



Texas Commission on Environmental Quality  
**RADIOACTIVE MATERIAL LICENSE**

Pursuant to the Texas Radiation Control Act and the applicable rules of the Texas Commission on Environmental Quality (TCEQ, or Commission) regulations on radioactive materials, and in reliance on statements and representations heretofore made by the Licensee, a license is hereby issued authorizing the Licensee to receive, acquire, possess, transfer and dispose radioactive material listed herein; and to use such radioactive material for the purpose(s) and at the place(s) designated herein. This license is subject to all applicable rules, regulations and orders of the Texas Commission on Environmental Quality (Agency) now or hereafter in effect and to any conditions specified below.

<b>LICENSEE</b>		This license is issued in response to an original application	
<b>Customer Number</b>	<b>CN600616890</b>	dated: June 21, 2004	
1. Name	Waste Control Specialists LLC	Signed by: Dean Kunihiro	
2. Address	ATTN: Guy Crawford, Ph.D. P. O. Box 1129 Andrews, Texas 79714	3. License Number	Amendment Number
		R 05807	
		4a. License Expiration Date	
		10 Years from the Date of Issuance	

**RADIOACTIVE MATERIAL AUTHORIZED**

5. Radioisotope	6. Form of Material	7. Maximum Activity	8. Authorized Use
A. By-product material, as defined in Title 25 of the Texas Administrative Code (25 TAC) Section (§) 289.260(c)(4)	A. Dry, discrete solid objects and containerized bulk by-product material.	A. Not to exceed a volume of 1,169,000 cubic yards and a total radioactivity of 24,530 curies.	A. Receipt of by-product material from other persons and disposal by shallow land burial.

9. This license authorizes the disposal of by-product material. No other material shall be accepted under this license. The receipt and/or disposal of low-level radioactive waste, mixed low-level radioactive waste, naturally-occurring radioactive material, hazardous waste, industrial solid waste, municipal solid waste, liquid waste, explosive or pyrophoric materials are specifically prohibited. By-product material shall be possessed and used only at:

<u>Site Number</u>	<u>Location</u>
000	Andrews – Approximately one and a half mile north of State Highway 176 at NW9999 on State Line Road, 250 feet east of the Texas and New Mexico State Line (30 miles west of Andrews, TX) <b>Regulated Entity No. RN104392790</b>

10. The Licensee shall comply with the provisions of Title 25 of the Texas Administrative Code (TAC) Section (§) 289.201, §289.202, §289.203, §289.204, §289.251, §289.252, §289.257, and §289.260 and provisions of Title 30 of the TAC.

11. The following words and terms when used in this license shall have the following meaning:

A. Executive Director - The Executive Director of the Texas Commission on Environmental Quality



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(TCEQ), or any authorized individual authorized to act for the Executive Director in the administration of the license and the rules of the TCEQ (for example, reporting, inspection, emergency response, etc.).

- B. Bulk Material – Material that is soil or soil-like in its physical form.
- C. By-product Material Disposal Facility – That area comprising approximately 36.39 acres and all the features supporting the disposal facility, including, but not limited to, the disposal units, decontamination building, contact water storage tanks and pad, incoming container storage pad, outgoing container storage area, guard house and counting lab, overhead inspection station, within the boundary circumscribed by the security fence as depicted in Figure 3.18 and 3.19 of Section 3 of Volume 1 of the application.
- D. Commission – The Commissioners of the Texas Commission on Environmental Quality acting in their official capacity.
- E. Container – A sealed, flexible or rigid drum, pail, box, sack, or similar container which does not tear, split, or rupture upon handling, placement, and compaction in the disposal unit; and which does not lose its structural strength and integrity when contacting water. Acceptable containers may include, but are not limited to, approved U.S. Department of Transportation containers. Containers to be placed in the disposal facility shall not contain free liquids, and shall have no more than 15% void volume.
- F. Containerized – To be confined within a container.
- G. Licensed site – – That area comprising approximately 36.39 acres and all the features supporting the disposal facility, including, but not limited to, the disposal units, decontamination building, contact water storage tanks and pad, incoming container storage pad, outgoing container storage area, guard house and counting lab, overhead inspection station, within the boundary circumscribed by the security fence as depicted in Figure 3.18 and 3.19 of Section 3 of Volume 1 of the application.
- H. Restricted Area – Has the same meaning as Licensed site.
- I. Site – Has the same meaning as Licensed site.
- J. Facility – Same meaning as Licensed site.
- K. Disposal Facility – Same meaning as Licensed site.
- L. Disposal area –The area containing by-product material to which the requirements of subsection 25 TAC §289.260(o)(16)-(27) apply.
- M. Disposal units – The features described in the application for the emplacement of by-product material.
- N. Operations - The receipt of by-product material for disposal from other persons and/or the emplacement of by-product material into a disposal unit and any other activities associated with the receipt and emplacement of by-product material. A disposal unit is in operation from the day that by-product material is first placed in it until the day that final closure of the last disposal unit begins.



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- O. Construction – Those activities that execute the construction of the features of the Disposal Facility as described in the application.
  - P. Excavation – Those subset of activities comprising Construction that involve the removal of native materials (e.g., soils) at the site for the construction of the Disposal Facility features, such as, the disposal units, receiving pad, contact water storage pad, and decontamination building.
12. The following are related to the designated Radiation Safety Officer under this license:
- A. The individual designated to perform the functions of Radiation Safety Officer (RSO) for activities covered by this license is Guy Crawford, Ph.D.
  - B. The RSO shall be the primary contact between the Licensee and the TCEQ for all matters relating to this license and radiation safety.
  - C. Any request for amendment of the license shall be submitted under the signature of the RSO.
  - D. The Licensee shall provide a resolution from its board of directors, attested by the secretary of the corporation, that the Licensee has delegated to the radiation safety officer position the authority to act for and on behalf of the Licensee in all matters relating to radiation safety matters and this radioactive material license.
  - E. The Licensee shall revise organizational chart and the description of the duties, responsibilities and authorities of the RSO submitted in the application to depict and specify that the designated RSO has a direct line of communication with the Licensee's President on all matters pertaining to radiation safety and compliance with the conditions of this license and the applicable rules.
  - F. The Licensee shall require the following qualifications of any person to be designated to serve as the RSO for this license:
    - (1) A bachelor's degree in the physical or biological sciences, industrial hygiene, or engineering from an accredited college or university or an equivalent combination of education and relevant experience in uranium recovery, waste processing or production facility radiation protection. Two years of relevant experience is considered equivalent to one (1) year of academic study.
    - (2) At least one (1) year of work experience relevant to uranium recovery, waste processing or production operations in applied health physics, radiation protection, industrial hygiene, or similar work. This experience should involve directly working with radiation detection and measurement equipment, not strictly administrative work. This experience should be in addition to any experience that is used to meet the educational requirement.
    - (3) At least four (4) weeks of specialized classroom training in health physics specifically applicable to uranium recovery, waste processing or production.



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- (4) The RSO should attend refresher training on uranium recovery, waste processing or production facility health physics every two (2) years.
- G. The RSO shall ensure that the radiation safety program provides, as a minimum, the same qualifications and same training as is provided to radiation safety technicians for all other positions at the By-product Material Disposal Facility involved with the administration and/or execution of the radiation safety program.
13. A. The by-product material disposal facility must be located as described in Section 3 of Volume 1 of the application.
- B. The by-product material disposal facility must consist of the features as depicted in, and constructed in accordance with the drawings, specifications, and references contained in Section 3 of Volume 1 of the application, and the conditions of this license.
- C. Any modification or deviation from the drawings, specifications, and references in Section 3 of Volume 1 of the application and the conditions of this license shall require approval by the commission by amendment of this license.
14. The Licensee shall not accept or dispose of uncontainerized, bulk by-product material.
- A. Containers for the disposal of by-product material shall conform to the definition in condition 11.
- B. The Licensee shall not receive by-product material intended for disposal by rail.
- C. The Licensee shall not open or empty any container of bulk by-product material received at the by-product material disposal facility, except to obtain a sample from the container for verification purposes. The Licensee shall dispose of received bulk by-product material by placement of the intact container into the by-product material disposal unit.
- D. The Licensee shall use uncontaminated or clean grout, sand, or other suitable flowable material to fill void spaces and gaps around emplaced containers of by-product material, and around emplaced non-bulk material in the disposal unit.
15. The Licensee has a duty to comply with all license conditions. Failure to comply with any license condition is a violation of the license and statutes under which the license is issued and is grounds for enforcement action, for license amendment, revocation, or suspension, or for denial of a license renewal application or an application for a license or permit for another facility.
16. The Licensee must apply for an amendment or renewal before the expiration of the existing license in order to continue receipt and disposal of by-product material after the expiration of the license. Authorization to continue such activity terminates upon the effective denial of said application. Obligations or requirements for decommissioning, environmental monitoring, financial assurance, radiation safety, and control of entry to restricted areas continue in effect beyond the expiration date of this license until the Executive Director notifies the licensee in writing that the provisions of the license are no longer binding.
17. It is not a defense in an enforcement action that it would have been necessary to halt or reduce the licensed activity to maintain compliance with the license conditions.



