1
Potassium-40	12.3		2.57	2.84		1.46	pCi/g	05/10/25 11:56	06/02/25 16:36	1
Protactinium-231	0.000	U	0.461	0.461		7.77	pCi/g	05/10/25 11:56	06/02/25 16:36	1
Radium-226	0.366	U	0.231	0.234	1.00	0.501	pCi/g	05/10/25 11:56	06/02/25 16:36	1
Radium-228	0.908		0.287	0.300		0.253	pCi/g	05/10/25 11:56	06/02/25 16:36	1
Thorium-232	0.908		0.287	0.300		0.253	pCi/g	05/10/25 11:56	06/02/25 16:36	1
Thorium-234	0.00346	U	0.0386	0.0386		2.28	pCi/g	05/10/25 11:56	06/02/25 16:36	1
Thallium-208	0.240		0.0894	0.0925		0.0770	pCi/g	05/10/25 11:56	06/02/25 16:36	1
Uranium-235	0.228	U	0.589	0.589		0.980	pCi/g	05/10/25 11:56	06/02/25 16:36	1
Uranium-238	0.00346	U	0.0386	0.0386		2.28	pCi/g	05/10/25 11:56	06/02/25 16:36	1
Cesium-137	-0.000623	U	0.108	0.108		0.198	pCi/g	05/10/25 11:56	06/02/25 16:36	1
Cobalt-60	-0.0418	U	0.121	0.121		0.204	pCi/g	05/10/25 11:56	06/02/25 16:36	1
Europium-152	0.105	U	0.226	0.226		0.299	pCi/g	05/10/25 11:56	06/02/25 16:36	1
Europium-154	0.000107	U	0.000719	0.000719		0.203	pCi/g	05/10/25 11:56	06/02/25 16:36	1
Europium-155	0.0309	U	0.251	0.251		0.431	pCi/g	05/10/25 11:56	06/02/25 16:36	1

2

4

5

7

9

10 4 4

12

Total

Project/Site: 10008 - Former Albany Landfill Site Inve

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Count

Lab Sample ID: MB 160-716958/1-A

Matrix: Solid

Analysis Batch: 720224

Client: GSI Environmental Inc

Client Sample ID: Method Blank

Prep Batch: 716958

Prep Type: Total/NA

			Jouine	. Ota.						
	MB	MB	Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium-227	0.1986	U	0.320	0.321		0.762	pCi/g	05/10/25 11:56	06/02/25 15:05	1
Actinium 228	0.1431	U	0.210	0.211		0.252	pCi/g	05/10/25 11:56	06/02/25 15:05	1
Bismuth-212	0.3016	U	0.794	0.795		1.37	pCi/g	05/10/25 11:56	06/02/25 15:05	1
Bismuth-214	-0.005768	U	0.0116	0.0116		0.388	pCi/g	05/10/25 11:56	06/02/25 15:05	1
Lead-210	1.136	U	1.61	1.61		2.45	pCi/g	05/10/25 11:56	06/02/25 15:05	1
Lead-212	0.002308	U	0.112	0.112		0.197	pCi/g	05/10/25 11:56	06/02/25 15:05	1
Lead-214	0.01567	U	0.162	0.162		0.283	pCi/g	05/10/25 11:56	06/02/25 15:05	1
Potassium-40	-0.3820	U	0.643	0.644		1.01	pCi/g	05/10/25 11:56	06/02/25 15:05	1
Protactinium-231	0.3697	U	1.33	1.33		4.55	pCi/g	05/10/25 11:56	06/02/25 15:05	1
Radium-226	-0.005768	U	0.0116	0.0116	1.00	0.388	pCi/g	05/10/25 11:56	06/02/25 15:05	1
Radium-228	0.1431	U	0.210	0.211		0.252	pCi/g	05/10/25 11:56	06/02/25 15:05	1
Thorium-232	0.1431	U	0.210	0.211		0.252	pCi/g	05/10/25 11:56	06/02/25 15:05	1
Thorium-234	-0.3377	U	0.949	0.949		1.65	pCi/g	05/10/25 11:56	06/02/25 15:05	1
Thallium-208	-0.03270	U	0.0641	0.0642		0.102	pCi/g	05/10/25 11:56	06/02/25 15:05	1
Uranium-235	0.0000	U	0.191	0.191		0.867	pCi/g	05/10/25 11:56	06/02/25 15:05	1
Uranium-238	-0.3377	U	0.949	0.949		1.65	pCi/g	05/10/25 11:56	06/02/25 15:05	1
Cesium-137	0.01597	U	0.0452	0.0452		0.0820	pCi/g	05/10/25 11:56	06/02/25 15:05	1
Cobalt-60	0.003828	U	0.0339	0.0340		0.0770	pCi/g	05/10/25 11:56	06/02/25 15:05	1
Europium-152	0.1617	U	0.112	0.113		0.207	pCi/g	05/10/25 11:56	06/02/25 15:05	1
Europium-154	0.04628	U	0.131	0.131		0.128	pCi/g	05/10/25 11:56	06/02/25 15:05	1
Europium-155	0.02817	U	0.0796	0.0797		0.374	pCi/g	05/10/25 11:56	06/02/25 15:05	1

Lab Sample ID: LCS 160-716958/2-A

Matrix: Solid

Analysis Batch: 720418

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 716958

				Total						
	Spike	LCS	LCS	Uncert.					%Rec	
Analyte	Added	Result	Qual	(2σ+/-)	RL	MDC	Unit	%Rec	Limits	
Americium-241	95.7	95.21		10.4		1.11	pCi/g	99	75 - 125	
Cesium-137	24.1	24.51		2.50		0.194	pCi/g	102	75 - 125	
Cobalt-60	5.26	5.419		0.584		0.118	pCi/g	103	75 - 125	

Lab Sample ID: 570-229049-1 DU Client Sample ID: L8-TP-0-1-COMP

Matrix: Solid

Analysis Batch: 720214

Prep Type: Total/NA

Prep Batch: 716958

					Total					
	Sample	Sample	DU	DU	Uncert.					RER
Analyte	Result	Qual	Result	Qual	(2σ+/-)	RL	MDC	Unit	RER	Limit
Actinium-227	-0.166	U	0.2684	U	0.468		0.752	pCi/g	0.38	1
Actinium 228	0.145	U	0.5673	F	0.187		0.249	pCi/g	1.67	1
Bismuth-212	0.323	U	0.0000	U	0.377		1.01	pCi/g	0.33	1
Bismuth-214	0.609		0.6175		0.168		0.144	pCi/g	0.02	1
Lead-210	-0.747	U	0.4685	U	1.20		1.95	pCi/g	0.39	1
Lead-212	0.591		0.6041		0.125		0.113	pCi/g	0.05	1
Lead-214	0.825		0.6249		0.157		0.140	pCi/g	0.56	1
Potassium-40	10.9		9.329		1.88		0.887	pCi/g	0.39	1
Protactinium-231	-1.20	U	0.0000	U	0.733		4.90	pCi/g	0.25	1
Radium-226	0.609		0.6175		0.168	1.00	0.144	pCi/g	0.02	1

QC Sample Results

Client: GSI Environmental Inc Job ID: 570-229049-1

Project/Site: 10008 - Former Albany Landfill Site Inve

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

Lab Sample ID: 570-229049-1 DU

Matrix: Solid

Analysis Batch: 720214

Client Sample ID: L8-TP-0-1-COMP

Prep Type: Total/NA

Prep Batch: 716958

					Total					
	Sample	Sample	DU	DU	Uncert.					RER
Analyte	Result	Qual	Result	Qual	(2σ+/-)	RL	MDC	Unit	RER	Limit
Radium-228	0.145	U	0.5673	F	0.187		0.249	pCi/g	1.67	1
Thorium-232	0.145	U	0.5673	F	0.187		0.249	pCi/g	1.67	1
Thorium-234	-0.527	U	0.8555		0.600		0.831	pCi/g	0.80	1
Thallium-208	0.215		0.1730		0.0888		0.110	pCi/g	0.25	1
Uranium-235	0.000	U	-0.07517	U	0.349		0.587	pCi/g	0.14	1
Uranium-238	-0.527	U	0.8555		0.600		0.831	pCi/g	0.80	1
Cesium-137	-0.0560	U	-0.04513	U	0.0894		0.151	pCi/g	0.06	1
Cobalt-60	0.00151	U	-0.02503	U	0.0942		0.134	pCi/g	0.27	1
Europium-152	0.0956	U	0.1113	U	0.223		0.188	pCi/g	0.04	1
Europium-154	0.117	U	0.02268	U	0.120		0.123	pCi/g	0.33	1
Europium-155	0.00929	U	0.05684	U	0.198		0.333	pCi/g	0.17	1

QC Association Summary

Client: GSI Environmental Inc

Project/Site: 10008 - Former Albany Landfill Site Inve

Rad

Leach Batch: 716233

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-229049-1	L8-TP-0-1-COMP	Total/NA	Solid	Dry and Grind	
570-229049-2	L8-TP-2-3-COMP	Total/NA	Solid	Dry and Grind	
570-229049-3	L8-TP-4-5-COMP	Total/NA	Solid	Dry and Grind	
570-229049-4	L2-TP-0-1-COMP	Total/NA	Solid	Dry and Grind	
570-229049-5	L2-TP-2-3-COMP	Total/NA	Solid	Dry and Grind	
570-229049-6	L2-TP-4-5-COMP	Total/NA	Solid	Dry and Grind	
570-229049-7	L5-TP-0-1-COMP	Total/NA	Solid	Dry and Grind	
570-229049-8	L5-TP-2-3-COMP	Total/NA	Solid	Dry and Grind	
570-229049-9	L5-TP-4-5-COMP	Total/NA	Solid	Dry and Grind	
570-229049-10	P2-SB-21	Total/NA	Solid	Dry and Grind	
570-229049-1 DU	L8-TP-0-1-COMP	Total/NA	Solid	Dry and Grind	

Prep Batch: 716958

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-229049-1	L8-TP-0-1-COMP	Total/NA	Solid	Fill_Geo-21	716233
570-229049-2	L8-TP-2-3-COMP	Total/NA	Solid	Fill_Geo-21	716233
570-229049-3	L8-TP-4-5-COMP	Total/NA	Solid	Fill_Geo-21	716233
570-229049-4	L2-TP-0-1-COMP	Total/NA	Solid	Fill_Geo-21	716233
570-229049-5	L2-TP-2-3-COMP	Total/NA	Solid	Fill_Geo-21	716233
570-229049-6	L2-TP-4-5-COMP	Total/NA	Solid	Fill_Geo-21	716233
570-229049-7	L5-TP-0-1-COMP	Total/NA	Solid	Fill_Geo-21	716233
570-229049-8	L5-TP-2-3-COMP	Total/NA	Solid	Fill_Geo-21	716233
570-229049-9	L5-TP-4-5-COMP	Total/NA	Solid	Fill_Geo-21	716233
570-229049-10	P2-SB-21	Total/NA	Solid	Fill_Geo-21	716233
MB 160-716958/1-A	Method Blank	Total/NA	Solid	Fill_Geo-21	
LCS 160-716958/2-A	Lab Control Sample	Total/NA	Solid	Fill_Geo-21	
570-229049-1 DU	L8-TP-0-1-COMP	Total/NA	Solid	Fill_Geo-21	716233

Job ID: 570-229049-1

3

4

_

8

9

11

12

1

Lab Sample ID: 570-229049-1

Client Sample ID: L8-TP-0-1-COMP

Date Collected: 04/29/25 08:43 Date Received: 05/02/25 09:40

Matrix: Solid

Job ID: 570-229049-1

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Leach	Dry and Grind			1.0 g	1.0 g	716233	05/06/25 16:54	CHM	EET SL
Total/NA	Prep	Fill_Geo-21			371.1800 g	1.0 g	716958	05/10/25 11:56	CHM	EET SL
Total/NA	Analysis	GA-01-R		1			720224	06/02/25 14:09	SCB	EET SL
	Instrume	nt ID: GAMMAVISION	1							

Client Sample ID: L8-TP-2-3-COMP

Date Collected: 04/29/25 09:27 Date Received: 05/02/25 09:40 Lab Sample ID: 570-229049-2

Matrix: Solid

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Leach	Dry and Grind			1.0 g	1.0 g	716233	05/06/25 16:54	CHM	EET SL
Total/NA	Prep	Fill_Geo-21			421.0800 g	1.0 g	716958	05/10/25 11:56	CHM	EET SL
Total/NA	Analysis	GA-01-R		1			720215	06/02/25 15:03	SCB	EET SL
	Instrume	nt ID: GAMMAVISIOI	N							

Client Sample ID: L8-TP-4-5-COMP

Date Collected: 04/29/25 10:00 Date Received: 05/02/25 09:40 Lab Sample ID: 570-229049-3

Lab Sample ID: 570-229049-4

Lab Sample ID: 570-229049-5

Matrix: Solid

Matrix: Solid

Matrix: Solid

_				Initial	Final	Batch	Prepared		
Гуре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
_each	Dry and Grind			1.0 g	1.0 g	716233	05/06/25 16:54	СНМ	EET SL
Prep	Fill_Geo-21			423.5400 g	1.0 g	716958	05/10/25 11:56	CHM	EET SL
Analysis	GA-01-R		1			720205	06/02/25 15:04	SCB	EET SL
	each Prep Analysis	each Dry and Grind Prep Fill_Geo-21	Leach Dry and Grind Prep Fill_Geo-21 Analysis GA-01-R	Leach Dry and Grind Prep Fill_Geo-21 Analysis GA-01-R 1	Dry and Grind 1.0 g Prep Fill_Geo-21 423.5400 g Analysis GA-01-R 1	Dry and Grind 1.0 g 1.0 g Prep Fill_Geo-21 423.5400 g 1.0 g Analysis GA-01-R 1	Dry and Grind 1.0 g 1.0 g 716233 Prep Fill_Geo-21 423.5400 g 1.0 g 716958 Analysis GA-01-R 1 720205	Dry and Grind 1.0 g 1.0 g 716233 05/06/25 16:54 Prep Fill_Geo-21 423.5400 g 1.0 g 716958 05/10/25 11:56	Dry and Grind 1.0 g 1.0 g 716233 05/06/25 16:54 CHM Prep Fill_Geo-21 423.5400 g 1.0 g 716958 05/10/25 11:56 CHM

