Summary of Relevant Intruder Scenarios

Annual Peak of Mean Doses (TEDE) for Exposure to Inadvertent Intruders Operating on the Proposed Federal Cell Disposal Site (Simulation Period = 10,000 years)

Inadvertent Intruder	Exposure Pathways Considered	Peak of Mean TEDE (mrem/yr)	
		All DU*	No Recycle*
Ranch Worker (ES)	• Ingestion • Inhalation • External radiation	0.0163 (peak at 10,000 years)	0.0163 (peak at 10,000 years)
Hunter (ES)	• Ingestion • Inhalation • External radiation	0.000799 (peak at 10,000 years)	0.000799 (peak at 10,000 years)
OHV Enthusiast (ES)	• Ingestion • Inhalation • External radiation	0.00127 (peak at 10,000 years)	0.00127 (peak at 10,000 years)
Industrial Worker (ES)	• Ingestion • Inhalation • External radiation	0.024 (peak at 10,000 years)	0.024 (peak at 10,000 years)
Acute Inadvertent Well Driller (ES)	• External exposure from unshielded contaminated drill cuttings pile • Inhalation of contaminated cuttings	0.0000017 (peak at 3,500 years)	0.000000066 (peak at 10,000 years)
Chronic Inadvertent Industrial Intruder (ES)	• External exposure from photon-emitting radionuclides in unshielded, surface-sprayed wastewater • Inhalation of radionuclides suspended in air from surface-sprayed wastewater	0.000084 (peak at 3,500 years)	0.0000031 (peak at 10,000 years)
Chronic Inadvertent Industrial Intruder (DEQ)	• Ingestion: Worker consumes 1,095 L of reverse-osmosis-treated well water annually	0.14 (peak at 3,500 years)	0.0047 (peak at 10,000 years)
Chronic Inadvertent Industrial Intruder (DEQ)	• External exposure from photon-emitting radionuclides in unshielded, surface-sprayed wastewater • Inhalation of radionuclides suspended in air from surface-sprayed wastewater	0.00016 (peak at 3,500 years)	0.0000059 (peak at 10,000 years)

(ES) = Energy*Solutions* performed the calculations. (DEQ) = SC&A, Inc. performed the calculations.

* DU can result from enrichment of natural uranium or re-enrichment of uranium that has been irradiated in a nuclear reactor (i.e., recycled uranium). The "All DU" column assumes the disposal of both types of DU. The "No Recycle" column assumes the disposal of only natural uranium.

Understanding Radiation Dose

Dose equivalent = a measure of the biological damage to living tissue as a result of radiation exposure.

Total effective dose equivalent (TEDE) = the sum of the effective dose equivalent for external exposures and the committed effective dose equivalent for internal exposures.

Annual total effective dose equivalent = DEQ has determined a 500 mrem/year maximum dose limit for an inadvertent intruder to be acceptable, based on the 1981 U.S. Nuclear Regulatory Commission (NRC) Draft Environmental Impact Statement, see NUREG-0782, Vol. 1, p. 29.

Note on waste contamination – DU from recycled uranium contains fission and activation products, such as technetium-99 (Tc-99), in addition to the uranium series of radionuclides.