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18. The Licensee shall take all reasonable steps to minimize or prevent any discharge, disposal, or other license violation which has a reasonable likelihood of adversely affecting human health or the environment.
19. The Licensee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) installed or used by the Licensee to achieve compliance with the license conditions.
20. The Licensee shall furnish to the Executive Director, upon request and within a reasonable time, any information to determine whether cause exists for amending, revoking, suspending, or terminating the license, and copies of records required to be kept by the licensee.
21. The Licensee shall give notice to the Executive Director before physical alterations or additions to the licensed facility if such alterations or additions would require a license amendment or result in a violation of license requirements.
22. Authorization from the commission is required before beginning any change in the licensed facility or activity that would result in noncompliance with other license requirements.
23. Unless subject to a different reporting requirement in this license or under 30 TAC Section 336.335 (relating to Reporting Requirements for Incidents), the Licensee shall report any noncompliance to the Executive Director which may endanger human health or safety or the environment. Such information must be provided orally within 24 hours from the time the Licensee becomes aware of the noncompliance. A written submission must also be provided within five days of the time the Licensee becomes aware of the noncompliance. The written submission shall contain a description of the noncompliance and its cause; the potential danger to human health or safety, or the environment; the period of noncompliance, including exact dates and times; if the noncompliance has not been corrected, the time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance, and to mitigate its adverse effects.
24. Inspection and entry by the Executive Director to the licensed site must be allowed under Texas Water Code, Chapters 26 - 28 and 32, Texas Health and Safety Code, §§361.032, 361.033, 361.037, 401.057(a), and 401.063, and Title 40 Code of Federal Regulations (CFR) §122.41(i). The statement in Texas Water Code, §26.014, that commission entry of a facility shall occur in accordance with an establishment's rules and regulations concerning safety, internal security, and fire protection is not grounds for denial or restriction of entry to any part of the facility, but merely describes the commission's duty to observe appropriate rules and regulations during an inspection.
25. This license may not be transferred except on approval of the commission.
26. All reports and other information requested by the Executive Director must be signed by the person and in the manner required by 30 TAC §305.128 of this title (relating to Signatories to Reports).
27. This license may be amended, suspended and reissued, or revoked for cause. The filing of a request by the Licensee for a license amendment, suspension and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any license condition.
28. This license does not convey any property rights of any sort, or any exclusive privilege.



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29. Where the Licensee becomes aware that it failed to submit any relevant facts in a license application, or submitted incorrect information in an application, or in any report to the Executive Director, the Licensee shall promptly submit such facts or information.
30. A. The Licensee shall notify the Executive Director, in writing, immediately following the filing of a voluntary or involuntary petition for bankruptcy under any chapter of Title 11 (Bankruptcy) of the United States Code (11 USC) by or against:
- (1) The Licensee;
  - (2) An entity (as that term is defined in 11 USC, §101(14)) controlling the Licensee or listing the license or Licensee as property of the estate;
  - (3) An affiliate (as that term is defined in 11 USC, §101(2)) of the Licensee; or
  - (4) Valhi, Inc.
- B. This notification must indicate:
- (1) The name of the Licensee;
  - (2) The license number(s);
  - (3) The bankruptcy court in which the petition for bankruptcy was filed; and
  - (4) The date of filing of the petition.
31. At any time before termination of the license, the Licensee shall submit written statements under oath upon request of the commission or Executive Director to enable the commission to determine whether or not the license should be modified, suspended or revoked.
32. The Licensee shall be subject to the applicable provisions of Texas Health and Safety Code, Chapter 401, also known as the Texas Radiation Control Act (TRCA) now or hereafter in effect and to applicable rules and orders of the commission. The terms and conditions of the license are subject to amendment, revision, or modification, by reason of amendments to the TRCA or other applicable law, or by reason of rules and orders issued in accordance with terms of the TRCA.
33. Any license may be revoked, suspended, or modified, in whole or in part, for any material false statement in the application or any statement of fact required under provisions of the TRCA, or because of conditions revealed by any application or statement of fact or any report, record, or inspection or other means that would warrant the commission to refuse to grant a license on the original application, or for failure to operate the facility in accordance with the terms of the license, or for any violation of or failure to observe any of the terms and conditions of the TRCA or other applicable law or the license or of any rule or order of the commission.
34. No by-product material may be disposed of until the Executive Director has inspected the facility and has found it to be in conformance with the description, design, and construction described in the application for the license. No by-product material may be received for disposal at the site until the Executive Director has approved financial assurance.



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35. The commission may incorporate in this license at the time of issuance, or thereafter, by appropriate rule or order, additional requirements and conditions with respect to the Licensee's receipt, possession, and disposal of by-product material as it deems appropriate or necessary in order to: (1) protect the health and safety of the public and the environment; or (2) require reports and recordkeeping and to provide for inspections of activities under the license that may be necessary or appropriate to effectuate the purposes of the TRCA and rules thereunder.
36. Financial security in an amount and form acceptable to the Executive Director must be provided by the Licensee and deemed acceptable by the Executive Director 60 days prior to the Licensee's receipt of by-product material for disposal. Financial security acceptable to the Executive Director in amount and form shall be maintained until license termination has been approved by the Executive Director, and the U.S. Nuclear Regulatory Commission (NRC) has concurred in that approval. The term "financial security" has the same meaning as "financial assurance."
- A. Financial security in an amount not less than \$4,266,925 (2004 dollars) for decommissioning, \$72,505 (2004 dollars) for five-years of post-operational surveillance, and \$724,310 (2004 dollars) for long-term care must be provided initially by the Licensee to the Executive Director 60 days prior to the receipt of by-product material. These amounts must be converted to current dollar amounts, by use of an inflation factor derived from the most recent annual Implicit Price Deflator for Gross National Product published by the United States Department of Commerce in its Survey of Current Business. The inflation factor is the result of dividing the latest published annual Deflator by the Deflator for the previous year.
- B. The Licensee shall reevaluate the decommissioning cost estimate on the anniversary date of this license each year and upon amendment to the license, and submit a revision of the decommissioning funding plan to the Executive Director for approval. Executive Director approval may be demonstrated by either amendment of this license to specify the current dollar amount, or a letter from the Director of the Radioactive Materials Division of the Texas Commission on Environmental Quality stating that the amount is acceptable. The licensee must provide any increase in the amount of financial security within 60 days of a determination of the cost estimate by the Executive Director.
37. The Licensee shall submit the following engineering reports to the Executive Director within 270 days of the issuance of this license, and no later than 60 days prior to the anticipated commencement of by-product material disposal operations:
- A. A complete hydraulic balance for the by-product material disposal facility utilizing all available data, including process flow diagrams showing all input and output streams from each disposal unit, disposal facility and storage tank inventory time charts, static liquid head over the primary disposal facility liner time charts, supporting calculations, assumptions, and data references for a full year of operations under the highest recorded rainfall scenarios for 24-hour, 10-day, and annual rainfalls assumed to occur in the single year studied. The basis for rainfall events are to be taken from National Weather Service (NWS) recorded data from the past 25 years for Midland/Odessa, Texas, and Hobbs, New Mexico, whichever station produces the larger rainfall amount for each time period. The Licensee shall measure and record the volume of all contact water from all sources that is placed in the contact water holding tanks. Further, the Licensee shall measure and record the volume of all contact water removed from the tanks and shall identify the disposition of the water. Records of the volumes of water collected and transferred shall be maintained at the facility for a period of three years and shall be available for inspection by the Executive Director at any time during normal business hours.