Client Sample ID: L2-TP-0-1-COMP

Date Collected: 04/29/25 11:15

Date Received: 05/02/25 09:40

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Leach	Dry and Grind			1.0 g	1.0 g	716233	05/06/25 16:54	CHM	EET SL
Total/NA	Prep	Fill_Geo-21			396.2800 g	1.0 g	716958	05/10/25 11:56	CHM	EET SL
Total/NA	Analysis	GA-01-R		1			720413	06/02/25 16:42	SCB	EET SL
	,	nt ID: GAMMAVISION		•				25,22,20 10112		

Client Sample ID: L2-TP-2-3-COMP

Date Collected: 04/29/25 11:28

Date Received: 05/02/25 09:40

_	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Leach	Dry and Grind			1.0 g	1.0 g	716233	05/06/25 16:54	CHM	EET SL
Total/NA	Prep	Fill_Geo-21			415.4700 g	1.0 g	716958	05/10/25 11:56	CHM	EET SL
Total/NA	Analysis	GA-01-R		1			720414	06/02/25 15:02	SCB	EET SL
	Instrume	nt ID: GAMMAVISION								

Client: GSI Environmental Inc

Project/Site: 10008 - Former Albany Landfill Site Inve

Client Sample ID: L2-TP-4-5-COMP

Date Collected: 04/29/25 11:50 Date Received: 05/02/25 09:40 Lab Sample ID: 570-229049-6

Matrix: Solid

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Leach	Dry and Grind			1.0 g	1.0 g	716233	05/06/25 16:54	CHM	EET SL
Total/NA	Prep	Fill_Geo-21			397.4600 g	1.0 g	716958	05/10/25 11:56	CHM	EET SL
Total/NA	Analysis	GA-01-R		1			720412	06/02/25 15:03	SCB	EET SL
	Instrume	nt ID: GAMMAVISION								

Client Sample ID: L5-TP-0-1-COMP

Date Collected: 04/29/25 13:37 Date Received: 05/02/25 09:40 Lab Sample ID: 570-229049-7

Matrix: Solid

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Leach	Dry and Grind			1.0 g	1.0 g	716233	05/06/25 16:54	СНМ	EET SL
Total/NA	Prep	Fill_Geo-21			445.7300 g	1.0 g	716958	05/10/25 11:56	CHM	EET SL
Total/NA	Analysis	GA-01-R		1			720413	06/02/25 15:04	SCB	EET SL
	Instrume	nt ID: GAMMAVISION	l							

Client Sample ID: L5-TP-2-3-COMP

Date Collected: 04/29/25 14:20 Date Received: 05/02/25 09:40 Lab Sample ID: 570-229049-8

Lab Sample ID: 570-229049-9

Lab Sample ID: 570-229049-10

Matrix: Solid

Matrix: Solid

Matrix: Solid

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Leach	Dry and Grind			1.0 g	1.0 g	716233	05/06/25 16:54	CHM	EET SL
Total/NA	Prep	Fill_Geo-21			403.0000 g	1.0 g	716958	05/10/25 11:56	CHM	EET SL
Total/NA	Analysis	GA-01-R		1			720427	06/03/25 14:49	MLS	EET SL
IUIAI/INA	Instrume		N	1			120421	00/03/25 14:49	IVILO	

Client Sample ID: L5-TP-4-5-COMP

Date Collected: 04/29/25 14:50

Date Received: 05/02/25 09:40

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Leach	Dry and Grind			1.0 g	1.0 g	716233	05/06/25 16:54	CHM	EET SL
Total/NA	Prep	Fill_Geo-21			415.1500 g	1.0 g	716958	05/10/25 11:56	CHM	EET SL
Total/NA	Analysis	GA-01-R		1			720215	06/02/25 16:35	SCB	EET SL
Total/TV	,	nt ID: GAMMAVISION					720210	00/02/20 10:00	OOD	

Client Sample ID: P2-SB-21

Date Collected: 05/01/25 11:00

Date Received: 05/02/25 09:40

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Leach	Dry and Grind			1.0 g	1.0 g	716233	05/06/25 16:54	CHM	EET SL
Total/NA	Prep	Fill_Geo-21			268.5500 g	1.0 g	716958	05/10/25 11:56	CHM	EET SL
Total/NA	Analysis	GA-01-R		1			720205	06/02/25 16:36	SCB	EET SL
	Instrume	nt ID: GAMMAVISION								

Laboratory References:

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Accreditation/Certification Summary

Client: GSI Environmental Inc Job ID: 570-229049-1

Project/Site: 10008 - Former Albany Landfill Site Inve

Laboratory: Eurofins St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	20-001	05-06-27
ANAB	Dept. of Defense ELAP	L2305	04-06-27
ANAB	Dept. of Energy	L2305.01	04-06-27
ANAB	ISO/IEC 17025	L2305	04-06-27
Arizona	State	AZ0813	12-08-25
California	Los Angeles County Sanitation Districts	10259	06-30-22 *
California	State	2886	06-30-25
Connecticut	State	PH-0241	03-31-27
Florida	NELAP	E87689	06-30-25
HI - RadChem Recognition	State	n/a	06-30-25
Illinois	NELAP	200023	11-30-25
lowa	State	373	12-01-26
Kansas	NELAP	E-10236	10-31-25
Kentucky (DW)	State	KY90125	12-31-25
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-25
Louisiana (All)	NELAP	106151	06-30-25
Louisiana (DW)	State	LA011	12-31-25
Maryland	State	310	09-30-25
Massachusetts	State	M-MO054	06-30-25
MI - RadChem Recognition	State	9005	06-30-25
Missouri	State	780	06-30-25
Nevada	State	MO00054	07-31-25
New Jersey	NELAP	MO002	06-30-25
New Mexico	State	MO00054	06-30-25
New York	NELAP	11616	03-31-26
North Carolina (DW)	State	29700	07-31-25
North Dakota	State	R-207	06-30-25
Oklahoma	NELAP	9997	08-31-25
Oregon	NELAP	4157	09-01-25
Pennsylvania	NELAP	68-00540	02-28-26
South Carolina	State	85002	06-30-25
Texas	NELAP	T104704193	07-31-25
US Fish & Wildlife	US Federal Programs	058448	07-31-25
USDA	US Federal Programs	525-23-138-94730	05-18-26
Utah	NELAP	MO00054	07-31-25
Virginia	NELAP	460230	06-14-25
Washington	State	C592	08-30-25
West Virginia DEP	State	381	10-31-25

 $^{^{\}star} \ \text{Accreditation/Certification renewal pending - accreditation/certification considered valid}.$

Method Summary

Client: GSI Environmental Inc

Project/Site: 10008 - Former Albany Landfill Site Inve

Method	Method Description	Protocol	Laboratory
GA-01-R	Radium-226 & Other Gamma Emitters (GS)	DOE	EET SL
Dry and Grind	Preparation, Dry and Grind	None	EET SL
Fill_Geo-21	Fill Geometry, 21-Day In-Growth	None	EET SL

Protocol References:

DOE = U.S. Department of Energy

None = None

Laboratory References:

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Job ID: 570-229049-1

3

4

5

6

0

9

10

4.4

12

13

Sample Summary

Client: GSI Environmental Inc

Project/Site: 10008 - Former Albany Landfill Site Inve

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
570-229049-1	L8-TP-0-1-COMP	Solid	04/29/25 08:43	05/02/25 09:40
570-229049-2	L8-TP-2-3-COMP	Solid	04/29/25 09:27	05/02/25 09:40
570-229049-3	L8-TP-4-5-COMP	Solid	04/29/25 10:00	05/02/25 09:40
570-229049-4	L2-TP-0-1-COMP	Solid	04/29/25 11:15	05/02/25 09:40
570-229049-5	L2-TP-2-3-COMP	Solid	04/29/25 11:28	05/02/25 09:40
570-229049-6	L2-TP-4-5-COMP	Solid	04/29/25 11:50	05/02/25 09:40
570-229049-7	L5-TP-0-1-COMP	Solid	04/29/25 13:37	05/02/25 09:40
570-229049-8	L5-TP-2-3-COMP	Solid	04/29/25 14:20	05/02/25 09:40
570-229049-9	L5-TP-4-5-COMP	Solid	04/29/25 14:50	05/02/25 09:40
570-229049-10	P2-SB-21	Solid	05/01/25 11:00	05/02/25 09:40

Job ID: 570-229049-1

3

4

Ę

6

0

11

10

11:

CHAIN-OF-CUSTODY RECORD

DATE:	Wad	宝	K
DATE.			

PAGE: OF

Environment Testing

Calscience 2841 Dow Avenue, Suite 100, Tustin, CA 92780 • (714) 895-5494

For courier service / sample drop off information, contact us26_sales@e	rofinsus.com or call us	•																				
LABORATORY CLIENT: GSI ENVIYONN				NT PRO				n	lan	T.	11/1	000	28	P.O. 1	1 0.≟							
ADDRESS: 2000 Pomell Str	eet, sui	Je 821	0				JECT CO				J			-, .		-	LABC	CONTAC	CT OR Q	UOTE NO.:		-
ADDRESS: 2000 Pomell Str CITY: Enerville STAT	CA	ZIP: 91	16	08			3	a	No	e	}	K	U				5	702	235	8-1	7	
TEL: (925) - 330 - 9267 KCAI MES A ad TURNAROUND TIME (Rush surcharges may apply to any TAT not "STANDARD"):	egsienu	om, eve	ay 1941	جارہ م	tious	GLOE	BAL ID:					LOG	CODE:): (PRINT	M		
	JEDAVO VO	TANDADD		COL	M	_			_									$\overline{}$	11.	// /		ш
□ SAME DAY □ 24 HR □ 48 HR □ 72 HR EDD:	B DAYS	TANDARD							7		F	REQ	UES	TED	ΑN	ALY	SES	3				
□ COELT EDF □ OTHER											Ple	ase ch	eck b	ox or fil	l in bl	ank as	need	ed.				
SPECIAL INSTRUCTIONS: +24-day mgrowth pe GA-01-R+													Core					0/747X		45		
570-229049 C	ain of Custody		1 8		pa	□ GRO	□ DRO	TPH □ C6-C36 □ C6-C44		.BE □ 8260 □	- (09	ıs (8260)) ☐ En Core ☐ Terra	270)	(8081)	(2)	PAHs ☐ 8270 ☐ 8270 SIM	T22 Metals □ 6010/747X □ 6020/747X	7196 🗆 7199 🗆 218.6	+ EU 152/		
LAB SAMPLING SAMPLING ONLY DATE TIME	MATRIX	NO. OF CONT.	Unpreserved	Preserved	Field Filtered	□ TPH(g) □ GRO	□ TPH(d) □ DRO	TPH 🗆 C6	ТРН	втех / мтве	VOCs (8260)	Oxygenates (8260)	Prep (5035) 🗆 l	SVOCs (8270)	Pesticides (8081)	PCBs (8082)	PAHs 🗆 8;	T22 Metals	<u> </u>	04-45 77-75		
1 L8-TP-0-1-COMP 4/29/2025 0843	5	1	Χ																,	$\overline{\mathbf{x}}$		
2 LE-TP-2-3-COMP 1 0927	5	1	Y																	X		
3 L6-TP-4-5-COMP 1000	5	1	~					7													2	
4 L2-TP-0-1-COMP 1115	5		Ŷ																	\Diamond	1	
5 L2-TP-23-COMP 1128	5	1	\Diamond												\dashv				1			
6 L2-TP-4-5-COMP 1150	5	1	$\overline{\mathbf{v}}$																1			
7 LS-TP-0-1-COMP 1337	1	1	Ŷ																 	$\stackrel{\textstyle \mbox{\ }}{\!$	1	
8 L5-TP-2-3-COMP 1420	5		\Rightarrow																	\bigcirc	1	
9 LS-TP-4-5-COMP 1450	1 (X																1			
10 P2-58-21 5/1/2025 1100	1 5		×												一			\neg		}		Н
Relinquished by (Signature)	Date: 5/1/2025	Time: 1515	Recei	ved by:	1	>				, ;	-e	7	ex			Date:	1/2	رسا 2ع	25	Time:	5	
Relinquished by: (Signature)	Date:	Time:	Recei	ved by:	(Signat	ure/Affi	liation)	1	EC	,			T			Date:	ala	35		Time:	10	
Relinquished by: (Signature)	ved by:	(Signat	ure/Affi	liation)									Date:				Time:					

Attachment "Chain_of_Custody_General_Color_221004rev.xls" to "US Eurofins Calscience - CoC Templates" Printed by Jenny Magana, d. Tue 04 Oct 2022 16:31 PDT

