

Basis to Demonstrate Compliance with the National Emission Standards for Hazardous Air Pollutants for the Stand-off Experiments Range

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SUMMARY

This report provides the proposed methodology for evaluating diffuse radionuclide emissions for the outdoor linear accelerator (linac) operations at the Idaho National Laboratory (INL) Stand-off Experiments Range (SOX). In accordance with the National Emission Standards for Hazardous Air Pollutants (NESHAP), 40 CFR 61 Subpart H, “National Emission Standards for Emissions of Radionuclides Other Than Radon from Department of Energy Facilities,” section 61.96(b) and the 1995 Memorandum of Understanding (MOU) (EPA 1995), U.S. Department of Energy (DOE) is required to obtain U.S. Environmental Protection Agency (EPA) approval of alternate procedures for estimating source terms, and specifically per the MOU, for diffuse emission sources.

Photonuclear active interrogation research at INL uses high-energy x-ray (photon) radiation (bremsstrahlung), up to a nominal 60 MeV, to interrogate inspection objects up to several thousand meters away. This research supports the Department of Defense, Department of Homeland Security, and Department of Energy’s research and evaluation of deployment issues associated with outdoor inspections of configurations of shielded nuclear material. The photons are generated by open installation electron linacs. Some of the photons create airborne radioactive gaseous isotopes as the photon beam transits the air to the inspection object. High-energy linacs in this INL program are not enclosed in a shielded building or other enclosure that confines the radioactive isotopes.

Calculation of the source terms is performed using methods principally from the National Council on Radiation Protection and Measurements (NCRP) report 144, “Radiation Protection for Particle Accelerator Facilities” and Monte Carlo N-Particle eXtended (MCNPX) codes. The bounding limit at the SOX Range is a nominal 60 MeV maximum electron energy and 100 microamps average beam current. A range of linac energies and power up to that limit is expected, and source terms have been calculated based on anticipated operating configurations. In accordance with Federal regulations 40 CFR 61 subpart H, the atmospheric transport and radiological dose code, CAP88-PC-Version 3 (EPA 2007), is used to calculate effective dose equivalent (EDE) to a maximally exposed individual (MEI) located off the INL Site boundary using the methodology described in the 2009 Radiological NESHAP report (DOE-ID 2010). The EDE is calculated prior to any linac operation at the SOX Range to maintain the dose to the MEI less than 0.1 mrem per year.

Prior to any linac operation at the SOX Range, a beam authorization sheet must be prepared and approved by the Accelerator Safety Officer. The beam authorization sheet identifies the linac to be operated, the maximum beam energy and average beam current (maximum SOX Range values for these parameters are 60 MeV and 100 microamperes, respectively), the type of converter and collimator used, and the maximum hours of operation for the specified parameters. The Accelerator Safety Officer uses this information to calculate the maximum radioactive source term that could be generated for the particular linac operation. This source term is then analyzed using CAP88 to determine the EDE that would result to the MEI. The Accelerator Safety Officer tallies the cumulative EDE for all linac operations during a calendar year. If the cumulative dose to the MEI for proposed linac operations when summed with all other approved linac operations within that calendar year is less than 0.1 mrem, then the beam authorization sheet is approved, and the proposed linac operation may commence. Any proposed operation of a linac that would result in a cumulative EDE that equals or exceeds 0.1 mrem in a calendar year would not be approved. This process controls the dose to the MEI resulting from SOX Range operations to less than 1% of the NESHAP standard, the threshold that would require an EPA approval to construct. As a comparison, in 2009, radionuclide air emissions and the resulting EDE to the MEI from all operations at the INL Site was 0.0687 mrem/yr, 0.69% of the 10-mrem standard (DOE/ID-10890 2010). The cumulative EDE from SOX Range and other INL operations would remain far below the 10 mrem regulatory limit. The source terms are calculated without any credit for pollution control equipment, as it is not practical for the types of linac operations at the SOX Range.

The average electron beam power and operating time are measured, recorded, and used to calculate radionuclide emissions for inclusion in INL's annual NESHAP report.

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ACRONYMS

μ	linear attenuation coefficient
μA	microamperes
μm	micrometer
Ar	Argon
Be	beryllium
Bq	Becquerel
C	carbon
Cl	Chlorine
D	dose
H	hydrogen
INL	Idaho National Laboratory
Ir	iridium
keV	kilo electron volts
linac	linear accelerator
MCNPX	Monte Carlo N-Particle eXtended
MEI	maximally exposed individual
MeV	mega electron volts
mrem	millirem
N	nitrogen
NCRP	National Council on Radiation Protection and Measurements
NESHAP	National Emission Standards for Hazardous Air Pollutants
O	oxygen
Pb	lead
PR	production rate
S	saturated activity
SOX	Stand-off Experiments
W	tungsten
YF	yield factor
Z	atomic number

Basis to Demonstrate Compliance with the National Emission Standards for Hazardous Air Pollutants for the Stand-off Experiments Range

1. OVERVIEW OF THE ACTIVE INTERROGATION RESEARCH AND DEVELOPMENT

Photonuclear active interrogation research at INL uses high-energy x-ray (photon) radiation (bremsstrahlung) to interrogate threat objects to detect, identify, and characterize shielded fissionable materials, including uranium and plutonium that may be contained in the threat objects. In this work, the threat objects vary in size from small shipping drums to large, full-size cargo containers that may be empty or filled with different shield materials. Shield materials used in this work are chosen based upon their potential ability to challenge and/or defeat the photonuclear active interrogation process and include low-atomic number (Z) materials, such as plastic or borated plastic (which attenuate neutron radiation) and high- Z materials such as iron, lead, or tungsten (which attenuate photon radiation).

The interrogating photon radiation used in this work is produced from high-energy linacs. In these devices, electrons with nominal energies of up to 60 MeV, depending upon the configuration, are directed against a converter such as carbon, aluminum, copper, tantalum, tungsten, or air, which causes the electrons to decelerate and lose energy. This process results in the creation of high-energy photons. The photons are produced in a continuous energy spectrum, with small numbers produced at the very highest energy, corresponding to the maximum electron beam energy, and progressively more photons produced at lower energies. Typically a thin “window” is used to allow the electron beam to exit the linac while maintaining the vacuum in the system before it strikes the converter. The linacs almost exclusively operate as pulsed machines and generate photon pulses on the order of 5 microseconds in duration with repetition rates typically in the range of 60 to 120 Hz.

Linacs are commonly used in medical, commercial/industrial, university, and government laboratories throughout the United States and the world. In the medical field, linacs are used for radiation therapy and for surgical equipment and materials sterilization. In the commercial/industrial world, linacs are used for food safety inspection and treatment, water treatment, material manufacturing, large and/or dense object x-ray inspections, etc. Universities use linacs for anything from the nature-of-matter basic research to assessing the age of ancient artifacts. Government laboratories use linacs in ways similar to universities, but have also used them to conduct research and development for waste characterization, material identification, and national defense needs. The uses here are not all inclusive, but are provided to highlight the fact that linac machines are relatively common. Most major cities in the U.S. have at least one, though linac use is typically conducted indoors.

To better understand electron linacs and the effects of their accelerated particles, there are two characteristics that are important: the energy level and the current of the electrons. The energy level determines the types of possible interactions with matter. The current determines the interaction rate or number of interactions per unit time. While the primary interaction of electrons with matter is ionization and heating, there is a process that is referred to as bremsstrahlung where the electron releases its excess energy as electromagnetic waves (or photons) commonly called x-rays. The difference between the photons that are generated by an x-ray machine in a dental office and the photons used for INL’s research and development is that the dental office photons are of the order of tens of keV and those at INL are about 1,000 times more energetic or tens of MeV. The difference between the keV and MeV photons is that, as the energy increases, the electromagnetic wave length shortens, causing different interaction mechanisms in various materials.

The linacs used at INL's Stand-off Experiments (SOX) Range are modest in size and capable of being transported in small cargo trucks or containers. The linacs are comparable to those used for photon and electron beam therapy in a hospital or cancer center. They contrast with the very large, complex, and very high-energy linacs found at major accelerator facilities. Historic use of linacs at INL has been at low energies and current settings that do not result in photonuclear reactions in the air.

Unshielded photon radiation from high energy linacs tend to be forward focused and can travel very long distances. This effect proves beneficial in measurement situations focused at interrogating objects long distances from the linac (often called stand-off interrogation).

Part of the proposed research may include methods to make the system more radiation safe. A collimator may be used during the research to modify the beam generated by the linac. The collimator is essentially a radiation shield that attenuates the incident radiation emitted from the linac. The collimator aperture is in line with the primary electron beam. This allows a desirable component of the generated radiation to continue downrange without interacting with the collimation materials. The collimator is also a key topical area in research and development efforts to optimize the high-energy linac parameters. The collimator can substantially reduce off-axis dose rates when a converter is integrated with the linac at the end of the electron beam. The collimator effectively reduces the broad beam in the forward direction, leaving a narrower unaffected beam and minimizes the off-axis radiation from the converter. This reduces the overall width of the radiation area and the resulting photonuclear reactions in the air. The residual linac photon beam is best characterized as a narrow cone gradually expanding from the point of origin (collimator).

When energetic photons interact with materials, they have the potential to cause the ejection of neutrons, protons, and other charged particles from atomic nuclei via photonuclear reactions. These include photo-neutron (γ, n), photon-dual neutron ($\gamma, 2n$), and photon-proton (γ, p) reactions. Giant dipole resonance (giant resonance) is the photonuclear mechanism that will dominate reactions from the INL linac photons.

In fissionable materials, including uranium and plutonium, incident energetic photons can induce fission via the photofission (γ , fission) reaction. The photon energy thresholds and reaction probabilities for these reactions vary from isotope to isotope. Photoneutrons and neutrons produced during fission occur nearly simultaneously with the reactions and are referred to as prompt neutrons.

In a similar fashion, prompt gamma rays can also be generated within an inspection object subjected to irradiation from energetic photons. In addition to these prompt radiation emissions, a second source of neutrons and photons exists in inspection objects when fission takes place. This secondary radiation source is a result of the decay of the fission products created during fission. Nearly all radioactive fission products will emit gamma rays as they decay; these emissions are referred to as delayed gamma rays and they are generated in relation to the decay rates of the fission products. A small subset of fission products also yields neutrons during the decay processes; these are referred to as delayed neutrons.

Unique differences exist in the energy, emission rates, and emission properties between prompt and delayed radiations among different materials. Photonuclear active interrogation exploits these unique signatures to detect, identify, and characterize different fissionable materials. Prompt and delayed photofission neutrons can remain in a test object for short periods of time (milliseconds) after each linac photon pulse. To measure these signatures, special detector systems must be employed that are simultaneously capable of withstanding the radiation fields generated when the linac pulses and, also, of achieving very sensitive detection efficiencies for the delayed radiation products. See Figure 1 for a simple representation of the linac detector systems and inspected object.

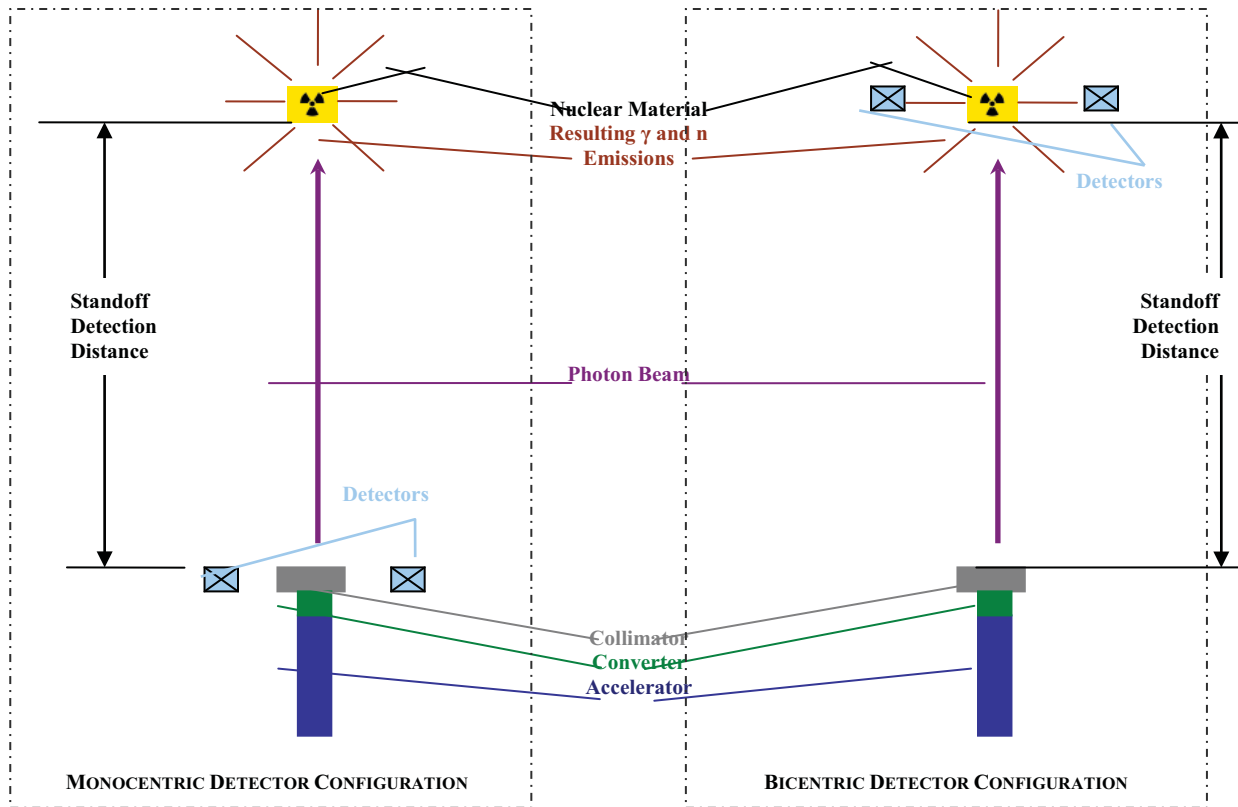


Figure 1. Linac example with inspection object and monostatic and bistatic detector configurations.

2. SOURCE TERM

2.1 Sources of Radioactivity

The principal source of radioactivity from INL linac operations is from photonuclear interactions with atoms in the air, primarily ^{16}O , ^{14}N , ^{12}C , and ^{40}Ar . As previously noted, linac photons have the potential to cause the ejection of neutrons, as well as protons and other charged particles, from atomic nuclei.

The next most important source of radioactivity in air is from thermal neutron capture (such as creation of ^{41}Ar from ^{40}Ar). The source of these thermal neutrons is from the neutrons ejected by the giant resonance mechanism in the air and converter. They have an energy spectra compared to the fission spectra that averages about 1–3 MeV. Activation of air by interaction with high-energy neutrons (>20 MeV neutron energy) is not an important source of radioactivity unless a linac is operated at electron beam energies greater than 100 MeV. INL linacs will not be operated at energies greater than 60 MeV, so high-energy neutron activation is not significant.

2.2 Isotopes of Interest

The airborne radionuclides of significance for environmental release are ^{13}N , ^{15}O , ^{11}C , and ^{41}Ar . These radionuclides contribute approximately 99% of the effective dose. Of lesser importance are ^{39}Cl , ^{38}Cl , ^{39}Ar , ^3H , and ^7Be . With the exception of ^{39}Ar , ^3H , and ^7Be , the half-lives of these radionuclides are relatively short. All isotopes of interest and their half-lives are appropriately modeled by CAP88.

3. CALCULATION OF RADIOACTIVITY USING NCRP-144 METHODS

The production of airborne radioactivity may be analyzed using calculated yields listed in Table 6.4 of NCRP report 144, “Radiation Protection for Particle Accelerator Facilities.” The table provides the yield factor that may be used to obtain the saturated activity (S) in Becquerel (Bq) per unit electron beam power (kW) and per unit bremsstrahlung path length (m – meters of air).

For example, the yield factor (YF) for $^{13}\text{N} = 1.1 \times 10^8 \text{ Bq kW}^{-1} \text{ m}^{-1}$.

Beam power in kilowatts (kW) is determined by multiplying the maximum electron beam energy in MeV by the average electron beam current in μA and dividing by 1000 to convert watts into kW. The following example is for a 60 MeV linac operating at 100 μA .

$$\text{Power} = 60 \text{ MeV} \times 100 \mu\text{A}/1000 = 6 \text{ kW}$$

The photon path length in air at a typical accelerator facility is generally very short, in the range of a few meters to 10 meters. The generation of airborne radioactivity by the photon radiation ceases once it begins striking the shield wall. The path length is taken to be the distance from where the electron beam strikes the bremsstrahlung converter (either an electron converter or linac component) and the shield wall. The saturated activity for ^{13}N within the shielded facility assuming 6 kW power and 5 meter path length is calculated as follows:

$$S = 1.1 \times 10^8 \text{ Bq kW}^{-1} \text{ m}^{-1} \times 6 \text{ kW} \times 5 \text{ m} = 3.3 \times 10^9 \text{ Bq}$$

The concept of saturation is useful for an enclosed installation or room where equilibrium can be reached between the production and decay rates of individual radionuclides. However, when applied to an open installation with short run times, such as the SOX Range, it becomes less instructive due to the variable atmospheric conditions to which this type of configuration is exposed. For the SOX Range saturation rate is only used in the determination of production rates.

3.1 Beam Length in Open Installations

The photon path length is significantly longer for the open installation used at INL. The path length is potentially thousands of meters unless a backstop such as a hill or shield wall is encountered. In this case, the photon flux is greatly affected by the air acting as shielding. The radioactivity yield in the first meter of the photon path would be significantly higher than at the 1000th meter. Therefore, the yield for each increment along the path length must take into account the reduction of the photon flux based on the shielding effect of air. The reduction of the photon flux from the original strength to any distance (s) can be determined by multiplying the original flux by $e^{-\mu s}$, where μ is the linear attenuation coefficient. The following equation may be substituted for the beam path length and solved for a particular path length to integrate the effect of air as shielding: $\int e^{-\mu s} ds$.

The linear attenuation coefficient (μ) may be determined by taking the mass attenuation coefficient and multiplying by the density of air. A selected single value of the mass attenuation coefficient (μ_m) for photons in the range of 10 MeV through 60 MeV is 0.016 cm^2/g . This value was taken from the NIST “Tables of X-Ray Mass Attenuation Coefficients and Mass Energy-Absorption Coefficients” (<http://physics.nist.gov/PhysRefData/XrayMassCoef/cover.html>). This is the value for a 40 MeV photon, which is the minimum cross section through air. This value significantly underestimates the attenuation from air as the photon energy decreases to 1 MeV and less. The density of air at 1,500 meters elevation, the altitude at the INL, is 0.001056 g/cm^3 compared to 0.0012 g/cm^3 at sea level. The linear attenuation coefficient (μ) is the product of the mass attenuation coefficient and the density of air. The value of the linear attenuation coefficient at 1500 meters is $1.69 \times 10^{-5}/\text{cm}$.

The following example is used for clarity. Assume a distance from the linac to the shield wall of 500 meters in a large (unrealistic) shielded facility. The saturated activity for ^{13}N within the shielded

facility assuming 6 kW power and integrating $\int e^{-\mu s} ds$ from zero to 500 meters as the path length is calculated as follows:

$$S = 1.1 \times 10^8 \text{ Bq kW}^{-1} \text{ m}^{-1} \times 6 \text{ kW} \times \int e^{-\mu s} ds \text{ (see Appendix A)}$$

$$S = 1.1 \times 10^8 \text{ Bq kW}^{-1} \text{ m}^{-1} \times 6 \text{ kW} \times 338 \text{ m}$$

$$S = 2.2 \times 10^{11} \text{ Bq}$$

Assume the same example with an infinite distance for beam length. The saturated activity for ^{13}N within the shielded facility assuming 6 kW power and integrating $\int e^{-\mu s} ds$ from zero to ∞ meters as the path length is calculated as follows:

$$S = 1.1 \times 10^8 \text{ Bq kW}^{-1} \text{ m}^{-1} \times 6 \text{ kW} \times \int e^{-\mu s} ds \text{ m}$$

$$S = 1.1 \times 10^8 \text{ Bq kW}^{-1} \text{ m}^{-1} \times 6 \text{ kW} \times 592 \text{ m}$$

$$S = 3.9 \times 10^{11} \text{ Bq}$$

This saturated activity result converges on this maximum at about 2500 meters of the photon path length. This concept is useful for open installations for determining maximum production rates given the power of the linac. It may also be used for determining the average saturated activity concentration in a virtual unshielded box that has mixing and no dispersion.

3.2 Determining Activity Production Rate from the Maximum Saturated Activity

For radioactivity, saturation is achieved when the rate of decay is equal to the build-up. That is, one atom is lost to decay and one atom replaces it. The unit Bq is equal to a single disintegration per second. It follows that if a linac has a saturated activity of $3.9 \times 10^{11} \text{ Bq}$, it has a production rate (PR) of 3.9×10^{11} atoms (^{13}N) per second. The operating time at a particular power can be used to determine the number of radioactive atoms produced. For example, the number of ^{13}N atoms produced for a 3 minute run of the linac at 6 kW would be as follows:

$$\left. \begin{aligned} S &= 1.1 \times 10^8 \text{ Bq kW}^{-1} \text{ m}^{-1} \times 6 \text{ kW} \times \int e^{-\mu s} ds \text{ m} \\ S &= 1.1 \times 10^8 \text{ Bq kW}^{-1} \text{ m}^{-1} \times 6 \text{ kW} \times 592 \text{ m} \\ S &= 3.9 \times 10^{11} \text{ Bq} \end{aligned} \right\} \text{ from Section 3.1}$$

$$\text{PR} = 3.9 \times 10^{11} \text{ atoms/sec}$$

$$\text{Production (N)} = \text{PR} \times \text{time}$$

$$N = 3.9 \times 10^{11} \text{ atoms/sec} \times 180 \text{ sec}$$

$$N = 7.02 \times 10^{13} \text{ atoms}$$

The activity may be determined by multiplying the number of atoms by λ , which is 0.693 divided by the half-life ($A = N \lambda$). The production may then be expressed in units of activity. The activity production for the ^{13}N example assuming a 180 second run would be:

$$\begin{aligned}
 S &= 1.1 \times 10^8 \text{ Bq kW}^{-1} \text{ m}^{-1} \times 6 \text{ kW} \times \int e^{-\mu_s} ds \text{ m} \\
 S &= 1.1 \times 10^8 \text{ Bq kW}^{-1} \text{ m}^{-1} \times 6 \text{ kW} \times 592 \text{ m} \\
 S &= 3.9 \times 10^{11} \text{ Bq} \\
 PR &= 3.9 \times 10^{11} \text{ atoms/sec} \\
 \text{Production} &= PR \times \text{time} \\
 \text{Production} &= 3.9 \times 10^{11} \text{ atoms/sec} \times 180 \text{ sec} \\
 \text{Production} &= 7.02 \times 10^{13} \text{ atoms} \\
 A &= N \lambda \\
 A &= 7.02 \times 10^{13} \text{ atoms} \times 0.693/10\text{min} \\
 A &= 7.02 \times 10^{13} \text{ atoms} \times 0.693/600\text{sec} \\
 A &= 8.1 \times 10^{10} \text{ Bq}
 \end{aligned}
 \quad \left. \vphantom{\begin{aligned} S &= 1.1 \times 10^8 \text{ Bq kW}^{-1} \text{ m}^{-1} \times 6 \text{ kW} \times \int e^{-\mu_s} ds \text{ m} \\ S &= 1.1 \times 10^8 \text{ Bq kW}^{-1} \text{ m}^{-1} \times 6 \text{ kW} \times 592 \text{ m} \\ S &= 3.9 \times 10^{11} \text{ Bq} \\ PR &= 3.9 \times 10^{11} \text{ atoms/sec} \\ \text{Production} &= PR \times \text{time} \\ \text{Production} &= 3.9 \times 10^{11} \text{ atoms/sec} \times 180 \text{ sec} \\ \text{Production} &= 7.02 \times 10^{13} \text{ atoms} \end{aligned}} \right\} \text{from above}$$

3.2.1 Determining the Production of Argon-41

Neutrons are created by photonuclear reactions in the convertor and during the production of ^{13}N , ^{15}O , ^{11}C , ^{38}Cl , and ^{39}Ar in the air. While other minor sources of neutrons exist, the addition of these sources is not a significant contribution to the total neutron production. A conservative assumption has been made in this analysis that all of the neutrons created slow down and become thermal energy neutrons. The thermal neutrons are captured by various isotopes in air, predominately nitrogen, in proportion to the number of atoms in air and the cross section for absorption of thermal neutrons. An ^{41}Ar atom is created when a neutron is captured in an ^{40}Ar atom. ^{40}Ar captures a small fraction (0.035) of all neutrons generated by the photonuclear reactions (see Appendix D). This factor is applied to the neutron production in the air and from the convertor. The neutron generation at the convertor is isotropic, distributing neutrons in all directions. About half of these neutrons are absorbed into the ground below the convertor and along the photon beam path.

Example: The neutron production rate for a high Z convertor (such as tungsten) is about 2.3×10^{12} neutrons per second per kW power at 60 MeV electron beam energy. This value is taken from Figure 3.12 of NCRP-144. This corresponds to a neutron production rate of 1.3×10^{13} neutrons per second at 6kW power. See Appendix E. The ^{41}Ar atom production rate for this convertor is equal to:

$$PR \text{ (atoms/sec)} \text{ } ^{41}\text{Ar} = 1.38 \times 10^{13} \text{ neutrons/sec} \times 0.035 \text{ } ^{41}\text{Ar atoms/neutron} \times 0.5$$

$$PR \text{ (atoms/sec)} \text{ } ^{41}\text{Ar} = 2.42 \times 10^{11} \text{ } ^{41}\text{Ar atoms/second.}$$

$$\text{Production (N)} = PR \times \text{time}$$

$$\text{Activity} = N \times \lambda$$

$$\text{Note: } \lambda = .693/T_{1/2} = .693/\text{half-life} = .693/1.827 \text{ hours} = 0.693/6577 \text{ seconds}$$

The neutron production rate of ^{41}Ar from photonuclear reactions in the air may be calculated by adding together the production rates of ^{13}N , ^{15}O , ^{11}C , ^{38}Cl , and ^{39}Ar and assuming one neutron is created from the creation of these radionuclides. The production values for these neutron sources are located in row 13 of the source term spreadsheets in Appendix C. The activity production rate of ^{41}Ar is calculated in the same manner as the example above.

The total production rate for ^{41}Ar may be calculated by adding together the neutron production rates from the convertor and the production of ^{13}N , ^{15}O , ^{11}C , ^{38}Cl , and ^{39}Ar then multiply by the ^{40}Ar neutron capture fraction.

3.3 Assumptions and Adjustment Factors (Ground, Converter, Energy Yield)

The radiation flux pattern of these open installation high energy linacs is broad and heavily weighted in the forward directions. This contrasts with lower energy sources, such as an ^{192}Ir radiography source or a 1 or 2 MeV linac, which emits radiation more evenly in all directions. Figure 2 depicts the radiation flux pattern of a high-energy linac. The image was created using MCNPX. The photon flux field was generated by 60 MeV maximum electron beam energy, 100 μA average beam current, no collimator at the converter, and a 0.84 cm thick tungsten converter on the linac. The image scale is 520 meters long down the beam axis and 100 meters wide in each direction at 90 degrees from the beam axis. The flux pattern is symmetrical in full rotation around the beam axis assuming the linac was suspended at least 100 meters above the ground.

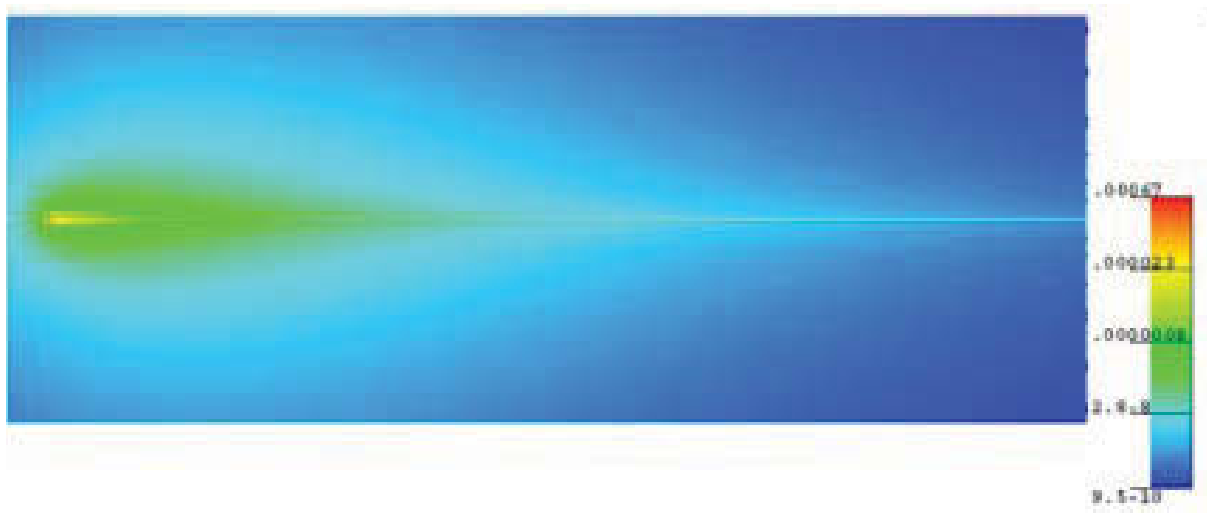


Figure 2. Photon flux field at 60 MeV maximum electron beam energy and 100 μA with high Z converter in the linac, no collimator or ground plane.

The INL open installation linac is at ground level. The beam line is typically 1–2 meters above the ground at the point of creation. It may be seen by inspection that about 50% of the broad beam from a linac without a collimator is absorbed or attenuated in the ground. MCNPX modeling has shown high energy photons are absorbed in the ground, not reflected. It is realistic to reduce the airborne radioactivity production rate by a fraction to account for ground attenuation. A conservative factor of 0.6 (a beam reduction of 40%), rather than 0.5, has been chosen to take credit for the ground absorption effect and to make allowance for the linac placement slightly above the ground.

Electrons cause ionization and excitation or create bremsstrahlung photons when they interact with materials. The number of photons created by bremsstrahlung is dependent on the energy of the electron beam and the atomic number of the converter being struck by the electrons. The fraction of bremsstrahlung photons created increases as the electron energy increases. Conversely, the fraction of bremsstrahlung photons decrease with a smaller atomic number converter, such as carbon (C), compared to a high-Z converter such as Pb. The yield factors assume the electrons interact with an optimally thick high-Z converter, such as Pb or W. A radiation yield fraction (converter factor) for the converter in use can be multiplied with the yield factor when determining production of airborne radionuclides. The converter factor would be one (1) when using Pb or W. For example, at 60 MeV electron beam energy, the radiation yield for Pb is about 0.67; the radiation yield for C is about 0.22. A converter factor is calculated by dividing the carbon radiation yield by the Pb radiation yield ($0.22/0.67 = 0.33$). This carbon converter factor (0.33) can be multiplied with the airborne radionuclide yield values to determine a

realistic source term production rate. Table 1 is a summary of these calculations. Figure 3 is similar to Figure 2 and uses the same parameters, except the W converter is removed, and the electron beam interacts directly with the air. Note that the scale changes. The flux is reduced by at least a factor of 10 down the beam line axis. This is due to the reduced radiation yield of the air atoms (low Z) as a convertor compared to W, and scattering attributed to the delayed conversion to bremsstrahlung due to the density of the convertor air atoms. This scattering attribute does not reduce the overall production of radionuclides. Therefore, no reduction factor is applied for the scattering when determining total radionuclide production.

Table 1. Radiation yields and convertor factors for various materials extracted from Figure 3.3 of NCRP-144.

Material	Radiation Yield at 30 MeV	Radiation Yield at 60 MeV	Convertor Factor at 30 MeV	Convertor Factor at 60 MeV
Pb or W	.55	.67	1	1
Al or air	.2	.33	.37	.5
C	.13	.22	.24	.33

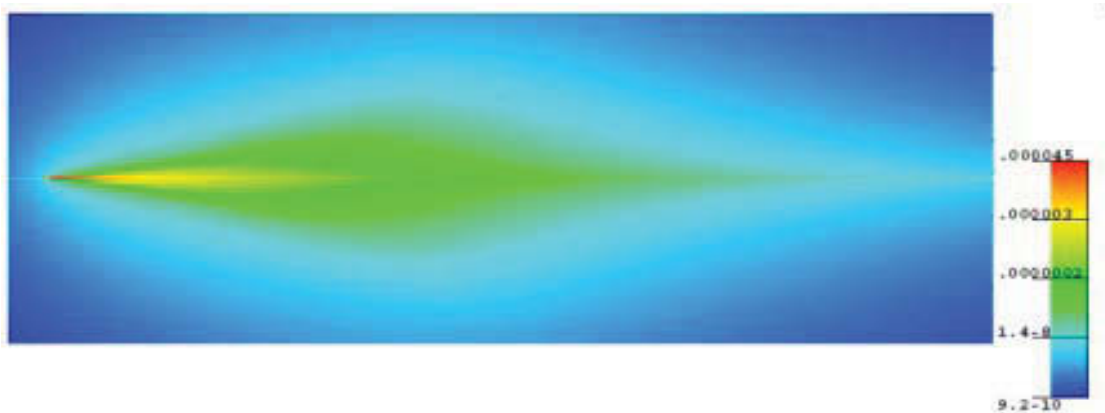


Figure 3. Photon flux field at 60 MeV electron beam energy and 100 μ A using air as the convertor, without a collimator or ground plane.