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B. An evaluation of the corrosion rates and predicted failure schedules for all actual pipelines, pumps, and tanks provided for the facility. The report must include an evaluation of pipeline freezing potential, and prevention, as applicable. The Licensee shall inspect the contact water collection, holding and transfer system in accordance with Table 37.B. Records of the inspections, results of the inspections, identification of leaks, remedial activities resulting from the inspections and identification of replaced/repared equipment shall be maintained at the facility for a period of three years and shall be available for inspection by the Executive Director any time during normal business hours.

**Table 37.B - Inspection of Contact Water Collection, Holding and Transfer System**

Facility Unit(s) and Basic Elements	Possible Error, Malfunction, or Deterioration	Frequency of Inspection
Tank Truck Loading/Unloading Areas	<ul style="list-style-type: none"> <li>Check for evidence of spills</li> <li>Check for removal of spill absorbent and cleanup materials</li> <li>Check containment system base, sump, and curbs for cracks, damage</li> <li>Check liquid levels in sumps</li> <li>Inspect hoses, couplings, pumps, and valves for leakage</li> <li>Inspect hoses, couplings, pumps, and valves for deterioration</li> </ul>	Daily Daily Weekly Daily Daily Weekly
Tank Containment Areas	<ul style="list-style-type: none"> <li>Check for evidence of spilled materials</li> <li>Check for gaps and cracks in base and walls/curbs</li> <li>Check coating system for integrity</li> <li>Check for evidence of seepage outside containment (e.g., discoloration)</li> <li>Check for debris, cleanup residue, improperly stored equipment</li> <li>Check for liquids in containment system</li> </ul>	Daily Daily Weekly Daily Daily Daily
Holding Tanks	<ul style="list-style-type: none"> <li>Inspect tank exterior for cracks, leaks, discoloration, and obvious deformation</li> <li>Check grounding wire for damage</li> <li>Check tank wall thickness and integrity using appropriate methods</li> <li>Conduct visual internal inspection</li> </ul>	Daily Weekly 2 years 5 years
Access Hatches and Vents	<ul style="list-style-type: none"> <li>Check for leaks</li> <li>Check for damage</li> </ul>	Weekly Weekly
Pumps and Piping	<ul style="list-style-type: none"> <li>Inspect for leaks</li> <li>Inspect for deterioration</li> </ul>	Daily Weekly
Temperature Gauges, Pressure Gauges	<ul style="list-style-type: none"> <li>Check for operability</li> </ul>	Daily
Overflow System (switches, controllers, flow	<ul style="list-style-type: none"> <li>Check for operability</li> </ul>	Daily
	<ul style="list-style-type: none"> <li>Check tank liquid level indicators (overflow control monitors) for operability</li> </ul>	Daily



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control valves)		
Leak Detection and Leachate Collection Sumps	<ul style="list-style-type: none"> <li>Collect a liquid grab samples, if present</li> <li>Monitoring system sumps – wipe samples and record level in sumps and volume of any leachate pumped.</li> <li>Exterior surface of standpipe cover – wipe sample</li> </ul>	Monthly analyze liquid sample from each sump for: gross alpha, gross beta, alpha isotopic <sup>1</sup> , gamma isotopic, and liquid scintillation <sup>2</sup>

- Alpha isotopic analyses performed if confirmed gross alpha (initial result and re-analysis) exceeds natural background levels. Analyses will include radium, thorium, and uranium using the EPA and DOE modified analytical method used for the appropriate baseline analyses.
- Liquid scintillation analysis for primordial and man-made isotopes may be performed as designated by the RSO.

- The Licensee shall verify during excavation and construction of the disposal facility, by geotechnical sampling taken at the time of excavation and laboratory analysis, the original geotechnical soil design parameters and features including, but not limited to: soil moisture, bearing capacity, slope stability, and permeable soil stringers, as contained in the application. The Licensee shall cease excavation and construction when directed to do so by the Executive Director in order to sample, verify or test.
- During excavation and construction of the disposal facility, the Licensee shall provide weekly written reports and photographs to accommodate the Executive Director’s inspection and observation of all excavation and construction activities. Particular attention must be directed to fractures, faults, any evidence of collapse features or groundwater flow, or unanticipated geologic features encountered. The Licensee shall cease excavation and construction when directed to do so by the Executive Director in order to sample, verify or test.
- During excavation and construction of the disposal facility, the Licensee shall perform geotechnical studies, and allow for observation by the Executive Director, to verify original geotechnical conditions by continuously monitoring parameters and features including, but not limited, to: soil moisture, bearing capacity, slope stability, and permeable soil stringers as construction progresses. The Licensee shall report verification results to the Executive Director and provide certification of geotechnical studies by a qualified geotechnical professional.
- Prior to facility construction, the Licensee shall perform and report the results for Executive Director review of the following verification and monitoring studies:
  - Install and monitor eight additional borings inside the licensed site, to monitor soil moisture conditions immediately outside the disposal unit. These borings must be located as follows: one at each corner of the proposed by-product disposal facility, and two additional borings evenly spaced along the western and northern edges to the top of the 180-Foot Sand. The north eastern-most of these borings should stop just above the sand layer, as it may be located in the confined portion of the zone.

The methods selected for monitoring shall allow for monitoring prior to waste acceptance and for annual monitoring, thereafter. Should any of these borings indicate soil saturation above the bottom of the disposal facility, disposal operations must cease to accommodate additional sampling, monitoring or testing.

- Resistivity survey verification of the previous resistivity line (T1) to re-establish as closely as



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possible the original line, and extend to the south across the disposal facility location. A boring must be installed and logged to calibrate the resistivity survey. If the survey indicates the dry line has moved over the proposed facility, additional sampling, verification or testing must be proposed.

- C. Verification of matric potential above the 180-foot Sandstone to locate the top of the zone of saturation.
42. Prior to facility construction, the Licensee shall install five new Ogallala/Antlers/Gatuña (OAG) piezometers to the north and west of the by-product facility, between the facility and the OAG “dry line” as indicated in the application. The general locations will be: north of MW-4; east of the LSA pad; directly north of TP-42, but north of the Low-Specific Activity (LSA) pad; west of the northwest corner of the facility halfway between the facility and TP-31; in the vicinity of NMB-28; and in the general vicinity of NMB-24. The specific locations and manner for installation shall be determined by the Executive Director based upon local surface and subsurface conditions prior to installation.
  43. Prior to facility construction, the Licensee shall verify the matric potential of the subsurface Dockum formation, or red-bed formation, at the licensed site to locate the top of the zone of saturation. The Licensee must allow for observation by the Executive Director of any verification measurements or testing, provide data and interpretation of the results in a report to the Executive Director.
  44. The Licensee must conduct water level elevation measurements monthly on all wells completed in the OAG formation, and report, in writing, these elevations to the Executive Director within 10 days, to monitor potential movement in the mapped dry line. If the water level elevations are at or higher than the top of the Dockum formation at the facility, excavation shall cease in order to sample, verify or test.
  45. Thirty days prior to the receipt of by-product material for disposal, the Licensee shall provide a final geotechnical report and “as-built” construction drawings for review by the Executive Director. A Registered Professional Engineer licensed to practice in Texas shall certify that the disposal facility has been constructed in accordance with the license application and the conditions of this license.
  46. The Licensee shall minimize the potential for the introduction of water into the disposal facility.
    - A. The Licensee shall minimize the potential for the introduction of water into the Ogallala/Antlers/Gatuna (OAG) formation from the bench of the disposal unit. The Licensee must take precautions to minimize precipitation or runoff from the bench entering any active disposal unit. Exposed portions of the OAG formation shall be temporarily sealed by a 2-foot thick re-compacted clay liner of the same specifications as applied to the disposal facility liner. This temporary liner shall remain fully functional until the final cover is applied at which time the OAG and permeable layer of the cover shall be hydraulically connected.
    - B. The Licensee shall minimize the use of water or other liquid for the purpose of dust suppression in the disposal unit and on the licensed site. General nuisance dust suppression within the by-product material waste disposal facility, and within the disposal unit itself as required, shall utilize only non-contact, uncontaminated water; may utilize performance enhancing additives approved by the Executive Director; and shall be limited to those reasonable spray application rates necessary to meet the requirements of 25 TAC 289.260(o)(30)(C).
  47. The Licensee shall monitor the 125-Foot Sandstone in accordance with the following:
    - A. The Licensee shall install additional monitoring wells prior to disposal of by-product material,



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constructed to the specifications required by the Executive Director at the time of installation. The monitor wells shall be spaced around the perimeter of the by-product material disposal facility every 200 feet.