Page 28 of 28 Babble Way

Eurofins Calscience

2841 Dow Avenue, Suite 100

Tustin, CA 92780 Phone: 714-895-5494

Chain of Custody Record



eurofins

Environment Testing

Phone: /14-895-5494																			
Client Information (Sub Contract Lab)	Sampler: N/A			Hsu		anice						rrier Tra 'A	cking N	o(s):			COC No: 570-442949.1		
Client Contact: Shipping/Receiving	Phone: N/A			E-Ma Jan		Hsu@	et.eu	rofinsus	.com			ate of Or alifornia					Page: Page 1 of 2		
Company: TestAmerica Laboratories, Inc.								equired (S									Job #: 570-229049-1		
Address:	Due Date Request	ed:			T			, ,						-		_	Preservation Code	as:	
13715 Rider Trail North, ,	6/3/2025								Ana	lysis l	Requ	ested				-	-		
City: Earth City	TAT Requested (da	iys): N/A																	
State, Zip: MO, 63045						et List													
Phone:	PO #:					E													
314-298-8566(Tel) 314-298-8757(Fax)	N/A				ြ	₹									1 1				
Email:	WO #:				or N	ا چ ا													
N/A Project Name:	N/A Project #:				1 8	Z										878			
10008 - Former Albany Landfill Site Inve	57024852				څ	0 8				1						container			
Site:	SSOW#:				를	ا گا اِ										5 0	Other:		
N/A	N/A				San	00 5											N/A		
Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=wasta/oli, BT=Tissue, A=Air	Field Filtered	Perform MS/MSD (Yes or No) GA 01 R Ru/Dry Grind (MOD) NORM Target List	Eu 152/4/5									Total Number	Special Ins	structions/N	Note:
		$\geq \leq$	Preserva	ation Code:	X	\mathbb{X}										\leq L		\sim	
L8-TP-0-1-COMP (570-229049-1)	4/29/25	08:43 Pacific	G	Solid			x									1			
L8-TP-2-3-COMP (570-229049-2)	4/29/25	09:27 Pacific	G	Solid			x									1			
L8-TP-4-5-COMP (570-229049-3)	4/29/25	10:00 Pacific	G	Solid			X									1			
L2-TP-0-1-COMP (570-229049-4)	4/29/25	11:15 Pacific	G	Solid			x									1			
L2-TP-2-3-COMP (570-229049-5)	4/29/25	11:28 Pacific	G	Solid			X									1			
L2-TP-4-5-COMP (570-229049-6)	4/29/25	11:50 Pacific	G	Solid			×									1			
L5-TP-0-1-COMP (570-229049-7)	4/29/25	13:37 Pacific	G	Solid	Ш		x								•	1			
L5-TP-2-3-COMP (570-229049-8)	4/29/25	14:20 Pacific	G	Solid	Ц		X									1			
L5-TP-4-5-COMP (570-229049-9)	4/29/25	14:50 Pacific	G	Solid	Ш		x									1			
Note: Since laboratory accreditations are subject to change, Eurofins Calscience maintain accreditation in the State of Origin listed above for analysis/tests/matrix attention immediately. If all requested accreditations are current to date, return t	being analyzed, the sa	imples must be	shipped back	to the Eurofins	Cal	Iscience	labora e,	itory or ot	her instri	uctions w	ill be pro	vided. A	ny cha	nges to a	ccreditati	ion s	tatus should be broug	ght to Eurofins	
Possible Hazard Identification						Sam	ple Di	sposal	(A fee	may I	be ass	essed	if san	ples a	re retai	inec	d longer than 1 i	nonth)	
Unconfirmed						-	Retu	ım To C	lient	L	⊐ _{Dist}	osal B	y Lab		\bigsqcup_{Arc}	chiv	e For	Months	
Deliverable Requested: I, II, III, IV, Other (specify)	Primary Delivera	able Rank: 2	2			Spec	ial Ins	truction	s/QC F										
Empty Kit Relinquished by:		Date:			Tin	me:						Metho	od of Si	nipment					
Relinquished by:	Date/Time:	11	140	Company	_	R	eceive	by:					C	ate/Time): 			Company	
Relinquished by:	Date/Time:			Company		R	eceive	d by:					C	ate/Time):			Company	
Relinquished by:	Date/Time:			Company		R	eceive	d by:					C	ate/Time):			Company	
Custody Seals Intact: Custody Seal No.:						C	ooler T	emperat.	re(s) °C	and Othe	r Remai	ks:							

Eurofins Calscience

2841 Dow Avenue, Suite 100

Tustin, CA 92780 Phone: 714-895-5494

Chain of Custody Record

	e i	ırn	fi	nc
A	Cu	II O	11	112

Environment Testing

Phone: 714-895-5494																			
Client Information (Sub Contract Lab)	Sampler: N/A			Lab I Hsu		nice						Carrier Tr V/A	acking	No(s):			COC No: 570-442949.2		
Client Contact: Shipping/Receiving	Phone: N/A			E-Ma		Hsu@	et.eur	ofinsus	.com			State of C					Page: Page 2 of 2		
Company:								quired (S		e):							Job #:	-	
TestAmerica Laboratories, Inc.					NE	ELAP	- Oreg	on; Sta	te - C	aliforn	ia						570-229049-1		_
Address: 13715 Rider Trail North,	Due Date Requeste 6/3/2025	ed:			İ				Ana	alvsis	Rea	uested	ı				Preservation Cod	es:	
City:	TAT Requested (da						\top		T	Ť	Ti		Τ				1		
Earth City		N/A	`			1													
State, Zip: MO, 63045					П				İ	1									
Phone:	PO #:				10	Taro							1						
314-298-8566(Tel) 314-298-8757(Fax)	N/A				9	N N			- 1										
Email: N/A	WO#: N/A				or No)											S			
Project Name:	Project #:				Ş	2 3										containers			
10008 - Former Albany Landfill Site Inve	57024852) 	Yes			-							onta	Other:		
Site: N/A	ssow#: N/A				аш	واق										o Jc	N/A		
				Matrix	S pe	SW G										per o			
			Sample Type	(W=water,	#ter	Perform MS/MSD (Yes or No) GA 01 R Ra/Dry Grind (MOD) NORM Target List	415									Total Number of			
		Sample	(C=Comp,	S=solid, O=waste/oil,	Ē	흔	162									tal			
Sample Identification - Client ID (Lab ID)	Sample Date	Time	- J	BT=Tissue, A=Air		2 2	3								_	2	Special In	structions/No	ote:
	_><	<u> </u>	Preservat	ion Code:	X	X			_	7	-					X			
P2-SB-21 (570-229049-10)	5/1/25	11:00 Pacific	G	Solid			x									1			
					П														
								Ħ		\top									
				-	H	\Box	\top	\Box	\dashv		\Box				+				
				-	H	H		T	+		\Box				+				
					H	\vdash		\forall	+		\Box	\dashv	 						
- 187					Н	\vdash		\Box	\dashv	+		+			+-				
					Н	\vdash	+		+	+		_			+				
Note: Since laboratory accreditations are subject to change, Eurofins Calscier	as slesse the sumambin	of method and	han a negradita	tion complian			- Luboon	tract lab		e Thie	sample	hinment	is form	arded up	ter chai	n of c	rietody. If the laborate	on does not curre	antly
maintain accreditation in the State of Origin listed above for analysis/tests/ma attention immediately. If all requested accreditations are current to date, return	rix being analyzed, the sa	imples must be	e shipped back	to the Eurofins	s Cal	science	laborat	ory or ot	her inst	tructions	will be p	rovided.	Any ch	anges to	accredi	itation	status should be brou	ight to Eurofins C	Calscience
Possible Hazard Identification						Sam	ple Dis	sposal	(A fe	ee may	be as	sessed	if sa	mples		taine	ed longer than 1	month)	
Unconfirmed							Retui	m To C	Client		\square_{D_l}	sposal	Зу Lа	b		Arch	ive For	Months	
Deliverable Requested I, II, III, IV, Other (specify)	Primary Delivera	able Rank: 2	2								rement								
Empty Kit Relinquished by:		Date:			Tir	me:				•		Met	nod of	Shipment					
Relinquished by:	Date/Time:	10	40	Company	_	R	eceived	by:						Date/Tin	ne:			Company	
Relinquished by:	Date/Time:			Company		R	eceived	by:						Date/Tin	ne:			Company	
Relinquished by:	Date/Time:		C	Company		R	eceived	by:						Date/Tin	ne:			Company	
Custody Seals Intact: Custody Seal No.:				*		c	ooler Te	mperatu	ıre(s) °(C and Ot	her Rem	arks:						1	

2

3

_4

6

8

10

12

Ш

Do not lift using this tag.

ORIGIN ID: JEMA (510) 463-8484

JENNIFER DUFFIELD
GSI ENVIRONMENTAL INC
SUITE 820
2000 POWELL ST STE 820
EMERYVILLE, CA 94608
UNITED STATES US

TO EUROFINS ENVIRONMENT TE

10008
2841 DOW AVE

TUSTIN CA 92780
(925) 330-9267
REF:
INU:
P0:
DEPT:
CLIENT

CASSINGLE STREET

TO EUROFINS ENVIRONMENT TE

10008
2841 DOW AVE

CASSINGLE STREET

TO EUROFINS ENVIRONMENT TE

10008
2841 DOW AVE

CLIENT

CLIENT

CASSINGLE STREET

TO EUROFINS ENVIRONMENT TE

10008
2841 DOW AVE

CLIENT

CLIENT

CLIENT

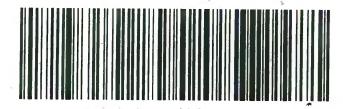
CLIENT

2 of 2 MPS# 8809 6077 2545 Metr# 8809 6077 2534 FRI - 02 MAY 5:00P STANDARD OVERNIGHT

0201

92 DTHA

92780 CA-US SNA





570-229049 Waybill

Phone: 714-895-5494

2841 Dow Avenue, Suite 100 Tustin, CA 92780

Chain of Custody Record

🔅 eurofins

Environment Testing

1 110110. 1 14 000 0404																							
	Sampler: Lab PM: N/A Hsu, Ji											Carrier Tracking No(s): N/A							COC №: 570-442949.1				
Client Information (Sub Contract Lab) Client Contact:	N/A Phone:			E-Ma		lice							tate of	f Origin	n·					10-442949. i nge:			
Shipping/Receiving	N/A					isu@e	et.eur	ofinsu	s.con	n			Califo							age 1 of 2			
Company:								quired (b #:			
TestAmerica Laboratories, Inc.					NEI	LAP -	Oreg	jon; S	tate -	Califo	ornia								_	70-229049-1	<u></u>		
Address: 13715 Rider Trail North,	Due Date Requeste 6/3/2025	d:							Aı	nalvs	sis R	lear	est	ed						reservation Cod	es:		
City:	TAT Requested (da	ys):					\neg	1	T		T		T	T	Т	$\overline{}$	T						
Earth City	·	N/A				÷							İ				j						
State, Zip: MO, 63045) NORM Target List								ĺ									
Phone:	PO #:				11	Tang	'								-								
314-298-8566(Tel) 314-298-8757(Fax)	N/A				Ы	₹			1			- 1											
Email:	WO#: N/A				Sample (Yes or No	(ON CO		1			1	-	-				1						
N/A Project Name:	Project #:					(MOD)	-											Į de	Ē				
10008 - Former Albany Landfill Site Inve	57024852					(Yes (.	1										Confaine					
Site:	SSOW#:				١١		.				l						- 1			ther:			
N/A	N/A		r .		ايّا <u>-</u>	MSD Dy G	:				l					İ		Ĭ		/A			
			Sample	Matrix		MS/M Ra/D				1 1	ı	ļ				I	1	Total Mumber					
			Туре	(W=water, S=solid.	臣	form P	2/4										-	Ž					
00 410 4 510	Samula Data	Sample Time	(C=comp,	O≃waste/oil,		Perfe GA 0	Eu 152/	İ										1	8	Special In	etructi	one/No	sta.
Sample Identification - Client ID (Lab ID)	Sample Date	Time	G=grab) e Preservat	T=Tissue, A=Air	枌	₹,								1000				-5	オ᠇	Special III	Struction	JIIS/ING	
		08:43	1		H	Δ $+$			+			\dashv			\dashv				}-				
L8-TP-0-1-COMP (570-229049-1)	4/29/25	Pacific	G	Solid	\sqcup		<u> </u>	-	┼			_	_	_	\dashv	_	_		1				
L8-TP-2-3-COMP (570-229049-2)	4/29/25	09:27 Pacific	G	Solid	Ш		X		1		\Box		_		_				1				
L8-TP-4-5-COMP (570-229049-3)	4/29/25	10:00 Pacific	G	Solid	Ш		x												1			,,.,	
L2-TP-0-1-COMP (570-229049-4)	4/29/25	11:15 Pacific	G	Solid	Ш		x												1				
L2-TP-2-3-COMP (570-229049-5)	4/29/25	11:28 Pacific	G	Solid	Ш		x												1				
L2-TP-4-5-COMP (570-229049-6)	4/29/25	11:50 Pacific	G	Solid	Ш		×												1				
L5-TP-0-1-COMP (570-229049-7)	4/29/25	13:37 Pacific	G	Solid			х												1				
L5-TP-2-3-COMP (570-229049-8)	4/29/25	14:20 Pacific	G	Solid	Ш		х												1				
L5-TP-4-5-COMP (570-229049-9)	4/29/25	14:50 Pacific	G	Solid			х												1				
Note: Since laboratory accreditations are subject to change, Eurofins Calscience	places the ownership	of method, an	alyte & accredita	ation complia	nce up	pon ou	r subco	ontract I	aborat	ories.	This sa	mple	shipm	ent is	forwa	rded i	under (chain-c	of-cus	stody. If the labora	itory does	not curre	antly
maintain accreditation in the State of Origin listed above for analysis/tests/matrix attention immediately. If all requested accreditations are current to date, return the	being analyzed, the s	amples must b	e shipped back	to the Eurofir	is Cal	science	e labor	atory or	other	instruc	tions w	ill be	provid	ed. Aı	ny cha	anges	to acc	reditat	tion st	tatus should be bro	ought to E	urofins C	alscience
Possible Hazard Identification						Sam	ple D	ispos	al (A	fee .	may l	be as	sses	sed i	f sar	mple			inec	d longer than 1	1 month	1)	
Unconfirmed						L		urn To			L		ispos	al B	y Lat	b	L	-	rchiv	ve For	Mo	nths	
Deliverable Requested: I, II, III, IV, Other (specify)	Primary Deliver	able Rank:	2			Spec	cial In	structi	ions/0	QC Re	equire	emen	ts:										
Empty Kit Relinquished by:		Date:			Tir	me:								Metho	d of S	Shipm	ent:						***************************************
Relinquished by:	Date/Time:	1	040	Company	_	F	Receive	ed by:	11.	1. P.	net	te	,			MA	Nme:) 6	21	J25084C	Compa	any	
Relinquished by:	Date/Time:			Company		F	Receive	ed by:	Me	ado	w Pi	neti	e			Date/	Time:				Compa	any	
Relinquished by:	Date/Time:			Company		F	Receive	ed by:								Date/	Time:				Compa	any	
Custody Seals Intact: Custody Seal No.:	1					-	Cooler	Tempe	rature(s) ºC a	nd Oth	er Rei	marks	:		L							
Δ Yes Δ No																							