The shape of the broad field photon flux is similar at lower power levels (lower energies and/or average beam currents) and convertor configurations shown in the two images above. However, the photon fluxes are reduced.

The yield factors for the creation of airborne radionuclides by photonuclear reactions assume all photons are above the threshold for those reactions. Thresholds for radionuclides of interest are shown in Table 2. This is a realistic assumption if the maximum electron beam energy is hundreds of MeV. This is not the case for the 60 MeV maximum electron beam energy linacs proposed for use at INL. The photons created by bremsstrahlung are produced in a continuous energy spectrum, with small numbers produced at the very highest energy, corresponding to the maximum electron beam energy, and progressively more photons produced at lower and lower energies. Figure 4 shows the relative number of photons at the various energy levels for a range of electron beam energies. The data for the figure was created using MCNPX and placed in a spreadsheet, shown in Appendix B. Using this spreadsheet, the fraction of the photon flux above specific threshold energies may be determined from the tally equal to or greater than the threshold divided by the total number of photons. Table 2 shows the resulting fraction of photons above the minimum threshold for photonuclear reactions that result in the selected radioactive isotopes at two different maximum electron beam energy levels.

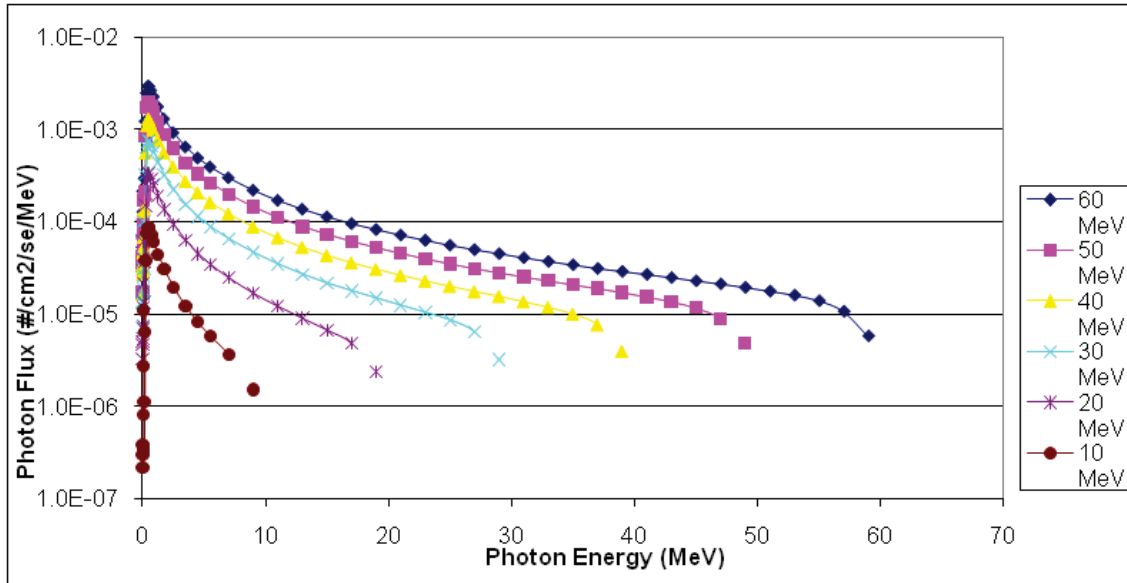


Figure 4. Bremsstrahlung distribution curves at various maximum electron beam energies.

Table 2. Threshold values for selected photonuclear reactions and radiation fraction values for 30 and 60 MeV linacs.

Radionuclide	Half-Life	Threshold	Fraction of 30 MeV Radiation above Minimum Threshold	Fraction of 60 MeV Radiation above Minimum Threshold
³⁹ Ar	269 years	9.37 MeV	.21	.31
¹³ N	10 minutes	10.6 MeV	.16	.26
³⁹ Cl	55 minutes	12.5 MeV	.12	.23
¹⁵ O	2.1 minutes	15.7 MeV	.07	.17
¹¹ C	20.5 minutes	18.7, 22.7 and 25.9 MeV	.06	.15
³⁸ Cl	37 minutes	20.6 MeV	.04	.13
³ H	12.3 years	22.7 and 25 MeV	.03	.12
⁷ Be	54 days	31.9 and 37.8 MeV	0	.07

Application of the factors is a simple multiplication with the production elements. The following is an example using the factors discussed in this section. The ¹³N activity produced for a 3 minute run of the linac at 6 kW would be:

$$\left. \begin{aligned}
 S &= 1.1 \times 10^8 \text{ Bq kW}^{-1} \text{ m}^{-1} \times 6 \text{ kW} \times \int e^{-\lambda s} ds \text{ m} \\
 S &= 1.1 \times 10^8 \text{ Bq kW}^{-1} \text{ m}^{-1} \times 6 \text{ kW} \times 592 \text{ m} \\
 S &= 3.9 \times 10^{11} \text{ Bq} \\
 \text{PR} &= 3.9 \times 10^{11} \text{ atoms/sec}
 \end{aligned} \right\} \text{from Section 3.2}$$

$$\text{Production (N)} = 3.9 \times 10^{11} \text{ atoms/sec} \times \text{time} \times \text{ground factor} \times \text{converter factor} \times \text{threshold factor}$$

Maximum electron beam energy = 60 MeV

Ground factor = 0.6

Carbon convertor factor = 0.33

Fraction of radiation above threshold = 0.26

$$N = 3.9 \times 10^{11} \text{ atoms/sec} \times 180 \text{ sec} \times 0.6 \times 0.33 \times 0.26$$

$$N = 3.6 \times 10^{12} \text{ atoms}$$

$$A = N \lambda$$

$$A = 3.6 \times 10^{12} \text{ atoms} \times 0.693/10\text{min}$$

$$A = 3.6 \times 10^{12} \text{ atoms} \times 0.693/600\text{sec}$$

$$A = 4.2 \times 10^9 \text{ Bq}$$

3.4 Calculation of Radionuclide Production Rates

The radiation generated by the linac is used to stimulate photonuclear reaction in the inspection object. Any radiation not striking the inspection object has little or no value in the process. Additionally, the low-energy photons are also of no value since they do not cause photonuclear reactions. The linac radiation may be considered noise to the detector instrumentation in some cases. Therefore, project personnel will continue to develop techniques to optimize the characteristics of the radiation beam directed at the inspection object. Various methods may be used to narrow the forward beam of radiation and remove the lower-energy photons. For example, a collimator may be used during the research to modify the beam generated by the linac. The collimator is essentially a radiation shield that attenuates the incident radiation emitted from the linac. The collimator aperture is in line with the primary electron beam that allows a desirable component of the generated radiation to continue down-range without interacting with the collimation materials. The collimator is also a key topical area in the research and development efforts to optimize the high-energy accelerator linac parameters. The collimator can substantially reduce off-axis dose rates when a converter is integrated with the linac at the end of the electron beam. The collimator can effectively reduce the broad beam in the forward direction, leaving a narrower beam and minimizing the off-axis radiation field. This reduces the volume of air that is susceptible to photonuclear reactions. The resulting linac beam in this case is best characterized as a narrow cone gradually expanding from the point of origin (collimator).

These techniques and methods have the potential to significantly reduce the overall source term of radionuclides from photonuclear reactions, particularly in the collimated down-range radiation beam compared to the broad field radiation previously described. It may in some cases concentrate a portion of the neutron generation to the vicinity of the convertor. The quantitative impact on the generation of radionuclides may be very complex to calculate. Monte Carlo codes could be used in these cases to determine the photonuclear production rates based on equipment-specific configurations. The most common code used for this type of operation is MCNPX. Monte Carlo modeling parameters take into account the converter material Z, thickness and shape, collimator materials and shape, beam hardening filters, electron beam energy, and current. The modeling of equipment-specific parameters requires significant computer resources and labor to calculate and verify the radionuclide source term. This level of modeling may be employed in those cases where there has been significant operating time with a specific configuration and a more realistic radionuclide source term is desired for annual reporting.

3.4.1 Calculated Dose to MEI

High-energy linacs in this INL program are diffuse sources that will not be enclosed in a shielded building or other enclosure that confines the radioactive isotopes in air. There is no pollution control equipment, nor is it practical to install pollution-control equipment since the primary isotopes are gases in air. The airborne radionuclides produced during linac operation are released continuously from the photon field near the vicinity of the linac and along the beam path. This condition complicates the collection and comparison of sampling and monitoring data. Factors that make it difficult to monitor or sample include

creation of radionuclides throughout a large volume resulting in a low activity concentration; creation of isotopes with short half-lives; continuous mixing by molecular movement and atmospheric conditions; natural airborne radioactivity; and extremely high ambient radiation levels during linac operations.

In addition, the radionuclides do not reach equilibrium since typical linac operations consist of multiple short operating periods each day. The source term for each individual run could be determined by the production rate multiplied by the operating time. Each source term could then be entered into CAP88 to determine the dose to the MEI for the specific run. Alternatively, total radionuclide production for each run, or proposed run, may be summed with other runs and a cumulative source term used in CAP88. The resulting dose to the MEI is the same as calculating and adding the individual run doses. Determining the annual source term for reporting is accomplished by tracking the total operating run time for a specific linac configuration. This annual run time is then multiplied by the production rate to determine the source term.

Physical and operational constraints associated with the linacs utilized at the INL SOX Range maintain the calculated dose to less than 0.1 mrem/yr. Emissions will be evaluated and reported as proposed herein and approved in accordance with 40 CFR 61.96(b) and the 1995 Memorandum of Understanding (EPA 1995) that requires EPA and DOE to review and agree on procedures for evaluating diffuse emissions.

3.5 Use of CAP88

Operational controls associated with the linacs utilized at the SOX Range maintain the dose to the MEI to less than 0.1 mrem/year. There are 62 potential MEI locations surrounding the operating location at INL. The distance to these MEI locations ranges between 10,344 meters and 58,610 meters from the Test Area North SOX Range location. A broad field calculation in CAP88 was performed (See Appendix F). The dose to the MEI was the same as the point release because of the significant distance from the release location. Therefore, the calculated source term from the broad field generation is assumed to be discharged from a single point for this evaluation.

The dose to the MEIs was modeled from the SOX Range at Test Area North. The radionuclide release rates for each nuclide were applied to this location. Doses are calculated using a unit dose factor for each nuclide at each of the 62 potential MEI locations surrounding INL. Unit dose factors are by receptor location where the release occurs, and by nuclide. The dose (D) is given by

$$D = UDF \cdot Q$$

where

UDF = the unit dose factor (mrem/year per Ci/year released)

Q = the actual release rate (Ci/year).

Unit dose factor values are calculated using CAP88-PC-Version 3 code, INL-specific meteorology, and parameter values used in the annual INL NESHAP reporting.

3.6 Source Term

Source terms were calculated with various combinations of energies, currents and convertors based on currently available linac configurations. The following parameters and assumptions were incorporated:

- 12, 30 and 60 MeV maximum electron energy
- 11, 40 and 100 μ A average beam current
- No collimator
- Tungsten, aluminum, carbon and air convertors

- Ground absorption effect (ground plane factor – 0.6)
- Ground absorption effect for neutrons (ground plane factor – 0.5)
- 800 hours operation (considered normal operations based on historical linac operating experience)
- Hours corresponding to a dose of 0.1 mrem/year to the MEI.

See Appendix C for the source term calculations. Table 3 lists the physical and operations parameters, MEI dose for 800 hours of operation and hours of operation corresponding to 0.1 mrem/year to the MEI. The source term data is contained in Appendix C.

Table 3. Operational configurations, calculated MEI dose, and operating hour results.

Electron Beam Energy (MeV)	Average Electron Beam Current (microamperes)	Convertor Material	MEI Dose for 800 Hours of Operation (mrem/year)	Hours of Operation for an MEI Dose of 0.1 mrem/year
60	100	Tungsten	0.07	1,146
60	100	Air	0.021	3,809
60	100	Carbon	0.016	4,908
30	40	Tungsten	0.009	8,676
30	40	Aluminum	0.002	39,024
30	40	Air	0.0018	44,198
12	11	Tungsten	0.000005	15,037,593

3.7 Control of Dose to MEI

Linacs at the INL are used in research and development, particularly relating to detector and signal processing systems. The Laboratory typically works 10 hour days, four days a week, and fifty weeks a year at TAN. Daily set up and take down of the systems are expected to take an hour each. This leaves an average of 8 hours per day to conduct the R&D activities. Much of the time is used to prepare the detection and acquisition systems, clear the area, position materials and detectors, prepare the linac for operations, review data, change material and detector configurations, put materials and detectors away, and shut down the linac. Our experience during focused campaigns at a non-DOE offsite facility revealed only half the potential work hours are typically used operating the linacs. Using these factors, the typical linac operations would be:

Typical operations = (10 hrs-2hrs) \times 0.5 \times 4 days/week \times 50 weeks/year \approx 800 hours per year.

The average number of hours per day could be greater in the summer months when the weather is mild and the days are longer. The average number of hours would be significantly fewer in the winter during the extreme cold and shorter daylight hours. On rare occasions the operations could be expanded to seven days a week in case of high customer demand.

The most frequent operations are expected to use beam energies of 2 MeV to 30 MeV at beam currents between 1 to 30 μ A. The SOX Range will support the use of linacs operating at beam energies up to 60 MeV and beam currents up to 100 μ A. These are the maximum allowed parameters on the SOX Range. Converters will typically be composed of aluminum, carbon, or air, but tungsten converters may also be used on occasion.

Before any linac operation at the SOX Range may commence, a beam authorization sheet must be prepared and approved by the Accelerator Safety Officer. The beam authorization sheet identifies the linac to be operated, the maximum beam energy and average beam current (maximum SOX Range values for these parameters are 60 MeV and 100 microamperes, respectively), the type of converter used, and the

maximum hours of operation for the specified parameters. The Accelerator Safety Officer uses this information to calculate the maximum radioactive source term that could be generated for the particular linac operation. This source term is then analyzed using CAP88 to determine the EDE that would result to the MEI. The Accelerator Safety Officer tallies the cumulative EDE for all linac operations at the SOX Range during a calendar year. If the cumulative dose to the MEI for proposed linac operations, when summed with all other approved linac operations within that calendar year is less than 0.1 mrem, then the beam authorization sheet is approved and the proposed linac operation may proceed. Any proposed operation of a linac that would result in a cumulative EDE that equals or exceeds 0.1 mrem in a calendar year would not be approved. This process controls the dose to the MEI resulting from SOX Range operations to less than 1% of the NESHAP standard: the threshold that would require an EPA approval to construct. As a comparison, in 2009, radionuclide air emissions and the resulting EDE to the MEI from all operations at the INL Site was 0.0687 mrem/year, 0.69% of the 10-mrem standard (DOE/ID-10890 2010). The cumulative EDE from Site operations and linac operations at the SOX Range would not challenge the annual limit.

The source terms are calculated without any credit for pollution control equipment, as they are not practical to this operation, and the linacs at INL do not have them. The configurations and associated source terms in Table 3 have been analyzed using CAP88. These configurations represent likely configurations known at this time. If a different linac configuration is identified for use at the SOX Range, the source term will be calculated and recorded as given in Table 3. A beam authorization sheet must be completed and approved by the Accelerator Safety Officer prior to operation of any linac at the SOX Range. The proposed and/or actual hours of operation divided by the hours associated with the 0.1 mrem/year dose may be used to calculate the dose for a certain configuration. The sum of the fractions can be used to evaluate a combination of linac configurations. For example, suppose linac A has operated 420 hours this calendar year at 60 MeV and 100 μ A with a carbon convertor. Linac B is scheduled to operate 300 hours at 30 MeV and 40 μ A with an aluminum convertor, and linac C has operated 200 hours and is scheduled to operate another 100 hours at 12 MeV and 11 μ A using a tungsten convertor.

The calculated annual MEI dose is shown in Table 4:

Table 4. Calculated annual MEI dose.

linac A		linac B		linac C				Annual Dose
(420/4908	+	300/39024	+	300/15037593)	\times	0.1 mrem	=	EDE to the MEI
(0.09	+	0.008	+	0.00002)	\times	0.1 mrem	=	0.0098 mrem

Several layers of conservatism are applied to the calculation of the radioactive source term and determination of the effective dose to the MEI. These include:

1. Linear attenuation coefficient (μ) – the coefficient used applies to the minimum cross section in air for x-rays less than 60 MeV, which significantly underestimates the attenuation of photon energy from air, thus resulting in a high estimate of the saturated activity and production rate.
2. Neutron absorption – all neutrons created are assumed to slow down and undergo radiative capture in the air or entrained dust particles, which overestimates the production rate, thus resulting in a high estimate of the activity generated by the linac.
3. Collimator – no credit is being taken for collimators that would greatly reduce the photon flux off the beam axis, thus resulting in an overestimate of the activity generated by the linac.
4. Exposure scenario – although it is physically impossible for an individual to be exposed to all activated atoms generated in the linac beam path, CAP88 modeling for the SOX Range assumes that every atom of ^{39}Ar , ^{41}Ar , ^7Be , ^{11}C , ^{38}Cl , ^{39}Cl , ^3H , ^{13}N and ^{15}O is released from a single point source and contributes to the effective dose to the MEI.

5. The linacs operate over a range of power levels for a given maximum electron beam energy. The maximum power level for each maximum energy level will be used for the annual dose report to avoid detailed calculations at the lower power levels. The use of the higher power level overestimates the radionuclide emissions.

These practices produce an estimated dose that is bounding, whereas the actual impact to any member of the public is likely much lower.

The photon and neutron fluxes do cause activation of dust particles in the beam path. However, the activation potential of the dust is many orders of magnitude smaller than that of air due to the very small mass of the dust compared to air. A macroscopic evaluation of the potential to activate, assuming 10 micrograms of dust in a cubic meter of air, showed 8 orders of magnitude greater activation potential for air compared to dust. Therefore, the addition of the dust particles in the dose calculation will not change the resulting dose to the MEI. In addition, the linac would not likely operate in high dust conditions due to the impaired ability to view the downrange area. Furthermore, heavy dust particles would fall out of the air in close proximity to the SOX Range and would therefore not contribute to exposure to the nearest MEI, who is located more than 10,000 meters away from the SOX Range. The level of conservatism applied to the calculation of source term and modeling to the MEI would envelope any particulate activation that could occur.

3.8 Annual NESHAP Report of Dose to MEI

Radionuclide emissions evaluations, based on operating data, will be submitted to the Accelerator Safety Officer for evaluation and inclusion in INL's annual NESHAP report. The accelerator operations data and evaluation of the dose for inclusion in the INL NESHAP report will be documented.

4. REFERENCES

- CAP88-PC-Version 3, "Clean Air Act Assessment Package," 1988
- Guidebook for the ENDF/B-V Nuclear Data Files, ENDF-238, Brookhaven National Laboratory, July 1982
- Monte Carlo N-Particle eXtended (MCNPX)
- National Council on Radiation Protection and Measurements (NCRP) report 144, "Radiation Protection for Particle Accelerator Facilities"
- National Emission Standard for Hazardous Air Pollutants (NESHAPS) 40 CFR 61 Subpart H, "National Emission Standards for Emissions of Radionuclides Other Than Radon from Department of Energy Facilities"
- National Institute of Science and Technology – NIST XCOM: Photon Cross Section Database
- U.S. Environmental Protection Agency, U.S. Department of Energy, 1995, Memorandum of Understanding Between the U.S. EPA and the U.S. DOE concerning the Clean Air Act Emission Standards for Radionuclides, 40 CFR Part 61 Including Subparts H, I, Q, and T.

Appendix A

Path Length Integral

Appendix A

Path Length Integral

Essential Integral

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Appendix B

Bremsstrahlung Photon Flux versus Electron Energy (MeV)

Appendix B

Bremsstrahlung Photon Flux versus Electron Energy (MeV)

Bremsstrahlung Photon Flux versus Electron Energy (MeV)
0.30-cm thick, 1.0-cm diameter Tungsten (W) converter
Photon flux at 1.0-meter away from converter on beamline
0.5-cm radius electron beam on converter disk (3-mm)
Electron source energies at 10, 20, 30, 40, 50, 60 MeV

Photon Energy Lower Bin (MeV)	Photon Energy Upper Bin (MeV)	Photon Energy AVERAGE (MeV)	Photon Energy Interval (MeV)	10 MeV	20 MeV	30 MeV	40 MeV	50 MeV	60 MeV
				Photon Tally Flux (p/cm2/se)	Photon Tally Flux (p/cm2/se)	Photon Tally Flux (p/cm2/se)	Photon Tally Flux (p/cm2/se)	Photon Tally Flux (p/cm2/se)	Photon Tally Flux (p/cm2/se)
0.0	1.00E-02	0.0050	0.0100	2.20934E-09	3.32179E-08	7.15963E-08	1.66179E-07	1.72047E-07	2.90244E-07
1.00E-02	1.50E-02	0.0125	0.0050	1.96523E-09	2.33999E-08	6.66820E-08	1.69703E-07	2.12088E-07	3.52783E-07
1.50E-02	2.00E-02	0.0175	0.0050	1.52089E-09	2.54657E-08	6.85782E-08	1.53587E-07	1.78159E-07	2.66987E-07
2.00E-02	3.00E-02	0.0250	0.0100	3.56753E-09	5.46877E-08	1.33296E-07	2.72497E-07	4.35448E-07	6.69047E-07
3.00E-02	4.00E-02	0.0350	0.0100	3.77761E-09	7.31764E-08	1.84268E-07	3.48658E-07	5.35090E-07	7.36268E-07
4.00E-02	5.00E-02	0.0450	0.0100	8.30240E-09	1.15686E-07	2.63394E-07	4.69410E-07	6.91197E-07	1.05961E-06
5.00E-02	6.00E-02	0.0550	0.0100	1.10976E-07	6.15714E-07	1.00863E-06	1.31468E-06	1.69692E-06	2.15729E-06
6.00E-02	8.00E-02	0.0700	0.0200	5.52560E-08	4.25628E-07	8.26935E-07	1.35728E-06	1.89980E-06	2.58227E-06
8.00E-02	1.00E-01	0.0900	0.0200	6.55782E-09	1.35634E-07	3.29849E-07	6.06839E-07	9.84637E-07	1.33152E-06
1.00E-01	1.50E-01	0.1250	0.0500	5.65552E-08	6.72109E-07	1.55312E-06	2.74271E-06	4.26121E-06	5.76728E-06
1.50E-01	2.00E-01	0.1750	0.0500	3.25065E-07	1.87835E-06	3.95333E-06	6.89821E-06	1.03468E-05	1.48317E-05
2.00E-01	3.00E-01	0.2500	0.1000	3.78913E-06	1.51115E-05	3.25198E-05	5.59278E-05	8.50023E-05	1.23720E-04
3.00E-01	4.00E-01	0.3500	0.1000	7.59826E-06	2.92028E-05	6.44405E-05	1.10978E-04	1.70983E-04	2.51379E-04
4.00E-01	5.00E-01	0.4500	0.1000	8.62609E-06	3.35399E-05	7.47706E-05	1.29864E-04	2.00340E-04	2.95293E-04
5.00E-01	6.00E-01	0.5500	0.1000	8.67305E-06	3.37814E-05	7.52447E-05	1.29557E-04	2.00142E-04	2.95579E-04
6.00E-01	8.00E-01	0.7000	0.2000	1.46307E-05	5.87279E-05	1.33201E-04	2.32478E-04	3.61322E-04	5.34496E-04
8.00E-01	1.00E+00	0.9000	0.2000	1.20351E-05	4.94833E-05	1.12970E-04	1.97991E-04	3.08700E-04	4.56719E-04
1.00E+00	1.50E+00	1.2500	0.5000	2.23379E-05	9.45646E-05	2.18401E-04	3.84713E-04	6.00608E-04	8.91938E-04
1.50E+00	2.00E+00	1.7500	0.5000	1.53222E-05	6.79926E-05	1.58960E-04	2.80472E-04	4.42831E-04	6.57306E-04
2.00E+00	3.00E+00	2.5000	1.0000	1.97076E-05	9.32820E-05	2.22145E-04	3.95871E-04	6.24048E-04	9.31064E-04
3.00E+00	4.00E+00	3.5000	1.0000	1.21824E-05	6.24140E-05	1.53447E-04	2.74876E-04	4.36199E-04	6.50887E-04
4.00E+00	5.00E+00	4.5000	1.0000	8.20985E-06	4.51584E-05	1.13334E-04	2.06765E-04	3.30257E-04	4.95099E-04
5.00E+00	6.00E+00	5.5000	1.0000	5.81526E-06	3.45036E-05	8.86555E-05	1.63130E-04	2.63241E-04	3.95767E-04
6.00E+00	8.00E+00	7.0000	2.0000	7.30908E-06	4.94316E-05	1.31153E-04	2.44774E-04	3.97362E-04	6.03685E-04
8.00E+00	1.00E+01	9.0000	2.0000	3.07251E-06	3.37476E-05	9.33400E-05	1.77037E-04	2.90217E-04	4.42201E-04
1.00E+01	1.20E+01	11.0000	2.0000	0.00000E+00	2.43444E-05	6.98237E-05	1.34869E-04	2.24038E-04	3.43279E-04
1.20E+01	1.40E+01	13.0000	2.0000	0.00000E+00	1.80923E-05	5.40808E-05	1.06181E-04	1.77909E-04	2.75375E-04
1.40E+01	1.60E+01	15.0000	2.0000	0.00000E+00	1.35553E-05	4.33805E-05	8.67475E-05	1.46406E-04	2.27998E-04
1.60E+01	1.80E+01	17.0000	2.0000	0.00000E+00	9.73829E-06	3.58337E-05	7.24855E-05	1.23183E-04	1.92256E-04
1.80E+01	2.00E+01	19.0000	2.0000	0.00000E+00	4.71793E-06	2.98188E-05	6.15232E-05	1.05314E-04	1.65917E-04
2.00E+01	2.20E+01	21.0000	2.0000	0.00000E+00	0.00000E+00	2.49331E-05	5.29158E-05	9.10758E-05	1.44227E-04
2.20E+01	2.40E+01	23.0000	2.0000	0.00000E+00	0.00000E+00	2.08168E-05	4.59912E-05	7.98312E-05	1.26677E-04
2.40E+01	2.60E+01	25.0000	2.0000	0.00000E+00	0.00000E+00	1.72844E-05	4.01681E-05	7.03849E-05	1.12041E-04
2.60E+01	2.80E+01	27.0000	2.0000	0.00000E+00	0.00000E+00	1.27941E-05	3.53269E-05	6.23726E-05	1.00380E-04
2.80E+01	3.00E+01	29.0000	2.0000	0.00000E+00	0.00000E+00	6.45402E-06	3.13151E-05	5.62604E-05	9.08978E-05
3.00E+01	3.20E+01	31.0000	2.0000	0.00000E+00	0.00000E+00	0.00000E+00	2.74204E-05	5.07997E-05	8.19737E-05
3.20E+01	3.40E+01	33.0000	2.0000	0.00000E+00	0.00000E+00	0.00000E+00	2.37713E-05	4.60648E-05	7.47726E-05
3.40E+01	3.60E+01	35.0000	2.0000	0.00000E+00	0.00000E+00	0.00000E+00	2.01056E-05	4.18033E-05	6.86906E-05
3.60E+01	3.80E+01	37.0000	2.0000	0.00000E+00	0.00000E+00	0.00000E+00	1.54232E-05	3.81133E-05	6.27539E-05
3.80E+01	4.00E+01	39.0000	2.0000	0.00000E+00	0.00000E+00	0.00000E+00	7.93897E-06	3.45958E-05	5.83320E-05
4.00E+01	4.20E+01	41.0000	2.0000	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	3.08995E-05	5.41066E-05
4.20E+01	4.40E+01	43.0000	2.0000	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	2.74655E-05	4.99656E-05
4.40E+01	4.60E+01	45.0000	2.0000	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	2.34454E-05	4.60677E-05
4.60E+01	4.80E+01	47.0000	2.0000	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	1.80060E-05	4.27213E-05
4.80E+01	5.00E+01	49.0000	2.0000	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	9.62111E-06	3.90946E-05
5.00E+01	5.20E+01	51.0000	2.0000	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	3.56198E-05
5.20E+01	5.40E+01	53.0000	2.0000	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	3.22393E-05
5.40E+01	5.60E+01	55.0000	2.0000	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	2.80411E-05
5.60E+01	5.80E+01	57.0000	2.0000	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	2.15413E-05
5.80E+01	6.00E+01	59.0000	2.0000	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	1.16454E-05

Sum 1.49885E-04 7.75442E-04 1.99626E-03 3.76112E-03 6.19026E-03 9.54179E-03

Energy (MeV)	10	20	30	40	50	60
Fraction > 6 MeV	6.9%	19.8%	27.0%	31.5%	34.7%	37.0%
³⁹ Ar Fraction > 9.37 MeV	2.0%	13.4%	20.5%	25.0%	28.2%	30.7%
¹³ N Fraction > 10.6 MeV	0.0%	9.1%	15.8%	20.3%	23.5%	26.1%
³⁹ Cl Fraction > 12.5 MeV	0.0%	5.9%	12.3%	16.7%	19.9%	22.5%
¹⁶ O Fraction > 15.7 MeV	0.0%	1.9%	7.4%	11.5%	14.7%	17.2%
¹¹ C Fraction > 18.7 MeV	0.0%	0.6%	5.6%	9.6%	12.7%	15.2%
³⁸ Cl Fraction > 20.6 MeV	0.0%	0.0%	4.1%	8.0%	11.0%	13.4%
³ H Fraction > 22.7 MeV	0.0%	0.0%	2.9%	6.6%	9.5%	11.9%
⁷ Be Fraction > 31.9 MeV	0.0%	0.0%	0.0%	1.8%	4.4%	6.6%

Appendix C

Source Term Calculations

Appendix C

Source Term Calculations

Glossary

- S sat = Saturated airborne radioactivity of a specific nuclide
- YF = Yield Factor - Specific yields [Bq/(kW*m)] of radionuclides from photoactivated air. (NCRP-144, pg 342 Table 6.4) (For neutrons, the yield is 10E+12 taken from Figure 3.12 of NCRP-144.)
- f (ground plane) = The fraction of the radiation not absorbed in the ground.
- f (converter) = For bremsstrahlung, the effectiveness for a converter to produce photons compared to tungsten. Derived from Figure 3.3 of NCRP-144. See Table 1. For neutrons, it is the factor that is multiplied by the YF (1E-12) to determine the photo neutron yield of a thick target (converter). This is taken from Figure 3.12 of NCRP-144. See Appendix E.
- f (energy factor) = The fraction of bremsstrahlung photons that are equal to or greater than the threshold for photonuclear reactions. See Table 2.
- f (neutron capture) = The fraction of thermal neutrons that will be captured by ^{40}Ar to create ^{41}Ar . The value is 0.035. See Appendix D.
- YF adjusted = YF x f (ground plane) x f (converter) x f (energy factor) x f (neutron capture) as applicable.
- P = power (kW) = $E_0 \times I / 1000$ (MeV x μA)
- E_0 = maximum electron beam energy (MeV)
- I = electron beam current (μA)
- s = Integrated beam distance
- PR = Production rate of a radionuclide (atoms per sec) = YF adjusted x P x s
- N = PR x operating time
- $A = N \times \lambda = N \times .693 / T_{1/2}$
- A(xxxx) = Activity for an operating time of xxxx hours.