- B. The Licensee shall monitor these wells quarterly for the presence of water and the water level elevation.
- (1) If water is detected in any well(s), the Licensee shall notify the Executive Director in writing within seven (7) days of the first occurrence of this condition, otherwise the reporting period must be quarterly.
  - (2) If sufficient water exists to take a sample, it shall be collected and analyzed in compliance with the by-product material disposal facility sampling plan for radiological constituents specified in the procedure entitled "Groundwater Sampling" and identified as BP-EV-7.1.8.
  - (3) Non-radiological contaminant concentration limits will fall under the jurisdiction of 30 TAC 350, the Texas Risk Reduction Program and the provisions of 25 TAC §289.260(o)(9) and (10) for hazardous constituents.
48. The Licensee shall monitor on-site wells quarterly for the presence of any non-radiological, hazardous constituents consistent with the received by-product material waste streams. The analytical results, including laboratory quality control summary data, must be reported in writing to the Executive Director within 30 days of receipt of the results.
49. The Licensee shall divert drainage of water away from areas of potential recharge for piezometers TP-42 and TP-43 within 60 days of the issuance of this license.
50. The licensee shall perform the following activities related to erosion and deposition monitoring:
- A. The Licensee shall install, maintain, and monitor an erosion pin array near the by-product material disposal facility to monitor local erosion. The location of the erosion pin array shall be in the drainage feature west of the by-product disposal facility just beyond the present spoil piles.
  - B. The Licensee shall measure erosion and deposition at the pin array and report the measurements in writing to the Executive Director on a quarterly basis.
51. In the event that the spoil piles west of the by-product disposal facility are removed by natural or man-made means, the Licensee must redirect the drainage away from the disposal facility. The intent of the realignment is to direct potential future erosion away from the by-product disposal facility. The proposed design must be submitted to and approved by the Executive Director prior to implementation.
52. Sixty days prior to the receipt of by-product material for disposal, the Licensee shall log the Central Industrial Well (also known as the great Western Drilling Company Scratch Royalty #1A), analyze the condition of the well and condition of the cement behind pipe to ensure and prevent the well bore from providing a conduit for contaminants to lower aquifers. Within 30 days of logging the wells and analyzing the conditions of the wells, the Licensee shall submit a report on the condition of the wells to the Executive Director. Based on the condition of the well or cement behind pipe, appropriate remedial action may be required by the Licensee.
53. The Licensee shall follow all procedures provided in the application, except as required in this license.



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The following requirements are related to standard operating procedures:

- A. The development or revision of a standard operating procedure involving by-product material shall be done with the oversight of the RSO.
  - B. Prior to implementing new or revised standard operating procedures that involve by-product material, the Licensee shall obtain approval of the commission by amendment of the license.
54. Sixty days prior to the receipt of by-product material for disposal, the Licensee shall submit waste emplacement procedures for the Executive Director's review.
55. The Licensee shall conduct audits and a review of the radiation safety program in accordance with the following:
- A. At intervals not to exceed 12 months;
  - B. Include all of the items listed in Section 5.1.2 of procedure BP-RS-1.2.1 as activities conducted to evaluate specific components of an audit; and
  - C. Include observation of the performance of radiation safety procedures as a part of an audit of the radiation safety program.
56. A. The Licensee shall require all persons (employees and/or contractors) who work in the By-product Material Disposal Facility to successfully complete the licensee's basic radiation safety training course, without exception.
- B. The Licensee shall provide training to radiation workers covering the topics indicated in Section 5.5 and Section 5.5.1, of the Licensee's BP-RSP-100 Radiation Safety Program, indicated to be for radiation workers and basic radiation safety training, respectively. A minimum of 16 hours of training shall be provided to each radiation worker.
57. The Licensee must comply with the following regarding personnel dosimetry:
- A. The Licensee must provide personnel dosimetry to all employees and contractors who enter the by-product material disposal facility.
  - B. The Licensee shall revise the Dosimeter User Instructions, identified in the application as BP-RS-2.1.1-4, to include an instruction to the users of personnel dosimetry that personnel dosimetry must be worn at all times in the By-product Material Disposal Facility.
  - C. The Licensee shall comply with the following regarding the storage of dosimeters issued to employees when the dosimeters are not in use:
    - (1) The Licensee shall provide a place for storage of dosimeters issued to personnel when personnel exit the restricted area;
    - (2) The place for storage of issued dosimeters (when not in use) shall be in an area determined to be of natural-background radiation;



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- (3) A control dosimeter shall be located in the issued dosimeter storage area; and
- (4) The control dosimeter for the issued dosimeter storage area shall be exchanged and processed at the same frequency as the dosimeters issued to personnel.

58. The Licensee must comply with the following regarding training and operations:

- A. Visitors to By-product Material Disposal Facility shall be escorted by personnel trained in the facility's safety procedures. A maximum of five (5) visitors may be escorted by a single trained person.
- B. All clerical and office support staff shall be given safety training which may be an abridged version of that given to operations personnel. If any one of these employees transfers to other duties, the employee shall be given appropriate radiation safety training for his or her new assignments.
- C. All female employees shall be given instruction concerning prenatal radiation exposure.
- D. The Licensee shall make a record of the training provided to all of the above. The record shall indicate the name of the individual receiving the training or instructions, the date the training or instruction is provided, the results of examinations for course material retention, and the name of the training course provider or instructor.

59. Prior to the receipt of by-product material for disposal, as part of the acceptance process, the Licensee shall require the generator/shipper of by-product material to provide a chemical constituent profile of any by-product material offered for disposal. The chemical constituent profile shall list the chemicals contained in the by-product material and their concentration.

60. The Licensee shall randomly sample shipments of by-product material received at the by-product material disposal facility to confirm that the material is as manifested and is consistent with the definition of by-product material in accordance with the following:

- A. Five (5) percent of the shipments received shall be sampled, that is, one (1) out of every twenty vehicles delivering by-product material for disposal to the by-product material disposal.
- B. The samples shall be analyzed to ensure that only by-product material is received at the facility. The analysis shall consist of, at a minimum of, alpha and gamma spectroscopy to identify any radionuclides that do not fit within the decay schemes of uranium-238 and thorium-232.
- C. The Licensee shall make a record of each sampling and analysis. The record shall indicate the following:
  - (1) Date(s) of sampling and analysis;
  - (2) Person performing the sampling;
  - (3) Method/procedures used to perform sampling;



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- (4) Results of the analysis;
- (5) Identity of the shipper; and
- (6) Actions taken if material is not consistent with manifest, or is not by-product material.

D. The Fernald Silos 1 and 2 – Stabilized Uranium Ore Processing Residues canisters, which were previously received for storage at the Licensee’s site, are excluded from random sampling for verification that material is as manifested.