Ver: 10/10/2024









2841 Dow Avenue, Suite 100 Tustin, CA 92780

Phone: 714-895-5494

Chain of Custody Record

eu	rofi	ns

Environment Testing

Filone. 714-033-0434																									
(0.1.0	Sampler: Lab PM: N/A Hsu, Ja Phone: E-Mail:															Carrier Tracking No(s): N/A						COC No: 570-442949.2			
Client Information (Sub Contract Lab) Client Contact:	Phone:					100	-						State o	f Orig	in:				Page					_	
Shipping/Receiving	N/A			Janie				rofins					Califo	rnia						e 2 of 2					
Company: TestAmerica Laboratories, Inc.								equired		note): - Cali	fornia								Job #	r: -229049	3 -1				
Address:	Due Date Requeste	ed:			-			3												ervation		s:			
13715 Rider Trail North, ,	6/3/2025				62027	Section 1			/	Analy	/sis F	Req	uest	ed				10000	-						
City: Earth City	TAT Requested (da	ıys): N/A				±	İ						- 1												
State, Zip:					Н) NORM Target List								ı											
MO, 63045 Phone:	PO #:				Н	arge							1	l		Į	1								
314-298-8566(Tel) 314-298-8757(Fax)	N/A				اءا	ZW T																			
Email:	WO#: N/A				Sample (Yes or No			1				-													
N/A Project Name:	Project #:					res or No ind (MOD)	`						Į					185							
10008 - Former Albany Landfill Site Inve	57024852				덻	(Yes or								ļ				igi igi							
Site: N/A	ssow#: N/A				틻	ISD ()	,											of con		r:					
IN/A	14/7		I I	10-4-2-	8	MS/MS Ra/Dry													530						
			[Cumpic	Matrix (w=water,	Filtered	E R	4/5								ļ	1	ļ	Total Number							
		Sample	(C=comp, (G=grab) BT=	S=solid, l=waste/oil,	힐	2 0	152/	- 1																	
Sample Identification - Client ID (Lab ID)	Sample Date	Time			闖	8 8	显	23000						80000				<u>Lº</u>		Spec	ial Ins	truction	ns/Note:		
		14,00	Preservatio	n Code:	X	$A_{\!\perp}$	4		_									$-\!$	4_						
P2-SB-21 (570-229049-10)	5/1/25	11:00 Pacific	G	Solid			X											1							
					П									İ		İ									
2 2000					H	\dashv	+	_	+	+				\dashv	1	1	$-\dagger$								
					H	\dashv	\perp	_	-		+														
					Ш												\perp								
					$\ \ $										1	İ									
					П				\top																
- Landan - L					╂╢	\dashv	-	+	-	+					-	\dashv		-							
					Ш	1	_		\bot	1		ļ			_										
					П																				
					П	П																			
			1 1 1								Thin a			ant in		l	LLLL.	oboin of	f ouata	du If the	laborate	nı doos n	at ourrantly		
Note: Since laboratory accreditations are subject to change, Eurofins Calscie maintain accreditation in the State of Origin listed above for analysis/tests/m	atrix being analyzed, the s	samples must b	e shipped back to	the Eurofin	s Cals	scienc	e labo	ratory	or othe	atones. er instru	ctions v	will be	provid	led. A	ny cha	anges	to acc	reditatio	on stat	us should	be brou	ght to Eur	ofins Calsc	ience	
attention immediately. If all requested accreditations are current to date, retr	urn the signed Chain of C	ustody attesting	to said compliand	e to Eurofir	ns Cal	Iscienc	:e.																		
Possible Hazard Identification						Sam	ple l	Dispo	sal (A fee	may	be a	sses	sed .	if saı	mple	s are				han 1	month)			
Unconfirmed								turn T			٠		Dispo.	sal B	y Lal	b	L	Arc	chive	For		Mon	ths		
Deliverable Requested I, II, III, IV, Other (specify)	Primary Delive	rable Rank:	2			Spec	ciai ii	nstruc	ctions	/QC F	(equir	eme	nts:												
Empty Kit Relinquished by:		Date:			Tir	ne:								Metho	od of S	Shipm	ent:								
Relinquished by:	Date/Time:	1 :	Nec / Co	mpany	-	F	Receiv	ed by:	M.	Pin	otto	·				Da	AY	0 6	\$ 21	17500	ZÍA	Compan	у		
	55 Date/Time:	1()4V	mpany													/Time:	D. E	J 2.1	12001	<u>) </u>	Compan	v		
Relinquished by:	Date/Time.			mpany			100011	, cu b,	Mea	dow	Pine	eme				Du.o.							,		
Relinquished by:	Date/Time:		Co	mpany		F	Receiv	ved by:								Date	/Time:	-				Compan	у		
Custody Social Intests Custody Social No.:			i				Coole	r Temp	eratur	e(s) °C	and Off	her Re	emarks									Ь			
Custody Seals Intact: Custody Seal No.: Δ Yes Δ No						[J, Jiuli	_,,,															
		****	***************************************																			Ver: 10	/10/2024		













Client: GSI Environmental Inc

Job Number: 570-229049-1

Login Number: 229049 List Source: Eurofins Calscience

List Number: 1 Creator: Patel, Jayesh

Creator: Patei, Jayesii		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Client: GSI Environmental Inc

Job Number: 570-229049-1

List Source: Eurofins St. Louis
List Number: 2
List Creation: 05/06/25 11:19 AM

Creator: Pinette, Meadow L

Answer Comment	
True	
True	
True	
True	
N/A	
True	
N/A	
True	
N/A	
True	
N/A	
True	
True	
N/A	
	True True True True N/A True True True True True True True True

GSI Job No.: 10008



SITE INVESTIGATION COMPLETION REPORT Former Albany Landfill (Albany Bulb)

End of Buchanan Street Albany, CA

APPENDIX J

RESRAD Model Results

Summary : RESRAD Default Parameters

File : C:\RESRAD_FAMILY\ONSITE\7.2\USERFILES\SITE1.RAD

Table of Contents

Part I: Mixture Sums and Single Radionuclide Guidelines

Dose Conversion Factor (and Related) Parameter Summary	2
Site-Specific Parameter Summary	6
Summary of Pathway Selections	12
Contaminated Zone and Total Dose Summary	13
Total Dose Components	
Time = 0.000E+00	14
Time = 1.000E+00	15
Time = 3.000E+00	16
Time = 1.000E+01	17
Time = 3.000E+01	18
Time = 1.000E+02	19
Time = 3.000E+02	20
Time = 1.000E+03	21
Dose/Source Ratios Summed Over All Pathways	22
Single Radionuclide Soil Guidelines	23
Dose Per Nuclide Summed Over All Pathways	24
Soil Concentration Per Nuclide	25

Summary : RESRAD Default Parameters

File : C:\RESRAD_FAMILY\ONSITE\7.2\USERFILES\SITE1.RAD

Dose Conversion Factor (and Related) Parameter Summary Dose Library: DOE STD-1196-2011 (Reference Person)

| Current | Base | Parameter

	I	Carrene	Dabe	rarameter	
Menu	Parameter	Value#	Case*	Name	
A-1	DCF's for external ground radiation, (mrem/yr)/(pCi/g)	1		•
A-1	Ac-228 (Source: DCFPAK3.02)	5.044E+00	5.044E+00	DCF1(1)	
A-1	At-218 (Source: DCFPAK3.02)	5.567E-05	5.567E-05	DCF1(2)	
A-1	Bi-210 (Source: DCFPAK3.02)	5.473E-03	5.473E-03	DCF1(3)	
A-1	Bi-212 (Source: DCFPAK3.02)	6.258E-01	6.258E-01	DCF1(4)	
A-1	Bi-214 (Source: DCFPAK3.02)	9.135E+00	9.135E+00	DCF1(5)	
A-1	Eu-152 (Source: DCFPAK3.02)	6.743E+00	6.743E+00	DCF1(6)	
A-1	Gd-152 (Source: DCFPAK3.02)	0.000E+00	0.000E+00	DCF1(7)	
A-1	Hg-206 (Source: DCFPAK3.02)	6.127E-01	6.127E-01	DCF1(8)	
A-1	Nd-144 (Source: DCFPAK3.02)	0.000E+00	0.000E+00	DCF1(9)	
A-1	Pa-234 (Source: DCFPAK3.02)	8.275E+00	8.275E+00	DCF1(10)	
A-1	Pa-234m (Source: DCFPAK3.02)	1.257E-01	1.257E-01	DCF1(11)	
A-1	Pb-210 (Source: DCFPAK3.02)	2.092E-03	2.092E-03	DCF1(12)	
A-1	Pb-212 (Source: DCFPAK3.02)	6.314E-01	6.314E-01	DCF1(13)	
A-1	Pb-214 (Source: DCFPAK3.02)	1.257E+00	1.257E+00	DCF1(14)	
A-1	Po-210 (Source: DCFPAK3.02)	5.641E-05	5.641E-05	DCF1(15)	
A-1	Po-212 (Source: DCFPAK3.02)	0.000E+00	0.000E+00	DCF1(16)	
A-1	Po-214 (Source: DCFPAK3.02)	4.801E-04	4.801E-04	DCF1(17)	
A-1	Po-216 (Source: DCFPAK3.02)	8.873E-05	8.873E-05	DCF1(18)	
A-1	Po-218 (Source: DCFPAK3.02)	9.228E-09	9.228E-09	DCF1(19)	
A-1	Ra-224 (Source: DCFPAK3.02)	4.950E-02	4.950E-02	DCF1(20)	
A-1	Ra-226 (Source: DCFPAK3.02)	3.176E-02	3.176E-02	DCF1(21)	
A-1	Ra-228 (Source: DCFPAK3.02)	6.575E-05	6.575E-05	DCF1(22)	
A-1	Rn-218 (Source: DCFPAK3.02)	4.259E-03	4.259E-03	DCF1(23)	
A-1	Rn-220 (Source: DCFPAK3.02)	3.474E-03	3.474E-03	DCF1(24)	
A-1	Rn-222 (Source: DCFPAK3.02)		2.130E-03	DCF1(25)	
A-1	Sm-148 (Source: DCFPAK3.02)		0.000E+00	DCF1(26)	
	Th-228 (Source: DCFPAK3.02)		7.248E-03	. , ,	
A-1	Th-230 (Source: DCFPAK3.02)		1.106E-03		
A-1	Th-232 (Source: DCFPAK3.02)	!	4.782E-04		
A-1	Th-234 (Source: DCFPAK3.02)		2.316E-02		
A-1	T1-206 (Source: DCFPAK3.02)		1.278E-02		
A-1	T1-208 (Source: DCFPAK3.02)		2.167E+01		
A-1	T1-210 (Source: DCFPAK3.02)	'	1.677E+01		
A-1	U-234 (Source: DCFPAK3.02)	·	3.456E-04		
A-1	U-238 (Source: DCFPAK3.02)	!	1.713E-04	, ,	
-z - T	(Source: Defraction)		1.7135-04	DOFT(33)	
3-1	Dose conversion factors for inhalation	, mrem/pCi:	İ		
3-1	Eu-152	3.674E-04	3.674E-04	DCF2(1)	
3-1	Gd-152	7.437E-02	7.437E-02	DCF2(3)	
3-1	Nd-144	7.437E-02	7.437E-02	DCF2(4)	
3-1	Pb-210+D	4.017E-02	2.231E-02	DCF2(5)	
3-1	Ra-226+D	3.823E-02	3.811E-02	DCF2(6)	
3-1	Ra-228+D	6.333E-02	6.327E-02	DCF2(7)	
3-1	Sm-148	7.770E-02	7.770E-02	DCF2(8)	
3-1	Th-228+D	1.753E-01	1.610E-01	DCF2(9)	
3-1	Th-230	3.848E-01	3.848E-01	DCF2(10)	
3-1	Th-232	4.255E-01	4.255E-01	DCF2(11)	
3-1	U-234	3.737E-02	3.737E-02	DCF2(12)	
3-1	U-238	3.212E-02	3.212E-02	DCF2(13)	
,		·			

RESRAD-ONSITE, Version 7.2 T^{1}_{2} Limit = 180 days 06/11/2025 18:06 Page 3

Summary : RESRAD Default Parameters

File : C:\RESRAD_FAMILY\ONSITE\7.2\USERFILES\SITE1.RAD

Dose Conversion Factor (and Related) Parameter Summary (continued)

Dose Library: DOE STD-1196-2011 (Reference Person)

			Current	Base	Parameter
Menu		Parameter	Value#	Case*	Name
s-1	U-238+D		3.215E-02	3.212E-02	DCF2(14)
 -1	Dose conv	ersion factors for ingestion, mrem/pCi:	1	 	
)-1	Eu-152		6.438E-06	6.438E-06	DCF3(1)
)-1	Gd-152		1.968E-04	1.968E-04	DCF3(3)
)-1	Nd-144		1.954E-04	1.954E-04	DCF3(4)
0-1	Pb-210+D		1.026E-02	3.774E-03	DCF3(5)
0-1	Ra-226+D		1.677E-03	1.676E-03	DCF3(6)
0-1	Ra-228+D		5.922E-03	5.920E-03	DCF3(7)
0-1	Sm-148		2.035E-04	2.035E-04	DCF3(8)
)-1	Th-228+D		9.348E-04	4.292E-04	DCF3(9)
)-1	Th-230		9.361E-04	9.361E-04	DCF3(10)
)-1	Th-232		1.029E-03	1.029E-03	DCF3(11)
)-1	U-234		2.150E-04	2.150E-04	DCF3(12)
)-1	U-238		1.939E-04	1.939E-04	DCF3(13)
⊃-1 	U-238+D		2.112E-04	1.939E-04	DCF3(14)
i			İ		, , , ,
D-34	Food tran	sfer factors:	İ		
D-34	Eu-152	, plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(1,1)
D-34	Eu-152	, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03		RTF(1,2)
5-34 	Eu-152	, milk/livestock-intake ratio, (pCi/L)/(pCi/d)		5.000E-05	
0-34 		, , , , , , , , , , , , , , , , , , , ,	1		l
D-34	Gd-152	, plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(3,1)
5-34 	Gd-152	, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)		2.000E-03	
5-34 	Gd-152	<pre>, milk/livestock-intake ratio, (pCi/L)/(pCi/d)</pre>		2.000E-05	
D-34	04 102	, with the second industry (point) (point)	1		1111 (0 , 07
5-34 	Nd-144	, plant/soil concentration ratio, dimensionless	2.400E-03	1 2.400E-03	RTF(4,1)
5-34 	Nd-144	, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03		RTF(4,2)
5-34 	Nd-144	, milk/livestock-intake ratio, (pCi/L)/(pCi/d)		2.000E-05	RTF(4,3)
0-34 		, , , , , , , , , , , , , , , , , , , ,	1	 	l
D-34	Pb-210+D	, plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(5,1)
D-34	Pb-210+D	, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)		8.000E-04	
D-34	Pb-210+D	, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(5,3)
D-34			i		
D-34	Ra-226+D	, plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(6,1)
)-34	Ra-226+D	, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(6,2)
D-34	Ra-226+D	, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(6,3)
)-34			i		
D-34	Ra-228+D	, plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(7,1)
D-34	Ra-228+D	, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(7,2)
D-34	Ra-228+D	, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	•	RTF(7,3)
D-34	· 		i		
o-34	Sm-148	, plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(8,1)
D-34	Sm-148	, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)		2.000E-03	
D-34	Sm-148	, milk/livestock-intake ratio, (pCi/L)/(pCi/d)		2.000E-05	
0-34		- NA	İ		
0-34		, plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(9,1)
0-34		, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)		1.000E-04	
0-34	Th-228+D	, milk/livestock-intake ratio, (pCi/L)/(pCi/d)		5.000E-06	
	•		•		