	A	B	C	D	E	F	G	H	I	J	K	L
1	Convertor Type =		Tungsten (W)		Bremsstrahlung Production Convertor Factor (Cells B8, C8, D8, E8, F8, G8, H8, & J8 only)				Neutron Production Convertor Factor 1 (Cell K8 only) =	2.3		
2	Energy Eo =	60	Current I =	100	Power P =	6	Beam Distance s =	592				
3												
4	Radionuclide	H-3	Be-7	C-11	N-13	O-15	Cl-38	Cl-39	Ar-41 Beam Path	Ar-39	Ar-41 Convertor	Total Ar-41 Activity (columns I + K)
5	Half-life	12.3 y	54 d	20.5 min	10 min	2.1 min	37 min	55 min	1.827 hr	269 y	1.827 hr	
6	Half-life (sec)	387892800	4665600	1230	600	126	2220	3300	6577.2	8.483E+09	6577.2	
7	f (ground plane)	6.00E-01	6.00E-01	6.00E-01	6.00E-01	6.00E-01	6.00E-01	6.00E-01	5.00E-01	6.00E-01	5.00E-01	
8	f (convertor)	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	2.30E+00	
9	f (energy fraction)	1.20E-01	7.00E-02	1.50E-01	2.60E-01	1.70E-01	1.30E-01	2.30E-01	1.00E+00	3.10E-01	1.00E+00	
10	f (neutron capture)	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	3.50E-02	1.00E+00	3.50E-02	
11	YF	7.10E+06	1.10E+06	1.10E+07	1.10E+08	5.60E+07	6.80E+05	8.50E+06	9.06E+10	8.50E+06	1.00E+12	
12	YF adjusted	5.11E+05	4.62E+04	9.90E+05	1.72E+07	5.71E+06	5.30E+04	1.17E+06	1.58E+09	1.58E+06	4.03E+10	
13	Ssat (Bq)	1.82E+09	1.64E+08	3.52E+09	6.10E+10	2.03E+10	1.88E+08	4.17E+09	1.58E+09	5.62E+09	2.42E+11	
14	PR (atoms/s)	1.82E+09	1.64E+08	3.52E+09	6.10E+10	2.03E+10	1.88E+08	4.17E+09	1.58E+09	5.62E+09	2.42E+11	
15	N (PR * 1146 h)	7.49E+15	6.77E+14	1.45E+16	2.51E+17	8.37E+16	7.77E+14	1.72E+16	6.54E+15	2.32E+16	9.96E+17	
16	A (1146 h) (Bq)	1.34E+07	1.01E+08	8.17E+12	2.90E+14	4.60E+14	2.43E+11	3.61E+12	6.89E+11	1.89E+06	1.05E+14	1.06E+14
17	A (1146 h) (Ci)	3.62E-04	2.72E-03	2.21E+02	7.85E+03	1.24E+04	6.56E+00	9.76E+01	1.86E+01	5.12E-05	2.84E+03	2.86E+03
18	N (PR * 800 h)	5.23E+15	4.73E+14	1.01E+16	1.76E+17	5.84E+16	5.43E+14	1.20E+16	4.56E+15	1.62E+16	6.96E+17	
19	A (800 h) (Bq)	9.34E+06	7.02E+07	5.71E+12	2.03E+14	3.21E+14	1.69E+11	2.52E+12	4.81E+11	1.32E+06	7.33E+13	7.38E+13
20	A (800 h) (Ci)	2.53E-04	1.90E-03	1.54E+02	5.48E+03	8.69E+03	4.58E+00	6.81E+01	1.30E+01	3.57E-05	1.98E+03	1.99E+03
21	Threshold (MeV)	22.7	31.9	18.7	10.6	15.7	20.6	12.5		9.37		
22		H-3	Be-7	C-11	N-13	O-15	Cl-38	Cl-39	Ar-41 Beam Path	Ar-39	Ar-41 Convertor	Total Ar-41 Activity (columns I + K)
23	Maximum MEI Dose at 800 Hours =			0.0698	mrem/yr							
24	Maximum MEI Dose at 1146 Hours =			0.1	mrem/yr							

	A	B	C	D	E	F	G	H	I	J	K	L
1	Convertor Type =	Air			Production Convertor Factor (Cells B8, C8, D8, E8, F8, G8, H8, & J8 only) =		0.5	Neutron Production Convertor Factor (Cell K8 only) =		0		
2	Energy Eo =	60	Current I =	100	Power P =	6	Beam Distance s =	592				
3												
4	Radionuclide	H-3	Be-7	C-11	N-13	O-15	Cl-38	Cl-39	Ar-41 Beam Path	Ar-39	Ar-41 Convertor	Total Ar- 41 Activity (columns
5	Half-life	12.3 y	54 d	20.5 min	10 min	2.1 min	37 min	55 min	1.827 hr	269 y	1.827 hr	
6	Half-life (sec)	387892800	4665600	1230	600	126	2220	3300	6577.2	8483184000	6577.2	
7	f (ground plane)	6.00E-01	6.00E-01	6.00E-01	6.00E-01	6.00E-01	6.00E-01	6.00E-01	5.00E-01	6.00E-01	5.00E-01	
8	f (convertor)	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	1.00E+00	5.00E-01	0.00E+00	
9	f (energy fraction)	1.20E-01	7.00E-02	1.50E-01	2.60E-01	1.70E-01	1.30E-01	2.30E-01	1.00E+00	3.10E-01	1.00E+00	
10	f(neutron capture)	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	3.50E-02	1.00E+00	3.50E-02	
11	YF	7.10E+06	1.10E+06	1.10E+07	1.10E+08	5.60E+07	6.80E+05	8.50E+06	4.53E+10	8.50E+06	1.00E+12	
12	YF adjusted	2.56E+05	2.31E+04	4.95E+05	8.58E+06	2.86E+06	2.65E+04	5.87E+05	7.92E+08	7.91E+05	0.00E+00	
13	Ssat (Bq)	9.08E+08	8.21E+07	1.76E+09	3.05E+10	1.01E+10	9.42E+07	2.08E+09	7.92E+08	2.81E+09	0.00E+00	
14	PR (atoms/s)	9.08E+08	8.21E+07	1.76E+09	3.05E+10	1.01E+10	9.42E+07	2.08E+09	7.92E+08	2.81E+09	0.00E+00	
15	N (PR * 3809 h)	1.24E+16	1.13E+15	2.41E+16	4.18E+17	1.39E+17	1.29E+15	2.86E+16	1.09E+16	3.85E+16	0.00E+00	
16	A (3809 h) (Bq)	2.22E+07	1.67E+08	1.36E+13	4.83E+14	7.65E+14	4.03E+11	6.00E+12	1.14E+12	3.15E+06	0.00E+00	1.14E+12
17	A (3809 h) (Ci)	6.01E-04	4.52E-03	3.67E+02	1.30E+04	2.07E+04	1.09E+01	1.62E+02	3.09E+01	8.50E-05	0.00E+00	3.09E+01
18	N (PR * 800 h)	2.61E+15	2.36E+14	5.06E+15	8.78E+16	2.92E+16	2.71E+14	6.00E+15	2.28E+15	8.09E+15	0.00E+00	
19	A (800 h) (Bq)	4.67E+06	3.51E+07	2.85E+12	1.01E+14	1.61E+14	8.47E+10	1.26E+12	2.40E+11	6.61E+05	0.00E+00	2.40E+11
20	A (800 h) (Ci)	1.26E-04	9.49E-04	7.71E+01	2.74E+03	4.34E+03	2.29E+00	3.41E+01	6.50E+00	1.79E-05	0.00E+00	6.50E+00
21	Threshold (MeV)	22.7	31.9	18.7	10.6	15.7	20.6	12.5		9.37		
22		H-3	Be-7	C-11	N-13	O-15	Cl-38	Cl-39	Ar-41 Beam Path	Ar-39	Ar-41 Convertor	Total Ar- 41 Activity (columns I + K)
23	Maximum MEI Dose at 800 Hours =			0.021	mrem/yr							
24	Maximum MEI Dose at 3809 Hours =			0.1	mrem/yr							

					Bremsstrahlung Production Convertor Factor (Cells B8, C8, D8, E8, F8, G8, H8, & J8 only) =				Neutron Production Convertor Factor (Cell K8 only) =			
1	Convertor Type =	Carbon							0.33		0.2	
2	Energy Eo =	60	Current I =	100	Power P =		6	Beam Distance s =	592			
3												
4	Radionuclide	H-3	Be-7	C-11	N-13	O-15	Cl-38	Cl-39	Ar-41 Beam Path	Ar-39	Ar-41 Convertor	Total Ar-41 Activity (columns I + K)
5	Half-life	12.3 y	54 d	20.5 min	10 min	2.1 min	37 min	55 min	1.827 hr	269 y	1.827 hr	
6	Half-life (sec)	3.88E+08	4665600	1230	600	126	2220	3300	6577.2	8.48E+09	6577.2	
7	f (ground plane)	6.00E-01	6.00E-01	6.00E-01	6.00E-01	6.00E-01	6.00E-01	6.00E-01	5.00E-01	6.00E-01	5.00E-01	
8	f (convertor)	3.30E-01	3.30E-01	3.30E-01	3.30E-01	3.30E-01	3.30E-01	3.30E-01	1.00E+00	3.30E-01	2.00E-01	
9	f (energy fraction)	1.20E-01	7.00E-02	1.50E-01	2.60E-01	1.70E-01	1.30E-01	2.30E-01	1.00E+00	3.10E-01	1.00E+00	
10	f(neutron capture)	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	3.50E-02	1.00E+00	3.50E-02	
11	YF	7.10E+06	1.10E+06	1.10E+07	1.10E+08	5.60E+07	6.80E+05	8.50E+06	2.99E+10	8.50E+06	1.00E+12	
12	YF adjusted	1.69E+05	1.52E+04	3.27E+05	5.66E+06	1.88E+06	1.75E+04	3.87E+05	5.23E+08	5.22E+05	3.50E+09	
13	Ssat (Bq)	5.99E+08	5.42E+07	1.16E+09	2.01E+10	6.70E+09	6.22E+07	1.37E+09	5.23E+08	1.85E+09	2.10E+10	
14	PR (atoms/s)	5.99E+08	5.42E+07	1.16E+09	2.01E+10	6.70E+09	6.22E+07	1.37E+09	5.23E+08	1.85E+09	2.10E+10	
15	N (PR * 4908 h)	1.06E+16	9.57E+14	2.05E+16	3.55E+17	1.18E+17	1.10E+15	2.43E+16	9.24E+15	3.27E+16	3.71E+17	
16	A (4908h) (Bq)	1.89E+07	1.42E+08	1.16E+13	4.10E+14	6.51E+14	3.43E+11	5.10E+12	9.74E+11	2.67E+06	3.91E+13	4.01E+13
17	A (4908 h) (Ci)	5.11E-04	3.84E-03	3.12E+02	1.11E+04	1.76E+04	9.27E+00	1.38E+02	2.63E+01	7.23E-05	1.06E+03	1.08E+03
18	N (PR * 800 h)	1.73E+15	1.56E+14	3.34E+15	5.79E+16	1.93E+16	1.79E+14	3.96E+15	1.51E+15	5.34E+15	6.05E+16	
19	A (800 h) (Bq)	3.08E+06	2.32E+07	1.88E+12	6.69E+13	1.06E+14	5.59E+10	8.32E+11	1.59E+11	4.36E+05	6.37E+12	6.53E+12
20	A (800 h) (Ci)	8.33E-05	6.26E-04	5.09E+01	1.81E+03	2.87E+03	1.51E+00	2.25E+01	4.29E+00	1.18E-05	1.72E+02	1.77E+02
21	Threshold (MeV)	22.7	31.9	18.7	10.6	15.7	20.6	12.5		9.37		
22		H-3	Be-7	C-11	N-13	O-15	Cl-38	Cl-39	Ar-41 Beam Path	Ar-39	Ar-41 Convertor	Total Ar-41 Activity (columns I + K)
23	Maximum MEI Dose at 800 Hours =			0.0163	mrem/yr							
24	Maximum MEI Dose at 4908 Hours =			0.1	mrem/yr							

	A	B	C	D	E	F	G	H	I	J	K	L
1	Convertor Type =		Tungsten		Production Convertor Factor (Cells B8, C8, D8, E8, F8, G8, H8, & J8 only) =			Neutron Production Convertor Factor 1 (Cell K8 only) =		1.8		
2	Energy Eo =	30	Current I =	40	Power P =	1.2	Beam Distance s =	592				
3												
4	Radionuclide	H-3	Be-7	C-11	N-13	O-15	Cl-38	Cl-39	Ar-41 Beam Path	Ar-39	Ar-41 Convertor	Total Ar- 41 Activity (columns
5	Half-life	12.3 y	54 d	20.5 min	10 min	2.1 min	37 min	55 min	1.827 hr	269 y	1.827 hr	
6	Half-life (sec)	387892800	4665600	1230	600	126	2220	3300	6577.2	8.483E+09	6577.2	
7	f (ground plane)	6.00E-01	6.00E-01	6.00E-01	6.00E-01	6.00E-01	6.00E-01	6.00E-01	5.00E-01	6.00E-01	5.00E-01	
8	f (convertor)	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.80E+00	
9	f (energy fraction)	3.00E-02	0.00E+00	6.00E-02	1.60E-01	7.00E-02	4.00E-02	1.20E-01	1.00E+00	2.10E-01	1.00E+00	
10	f (neutron capture)	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	3.50E-02	1.00E+00	3.50E-02	
11	YF	7.10E+06	1.10E+06	1.10E+07	1.10E+08	5.60E+07	6.80E+05	8.50E+06	1.02E+10	8.50E+06	1.00E+12	
12	YF adjusted	1.28E+05	0.00E+00	3.96E+05	1.06E+07	2.35E+06	1.63E+04	6.12E+05	1.79E+08	1.07E+06	3.15E+10	
13	Ssat (Bq)	9.08E+07	0.00E+00	2.81E+08	7.50E+09	1.67E+09	1.16E+07	4.35E+08	1.79E+08	7.61E+08	3.78E+10	
14	PR (atoms/s)	9.08E+07	0.00E+00	2.81E+08	7.50E+09	1.67E+09	1.16E+07	4.35E+08	1.79E+08	7.61E+08	3.78E+10	
15	N (PR * 8676 h)	2.84E+15	0.00E+00	8.79E+15	2.34E+17	5.22E+16	3.62E+14	1.36E+16	5.59E+15	2.38E+16	1.18E+18	
16	A (8676 h) (Bq)	5.07E+06	0.00E+00	4.95E+12	2.71E+14	2.87E+14	1.13E+11	2.85E+12	5.89E+11	1.94E+06	1.24E+14	1.25E+14
17	A (8676 h) (Ci)	1.37E-04	0.00E+00	1.34E+02	7.31E+03	7.76E+03	3.06E+00	7.71E+01	1.59E+01	5.25E-05	3.36E+03	3.38E+03
18	N (PR * 800 h)	2.61E+14	0.00E+00	8.10E+14	2.16E+16	4.81E+15	3.34E+13	1.25E+15	5.15E+14	2.19E+15	1.09E+17	
19	A (800 h) (Bq)	4.67E+05	0.00E+00	4.56E+11	2.50E+13	2.65E+13	1.04E+10	2.63E+11	5.43E+10	1.79E+05	1.15E+13	1.15E+13
20	A (800 h) (Ci)	1.26E-05	0.00E+00	1.23E+01	6.74E+02	7.15E+02	2.82E-01	7.11E+00	1.47E+00	4.84E-06	3.10E+02	3.11E+02
21	Threshold (MeV)	22.7	31.9	18.7	10.6	15.7	20.6	12.5		9.37		
22		H-3	Be-7	C-11	N-13	O-15	Cl-38	Cl-39	Ar-41 Beam Path	Ar-39	Ar-41 Convertor	Total Ar- 41 Activity (columns I + K)
23	Maximum MEI Dose at 800 Hours =			0.00922	mrem/yr							
24	Maximum MEI Dose at 8676 Hours =			0.1	mrem/yr							

	A	B	C	D	E	F	G	H	I	J	K	L
1	Converter Type =	Aluminum (Al)			Bremsstrahlung Production Converter Factor (Cells B8, C8, D8, E8, F8, G8, H8, & J8 only) =		0.37	Neutron Production Converter Factor (Cell K8 only) =		0.1		
2	Energy Eo =	30	Current I =	40	Power P =	1.2	Beam Distance s =	592				
3												
4	Radionuclide	H-3	Be-7	C-11	N-13	O-15	Cl-38	Cl-39	Ar-41 Beam Path	Ar-39	Ar-41 Converter	Total Ar- 41 Activity (columns I + K)
5	Half-life	12.3 y	54 d	20.5 min	10 min	2.1 min	37 min	55 min	1.827 hr	269 y	1.827 hr	
6	Half-life (sec)	387892800	4665600	1230	600	126	2220	3300	6577.2	8.483E+09	6577.2	
7	f (ground plane)	6.00E-01	6.00E-01	6.00E-01	6.00E-01	6.00E-01	6.00E-01	6.00E-01	5.00E-01	6.00E-01	5.00E-01	
8	f (converter)	3.70E-01	3.70E-01	3.70E-01	3.70E-01	3.70E-01	3.70E-01	3.70E-01	1.00E+00	3.70E-01	1.00E-01	
9	f (energy fraction)	3.00E-02	0.00E+00	6.00E-02	1.60E-01	7.00E-02	4.00E-02	1.20E-01	1.00E+00	2.10E-01	1.00E+00	
10	f(neutron capture)	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	3.50E-02	1.00E+00	3.50E-02	
11	YF	7.10E+06	1.10E+06	1.10E+07	1.10E+08	5.60E+07	6.80E+05	8.50E+06	3.78E+09	8.50E+06	1.00E+12	
12	YF adjusted	4.73E+04	0.00E+00	1.47E+05	3.91E+06	8.70E+05	6.04E+03	2.26E+05	6.62E+07	3.96E+05	1.75E+09	
13	Ssat (Bq)	3.36E+07	0.00E+00	1.04E+08	2.78E+09	6.18E+08	4.29E+06	1.61E+08	6.62E+07	2.82E+08	2.10E+09	
14	PR (atoms/s)	3.36E+07	0.00E+00	1.04E+08	2.78E+09	6.18E+08	4.29E+06	1.61E+08	6.62E+07	2.82E+08	2.10E+09	
15	N (PR * 39024 h)	4.72E+15	0.00E+00	1.46E+16	3.90E+17	8.69E+16	6.03E+14	2.26E+16	9.30E+15	3.95E+16	2.95E+17	
16	A (39024 h) (Bq)	8.43E+06	0.00E+00	8.24E+12	4.50E+14	4.78E+14	1.88E+11	4.75E+12	9.80E+11	3.23E+06	3.11E+13	3.21E+13
17	A (39024 h) (Ci)	2.28E-04	0.00E+00	2.23E+02	1.22E+04	1.29E+04	5.08E+00	1.28E+02	2.65E+01	8.73E-05	8.40E+02	8.67E+02
18	N (PR * 800 h)	9.67E+13	0.00E+00	3.00E+14	7.99E+15	1.78E+15	1.24E+13	4.63E+14	1.91E+14	8.11E+14	6.05E+15	
19	A (800 h) (Bq)	1.73E+05	0.00E+00	1.69E+11	9.23E+12	9.79E+12	3.86E+09	9.73E+10	2.01E+10	6.62E+04	6.37E+11	6.57E+11
20	A (800 h) (Ci)	4.67E-06	0.00E+00	4.56E+00	2.50E+02	2.65E+02	1.04E-01	2.63E+00	5.43E-01	1.79E-06	1.72E+01	1.78E+01
21	Threshold (MeV)	22.7	31.9	18.7	10.6	15.7	20.6	12.5		9.37		
22		H-3	Be-7	C-11	N-13	O-15	Cl-38	Cl-39	Ar-41 Beam Path	Ar-39	Ar-41 Converter	Total Ar- 41 Activity (columns I + K)
23	Maximum MEI Dose at 800 Hours =			0.00205	mrem/yr							
24	Maximum MEI Dose at 39024 Hours =			0.1	mrem/yr							

	A	B	C	D	E	F	G	H	I	J	K	L
					Bremsstrahlung Production Converter Factor (Cells B8, C8, D8, E8, F8, G8, H8, & J8 only)				Neutron Production Converter Factor (Cell K8 only) =			
1	Converter Type =	Air					0.37			0		
2	Energy Eo =	30	Current I =	40	Power P =	1.2	Beam Distance s =	592				
3												
4	Radionuclide	H-3	Be-7	C-11	N-13	O-15	Cl-38	Cl-39	Ar-41 Beam Path	Ar-39	Ar-41 Converter	Total Ar- 41 Activity (columns
5	Half-life	12.3 y	54 d	20.5 min	10 min	2.1 min	37 min	55 min	1.827 hr	269 y	1.827 hr	
6	Half-life (sec)	387892800	4665600	1230	600	126	2220	3300	6577.2	8.483E+09	6577.2	
7	f (ground plane)	6.00E-01	6.00E-01	6.00E-01	6.00E-01	6.00E-01	6.00E-01	6.00E-01	5.00E-01	6.00E-01	5.00E-01	
8	f (converter)	3.70E-01	3.70E-01	3.70E-01	3.70E-01	3.70E-01	3.70E-01	3.70E-01	1.00E+00	3.70E-01	0.00E+00	
9	f (energy fraction)	3.00E-02	0.00E+00	6.00E-02	1.60E-01	7.00E-02	4.00E-02	1.20E-01	1.00E+00	2.10E-01	1.00E+00	
10	f(neutron capture)	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	3.50E-02	1.00E+00	3.50E-02	
11	YF	7.10E+06	1.10E+06	1.10E+07	1.10E+08	5.60E+07	6.80E+05	8.50E+06	3.78E+09	8.50E+06	1.00E+12	
12	YF adjusted	4.73E+04	0.00E+00	1.47E+05	3.91E+06	8.70E+05	6.04E+03	2.26E+05	6.62E+07	3.96E+05	0.00E+00	
13	Ssat (Bq)	3.36E+07	0.00E+00	1.04E+08	2.78E+09	6.18E+08	4.29E+06	1.61E+08	6.62E+07	2.82E+08	0.00E+00	
14	PR (atoms/s)	3.36E+07	0.00E+00	1.04E+08	2.78E+09	6.18E+08	4.29E+06	1.61E+08	6.62E+07	2.82E+08	0.00E+00	
15	N (PR * 44198 h)	5.34E+15	0.00E+00	1.66E+16	4.42E+17	9.84E+16	6.83E+14	2.56E+16	1.05E+16	4.48E+16	0.00E+00	
16	A (44198 h) (Bq)	9.55E+06	0.00E+00	9.33E+12	5.10E+14	5.41E+14	2.13E+11	5.38E+12	1.11E+12	3.66E+06	0.00E+00	1.11E+12
17	A (44198 h) (Ci)	2.58E-04	0.00E+00	2.52E+02	1.38E+04	1.46E+04	5.76E+00	1.45E+02	3.00E+01	9.89E-05	0.00E+00	3.00E+01
18	N (PR * 800 h)	9.67E+13	0.00E+00	3.00E+14	7.99E+15	1.78E+15	1.24E+13	4.63E+14	1.91E+14	8.11E+14	0.00E+00	
19	A (800 h) (Bq)	1.73E+05	0.00E+00	1.69E+11	9.23E+12	9.79E+12	3.86E+09	9.73E+10	2.01E+10	6.62E+04	0.00E+00	2.01E+10
20	A (800 h) (Ci)	4.67E-06	0.00E+00	4.56E+00	2.50E+02	2.65E+02	1.04E-01	2.63E+00	5.43E-01	1.79E-06	0.00E+00	5.43E-01
21	Threshold (MeV)	22.7	31.9	18.7	10.6	15.7	20.6	12.5		9.37		
22		H-3	Be-7	C-11	N-13	O-15	Cl-38	Cl-39	Ar-41 Beam Path	Ar-39	Ar-41 Converter	Total Ar- 41 Activity (columns I + K)
23	Maximum MEI Dose at 800 Hours =			0.00181	mrem/yr							
24	Maximum MEI Dose at 44198 Hours =			0.1	mrem/yr							

1	Convertor Type =	Tungsten (W)		Bremsstrahlung Production Convertor Factor (Cells B8, C8, D8, E8, F8, G8, H8, & J8 only) =			Neutron Production Convertor Factor 1 (Cell K8 only) =		0.02			
2	Energy Eo =	12	Current I =	11	Power P =	0.132	Beam Distance s =	592				
3												
4	Radionuclide	H-3	Be-7	C-11	N-13	O-15	Cl-38	Cl-39	Ar-41 Beam Path	Ar-39	Ar-41 Convertor	Total Ar-41 Activity (columns I + K)
5	Half-life	12.3 y	54 d	20.5 min	10 min	2.1 min	37 min	55 min	1.827 hr	269 y	1.827 hr	
6	Half-life (sec)	3.88E+08	4665600	1230	600	126	2220	3300	6577.2	8.48E+09	6577.2	
7	f (ground plane)	6.00E-01	6.00E-01	6.00E-01	6.00E-01	6.00E-01	6.00E-01	6.00E-01	5.00E-01	6.00E-01	5.00E-01	
8	f (convertor)	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	2.00E-02	
9	f (energy fraction)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	2.00E-02	1.00E+00	
10	f(neutron capture)	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	3.50E-02	1.00E+00	3.50E-02	
11	YF	7.10E+06	1.10E+06	1.10E+07	1.10E+08	5.60E+07	6.80E+05	8.50E+06	7.97E+06	8.50E+06	1.00E+12	
12	YF adjusted	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.39E+05	1.02E+05	3.50E+08	
13	Ssat (Bq)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.39E+05	7.97E+06	4.62E+07	
14	PR (atoms/s)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.39E+05	7.97E+06	4.62E+07	
15	N (PR * 15037593 h)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.55E+15	4.31E+17	2.50E+18	
16	A (15037593 h) (Bq)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.96E+11	3.52E+07	2.64E+14	2.64E+14
17	A (15037593 h) (Ci)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.15E+01	9.53E-04	7.12E+03	7.14E+03
18	N (PR * 800 h)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.02E+11	2.30E+13	1.33E+14	
19	A (800 h) (Bq)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.23E+07	1.88E+03	1.40E+10	1.41E+10
20	A (800 h) (Ci)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.14E-03	5.07E-08	3.79E-01	3.80E-01
21	Threshold (MeV)	22.7	31.9	18.7	10.6	15.7	20.6	12.5		9.37		
22		H-3	Be-7	C-11	N-13	O-15	Cl-38	Cl-39	Ar-41 Beam Path	Ar-39	Ar-41 Convertor	Total Ar-41 Activity (columns I + K)
23	Maximum MEI Dose at 800 Hours =			5.32E-06	mrem/yr							
24	Maximum MEI Dose at 15,037,593 Hours =			0.1	mrem/yr							

Appendix D

Relative Capture Fractions for Thermal Neutrons in Isotopes of Air

Appendix D

Relative Capture Fractions for Thermal Neutrons in Isotopes of Air

STP Air Isotope	No. density (atoms/barn/cm)	Microscopic Radiative Capture Cross Section at 0.02 eV (barn)	Macroscopic Cross Section Capital Sigma Product (1/cm)	Capture Fraction
N-14	3.89414E-05	0.1	3.89414E-06	0.96298
N-15	1.44648E-07	3.00E-05	4.33944E-12	0.00000
O-16	1.04878E-05	0.0003	3.14634E-09	0.00078
O-17	4.20520E-09	0.005	2.10260E-11	0.00001
O-18	2.10260E-08	0.00016	3.36416E-12	0.00000
C-12	8.14756E-09	0.004	3.25902E-11	0.00001
C-13	9.06199E-11	0.00137	1.24149E-13	0.00000
Ar-36	7.89106E-10	5.2	4.10335E-09	0.00101
Ar-38	1.47518E-10	0.8	1.18014E-10	0.00003
Ar-40	2.33219E-07	0.61	1.42264E-07	0.03518
TOTAL			4.04383E-06	

The capture factor is the macroscopic cross section (Σ) product for a specific air isotope divided by the sum of all Σ values. This represents the fraction of thermal neutrons that will be captured by a specific air isotope.

Cross section data from "Guidebook for the ENDF/B-V Nuclear Data Files, NP-2510, ENDF-328, July 1982

Appendix E

Neutrons Production from Thick Targets (Convertor)

Appendix E

Neutrons Production from Thick Targets (Convertor)

Maximum Electron Beam Energy (MeV)	Tungsten*	Aluminum*	Carbon*	Air*
60	2.3	0.4	0.2	0
30	1.8	0.1	0.04	0
12	0.02	0	0	0

*Neutrons x 10^{12} per kW

Reference – Figure 3.12, NCRP-144

Appendix F

CAP88 Data

Ar-39A.dat
 08/02/20 2:16:00 PM Feb 20, 2008 02:30 pm
 RUNA RUNA.
 C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

INL
 PO Box 1625

Idaho Falls ID 83415
 2008

TAN-TSF
 Receptors 1-20
 100.0000,500.0000

0	0	0	0	0	20		
10344	10365	10472	10590	11103	11989	12522	13245
13286	13483	13612	13664	13959	14258	14374	15241
15441	15784	15844	16323				
800	280.20	16.30	3.54				
0	0						

1	1.00	1.00	0.000E+00	0.000E+00			
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
1	0	0					
Ar-39	G	0	0.000e+00	0.000e+00	5.480e-05		0
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.053E-06	
0.70	0.30	0.00					
0.40	0.60	0.00					
0.44	0.56	0.00					

F	F	T	T				
7.190e-02	8.560e-03	7.150e-02					
Ar-39	18	0					
00	00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00			
1							
Ar-39	G	0	0.000e+00	0.000e+00	5.480e-05		0
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
4.606E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.053E-06	
--DecayStep--1							
--LimitChildren--1							
--Children--5							

Ar-39B.dat
 08/02/20 2:17:00 PM Feb 20, 2008 02:30 pm
 RUNB RUNB.
 C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

INL
 PO Box 1625

Idaho Falls ID 83415
 2008

TAN-TSF
 Receptors 21-39
 100.0000,500.0000

0	0	0	0	0	19		
17035	17329	18607	18834	18860	18890	19860	19891
20457	21314	21349	22159	23521	24430	24545	25171
26794	27275	27389	0				
800	280.20	16.30	3.54				
0	0						

1	1.00	1.00	0.000E+00	0.000E+00			
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1	0	0					

Ar-39	G	0	0.000e+00	0.000e+00	5.480e-05	0	
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.053E-06	
0.70	0.30	0.00	Rural				
0.40	0.60	0.00					
0.44	0.56	0.00					

F	F	T	T				
7.190e-02	8.560e-03	7.150e-02					
Ar-39	18	0					
00	00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00			

1							
Ar-39	G	0	0.000e+00	0.000e+00	5.480e-05	0	
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
4.606E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.053E-06	

--DecayStep--1
 --LimitChildren--1
 --Children--5

Ar-39C.dat
 08/02/20 2:19:00 PM Feb 20, 2008 02:31 pm
 RUNC RUNC.
 C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

INL
 PO Box 1625

Idaho Falls ID 83415
 2008

TAN-TSF
 Receptors 40-59
 100.0000,500.0000

0	0	0	0	0	20		
27715	28919	31060	32802	34577	35279	35683	36721
36809	37729	39079	39220	39559	43584	45196	45275
45654	45677	46668	47969				
800	280.20	16.30	3.54				
0	0						

1	1.00	1.00	0.000E+00	0.000E+00			
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1	0	0					
Ar-39	G	0	0.000e+00	0.000e+00	5.480e-05		0
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.053E-06	
0.70	0.30	0.00	Rural				
0.40	0.60	0.00					
0.44	0.56	0.00					

F	F	T	T				
7.190e-02	8.560e-03	7.150e-02					
Ar-39	18	0					
00	00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00			
1							
Ar-39	G	0	0.000e+00	0.000e+00	5.480e-05		0
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
4.606E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.053E-06	

--DecayStep--1
 --LimitChildren--1
 --Children--5

Ar-39D.dat
 08/02/20 2:20:00 PM Feb 20, 2008 02:31 pm
 RUND RUND.
 C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

INL
 PO Box 1625

Idaho Falls ID 83415
 2008

TAN-TSF
 Receptors 60-62
 100.0000,500.0000

0	0	0	0	0	3		
50024	54611	58610	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0			
800	280.20	16.30	3.54				
0	0						

1	1.00	1.00	0.000E+00	0.000E+00			
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1	0	0					

Ar-39	G	0	0.000e+00	0.000e+00	5.480e-05		0
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified		0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.053E-06	
0.70	0.30	0.00	Rural				
0.40	0.60	0.00					
0.44	0.56	0.00					

F	F	T	T			
7.190e-02	8.560e-03	7.150e-02				
Ar-39	18	0				
00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00		

1						
Ar-39	G	0	0.000e+00	0.000e+00	5.480e-05	0
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
4.606E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
0.000e+00	0	0.000e+00				
unspecified		0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.053E-06

--DecayStep--1
 --LimitChildren--1
 --Children--5

Ar-39A.SUM

C A P 8 8 - P C

Version 3.0

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment

Feb 20, 2008 02:30 pm

Facility: INL
Address: PO Box 1625
City: Idaho Falls
State: ID Zip: 83415

Source Category:
Source Type: Stack
Emission Year: 2008

Comments: TAN-TSF
Receptors 1-20

Dataset Name: RUNA
Dataset Date: 08/02/20 2:16:00 PM
Wind File: C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

Feb 20, 2008 02:30 pm

SUMMARY
Page 1

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	0.00E+00
INHALATION	0.00E+00
AIR IMMERSION	7.30E-08
GROUND SURFACE	0.00E+00
INTERNAL	0.00E+00
EXTERNAL	7.30E-08
TOTAL	7.30E-08

Feb 20, 2008 02:30 pm

SUMMARY
Page 2

NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
Ar-39	7.30E-08
TOTAL	7.30E-08

Feb 20, 2008 02:30 pm

SUMMARY
Page 3

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
Esophagu	3.71E-17
Stomach	1.70E-16
Colon	3.63E-16
Liver	6.48E-17
LUNG	4.86E-16
Bone	1.65E-17
Skin	6.79E-15
Breast	3.50E-16
Ovary	4.45E-17
Bladder	9.59E-17
Kidneys	2.32E-17
Thyroid	1.79E-17
Leukemia	2.36E-16
Residual	5.99E-16
Total	9.27E-15
TOTAL	1.86E-14

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	0.00E+00
INHALATION	0.00E+00
AIR IMMERSION	9.27E-15
GROUND SURFACE	0.00E+00
INTERNAL	0.00E+00
EXTERNAL	9.27E-15
TOTAL	9.27E-15

Feb 20, 2008 02:30 pm

SUMMARY
Page 4

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
Ar-39	9.27E-15
TOTAL	9.27E-15

Feb 20, 2008 02:30 pm

SUMMARY
Page 5

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y) (All Radionuclides and Pathways)