- 61. The Licensee shall perform and document visual inspection and radiation surveys of all incoming radioactive material packages in accordance with Procedure No. BP-RS-4.2.1, titled “Survey of Incoming and Outgoing Radioactive Materials.” The Licensee shall wipe an area of 300 square centimeters to test for removable contamination, per the requirements of 25 TAC §289.202(ee)(4)(A).
- 62. The Licensee shall make available for inspection and review by the Executive Director immediately upon request, all records required by this license, the applicable rule (i.e., 25 TAC Chapter 289, or 30 TAC Chapter 336), statute, or committed to by the Licensee in the referenced application, procedures and correspondence.
- 63. The Licensee shall survey all equipment and vehicles immediately prior to leaving the restricted area as described in procedure BP-RS-4.2.2, titled “Transport Vehicle Release Surveys”. The Licensee shall not allow any vehicle or equipment to leave the restricted area for release to unrestricted use until it is demonstrated to not exceed the surface contamination limits criteria specified at 25 TAC, §289.202(ggg)(6).
- 64. The Licensee shall maintain operation of the leachate collection and leak detection systems through site closure.
- 65. The Licensee shall make a record of inspections performed daily and certified by a qualified person to verify the integrity of the by-product material retention systems per the requirements of 25 TAC §289.260(g)(1). The inspection records shall indicate the date of the inspection, the person making the inspection, list the items inspected and note the findings of the inspection with respect to the by-product material retention systems. In addition to the items listed in Section 3.11 of Volume 1 of the application, the Licensee shall daily inspect any containers of by-product material stored or staged on the receiving pad and the contact water tanks. The Licensee shall maintain the records of the inspections performed. The Licensee shall make the records of inspections performed available, immediately upon request, for inspection and review by the Executive Director.
- 66. The Licensee shall designate all of the area within the confines of the security fence surrounding the by-product material disposal facility as a restricted area for the purpose of controlling exposure to ionizing radiation.
- 67. To demonstrate compliance with License Condition 7.A, the Licensee shall record volume and radioactivity of each waste emplacement made into the disposal facility, the date and location of placement, the date of receipt at the by-product material disposal facility, and the name, address and radioactive material license number of the generator. The Licensee shall use a record keeping system that provides a running total of the volume and radioactivity of by-product material disposed.



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68. Eating, drinking, and/or smoking shall not be allowed within the restricted area or in any area where radioactive material is handled, transferred, or processed.
69. The Licensee shall designate any area where the total airborne radioactivity, as determined by air sampling, exceeds  $5 \times 10^{-13}$  microcuries per milliliter total activity as an airborne radioactivity area.
70. The Licensee shall monitor for radon at the facility. Procedures and monitoring locations must be submitted for the Executive Director's review prior to receipt of by-product material for disposal.
71. If historic or cultural properties are encountered during construction, operation, decommissioning, or any other activities, the Licensee shall cease work at the immediate vicinity of that site and shall notify the State Historical Preservation Officer, the Advisory Council on Historic Preservation, and the Executive Director. These agencies shall be afforded an opportunity to comment in accordance with Protection of Historic and Cultural Properties (Federal Register Notice, Vol. 44, No. 21, January 30, 1979).
72. The Licensee shall post the security fence enclosing the 36.39 acre by-product material disposal facility. The postings shall comply with the following:
- A. The postings shall read: "Restricted Area, Unauthorized Entry is Prohibited."
  - B. The lettering on the posting shall be clearly visible and legible from a distance of 100 feet by a person with 20/20 vision.
  - C. The postings shall be spaced at intervals of not less than 200 feet around the circumference of the security fence.
  - D. The postings shall be placed at a height of between five (5) feet and six (6) feet above the surface of the ground.
73. The Licensee shall obtain all permits and licenses required by federal, State and/or local authorities prior to commencing any operations. Copies of all such permits, licenses, and their respective amendments shall be provided to the Executive Director within 30 days of their receipt by the Licensee.
74. The Licensee shall not begin any operations without the required Texas Commission on Environmental Quality (TCEQ) permit(s) and/or authorization(s) and shall abide by the requirements of any TCEQ permit, authorization, and/or rule. The Licensee shall notify the Executive Director of any proposed modifications to any TCEQ permit(s) and/or authorization(s) and of their final approval.
75. All records required by this license, the applicable rule (i.e., 25 TAC Chapter 289, or 30 TAC Chapter 336), statute, or committed to by the licensee in the referenced application, procedures and correspondence shall be made available immediately upon request for inspection and review by the Executive Director.
76. The Licensee shall maintain records of the following for review by the Executive Director: monitoring,



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sampling, and analyses programs; transfer, shipments, and disposal of radioactive materials; program audits, inspections, surveys, and any other records required by this license, 25 TAC §289.201, §289.202, §289.203, §289.204, §289.205, §289.251, §289.252, §289.257, or §289.260.

77. The Licensee shall submit to the Executive Director each year, no later than September 1 for the period of January 1 through June 30 and March 1 for the period of July 1 through December 31, a report specifying the quantity of each principle radionuclide released to unrestricted areas in liquid and in gaseous effluents (including particulates) during the specified semi-annual period of operations.
78. During the first week of each quarter, the Licensee shall provide a report to the Executive Director that states any change in plans for the following quarter. Once operations as defined here are started, the RSO and/or other designated officials shall prepare an annual report on the following areas of the radiation safety program:
- A. health physics authority and responsibility;
  - B. operating procedures involving the handling, processing, and/or storage of radioactive materials;
  - C. control of airborne by-product material, and radon 222;
  - D. records of audits, inspections, and surveys conducted by the facility RSO (for timeliness and the resolution of any problems);
  - E. personnel radiation protection programs, including employee exposure records and internal dose assessment records (e.g., air sampling results, whole body counting results, bioassay procedures and results);
  - F. radiation safety training program and records;
  - G. respiratory protection program as specified in 25 TAC §289.202(x);
  - H. records of all required radiological surveys, sampling, wipe tests, inspections, and environmental monitoring;
  - I. facility and equipment and by-product material storage locations; and
  - J. compliance for the previous 12 months with the requirements of 25 TAC §289.201, §289.202, §289.203, §289.204, §289.205, §289.251, §289.252, §289.257, §289.260, any other applicable federal and state regulations, and the conditions of this license.
  - K. These reports shall be maintained by the Licensee for review by the Executive Director for a period of three (3) years.
79. The following requirements are related to personnel surveys and monitoring:



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- A. The licensee shall establish monitoring/frisking stations at all exits to the restricted area.
  - B. All persons exiting the restricted area shall be surveyed/frisked for alpha and beta/gamma contamination.
  - C. Any reading above background detected on personnel upon exiting shall be indicative of contamination.
  - D. The Licensee shall make a record of all surveys. The record shall include as a minimum the following information:
    - (1) Date,
    - (2) Identity of person being surveyed,
    - (3) Identity of person performing survey,
    - (4) Make, model and unique identification of instrument/probe used to perform the survey,
    - (5) Results of survey, and
    - (6) If contamination indicated, action taken.
80. If the Licensee uses bioassay data or whole body counting data to derive the committed effective dose equivalent (CEDE) for personnel, the Licensee shall engage the services of a qualified dosimetrist to evaluate the whole body counting data and/or bioassay data and calculate the CEDE. The calculation and supporting information are subject to review by the Executive Director.
81. The Licensee shall monitor for occupational exposure to radon and include the occupational exposure to radon in the calculation of the total effective dose equivalent for employees. The calculation and supporting information are subject to review by the Executive Director
82. The Licensee shall perform monthly surveys to determine the airborne concentration of radon-222 (Rn-222) and/or Rn-222 progeny in working areas where concentrations may exceed 10% of the limits in 25 TAC §289.202(ggg)(2) Table I, Column 3. If airborne concentrations exceed 10% of these limits, then surveys shall be performed weekly until four consecutive weekly samples are below 10% of the limits. These working areas shall include, as a minimum, the areas in the disposal units where by-product emplacement activities occur, and areas down-wind of the disposal units at the surface of the by-product material disposal facility where workers may be present.
83. In addition to calibration of the air samplers at intervals not to exceed six months, the Licensee must also calibrate air sampler flow meters after repairs or modifications to the air flow meter have occurred, or if the air flow meter is damaged.
84. Respirators made available for reissuance or reuse must show no removable contamination in excess of 100 dpm/100 cm<sup>2</sup> alpha, and/or in excess of 1,000 dpm/100 cm<sup>2</sup> beta gamma (as determined by standard wipe or smear techniques), and no fixed beta gamma contamination in excess of 0.2 mR/hr above background on contact.