RESRAD-ONSITE, Version 7.2 $ext{T}_2$ Limit = 180 days $ext{06/11/2025}$ 18:06 Page 4

Summary : RESRAD Default Parameters

File : C:\RESRAD_FAMILY\ONSITE\7.2\USERFILES\SITE1.RAD

Dose Conversion Factor (and Related) Parameter Summary (continued)

Dose Library: DOE STD-1196-2011 (Reference Person)

Menu	 	Parameter	Current Value#	Base Case*	Parameter Name
D-34	Th-230	, plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(10,1)
D-34	Th-230	, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(10,2)
D-34 D-34		, milk/livestock-intake ratio, (pCi/L)/(pCi/d) $$	5.000E-06	5.000E-06	RTF(10,3)
D-34		, plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	 RTF(11,1)
D-34	Th-232	, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(11,2)
D-34	Th-232	, milk/livestock-intake ratio, $(pCi/L)/(pCi/d)$	5.000E-06	5.000E-06	RTF(11,3)
D-34			I	I	I
D-34	U-234	, plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(12,1)
D-34	U-234	, beef/livestock-intake ratio, $(pCi/kg)/(pCi/d)$	3.400E-04	3.400E-04	RTF(12,2)
D-34	U-234	, milk/livestock-intake ratio, $(pCi/L)/(pCi/d)$	6.000E-04	6.000E-04	RTF(12,3)
D-34			I	I	l
D-34	U-238	, plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(13,1)
D-34	U-238	, beef/livestock-intake ratio, $(pCi/kg)/(pCi/d)$	3.400E-04	3.400E-04	RTF(13,2)
D-34	U-238	, milk/livestock-intake ratio, $(pCi/L)/(pCi/d)$	6.000E-04	6.000E-04	RTF(13,3)
D-34					I
D-34	U-238+D	, plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(14,1)
D-34	U-238+D	, beef/livestock-intake ratio, $(pCi/kg)/(pCi/d)$	3.400E-04	3.400E-04	RTF(14,2)
D-34	U-238+D	, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(14,3)
D-5	Bioaccumu	lation factors, fresh water, L/kg:			
D-5	Eu-152	, fish	5.000E+01	5.000E+01	BIOFAC(1,1)
D-5 D-5	Eu-152	, crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(1,2)
D-5	Gd-152	, fish	2.500E+01	2.500E+01	BIOFAC(3,1)
D-5	Gd-152	, crustacea and mollusks	•	1.000E+03	
D-5		,	I	I	1
D-5	Nd-144	, fish	1.000E+02	1.000E+02	BIOFAC(4,1)
D-5	Nd-144	, crustacea and mollusks	1.000E+03	1.000E+03	
D-5	· 		İ	I	
D-5	Pb-210+D	, fish	3.000E+02	3.000E+02	BIOFAC(5,1)
D-5	Pb-210+D	, crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(5,2)
D-5	· 		ĺ	l	
D-5	Ra-226+D	, fish	5.000E+01	5.000E+01	BIOFAC(6,1)
D-5	Ra-226+D	, crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(6,2)
D-5			I	I	1
D-5	Ra-228+D	, fish	5.000E+01	5.000E+01	BIOFAC(7,1)
D-5	Ra-228+D	, crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(7,2)
D-5			I	I	1
D-5	Sm-148	, fish	2.500E+01	2.500E+01	BIOFAC(8,1)
D-5	Sm-148	, crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(8,2)
D-5					I
D-5	Th-228+D	, fish	1.000E+02	1.000E+02	BIOFAC(9,1)
D-5	Th-228+D	, crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(9,2)
D-5					I
D-5	Th-230	, fish	1.000E+02	1.000E+02	BIOFAC(10,1)
D-5	Th-230	, crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(10,2)
D-5					I
D-5	Th-232	, fish	1.000E+02	1.000E+02	BIOFAC(11,1)
D-5	Th-232	, crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(11,2)

RESRAD-ONSITE, Version 7.2 $T^{1/2}$ Limit = 180 days 06/11/2025 18:06 Page 5

Summary : RESRAD Default Parameters

File : C:\RESRAD_FAMILY\ONSITE\7.2\USERFILES\SITE1.RAD

Dose Conversion Factor (and Related) Parameter Summary (continued) Dose Library: DOE STD-1196-2011 (Reference Person)

I			Current	Base	Parameter
Menu		Parameter	Value#	Case*	Name
D-5	U-234	, fish	1.000E+01	1.000E+01	BIOFAC(12,1)
D-5	U-234	, crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(12,2)
D-5					l
D-5	U-238	, fish	1.000E+01	1.000E+01	BIOFAC(13,1)
D-5	U-238	, crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(13,2)
D-5					l
D-5	U-238+D	, fish	1.000E+01	1.000E+01	BIOFAC(14,1)
D-5	U-238+D	, crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(14,2)

#For DCF1(xxx) only, factors are for infinite depth & area. See ETFG table in Ground Pathway of Detailed Report.

^{*}Base Case means Default.Lib w/o Associate Nuclide contributions.

Summary : RESRAD Default Parameters

File : C:\RESRAD_FAMILY\ONSITE\7.2\USERFILES\SITE1.RAD

Site-Specific Parameter Summary

Menu	Parameter	User Input	 Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	1.000E+02	1.000E+04		AREA
R011	Thickness of contaminated zone (m)	1.000E+00	2.000E+00		THICKO
R011	Fraction of contamination that is submerged	0.000E+00	0.000E+00		SUBMFRACT
R011	Length parallel to aquifer flow (m)	not used	1.000E+02		LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	3.000E+01		BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00		TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00		T(2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00		T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01		T(4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01		T(5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02		Т(6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02		Т(7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03		T(8)
R011	Times for calculations (yr)	not used	0.000E+00		Т(9)
R011	-	not used	0.000E+00		T(10)
	, ,	1		' 	
R012	Initial principal radionuclide (pCi/q): Eu-152	2.250E-01	0.000E+00	' 	S1(1)
R012	Initial principal radionuclide (pCi/g): Pb-210	•	0.000E+00		S1(5)
R012	Initial principal radionuclide (pCi/g): Ra-226		0.000E+00		S1(6)
R012	1 1 1	•	0.000E+00		S1(0) S1(7)
R012		•	0.000E+00	•	S1(7)
R012	1 1 1	•	0.000E+00		S1(10)
R012		1.010E+00			
				1	S1(11)
R012	Initial principal radionuclide (pCi/g): U-234	2.650E+00			S1(12)
R012		2.650E+00			S1(13)
R012		not used	0.000E+00		W1 (1)
R012		not used	0.000E+00		W1 (5)
R012		not used	0.000E+00	1	W1 (6)
R012		not used	0.000E+00		W1(7)
R012		not used	0.000E+00		W1 (9)
R012		not used	0.000E+00		W1(10)
	Concentration in groundwater (pCi/L): Th-232	•	0.000E+00	•	W1(11)
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00		W1(12)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00		W1(13)
R013		0.000E+00	0.000E+00		COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00		DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03		VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00		DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03		VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01		TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01		FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01		HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00		BCZ
R013	Average annual wind speed (m/sec)	2.000E+00	2.000E+00		WIND
R013	Humidity in air $(g/m**3)$	not used	8.000E+00		HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01		EVAPTR
R013	Precipitation (m/yr)	1.000E+00	1.000E+00		PRECIP
R013	Irrigation (m/yr)	2.000E-01	2.000E-01		RI
R013	Irrigation mode	overhead	overhead		IDITCH
			'		

Summary : RESRAD Default Parameters

File : C:\RESRAD_FAMILY\ONSITE\7.2\USERFILES\SITE1.RAD

Menu	Parameter	User Input	 Default	Used by RESRAD (If different from user input)	Parameter Name
R013	Runoff coefficient	2.000E-01	2.000E-01		RUNOFF
R013	Watershed area for nearby stream or pond $(m^{**}2)$	not used	1.000E+06	ļ	WAREA
R013	Accuracy for water/soil computations	not used	1.000E-03		EPS
R014	Density of saturated zone (g/cm**3)	not used	1.500E+00	 	DENSAQ
R014	Saturated zone total porosity	not used	4.000E-01		TPSZ
R014	Saturated zone effective porosity	not used	2.000E-01		EPSZ
R014	Saturated zone field capacity	not used	2.000E-01		FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	not used	1.000E+02		HCSZ
R014	Saturated zone hydraulic gradient	not used	2.000E-02		HGWT
R014	Saturated zone b parameter	not used	5.300E+00		BSZ
R014	Water table drop rate (m/yr)	not used	1.000E-03		VWT
R014	Well pump intake depth (m below water table)	not used	1.000E+01		DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	not used	ND		MODEL
R014	Well pumping rate (m**3/yr)	not used	2.500E+02		UW
-045					
R015		not used	1		NS
R015	, , ,	not used	4.000E+00	ı	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	not used	1.500E+00	!	DENSUZ(1)
R015		not used	4.000E-01		TPUZ(1)
R015	·	not used	2.000E-01		EPUZ(1)
	Unsat. zone 1, field capacity	not used	2.000E-01		FCUZ(1)
R015		not used	5.300E+00		BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	not used	1.000E+01	 	HCUZ(1)
R016	Distribution coefficients for Eu-152			' 	
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	not used	-1.000E+00		DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	not used	-1.000E+00		DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.040E-04	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for Pb-210	 		 	
R016		1.000E+02	1.000E+02		DCNUCC(5)
R016			1.000E+02		DCNUCU(5,1)
R016			1.000E+02		DCNUCS(5)
R016	, , , , , , , , , , , , , , , , , , , ,		0.000E+00		ALEACH(5)
R016			0.000E+00		SOLUBK(5)
0016	Distribution coefficient for D. 220				
R016		I 7 000B101	I 7 000B:01	I I	DOMINGO (C)
R016			7.000E+01		DCNUCC (6)
R016			7.000E+01		DCNUCU(6,1)
R016			7.000E+01		DCNUCS (6)
R016			0.000E+00		ALEACH (6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)

RESRAD-ONSITE, Version 7.2 $ext{T}_2$ Limit = 180 days $ext{06/11/2025}$ 18:06 Page 8

Summary : RESRAD Default Parameters

File : C:\RESRAD_FAMILY\ONSITE\7.2\USERFILES\SITE1.RAD

		User		Used by RESRAD	Parameter
enu	Parameter	Input	Default	(If different from user input)	Name
016	Distribution coefficients for Ra-228				<u> </u>
16	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01		DCNUCC(7)
16	Unsaturated zone 1 (cm**3/g)	not used	7.000E+01		DCNUCU(7,1
16	Saturated zone (cm**3/g)	not used	7.000E+01		DCNUCS(7)
16	Leach rate (/yr)	0.000E+00	0.000E+00	4.747E-03	ALEACH(7)
16	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
16	Distribution coefficients for Th-228		 	 	
16	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04		DCNUCC(9)
16	Unsaturated zone 1 (cm**3/g)	not used	6.000E+04		DCNUCU(9,
16	Saturated zone (cm**3/g)	not used	6.000E+04		DCNUCS(9)
16	Leach rate (/yr)	0.000E+00	0.000E+00	5.556E-06	ALEACH(9)
16	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(9)
16	Distribution coefficients for Th-230		1	 	
16	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04		DCNUCC(10)
16	Unsaturated zone 1 (cm**3/g)	not used	6.000E+04		DCNUCU(10,
16	Saturated zone (cm**3/g)	not used	6.000E+04		DCNUCS(10)
16	Leach rate (/yr)	0.000E+00	0.000E+00	5.556E-06	ALEACH(10)
16	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(10)
16	Distribution coefficients for Th-232		 	 	
16	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04		DCNUCC(11)
16	Unsaturated zone 1 (cm**3/g)	not used	6.000E+04		DCNUCU(11,
16	Saturated zone (cm**3/g)	not used	6.000E+04		DCNUCS(11)
16	Leach rate (/yr)	0.000E+00	0.000E+00	5.556E-06	ALEACH(11)
16	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(11)
16	Distribution coefficients for U-234		 	 	
16	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01		DCNUCC(12)
16	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01		DCNUCU(12,
16	Saturated zone (cm**3/g)	not used	5.000E+01		DCNUCS(12)
16	Leach rate (/yr)	0.000E+00	0.000E+00	6.638E-03	ALEACH(12)
16	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(12)
16	Distribution coefficients for U-238	 	<u> </u>	 	1
16	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01		DCNUCC(13)
16	Unsaturated zone 1 (cm**3/g)	not used	5.000E+01		DCNUCU(13,
16	Saturated zone (cm**3/g)	not used	5.000E+01		DCNUCS(13)
16	Leach rate (/yr)	0.000E+00	0.000E+00	6.638E-03	ALEACH(13)
16	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(13)
16	Distribution coefficients for daughter Gd-152	1		 	
16	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCC(3)
16	Unsaturated zone 1 (cm**3/g)	not used	-1.000E+00		DCNUCU(3,
16	Saturated zone (cm**3/g)	not used	-1.000E+00		DCNUCS (3)
16	Leach rate (/yr)	0.000E+00	0.000E+00	4.040E-04	ALEACH(3)
16	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)