	Distance (m)						
Direction	10344	10365	10472	10590	11103	11989	12522
N	1.8E-08	1.8E-08	1.7E-08	1.7E-08	1.6E-08	1.5E-08	1.4E-08
NNW	6.7E-09	6.7E-09	6.6E-09	6.5E-09	6.2E-09	5.6E-09	5.4E-09
NW	9.2E-09	9.2E-09	9.1E-09	9.0E-09	8.5E-09	7.8E-09	7.5E-09
WNW	1.2E-08	1.2E-08	1.2E-08	1.2E-08	1.1E-08	1.0E-08	1.0E-08
W	1.4E-08	1.4E-08	1.4E-08	1.4E-08	1.3E-08	1.2E-08	1.1E-08
WSW	1.9E-08	1.9E-08	1.9E-08	1.9E-08	1.8E-08	1.6E-08	1.5E-08
SW	3.1E-08	3.1E-08	3.1E-08	3.0E-08	2.9E-08	2.6E-08	2.5E-08
SSW	5.2E-08	5.2E-08	5.1E-08	5.0E-08	4.8E-08	4.3E-08	4.1E-08
S	7.3E-08	7.3E-08	7.2E-08	7.1E-08	6.7E-08	6.1E-08	5.8E-08
SSE	6.1E-08	6.1E-08	6.0E-08	5.9E-08	5.6E-08	5.1E-08	4.8E-08
SE	3.2E-08	3.2E-08	3.1E-08	3.1E-08	2.9E-08	2.7E-08	2.6E-08
ESE	2.1E-08	2.1E-08	2.1E-08	2.1E-08	1.9E-08	1.8E-08	1.7E-08
E	2.7E-08	2.7E-08	2.7E-08	2.6E-08	2.5E-08	2.3E-08	2.2E-08
ENE	2.3E-08	2.3E-08	2.3E-08	2.3E-08	2.2E-08	2.0E-08	1.9E-08
NE	3.6E-08	3.6E-08	3.5E-08	3.5E-08	3.3E-08	3.0E-08	2.8E-08
NNE	2.3E-08	2.2E-08	2.2E-08	2.2E-08	2.1E-08	1.9E-08	1.8E-08

	Distance (m)						
Direction	13245	13286	13483	13612	13664	13959	14258
N	1.3E-08	1.3E-08	1.3E-08	1.3E-08	1.3E-08	1.3E-08	1.2E-08
NNW	5.0E-09	5.0E-09	4.9E-09	4.9E-09	4.9E-09	4.7E-09	4.6E-09
NW	7.0E-09	7.0E-09	6.9E-09	6.8E-09	6.8E-09	6.6E-09	6.5E-09
WNW	9.4E-09	9.4E-09	9.2E-09	9.1E-09	9.1E-09	8.9E-09	8.6E-09
W	1.1E-08	1.1E-08	1.0E-08	1.0E-08	1.0E-08	1.0E-08	9.9E-09
WSW	1.4E-08	1.4E-08	1.4E-08	1.4E-08	1.4E-08	1.3E-08	1.3E-08
SW	2.3E-08	2.3E-08	2.3E-08	2.2E-08	2.2E-08	2.2E-08	2.1E-08
SSW	3.8E-08	3.8E-08	3.8E-08	3.7E-08	3.7E-08	3.6E-08	3.5E-08

	Ar-39A.SUM						
S	5.4E-08	5.4E-08	5.3E-08	5.2E-08	5.2E-08	5.1E-08	4.9E-08
SSE	4.5E-08	4.5E-08	4.4E-08	4.4E-08	4.3E-08	4.2E-08	4.1E-08
SE	2.4E-08	2.4E-08	2.3E-08	2.3E-08	2.3E-08	2.3E-08	2.2E-08
ESE	1.6E-08	1.6E-08	1.6E-08	1.5E-08	1.5E-08	1.5E-08	1.5E-08
E	2.1E-08	2.0E-08	2.0E-08	2.0E-08	2.0E-08	1.9E-08	1.9E-08
ENE	1.8E-08	1.8E-08	1.7E-08	1.7E-08	1.7E-08	1.7E-08	1.6E-08
NE	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.5E-08	2.5E-08	2.4E-08
NNE	1.7E-08	1.7E-08	1.6E-08	1.6E-08	1.6E-08	1.6E-08	1.5E-08

Feb 20, 2008 02:30 pm

SUMMARY
Page 6

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

	Distance (m)					
Direction	14374	15241	15441	15784	15844	16323
N	1.2E-08	1.1E-08	1.1E-08	1.1E-08	1.1E-08	1.1E-08
NNW	4.6E-09	4.3E-09	4.2E-09	4.1E-09	4.1E-09	4.0E-09
NW	6.4E-09	6.0E-09	5.9E-09	5.8E-09	5.7E-09	5.6E-09
WNW	8.6E-09	8.0E-09	7.9E-09	7.7E-09	7.7E-09	7.4E-09
W	9.8E-09	9.1E-09	9.0E-09	8.8E-09	8.8E-09	8.5E-09
WSW	1.3E-08	1.2E-08	1.2E-08	1.2E-08	1.2E-08	1.1E-08
SW	2.1E-08	2.0E-08	1.9E-08	1.9E-08	1.9E-08	1.8E-08
SSW	3.5E-08	3.3E-08	3.2E-08	3.1E-08	3.1E-08	3.0E-08
S	4.9E-08	4.6E-08	4.5E-08	4.4E-08	4.4E-08	4.2E-08
SSE	4.1E-08	3.8E-08	3.8E-08	3.7E-08	3.6E-08	3.5E-08
SE	2.2E-08	2.0E-08	2.0E-08	2.0E-08	2.0E-08	1.9E-08
ESE	1.5E-08	1.4E-08	1.3E-08	1.3E-08	1.3E-08	1.3E-08
E	1.9E-08	1.8E-08	1.7E-08	1.7E-08	1.7E-08	1.6E-08
ENE	1.6E-08	1.5E-08	1.5E-08	1.4E-08	1.4E-08	1.4E-08
NE	2.4E-08	2.2E-08	2.2E-08	2.1E-08	2.1E-08	2.1E-08
NNE	1.5E-08	1.4E-08	1.4E-08	1.4E-08	1.4E-08	1.3E-08

Feb 20, 2008 02:30 pm

SUMMARY
Page 7

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)						
Direction	10344	10365	10472	10590	11103	11989	12522
N	2.3E-15	2.2E-15	2.2E-15	2.2E-15	2.1E-15	1.9E-15	1.8E-15
NNW	8.5E-16	8.5E-16	8.4E-16	8.3E-16	7.8E-16	7.2E-16	6.8E-16
NW	1.2E-15	1.2E-15	1.2E-15	1.1E-15	1.1E-15	1.0E-15	9.5E-16
WNW	1.6E-15	1.6E-15	1.5E-15	1.5E-15	1.5E-15	1.3E-15	1.3E-15

	Ar-39A.SUM						
W	1.8E-15	1.8E-15	1.8E-15	1.7E-15	1.7E-15	1.5E-15	1.4E-15
WSW	2.4E-15	2.4E-15	2.4E-15	2.4E-15	2.2E-15	2.0E-15	1.9E-15
SW	3.9E-15	3.9E-15	3.9E-15	3.8E-15	3.6E-15	3.3E-15	3.1E-15
SSW	6.6E-15	6.6E-15	6.5E-15	6.4E-15	6.0E-15	5.5E-15	5.2E-15
S	9.3E-15	9.2E-15	9.1E-15	9.0E-15	8.5E-15	7.7E-15	7.3E-15
SSE	7.7E-15	7.7E-15	7.6E-15	7.5E-15	7.1E-15	6.5E-15	6.1E-15
SE	4.0E-15	4.0E-15	4.0E-15	3.9E-15	3.7E-15	3.4E-15	3.2E-15
ESE	2.7E-15	2.7E-15	2.6E-15	2.6E-15	2.5E-15	2.3E-15	2.2E-15
E	3.4E-15	3.4E-15	3.4E-15	3.4E-15	3.2E-15	2.9E-15	2.8E-15
ENE	3.0E-15	3.0E-15	2.9E-15	2.9E-15	2.7E-15	2.5E-15	2.4E-15
NE	4.5E-15	4.5E-15	4.5E-15	4.4E-15	4.2E-15	3.8E-15	3.6E-15
NNE	2.9E-15	2.9E-15	2.8E-15	2.8E-15	2.6E-15	2.4E-15	2.3E-15

	Distance (m)						
Direction	13245	13286	13483	13612	13664	13959	14258
N	1.7E-15	1.7E-15	1.7E-15	1.7E-15	1.6E-15	1.6E-15	1.6E-15
NNW	6.4E-16	6.4E-16	6.3E-16	6.2E-16	6.2E-16	6.0E-16	5.9E-16
NW	8.9E-16	8.9E-16	8.7E-16	8.6E-16	8.6E-16	8.4E-16	8.2E-16
WNW	1.2E-15	1.2E-15	1.2E-15	1.2E-15	1.2E-15	1.1E-15	1.1E-15
W	1.4E-15	1.4E-15	1.3E-15	1.3E-15	1.3E-15	1.3E-15	1.3E-15
WSW	1.8E-15	1.8E-15	1.8E-15	1.8E-15	1.7E-15	1.7E-15	1.7E-15
SW	2.9E-15	2.9E-15	2.9E-15	2.8E-15	2.8E-15	2.7E-15	2.7E-15
SSW	4.9E-15	4.9E-15	4.8E-15	4.7E-15	4.7E-15	4.6E-15	4.5E-15
S	6.9E-15	6.8E-15	6.7E-15	6.6E-15	6.6E-15	6.4E-15	6.3E-15
SSE	5.7E-15	5.7E-15	5.6E-15	5.5E-15	5.5E-15	5.4E-15	5.2E-15
SE	3.0E-15	3.0E-15	3.0E-15	3.0E-15	2.9E-15	2.9E-15	2.8E-15
ESE	2.0E-15	2.0E-15	2.0E-15	2.0E-15	2.0E-15	1.9E-15	1.9E-15
E	2.6E-15	2.6E-15	2.6E-15	2.5E-15	2.5E-15	2.5E-15	2.4E-15
ENE	2.2E-15	2.2E-15	2.2E-15	2.2E-15	2.2E-15	2.1E-15	2.1E-15
NE	3.3E-15	3.3E-15	3.3E-15	3.2E-15	3.2E-15	3.1E-15	3.1E-15
NNE	2.1E-15	2.1E-15	2.1E-15	2.1E-15	2.1E-15	2.0E-15	2.0E-15

Feb 20, 2008 02:30 pm

SUMMARY
Page 8

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)					
Direction	14374	15241	15441	15784	15844	16323
N	1.6E-15	1.5E-15	1.4E-15	1.4E-15	1.4E-15	1.3E-15
NNW	5.8E-16	5.5E-16	5.4E-16	5.3E-16	5.2E-16	5.1E-16
NW	8.1E-16	7.6E-16	7.5E-16	7.3E-16	7.3E-16	7.1E-16
WNW	1.1E-15	1.0E-15	1.0E-15	9.8E-16	9.8E-16	9.5E-16
W	1.2E-15	1.2E-15	1.1E-15	1.1E-15	1.1E-15	1.1E-15
WSW	1.6E-15	1.5E-15	1.5E-15	1.5E-15	1.5E-15	1.4E-15
SW	2.7E-15	2.5E-15	2.4E-15	2.4E-15	2.4E-15	2.3E-15
SSW	4.4E-15	4.1E-15	4.1E-15	4.0E-15	3.9E-15	3.8E-15
S	6.2E-15	5.8E-15	5.7E-15	5.5E-15	5.5E-15	5.3E-15

	Ar-39A.SUM					
SSE	5.2E-15	4.8E-15	4.8E-15	4.6E-15	4.6E-15	4.5E-15
SE	2.8E-15	2.6E-15	2.6E-15	2.5E-15	2.5E-15	2.4E-15
ESE	1.8E-15	1.7E-15	1.7E-15	1.7E-15	1.7E-15	1.6E-15
E	2.4E-15	2.2E-15	2.2E-15	2.1E-15	2.1E-15	2.1E-15
ENE	2.0E-15	1.9E-15	1.9E-15	1.8E-15	1.8E-15	1.8E-15
NE	3.0E-15	2.8E-15	2.8E-15	2.7E-15	2.7E-15	2.6E-15
NNE	1.9E-15	1.8E-15	1.8E-15	1.7E-15	1.7E-15	1.7E-15

Ar-39B.SUM

C A P 8 8 - P C

Version 3.0

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment

Feb 20, 2008 02:30 pm

Facility: INL
Address: PO Box 1625
City: Idaho Falls
State: ID Zip: 83415

Source Category:
Source Type: Stack
Emission Year: 2008

Comments: TAN-TSF
Receptors 21-39

Dataset Name: RUNB
Dataset Date: 08/02/20 2:17:00 PM
Wind File: C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

Feb 20, 2008 02:30 pm

SUMMARY
Page 1

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	0.00E+00
INHALATION	0.00E+00
AIR IMMERSION	3.99E-08
GROUND SURFACE	0.00E+00
INTERNAL	0.00E+00
EXTERNAL	3.99E-08
TOTAL	3.99E-08

Feb 20, 2008 02:30 pm

SUMMARY
Page 2

NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
Ar-39	3.99E-08
TOTAL	3.99E-08

Feb 20, 2008 02:30 pm

SUMMARY
Page 3

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
Esophagu	2.02E-17
Stomach	9.26E-17
Colon	1.98E-16
Liver	3.54E-17
LUNG	2.65E-16
Bone	9.01E-18
Skin	3.71E-15
Breast	1.91E-16
Ovary	2.43E-17
Bladder	5.24E-17
Kidneys	1.27E-17
Thyroid	9.78E-18
Leukemia	1.29E-16
Residual	3.27E-16
Total	5.06E-15
TOTAL	1.01E-14

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	0.00E+00
INHALATION	0.00E+00
AIR IMMERSION	5.06E-15
GROUND SURFACE	0.00E+00
INTERNAL	0.00E+00
EXTERNAL	5.06E-15
TOTAL	5.06E-15

Feb 20, 2008 02:30 pm

SUMMARY
Page 4

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
Ar-39	5.06E-15
TOTAL	5.06E-15

Feb 20, 2008 02:30 pm

SUMMARY
Page 5

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y) (All Radionuclides and Pathways)

Direction	Distance (m)						
	17035	17329	18607	18834	18860	18890	19860
N	1.0E-08	9.9E-09	9.2E-09	9.0E-09	9.0E-09	9.0E-09	8.5E-09
NNW	3.8E-09	3.7E-09	3.4E-09	3.4E-09	3.4E-09	3.4E-09	3.2E-09
NW	5.3E-09	5.2E-09	4.8E-09	4.7E-09	4.7E-09	4.7E-09	4.5E-09
WNW	7.1E-09	7.0E-09	6.4E-09	6.4E-09	6.3E-09	6.3E-09	6.0E-09
W	8.1E-09	7.9E-09	7.3E-09	7.2E-09	7.2E-09	7.2E-09	6.8E-09
WSW	1.1E-08	1.0E-08	9.7E-09	9.6E-09	9.5E-09	9.5E-09	9.0E-09
SW	1.7E-08	1.7E-08	1.5E-08	1.5E-08	1.5E-08	1.5E-08	1.4E-08
SSW	2.9E-08	2.8E-08	2.6E-08	2.5E-08	2.5E-08	2.5E-08	2.4E-08
S	4.0E-08	3.9E-08	3.6E-08	3.5E-08	3.5E-08	3.5E-08	3.3E-08
SSE	3.3E-08	3.3E-08	3.0E-08	3.0E-08	3.0E-08	3.0E-08	2.8E-08
SE	1.8E-08	1.8E-08	1.6E-08	1.6E-08	1.6E-08	1.6E-08	1.5E-08
ESE	1.2E-08	1.2E-08	1.1E-08	1.1E-08	1.1E-08	1.1E-08	1.0E-08
E	1.5E-08	1.5E-08	1.4E-08	1.4E-08	1.4E-08	1.4E-08	1.3E-08
ENE	1.3E-08	1.3E-08	1.2E-08	1.2E-08	1.2E-08	1.2E-08	1.1E-08
NE	2.0E-08	1.9E-08	1.8E-08	1.7E-08	1.7E-08	1.7E-08	1.6E-08
NNE	1.3E-08	1.2E-08	1.1E-08	1.1E-08	1.1E-08	1.1E-08	1.1E-08

Direction	Distance (m)						
	19891	20457	21314	21349	22159	23521	24430
N	8.5E-09	8.2E-09	7.9E-09	7.9E-09	7.5E-09	7.1E-09	6.8E-09
NNW	3.2E-09	3.1E-09	3.0E-09	3.0E-09	2.8E-09	2.6E-09	2.5E-09
NW	4.5E-09	4.3E-09	4.1E-09	4.1E-09	4.0E-09	3.7E-09	3.6E-09
WNW	6.0E-09	5.8E-09	5.5E-09	5.5E-09	5.3E-09	5.0E-09	4.8E-09
W	6.8E-09	6.6E-09	6.3E-09	6.3E-09	6.0E-09	5.6E-09	5.4E-09
WSW	9.0E-09	8.7E-09	8.3E-09	8.3E-09	8.0E-09	7.4E-09	7.1E-09
SW	1.4E-08	1.4E-08	1.3E-08	1.3E-08	1.3E-08	1.2E-08	1.1E-08
SSW	2.4E-08	2.3E-08	2.2E-08	2.2E-08	2.1E-08	2.0E-08	1.9E-08

	Ar-39B.SUM						
S	3.3E-08	3.2E-08	3.0E-08	3.0E-08	2.9E-08	2.7E-08	2.6E-08
SSE	2.8E-08	2.7E-08	2.6E-08	2.6E-08	2.4E-08	2.3E-08	2.2E-08
SE	1.5E-08	1.5E-08	1.4E-08	1.4E-08	1.3E-08	1.2E-08	1.2E-08
ESE	1.0E-08	9.8E-09	9.3E-09	9.3E-09	8.9E-09	8.3E-09	8.0E-09
E	1.3E-08	1.3E-08	1.2E-08	1.2E-08	1.1E-08	1.1E-08	1.0E-08
ENE	1.1E-08	1.1E-08	1.0E-08	1.0E-08	9.8E-09	9.1E-09	8.7E-09
NE	1.6E-08	1.6E-08	1.5E-08	1.5E-08	1.4E-08	1.3E-08	1.3E-08
NNE	1.1E-08	1.0E-08	9.8E-09	9.7E-09	9.3E-09	8.7E-09	8.3E-09

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SUMMARY
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INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

	Distance (m)				
Direction	24545	25171	26794	27275	27389
N	6.7E-09	6.5E-09	6.1E-09	6.0E-09	6.0E-09
NNW	2.5E-09	2.5E-09	2.3E-09	2.2E-09	2.2E-09
NW	3.5E-09	3.4E-09	3.2E-09	3.2E-09	3.1E-09
WNW	4.7E-09	4.6E-09	4.3E-09	4.2E-09	4.2E-09
W	5.4E-09	5.2E-09	4.9E-09	4.8E-09	4.8E-09
WSW	7.1E-09	6.9E-09	6.4E-09	6.3E-09	6.3E-09
SW	1.1E-08	1.1E-08	1.0E-08	9.9E-09	9.9E-09
SSW	1.9E-08	1.8E-08	1.7E-08	1.6E-08	1.6E-08
S	2.6E-08	2.5E-08	2.3E-08	2.3E-08	2.3E-08
SSE	2.2E-08	2.1E-08	2.0E-08	1.9E-08	1.9E-08
SE	1.2E-08	1.2E-08	1.1E-08	1.1E-08	1.0E-08
ESE	8.0E-09	7.7E-09	7.2E-09	7.1E-09	7.0E-09
E	1.0E-08	1.0E-08	9.3E-09	9.1E-09	9.1E-09
ENE	8.7E-09	8.4E-09	7.9E-09	7.7E-09	7.7E-09
NE	1.3E-08	1.2E-08	1.1E-08	1.1E-08	1.1E-08
NNE	8.3E-09	8.1E-09	7.5E-09	7.4E-09	7.3E-09

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)						
Direction	17035	17329	18607	18834	18860	18890	19860
N	1.3E-15	1.3E-15	1.2E-15	1.1E-15	1.1E-15	1.1E-15	1.1E-15
NNW	4.8E-16	4.7E-16	4.4E-16	4.3E-16	4.3E-16	4.3E-16	4.1E-16
NW	6.7E-16	6.6E-16	6.1E-16	6.0E-16	6.0E-16	6.0E-16	5.7E-16
WNW	9.0E-16	8.8E-16	8.2E-16	8.1E-16	8.1E-16	8.0E-16	7.6E-16

	Ar-39B.SUM						
W	1.0E-15	1.0E-15	9.3E-16	9.2E-16	9.2E-16	9.1E-16	8.6E-16
WSW	1.4E-15	1.3E-15	1.2E-15	1.2E-15	1.2E-15	1.2E-15	1.1E-15
SW	2.2E-15	2.1E-15	2.0E-15	1.9E-15	1.9E-15	1.9E-15	1.8E-15
SSW	3.6E-15	3.6E-15	3.3E-15	3.2E-15	3.2E-15	3.2E-15	3.0E-15
S	5.1E-15	5.0E-15	4.6E-15	4.5E-15	4.5E-15	4.5E-15	4.2E-15
SSE	4.2E-15	4.2E-15	3.8E-15	3.8E-15	3.8E-15	3.8E-15	3.5E-15
SE	2.3E-15	2.2E-15	2.1E-15	2.0E-15	2.0E-15	2.0E-15	1.9E-15
ESE	1.5E-15	1.5E-15	1.4E-15	1.4E-15	1.4E-15	1.4E-15	1.3E-15
E	2.0E-15	1.9E-15	1.8E-15	1.8E-15	1.7E-15	1.7E-15	1.7E-15
ENE	1.7E-15	1.6E-15	1.5E-15	1.5E-15	1.5E-15	1.5E-15	1.4E-15
NE	2.5E-15	2.4E-15	2.2E-15	2.2E-15	2.2E-15	2.2E-15	2.1E-15
NNE	1.6E-15	1.6E-15	1.4E-15	1.4E-15	1.4E-15	1.4E-15	1.3E-15

Distance (m)

Direction	19891	20457	21314	21349	22159	23521	24430
N	1.1E-15	1.0E-15	1.0E-15	1.0E-15	9.6E-16	9.0E-16	8.6E-16
NNW	4.1E-16	3.9E-16	3.8E-16	3.7E-16	3.6E-16	3.4E-16	3.2E-16
NW	5.7E-16	5.5E-16	5.3E-16	5.2E-16	5.0E-16	4.7E-16	4.5E-16
WNW	7.6E-16	7.4E-16	7.0E-16	7.0E-16	6.7E-16	6.3E-16	6.1E-16
W	8.6E-16	8.4E-16	8.0E-16	8.0E-16	7.7E-16	7.2E-16	6.9E-16
WSW	1.1E-15	1.1E-15	1.1E-15	1.1E-15	1.0E-15	9.4E-16	9.0E-16
SW	1.8E-15	1.8E-15	1.7E-15	1.7E-15	1.6E-15	1.5E-15	1.4E-15
SSW	3.0E-15	2.9E-15	2.8E-15	2.8E-15	2.7E-15	2.5E-15	2.4E-15
S	4.2E-15	4.1E-15	3.9E-15	3.9E-15	3.7E-15	3.4E-15	3.3E-15
SSE	3.5E-15	3.4E-15	3.3E-15	3.2E-15	3.1E-15	2.9E-15	2.8E-15
SE	1.9E-15	1.9E-15	1.8E-15	1.8E-15	1.7E-15	1.6E-15	1.5E-15
ESE	1.3E-15	1.2E-15	1.2E-15	1.2E-15	1.1E-15	1.1E-15	1.0E-15
E	1.6E-15	1.6E-15	1.5E-15	1.5E-15	1.5E-15	1.4E-15	1.3E-15
ENE	1.4E-15	1.4E-15	1.3E-15	1.3E-15	1.2E-15	1.2E-15	1.1E-15
NE	2.1E-15	2.0E-15	1.9E-15	1.9E-15	1.8E-15	1.7E-15	1.6E-15
NNE	1.3E-15	1.3E-15	1.2E-15	1.2E-15	1.2E-15	1.1E-15	1.1E-15

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

Distance (m)

Direction	24545	25171	26794	27275	27389
N	8.5E-16	8.3E-16	7.7E-16	7.6E-16	7.6E-16
NNW	3.2E-16	3.1E-16	2.9E-16	2.9E-16	2.8E-16
NW	4.5E-16	4.4E-16	4.1E-16	4.0E-16	4.0E-16
WNW	6.0E-16	5.9E-16	5.5E-16	5.4E-16	5.3E-16
W	6.8E-16	6.6E-16	6.2E-16	6.1E-16	6.1E-16
WSW	9.0E-16	8.7E-16	8.1E-16	8.0E-16	8.0E-16
SW	1.4E-15	1.4E-15	1.3E-15	1.3E-15	1.3E-15
SSW	2.4E-15	2.3E-15	2.1E-15	2.1E-15	2.1E-15
S	3.3E-15	3.2E-15	2.9E-15	2.9E-15	2.9E-15

	Ar-39B.SUM				
SSE	2.8E-15	2.7E-15	2.5E-15	2.4E-15	2.4E-15
SE	1.5E-15	1.5E-15	1.4E-15	1.3E-15	1.3E-15
ESE	1.0E-15	9.8E-16	9.2E-16	9.0E-16	8.9E-16
E	1.3E-15	1.3E-15	1.2E-15	1.2E-15	1.1E-15
ENE	1.1E-15	1.1E-15	1.0E-15	9.8E-16	9.7E-16
NE	1.6E-15	1.6E-15	1.4E-15	1.4E-15	1.4E-15
NNE	1.1E-15	1.0E-15	9.5E-16	9.3E-16	9.3E-16

Ar-39C.SUM

C A P 8 8 - P C

Version 3.0

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment

Feb 20, 2008 02:31 pm

Facility: INL
Address: PO Box 1625
City: Idaho Falls
State: ID Zip: 83415

Source Category:
Source Type: Stack
Emission Year: 2008

Comments: TAN-TSF
Receptors 40-59

Dataset Name: RUNC
Dataset Date: 08/02/20 2:19:00 PM
Wind File: C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

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SUMMARY
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PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	0.00E+00
INHALATION	0.00E+00
AIR IMMERSION	2.23E-08
GROUND SURFACE	0.00E+00
INTERNAL	0.00E+00
EXTERNAL	2.23E-08
TOTAL	2.23E-08

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SUMMARY
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Ar-39C.SUM

NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
Ar-39	2.23E-08
TOTAL	2.23E-08

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SUMMARY
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CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
Esophagu	1.13E-17
Stomach	5.18E-17
Colon	1.11E-16
Liver	1.98E-17
LUNG	1.48E-16
Bone	5.04E-18
Skin	2.07E-15
Breast	1.07E-16
Ovary	1.36E-17
Bladder	2.93E-17
Kidneys	7.08E-18
Thyroid	5.47E-18
Leukemia	7.21E-17
Residual	1.83E-16
Total	2.83E-15
TOTAL	5.67E-15

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	0.00E+00
INHALATION	0.00E+00
AIR IMMERSION	2.83E-15
GROUND SURFACE	0.00E+00
INTERNAL	0.00E+00
EXTERNAL	2.83E-15
TOTAL	2.83E-15

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SUMMARY
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NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
Ar-39	2.83E-15
TOTAL	2.83E-15

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SUMMARY
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INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y) (All Radionuclides and Pathways)

Direction	Distance (m)						
	27715	28919	31060	32802	34577	35279	35683
N	5.9E-09	5.6E-09	5.2E-09	4.9E-09	4.6E-09	4.5E-09	4.4E-09
NNW	2.2E-09	2.1E-09	1.9E-09	1.8E-09	1.7E-09	1.7E-09	1.7E-09
NW	3.1E-09	3.0E-09	2.7E-09	2.6E-09	2.4E-09	2.4E-09	2.3E-09
WNW	4.1E-09	4.0E-09	3.7E-09	3.4E-09	3.3E-09	3.2E-09	3.1E-09
W	4.7E-09	4.5E-09	4.1E-09	3.9E-09	3.7E-09	3.6E-09	3.6E-09
WSW	6.2E-09	5.9E-09	5.4E-09	5.1E-09	4.8E-09	4.7E-09	4.7E-09
SW	9.7E-09	9.3E-09	8.5E-09	8.0E-09	7.5E-09	7.4E-09	7.3E-09
SSW	1.6E-08	1.5E-08	1.4E-08	1.3E-08	1.2E-08	1.2E-08	1.2E-08
S	2.2E-08	2.1E-08	1.9E-08	1.8E-08	1.7E-08	1.7E-08	1.7E-08
SSE	1.9E-08	1.8E-08	1.6E-08	1.5E-08	1.5E-08	1.4E-08	1.4E-08
SE	1.0E-08	9.8E-09	9.1E-09	8.5E-09	8.0E-09	7.9E-09	7.8E-09
ESE	6.9E-09	6.6E-09	6.1E-09	5.7E-09	5.4E-09	5.3E-09	5.2E-09
E	8.9E-09	8.5E-09	7.9E-09	7.4E-09	7.0E-09	6.8E-09	6.7E-09
ENE	7.6E-09	7.2E-09	6.6E-09	6.2E-09	5.9E-09	5.7E-09	5.7E-09
NE	1.1E-08	1.0E-08	9.6E-09	9.0E-09	8.5E-09	8.3E-09	8.1E-09
NNE	7.2E-09	6.9E-09	6.3E-09	6.0E-09	5.6E-09	5.5E-09	5.4E-09

Direction	Distance (m)						
	36721	36809	37729	39079	39220	39559	43584
N	4.3E-09	4.3E-09	4.2E-09	4.0E-09	4.0E-09	4.0E-09	3.5E-09
NNW	1.6E-09	1.6E-09	1.6E-09	1.5E-09	1.5E-09	1.5E-09	1.3E-09
NW	2.3E-09	2.3E-09	2.2E-09	2.1E-09	2.1E-09	2.1E-09	1.9E-09
WNW	3.0E-09	3.0E-09	3.0E-09	2.8E-09	2.8E-09	2.8E-09	2.5E-09
W	3.4E-09	3.4E-09	3.3E-09	3.2E-09	3.2E-09	3.2E-09	2.8E-09
WSW	4.5E-09	4.5E-09	4.4E-09	4.2E-09	4.2E-09	4.1E-09	3.7E-09
SW	7.0E-09	7.0E-09	6.8E-09	6.6E-09	6.5E-09	6.5E-09	5.8E-09
SSW	1.2E-08	1.2E-08	1.1E-08	1.1E-08	1.1E-08	1.1E-08	9.5E-09

	Ar-39C.SUM						
S	1.6E-08	1.6E-08	1.5E-08	1.5E-08	1.5E-08	1.5E-08	1.3E-08
SSE	1.4E-08	1.3E-08	1.3E-08	1.3E-08	1.3E-08	1.2E-08	1.1E-08
SE	7.5E-09	7.5E-09	7.3E-09	7.0E-09	7.0E-09	6.9E-09	6.2E-09
ESE	5.1E-09	5.0E-09	4.9E-09	4.7E-09	4.7E-09	4.7E-09	4.2E-09
E	6.5E-09	6.5E-09	6.3E-09	6.1E-09	6.1E-09	6.0E-09	5.4E-09
ENE	5.5E-09	5.5E-09	5.3E-09	5.1E-09	5.1E-09	5.0E-09	4.5E-09
NE	7.9E-09	7.9E-09	7.6E-09	7.3E-09	7.3E-09	7.2E-09	6.4E-09
NNE	5.2E-09	5.2E-09	5.1E-09	4.9E-09	4.9E-09	4.8E-09	4.3E-09

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SUMMARY
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INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

	Distance (m)					
Direction	45196	45275	45654	45677	46668	47969
N	3.4E-09	3.4E-09	3.4E-09	3.4E-09	3.3E-09	3.2E-09
NNW	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.2E-09	1.2E-09
NW	1.8E-09	1.8E-09	1.8E-09	1.8E-09	1.7E-09	1.7E-09
WNW	2.4E-09	2.4E-09	2.4E-09	2.4E-09	2.3E-09	2.3E-09
W	2.7E-09	2.7E-09	2.7E-09	2.7E-09	2.6E-09	2.6E-09
WSW	3.6E-09	3.6E-09	3.5E-09	3.5E-09	3.4E-09	3.3E-09
SW	5.5E-09	5.5E-09	5.5E-09	5.5E-09	5.3E-09	5.2E-09
SSW	9.1E-09	9.1E-09	9.0E-09	9.0E-09	8.8E-09	8.5E-09
S	1.3E-08	1.2E-08	1.2E-08	1.2E-08	1.2E-08	1.2E-08
SSE	1.1E-08	1.1E-08	1.0E-08	1.0E-08	1.0E-08	9.9E-09
SE	5.9E-09	5.9E-09	5.9E-09	5.9E-09	5.7E-09	5.5E-09
ESE	4.0E-09	4.0E-09	4.0E-09	4.0E-09	3.9E-09	3.8E-09
E	5.2E-09	5.2E-09	5.1E-09	5.1E-09	5.0E-09	4.8E-09
ENE	4.3E-09	4.3E-09	4.3E-09	4.3E-09	4.2E-09	4.0E-09
NE	6.2E-09	6.2E-09	6.1E-09	6.1E-09	6.0E-09	5.8E-09
NNE	4.1E-09	4.1E-09	4.1E-09	4.1E-09	4.0E-09	3.9E-09