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85. Along with complying with all confined space entry requirements and before any work, including maintenance, repair, cleaning, dismantling or other such activities, is performed within closed tanks on the licensed facility which may contain or have contained radioactive materials, radiation work permits (or their equivalent) shall be submitted to the RSO. The RSO shall survey all tank interiors using radiological measuring and detection instruments and wipe methods to determine if contamination is present prior to any work being performed. If contamination exceeding 220,000 dpm/100 cm<sup>2</sup> is found or if the RSO does not perform such a survey, then protective clothing and respiratory protection shall be worn by employees during the performance of operations.
86. The Licensee must comply with the following regarding fixed and removable contamination:
- A. The Licensee shall conduct surveys for fixed and removable alpha contamination, by standard wipe or smear methods, at least monthly in all eating areas, shower and change areas, administrative areas, control rooms, and laboratories. Surfaces which have removable alpha contamination greater than the limits stated in 25 TAC §289.202(ggg)(6) shall be decontaminated.
  - B. Gamma surveys shall be conducted quarterly at all work stations and vessels which contain or have contained radioactive materials.
  - C. Each employee (including temporary and contract workers) shall be surveyed before leaving the restricted area. The worker's skin, clothing, and shoes shall be surveyed with a radiation detection instrument for removable external contamination. Removable external contamination on clothing or shoes exceeding the limits stated in 25 TAC §289.202(ggg)(6) shall be removed before the worker departs the restricted area. Results of all worker surveys shall be maintained in a log book at the survey location.
  - D. At least monthly, the RSO shall conduct an unannounced audit of each alpha survey location to ensure that workers follow the survey and administrative procedures.
87. All survey and monitoring program records shall be maintained for review by the Executive Director.
88. Any soil outside the disposal unit exceeding the following limits shall be removed and disposed of as by-product material, unless alternative methods of disposal and/or processing are authorized by the Executive Director:
- A. Radium-226 or radium-228 in soil, averaged over any 100 square meters (m<sup>2</sup>), shall not exceed the background level by more than 5 picocuries per gram (pCi/g) (0.185 becquerel per gram (Bq/g)), averaged over the first 15 centimeters (cm) of soil below the surface; and 15 pCi/g (0.555 Bq/g), averaged over 15 cm thick layers of soil more than 15 cm below the surface.
  - B. Natural uranium in soil, with no daughters present, averaged over any 100 m<sup>2</sup>, shall not exceed the background level by more than 30 pCi/g (1.11 Bq/g), averaged over the top 15 cm of soil below the surface; and 150 pCi/g (5.55 Bq/g), average concentration at depths greater than 15 cm below the surface so that no individual member of the public will receive an effective dose equivalent in excess



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of 100 millirem (1 milliSieverts) per year.

- C. Where background radiation levels for soils were not established before the soil surface was disturbed, the background levels shall be established by sampling nearby locations which have not been disturbed by on-site by-product material transport, handling, processing, or disposal. The background levels established by this means are subject to approval by the Executive Director.
89. Solid by-product material intended for disposal shall not be stored for more than 60 days, without written permission from the Executive Director.
  90. The Licensee shall include as a part of the decommissioning of the by-product material disposal facility for the management of any equipment, vehicle, structure or portion of a structure (including concrete foundations), or discrete solid objects such that they shall not be released from the facility for unrestricted use until it is demonstrated by survey that it does not exceed the surface contamination limits specified at 25 TAC §289.202(ggg)(6), or will be transferred to a person possessing a radioactive material license issued by either an Agreement State or the NRC authorizing the possession of the specific radionuclide(s) and activities contaminating the item, or will dispose of the item by placement into the last disposal unit, and will remove any soils at the facility that exceed the contamination limits specified at 25 TAC §289.202(eee)(4) and (6), that is, radium-226 or radium-228 concentration shall not exceed 5 pCi/g averaged over the first 15 cm of soil below the surface, and shall not exceed 15 pCi/g averaged over any 15 cm thick soil layer more than 15 cm below the surface of the soil, and shall not exceed 30 pCi/g of natural uranium averaged over the top 15 cm of soil below the surface, and 150 pCi/g average concentration at depths greater than 15 cm, so that no individual member of the public will receive an effective dose equivalent in excess of 100 millirem (1 milliSieverts) per year, and shall place those soils in the disposal unit.
  91. Regarding interest in the mineral estate where the by-product material disposal facility is located, the Licensee shall comply with the following:
    - A. The Licensee shall make a good faith effort to acquire fee simple title to all mineral rights underlying the disposal area. The Licensee shall report annually to the Executive Director all efforts to acquire outstanding mineral interests. The report must describe the efforts made during the proceeding year to acquire fee simple title to all mineral rights underlying the disposal area, must identify the owners and extent of mineral interests not yet acquired by the Licensee, and must state the amount of mineral interests underlying the disposal area owned by the Licensee. The Licensee shall maintain records of all conveyances and correspondence relating to the acquisition of mineral rights.
    - B. The Licensee shall file notification in the public lands records of Andrews County of the fact that the land underlying the disposal area is being used for the disposal of radioactive material and is subject to a license prohibiting the disruption and disturbance of the radioactive material. Within 60 days of the first emplacement of by-product material in the disposal area, the Licensee shall provide to the Executive Director a certified copy of the filed notification.
  92. A. The Licensee shall conduct the following radiological and non-radiological environmental



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monitoring program until the license is terminated.

Sample	Station Location Reference	Location <sup>7</sup>	Method	Frequency <sup>5</sup>	Type of Analysis
Air Particulate <sup>6</sup>	1	East of guard house	high-vol. Sampler	Continuous	Collect samples on a weekly or more frequent basis as required due to dust loading from each location and analyze monthly composite samples for: gross alpha, gross beta, Alpha isotopic <sup>1</sup> , Gamma Isotopic, Liquid Scintillation <sup>2</sup>
	3	Northwest of RCRA landfill			
	4	North of RCRA landfill			
	6	Northwest facility fence line			
	7	North fence line center of RCRA permit area			
	8	Southeast rail yard			
	9	Control station 3.5 mi. east of TX/NMex state line, south of Hwy 176			
	P11	East of by-product facility and west of Federal facility			
	26	About center of east edge of RCRA permit area (north of old ranch house)			
	27	Southeast of facility operational area (prevalent upwind direction)			
	P30	North of by-product facility			
	P31	Southwest of facility (approximately 1-4 0.25 mile west of Texas/New Mexico border			
P32	North of rail road spur				
Radon	1	East of guard house	track-etch detector	quarterly	radon
	3	Northwest of RCRA landfill			
	4	North of RCRA landfill			
	6	Northwest facility fence line			
	7	North fence line center of RCRA permit area			
	8	Southeast rail yard			
	9	Control station 3.5 mi. east of TX/NMex state line, south of Hwy 176			
	P11	East of by-product facility			
	26	About center of east edge of RCRA permit area (north of old ranch house)			
	27	Southeast of facility operational area (prevalent upwind direction)			
	P30	North of by-product facility			
	P31	Southwest of facility (approximately 0.25 mile west of Texas/New Mexico border			
P32	North of rail road spur				



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Sample	Station Location Reference	Location <sup>7</sup>	Method	Frequency <sup>5</sup>	Type of Analysis
Surface water	18	West of by-product facility (Baker Spring)	grab	semi-annual when sufficient water is present	Analyze samples from each location for: gross alpha, gross beta Alpha isotopic <sup>1</sup> , Gamma Isotopic, Liquid Scintillation <sup>2</sup>
Sediment	18	West of by-product facility (Baker Spring)	grab	annual	Analyze samples from each location for: gross alpha, gross beta Alpha isotopic <sup>1</sup> , Gamma Isotopic, Liquid Scintillation <sup>2</sup>
Ground water <sup>9</sup>	9	Control station 3.5 mi. east of TX/NMex state line, south of Hwy 176	grab	quarterly	Analyze samples from each location for <sup>4</sup> : gross alpha, gross beta, Alpha isotopic <sup>1</sup> , Gamma Isotopic, Liquid Scintillation <sup>2</sup>
	11A <sup>10</sup>	Well in the "225-foot zone" located southeast of by-product facility	grab	quarterly	
	11B <sup>10</sup>	Well in the "225-foot zone" located south of by-product facility	grab	quarterly	
	11C <sup>10</sup>	Well in the "225-foot zone" located southwest corner of by-product facility	grab	quarterly	
	11D <sup>10</sup>	Replacement well in the "225-foot zone" located west of by-product material landfill	grab	quarterly	
	11E-G <sup>10</sup>	East of by-product material landfill	grab	quarterly	
	3A <sup>10</sup>	North of by-product facility	grab	quarterly	
	3B <sup>10</sup>	North of by-product facility	grab	quarterly	
	A-16 <sup>11</sup>	OAG well located southeast of compact facility	grab	quarterly	
	A-22	Well in the "225-foot zone" located southeast of the compact facility and A-16	grab	annually	
	A-24	Well in the "225-foot zone" located southeast of the compact facility and east of A-22	grab	annually	
5E-A	Well in the "225-foot zone" located south of the by-product facility	grab	annually		
6B2	Well in the "225-foot zone" located in the northern perimeter of the federal facility	grab	annually		
DW35A	Well in the "225-foot zone" locate south of the RCRA landfill	grab	annually		
PM-01	OAG well located in northeast portion of RCRA permit area	grab	Annually <sup>12</sup>		