Summary : RESRAD Default Parameters

File : C:\RESRAD_FAMILY\ONSITE\7.2\USERFILES\SITE1.RAD

Menu	Parameter	Input	Dofo1+	1 4-6 1166 . 6	
		1 Inpac	Default	(If different from user input)	Name
016	Distribution coefficients for daughter Nd-144	 	 		
016	Contaminated zone (cm**3/g)	1.580E+02	1.580E+02		DCNUCC(4)
016	Unsaturated zone 1 (cm**3/g)	not used	1.580E+02		DCNUCU(4,1)
016	Saturated zone (cm**3/g)	not used	1.580E+02		DCNUCS(4)
016	Leach rate (/yr)	0.000E+00	0.000E+00	2.107E-03	ALEACH(4)
.016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)
 016.	Distribution coefficients for daughter Sm-148		 	 	
.016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCC(8)
016	Unsaturated zone 1 (cm**3/g)	not used	-1.000E+00		DCNUCU(8,1)
016	Saturated zone (cm**3/g)	not used	-1.000E+00		DCNUCS(8)
016	Leach rate (/yr)	0.000E+00	0.000E+00	4.040E-04	ALEACH(8)
.016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)
1		1		1	I
017	Inhalation rate (m**3/yr)	not used	8.400E+03		INHALR
.017	Mass loading for inhalation $(g/m**3)$	not used	1.000E-04		MLINH
.017	Exposure duration	3.000E+01	3.000E+01		ED
.017	Shielding factor, inhalation	not used	4.000E-01		SHF3
.017	Shielding factor, external gamma	7.000E-01	7.000E-01		SHF1
.017	Fraction of time spent indoors	0.000E+00	5.000E-01		FIND
017	Fraction of time spent outdoors (on site)	3.300E-02	2.500E-01		FOTD
017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS
017	Radii of shape factor array (used if FS = -1):	İ	i I		I
017	Outer annular radius (m), ring 1:	not used	5.000E+01		RAD SHAPE(
017	Outer annular radius (m), ring 2:	not used	7.071E+01		RAD SHAPE(
017	Outer annular radius (m), ring 3:	not used	0.000E+00		RAD SHAPE(
017	Outer annular radius (m), ring 4:	not used	0.000E+00		RAD SHAPE(
017	Outer annular radius (m), ring 5:	not used	0.000E+00		RAD SHAPE(
017	Outer annular radius (m), ring 6:	not used	0.000E+00		RAD SHAPE(
017	Outer annular radius (m), ring 7:	not used	0.000E+00		RAD SHAPE(
017	Outer annular radius (m), ring 8:	not used	0.000E+00		RAD SHAPE(
017	Outer annular radius (m), ring 9:	not used	0.000E+00		RAD SHAPE(
017	Outer annular radius (m), ring 10:	not used	0.000E+00		RAD_SHAPE(1
017		not used	0.000E+00		RAD SHAPE(1
017		not used	0.000E+00		RAD_SHAPE(1
 017	Fractions of annular areas within AREA:	 	 	[[
017	Ring 1	not used	1.000E+00		FRACA(1)
017	Ring 2	not used	2.732E-01		FRACA(2)
017	Ring 3	not used	0.000E+00		FRACA(3)
017	Ring 4	not used	0.000E+00		FRACA(4)
017	Ring 5	not used	0.000E+00		FRACA(5)
) 17	Ring 6	not used	0.000E+00		FRACA(6)
017 	Ring 7	not used	0.000E+00		FRACA(7)
017	Ring 8	not used	0.000E+00		FRACA(8)
017		not used	0.000E+00	·	FRACA(9)
017	-	not used	0.000E+00	·	FRACA(10)
017		not used	0.000E+00		FRACA(11)
	Ring 12	not used	0.000E+00	·	FRACA(12)

Summary : RESRAD Default Parameters

File : C:\RESRAD_FAMILY\ONSITE\7.2\USERFILES\SITE1.RAD

		User	1	Used by RESRAD	Parameter
enu	Parameter	Input	Default	(If different from user input)	Name
018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02		DIET(1)
18	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	' 	DIET(2)
18	Milk consumption (L/yr)	not used	9.200E+01	 	DIET(3)
18	Meat and poultry consumption (kg/yr)	not used	6.300E+01		DIET(4)
18	Fish consumption (kg/yr)	not used	5.400E+00		DIET(5)
18	Other seafood consumption (kg/yr)	not used	9.000E-01		DIET(6)
18	Soil ingestion rate (g/yr)	not used	3.650E+01		SOIL
18	Drinking water intake (L/yr)	not used	5.100E+02	'	DWI
18		not used	1.000E+00		FDW
18	-	not used	1.000E+00		· FHHW
L8		not used	1.000E+00	' 	 FLW
L8	Contamination fraction of irrigation water	not used	1.000E+00	' 	 FIRW
L8	Contamination fraction of aquatic food	not used	5.000E-01	' 	FR9
L8	Contamination fraction of plant food	not used	-1	' 	FPLANT
.8	Contamination fraction of meat	not used	-1	' 	FMEAT
18		not used	-1	' 	FMILK
			1	' 	
L9	Livestock fodder intake for meat (kg/day)	l not used	6.800E+01	' 	LFI5
L9		not used	5.500E+01		 LFI6
L9	1 3. 2.	not used	5.000E+01		LWI5
9	Livestock water intake for milk (L/day)	not used	1.600E+02		LWI6
9	Livestock soil intake (kg/day)	not used	5.000E-01		LSI
9	Mass loading for foliar deposition (g/m**3)	not used	1.000E-04		MLFD
.9	Depth of soil mixing layer (m)	not used	1.500E-01	 	DM
9	Depth of roots (m)	not used	9.000E-01	' 	DROOT
L9	Drinking water fraction from ground water	not used	1.000E+00		FGWDW
19	Household water fraction from ground water	not used	1.000E+00		FGWHH
19	Livestock water fraction from ground water	not used	1.000E+00		FGWLW
19	· ·	not used	1.000E+00	' 	FGWIR
	TITIGUETON TIUCCION TIOM GIOUNA WACCI				
9в	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01		YV(1)
)B	Wet weight crop yield for Leafy $(kg/m**2)$	not used	1.500E+00		YV(2)
9в	Wet weight crop yield for Fodder $(kg/m**2)$	not used	1.100E+00		YV(3)
ЭВ	Growing Season for Non-Leafy (years)	not used	1.700E-01		TE(1)
9в	Growing Season for Leafy (years)	not used	2.500E-01		TE(2)
)B	Growing Season for Fodder (years)	not used	8.000E-02		TE(3)
9в	Translocation Factor for Non-Leafy	not used	1.000E-01		TIV(1)
ЭВ	Translocation Factor for Leafy	not used	1.000E+00		TIV(2)
ЭВ	Translocation Factor for Fodder	not used	1.000E+00		TIV(3)
9в	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01		RDRY(1)
9в	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01		RDRY(2)
9в	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01		RDRY(3)
9в	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01		RWET(1)
9в	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01		RWET(2)
9в	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01		RWET(3)
9в	Weathering Removal Constant for Vegetation	not used	2.000E+01		WLAM
			1	I	
4	C-12 concentration in water (g/cm**3)	not used	2.000E-05		C12WTR
4	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02		C12CZ
4	Fraction of vegetation carbon from soil	not used	2.000E-02	I	CSOIL

Summary : RESRAD Default Parameters

File : C:\RESRAD_FAMILY\ONSITE\7.2\USERFILES\SITE1.RAD

		User	1	Used by RESRAD	Parameter
enu	Parameter	Input	Default	(If different from user input)	Name
14	Fraction of vegetation carbon from air	not used	9.800E-01		CAIR
14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01		DMC
L 4	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07		EVSN
. 4	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10		REVSN
. 4	Fraction of grain in beef cattle feed	not used	8.000E-01		AVFG4
4	Fraction of grain in milk cow feed	not used	2.000E-01		AVFG5
'OR	Storage times of contaminated foodstuffs (days):	 	 	 	
'OR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01		STOR_T(1)
OR	Leafy vegetables	1.000E+00	1.000E+00		STOR_T(2)
OR	Milk	1.000E+00	1.000E+00		STOR_T(3)
'OR	Meat and poultry	2.000E+01	2.000E+01		STOR_T(4)
OR	Fish	7.000E+00	7.000E+00		STOR_T(5)
OR	Crustacea and mollusks	7.000E+00	7.000E+00		STOR_T(6)
OR	Well water	1.000E+00	1.000E+00		STOR_T(7)
OR	Surface water	1.000E+00	1.000E+00		STOR_T(8)
OR	Livestock fodder	4.500E+01	4.500E+01		STOR_T(9)
21	Thickness of building foundation (m)	 not used	1.500E-01	 	 FLOOR1
21	Bulk density of building foundation (g/cm**3)	not used	2.400E+00		DENSFL
21	Total porosity of the cover material	not used	4.000E-01		TPCV
21	Total porosity of the building foundation	not used	1.000E-01		TPFL
21	Volumetric water content of the cover material	not used	5.000E-02		PH2OCV
21	Volumetric water content of the foundation	not used	3.000E-02		PH2OFL
21	Diffusion coefficient for radon gas (m/sec):	I	I	I	
21	in cover material	not used	2.000E-06		DIFCV
21	in foundation material	not used	3.000E-07		DIFFL
21	in contaminated zone soil	not used	2.000E-06		DIFCZ
21	Radon vertical dimension of mixing (m)	not used	2.000E+00		HMIX
21	Average building air exchange rate (1/hr)	not used	5.000E-01		REXG
21	Height of the building (room) (m)	not used	2.500E+00		HRM
21	Building interior area factor	not used	0.000E+00		FAI
21	Building depth below ground surface (m)	not used	-1.000E+00		DMFL
21	Emanating power of Rn-222 gas	not used	2.500E-01		EMANA(1)
21	Emanating power of Rn-220 gas	not used	1.500E-01		EMANA(2)
TL	Number of graphical time points	 32		 	 NPTS
TL	Maximum number of integration points for dose	17			LYMAX
TL		257	· 		KYMAX
	· · · · · · · · · · · · · · · · · · ·				

Summary : RESRAD Default Parameters

File : C:\RESRAD_FAMILY\ONSITE\7.2\USERFILES\SITE1.RAD

Summary of Pathway Selections

Pathway	User Selection
1 external gamma 2 inhalation (w/o radon) 3 plant ingestion 4 meat ingestion 5 milk ingestion	active suppressed suppressed suppressed suppressed
6 aquatic foods 7 drinking water 8 soil ingestion 9 radon Find peak pathway doses	suppressed suppressed suppressed suppressed suppressed suppressed

Summary : RESRAD Default Parameters

File : C:\RESRAD_FAMILY\ONSITE\7.2\USERFILES\SITE1.RAD

Contamin	ated Zone	Dimensions	Initial Soil Co	ncentrations, pCi/g
Area:	100.00	square meters	Eu-152	2.250E-01
Thickness:	1.00	meters	Pb-210	2.650E+00
Cover Depth:	0.00	meters	Ra-226	2.650E+00
			Ra-228	1.010E+00
			Th-228	1.010E+00
			Th-230	2.650E+00
			Th-232	1.010E+00
			U-234	2.650E+00
			U-238	2.650E+00

Total Dose TDOSE(t), mrem/yr

Basic Radiation Dose Limit = 2.500E+01 mrem/yr

Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years): 0.000E+00 1.000E+00 3.000E+00 1.000E+01 3.000E+01 1.000E+02 3.000E+02 1.000E+03 TDOSE(t): 1.143E+00 1.136E+00 1.124E+00 1.084E+00 1.002E+00 8.179E-01 5.587E-01 0.000E+00

Maximum TDOSE(t): 1.143E+00 mrem/yr at t = 0.000E+00 years

Summary : RESRAD Default Parameters

File : C:\RESRAD_FAMILY\ONSITE\7.2\USERFILES\SITE1.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p) As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhala	tion	Rado	on	Plan	nt	Meat	Ę	Mil	ς	Soil	-
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Eu-152	3.836E-02	0.0336	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pb-210	5.575E-04	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	7.204E-01	0.6305	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-228	1.613E-01	0.1412	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-228	2.013E-01	0.1762	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	2.372E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	9.212E-03	0.0081	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-234	2.979E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	1.123E-02	0.0098	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	1.143E+00	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p) As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

	Wate	er	Fis	n	Rado	on	Plan	nt	Meat	5	Mill	k	All Path	nways*
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.836E-02	0.0336
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.575E-04	0.0005
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.204E-01	0.6305
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.613E-01	0.1412
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.013E-01	0.1762
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.372E-04	0.0002
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.212E-03	0.0081
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.979E-05	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.123E-02	0.0098
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.143E+00	1.0000

^{*}Sum of all water independent and dependent pathways.

Summary : RESRAD Default Parameters

File : C:\RESRAD_FAMILY\ONSITE\7.2\USERFILES\SITE1.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p) As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		round Inhalation		Rado	Radon		nt	Meat	5	Mil	ς	Soil	-
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Eu-152	3.643E-02	0.0321	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pb-210	5.385E-04	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	7.167E-01	0.6307	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-228	1.996E-01	0.1757	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-228	1.401E-01	0.1233	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	5.485E-04	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	3.124E-02	0.0275	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-234	2.959E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	1.116E-02	0.0098	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	1.136E+00	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p) As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water		Water Fish		Rado	Radon		nt	Meat	5	Mil	ζ.	All Pathways*		
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.643E-02	0.0321
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.385E-04	0.0005
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.167E-01	0.6307
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.996E-01	0.1757
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.401E-01	0.1233
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.485E-04	0.0005
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.124E-02	0.0275
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.959E-05	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.116E-02	0.0098
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.136E+00	1.0000

^{*}Sum of all water independent and dependent pathways.