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)						
Direction	27715	28919	31060	32802	34577	35279	35683
N	7.5E-16	7.1E-16	6.6E-16	6.2E-16	5.8E-16	5.7E-16	5.6E-16
NNW	2.8E-16	2.7E-16	2.5E-16	2.3E-16	2.2E-16	2.1E-16	2.1E-16
NW	3.9E-16	3.8E-16	3.5E-16	3.3E-16	3.1E-16	3.0E-16	3.0E-16
WNW	5.3E-16	5.0E-16	4.6E-16	4.4E-16	4.1E-16	4.0E-16	4.0E-16

	Ar-39C.SUM						
W	6.0E-16	5.7E-16	5.3E-16	5.0E-16	4.7E-16	4.6E-16	4.5E-16
WSW	7.8E-16	7.5E-16	6.9E-16	6.5E-16	6.1E-16	6.0E-16	5.9E-16
SW	1.2E-15	1.2E-15	1.1E-15	1.0E-15	9.6E-16	9.4E-16	9.2E-16
SSW	2.0E-15	1.9E-15	1.8E-15	1.7E-15	1.6E-15	1.5E-15	1.5E-15
S	2.8E-15	2.7E-15	2.5E-15	2.3E-15	2.2E-15	2.1E-15	2.1E-15
SSE	2.4E-15	2.3E-15	2.1E-15	2.0E-15	1.8E-15	1.8E-15	1.8E-15
SE	1.3E-15	1.2E-15	1.2E-15	1.1E-15	1.0E-15	1.0E-15	9.8E-16
ESE	8.8E-16	8.4E-16	7.8E-16	7.3E-16	6.9E-16	6.7E-16	6.6E-16
E	1.1E-15	1.1E-15	1.0E-15	9.4E-16	8.9E-16	8.7E-16	8.5E-16
ENE	9.6E-16	9.1E-16	8.4E-16	7.9E-16	7.5E-16	7.3E-16	7.2E-16
NE	1.4E-15	1.3E-15	1.2E-15	1.1E-15	1.1E-15	1.0E-15	1.0E-15
NNE	9.2E-16	8.7E-16	8.1E-16	7.6E-16	7.1E-16	7.0E-16	6.9E-16

	Distance (m)						
Direction	36721	36809	37729	39079	39220	39559	43584
N	5.4E-16	5.4E-16	5.3E-16	5.1E-16	5.1E-16	5.0E-16	4.5E-16
NNW	2.0E-16	2.0E-16	2.0E-16	1.9E-16	1.9E-16	1.9E-16	1.7E-16
NW	2.9E-16	2.9E-16	2.8E-16	2.7E-16	2.7E-16	2.7E-16	2.4E-16
WNW	3.9E-16	3.9E-16	3.7E-16	3.6E-16	3.6E-16	3.6E-16	3.2E-16
W	4.4E-16	4.4E-16	4.2E-16	4.1E-16	4.1E-16	4.0E-16	3.6E-16
WSW	5.7E-16	5.7E-16	5.5E-16	5.3E-16	5.3E-16	5.3E-16	4.7E-16
SW	8.9E-16	8.9E-16	8.7E-16	8.3E-16	8.3E-16	8.2E-16	7.3E-16
SSW	1.5E-15	1.5E-15	1.4E-15	1.4E-15	1.4E-15	1.4E-15	1.2E-15
S	2.0E-15	2.0E-15	2.0E-15	1.9E-15	1.9E-15	1.9E-15	1.7E-15
SSE	1.7E-15	1.7E-15	1.7E-15	1.6E-15	1.6E-15	1.6E-15	1.4E-15
SE	9.5E-16	9.5E-16	9.2E-16	8.9E-16	8.8E-16	8.8E-16	7.9E-16
ESE	6.4E-16	6.4E-16	6.2E-16	6.0E-16	6.0E-16	5.9E-16	5.3E-16
E	8.3E-16	8.3E-16	8.0E-16	7.7E-16	7.7E-16	7.6E-16	6.8E-16
ENE	7.0E-16	6.9E-16	6.7E-16	6.5E-16	6.5E-16	6.4E-16	5.7E-16
NE	1.0E-15	1.0E-15	9.7E-16	9.3E-16	9.3E-16	9.2E-16	8.2E-16
NNE	6.7E-16	6.6E-16	6.5E-16	6.2E-16	6.2E-16	6.1E-16	5.5E-16

Feb 20, 2008 02:31 pm

SUMMARY
Page 8

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)					
Direction	45196	45275	45654	45677	46668	47969
N	4.3E-16	4.3E-16	4.3E-16	4.3E-16	4.2E-16	4.0E-16
NNW	1.6E-16	1.6E-16	1.6E-16	1.6E-16	1.6E-16	1.5E-16
NW	2.3E-16	2.3E-16	2.3E-16	2.3E-16	2.2E-16	2.1E-16
WNW	3.1E-16	3.1E-16	3.0E-16	3.0E-16	3.0E-16	2.9E-16
W	3.5E-16	3.5E-16	3.4E-16	3.4E-16	3.4E-16	3.3E-16
WSW	4.5E-16	4.5E-16	4.5E-16	4.5E-16	4.4E-16	4.2E-16
SW	7.0E-16	7.0E-16	7.0E-16	7.0E-16	6.8E-16	6.6E-16
SSW	1.2E-15	1.2E-15	1.1E-15	1.1E-15	1.1E-15	1.1E-15
S	1.6E-15	1.6E-15	1.6E-15	1.6E-15	1.5E-15	1.5E-15

	Ar-39C.SUM					
SSE	1.3E-15	1.3E-15	1.3E-15	1.3E-15	1.3E-15	1.3E-15
SE	7.5E-16	7.5E-16	7.4E-16	7.4E-16	7.3E-16	7.0E-16
ESE	5.1E-16	5.1E-16	5.0E-16	5.0E-16	4.9E-16	4.8E-16
E	6.6E-16	6.5E-16	6.5E-16	6.5E-16	6.3E-16	6.1E-16
ENE	5.5E-16	5.5E-16	5.4E-16	5.4E-16	5.3E-16	5.1E-16
NE	7.8E-16	7.8E-16	7.8E-16	7.7E-16	7.6E-16	7.3E-16
NNE	5.3E-16	5.3E-16	5.2E-16	5.2E-16	5.1E-16	4.9E-16

Ar-39D.SUM

C A P 8 8 - P C

Version 3.0

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment

Feb 20, 2008 02:31 pm

Facility: INL
Address: PO Box 1625
City: Idaho Falls
State: ID Zip: 83415

Source Category:
Source Type: Stack
Emission Year: 2008

Comments: TAN-TSF
Receptors 60-62

Dataset Name: RUND
Dataset Date: 08/02/20 2:20:00 PM
wind File: C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

Feb 20, 2008 02:31 pm

SUMMARY
Page 1

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	0.00E+00
INHALATION	0.00E+00
AIR IMMERSION	1.11E-08
GROUND SURFACE	0.00E+00
INTERNAL	0.00E+00
EXTERNAL	1.11E-08
TOTAL	1.11E-08

Feb 20, 2008 02:31 pm

SUMMARY
Page 2

NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
Ar-39	1.11E-08
TOTAL	1.11E-08

Feb 20, 2008 02:31 pm

SUMMARY
Page 3

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
Esophagu	5.64E-18
Stomach	2.58E-17
Colon	5.51E-17
Liver	9.85E-18
LUNG	7.39E-17
Bone	2.51E-18
Skin	1.03E-15
Breast	5.32E-17
Ovary	6.77E-18
Bladder	1.46E-17
Kidneys	3.52E-18
Thyroid	2.72E-18
Leukemia	3.59E-17
Residual	9.12E-17
Total	1.41E-15
TOTAL	2.82E-15

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	0.00E+00
INHALATION	0.00E+00
AIR IMMERSION	1.41E-15
GROUND SURFACE	0.00E+00
INTERNAL	0.00E+00
EXTERNAL	1.41E-15
TOTAL	1.41E-15

Feb 20, 2008 02:31 pm

SUMMARY
Page 4

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
Ar-39	1.41E-15
TOTAL	1.41E-15

Feb 20, 2008 02:31 pm

SUMMARY
Page 5

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y) (All Radionuclides and Pathways)

	Distance (m)		
Direction	50024	54611	58610
N	3.0E-09	2.8E-09	2.6E-09
NNW	1.1E-09	1.0E-09	9.6E-10
NW	1.6E-09	1.5E-09	1.4E-09
WNW	2.2E-09	2.0E-09	1.8E-09
W	2.4E-09	2.2E-09	2.1E-09
WSW	3.2E-09	2.9E-09	2.7E-09
SW	4.9E-09	4.5E-09	4.1E-09
SSW	8.1E-09	7.3E-09	6.8E-09
S	1.1E-08	1.0E-08	9.2E-09
SSE	9.4E-09	8.5E-09	7.8E-09
SE	5.3E-09	4.8E-09	4.4E-09
ESE	3.6E-09	3.2E-09	3.0E-09
E	4.6E-09	4.2E-09	3.9E-09
ENE	3.9E-09	3.5E-09	3.2E-09
NE	5.5E-09	5.0E-09	4.6E-09
NNE	3.7E-09	3.3E-09	3.1E-09

Feb 20, 2008 02:31 pm

SUMMARY
Page 6

INDIVIDUAL LIFETIME RISK (deaths) (All Radionuclides and Pathways)

	Distance (m)		
Direction	50024	54611	58610

Ar-39D.SUM

N	3.9E-16	3.5E-16	3.2E-16
NNW	1.5E-16	1.3E-16	1.2E-16
NW	2.1E-16	1.9E-16	1.7E-16
WNW	2.7E-16	2.5E-16	2.3E-16
W	3.1E-16	2.8E-16	2.6E-16
WSW	4.0E-16	3.7E-16	3.4E-16
SW	6.3E-16	5.7E-16	5.2E-16
SSW	1.0E-15	9.3E-16	8.6E-16
S	1.4E-15	1.3E-15	1.2E-15
SSE	1.2E-15	1.1E-15	1.0E-15
SE	6.7E-16	6.1E-16	5.6E-16
ESE	4.5E-16	4.1E-16	3.8E-16
E	5.9E-16	5.3E-16	4.9E-16
ENE	4.9E-16	4.4E-16	4.1E-16
NE	7.0E-16	6.3E-16	5.8E-16
NNE	4.7E-16	4.2E-16	3.9E-16

Ar-41A.dat
 08/02/20 2:16:00 PM Feb 20, 2008 02:30 pm
 RUNA RUNA.
 C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

INL
 PO Box 1625

Idaho Falls ID 83415
 2008

TAN-TSF
 Receptors 1-20
 100.0000,500.0000

0	0	0	0	0	20		
10344	10365	10472	10590	11103	11989	12522	13245
13286	13483	13612	13664	13959	14258	14374	15241
15441	15784	15844	16323				
800	280.20	16.30	3.54				
0	0						

1	1.00	1.00	0.000E+00	0.000E+00			
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
1	0	0					
Ar-41	G	0	0.000e+00	0.000e+00	5.480e-05		0
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.103E+00	
0.08	0.92	0.00	Urban				
0.00	1.00	0.00					
0.01	0.99	0.00					

T	T	T	T				
2.030e-01	4.560e-02	1.700e-02					
Ar-41	18	0					
00	00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00			
1							
Ar-41	G	0	0.000e+00	0.000e+00	5.480e-05		0
9.487E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
3.047E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.103E+00	
--DecayStep--1							
--LimitChildren--1							
--Children--5							

Ar-41B.dat
 08/02/20 2:17:00 PM Feb 20, 2008 02:30 pm
 RUNB RUNB.
 C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

INL
 PO Box 1625

Idaho Falls ID 83415 2008

TAN-TSF
 Receptors 21-39
 100.0000,500.0000

0	0	0	0	0	19		
17035	17329	18607	18834	18860	18890	19860	19891
20457	21314	21349	22159	23521	24430	24545	25171
26794	27275	27389	0				
800	280.20	16.30	3.54				
0	0						
1							
1.00	1.00	0.000E+00	0.000E+00				
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
1	0	0					
Ar-41	G	0	0.000e+00	0.000e+00	5.480e-05		0
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified		0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.103E+00	
0.08	0.92	0.00	Urban				
0.00	1.00	0.00					
0.01	0.99	0.00					
T	T	T	T				
2.030e-01	4.560e-02	1.700e-02					
Ar-41	18	0					
00	00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00			
1							
Ar-41	G	0	0.000e+00	0.000e+00	5.480e-05		0
9.487E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
3.047E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified		0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.103E+00	

--DecayStep--1
 --LimitChildren--1
 --Children--5

Ar-41C.dat
 08/02/20 2:19:00 PM Feb 20, 2008 02:31 pm
 RUNC RUNC.
 C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

INL
 PO Box 1625

Idaho Falls ID 83415
 2008

TAN-TSF
 Receptors 40-59
 100.0000,500.0000

0	0	0	0	0	20		
27715	28919	31060	32802	34577	35279	35683	36721
36809	37729	39079	39220	39559	43584	45196	45275
45654	45677	46668	47969				
800	280.20	16.30	3.54				
0	0						

1	1.00	1.00	0.000E+00	0.000E+00			
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
1	0	0					
Ar-41	G	0	0.000e+00	0.000e+00	5.480e-05		0
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.103E+00	
0.08	0.92	0.00	Urban				
0.00	1.00	0.00					
0.01	0.99	0.00					

T	T	T	T				
2.030e-01	4.560e-02	1.700e-02					
Ar-41	18	0					
00	00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00			
1							
Ar-41	G	0	0.000e+00	0.000e+00	5.480e-05		0
9.487E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
3.047E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.103E+00	
--DecayStep--1							
--LimitChildren--1							
--Children--5							

Ar-41D.dat
 08/02/20 2:20:00 PM Feb 20, 2008 02:31 pm
 RUND RUND.
 C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

INL
 PO Box 1625

Idaho Falls ID 83415
 2008

TAN-TSF
 Receptors 60-62
 100.0000,500.0000

0	0	0	0	0	3		
50024	54611	58610	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0			
800	280.20	16.30	3.54				
0	0						

1	1.00	1.00	0.000E+00	0.000E+00			
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1	0	0					

Ar-41	G	0	0.000e+00	0.000e+00	5.480e-05	0	
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.103E+00	
0.08	0.92	0.00	Urban				
0.00	1.00	0.00					
0.01	0.99	0.00					

T	T	T	T				
2.030e-01	4.560e-02	1.700e-02					
Ar-41	18	0					
00	00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00			
1							
Ar-41	G	0	0.000e+00	0.000e+00	5.480e-05	0	
9.487E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
3.047E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.103E+00	

--DecayStep--1
 --LimitChildren--1
 --Children--5

Ar-41A.SUM

C A P 8 8 - P C

Version 3.0

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment
Feb 20, 2008 02:30 pm

Facility: INL
Address: PO Box 1625
City: Idaho Falls
State: ID Zip: 83415

Source Category:
Source Type: Stack
Emission Year: 2008

Comments: TAN-TSF
Receptors 1-20

Dataset Name: RUNA
Dataset Date: 08/02/20 2:16:00 PM
Wind File: C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

Feb 20, 2008 02:30 pm

SUMMARY
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
Adrenals	3.22E-05
B Surfac	5.47E-05
Breasts	4.31E-05
St wall	3.45E-05
ULI wall	3.27E-05
Kidneys	3.47E-05
Lungs	3.84E-05
Ovaries	3.32E-05
R Marrow	3.81E-05
Spleen	3.51E-05
Thymus	3.64E-05
Uterus	3.11E-05

	Ar-41A.SUM
Bld wall	3.22E-05
Brain	4.14E-05
Esophagu	3.33E-05
SI wall	3.19E-05
LLI wall	3.24E-05
Liver	3.51E-05
Muscle	3.75E-05
Pancreas	3.14E-05
Skin	6.08E-05
Testes	3.81E-05
Thyroid	3.93E-05
EFEC	3.70E-05

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	0.00E+00
INHALATION	0.00E+00
AIR IMMERSION	3.70E-05
GROUND SURFACE	0.00E+00
INTERNAL	0.00E+00
EXTERNAL	3.70E-05
TOTAL	3.70E-05

Feb 20, 2008 02:30 pm

SUMMARY
Page 2

NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
Ar-41	3.70E-05
TOTAL	3.70E-05

Feb 20, 2008 02:30 pm

SUMMARY
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CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
Esophagu	3.83E-13

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	Ar-41A.SUM
Stomach	1.39E-12
Colon	3.36E-12
Liver	5.31E-13
LUNG	3.76E-12
Bone	5.19E-14
Skin	6.08E-14
Breast	2.08E-12
Ovary	4.72E-13
Bladder	7.77E-13
Kidneys	1.81E-13
Thyroid	1.25E-13
Leukemia	2.14E-12
Residual	5.02E-12
Total	2.04E-11
TOTAL	4.07E-11

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	0.00E+00
INHALATION	0.00E+00
AIR IMMERSION	2.04E-11
GROUND SURFACE	0.00E+00
INTERNAL	0.00E+00
EXTERNAL	2.04E-11
TOTAL	2.04E-11

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SUMMARY
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NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
Ar-41	2.04E-11
TOTAL	2.04E-11

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SUMMARY
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INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)

Direction	10344	10365	10472	Ar-41A.SUM 10590	11103	11989	12522
N	9.0E-06	9.0E-06	8.9E-06	8.8E-06	8.3E-06	7.6E-06	7.3E-06
NNW	3.4E-06	3.4E-06	3.3E-06	3.3E-06	3.1E-06	2.9E-06	2.7E-06
NW	4.7E-06	4.7E-06	4.6E-06	4.6E-06	4.3E-06	4.0E-06	3.8E-06
WNW	6.3E-06	6.3E-06	6.2E-06	6.1E-06	5.8E-06	5.3E-06	5.1E-06
W	7.2E-06	7.2E-06	7.1E-06	7.0E-06	6.6E-06	6.1E-06	5.8E-06
WSW	9.7E-06	9.6E-06	9.5E-06	9.4E-06	8.9E-06	8.1E-06	7.7E-06
SW	1.6E-05	1.6E-05	1.6E-05	1.5E-05	1.4E-05	1.3E-05	1.3E-05
SSW	2.6E-05	2.6E-05	2.6E-05	2.6E-05	2.4E-05	2.2E-05	2.1E-05
S	3.7E-05	3.7E-05	3.6E-05	3.6E-05	3.4E-05	3.1E-05	2.9E-05
SSE	3.1E-05	3.1E-05	3.0E-05	3.0E-05	2.8E-05	2.6E-05	2.4E-05
SE	1.6E-05	1.6E-05	1.6E-05	1.6E-05	1.5E-05	1.4E-05	1.3E-05
ESE	1.1E-05	1.1E-05	1.1E-05	1.0E-05	9.9E-06	9.0E-06	8.6E-06
E	1.4E-05	1.4E-05	1.4E-05	1.3E-05	1.3E-05	1.2E-05	1.1E-05
ENE	1.2E-05	1.2E-05	1.2E-05	1.2E-05	1.1E-05	1.0E-05	9.6E-06
NE	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.7E-05	1.5E-05	1.4E-05
NNE	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05	9.6E-06	9.1E-06

Distance (m)

Direction	13245	13286	13483	13612	13664	13959	14258
N	6.8E-06	6.8E-06	6.7E-06	6.6E-06	6.6E-06	6.4E-06	6.3E-06
NNW	2.6E-06	2.5E-06	2.5E-06	2.5E-06	2.5E-06	2.4E-06	2.4E-06
NW	3.6E-06	3.5E-06	3.5E-06	3.5E-06	3.4E-06	3.4E-06	3.3E-06
WNW	4.8E-06	4.7E-06	4.7E-06	4.6E-06	4.6E-06	4.5E-06	4.4E-06
W	5.4E-06	5.4E-06	5.3E-06	5.3E-06	5.2E-06	5.1E-06	5.0E-06
WSW	7.2E-06	7.2E-06	7.1E-06	7.0E-06	7.0E-06	6.8E-06	6.6E-06
SW	1.2E-05	1.2E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05
SSW	2.0E-05	1.9E-05	1.9E-05	1.9E-05	1.9E-05	1.8E-05	1.8E-05
S	2.7E-05	2.7E-05	2.7E-05	2.7E-05	2.6E-05	2.6E-05	2.5E-05
SSE	2.3E-05	2.3E-05	2.2E-05	2.2E-05	2.2E-05	2.1E-05	2.1E-05
SE	1.2E-05	1.2E-05	1.2E-05	1.2E-05	1.2E-05	1.1E-05	1.1E-05
ESE	8.1E-06	8.1E-06	7.9E-06	7.8E-06	7.8E-06	7.6E-06	7.4E-06
E	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05	9.8E-06	9.6E-06
ENE	8.9E-06	8.9E-06	8.8E-06	8.7E-06	8.6E-06	8.4E-06	8.2E-06
NE	1.3E-05	1.3E-05	1.3E-05	1.3E-05	1.3E-05	1.3E-05	1.2E-05
NNE	8.5E-06	8.5E-06	8.4E-06	8.3E-06	8.2E-06	8.0E-06	7.8E-06

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INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Direction	14374	15241	15441	15784	15844	16323
N	6.2E-06	5.8E-06	5.7E-06	5.6E-06	5.6E-06	5.4E-06
NNW	2.3E-06	2.2E-06	2.2E-06	2.1E-06	2.1E-06	2.0E-06

	Ar-41A.SUM					
NW	3.2E-06	3.0E-06	3.0E-06	2.9E-06	2.9E-06	2.8E-06
WNW	4.3E-06	4.1E-06	4.0E-06	3.9E-06	3.9E-06	3.8E-06
W	5.0E-06	4.6E-06	4.6E-06	4.5E-06	4.4E-06	4.3E-06
WSW	6.6E-06	6.2E-06	6.1E-06	5.9E-06	5.9E-06	5.7E-06
SW	1.1E-05	9.9E-06	9.8E-06	9.5E-06	9.5E-06	9.1E-06
SSW	1.8E-05	1.7E-05	1.6E-05	1.6E-05	1.6E-05	1.5E-05
S	2.5E-05	2.3E-05	2.3E-05	2.2E-05	2.2E-05	2.1E-05
SSE	2.1E-05	1.9E-05	1.9E-05	1.9E-05	1.8E-05	1.8E-05
SE	1.1E-05	1.0E-05	1.0E-05	1.0E-05	9.9E-06	9.6E-06
ESE	7.4E-06	6.9E-06	6.8E-06	6.6E-06	6.6E-06	6.4E-06
E	9.5E-06	8.9E-06	8.8E-06	8.5E-06	8.5E-06	8.2E-06
ENE	8.1E-06	7.6E-06	7.5E-06	7.3E-06	7.3E-06	7.0E-06
NE	1.2E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.0E-05
NNE	7.8E-06	7.3E-06	7.2E-06	7.0E-06	7.0E-06	6.7E-06

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)						
Direction	10344	10365	10472	10590	11103	11989	12522
N	4.9E-12	4.9E-12	4.9E-12	4.8E-12	4.6E-12	4.2E-12	4.0E-12
NNW	1.9E-12	1.9E-12	1.8E-12	1.8E-12	1.7E-12	1.6E-12	1.5E-12
NW	2.6E-12	2.6E-12	2.5E-12	2.5E-12	2.4E-12	2.2E-12	2.1E-12
WNW	3.5E-12	3.4E-12	3.4E-12	3.4E-12	3.2E-12	2.9E-12	2.8E-12
W	3.9E-12	3.9E-12	3.9E-12	3.8E-12	3.6E-12	3.3E-12	3.2E-12
WSW	5.3E-12	5.3E-12	5.2E-12	5.2E-12	4.9E-12	4.5E-12	4.3E-12
SW	8.7E-12	8.6E-12	8.5E-12	8.4E-12	8.0E-12	7.3E-12	6.9E-12
SSW	1.4E-11	1.4E-11	1.4E-11	1.4E-11	1.3E-11	1.2E-11	1.1E-11
S	2.0E-11	2.0E-11	2.0E-11	2.0E-11	1.9E-11	1.7E-11	1.6E-11
SSE	1.7E-11	1.7E-11	1.7E-11	1.6E-11	1.6E-11	1.4E-11	1.3E-11
SE	8.9E-12	8.9E-12	8.8E-12	8.6E-12	8.2E-12	7.5E-12	7.1E-12
ESE	5.9E-12	5.9E-12	5.8E-12	5.7E-12	5.4E-12	5.0E-12	4.7E-12
E	7.6E-12	7.5E-12	7.5E-12	7.4E-12	7.0E-12	6.4E-12	6.1E-12
ENE	6.6E-12	6.5E-12	6.5E-12	6.4E-12	6.0E-12	5.5E-12	5.2E-12
NE	1.0E-11	9.9E-12	9.8E-12	9.7E-12	9.1E-12	8.3E-12	7.9E-12
NNE	6.3E-12	6.3E-12	6.2E-12	6.1E-12	5.8E-12	5.3E-12	5.0E-12

	Distance (m)						
Direction	13245	13286	13483	13612	13664	13959	14258
N	3.7E-12	3.7E-12	3.7E-12	3.6E-12	3.6E-12	3.5E-12	3.4E-12
NNW	1.4E-12	1.4E-12	1.4E-12	1.4E-12	1.4E-12	1.3E-12	1.3E-12
NW	2.0E-12	1.9E-12	1.9E-12	1.9E-12	1.9E-12	1.8E-12	1.8E-12
WNW	2.6E-12	2.6E-12	2.6E-12	2.5E-12	2.5E-12	2.5E-12	2.4E-12
W	3.0E-12	3.0E-12	2.9E-12	2.9E-12	2.9E-12	2.8E-12	2.7E-12
WSW	4.0E-12	4.0E-12	3.9E-12	3.9E-12	3.8E-12	3.7E-12	3.7E-12
SW	6.4E-12	6.4E-12	6.3E-12	6.2E-12	6.2E-12	6.0E-12	5.9E-12
SSW	1.1E-11	1.1E-11	1.0E-11	1.0E-11	1.0E-11	1.0E-11	9.8E-12

	Ar-41A.SUM						
S	1.5E-11	1.5E-11	1.5E-11	1.5E-11	1.5E-11	1.4E-11	1.4E-11
SSE	1.3E-11	1.3E-11	1.2E-11	1.2E-11	1.2E-11	1.2E-11	1.2E-11
SE	6.7E-12	6.7E-12	6.6E-12	6.5E-12	6.5E-12	6.3E-12	6.1E-12
ESE	4.4E-12	4.4E-12	4.4E-12	4.3E-12	4.3E-12	4.2E-12	4.1E-12
E	5.7E-12	5.7E-12	5.6E-12	5.5E-12	5.5E-12	5.4E-12	5.3E-12
ENE	4.9E-12	4.9E-12	4.8E-12	4.8E-12	4.7E-12	4.6E-12	4.5E-12
NE	7.4E-12	7.3E-12	7.2E-12	7.1E-12	7.1E-12	6.9E-12	6.7E-12
NNE	4.7E-12	4.7E-12	4.6E-12	4.5E-12	4.5E-12	4.4E-12	4.3E-12

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)					
Direction	14374	15241	15441	15784	15844	16323
N	3.4E-12	3.2E-12	3.2E-12	3.1E-12	3.1E-12	3.0E-12
NNW	1.3E-12	1.2E-12	1.2E-12	1.2E-12	1.1E-12	1.1E-12
NW	1.8E-12	1.7E-12	1.6E-12	1.6E-12	1.6E-12	1.6E-12
WNW	2.4E-12	2.2E-12	2.2E-12	2.2E-12	2.1E-12	2.1E-12
W	2.7E-12	2.6E-12	2.5E-12	2.5E-12	2.4E-12	2.4E-12
WSW	3.6E-12	3.4E-12	3.3E-12	3.3E-12	3.2E-12	3.1E-12
SW	5.8E-12	5.4E-12	5.4E-12	5.2E-12	5.2E-12	5.0E-12
SSW	9.7E-12	9.1E-12	8.9E-12	8.7E-12	8.7E-12	8.4E-12
S	1.4E-11	1.3E-11	1.3E-11	1.2E-11	1.2E-11	1.2E-11
SSE	1.1E-11	1.1E-11	1.0E-11	1.0E-11	1.0E-11	9.8E-12
SE	6.1E-12	5.7E-12	5.6E-12	5.5E-12	5.4E-12	5.3E-12
ESE	4.1E-12	3.8E-12	3.7E-12	3.6E-12	3.6E-12	3.5E-12
E	5.2E-12	4.9E-12	4.8E-12	4.7E-12	4.7E-12	4.5E-12
ENE	4.5E-12	4.2E-12	4.1E-12	4.0E-12	4.0E-12	3.9E-12
NE	6.7E-12	6.2E-12	6.1E-12	6.0E-12	5.9E-12	5.7E-12
NNE	4.3E-12	4.0E-12	3.9E-12	3.8E-12	3.8E-12	3.7E-12

Ar-41B.SUM

C A P 8 8 - P C

Version 3.0

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment

Feb 20, 2008 02:30 pm

Facility: INL
Address: PO Box 1625
City: Idaho Falls
State: ID Zip: 83415

Source Category:
Source Type: Stack
Emission Year: 2008

Comments: TAN-TSF
Receptors 21-39

Dataset Name: RUNB
Dataset Date: 08/02/20 2:17:00 PM
Wind File: C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

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SUMMARY
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ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
Adrenals	1.76E-05
B Surfac	2.99E-05
Breasts	2.35E-05
St wall	1.88E-05
ULI wall	1.79E-05
Kidneys	1.89E-05
Lungs	2.10E-05
Ovaries	1.81E-05
R Marrow	2.08E-05
Spleen	1.92E-05
Thymus	1.99E-05
Uterus	1.70E-05

	Ar-41B.SUM
Bld wall	1.76E-05
Brain	2.26E-05
Esophagu	1.82E-05
SI wall	1.74E-05
LLI wall	1.77E-05
Liver	1.91E-05
Muscle	2.05E-05
Pancreas	1.72E-05
Skin	3.32E-05
Testes	2.08E-05
Thyroid	2.14E-05
EFEC	2.02E-05

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	0.00E+00
INHALATION	0.00E+00
AIR IMMERSION	2.02E-05
GROUND SURFACE	0.00E+00
INTERNAL	0.00E+00
EXTERNAL	2.02E-05
TOTAL	2.02E-05

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SUMMARY
Page 2

NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
Ar-41	2.02E-05
TOTAL	2.02E-05

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SUMMARY
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CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
Esophagu	2.09E-13

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	Ar-41B.SUM
Stomach	7.60E-13
Colon	1.84E-12
Liver	2.90E-13
LUNG	2.05E-12
Bone	2.84E-14
Skin	3.32E-14
Breast	1.14E-12
Ovary	2.58E-13
Bladder	4.24E-13
Kidneys	9.87E-14
Thyroid	6.84E-14
Leukemia	1.17E-12
Residual	2.74E-12
Total	1.11E-11
TOTAL	2.22E-11

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	0.00E+00
INHALATION	0.00E+00
AIR IMMERSION	1.11E-11
GROUND SURFACE	0.00E+00
INTERNAL	0.00E+00
EXTERNAL	1.11E-11
TOTAL	1.11E-11

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SUMMARY
Page 4

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
Ar-41	1.11E-11
TOTAL	1.11E-11

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SUMMARY
Page 5

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)

Direction	Ar-41B.SUM						
	17035	17329	18607	18834	18860	18890	19860
N	5.1E-06	5.0E-06	4.7E-06	4.6E-06	4.6E-06	4.6E-06	4.3E-06
NNW	1.9E-06	1.9E-06	1.7E-06	1.7E-06	1.7E-06	1.7E-06	1.6E-06
NW	2.7E-06	2.6E-06	2.4E-06	2.4E-06	2.4E-06	2.4E-06	2.3E-06
WNW	3.6E-06	3.5E-06	3.3E-06	3.2E-06	3.2E-06	3.2E-06	3.0E-06
W	4.1E-06	4.0E-06	3.7E-06	3.7E-06	3.7E-06	3.7E-06	3.5E-06
WSW	5.4E-06	5.3E-06	4.9E-06	4.8E-06	4.8E-06	4.8E-06	4.6E-06
SW	8.7E-06	8.5E-06	7.9E-06	7.7E-06	7.7E-06	7.7E-06	7.3E-06
SSW	1.4E-05	1.4E-05	1.3E-05	1.3E-05	1.3E-05	1.3E-05	1.2E-05
S	2.0E-05	2.0E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.7E-05
SSE	1.7E-05	1.7E-05	1.5E-05	1.5E-05	1.5E-05	1.5E-05	1.4E-05
SE	9.1E-06	8.9E-06	8.2E-06	8.1E-06	8.1E-06	8.1E-06	7.7E-06
ESE	6.1E-06	6.0E-06	5.5E-06	5.4E-06	5.4E-06	5.4E-06	5.1E-06
E	7.8E-06	7.7E-06	7.1E-06	7.0E-06	7.0E-06	7.0E-06	6.6E-06
ENE	6.7E-06	6.6E-06	6.0E-06	6.0E-06	6.0E-06	5.9E-06	5.6E-06
NE	9.9E-06	9.7E-06	8.9E-06	8.8E-06	8.8E-06	8.8E-06	8.2E-06
NNE	6.4E-06	6.3E-06	5.8E-06	5.7E-06	5.7E-06	5.7E-06	5.4E-06

Distance (m)