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Sample	Station Location Reference	Location <sup>7</sup>	Method	Frequency <sup>5</sup>	Type of Analysis
	PM-03	Well in the "225-foot zone" located in the northeast portion of RCRA permit area	grab	annually	
	PM-06	Well in the "225-foot zone" located northeast of compact facility	grab	annually	
	PM-07 <sup>11</sup>	OAG well located in eastern portion of RCRA permit area, northwest of old ranch house	grab	quarterly	
	TP-14 <sup>11</sup>	OAG well located northeast of federal facility	grab	quarterly	
	TP-18 <sup>11</sup>	OAG well located just outside the northeast corner of federal facility	grab	quarterly	
	TP-19 <sup>11</sup>	OAG well located north of the compact facility	grab	quarterly	
	TP-20 <sup>11</sup>	OAG well just north of RCRA permit area, between stations 7 and 16	grab	quarterly	
	TP-31 <sup>11</sup>	OAG well located at Bakers Springs	grab	quarterly	
	TP-46 <sup>11</sup>	OAG well located south of the federal facility	grab	quarterly	
	Vadose Zone Wells <sup>10</sup>	All wells completed in the "125-foot zone" located along all sides of the by-product landfill <sup>4</sup>	grab	quarterly	
Vegetation <sup>5</sup>	3	Northwest of RCRA landfill	Grab	spring and autumn <sup>3</sup>	Analyze samples from each location for: gross alpha, gross beta, Alpha isotopic <sup>1</sup> , Gamma Isotopic, Liquid Scintillation <sup>2</sup>
	6	Northwest facility fence line			
	8	Southeast rail yard			
	9	Control station 3.5 mi. east of TX/NMex state line, south of Hwy 176			
Soil	3	Northwest of RCRA landfill	Grab	quarterly-	Analyze samples from each location for: gross alpha, gross beta, Alpha isotopic <sup>1</sup> , Gamma Isotopic, Liquid Scintillation <sup>2</sup>
	6	Northwest facility fence line			
	8	Southeast rail yard			
	9	Control station 3.5 mi. east of TX/NMex state line, south of Hwy 176			
	22	Northwest corner, by-product facility fence line			
	26	About center of east edge of RCRA permit area (north of old ranch house)			
Fauna	General Site Area	Primary herbivore	Grab	annually	Analyze samples from each location for: gross alpha, gross beta



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Sample	Station Location Reference	Location <sup>7</sup>	Method	Frequency <sup>5</sup>	Type of Analysis
					Alpha isotopic <sup>1</sup> , Gamma Isotopic, Liquid Scintillation <sup>2</sup>
Meteoro-logical	Onsite Met. Station	2 meters	reading	10 minute averages <sup>8</sup>	precipitation, barometric pressure, solar radiation scalar wind speed and direction, temperature, relative humidity, standard deviation scalar wind direction
Meteoro-logical	Onsite Met. Station	10 meters	reading	10 minute averages <sup>8</sup>	vector wind speed and direction, scalar wind speed and direction, temperature, relative humidity, standard deviation vector and standard deviation scalar wind direction
Ambient radiation	1 3 4 6 7 8 9 P11 12 13 14 15 16 17 18 19	East of guard house Northwest of RCRA landfill North of RCRA landfill Northwest facility fence line North fence line center of RCRA permit area Southeast rail yard Control station 3.5 mi. east of TX/NM state line, south of Hwy 176 East of by-product facility and west of Federal facility Southwest of by-product facility on the Texas NM border <sup>4</sup> Southwest corner of property line. Southwest of facility (approximately 0.5 mile west of TX/NM border) Northwest corner of Texas – NM border Northeast corner of RCRA permit area Southeast corner near Hwy 176 West of by-product facility (Baker Spring) North of proposed Federal facility	TLD (for all locations)	quarterly (for all locations)	Ambient gamma radiation measurements taken at each location.



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Sample	Station Location Reference	Location <sup>7</sup>	Method	Frequency <sup>5</sup>	Type of Analysis
	21	Northeast corner, by-product facility fence line.			
	22	Northwest corner, by-product facility fence line.			
	23	West of by-product facility			
	24	Southeast corner, by-product facility fence line.			
	25	Old ranch house on east edge of RCRA facility			
	26	About center of east edge of RCRA permit area (north of old ranch house)			
	27	Southeast of facilities operational area (prevalent upwind direction)			
	28	Approximately 1000 feet east of Station 8			
	P30	North of by-product facility			
	P31	Southwest of facility (approximately 0.25 mile west of Texas/New Mexico border)			
	P32	North of proposed rail road spur			

- Alpha isotopic analyses performed if confirmed gross alpha (initial result and re-analysis) exceeds investigation limit (IL). Analyses will include radium, thorium, and uranium using the EPA and DOE modified analytical method used for the appropriate baseline analyses.
- Liquid scintillation analysis for primordial and man-made isotopes may be performed as designated by the RSO.
- No vegetation sample is required if sufficient live vegetation can not be obtained within 200 feet of the air sampling station, as per WCS sampling procedure BP-EV-7.1.7.
- Compositing of groundwater from any and all 125 ft vadose zone wells is permitted to obtain a sufficient groundwater sample volume for analysis.
- Unless noted otherwise, analysis frequency is same as sample collection frequency.
- Air particulate filters shall be replaced weekly or more frequently if excessive loading develops.
- Refer to Figure 4.1, "By-product Disposal Facility Environmental Monitoring Locations." Some locations may vary due to construction of disposal units or other facility features.
- 90% data retrieval.
- Groundwater samples shall be collected in accordance with ASTM D 4448 – 85a (1992), "Standard Guide to Sampling Ground-Water Monitoring Wells" with the exception of using the well's purge water for the sample if insufficient water can be obtained through natural recharge of the well. Samples for analyses of radionuclides shall be filtered by the laboratory through a 0.45 µm membrane filter prior to analyses. Samples shall be analyzed according to the following prioritization criteria: i) gross alpha and beta, ii) gamma spectrometry, and iii) alpha spectrometry.
- The Licensee shall conduct operational non-radiological contaminant sampling and analysis, as required, as governed by the non-radiological hazardous constituents which are determined to be present in the by-product material which may be accepted for disposal in the by-product material disposal facility.
- OAG wells shall be inspected and measurements shall be made of the depth to liquid on a quarterly basis. Records of



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these measurements shall be maintained in the facility operating record until the license is terminated and shall be made available for inspection by the Executive Director at any time during normal business hours.