Summary : RESRAD Default Parameters

File : C:\RESRAD_FAMILY\ONSITE\7.2\USERFILES\SITE1.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

	Groun	nd	Inhala	tion	Rado	on	Plan	nt	Meat	Ę	Mil	ς	Soil	-
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Eu-152	3.286E-02	0.0292	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pb-210	5.026E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	7.093E-01	0.6312	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-228	2.183E-01	0.1943	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-228	6.782E-02	0.0603	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	1.166E-03	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	8.276E-02	0.0736	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-234	2.922E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	1.101E-02	0.0098	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	1.124E+00	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

	Wate	er	Fisl	n	Rado	on	Plan	nt	Meat	t	Mill	k	All Path	nways*
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.286E-02	0.0292
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.026E-04	0.0004
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.093E-01	0.6312
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.183E-01	0.1943
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.782E-02	0.0603
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.166E-03	0.0010
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.276E-02	0.0736
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.922E-05	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.101E-02	0.0098
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.124E+00	1.0000

^{*}Sum of all water independent and dependent pathways.

Summary : RESRAD Default Parameters

File : C:\RESRAD_FAMILY\ONSITE\7.2\USERFILES\SITE1.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p) As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

	Groun	nd	Inhala	tion	Rado	on	Plar	nt	Meat	:	Mil	2	Soil	-
Radio-			-						-					
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Eu-152	2.289E-02	0.0211	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pb-210	3.946E-04	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	6.841E-01	0.6310	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-228	1.257E-01	0.1160	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-228	5.358E-03	0.0049	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	3.279E-03	0.0030	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	2.319E-01	0.2139	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-234	2.803E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	1.051E-02	0.0097	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	1.084E+00	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p) As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

	Wate	er	Fish	n	Rado	on	Plan	nt	Meat	:	Mil	2	All Path	nways*
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.289E-02	0.0211
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.946E-04	0.0004
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.841E-01	0.6310
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.257E-01	0.1160
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.358E-03	0.0049
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.279E-03	0.0030
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.319E-01	0.2139
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.803E-05	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.051E-02	0.0097
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.084E+00	1.0000

^{*}Sum of all water independent and dependent pathways.

Summary : RESRAD Default Parameters

File : C:\RESRAD_FAMILY\ONSITE\7.2\USERFILES\SITE1.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Wa cci	THACPCHACHE	I a ciiwa y b	(IIIIIGIGCIOII	CMCIGGCD	raacii,

Dadia	Groun	nd	Inhalat	cion	Rado	on	Plar	nt	Meat	=	Mil	ς	Soil	L
Radio- Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Eu-152	8.156E-03	0.0081	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pb-210	1.977E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	6.170E-01	0.6158	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-228	1.092E-02	0.0109	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-228	3.797E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	8.908E-03	0.0089	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	3.475E-01	0.3469	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-234	2.561E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	9.203E-03	0.0092	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	1.002E+00	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

	Wate	er	Fisl	h	Rado	on	Plan	nt	Meat	=	Mil	2	All Path	nways*
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.156E-03	0.0081
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.977E-04	0.0002
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.170E-01	0.6158
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.092E-02	0.0109
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.797E-06	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.908E-03	0.0089
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.475E-01	0.3469
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.561E-05	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.203E-03	0.0092
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.002E+00	1.0000

^{*}Sum of all water independent and dependent pathways.

Summary : RESRAD Default Parameters

File : C:\RESRAD_FAMILY\ONSITE\7.2\USERFILES\SITE1.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

	Groun	nd	Inhalat	tion	Rado	on	Plar	nt	Meat	:	Mil	2	Soil	=
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Eu-152	2.201E-04	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.000
	1.761E-05		0.000E+00		0.000E+00		0.000E+00		0.000E+00		0.000E+00		0.000E+00	
Ra-226	4.294E-01	0.5250	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-228	1.696E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-228	3.597E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	2.459E-02	0.0301	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	3.579E-01	0.4375	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-234	2.527E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	5.783E-03	0.0071	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	8.179E-01	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p) As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

	Wate	er	Fisl	n	Rado	on	Plan	nt	Meat	t	Mill	k	All Path	nways*
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.201E-04	0.0003
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.761E-05	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.294E-01	0.5250
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.696E-06	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.597E-17	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.459E-02	0.0301
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.579E-01	0.4375
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.527E-05	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.783E-03	0.0071
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.179E-01	1.0000

^{*}Sum of all water independent and dependent pathways.

Summary : RESRAD Default Parameters

File : C:\RESRAD_FAMILY\ONSITE\7.2\USERFILES\SITE1.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

	Groun	nd	Inhalat	tion	Rado	on	Plan	nt	Meat	5	Mil	C	Soil	L
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Eu-152	7.242E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pb-210	1.757E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	1.523E-01	0.2726	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-228	2.219E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	4.762E-02	0.0852	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	3.572E-01	0.6393	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-234	4.786E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	1.533E-03	0.0027	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	5.587E-01	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

	Wate	er	Fis	n	Rado	on	Plan	nt	Meat	5	Mill	k	All Path	nways*
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.242E-09	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.757E-08	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.523E-01	0.2726
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.219E-17	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.762E-02	0.0852
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.572E-01	0.6393
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.786E-05	0.0001
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.533E-03	0.0027
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.587E-01	1.0000

^{*}Sum of all water independent and dependent pathways.

Summary : RESRAD Default Parameters

File : C:\RESRAD_FAMILY\ONSITE\7.2\USERFILES\SITE1.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p) As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Independent Pathways (Inhalation excludes radon)

	Groun	nd	Inhala	tion	Rado	on	Plan	nt	Meat	5	Mil	ς.	Soil	-
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p) As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

	Wate	Water		Water Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-															
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	
Eu-152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	

^{*}Sum of all water independent and dependent pathways.

Summary : RESRAD Default Parameters

File : C:\RESRAD_FAMILY\ONSITE\7.2\USERFILES\SITE1.RAD

Dose/Source Ratios Summed Over All Pathways Parent and Progeny Principal Radionuclide Contributions Indicated

Parent	Product	Thread			_	ime in Yea			-	
(i)	(j) 	Fraction 	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Eu-152	Eu-152	7.210E-01	1.229E-01	1.167E-01	1.053E-01	7.337E-02	2.614E-02	7.052E-04	2.321E-08	0.000E+00
Eu-152	Eu-152	2.790E-01	4.757E-02	4.517E-02	4.074E-02	2.839E-02	1.011E-02	2.729E-04	8.980E-09	0.000E+00
Eu-152	Gd-152	2.790E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Eu-152	Sm-148	2.790E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Eu-152	Nd-144	2.790E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Eu-152	∑DSR(j)		4.757E-02	4.517E-02	4.074E-02	2.839E-02	1.011E-02	2.729E-04	8.980E-09	0.000E+00
Pb-210+D	Pb-210+D	1.000E+00	2.104E-04	2.032E-04	1.896E-04	1.489E-04	7.462E-05	6.645E-06	6.632E-09	0.000E+00
Ra-226+D	Ra-226+D	1.000E+00	2.718E-01	2.704E-01	2.676E-01	2.581E-01	2.327E-01	1.619E-01	5.743E-02	0.000E+00
Ra-226+D	Pb-210+D	1.000E+00	3.297E-06	9.719E-06	2.182E-05	5.717E-05	1.149E-04	1.281E-04	4.796E-05	0.000E+00
Ra-226+D	∑DSR(j)		2.718E-01	2.704E-01	2.677E-01	2.582E-01	2.328E-01	1.620E-01	5.748E-02	0.000E+00
Ra-228+D	Ra-228+D	1.000E+00	1.230E-01	1.085E-01	8.448E-02	3.514E-02	2.868E-03	4.451E-07	5.827E-18	0.000E+00
Ra-228+D	Th-228+D	1.000E+00	3.671E-02	8.914E-02	1.317E-01	8.936E-02	7.948E-03	1.234E-06	1.614E-17	0.000E+00
Ra-228+D	∑DSR(j)		1.597E-01	1.977E-01	2.162E-01	1.245E-01	1.082E-02	1.680E-06	2.197E-17	0.000E+00
Th-228+D	Th-228+D	1.000E+00	1.993E-01	1.387E-01	6.715E-02	5.305E-03	3.759E-06	3.561E-17	0.000E+00	0.000E+00
Th-230	Th-230	1.000E+00	3.060E-05	3.060E-05	3.059E-05	3.059E-05	3.058E-05	3.055E-05	3.046E-05	0.000E+00
Th-230	Ra-226+D	1.000E+00	5.893E-05	1.764E-04	4.095E-04	1.206E-03	3.330E-03	9.242E-03	1.793E-02	0.000E+00
Th-230	Pb-210+D	1.000E+00	4.777E-10	3.306E-09	1.704E-08	1.394E-07	9.224E-07	4.955E-06	1.213E-05	0.000E+00
Th-230	∑DSR(j)		8.953E-05	2.070E-04	4.401E-04	1.237E-03	3.362E-03	9.277E-03	1.797E-02	0.000E+00
Th-232	Th-232	1.000E+00	1.533E-05	1.533E-05	1.533E-05	1.533E-05	1.533E-05	1.533E-05	1.531E-05	0.000E+00
Th-232	Ra-228+D	1.000E+00	7.570E-03	2.151E-02	4.465E-02	9.212E-02	1.232E-01	1.259E-01	1.257E-01	0.000E+00
Th-232	Th-228+D	1.000E+00	1.535E-03	9.407E-03	3.727E-02	1.375E-01	2.209E-01	2.284E-01	2.279E-01	0.000E+00
Th-232	∑DSR(j)		9.121E-03	3.093E-02	8.194E-02	2.296E-01	3.441E-01	3.543E-01	3.537E-01	0.000E+00
U-234	U-234	1.000E+00	1.124E-05	1.117E-05	1.102E-05	1.052E-05	9.209E-06	5.785E-06	1.533E-06	0.000E+00
U-234	Th-230	1.000E+00	1.404E-10	4.198E-10	9.732E-10	2.853E-09	7.766E-09	2.061E-08	3.650E-08	0.000E+00
U-234	Ra-226+D	1.000E+00	1.804E-10	1.259E-09	6.602E-09	5.746E-08	4.482E-07	3.727E-06	1.648E-05	0.000E+00
U-234	Pb-210+D	1.000E+00	1.099E-15	1.632E-14	1.863E-13	4.565E-12	8.983E-11	1.642E-09	1.049E-08	0.000E+00
U-234	∑DSR(j)		1.124E-05	1.117E-05	1.103E-05	1.058E-05	9.665E-06	9.534E-06	1.806E-05	0.000E+00
U-238	U-238	5.450E-07	2.722E-12	2.704E-12	2.669E-12	2.548E-12	2.231E-12	1.402E-12	3.716E-13	0.000E+00
U-238+D	U-238+D	1.000E+00	4.238E-03	4.210E-03	4.155E-03	3.966E-03	3.473E-03	2.182E-03	5.784E-04	0.000E+00
U-238+D	U-234	1.000E+00	1.585E-11	4.727E-11	1.089E-10	3.118E-10	7.931E-10	1.642E-09	1.301E-09	0.000E+00
U-238+D	Th-230	1.000E+00	1.320E-16	9.202E-16	4.822E-15	4.183E-14	3.232E-13	2.603E-12	1.066E-11	0.000E+00
U-238+D	Ra-226+D	1.000E+00	1.272E-16	1.901E-15	2.199E-14	5.647E-13	1.260E-11	3.285E-10	3.720E-09	0.000E+00
U-238+D	Pb-210+D	1.000E+00	6.209E-22	1.907E-20	4.709E-19	3.424E-17	1.984E-15	1.226E-13	2.209E-12	0.000E+00
U-238+D	∑DSR(j)		4.238E-03	4.210E-03	4.155E-03	3.966E-03	3.473E-03	2.182E-03	5.784E-04	0.000E+00

The DSR includes contributions from associated (half-life \leq 180 days) daughters.