Direction	19891	20457	21314	21349	22159	23521	24430
N	4.3E-06	4.2E-06	4.0E-06	4.0E-06	3.8E-06	3.6E-06	3.4E-06
NNW	1.6E-06	1.6E-06	1.5E-06	1.5E-06	1.4E-06	1.3E-06	1.3E-06
NW	2.3E-06	2.2E-06	2.1E-06	2.1E-06	2.0E-06	1.9E-06	1.8E-06
WNW	3.0E-06	2.9E-06	2.8E-06	2.8E-06	2.7E-06	2.5E-06	2.4E-06
W	3.5E-06	3.3E-06	3.2E-06	3.2E-06	3.1E-06	2.9E-06	2.7E-06
WSW	4.6E-06	4.4E-06	4.2E-06	4.2E-06	4.0E-06	3.8E-06	3.6E-06
SW	7.3E-06	7.0E-06	6.7E-06	6.7E-06	6.4E-06	6.0E-06	5.7E-06
SSW	1.2E-05	1.2E-05	1.1E-05	1.1E-05	1.1E-05	9.9E-06	9.5E-06
S	1.7E-05	1.6E-05	1.5E-05	1.5E-05	1.5E-05	1.4E-05	1.3E-05
SSE	1.4E-05	1.4E-05	1.3E-05	1.3E-05	1.2E-05	1.2E-05	1.1E-05
SE	7.6E-06	7.4E-06	7.1E-06	7.1E-06	6.8E-06	6.3E-06	6.0E-06
ESE	5.1E-06	5.0E-06	4.7E-06	4.7E-06	4.5E-06	4.2E-06	4.1E-06
E	6.6E-06	6.4E-06	6.1E-06	6.1E-06	5.8E-06	5.5E-06	5.2E-06
ENE	5.6E-06	5.4E-06	5.2E-06	5.2E-06	5.0E-06	4.6E-06	4.4E-06
NE	8.2E-06	8.0E-06	7.6E-06	7.6E-06	7.2E-06	6.8E-06	6.5E-06
NNE	5.4E-06	5.2E-06	4.9E-06	4.9E-06	4.7E-06	4.4E-06	4.2E-06

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SUMMARY
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INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)					
Direction	24545	25171	26794	27275	27389
N	3.4E-06	3.3E-06	3.1E-06	3.0E-06	3.0E-06
NNW	1.3E-06	1.2E-06	1.2E-06	1.1E-06	1.1E-06

	Ar-41B.SUM				
NW	1.8E-06	1.7E-06	1.6E-06	1.6E-06	1.6E-06
WNW	2.4E-06	2.3E-06	2.2E-06	2.1E-06	2.1E-06
W	2.7E-06	2.7E-06	2.5E-06	2.4E-06	2.4E-06
WSW	3.6E-06	3.5E-06	3.3E-06	3.2E-06	3.2E-06
SW	5.7E-06	5.5E-06	5.1E-06	5.0E-06	5.0E-06
SSW	9.4E-06	9.2E-06	8.5E-06	8.3E-06	8.3E-06
S	1.3E-05	1.3E-05	1.2E-05	1.2E-05	1.1E-05
SSE	1.1E-05	1.1E-05	9.9E-06	9.7E-06	9.7E-06
SE	6.0E-06	5.8E-06	5.4E-06	5.3E-06	5.3E-06
ESE	4.0E-06	3.9E-06	3.7E-06	3.6E-06	3.6E-06
E	5.2E-06	5.1E-06	4.7E-06	4.6E-06	4.6E-06
ENE	4.4E-06	4.3E-06	4.0E-06	3.9E-06	3.9E-06
NE	6.4E-06	6.2E-06	5.8E-06	5.7E-06	5.6E-06
NNE	4.2E-06	4.1E-06	3.8E-06	3.7E-06	3.7E-06

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)						
Direction	17035	17329	18607	18834	18860	18890	19860
N	2.8E-12	2.8E-12	2.6E-12	2.5E-12	2.5E-12	2.5E-12	2.4E-12
NNW	1.1E-12	1.0E-12	9.6E-13	9.5E-13	9.5E-13	9.4E-13	8.9E-13
NW	1.5E-12	1.5E-12	1.3E-12	1.3E-12	1.3E-12	1.3E-12	1.2E-12
WNW	2.0E-12	1.9E-12	1.8E-12	1.8E-12	1.8E-12	1.8E-12	1.7E-12
W	2.3E-12	2.2E-12	2.0E-12	2.0E-12	2.0E-12	2.0E-12	1.9E-12
WSW	3.0E-12	2.9E-12	2.7E-12	2.7E-12	2.7E-12	2.7E-12	2.5E-12
SW	4.8E-12	4.7E-12	4.3E-12	4.3E-12	4.2E-12	4.2E-12	4.0E-12
SSW	8.0E-12	7.8E-12	7.2E-12	7.1E-12	7.1E-12	7.0E-12	6.6E-12
S	1.1E-11	1.1E-11	1.0E-11	9.9E-12	9.8E-12	9.8E-12	9.2E-12
SSE	9.3E-12	9.1E-12	8.4E-12	8.3E-12	8.3E-12	8.2E-12	7.8E-12
SE	5.0E-12	4.9E-12	4.5E-12	4.5E-12	4.5E-12	4.5E-12	4.2E-12
ESE	3.3E-12	3.3E-12	3.0E-12	3.0E-12	3.0E-12	3.0E-12	2.8E-12
E	4.3E-12	4.2E-12	3.9E-12	3.8E-12	3.8E-12	3.8E-12	3.6E-12
ENE	3.7E-12	3.6E-12	3.3E-12	3.3E-12	3.3E-12	3.3E-12	3.1E-12
NE	5.4E-12	5.3E-12	4.9E-12	4.8E-12	4.8E-12	4.8E-12	4.5E-12
NNE	3.5E-12	3.4E-12	3.2E-12	3.1E-12	3.1E-12	3.1E-12	2.9E-12

	Distance (m)						
Direction	19891	20457	21314	21349	22159	23521	24430
N	2.4E-12	2.3E-12	2.2E-12	2.2E-12	2.1E-12	2.0E-12	1.9E-12
NNW	8.9E-13	8.6E-13	8.2E-13	8.2E-13	7.9E-13	7.4E-13	7.1E-13
NW	1.2E-12	1.2E-12	1.2E-12	1.2E-12	1.1E-12	1.0E-12	9.9E-13
WNW	1.7E-12	1.6E-12	1.5E-12	1.5E-12	1.5E-12	1.4E-12	1.3E-12
W	1.9E-12	1.8E-12	1.8E-12	1.8E-12	1.7E-12	1.6E-12	1.5E-12
WSW	2.5E-12	2.4E-12	2.3E-12	2.3E-12	2.2E-12	2.1E-12	2.0E-12
SW	4.0E-12	3.9E-12	3.7E-12	3.7E-12	3.5E-12	3.3E-12	3.1E-12
SSW	6.6E-12	6.4E-12	6.1E-12	6.1E-12	5.8E-12	5.4E-12	5.2E-12

	Ar-41B.SUM						
S	9.2E-12	8.9E-12	8.5E-12	8.5E-12	8.1E-12	7.6E-12	7.2E-12
SSE	7.8E-12	7.5E-12	7.1E-12	7.1E-12	6.8E-12	6.4E-12	6.1E-12
SE	4.2E-12	4.1E-12	3.9E-12	3.9E-12	3.7E-12	3.5E-12	3.3E-12
ESE	2.8E-12	2.7E-12	2.6E-12	2.6E-12	2.5E-12	2.3E-12	2.2E-12
E	3.6E-12	3.5E-12	3.3E-12	3.3E-12	3.2E-12	3.0E-12	2.9E-12
ENE	3.1E-12	3.0E-12	2.8E-12	2.8E-12	2.7E-12	2.5E-12	2.4E-12
NE	4.5E-12	4.4E-12	4.2E-12	4.2E-12	4.0E-12	3.7E-12	3.5E-12
NNE	2.9E-12	2.8E-12	2.7E-12	2.7E-12	2.6E-12	2.4E-12	2.3E-12

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)				
Direction	24545	25171	26794	27275	27389
N	1.9E-12	1.8E-12	1.7E-12	1.7E-12	1.7E-12
NNW	7.0E-13	6.8E-13	6.4E-13	6.3E-13	6.2E-13
NW	9.9E-13	9.6E-13	9.0E-13	8.8E-13	8.8E-13
WNW	1.3E-12	1.3E-12	1.2E-12	1.2E-12	1.2E-12
W	1.5E-12	1.5E-12	1.4E-12	1.3E-12	1.3E-12
WSW	2.0E-12	1.9E-12	1.8E-12	1.8E-12	1.7E-12
SW	3.1E-12	3.0E-12	2.8E-12	2.8E-12	2.8E-12
SSW	5.2E-12	5.0E-12	4.7E-12	4.6E-12	4.6E-12
S	7.2E-12	7.0E-12	6.5E-12	6.3E-12	6.3E-12
SSE	6.0E-12	5.9E-12	5.5E-12	5.3E-12	5.3E-12
SE	3.3E-12	3.2E-12	3.0E-12	2.9E-12	2.9E-12
ESE	2.2E-12	2.2E-12	2.0E-12	2.0E-12	2.0E-12
E	2.9E-12	2.8E-12	2.6E-12	2.5E-12	2.5E-12
ENE	2.4E-12	2.4E-12	2.2E-12	2.1E-12	2.1E-12
NE	3.5E-12	3.4E-12	3.2E-12	3.1E-12	3.1E-12
NNE	2.3E-12	2.2E-12	2.1E-12	2.1E-12	2.0E-12

Ar-41C.SUM

C A P 8 8 - P C

Version 3.0

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment

Feb 20, 2008 02:31 pm

Facility: INL
Address: PO Box 1625
City: Idaho Falls
State: ID Zip: 83415

Source Category:
Source Type: Stack
Emission Year: 2008

Comments: TAN-TSF
Receptors 40-59

Dataset Name: RUNC
Dataset Date: 08/02/20 2:19:00 PM
Wind File: C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

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SUMMARY
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ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
Adrenals	9.82E-06
B Surfac	1.67E-05
Breasts	1.32E-05
St wall	1.05E-05
ULI wall	9.99E-06
Kidneys	1.06E-05
Lungs	1.17E-05
Ovaries	1.01E-05
R Marrow	1.16E-05
Spleen	1.07E-05
Thymus	1.11E-05
Uterus	9.51E-06

	Ar-41C.SUM
Bld wall	9.84E-06
Brain	1.26E-05
Esophagu	1.02E-05
SI wall	9.75E-06
LLI wall	9.89E-06
Liver	1.07E-05
Muscle	1.14E-05
Pancreas	9.60E-06
Skin	1.86E-05
Testes	1.16E-05
Thyroid	1.20E-05
EFEC	1.13E-05

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	0.00E+00
INHALATION	0.00E+00
AIR IMMERSION	1.13E-05
GROUND SURFACE	0.00E+00
INTERNAL	0.00E+00
EXTERNAL	1.13E-05
TOTAL	1.13E-05

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SUMMARY
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NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
Ar-41	1.13E-05
TOTAL	1.13E-05

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SUMMARY
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CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
Esophagu	1.17E-13

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	Ar-41C.SUM
Stomach	4.25E-13
Colon	1.03E-12
Liver	1.62E-13
LUNG	1.15E-12
Bone	1.59E-14
Skin	1.86E-14
Breast	6.36E-13
Ovary	1.44E-13
Bladder	2.37E-13
Kidneys	5.52E-14
Thyroid	3.82E-14
Leukemia	6.53E-13
Residual	1.53E-12
Total	6.22E-12
TOTAL	1.24E-11

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	0.00E+00
INHALATION	0.00E+00
AIR IMMERSION	6.22E-12
GROUND SURFACE	0.00E+00
INTERNAL	0.00E+00
EXTERNAL	6.22E-12
TOTAL	6.22E-12

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SUMMARY
Page 4

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
Ar-41	6.22E-12
TOTAL	6.22E-12

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SUMMARY
Page 5

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)

Direction	Ar-41C.SUM						
	27715	28919	31060	32802	34577	35279	35683
N	3.0E-06	2.8E-06	2.6E-06	2.5E-06	2.3E-06	2.3E-06	2.2E-06
NNW	1.1E-06	1.1E-06	9.9E-07	9.3E-07	8.8E-07	8.6E-07	8.5E-07
NW	1.6E-06	1.5E-06	1.4E-06	1.3E-06	1.2E-06	1.2E-06	1.2E-06
WNW	2.1E-06	2.0E-06	1.9E-06	1.7E-06	1.6E-06	1.6E-06	1.6E-06
W	2.4E-06	2.3E-06	2.1E-06	2.0E-06	1.9E-06	1.8E-06	1.8E-06
WSW	3.1E-06	3.0E-06	2.8E-06	2.6E-06	2.4E-06	2.4E-06	2.4E-06
SW	4.9E-06	4.7E-06	4.3E-06	4.1E-06	3.8E-06	3.7E-06	3.7E-06
SSW	8.2E-06	7.8E-06	7.2E-06	6.7E-06	6.3E-06	6.2E-06	6.1E-06
S	1.1E-05	1.1E-05	9.9E-06	9.3E-06	8.7E-06	8.5E-06	8.4E-06
SSE	9.5E-06	9.1E-06	8.3E-06	7.8E-06	7.4E-06	7.2E-06	7.1E-06
SE	5.2E-06	5.0E-06	4.6E-06	4.3E-06	4.1E-06	4.0E-06	3.9E-06
ESE	3.5E-06	3.4E-06	3.1E-06	2.9E-06	2.7E-06	2.7E-06	2.7E-06
E	4.5E-06	4.3E-06	4.0E-06	3.8E-06	3.5E-06	3.5E-06	3.4E-06
ENE	3.8E-06	3.7E-06	3.4E-06	3.2E-06	3.0E-06	2.9E-06	2.9E-06
NE	5.6E-06	5.3E-06	4.9E-06	4.6E-06	4.3E-06	4.2E-06	4.1E-06
NNE	3.7E-06	3.5E-06	3.2E-06	3.0E-06	2.9E-06	2.8E-06	2.7E-06

Distance (m)

Direction	36721	36809	37729	39079	39220	39559	43584
N	2.2E-06	2.2E-06	2.1E-06	2.0E-06	2.0E-06	2.0E-06	1.8E-06
NNW	8.2E-07	8.2E-07	7.9E-07	7.6E-07	7.6E-07	7.5E-07	6.8E-07
NW	1.2E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06	9.5E-07
WNW	1.5E-06	1.5E-06	1.5E-06	1.4E-06	1.4E-06	1.4E-06	1.3E-06
W	1.7E-06	1.7E-06	1.7E-06	1.6E-06	1.6E-06	1.6E-06	1.4E-06
WSW	2.3E-06	2.3E-06	2.2E-06	2.1E-06	2.1E-06	2.1E-06	1.9E-06
SW	3.6E-06	3.6E-06	3.5E-06	3.3E-06	3.3E-06	3.3E-06	2.9E-06
SSW	5.9E-06	5.9E-06	5.7E-06	5.5E-06	5.5E-06	5.4E-06	4.8E-06
S	8.1E-06	8.1E-06	7.9E-06	7.5E-06	7.5E-06	7.4E-06	6.6E-06
SSE	6.9E-06	6.8E-06	6.6E-06	6.4E-06	6.4E-06	6.3E-06	5.6E-06
SE	3.8E-06	3.8E-06	3.7E-06	3.5E-06	3.5E-06	3.5E-06	3.1E-06
ESE	2.6E-06	2.6E-06	2.5E-06	2.4E-06	2.4E-06	2.4E-06	2.1E-06
E	3.3E-06	3.3E-06	3.2E-06	3.1E-06	3.1E-06	3.0E-06	2.7E-06
ENE	2.8E-06	2.8E-06	2.7E-06	2.6E-06	2.6E-06	2.6E-06	2.3E-06
NE	4.0E-06	4.0E-06	3.9E-06	3.7E-06	3.7E-06	3.7E-06	3.3E-06
NNE	2.7E-06	2.7E-06	2.6E-06	2.5E-06	2.5E-06	2.4E-06	2.2E-06

□

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SUMMARY
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INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)						
Direction	45196	45275	45654	45677	46668	47969
N	1.7E-06	1.7E-06	1.7E-06	1.7E-06	1.7E-06	1.6E-06
NNW	6.5E-07	6.5E-07	6.4E-07	6.4E-07	6.3E-07	6.1E-07

	Ar-41C.SUM					
NW	9.2E-07	9.2E-07	9.1E-07	9.1E-07	8.9E-07	8.6E-07
WNW	1.2E-06	1.2E-06	1.2E-06	1.2E-06	1.2E-06	1.2E-06
W	1.4E-06	1.4E-06	1.4E-06	1.4E-06	1.3E-06	1.3E-06
WSW	1.8E-06	1.8E-06	1.8E-06	1.8E-06	1.7E-06	1.7E-06
SW	2.8E-06	2.8E-06	2.8E-06	2.8E-06	2.7E-06	2.6E-06
SSW	4.6E-06	4.6E-06	4.6E-06	4.6E-06	4.5E-06	4.3E-06
S	6.3E-06	6.3E-06	6.3E-06	6.3E-06	6.1E-06	5.9E-06
SSE	5.4E-06	5.4E-06	5.3E-06	5.3E-06	5.2E-06	5.0E-06
SE	3.0E-06	3.0E-06	3.0E-06	3.0E-06	2.9E-06	2.8E-06
ESE	2.0E-06	2.0E-06	2.0E-06	2.0E-06	2.0E-06	1.9E-06
E	2.6E-06	2.6E-06	2.6E-06	2.6E-06	2.5E-06	2.5E-06
ENE	2.2E-06	2.2E-06	2.2E-06	2.2E-06	2.1E-06	2.1E-06
NE	3.1E-06	3.1E-06	3.1E-06	3.1E-06	3.0E-06	2.9E-06
NNE	2.1E-06	2.1E-06	2.1E-06	2.1E-06	2.0E-06	2.0E-06

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)						
Direction	27715	28919	31060	32802	34577	35279	35683
N	1.6E-12	1.6E-12	1.4E-12	1.4E-12	1.3E-12	1.3E-12	1.2E-12
NNW	6.2E-13	5.9E-13	5.4E-13	5.1E-13	4.8E-13	4.7E-13	4.6E-13
NW	8.6E-13	8.2E-13	7.6E-13	7.2E-13	6.8E-13	6.6E-13	6.5E-13
WNW	1.2E-12	1.1E-12	1.0E-12	9.6E-13	9.1E-13	8.9E-13	8.8E-13
W	1.3E-12	1.3E-12	1.2E-12	1.1E-12	1.0E-12	1.0E-12	9.9E-13
WSW	1.7E-12	1.6E-12	1.5E-12	1.4E-12	1.3E-12	1.3E-12	1.3E-12
SW	2.7E-12	2.6E-12	2.4E-12	2.2E-12	2.1E-12	2.1E-12	2.0E-12
SSW	4.5E-12	4.3E-12	3.9E-12	3.7E-12	3.5E-12	3.4E-12	3.3E-12
S	6.2E-12	5.9E-12	5.4E-12	5.1E-12	4.8E-12	4.7E-12	4.6E-12
SSE	5.2E-12	5.0E-12	4.6E-12	4.3E-12	4.0E-12	4.0E-12	3.9E-12
SE	2.9E-12	2.7E-12	2.5E-12	2.4E-12	2.2E-12	2.2E-12	2.2E-12
ESE	1.9E-12	1.8E-12	1.7E-12	1.6E-12	1.5E-12	1.5E-12	1.5E-12
E	2.5E-12	2.4E-12	2.2E-12	2.1E-12	1.9E-12	1.9E-12	1.9E-12
ENE	2.1E-12	2.0E-12	1.8E-12	1.7E-12	1.6E-12	1.6E-12	1.6E-12
NE	3.1E-12	2.9E-12	2.7E-12	2.5E-12	2.4E-12	2.3E-12	2.3E-12
NNE	2.0E-12	1.9E-12	1.8E-12	1.7E-12	1.6E-12	1.5E-12	1.5E-12

	Distance (m)						
Direction	36721	36809	37729	39079	39220	39559	43584
N	1.2E-12	1.2E-12	1.2E-12	1.1E-12	1.1E-12	1.1E-12	9.9E-13
NNW	4.5E-13	4.5E-13	4.4E-13	4.2E-13	4.2E-13	4.1E-13	3.7E-13
NW	6.3E-13	6.3E-13	6.1E-13	5.9E-13	5.9E-13	5.8E-13	5.2E-13
WNW	8.5E-13	8.5E-13	8.2E-13	7.9E-13	7.9E-13	7.8E-13	7.0E-13
W	9.6E-13	9.6E-13	9.3E-13	9.0E-13	8.9E-13	8.8E-13	7.9E-13
WSW	1.3E-12	1.3E-12	1.2E-12	1.2E-12	1.2E-12	1.2E-12	1.0E-12
SW	2.0E-12	2.0E-12	1.9E-12	1.8E-12	1.8E-12	1.8E-12	1.6E-12
SSW	3.2E-12	3.2E-12	3.1E-12	3.0E-12	3.0E-12	3.0E-12	2.7E-12

	Ar-41C.SUM						
S	4.5E-12	4.4E-12	4.3E-12	4.1E-12	4.1E-12	4.1E-12	3.6E-12
SSE	3.8E-12	3.8E-12	3.7E-12	3.5E-12	3.5E-12	3.5E-12	3.1E-12
SE	2.1E-12	2.1E-12	2.0E-12	2.0E-12	1.9E-12	1.9E-12	1.7E-12
ESE	1.4E-12	1.4E-12	1.4E-12	1.3E-12	1.3E-12	1.3E-12	1.2E-12
E	1.8E-12	1.8E-12	1.8E-12	1.7E-12	1.7E-12	1.7E-12	1.5E-12
ENE	1.5E-12	1.5E-12	1.5E-12	1.4E-12	1.4E-12	1.4E-12	1.3E-12
NE	2.2E-12	2.2E-12	2.1E-12	2.0E-12	2.0E-12	2.0E-12	1.8E-12
NNE	1.5E-12	1.5E-12	1.4E-12	1.4E-12	1.4E-12	1.3E-12	1.2E-12

Feb 20, 2008 02:31 pm

SUMMARY
Page 8

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)					
Direction	45196	45275	45654	45677	46668	47969
N	9.5E-13	9.5E-13	9.4E-13	9.4E-13	9.2E-13	8.9E-13
NNW	3.6E-13	3.6E-13	3.5E-13	3.5E-13	3.4E-13	3.3E-13
NW	5.0E-13	5.0E-13	5.0E-13	5.0E-13	4.9E-13	4.7E-13
WNW	6.8E-13	6.7E-13	6.7E-13	6.7E-13	6.5E-13	6.3E-13
W	7.6E-13	7.6E-13	7.5E-13	7.5E-13	7.4E-13	7.1E-13
WSW	1.0E-12	9.9E-13	9.8E-13	9.8E-13	9.6E-13	9.3E-13
SW	1.5E-12	1.5E-12	1.5E-12	1.5E-12	1.5E-12	1.4E-12
SSW	2.5E-12	2.5E-12	2.5E-12	2.5E-12	2.5E-12	2.4E-12
S	3.5E-12	3.5E-12	3.4E-12	3.4E-12	3.4E-12	3.3E-12
SSE	3.0E-12	3.0E-12	2.9E-12	2.9E-12	2.8E-12	2.8E-12
SE	1.7E-12	1.7E-12	1.6E-12	1.6E-12	1.6E-12	1.5E-12
ESE	1.1E-12	1.1E-12	1.1E-12	1.1E-12	1.1E-12	1.0E-12
E	1.4E-12	1.4E-12	1.4E-12	1.4E-12	1.4E-12	1.3E-12
ENE	1.2E-12	1.2E-12	1.2E-12	1.2E-12	1.2E-12	1.1E-12
NE	1.7E-12	1.7E-12	1.7E-12	1.7E-12	1.7E-12	1.6E-12
NNE	1.2E-12	1.2E-12	1.1E-12	1.1E-12	1.1E-12	1.1E-12

Ar-41D.SUM

C A P 8 8 - P C

Version 3.0

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment

Feb 20, 2008 02:31 pm

Facility: INL
Address: PO Box 1625
City: Idaho Falls
State: ID Zip: 83415

Source Category:
Source Type: Stack
Emission Year: 2008

Comments: TAN-TSF
Receptors 60-62

Dataset Name: RUND
Dataset Date: 08/02/20 2:20:00 PM
Wind File: C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

Feb 20, 2008 02:31 pm

SUMMARY
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
Adrenals	4.89E-06
B Surfac	8.32E-06
Breasts	6.56E-06
St wall	5.25E-06
ULI wall	4.97E-06
Kidneys	5.28E-06
Lungs	5.84E-06
Ovaries	5.05E-06
R Marrow	5.79E-06
Spleen	5.34E-06
Thymus	5.54E-06
Uterus	4.74E-06

	Ar-41D.SUM
Bld wall	4.90E-06
Brain	6.29E-06
Esophagu	5.06E-06
SI wall	4.86E-06
LLI wall	4.93E-06
Liver	5.33E-06
Muscle	5.70E-06
Pancreas	4.78E-06
Skin	9.25E-06
Testes	5.80E-06
Thyroid	5.97E-06
EFEC	5.63E-06

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	0.00E+00
INHALATION	0.00E+00
AIR IMMERSION	5.63E-06
GROUND SURFACE	0.00E+00
INTERNAL	0.00E+00
EXTERNAL	5.63E-06
TOTAL	5.63E-06

Feb 20, 2008 02:31 pm

SUMMARY
Page 2

NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
Ar-41	5.63E-06
TOTAL	5.63E-06

Feb 20, 2008 02:31 pm

SUMMARY
Page 3

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
Esophagu	5.82E-14

Page 2

	Ar-41D.SUM
Stomach	2.12E-13
Colon	5.11E-13
Liver	8.08E-14
LUNG	5.72E-13
Bone	7.90E-15
Skin	9.25E-15
Breast	3.17E-13
Ovary	7.18E-14
Bladder	1.18E-13
Kidneys	2.75E-14
Thyroid	1.91E-14
Leukemia	3.25E-13
Residual	7.63E-13
Total	3.10E-12
TOTAL	6.19E-12

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	0.00E+00
INHALATION	0.00E+00
AIR IMMERSION	3.10E-12
GROUND SURFACE	0.00E+00
INTERNAL	0.00E+00
EXTERNAL	3.10E-12
TOTAL	3.10E-12

Feb 20, 2008 02:31 pm

SUMMARY
Page 4

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
Ar-41	3.10E-12
TOTAL	3.10E-12

Feb 20, 2008 02:31 pm

SUMMARY
Page 5

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)

Direction 50024 54611 58610 Ar-41D.SUM

N	1.5E-06	1.4E-06	1.3E-06
NNW	5.8E-07	5.3E-07	4.9E-07
NW	8.2E-07	7.4E-07	6.9E-07
WNW	1.1E-06	1.0E-06	9.2E-07
W	1.2E-06	1.1E-06	1.0E-06
WSW	1.6E-06	1.5E-06	1.4E-06
SW	2.5E-06	2.3E-06	2.1E-06
SSW	4.1E-06	3.7E-06	3.4E-06
S	5.6E-06	5.1E-06	4.7E-06
SSE	4.8E-06	4.3E-06	4.0E-06
SE	2.7E-06	2.4E-06	2.2E-06
ESE	1.8E-06	1.6E-06	1.5E-06
E	2.3E-06	2.1E-06	2.0E-06
ENE	2.0E-06	1.8E-06	1.6E-06
NE	2.8E-06	2.5E-06	2.3E-06
NNE	1.9E-06	1.7E-06	1.6E-06

Feb 20, 2008 02:31 pm

SUMMARY
Page 6

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

Distance (m)

Direction	50024	54611	58610
N	8.5E-13	7.7E-13	7.1E-13
NNW	3.2E-13	2.9E-13	2.7E-13
NW	4.5E-13	4.1E-13	3.8E-13
WNW	6.0E-13	5.5E-13	5.1E-13
W	6.8E-13	6.2E-13	5.7E-13
WSW	8.9E-13	8.1E-13	7.4E-13
SW	1.4E-12	1.2E-12	1.1E-12
SSW	2.3E-12	2.0E-12	1.9E-12
S	3.1E-12	2.8E-12	2.6E-12
SSE	2.6E-12	2.4E-12	2.2E-12
SE	1.5E-12	1.3E-12	1.2E-12
ESE	1.0E-12	9.0E-13	8.4E-13
E	1.3E-12	1.2E-12	1.1E-12
ENE	1.1E-12	9.7E-13	9.0E-13
NE	1.5E-12	1.4E-12	1.3E-12
NNE	1.0E-12	9.3E-13	8.6E-13

Be-7A.dat
 08/02/20 2:16:00 PM Feb 20, 2008 02:30 pm
 RUNA RUNA.
 C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

INL
 PO Box 1625

Idaho Falls ID 83415
 2008

TAN-TSF
 Receptors 1-20
 100.0000,500.0000

0	0	0	0	0	20		
10344	10365	10472	10590	11103	11989	12522	13245
13286	13483	13612	13664	13959	14258	14374	15241
15441	15784	15844	16323				
800	280.20	16.30	3.54				
0	0						

1	1.00	0.000E+00	0.000E+00				
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
1	0	1					
Be-7	M	1	5.000e-03	5.000e-03	5.480e-05		0
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.630e-06	0.0018	0.000e+00					
unspecified	4.000E-03	1.000E-01	2.000E-06	5.000E-03	1.300E-02		
0.08	0.92	0.00	Urban				
0.00	1.00	0.00					
0.01	0.99	0.00					

T	T	T	T				
2.030e-01	4.560e-02	1.700e-02					
Be-7	4	0					
00	00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00			
1							
Be-7	M	1	5.000e-03	5.000e-03	5.480e-05		0
9.999E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.697E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.010e-05	0.0018	0.000e+00					
unspecified	4.000E-03	1.000E-01	2.000E-06	5.000E-03	1.300E-02		
--DecayStep--1							
--LimitChildren--1							
--Children--5							

Be-7B.dat
 08/02/20 2:17:00 PM Feb 20, 2008 02:30 pm
 RUNB RUNB.
 C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

INL
 PO Box 1625

Idaho Falls ID 83415
 2008

TAN-TSF
 Receptors 21-39
 100.0000,500.0000

0	0	0	0	0	19		
17035	17329	18607	18834	18860	18890	19860	19891
20457	21314	21349	22159	23521	24430	24545	25171
26794	27275	27389	0				
800	280.20	16.30	3.54				
0	0						

1	1.00	0.000E+00	0.000E+00				
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
1	0	1					

Be-7	M	1	5.000e-03	5.000e-03	5.480e-05	0	
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.630e-06	0.0018	0.000e+00					
unspecified	4.000E-03	1.000E-01	2.000E-06	5.000E-03	1.300E-02		
0.08	0.92	0.00	Urban				
0.00	1.00	0.00					
0.01	0.99	0.00					

T	T	T	T				
2.030e-01	4.560e-02	1.700e-02					
Be-7	4	0					
00	00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00			

1							
Be-7	M	1	5.000e-03	5.000e-03	5.480e-05	0	
9.999E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.697E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.010e-05	0.0018	0.000e+00					
unspecified	4.000E-03	1.000E-01	2.000E-06	5.000E-03	1.300E-02		

--DecayStep--1
 --LimitChildren--1
 --Children--5

Be-7C.dat
 08/02/20 2:19:00 PM Feb 20, 2008 02:31 pm
 RUNC RUNC.
 C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

INL
 PO Box 1625

Idaho Falls ID 83415
 2008

TAN-TSF
 Receptors 40-59
 100.0000,500.0000

0	0	0	0	0	20		
27715	28919	31060	32802	34577	35279	35683	36721
36809	37729	39079	39220	39559	43584	45196	45275
45654	45677	46668	47969				
800	280.20	16.30	3.54				
0	0						

1	1.00	0.000E+00	0.000E+00				
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
1	0	1					

Be-7	M	1	5.000e-03	5.000e-03	5.480e-05		0
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.630e-06	0.0018	0.000e+00					
unspecified	4.000E-03	1.000E-01	2.000E-06	5.000E-03	1.300E-02		
0.08	0.92	0.00	Urban				
0.00	1.00	0.00					
0.01	0.99	0.00					

T	T	T	T				
2.030e-01	4.560e-02	1.700e-02					
Be-7	4	0					
00	00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00			

1							
Be-7	M	1	5.000e-03	5.000e-03	5.480e-05		0
9.999E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.697E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.010e-05	0.0018	0.000e+00					
unspecified	4.000E-03	1.000E-01	2.000E-06	5.000E-03	1.300E-02		

--DecayStep--1
 --LimitChildren--1
 --Children--5

Be-7D.dat
 08/02/20 2:20:00 PM Feb 20, 2008 02:31 pm
 RUND RUND.
 C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

INL
 PO Box 1625

Idaho Falls ID 83415
 2008

TAN-TSF
 Receptors 60-62
 100.0000,500.0000

0	0	0	0	0	3		
50024	54611	58610	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0			
800	280.20	16.30	3.54				
0	0						

1	1.00	1.00	0.000E+00	0.000E+00			
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1	0	1					

Be-7	M	1	5.000e-03	5.000e-03	5.480e-05	0
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
1.630e-06	0.0018	0.000e+00				
unspecified	4.000E-03	1.000E-01	2.000E-06	5.000E-03	1.300E-02	
0.08	0.92	0.00	Urban			
0.00	1.00	0.00				
0.01	0.99	0.00				