- B. Duplicate Samples and Other Environmental Samples. The Licensee shall provide the Executive Director an opportunity to obtain duplicate samples concurrent with the Licensee's data collection schedule. In addition, the Licensee shall allow the Executive Director the ability to obtain any environmental media sample(s) the Executive Director deems necessary.
- C. Evaluation of Data. The Licensee shall evaluate monitoring data using a two-tiered environmental monitoring response system (i.e., investigation and action levels) as described in Volume 4, Appendix 4.B, Procedure BP-EV-1.1.0, Section VIII of the Licensee's application. The results of the evaluation must be included in the annual environmental monitoring report to the Executive Director.
- D. Transitional Monitoring Period. The Licensee shall provide for a transitional environmental monitoring period whenever program components, including sampling locations, equipment, techniques, or laboratories, are changed. This transitional monitoring period must include parallel monitoring with both the old and new conditions for at least one sampling period or as directed by the Executive Director.
- E. The Licensee shall collect, at a minimum, the following additional baseline environmental monitoring data for a minimum period of one year prior to disposal:
  - (1) Air Particulate - Air particulate data shall be collected from all air particulate stations as specified in License Condition 92A, with the exception that analyses shall include, for all samples, alpha isotopic and liquid scintillation parameters.
  - (2) Groundwater. - Groundwater samples shall be collected on a quarterly basis from all existing wells identified in License Condition 92A; In addition to the gross alpha and gross beta analyses, these samples shall be analyzed for uranium and thorium isotopes, gross alpha, gamma isotopic, and liquid scintillation.
  - (3) Non-Radiological Contaminants: The Licensee shall conduct quarterly baseline non-radiological contaminant sampling and analysis of groundwater for a period of one year.

If one year of baseline environmental monitoring data has not been collected and analyzed prior to the completion of disposal unit construction, the emplacement of Fernald Silos 1 & 2 waste may begin.

Samples for non-radiological baseline monitoring shall be collected from groundwater monitoring wells identified in License Provision 92A where these wells yield sufficient groundwater for sampling. All samples shall be analyzed for hazardous constituents as discussed in License Condition 92.I.

- F. Data Evaluation Procedures. The Licensee shall develop control charts and/or nonparametric prediction limits for all environmental media measurements which will be used to determine whether contamination may be migrating from the site as seen by increasing trends in the periodic analyses. For whichever statistical monitoring method is used, a minimum of one year of data is



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required for each parameter under review. Prior to the disposal of by-product material, the Licensee shall submit a report to the Executive Director that includes the control charts, ~~or~~ prediction limits; the individual baseline measurements used to determine the control charts or prediction limits; and the analytical methods used for determining the control charts or prediction limits. The Licensee shall use the statistical evaluation values for determining whether contamination may be migrating from the disposal facility. (see WCS App., Vol. 4, Procedure BP-EV-1.1.0).

- G. Baker Spring Sampling Event. Prior to the disposal of by-product material, the Licensee shall conduct additional surface water and sediment sampling event of the Baker Spring surface water feature. These samples shall be analyzed for gross alpha, gross beta, alpha isotopic, gamma isotopic, and liquid scintillation parameters using all EPA and DOE Methods shown at the bottom of Table 2.28, "Pre-Operational Data for Baker Spring", included in the license application.-
- H. Pre-operational Fauna Samples. The Licensee shall submit, for review by the Executive Director, fauna sampling data from the existing site-wide perimeter monitoring program for determining whether this sample data can be used as a baseline for comparison with fauna samples taken during the site's operational period.
- I. Sampling of Non-Radiological Contaminants: The Licensee shall conduct quarterly baseline non-radiological contaminant sampling and analysis of all groundwater monitoring wells for a period of one year. All wells which yield sufficient water will be sampled for volatile and semi-volatile organic compounds, pesticides, polychlorinated biphenyls, cyanide, and metals. The Licensee shall conduct operational non-radiological contaminant sampling and analysis, as required, as governed by the non-radiological hazardous constituents which are determined to be present in the by-product material which may be accepted for disposal in the by-product material disposal facility. Samples for these non-radiological constituents shall be performed in all 125-foot and 225-foot monitoring wells which are located at the perimeter of the by-product material disposal facility.
- J. In the event that the 125 Foot zone indicates a release beneath the by-product disposal facility, installation and monitoring of wells in the 180 Foot zone must occur. This would follow Executive Director approval of a proposed monitoring plan, submitted within 90 days of release detection.
- K. Reporting Investigative and Action Level Exceedances: The Licensee shall immediately report any confirmed environmental investigative and/or action level exceedances to the Executive Director, in addition to the reporting requirements of 25 TAC §§289.220(xx), 25 TAC §§289.220(yy), and 25 TAC §289.260(g)(2)(A). Release of effluents to unrestricted areas in this case would include releases of leachate to any groundwater surrounding the by-product facility. The Licensee shall submit immediate notification within four (4) hours of confirmation of the analysis results using either facsimile, electronic mail, or other acceptable written or electronic form and shall include, to the extent that the information is available at the time of notification, the following information:
  - (1) the caller's name and call back telephone number;
  - (2) a description of the event, including date and time;
  - (3) the exact location of the event;
  - (4) the isotopes, quantities, and chemical and physical form of the radioactive material involved;
  - (5) a description of the event, including the probable cause and the manufacturer and model number (if applicable) of any equipment that failed or malfunctioned;
  - (6) corrective actions taken or planned and the results of any evaluations or assessments; and



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- (7) the extent of exposure of individuals to radioactive materials without identification of individuals by name.

The Licensee will follow-up with a written report within 30 days which, in addition to the immediate notification information, shall include:

- (1) determination, as to the amount of radioactive material released, likely sources of radioactive releases, possible location, size, and cause of any radioactive releases, and short-term actions taken and planned;
- (2) determine to the extent practicable the location, size, and cause of any radioactive releases;
- (3) determine whether any waste should be removed from the unit for inspection, repairs, or controls;
- (4) determine any other short-term and longer-term actions to be taken to mitigate or stop any effluent releases; and
- (5) the results of any remedial actions taken to date.

93. As the installation of final cover is completed, the Licensee must install settlement monitors on a 50 yard by 50 yard grid on the disposal facility final cover to allow monitoring of settlement. The location and elevations of these monitors and their respective benchmarks must be surveyed by a Texas Registered Professional Land Surveyor. Their location and elevations must be reported to at least the nearest 0.01 foot. Settlement reports (data and plots) sealed by a Texas Registered Professional Land Surveyor must be submitted to the Executive Director on a quarterly basis once a monitor is established.

94. A. The Licensee shall complete closure of the by-product material disposal unit(s) as expeditiously as practicable, considering technological feasibility, in accordance with the Closure Plan submitted with the application dated January 12, 2007.

B. Prior to requesting termination of this license, the Licensee shall complete monumentation of the by-product material disposal facility. The monument shall bear an inscription similar to the following:

Prior to requesting termination of this license, the Licensee shall complete monumentation of the tailings impoundment. The monument shall bear an inscription similar to the following:

WASTE CONTROL SPECIALISTS LLC BY-PRODUCT MATERIAL DISPOSAL SITE  
 XXX ACRES CONTAIN BY-PRODUCT MATERIAL  
 DATE OF CLOSURE: XXX  
 TONS OF CONTAINED BY-PRODUCT MATERIAL: XXX  
 CURIES/BECQUERELS OF CONTAINED RADIOACTIVITY: XXX  
 DO NOT DISTURB  
 SITE CONTAINS BURIED RADIOACTIVE BY-PRODUCT MATERIAL  
 CONTACT TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

XXX = Information to be provided by Licensee

95. All written submissions to the Executive Director as required by this license shall be made to the



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following:

A. For submissions by U. S. Postal Service:

Attn: Susan Jablonski, P.E., Director  
 Radioactive Materials Division  
 Texas Commission on Environmental Quality  
 Mail Code – 233  
 P. O. Box 13087  
 Austin, Texas 78711-3087

B. For Submissions by facsimile transmission the transmission should be addressed to the attention of the Uranium and Technical Assessments Section, Radioactive Materials Division and sent to the following number:

(512) 239-6464

C. For submission of portable document file (pdf) documents by electronic mail, address to the following:

sjablons@ tceq.state.tx.us

96. Except as specifically provided otherwise by this license, the Licensee shall possess and use the radioactive material authorized by this license in accordance with statements, representations, and procedures contained in the following:

Application dated: January 12, 2007;

Letters dated: February 27, 2007, with Attachments A and B; May 4, 2007; May 18, 2007, including revisions to the application and a Procedures Manual dated May 2007; and June 4, 2007, with revisions to the application.

If there is a conflict between a condition of this license, statements contained in the application materials, applicable provisions of Title 25 TAC Chapter 289, or Title 30 of TAC, the most stringent provision shall prevail.

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FOR THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Date \_\_\_\_\_