Summary : RESRAD Default Parameters

File : C:\RESRAD_FAMILY\ONSITE\7.2\USERFILES\SITE1.RAD

Single Radionuclide Soil Guidelines G(i,t) in pCi/gBasic Radiation Dose Limit = 2.500E+01 mrem/yr

Nuclide

(i)	t = 0.000E + 00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Eu-152	1.466E+02	1.544E+02	1.712E+02	2.457E+02	6.897E+02	2.556E+04	7.767E+08	*1.727E+14
Pb-210	1.188E+05	1.230E+05	1.318E+05	1.679E+05	3.350E+05	3.762E+06	3.770E+09	*7.632E+13
Ra-226	9.197E+01	9.244E+01	9.340E+01	9.684E+01	1.074E+02	1.543E+02	4.349E+02	*9.885E+11
Ra-228	1.565E+02	1.265E+02	1.156E+02	2.008E+02	2.312E+03	1.488E+07	*2.726E+14	*2.726E+14
Th-228	1.255E+02	1.803E+02	3.723E+02	4.713E+03	6.650E+06	*8.201E+14	*8.201E+14	*8.201E+14
Th-230	2.792E+05	1.208E+05	5.681E+04	2.021E+04	7.437E+03	2.695E+03	1.391E+03	*2.062E+10
Th-232	2.741E+03	8.083E+02	3.051E+02	1.089E+02	7.266E+01	7.056E+01	7.069E+01	*1.097E+05
U-234	2.224E+06	2.239E+06	2.268E+06	2.363E+06	2.587E+06	2.622E+06	1.384E+06	*6.222E+09
U-238	5.899E+03	5.938E+03	6.017E+03	6.304E+03	7.199E+03	1.146E+04	4.322E+04	*3.361E+05

^{*}At specific activity limit

Summed Dose/Source Ratios DSR(i,t) in (mrem/yr)/(pCi/g) and Single Radionuclide Soil Guidelines G(i,t) in pCi/gat tmin = time of minimum single radionuclide soil guidelineand at tmax = time of maximum total dose = 0.000E+00 years

Nuclide	Initial	tmin	DSR(i,tmin)	G(i,tmin)	DSR(i,tmax)	G(i,tmax)
(i)	(pCi/g)	(years)		(pCi/g)		(pCi/g)
Eu-152	2.250E-01	0.000E+00	1.705E-01	1.466E+02	1.705E-01	1.466E+02
Pb-210	2.650E+00	0.000E+00	2.104E-04	1.188E+05	2.104E-04	1.188E+05
Ra-226	2.650E+00	0.000E+00	2.718E-01	9.197E+01	2.718E-01	9.197E+01
Ra-228	1.010E+00	2.701 ± 0.005	2.166E-01	1.154E+02	1.597E-01	1.565E+02
Th-228	1.010E+00	0.000E+00	1.993E-01	1.255E+02	1.993E-01	1.255E+02
Th-230	2.650E+00	642 ± 1	2.152E-02	1.162E+03	8.953E-05	2.792E+05
Th-232	1.010E+00	80.4 ± 0.2	3.543E-01	7.055E+01	9.121E-03	2.741E+03
U-234	2.650E+00	709 ± 1	2.795E-05	8.945E+05	1.124E-05	2.224E+06
U-238	2.650E+00	0.000E+00	4.238E-03	5.899E+03	4.238E-03	5.899E+03

Summary : RESRAD Default Parameters

File : C:\RESRAD_FAMILY\ONSITE\7.2\USERFILES\SITE1.RAD

Individual Nuclide Dose Summed Over All Pathways

Parent	Nuclide	and	Branch	Fraction	Indicated

Nuclide	Parent	THF(i)					DOSE(j,t)	, mrem/yr			
(j)	(i)		t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Eu-152	Eu-152	7.210E-01		2.766E-02	2.627E-02	2.369E-02	1.651E-02	5.880E-03	1.587E-04	5.222E-09	0.000E+00
		2.790E-01								2.021E-09	
Eu-152	ΣDOSE (j)								7.242E-09	
	۵ ، ، ، ، ،	,									
Gd-152	Eu-152	2.790E-01		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Sm-148	Eu-152	2.790E-01		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Nd-144	Eu-152	2.790E-01		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pb-210	Pb-210	1.000E+00		5.575E-04	5.385E-04	5.026E-04	3.946E-04	1.977E-04	1.761E-05	1.757E-08	0.000E+00
Pb-210	Ra-226	1.000E+00		8.738E-06	2.576E-05	5.781E-05	1.515E-04	3.046E-04	3.395E-04	1.271E-04	0.000E+00
Pb-210	Th-230	1.000E+00		1.266E-09	8.762E-09	4.515E-08	3.693E-07	2.444E-06	1.313E-05	3.215E-05	0.000E+00
Pb-210	U-234	1.000E+00		2.912E-15	4.325E-14	4.936E-13	1.210E-11	2.380E-10	4.350E-09	2.779E-08	0.000E+00
Pb-210	U-238	1.000E+00		1.645E-21	5.054E-20	1.248E-18	9.074E-17	5.257E-15	3.248E-13	5.853E-12	0.000E+00
Pb-210	∑DOSE(j)		5.662E-04	5.643E-04	5.604E-04	5.465E-04	5.048E-04	3.703E-04	1.593E-04	0.000E+00
Ra-226	Ra-226	1.000E+00		7.204E-01	7.166E-01	7.092E-01	6.840E-01	6.167E-01	4.291E-01	1.522E-01	0.000E+00
Ra-226	Th-230	1.000E+00		1.562E-04	4.674E-04	1.085E-03	3.197E-03	8.825E-03	2.449E-02	4.751E-02	0.000E+00
Ra-226	U-234	1.000E+00		4.781E-10	3.335E-09	1.750E-08	1.523E-07	1.188E-06	9.875E-06	4.368E-05	0.000E+00
Ra-226	U-238	1.000E+00		3.372E-16	5.038E-15	5.826E-14	1.496E-12	3.340E-11	8.706E-10	9.859E-09	0.000E+00
Ra-226	∑DOSE(j)		7.205E-01	7.171E-01	7.103E-01	6.872E-01	6.255E-01	4.536E-01	1.997E-01	0.000E+00
Ra-228	Ra-228	1.000E+00		1.243E-01	1.096E-01	8.532E-02	3.549E-02	2.896E-03	4.496E-07	5.886E-18	0.000E+00
Ra-228	Th-232	1.000E+00		7.646E-03	2.172E-02	4.510E-02	9.304E-02	1.244E-01	1.271E-01	1.270E-01	0.000E+00
Ra-228	∑DOSE(j)		1.319E-01	1.313E-01	1.304E-01	1.285E-01	1.273E-01	1.271E-01	1.270E-01	0.000E+00
Th-228	Ra-228	1.000E+00		3.708E-02	9.003E-02	1.330E-01	9.025E-02	8.027E-03	1.247E-06	1.631E-17	0.000E+00
Th-228	Th-228	1.000E+00		2.013E-01	1.401E-01	6.782E-02	5.358E-03	3.797E-06	3.597E-17	0.000E+00	0.000E+00
Th-228	Th-232	1.000E+00		1.551E-03	9.501E-03	3.764E-02	1.389E-01	2.231E-01	2.307E-01	2.302E-01	0.000E+00
Th-228	∑DOSE(j)		2.399E-01	2.396E-01	2.385E-01	2.345E-01	2.311E-01	2.307E-01	2.302E-01	0.000E+00
Th-230	Th-230	1.000E+00		8.108E-05	8.108E-05	8.108E-05	8.107E-05	8.104E-05	8.096E-05	8.072E-05	0.000E+00
Th-230	U-234	1.000E+00		3.720E-10	1.113E-09	2.579E-09	7.561E-09	2.058E-08	5.462E-08	9.672E-08	0.000E+00
Th-230	U-238	1.000E+00		3.497E-16	2.438E-15	1.278E-14	1.109E-13	8.564E-13	6.897E-12	2.824E-11	0.000E+00
Th-230	∑DOSE(j)		8.108E-05	8.108E-05	8.108E-05	8.107E-05	8.106E-05	8.101E-05	8.082E-05	0.000E+00
Th-232	Th-232	1.000E+00		1.549E-05	1.549E-05	1.549E-05	1.549E-05	1.548E-05	1.548E-05	1.546E-05	0.000E+00
U-234	U-234	1.000E+00		2.978E-05	2.959E-05	2.920E-05	2.787E-05	2.440E-05	1.533E-05	4.062E-06	0.000E+00
U-234	U-238	1.000E+00		4.200E-11	1.253E-10	2.885E-10	8.262E-10	2.102E-09	4.351E-09	3.448E-09	0.000E+00
U-234	∑DOSE(j)		2.978E-05	2.959E-05	2.920E-05	2.787E-05	2.441E-05	1.534E-05	4.065E-06	0.000E+00
U-238	U-238	5.450E-07		7.214E-12	7.167E-12	7.072E-12	6.751E-12	5.912E-12	3.715E-12	9.847E-13	0.000E+00
U-238	U-238	1.000E+00		1.123E-02	1.116E-02	1.101E-02	1.051E-02	9.203E-03	5.783E-03	1.533E-03	0.000E+00
U-238	∑DOSE(j)								1.533E-03	

THF(i) is the thread fraction of the parent nuclide.

RESRAD-ONSITE, Version 7.2 $ext{T}_2$ Limit = 180 days $ext{06/11/2025}$ 18:06 Page 25

Summary : RESRAD Default Parameters

File : C:\RESRAD_FAMILY\ONSITE\7.2\USERFILES\SITE1.RAD

Individual Nuclide Soil Concentration Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	t=	0.000E+00	1.000E+00	3.000E+00	S(j,t),	pCi/g 3.000E+01	1.000E+02	3.000E+02	1.000E+03
Eu-152	Eu-152	7.210E-01		1.622E-01	1.541E-01	1.390E-01	9.683E-02	3.449E-02	9.307E-04	3.063E-08	6.267E-24
Eu-152	Eu-152	2.790E-01		6.278E-02	5.962E-02	5.377E-02	3.747E-02	1.335E-02	3.602E-04	1.185E-08	2.425E-24
Eu-152	∑S(j):			2.250E-01	2.137E-01	1.927E-01	1.343E-01	4.784E-02	1.291E-03	4.249E-08	8.693E-24
Gd-152	Eu-152	2.790E-01		0.000E+00	3.926E-16	1.119E-15	3.140E-15	6.101E-15	7.512E-15	6.970E-15	5.253E-15
Sm-148	Eu-152	2.790E-01		0.000E+00	1.960E-32	1.705E-31	1.687E-30	1.129E-29	6.030E-29	1.936E-28	5.100E-28
Nd-144	Eu-152	2.790E-01		0.000E+00	0.000E+00	0.000E+00	1.401E-45	3.784E-44	7.385E-43	7.077E-42	4.659E-41
Pb-210	Pb-210	1.000E+00		2.650E+00	2.560E+00	2.389E+00	1.876E+00	9.400E-01	8.371E-02	8.354E-05	2.623E-15
Pb-210	Ra-226	1.000E+00		0.000E+00	8.112E-02	2.339E-01	6.808E-01	1.412E+00	1.589E+00	5.954E-01	1.585E-02
Pb-210	Th-230	1.000E+00		0.000E+00	1.769E-05	1.551E-04	1.574E-03	1.111E-02	6.101E-02	1.501E-01	1.967E-01
Pb-210	U-234	1.000E+00		0.000E+00	5.430E-11	1.433E-09	4.901E-08	1.064E-06	2.011E-05	1.296E-04	2.680E-04
Pb-210	U-238	1.000E+00		0.000E+00	3.837E-17	3.043E-15	3.492E-13	2.309E-11	1.494E-09	2.726E-08	1.090E-07
Pb-210	∑S(j):			2.650E+00	2.641E+00	2.623E+00	2.558E+00	2.364E+00	1.734E+00	7.457E-01	2.128E-01
Ra-226	Ra-226	1.000E+00		2.650E+00	2.636E+00	2.609E+00	2.516E+00	2.269E+00	1.579E+00	5.601E-01	1.491E-02
Ra-226	Th-230	1.000E+00		0.000E+00	1.145E-03	3.417E-03	1.119E-02	3.189E-02	8.953E-02	1.743E-01	2.177E-01
Ra-226	U-234	1.000E+00		0.000E+00	5.257E-09	4.695E-08	5.075E-07	4.224E-06	3.594E-05	1.601E-04	2.974E-04
Ra-226	U-238	1.000E+00		0.000E+00	4.945E-15	1.323E-13	4.744E-12	1.168E-10	3.154E-09	3.609E-08	1.217E-07
Ra-226	∑S(j):			2.650E+00	2.637E+00	2.613E+00	2.527E+00	2.300E+00	1.668E+00	7.345E-01	2.329E-01
Ra-228	Ra-228	1.000E+00		1.010E+00	8.911E-01	6.935E-01	2.885E-01	2.354E-02	3.655E-06	4.785E-17	0.000E+00
Ra-228	Th-232	1.000E+00		0.000E+00	1.144E-01	3.045E-01	6.941E-01	9.490E-01	9.712E-01	9.702E-01	9.664E-01
Ra-228	∑S(j):			1.010E+00	1.005E+00	9.980E-01	9.826E-01	9.725E-01	9.712E-01	9.702E-01	9.664E-01
Th-228	Ra-228	1.000E+00		0.000E+00	2.876E-01	5.397E-01	3.998E-01	3.594E-02	5.584E-06	7.311E-17	0.000E+00
Th-228	Th-228	1.000E+00		1.010E+00	7.028E-01	3.403E-01	2.689E-02	1.905E-05	1.805E-16	0.000E+00	0.000E+00
Th-228	Th-232	1.000E+00		0.000E+00	1.881E-02	1.250E-01	5.612E-01	9.370E-01	9.712E-01	9.702E-01	9.664E-01
Th-228	∑S(j):			1.010E+00	1.009E+00	1.005E+00	9.879E-01	9.730E-01	9.712E-01	9.702E-01	9.664E-01
Th-230	Th-230	1.000E+00		2.650E+00	2.650E+00	2.650E+00	2.650E+00	2.649E+00	2.646E+00	2.638E+00	2.611E+00
Th-230	U-234	1.000E+00		0.000E+00	2.429E-05	7.238E-05	2.357E-04	6.627E-04	1.779E-03	3.160E-03	3.619E-03
Th-230	U-238	1.000E+00		0.000E+00	3.425E-11	3.055E-10	3.291E-09	2.714E-08	2.236E-07	9.217E-07	1.529E-06
Th-230	∑S(j):			2.650E+00	2.650E+00	2.650E+00	2.650E+00	2.649E+00	2.648E+00	2.641E+00	2.615E+00
Th-232	Th-232	1.000E+00		1.010E+00	1.010E+00	1.010E+00	1.010E+00	1.010E+00	1.009E+00	1.008E+00	1.004E+00
U-234	U-234	1.000E+00		2.650E+00	2.632E+00	2.598E+00	2.480E+00	2.171E+00	1.364E+00	3.614E-01	3.460E-03
U-234	U-238	1.000E+00		0.000E+00	7.433E-06	2.200E-05	7.001E-05	1.839E-04	3.852E-04	3.062E-04	9.782E-06
U-234	Σ S(j):			2.650E+00	2.632E+00	2.598E+00	2.480E+00	2.171E+00	1.364E+00	3.617E-01	3.470E-03
U-238	U-238	5.450E-07		1.444E-06	1.435E-06	1.416E-06	1.351E-06	1.183E-06	7.436E-07	1.971E-07	1.891E-09
U-238	U-238	1.000E+00		2.650E+00	2.632E+00	2.598E+00	2.480E+00	2.171E+00	1.364E+00	3.617E-01	3.470E-03
U-238	∑s(j):			2.650E+00	2.632E+00	2.598E+00	2.480E+00	2.171E+00	1.364E+00	3.617E-01	3.470E-03

THF(i) is the thread fraction of the parent nuclide.