T	T	T	T			
2.030e-01	4.560e-02	1.700e-02				
Be-7	4	0				
00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00		

1						
Be-7	M	1	5.000e-03	5.000e-03	5.480e-05	0
9.999E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
1.697E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
1.010e-05	0.0018	0.000e+00				
unspecified	4.000E-03	1.000E-01	2.000E-06	5.000E-03	1.300E-02	

--DecayStep--1
 --LimitChildren--1
 --Children--5

Be-7A.SUM

C A P 8 8 - P C

Version 3.0

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment

Feb 20, 2008 02:30 pm

Facility: INL
Address: PO Box 1625
City: Idaho Falls
State: ID Zip: 83415

Source Category:
Source Type: Stack
Emission Year: 2008

Comments: TAN-TSF
Receptors 1-20

Dataset Name: RUNA
Dataset Date: 08/02/20 2:16:00 PM
Wind File: C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

Feb 20, 2008 02:30 pm

SUMMARY
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
Adrenals	1.37E-04
B Surfac	2.37E-04
Breasts	1.63E-04
St wall	1.45E-04
ULI wall	1.48E-04
Kidneys	1.45E-04
Lungs	1.69E-04
Ovaries	1.57E-04
R Marrow	1.56E-04
Spleen	1.45E-04
Thymus	1.50E-04
Uterus	1.40E-04

	Be-7A.SUM
Bld wall	1.47E-04
Brain	1.42E-04
Esophagu	1.48E-04
SI wall	1.43E-04
LLI wall	1.56E-04
Liver	1.46E-04
Muscle	1.65E-04
Pancreas	1.34E-04
Skin	1.89E-04
Testes	1.66E-04
Thyroid	1.59E-04
EFEC	1.59E-04

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	2.04E-06
INHALATION	5.05E-06
AIR IMMERSION	8.60E-07
GROUND SURFACE	1.51E-04
INTERNAL	7.09E-06
EXTERNAL	1.52E-04
TOTAL	1.59E-04

Feb 20, 2008 02:30 pm

SUMMARY
Page 2

NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
Be-7	1.59E-04
TOTAL	1.59E-04

Feb 20, 2008 02:30 pm

SUMMARY
Page 3

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
Esophagu	1.53E-12

Page 2

	Be-7A.SUM
Stomach	5.89E-12
Colon	1.60E-11
Liver	2.22E-12
LUNG	1.67E-11
Bone	2.25E-13
Skin	1.89E-13
Breast	7.90E-12
Ovary	2.24E-12
Bladder	3.58E-12
Kidneys	7.53E-13
Thyroid	5.07E-13
Leukemia	8.78E-12
Residual	2.18E-11
Total	8.82E-11
TOTAL	1.76E-10

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	1.41E-12
INHALATION	3.69E-12
AIR IMMERSION	4.68E-13
GROUND SURFACE	8.27E-11
INTERNAL	5.10E-12
EXTERNAL	8.31E-11
TOTAL	8.82E-11

Feb 20, 2008 02:30 pm

SUMMARY
Page 4

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
Be-7	8.82E-11
TOTAL	8.82E-11

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SUMMARY
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INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)

Direction	10344	10365	10472	Be-7A.SUM 10590	11103	11989	12522
N	3.6E-05	3.6E-05	3.5E-05	3.5E-05	3.3E-05	3.0E-05	2.8E-05
NNW	2.2E-05	2.2E-05	2.1E-05	2.1E-05	2.0E-05	1.8E-05	1.8E-05
NW	2.5E-05	2.4E-05	2.4E-05	2.4E-05	2.3E-05	2.1E-05	2.0E-05
WNW	3.1E-05	3.1E-05	3.1E-05	3.1E-05	2.9E-05	2.7E-05	2.5E-05
W	3.4E-05	3.3E-05	3.3E-05	3.3E-05	3.1E-05	2.8E-05	2.7E-05
WSW	5.3E-05	5.3E-05	5.2E-05	5.1E-05	4.9E-05	4.4E-05	4.2E-05
SW	8.4E-05	8.4E-05	8.3E-05	8.1E-05	7.7E-05	7.0E-05	6.6E-05
SSW	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.0E-04	9.5E-05	9.0E-05
S	1.6E-04	1.6E-04	1.6E-04	1.5E-04	1.5E-04	1.3E-04	1.2E-04
SSE	1.4E-04	1.4E-04	1.3E-04	1.3E-04	1.3E-04	1.1E-04	1.1E-04
SE	5.4E-05	5.4E-05	5.3E-05	5.2E-05	4.9E-05	4.5E-05	4.2E-05
ESE	3.4E-05	3.4E-05	3.3E-05	3.3E-05	3.1E-05	2.8E-05	2.7E-05
E	4.0E-05	4.0E-05	4.0E-05	3.9E-05	3.7E-05	3.3E-05	3.2E-05
ENE	4.8E-05	4.7E-05	4.7E-05	4.6E-05	4.4E-05	4.0E-05	3.8E-05
NE	8.5E-05	8.5E-05	8.4E-05	8.3E-05	7.8E-05	7.1E-05	6.7E-05
NNE	5.2E-05	5.2E-05	5.1E-05	5.0E-05	4.8E-05	4.3E-05	4.1E-05

Distance (m)

Direction	13245	13286	13483	13612	13664	13959	14258
N	2.7E-05	2.6E-05	2.6E-05	2.6E-05	2.6E-05	2.5E-05	2.4E-05
NNW	1.7E-05	1.6E-05	1.6E-05	1.6E-05	1.6E-05	1.6E-05	1.5E-05
NW	1.9E-05	1.9E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.7E-05
WNW	2.4E-05	2.4E-05	2.3E-05	2.3E-05	2.3E-05	2.2E-05	2.2E-05
W	2.5E-05	2.5E-05	2.5E-05	2.4E-05	2.4E-05	2.4E-05	2.3E-05
WSW	3.9E-05	3.9E-05	3.8E-05	3.8E-05	3.8E-05	3.7E-05	3.6E-05
SW	6.2E-05	6.2E-05	6.1E-05	6.0E-05	6.0E-05	5.8E-05	5.7E-05
SSW	8.4E-05	8.4E-05	8.2E-05	8.1E-05	8.1E-05	7.9E-05	7.6E-05
S	1.2E-04	1.2E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04
SSE	1.0E-04	1.0E-04	9.9E-05	9.7E-05	9.7E-05	9.4E-05	9.2E-05
SE	3.9E-05	3.9E-05	3.8E-05	3.8E-05	3.8E-05	3.7E-05	3.6E-05
ESE	2.5E-05	2.5E-05	2.4E-05	2.4E-05	2.4E-05	2.3E-05	2.3E-05
E	2.9E-05	2.9E-05	2.9E-05	2.8E-05	2.8E-05	2.7E-05	2.7E-05
ENE	3.5E-05	3.5E-05	3.4E-05	3.4E-05	3.4E-05	3.3E-05	3.2E-05
NE	6.3E-05	6.2E-05	6.1E-05	6.0E-05	6.0E-05	5.9E-05	5.7E-05
NNE	3.8E-05	3.8E-05	3.8E-05	3.7E-05	3.7E-05	3.6E-05	3.5E-05

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INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Direction	14374	15241	15441	15784	15844	16323
N	2.4E-05	2.2E-05	2.2E-05	2.1E-05	2.1E-05	2.1E-05
NNW	1.5E-05	1.4E-05	1.4E-05	1.4E-05	1.4E-05	1.3E-05

	Be-7A.SUM					
NW	1.7E-05	1.6E-05	1.6E-05	1.5E-05	1.5E-05	1.5E-05
WNW	2.2E-05	2.0E-05	2.0E-05	1.9E-05	1.9E-05	1.9E-05
W	2.3E-05	2.1E-05	2.1E-05	2.0E-05	2.0E-05	2.0E-05
WSW	3.6E-05	3.3E-05	3.3E-05	3.2E-05	3.2E-05	3.1E-05
SW	5.6E-05	5.2E-05	5.1E-05	5.0E-05	5.0E-05	4.8E-05
SSW	7.6E-05	7.0E-05	6.9E-05	6.7E-05	6.7E-05	6.4E-05
S	1.0E-04	9.6E-05	9.5E-05	9.2E-05	9.2E-05	8.8E-05
SSE	9.1E-05	8.4E-05	8.3E-05	8.1E-05	8.0E-05	7.7E-05
SE	3.5E-05	3.3E-05	3.2E-05	3.1E-05	3.1E-05	3.0E-05
ESE	2.2E-05	2.1E-05	2.0E-05	2.0E-05	2.0E-05	1.9E-05
E	2.6E-05	2.4E-05	2.4E-05	2.3E-05	2.3E-05	2.2E-05
ENE	3.2E-05	2.9E-05	2.9E-05	2.8E-05	2.8E-05	2.7E-05
NE	5.6E-05	5.2E-05	5.2E-05	5.0E-05	5.0E-05	4.8E-05
NNE	3.5E-05	3.2E-05	3.2E-05	3.1E-05	3.1E-05	3.0E-05

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)						
Direction	10344	10365	10472	10590	11103	11989	12522
N	2.0E-11	2.0E-11	2.0E-11	1.9E-11	1.8E-11	1.7E-11	1.6E-11
NNW	1.2E-11	1.2E-11	1.2E-11	1.2E-11	1.1E-11	1.0E-11	9.9E-12
NW	1.4E-11	1.4E-11	1.4E-11	1.3E-11	1.3E-11	1.2E-11	1.1E-11
WNW	1.8E-11	1.8E-11	1.7E-11	1.7E-11	1.6E-11	1.5E-11	1.4E-11
W	1.9E-11	1.9E-11	1.8E-11	1.8E-11	1.7E-11	1.6E-11	1.5E-11
WSW	2.9E-11	2.9E-11	2.9E-11	2.9E-11	2.7E-11	2.5E-11	2.3E-11
SW	4.6E-11	4.6E-11	4.6E-11	4.5E-11	4.3E-11	3.9E-11	3.7E-11
SSW	6.4E-11	6.3E-11	6.3E-11	6.2E-11	5.8E-11	5.3E-11	5.0E-11
S	8.8E-11	8.8E-11	8.7E-11	8.6E-11	8.1E-11	7.3E-11	6.9E-11
SSE	7.6E-11	7.6E-11	7.5E-11	7.4E-11	7.0E-11	6.3E-11	6.0E-11
SE	3.0E-11	3.0E-11	3.0E-11	2.9E-11	2.7E-11	2.5E-11	2.4E-11
ESE	1.9E-11	1.9E-11	1.9E-11	1.8E-11	1.7E-11	1.6E-11	1.5E-11
E	2.2E-11	2.2E-11	2.2E-11	2.2E-11	2.1E-11	1.9E-11	1.8E-11
ENE	2.6E-11	2.6E-11	2.6E-11	2.6E-11	2.4E-11	2.2E-11	2.1E-11
NE	4.7E-11	4.7E-11	4.6E-11	4.6E-11	4.3E-11	3.9E-11	3.7E-11
NNE	2.9E-11	2.9E-11	2.8E-11	2.8E-11	2.6E-11	2.4E-11	2.3E-11

	Distance (m)						
Direction	13245	13286	13483	13612	13664	13959	14258
N	1.5E-11	1.5E-11	1.5E-11	1.4E-11	1.4E-11	1.4E-11	1.4E-11
NNW	9.3E-12	9.3E-12	9.2E-12	9.1E-12	9.0E-12	8.8E-12	8.6E-12
NW	1.0E-11	1.0E-11	1.0E-11	1.0E-11	1.0E-11	9.9E-12	9.7E-12
WNW	1.3E-11	1.3E-11	1.3E-11	1.3E-11	1.3E-11	1.3E-11	1.2E-11
W	1.4E-11	1.4E-11	1.4E-11	1.4E-11	1.4E-11	1.3E-11	1.3E-11
WSW	2.2E-11	2.2E-11	2.1E-11	2.1E-11	2.1E-11	2.1E-11	2.0E-11
SW	3.4E-11	3.4E-11	3.4E-11	3.3E-11	3.3E-11	3.2E-11	3.1E-11
SSW	4.7E-11	4.6E-11	4.6E-11	4.5E-11	4.5E-11	4.4E-11	4.2E-11

	Be-7A.SUM						
S	6.4E-11	6.4E-11	6.3E-11	6.2E-11	6.2E-11	6.0E-11	5.8E-11
SSE	5.6E-11	5.6E-11	5.5E-11	5.4E-11	5.4E-11	5.2E-11	5.1E-11
SE	2.2E-11	2.2E-11	2.2E-11	2.1E-11	2.1E-11	2.1E-11	2.0E-11
ESE	1.4E-11	1.4E-11	1.4E-11	1.4E-11	1.3E-11	1.3E-11	1.3E-11
E	1.6E-11	1.6E-11	1.6E-11	1.6E-11	1.6E-11	1.5E-11	1.5E-11
ENE	2.0E-11	2.0E-11	1.9E-11	1.9E-11	1.9E-11	1.8E-11	1.8E-11
NE	3.5E-11	3.5E-11	3.4E-11	3.4E-11	3.3E-11	3.3E-11	3.2E-11
NNE	2.1E-11	2.1E-11	2.1E-11	2.1E-11	2.1E-11	2.0E-11	2.0E-11

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)					
Direction	14374	15241	15441	15784	15844	16323
N	1.4E-11	1.3E-11	1.2E-11	1.2E-11	1.2E-11	1.2E-11
NNW	8.6E-12	8.0E-12	7.9E-12	7.7E-12	7.7E-12	7.5E-12
NW	9.6E-12	9.0E-12	8.8E-12	8.6E-12	8.6E-12	8.3E-12
WNW	1.2E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.0E-11
W	1.3E-11	1.2E-11	1.2E-11	1.1E-11	1.1E-11	1.1E-11
WSW	2.0E-11	1.9E-11	1.8E-11	1.8E-11	1.8E-11	1.7E-11
SW	3.1E-11	2.9E-11	2.9E-11	2.8E-11	2.8E-11	2.7E-11
SSW	4.2E-11	3.9E-11	3.8E-11	3.7E-11	3.7E-11	3.6E-11
S	5.8E-11	5.4E-11	5.3E-11	5.1E-11	5.1E-11	4.9E-11
SSE	5.0E-11	4.7E-11	4.6E-11	4.5E-11	4.5E-11	4.3E-11
SE	2.0E-11	1.8E-11	1.8E-11	1.8E-11	1.7E-11	1.7E-11
ESE	1.3E-11	1.2E-11	1.2E-11	1.1E-11	1.1E-11	1.1E-11
E	1.5E-11	1.4E-11	1.4E-11	1.3E-11	1.3E-11	1.3E-11
ENE	1.8E-11	1.6E-11	1.6E-11	1.6E-11	1.6E-11	1.5E-11
NE	3.1E-11	2.9E-11	2.9E-11	2.8E-11	2.8E-11	2.7E-11
NNE	1.9E-11	1.8E-11	1.8E-11	1.7E-11	1.7E-11	1.7E-11

Be-7B.SUM

C A P 8 8 - P C

Version 3.0

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment

Feb 20, 2008 02:30 pm

Facility: INL
Address: PO Box 1625
City: Idaho Falls
State: ID Zip: 83415

Source Category:
Source Type: Stack
Emission Year: 2008

Comments: TAN-TSF
Receptors 21-39

Dataset Name: RUNB
Dataset Date: 08/02/20 2:17:00 PM
Wind File: C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

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SUMMARY
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ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
Adrenals	7.10E-05
B Surfac	1.23E-04
Breasts	8.44E-05
St wall	7.49E-05
ULI wall	7.65E-05
Kidneys	7.49E-05
Lungs	8.69E-05
Ovaries	8.12E-05
R Marrow	8.09E-05
Spleen	7.52E-05
Thymus	7.76E-05
Uterus	7.26E-05

	Be-7B.SUM
Bld wall	7.61E-05
Brain	7.37E-05
Esophagu	7.58E-05
SI wall	7.39E-05
LLI wall	8.04E-05
Liver	7.54E-05
Muscle	8.57E-05
Pancreas	6.92E-05
Skin	9.81E-05
Testes	8.61E-05
Thyroid	8.25E-05
EFEC	8.23E-05

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	1.04E-06
INHALATION	2.44E-06
AIR IMMERSION	4.16E-07
GROUND SURFACE	7.84E-05
INTERNAL	3.48E-06
EXTERNAL	7.88E-05
TOTAL	8.23E-05

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SUMMARY
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NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
Be-7	8.23E-05
TOTAL	8.23E-05

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SUMMARY
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CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
Esophagu	7.92E-13

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	Be-7B.SUM
Stomach	3.05E-12
Colon	8.28E-12
Liver	1.15E-12
LUNG	8.58E-12
Bone	1.17E-13
Skin	9.80E-14
Breast	4.09E-12
Ovary	1.16E-12
Bladder	1.85E-12
Kidneys	3.90E-13
Thyroid	2.63E-13
Leukemia	4.54E-12
Residual	1.13E-11
Total	4.56E-11
TOTAL	9.12E-11

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	7.17E-13
INHALATION	1.78E-12
AIR IMMERSION	2.26E-13
GROUND SURFACE	4.29E-11
INTERNAL	2.50E-12
EXTERNAL	4.31E-11
TOTAL	4.56E-11

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SUMMARY
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NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
Be-7	4.56E-11
TOTAL	4.56E-11

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SUMMARY
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INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)

Direction	17035	17329	18607	Be-7B.SUM 18834	18860	18890	19860
N	1.9E-05	1.8E-05	1.7E-05	1.6E-05	1.6E-05	1.6E-05	1.5E-05
NNW	1.2E-05	1.2E-05	1.1E-05	1.0E-05	1.0E-05	1.0E-05	9.8E-06
NW	1.3E-05	1.3E-05	1.2E-05	1.2E-05	1.2E-05	1.2E-05	1.1E-05
WNW	1.7E-05	1.6E-05	1.5E-05	1.5E-05	1.5E-05	1.5E-05	1.4E-05
W	1.8E-05	1.7E-05	1.6E-05	1.6E-05	1.6E-05	1.6E-05	1.5E-05
WSW	2.8E-05	2.8E-05	2.5E-05	2.5E-05	2.5E-05	2.5E-05	2.3E-05
SW	4.5E-05	4.4E-05	4.0E-05	3.9E-05	3.9E-05	3.9E-05	3.6E-05
SSW	6.0E-05	5.8E-05	5.3E-05	5.2E-05	5.2E-05	5.2E-05	4.8E-05
S	8.2E-05	8.0E-05	7.3E-05	7.2E-05	7.1E-05	7.1E-05	6.6E-05
SSE	7.2E-05	7.1E-05	6.4E-05	6.3E-05	6.3E-05	6.3E-05	5.9E-05
SE	2.7E-05	2.7E-05	2.4E-05	2.4E-05	2.4E-05	2.4E-05	2.2E-05
ESE	1.7E-05	1.7E-05	1.5E-05	1.5E-05	1.5E-05	1.5E-05	1.4E-05
E	2.0E-05	2.0E-05	1.8E-05	1.7E-05	1.7E-05	1.7E-05	1.6E-05
ENE	2.5E-05	2.4E-05	2.2E-05	2.2E-05	2.1E-05	2.1E-05	2.0E-05
NE	4.5E-05	4.4E-05	4.0E-05	3.9E-05	3.9E-05	3.9E-05	3.6E-05
NNE	2.7E-05	2.7E-05	2.4E-05	2.4E-05	2.4E-05	2.4E-05	2.2E-05

Distance (m)

Direction	19891	20457	21314	21349	22159	23521	24430
N	1.5E-05	1.5E-05	1.4E-05	1.4E-05	1.3E-05	1.2E-05	1.1E-05
NNW	9.8E-06	9.4E-06	9.0E-06	8.9E-06	8.5E-06	7.9E-06	7.4E-06
NW	1.1E-05	1.0E-05	9.9E-06	9.8E-06	9.3E-06	8.5E-06	8.0E-06
WNW	1.4E-05	1.3E-05	1.3E-05	1.3E-05	1.2E-05	1.1E-05	1.0E-05
W	1.5E-05	1.4E-05	1.3E-05	1.3E-05	1.2E-05	1.1E-05	1.1E-05
WSW	2.3E-05	2.2E-05	2.1E-05	2.1E-05	2.0E-05	1.8E-05	1.7E-05
SW	3.6E-05	3.5E-05	3.3E-05	3.3E-05	3.1E-05	2.9E-05	2.7E-05
SSW	4.8E-05	4.6E-05	4.4E-05	4.4E-05	4.1E-05	3.7E-05	3.5E-05
S	6.6E-05	6.3E-05	6.0E-05	6.0E-05	5.6E-05	5.1E-05	4.7E-05
SSE	5.9E-05	5.6E-05	5.3E-05	5.3E-05	5.0E-05	4.5E-05	4.3E-05
SE	2.2E-05	2.1E-05	2.0E-05	2.0E-05	1.8E-05	1.6E-05	1.5E-05
ESE	1.4E-05	1.3E-05	1.2E-05	1.2E-05	1.1E-05	1.0E-05	9.3E-06
E	1.6E-05	1.5E-05	1.4E-05	1.4E-05	1.3E-05	1.2E-05	1.1E-05
ENE	2.0E-05	1.9E-05	1.8E-05	1.8E-05	1.7E-05	1.5E-05	1.4E-05
NE	3.6E-05	3.5E-05	3.3E-05	3.3E-05	3.1E-05	2.8E-05	2.6E-05
NNE	2.2E-05	2.1E-05	2.0E-05	2.0E-05	1.9E-05	1.7E-05	1.6E-05

□

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SUMMARY
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INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Direction	24545	25171	26794	27275	27389
N	1.1E-05	1.0E-05	9.4E-06	9.2E-06	9.2E-06
NNW	7.4E-06	7.1E-06	6.6E-06	6.5E-06	6.5E-06

	Be-7B.SUM				
NW	7.9E-06	7.6E-06	7.1E-06	6.9E-06	6.9E-06
WNW	1.0E-05	9.6E-06	8.9E-06	8.7E-06	8.7E-06
W	1.1E-05	1.0E-05	9.3E-06	9.1E-06	9.1E-06
WSW	1.7E-05	1.6E-05	1.5E-05	1.5E-05	1.5E-05
SW	2.7E-05	2.5E-05	2.4E-05	2.3E-05	2.3E-05
SSW	3.4E-05	3.3E-05	3.0E-05	2.9E-05	2.9E-05
S	4.7E-05	4.5E-05	4.1E-05	4.0E-05	4.0E-05
SSE	4.2E-05	4.0E-05	3.7E-05	3.6E-05	3.6E-05
SE	1.5E-05	1.4E-05	1.3E-05	1.3E-05	1.3E-05
ESE	9.2E-06	8.6E-06	7.9E-06	7.8E-06	7.7E-06
E	1.0E-05	9.7E-06	9.0E-06	8.8E-06	8.7E-06
ENE	1.4E-05	1.3E-05	1.2E-05	1.2E-05	1.2E-05
NE	2.6E-05	2.5E-05	2.3E-05	2.3E-05	2.3E-05
NNE	1.6E-05	1.5E-05	1.4E-05	1.4E-05	1.4E-05

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)						
Direction	17035	17329	18607	18834	18860	18890	19860
N	1.0E-11	1.0E-11	9.3E-12	9.1E-12	9.1E-12	9.1E-12	8.5E-12
NNW	6.6E-12	6.5E-12	5.9E-12	5.9E-12	5.8E-12	5.8E-12	5.5E-12
NW	7.4E-12	7.2E-12	6.6E-12	6.5E-12	6.5E-12	6.5E-12	6.1E-12
WNW	9.4E-12	9.2E-12	8.4E-12	8.3E-12	8.3E-12	8.3E-12	7.7E-12
W	9.9E-12	9.7E-12	8.9E-12	8.7E-12	8.7E-12	8.7E-12	8.1E-12
WSW	1.6E-11	1.5E-11	1.4E-11	1.4E-11	1.4E-11	1.4E-11	1.3E-11
SW	2.5E-11	2.4E-11	2.2E-11	2.2E-11	2.2E-11	2.2E-11	2.0E-11
SSW	3.3E-11	3.2E-11	2.9E-11	2.9E-11	2.9E-11	2.9E-11	2.7E-11
S	4.6E-11	4.5E-11	4.0E-11	4.0E-11	4.0E-11	3.9E-11	3.7E-11
SSE	4.0E-11	3.9E-11	3.6E-11	3.5E-11	3.5E-11	3.5E-11	3.3E-11
SE	1.5E-11	1.5E-11	1.3E-11	1.3E-11	1.3E-11	1.3E-11	1.2E-11
ESE	9.6E-12	9.4E-12	8.5E-12	8.3E-12	8.3E-12	8.3E-12	7.7E-12
E	1.1E-11	1.1E-11	9.9E-12	9.7E-12	9.7E-12	9.7E-12	8.9E-12
ENE	1.4E-11	1.3E-11	1.2E-11	1.2E-11	1.2E-11	1.2E-11	1.1E-11
NE	2.5E-11	2.4E-11	2.2E-11	2.2E-11	2.2E-11	2.2E-11	2.0E-11
NNE	1.5E-11	1.5E-11	1.4E-11	1.3E-11	1.3E-11	1.3E-11	1.2E-11

	Distance (m)						
Direction	19891	20457	21314	21349	22159	23521	24430
N	8.5E-12	8.1E-12	7.7E-12	7.6E-12	7.2E-12	6.5E-12	6.1E-12
NNW	5.5E-12	5.3E-12	5.0E-12	5.0E-12	4.8E-12	4.4E-12	4.2E-12
NW	6.1E-12	5.9E-12	5.5E-12	5.5E-12	5.3E-12	4.8E-12	4.5E-12
WNW	7.7E-12	7.4E-12	7.0E-12	7.0E-12	6.7E-12	6.1E-12	5.7E-12
W	8.1E-12	7.8E-12	7.4E-12	7.4E-12	7.0E-12	6.4E-12	5.9E-12
WSW	1.3E-11	1.2E-11	1.2E-11	1.2E-11	1.1E-11	1.0E-11	9.5E-12
SW	2.0E-11	1.9E-11	1.8E-11	1.8E-11	1.7E-11	1.6E-11	1.5E-11
SSW	2.7E-11	2.6E-11	2.4E-11	2.4E-11	2.3E-11	2.1E-11	1.9E-11

	Be-7B.SUM						
S	3.7E-11	3.5E-11	3.3E-11	3.3E-11	3.1E-11	2.8E-11	2.6E-11
SSE	3.2E-11	3.1E-11	2.9E-11	2.9E-11	2.8E-11	2.5E-11	2.4E-11
SE	1.2E-11	1.2E-11	1.1E-11	1.1E-11	1.0E-11	9.2E-12	8.4E-12
ESE	7.7E-12	7.3E-12	6.9E-12	6.8E-12	6.4E-12	5.7E-12	5.2E-12
E	8.9E-12	8.5E-12	8.0E-12	7.9E-12	7.4E-12	6.6E-12	6.0E-12
ENE	1.1E-11	1.1E-11	1.0E-11	1.0E-11	9.4E-12	8.5E-12	7.9E-12
NE	2.0E-11	1.9E-11	1.8E-11	1.8E-11	1.7E-11	1.6E-11	1.5E-11
NNE	1.2E-11	1.2E-11	1.1E-11	1.1E-11	1.1E-11	9.7E-12	9.1E-12

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)				
Direction	24545	25171	26794	27275	27389
N	6.0E-12	5.7E-12	5.3E-12	5.2E-12	5.2E-12
NNW	4.2E-12	4.0E-12	3.8E-12	3.7E-12	3.7E-12
NW	4.5E-12	4.3E-12	4.0E-12	3.9E-12	3.9E-12
WNW	5.6E-12	5.4E-12	5.0E-12	4.9E-12	4.9E-12
W	5.9E-12	5.6E-12	5.2E-12	5.1E-12	5.1E-12
WSW	9.4E-12	9.0E-12	8.3E-12	8.2E-12	8.1E-12
SW	1.5E-11	1.4E-11	1.3E-11	1.3E-11	1.3E-11
SSW	1.9E-11	1.8E-11	1.7E-11	1.6E-11	1.6E-11
S	2.6E-11	2.5E-11	2.3E-11	2.2E-11	2.2E-11
SSE	2.3E-11	2.2E-11	2.1E-11	2.0E-11	2.0E-11
SE	8.3E-12	7.8E-12	7.2E-12	7.1E-12	7.0E-12
ESE	5.2E-12	4.9E-12	4.5E-12	4.4E-12	4.4E-12
E	5.9E-12	5.5E-12	5.1E-12	5.0E-12	4.9E-12
ENE	7.8E-12	7.4E-12	6.9E-12	6.7E-12	6.7E-12
NE	1.5E-11	1.4E-11	1.3E-11	1.3E-11	1.3E-11
NNE	9.0E-12	8.6E-12	8.0E-12	7.8E-12	7.8E-12

Be-7C.SUM

C A P 8 8 - P C

Version 3.0

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment

Feb 20, 2008 02:31 pm

Facility: INL
Address: PO Box 1625
City: Idaho Falls
State: ID Zip: 83415

Source Category:
Source Type: Stack
Emission Year: 2008

Comments: TAN-TSF
Receptors 40-59

Dataset Name: RUNC
Dataset Date: 08/02/20 2:19:00 PM
Wind File: C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

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SUMMARY
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ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
Adrenals	3.35E-05
B Surfac	5.81E-05
Breasts	3.99E-05
St wall	3.54E-05
ULI wall	3.61E-05
Kidneys	3.54E-05
Lungs	4.07E-05
Ovaries	3.83E-05
R Marrow	3.82E-05
Spleen	3.55E-05
Thymus	3.66E-05
Uterus	3.43E-05

	Be-7C.SUM
Bld wall	3.60E-05
Brain	3.49E-05
Esophagu	3.54E-05
SI wall	3.49E-05
LLI wall	3.78E-05
Liver	3.56E-05
Muscle	4.05E-05
Pancreas	3.27E-05
Skin	4.64E-05
Testes	4.08E-05
Thyroid	3.90E-05
EFEC	3.88E-05

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	4.57E-07
INHALATION	1.03E-06
AIR IMMERSION	1.76E-07
GROUND SURFACE	3.72E-05
INTERNAL	1.49E-06
EXTERNAL	3.73E-05
TOTAL	3.88E-05

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SUMMARY
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NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
Be-7	3.88E-05
TOTAL	3.88E-05

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SUMMARY
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CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
Esophagu	3.73E-13

Page 2

	Be-7C.SUM
Stomach	1.44E-12
Colon	3.89E-12
Liver	5.42E-13
LUNG	4.02E-12
Bone	5.52E-14
Skin	4.64E-14
Breast	1.93E-12
Ovary	5.48E-13
Bladder	8.76E-13
Kidneys	1.84E-13
Thyroid	1.24E-13
Leukemia	2.15E-12
Residual	5.31E-12
Total	2.15E-11
TOTAL	4.30E-11

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	3.15E-13
INHALATION	7.54E-13
AIR IMMERSION	9.56E-14
GROUND SURFACE	2.03E-11
INTERNAL	1.07E-12
EXTERNAL	2.04E-11
TOTAL	2.15E-11

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SUMMARY
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NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
Be-7	2.15E-11
TOTAL	2.15E-11

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SUMMARY
Page 5

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)

Direction	27715	28919	31060	Be-7C.SUM 32802	34577	35279	35683
N	8.5E-06	8.1E-06	7.4E-06	6.9E-06	6.4E-06	6.2E-06	6.1E-06
NNW	5.9E-06	5.6E-06	5.1E-06	4.8E-06	4.5E-06	4.4E-06	4.3E-06
NW	6.3E-06	6.0E-06	5.5E-06	5.1E-06	4.8E-06	4.7E-06	4.6E-06
WNW	8.1E-06	7.7E-06	7.0E-06	6.5E-06	6.1E-06	5.9E-06	5.8E-06
W	8.5E-06	8.0E-06	7.3E-06	6.8E-06	6.3E-06	6.2E-06	6.1E-06
WSW	1.4E-05	1.3E-05	1.2E-05	1.1E-05	1.0E-05	1.0E-05	9.9E-06
SW	2.2E-05	2.1E-05	1.9E-05	1.8E-05	1.7E-05	1.6E-05	1.6E-05
SSW	2.8E-05	2.7E-05	2.4E-05	2.3E-05	2.1E-05	2.1E-05	2.0E-05
S	3.9E-05	3.7E-05	3.3E-05	3.1E-05	2.9E-05	2.8E-05	2.7E-05
SSE	3.5E-05	3.3E-05	3.0E-05	2.8E-05	2.6E-05	2.6E-05	2.5E-05
SE	1.2E-05	1.1E-05	1.0E-05	9.4E-06	8.7E-06	8.5E-06	8.4E-06
ESE	7.1E-06	6.7E-06	6.1E-06	5.7E-06	5.2E-06	5.1E-06	5.0E-06
E	8.1E-06	7.6E-06	6.9E-06	6.4E-06	5.9E-06	5.8E-06	5.7E-06
ENE	1.1E-05	1.1E-05	9.7E-06	9.0E-06	8.4E-06	8.2E-06	8.0E-06
NE	2.2E-05	2.1E-05	1.9E-05	1.8E-05	1.6E-05	1.6E-05	1.6E-05
NNE	1.3E-05	1.2E-05	1.1E-05	1.1E-05	9.9E-06	9.7E-06	9.5E-06

Distance (m)

Direction	36721	36809	37729	39079	39220	39559	43584
N	5.9E-06	5.9E-06	5.7E-06	5.4E-06	5.4E-06	5.3E-06	4.6E-06
NNW	4.2E-06	4.2E-06	4.1E-06	3.9E-06	3.9E-06	3.8E-06	3.4E-06
NW	4.4E-06	4.4E-06	4.3E-06	4.1E-06	4.1E-06	4.0E-06	3.5E-06
WNW	5.6E-06	5.6E-06	5.4E-06	5.2E-06	5.1E-06	5.1E-06	4.4E-06
W	5.9E-06	5.8E-06	5.6E-06	5.4E-06	5.4E-06	5.3E-06	4.6E-06
WSW	9.6E-06	9.5E-06	9.2E-06	8.8E-06	8.7E-06	8.6E-06	7.5E-06
SW	1.5E-05	1.5E-05	1.5E-05	1.4E-05	1.4E-05	1.4E-05	1.2E-05
SSW	1.9E-05	1.9E-05	1.9E-05	1.8E-05	1.8E-05	1.7E-05	1.5E-05
S	2.6E-05	2.6E-05	2.5E-05	2.4E-05	2.4E-05	2.4E-05	2.1E-05
SSE	2.4E-05	2.4E-05	2.3E-05	2.2E-05	2.2E-05	2.2E-05	1.9E-05
SE	8.0E-06	8.0E-06	7.7E-06	7.3E-06	7.3E-06	7.2E-06	6.2E-06
ESE	4.8E-06	4.8E-06	4.6E-06	4.4E-06	4.4E-06	4.3E-06	3.7E-06
E	5.4E-06	5.4E-06	5.2E-06	4.9E-06	4.9E-06	4.8E-06	4.2E-06
ENE	7.7E-06	7.7E-06	7.4E-06	7.1E-06	7.0E-06	7.0E-06	6.0E-06
NE	1.5E-05	1.5E-05	1.5E-05	1.4E-05	1.4E-05	1.4E-05	1.2E-05
NNE	9.2E-06	9.2E-06	8.9E-06	8.5E-06	8.4E-06	8.3E-06	7.3E-06

□

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SUMMARY
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INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Direction	45196	45275	45654	45677	46668	47969
N	4.4E-06	4.4E-06	4.3E-06	4.3E-06	4.2E-06	4.0E-06
NNW	3.2E-06	3.2E-06	3.2E-06	3.2E-06	3.1E-06	3.0E-06

	Be-7C.SUM					
NW	3.3E-06	3.3E-06	3.3E-06	3.3E-06	3.2E-06	3.1E-06
WNW	4.2E-06	4.2E-06	4.2E-06	4.2E-06	4.0E-06	3.9E-06
W	4.4E-06	4.4E-06	4.3E-06	4.3E-06	4.2E-06	4.0E-06
WSW	7.2E-06	7.1E-06	7.0E-06	7.0E-06	6.8E-06	6.6E-06
SW	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05
SSW	1.4E-05	1.4E-05	1.4E-05	1.4E-05	1.4E-05	1.3E-05
S	1.9E-05	1.9E-05	1.9E-05	1.9E-05	1.9E-05	1.8E-05
SSE	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.7E-05	1.7E-05
SE	5.9E-06	5.9E-06	5.8E-06	5.8E-06	5.6E-06	5.3E-06
ESE	3.5E-06	3.5E-06	3.5E-06	3.5E-06	3.3E-06	3.2E-06
E	3.9E-06	3.9E-06	3.8E-06	3.8E-06	3.7E-06	3.5E-06
ENE	5.7E-06	5.7E-06	5.6E-06	5.6E-06	5.5E-06	5.2E-06
NE	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.0E-05
NNE	7.0E-06	6.9E-06	6.9E-06	6.9E-06	6.6E-06	6.4E-06

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SUMMARY
Page 7

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)						
Direction	27715	28919	31060	32802	34577	35279	35683
N	4.8E-12	4.5E-12	4.1E-12	3.8E-12	3.6E-12	3.5E-12	3.4E-12
NNW	3.3E-12	3.1E-12	2.9E-12	2.7E-12	2.5E-12	2.5E-12	2.4E-12
NW	3.5E-12	3.3E-12	3.1E-12	2.9E-12	2.7E-12	2.6E-12	2.6E-12
WNW	4.5E-12	4.3E-12	3.9E-12	3.6E-12	3.4E-12	3.3E-12	3.3E-12
W	4.7E-12	4.5E-12	4.1E-12	3.8E-12	3.5E-12	3.4E-12	3.4E-12
WSW	7.7E-12	7.3E-12	6.6E-12	6.2E-12	5.8E-12	5.6E-12	5.5E-12
SW	1.2E-11	1.2E-11	1.1E-11	9.8E-12	9.2E-12	8.9E-12	8.8E-12
SSW	1.6E-11	1.5E-11	1.4E-11	1.3E-11	1.2E-11	1.1E-11	1.1E-11
S	2.1E-11	2.0E-11	1.8E-11	1.7E-11	1.6E-11	1.5E-11	1.5E-11
SSE	1.9E-11	1.8E-11	1.7E-11	1.6E-11	1.5E-11	1.4E-11	1.4E-11
SE	6.6E-12	6.2E-12	5.7E-12	5.3E-12	4.9E-12	4.7E-12	4.7E-12
ESE	4.0E-12	3.8E-12	3.4E-12	3.2E-12	2.9E-12	2.9E-12	2.8E-12
E	4.5E-12	4.3E-12	3.9E-12	3.6E-12	3.3E-12	3.2E-12	3.2E-12
ENE	6.3E-12	5.9E-12	5.4E-12	5.0E-12	4.7E-12	4.6E-12	4.5E-12
NE	1.2E-11	1.1E-11	1.0E-11	9.7E-12	9.1E-12	8.8E-12	8.7E-12
NNE	7.3E-12	6.9E-12	6.3E-12	5.9E-12	5.5E-12	5.4E-12	5.3E-12

	Distance (m)						
Direction	36721	36809	37729	39079	39220	39559	43584
N	3.3E-12	3.3E-12	3.2E-12	3.0E-12	3.0E-12	3.0E-12	2.6E-12
NNW	2.4E-12	2.3E-12	2.3E-12	2.2E-12	2.2E-12	2.2E-12	1.9E-12
NW	2.5E-12	2.5E-12	2.4E-12	2.3E-12	2.3E-12	2.3E-12	2.0E-12
WNW	3.1E-12	3.1E-12	3.0E-12	2.9E-12	2.9E-12	2.8E-12	2.5E-12
W	3.3E-12	3.3E-12	3.2E-12	3.0E-12	3.0E-12	3.0E-12	2.6E-12
WSW	5.3E-12	5.3E-12	5.1E-12	4.9E-12	4.9E-12	4.8E-12	4.2E-12
SW	8.5E-12	8.4E-12	8.2E-12	7.8E-12	7.7E-12	7.7E-12	6.7E-12
SSW	1.1E-11	1.1E-11	1.0E-11	9.9E-12	9.8E-12	9.7E-12	8.4E-12

	Be-7C.SUM						
S	1.5E-11	1.5E-11	1.4E-11	1.3E-11	1.3E-11	1.3E-11	1.1E-11
SSE	1.3E-11	1.3E-11	1.3E-11	1.2E-11	1.2E-11	1.2E-11	1.1E-11
SE	4.5E-12	4.5E-12	4.3E-12	4.1E-12	4.1E-12	4.0E-12	3.5E-12
ESE	2.7E-12	2.7E-12	2.6E-12	2.5E-12	2.5E-12	2.4E-12	2.1E-12
E	3.0E-12	3.0E-12	2.9E-12	2.8E-12	2.8E-12	2.7E-12	2.3E-12
ENE	4.3E-12	4.3E-12	4.2E-12	4.0E-12	3.9E-12	3.9E-12	3.4E-12
NE	8.4E-12	8.3E-12	8.1E-12	7.7E-12	7.7E-12	7.6E-12	6.7E-12
NNE	5.1E-12	5.1E-12	4.9E-12	4.7E-12	4.7E-12	4.6E-12	4.1E-12

Feb 20, 2008 02:31 pm

SUMMARY
Page 8

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)					
Direction	45196	45275	45654	45677	46668	47969
N	2.5E-12	2.5E-12	2.4E-12	2.4E-12	2.4E-12	2.3E-12
NNW	1.8E-12	1.8E-12	1.8E-12	1.8E-12	1.8E-12	1.7E-12
NW	1.9E-12	1.9E-12	1.9E-12	1.9E-12	1.8E-12	1.7E-12
WNW	2.4E-12	2.4E-12	2.3E-12	2.3E-12	2.3E-12	2.2E-12
W	2.5E-12	2.5E-12	2.4E-12	2.4E-12	2.4E-12	2.3E-12
WSW	4.0E-12	4.0E-12	3.9E-12	3.9E-12	3.8E-12	3.7E-12
SW	6.4E-12	6.3E-12	6.3E-12	6.3E-12	6.1E-12	5.8E-12
SSW	8.0E-12	8.0E-12	7.9E-12	7.8E-12	7.6E-12	7.3E-12
S	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.0E-11	9.8E-12
SSE	1.0E-11	1.0E-11	1.0E-11	9.9E-12	9.6E-12	9.3E-12
SE	3.3E-12	3.3E-12	3.2E-12	3.2E-12	3.1E-12	3.0E-12
ESE	2.0E-12	2.0E-12	2.0E-12	2.0E-12	1.9E-12	1.8E-12
E	2.2E-12	2.2E-12	2.2E-12	2.2E-12	2.1E-12	2.0E-12
ENE	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.1E-12	2.9E-12
NE	6.3E-12	6.3E-12	6.2E-12	6.2E-12	6.0E-12	5.8E-12
NNE	3.9E-12	3.9E-12	3.8E-12	3.8E-12	3.7E-12	3.6E-12

Be-7D.SUM

C A P 8 8 - P C

Version 3.0

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment

Feb 20, 2008 02:31 pm

Facility: INL
Address: PO Box 1625
City: Idaho Falls
State: ID Zip: 83415

Source Category:
Source Type: Stack
Emission Year: 2008

Comments: TAN-TSF
Receptors 60-62

Dataset Name: RUND
Dataset Date: 08/02/20 2:20:00 PM
Wind File: C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

Feb 20, 2008 02:31 pm

SUMMARY
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
Adrenals	1.41E-05
B Surfac	2.45E-05
Breasts	1.68E-05
St wall	1.50E-05
ULI wall	1.54E-05
Kidneys	1.50E-05
Lungs	1.70E-05
Ovaries	1.63E-05
R Marrow	1.61E-05
Spleen	1.50E-05
Thymus	1.54E-05
Uterus	1.46E-05

	Be-7D.SUM
Bld wall	1.52E-05
Brain	1.47E-05
Esophagu	1.48E-05
SI wall	1.48E-05
LLI wall	1.62E-05
Liver	1.50E-05
Muscle	1.71E-05
Pancreas	1.38E-05
Skin	1.96E-05
Testes	1.73E-05
Thyroid	1.65E-05
EFEC	1.64E-05

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	2.44E-07
INHALATION	3.87E-07
AIR IMMERSION	6.60E-08
GROUND SURFACE	1.57E-05
INTERNAL	6.31E-07
EXTERNAL	1.58E-05
TOTAL	1.64E-05

Feb 20, 2008 02:31 pm

SUMMARY
Page 2

NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
Be-7	1.64E-05
TOTAL	1.64E-05

Feb 20, 2008 02:31 pm

SUMMARY
Page 3

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
Esophagu	1.57E-13

Page 2

	Be-7D.SUM
Stomach	6.09E-13
Colon	1.67E-12
Liver	2.29E-13
LUNG	1.68E-12
Bone	2.33E-14
Skin	1.96E-14
Breast	8.15E-13
Ovary	2.33E-13
Bladder	3.72E-13
Kidneys	7.80E-14
Thyroid	5.25E-14
Leukemia	9.07E-13
Residual	2.24E-12
Total	9.08E-12
TOTAL	1.82E-11

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	1.68E-13
INHALATION	2.83E-13
AIR IMMERSION	3.59E-14
GROUND SURFACE	8.60E-12
INTERNAL	4.51E-13
EXTERNAL	8.63E-12
TOTAL	9.08E-12

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SUMMARY
Page 4

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
Be-7	9.08E-12
TOTAL	9.08E-12

Feb 20, 2008 02:31 pm

SUMMARY
Page 5

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)

Be-7D.SUM

Direction	50024	54611	58610
-----------	-------	-------	-------

N	3.6E-06	3.1E-06	2.7E-06
NNW	2.7E-06	2.3E-06	2.1E-06
NW	2.7E-06	2.4E-06	2.1E-06
WNW	3.5E-06	3.0E-06	2.6E-06
W	3.6E-06	3.1E-06	2.7E-06
WSW	6.0E-06	5.2E-06	4.5E-06
SW	9.7E-06	8.4E-06	7.4E-06
SSW	1.2E-05	1.0E-05	8.9E-06
S	1.6E-05	1.4E-05	1.2E-05
SSE	1.6E-05	1.3E-05	1.2E-05
SE	4.8E-06	4.1E-06	3.4E-06
ESE	2.8E-06	2.4E-06	1.9E-06
E	3.1E-06	2.6E-06	2.1E-06
ENE	4.7E-06	4.0E-06	3.4E-06
NE	9.7E-06	8.5E-06	7.4E-06
NNE	5.9E-06	5.1E-06	4.5E-06

Feb 20, 2008 02:31 pm

SUMMARY
Page 6

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)		
Direction	50024	54611	58610

N	2.0E-12	1.8E-12	1.5E-12
NNW	1.5E-12	1.3E-12	1.2E-12
NW	1.5E-12	1.3E-12	1.2E-12
WNW	1.9E-12	1.7E-12	1.5E-12
W	2.0E-12	1.8E-12	1.5E-12
WSW	3.3E-12	2.9E-12	2.5E-12
SW	5.4E-12	4.7E-12	4.1E-12
SSW	6.7E-12	5.8E-12	4.9E-12
S	9.1E-12	7.8E-12	6.7E-12
SSE	8.6E-12	7.4E-12	6.4E-12
SE	2.7E-12	2.3E-12	1.9E-12
ESE	1.6E-12	1.3E-12	1.1E-12
E	1.8E-12	1.5E-12	1.2E-12
ENE	2.6E-12	2.3E-12	1.9E-12
NE	5.4E-12	4.7E-12	4.1E-12
NNE	3.3E-12	2.8E-12	2.5E-12

C-11A.dat
 08/02/20 2:16:00 PM Feb 20, 2008 02:30 pm
 RUNA RUNA.
 C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

INL
 PO Box 1625

Idaho Falls ID 83415
 2008

TAN-TSF
 Receptors 1-20
 100.0000,500.0000

0	0	0	0	0	20		
10344	10365	10472	10590	11103	11989	12522	13245
13286	13483	13612	13664	13959	14258	14374	15241
15441	15784	15844	16323				
800	280.20	16.30	3.54				
0	0						

1	1.00	0.000E+00	0.000E+00				
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
1	0	1					
C-11	M	1	1.000e+00	1.000e+00	5.480e-05		0
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.630e-06	0.0018	0.000e+00					
particulate	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.897E+01	
0.08	0.92	0.00	Urban				
0.00	1.00	0.00					
0.01	0.99	0.00					

T	T	T	T				
2.030e-01	4.560e-02	1.700e-02					
C-11	6	0					
00	00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00			
1							
C-11	M	1	1.000e+00	1.000e+00	5.480e-05		0
7.532E-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	0.000E+00	0.000E+00	0.000E+00		
1.010e-05	0.0018	0.000e+00					
particulate	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.897E+01	
--DecayStep--1							
--LimitChildren--1							
--Children--5							

C-11B.dat
 08/02/20 2:17:00 PM Feb 20, 2008 02:30 pm
 RUNB RUNB.
 C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

INL
 PO Box 1625

Idaho Falls ID 83415
 2008

TAN-TSF
 Receptors 21-39
 100.0000,500.0000

0	0	0	0	0	19		
17035	17329	18607	18834	18860	18890	19860	19891
20457	21314	21349	22159	23521	24430	24545	25171
26794	27275	27389	0				
800	280.20	16.30	3.54				
0	0						

1	1.00	0.000E+00	0.000E+00				
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
1	0	1					
C-11	M	1	1.000e+00	1.000e+00	5.480e-05		0
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.630e-06	0.0018	0.000e+00					
particulate	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.897E+01	
0.08	0.92	0.00	Urban				
0.00	1.00	0.00					
0.01	0.99	0.00					

T	T	T	T				
2.030e-01	4.560e-02	1.700e-02					
C-11	6	0					
00	00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00			
1							
C-11	M	1	1.000e+00	1.000e+00	5.480e-05		0
7.532E-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	0.000E+00	0.000E+00	0.000E+00		
1.010e-05	0.0018	0.000e+00					
particulate	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.897E+01	

--DecayStep--1
 --LimitChildren--1
 --Children--5

C-11C.dat
 08/02/20 2:19:00 PM Feb 20, 2008 02:31 pm
 RUNC RUNC.
 C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

INL
 PO Box 1625

Idaho Falls ID 83415
 2008

TAN-TSF
 Receptors 40-59
 100.0000,500.0000

0	0	0	0	0	20		
27715	28919	31060	32802	34577	35279	35683	36721
36809	37729	39079	39220	39559	43584	45196	45275
45654	45677	46668	47969				
800	280.20	16.30	3.54				

0	0						
1	1.00	0.000E+00	0.000E+00				
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	

1	0	1					
C-11	M	1	1.000e+00	1.000e+00	5.480e-05		0
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.630e-06	0.0018	0.000e+00					
particulate		0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.897E+01	
0.08	0.92	0.00	Urban				
0.00	1.00	0.00					
0.01	0.99	0.00					

T	T	T	T				
2.030e-01	4.560e-02	1.700e-02					
C-11	6	0					
00	00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00			

1							
C-11	M	1	1.000e+00	1.000e+00	5.480e-05		0
7.532E-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	0.000E+00	0.000E+00	0.000E+00		
1.010e-05	0.0018	0.000e+00					
particulate		0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.897E+01	

--DecayStep--1
 --LimitChildren--1
 --Children--5

C-11D.dat
 08/02/20 2:20:00 PM Feb 20, 2008 02:31 pm
 RUND RUND.
 C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

INL
 PO Box 1625

Idaho Falls ID 83415
 2008

TAN-TSF
 Receptors 60-62
 100.0000,500.0000

0	0	0	0	0	3		
50024	54611	58610	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0			
800	280.20	16.30	3.54				
0	0						

1	1.00	0.000E+00	0.000E+00				
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
1	0	1					

C-11	M	1	1.000e+00	1.000e+00	5.480e-05	0
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
1.630e-06	0.0018	0.000e+00				
particulate	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.897E+01
0.08	0.92	0.00	Urban			
0.00	1.00	0.00				
0.01	0.99	0.00				

T	T	T	T
2.030e-01	4.560e-02	1.700e-02	
C-11	6	0	
00	00	00	00
0.000e+00	0.000e+00	0.000e+00	0.000e+00

1						
C-11	M	1	1.000e+00	1.000e+00	5.480e-05	0
7.532E-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	0.000E+00	0.000E+00	0.000E+00	
1.010e-05	0.0018	0.000e+00				
particulate	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.897E+01

--DecayStep--1
 --LimitChildren--1
 --Children--5

C-11A.SUM

C A P 8 8 - P C

Version 3.0

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment

Feb 20, 2008 02:30 pm

Facility: INL
Address: PO Box 1625
City: Idaho Falls
State: ID Zip: 83415

Source Category:
Source Type: Stack
Emission Year: 2008

Comments: TAN-TSF
Receptors 1-20

Dataset Name: RUNA
Dataset Date: 08/02/20 2:16:00 PM
Wind File: C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

Feb 20, 2008 02:30 pm

SUMMARY
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
Adrenals	1.18E-05
B Surfac	2.50E-05
Breasts	1.62E-05
St wall	1.42E-05
ULI wall	1.18E-05
Kidneys	1.26E-05
Lungs	1.77E-05
Ovaries	1.06E-05
R Marrow	1.36E-05
Spleen	1.28E-05
Thymus	1.31E-05
Uterus	1.08E-05

	C-11A.SUM
Bld wall	1.17E-05
Brain	1.50E-05
Esophagu	3.78E-05
SI wall	1.15E-05
LLI wall	1.13E-05
Liver	1.27E-05
Muscle	1.38E-05
Pancreas	1.11E-05
Skin	2.34E-05
Testes	1.42E-05
Thyroid	1.45E-05
EFPEC	1.48E-05

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	0.00E+00
INHALATION	1.34E-06
AIR IMMERSION	1.35E-05
GROUND SURFACE	0.00E+00
INTERNAL	1.34E-06
EXTERNAL	1.35E-05
TOTAL	1.48E-05

Feb 20, 2008 02:30 pm

SUMMARY
Page 2

NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
C-11	1.48E-05
TOTAL	1.48E-05

Feb 20, 2008 02:30 pm

SUMMARY
Page 3

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
Esophagu	1.34E-13

Page 2

	C-11A.SUM
Stomach	5.97E-13
Colon	1.20E-12
Liver	1.92E-13
LUNG	1.75E-12
Bone	2.37E-14
Skin	2.34E-14
Breast	7.85E-13
Ovary	1.50E-13
Bladder	2.84E-13
Kidneys	6.57E-14
Thyroid	4.60E-14
Leukemia	7.64E-13
Residual	1.83E-12
Total	7.85E-12
TOTAL	1.57E-11

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	0.00E+00
INHALATION	5.10E-13
AIR IMMERSION	7.34E-12
GROUND SURFACE	0.00E+00
INTERNAL	5.10E-13
EXTERNAL	7.34E-12
TOTAL	7.85E-12

Feb 20, 2008 02:30 pm

SUMMARY
Page 4

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
C-11	7.85E-12
TOTAL	7.85E-12

Feb 20, 2008 02:30 pm

SUMMARY
Page 5

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)

Direction	10344	10365	10472	C-11A.SUM 10590	11103	11989	12522
N	2.9E-06	2.8E-06	2.8E-06	2.8E-06	2.6E-06	2.3E-06	2.2E-06
NNW	1.3E-06	1.3E-06	1.3E-06	1.3E-06	1.2E-06	1.1E-06	1.0E-06
NW	1.6E-06	1.6E-06	1.6E-06	1.6E-06	1.5E-06	1.3E-06	1.3E-06
WNW	2.2E-06	2.2E-06	2.1E-06	2.1E-06	2.0E-06	1.8E-06	1.7E-06
W	2.3E-06	2.3E-06	2.2E-06	2.2E-06	2.1E-06	1.9E-06	1.7E-06
WSW	3.6E-06	3.6E-06	3.6E-06	3.5E-06	3.3E-06	3.0E-06	2.8E-06
SW	6.5E-06	6.5E-06	6.4E-06	6.3E-06	5.9E-06	5.3E-06	5.0E-06
SSW	1.1E-05	1.0E-05	1.0E-05	1.0E-05	9.5E-06	8.6E-06	8.1E-06
S	1.5E-05	1.5E-05	1.5E-05	1.4E-05	1.3E-05	1.2E-05	1.1E-05
SSE	1.3E-05	1.3E-05	1.3E-05	1.3E-05	1.2E-05	1.1E-05	1.0E-05
SE	5.3E-06	5.3E-06	5.2E-06	5.1E-06	4.8E-06	4.3E-06	4.0E-06
ESE	3.3E-06	3.2E-06	3.2E-06	3.2E-06	3.0E-06	2.7E-06	2.5E-06
E	4.1E-06	4.1E-06	4.0E-06	4.0E-06	3.7E-06	3.3E-06	3.1E-06
ENE	4.4E-06	4.4E-06	4.4E-06	4.3E-06	4.0E-06	3.6E-06	3.4E-06
NE	7.4E-06	7.4E-06	7.3E-06	7.1E-06	6.7E-06	6.0E-06	5.6E-06
NNE	4.2E-06	4.2E-06	4.1E-06	4.0E-06	3.8E-06	3.4E-06	3.2E-06

Distance (m)

Direction	13245	13286	13483	13612	13664	13959	14258
N	2.0E-06	2.0E-06	2.0E-06	2.0E-06	1.9E-06	1.9E-06	1.8E-06
NNW	9.4E-07	9.4E-07	9.2E-07	9.1E-07	9.0E-07	8.8E-07	8.5E-07
NW	1.2E-06	1.2E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06
WNW	1.6E-06	1.5E-06	1.5E-06	1.5E-06	1.5E-06	1.4E-06	1.4E-06
W	1.6E-06	1.6E-06	1.6E-06	1.6E-06	1.5E-06	1.5E-06	1.5E-06
WSW	2.6E-06	2.6E-06	2.5E-06	2.5E-06	2.5E-06	2.4E-06	2.3E-06
SW	4.6E-06	4.6E-06	4.5E-06	4.4E-06	4.4E-06	4.3E-06	4.2E-06
SSW	7.4E-06	7.4E-06	7.3E-06	7.2E-06	7.1E-06	6.9E-06	6.7E-06
S	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05	9.7E-06	9.4E-06
SSE	9.4E-06	9.4E-06	9.2E-06	9.1E-06	9.0E-06	8.7E-06	8.5E-06
SE	3.7E-06	3.7E-06	3.6E-06	3.6E-06	3.6E-06	3.5E-06	3.4E-06
ESE	2.3E-06	2.3E-06	2.2E-06	2.2E-06	2.2E-06	2.1E-06	2.1E-06
E	2.9E-06	2.9E-06	2.8E-06	2.8E-06	2.8E-06	2.7E-06	2.6E-06
ENE	3.2E-06	3.1E-06	3.1E-06	3.0E-06	3.0E-06	2.9E-06	2.8E-06
NE	5.2E-06	5.2E-06	5.1E-06	5.0E-06	5.0E-06	4.8E-06	4.7E-06
NNE	3.0E-06	2.9E-06	2.9E-06	2.8E-06	2.8E-06	2.7E-06	2.7E-06

□

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SUMMARY
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INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Direction	14374	15241	15441	15784	15844	16323
N	1.8E-06	1.7E-06	1.6E-06	1.6E-06	1.6E-06	1.5E-06
NNW	8.4E-07	7.8E-07	7.6E-07	7.4E-07	7.4E-07	7.1E-07

	C-11A.SUM					
NW	1.1E-06	9.7E-07	9.5E-07	9.2E-07	9.2E-07	8.8E-07
WNW	1.4E-06	1.3E-06	1.3E-06	1.2E-06	1.2E-06	1.2E-06
W	1.4E-06	1.3E-06	1.3E-06	1.3E-06	1.2E-06	1.2E-06
WSW	2.3E-06	2.1E-06	2.1E-06	2.0E-06	2.0E-06	1.9E-06
SW	4.1E-06	3.8E-06	3.7E-06	3.6E-06	3.6E-06	3.4E-06
SSW	6.6E-06	6.1E-06	6.0E-06	5.8E-06	5.8E-06	5.5E-06
S	9.3E-06	8.5E-06	8.3E-06	8.1E-06	8.0E-06	7.7E-06
SSE	8.4E-06	7.7E-06	7.6E-06	7.3E-06	7.3E-06	7.0E-06
SE	3.3E-06	3.0E-06	3.0E-06	2.9E-06	2.9E-06	2.7E-06
ESE	2.0E-06	1.9E-06	1.8E-06	1.8E-06	1.8E-06	1.7E-06
E	2.6E-06	2.3E-06	2.3E-06	2.2E-06	2.2E-06	2.1E-06
ENE	2.8E-06	2.6E-06	2.5E-06	2.5E-06	2.4E-06	2.3E-06
NE	4.6E-06	4.2E-06	4.2E-06	4.0E-06	4.0E-06	3.8E-06
NNE	2.6E-06	2.4E-06	2.4E-06	2.3E-06	2.3E-06	2.2E-06

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)						
Direction	10344	10365	10472	10590	11103	11989	12522
N	1.5E-12	1.5E-12	1.5E-12	1.5E-12	1.4E-12	1.2E-12	1.2E-12
NNW	6.9E-13	6.9E-13	6.8E-13	6.7E-13	6.3E-13	5.7E-13	5.4E-13
NW	8.6E-13	8.6E-13	8.5E-13	8.4E-13	7.9E-13	7.1E-13	6.7E-13
WNW	1.1E-12	1.1E-12	1.1E-12	1.1E-12	1.0E-12	9.4E-13	8.9E-13
W	1.2E-12	1.2E-12	1.2E-12	1.2E-12	1.1E-12	9.8E-13	9.3E-13
WSW	1.9E-12	1.9E-12	1.9E-12	1.9E-12	1.7E-12	1.6E-12	1.5E-12
SW	3.4E-12	3.4E-12	3.4E-12	3.3E-12	3.1E-12	2.8E-12	2.6E-12
SSW	5.6E-12	5.6E-12	5.5E-12	5.4E-12	5.0E-12	4.5E-12	4.3E-12
S	7.9E-12	7.8E-12	7.7E-12	7.6E-12	7.1E-12	6.4E-12	6.0E-12
SSE	7.0E-12	7.0E-12	6.9E-12	6.8E-12	6.3E-12	5.7E-12	5.4E-12
SE	2.8E-12	2.8E-12	2.7E-12	2.7E-12	2.5E-12	2.3E-12	2.1E-12
ESE	1.7E-12	1.7E-12	1.7E-12	1.7E-12	1.6E-12	1.4E-12	1.3E-12
E	2.2E-12	2.2E-12	2.1E-12	2.1E-12	2.0E-12	1.8E-12	1.7E-12
ENE	2.3E-12	2.3E-12	2.3E-12	2.3E-12	2.1E-12	1.9E-12	1.8E-12
NE	3.9E-12	3.9E-12	3.8E-12	3.8E-12	3.5E-12	3.2E-12	3.0E-12
NNE	2.2E-12	2.2E-12	2.2E-12	2.1E-12	2.0E-12	1.8E-12	1.7E-12

	Distance (m)						
Direction	13245	13286	13483	13612	13664	13959	14258
N	1.1E-12	1.1E-12	1.1E-12	1.0E-12	1.0E-12	1.0E-12	9.7E-13
NNW	5.0E-13	5.0E-13	4.9E-13	4.8E-13	4.8E-13	4.6E-13	4.5E-13
NW	6.2E-13	6.2E-13	6.1E-13	6.0E-13	6.0E-13	5.8E-13	5.6E-13
WNW	8.2E-13	8.2E-13	8.0E-13	7.9E-13	7.9E-13	7.7E-13	7.4E-13
W	8.5E-13	8.5E-13	8.3E-13	8.2E-13	8.2E-13	7.9E-13	7.7E-13
WSW	1.4E-12	1.4E-12	1.3E-12	1.3E-12	1.3E-12	1.3E-12	1.2E-12
SW	2.4E-12	2.4E-12	2.4E-12	2.3E-12	2.3E-12	2.3E-12	2.2E-12
SSW	3.9E-12	3.9E-12	3.8E-12	3.8E-12	3.8E-12	3.7E-12	3.5E-12

	C-11A.SUM						
S	5.5E-12	5.5E-12	5.4E-12	5.3E-12	5.3E-12	5.1E-12	5.0E-12
SSE	5.0E-12	5.0E-12	4.9E-12	4.8E-12	4.8E-12	4.6E-12	4.5E-12
SE	2.0E-12	2.0E-12	1.9E-12	1.9E-12	1.9E-12	1.8E-12	1.8E-12
ESE	1.2E-12	1.2E-12	1.2E-12	1.2E-12	1.2E-12	1.1E-12	1.1E-12
E	1.5E-12	1.5E-12	1.5E-12	1.5E-12	1.5E-12	1.4E-12	1.4E-12
ENE	1.7E-12	1.7E-12	1.6E-12	1.6E-12	1.6E-12	1.6E-12	1.5E-12
NE	2.7E-12	2.7E-12	2.7E-12	2.6E-12	2.6E-12	2.5E-12	2.5E-12
NNE	1.6E-12	1.6E-12	1.5E-12	1.5E-12	1.5E-12	1.5E-12	1.4E-12

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)					
Direction	14374	15241	15441	15784	15844	16323
N	9.6E-13	8.8E-13	8.7E-13	8.4E-13	8.3E-13	8.0E-13
NNW	4.5E-13	4.1E-13	4.0E-13	3.9E-13	3.9E-13	3.7E-13
NW	5.6E-13	5.1E-13	5.0E-13	4.9E-13	4.9E-13	4.7E-13
WNW	7.4E-13	6.8E-13	6.7E-13	6.5E-13	6.4E-13	6.2E-13
W	7.6E-13	7.0E-13	6.9E-13	6.6E-13	6.6E-13	6.3E-13
WSW	1.2E-12	1.1E-12	1.1E-12	1.1E-12	1.1E-12	1.0E-12
SW	2.2E-12	2.0E-12	2.0E-12	1.9E-12	1.9E-12	1.8E-12
SSW	3.5E-12	3.2E-12	3.2E-12	3.1E-12	3.0E-12	2.9E-12
S	4.9E-12	4.5E-12	4.4E-12	4.3E-12	4.2E-12	4.1E-12
SSE	4.4E-12	4.1E-12	4.0E-12	3.9E-12	3.9E-12	3.7E-12
SE	1.8E-12	1.6E-12	1.6E-12	1.5E-12	1.5E-12	1.4E-12
ESE	1.1E-12	9.9E-13	9.7E-13	9.4E-13	9.4E-13	8.9E-13
E	1.4E-12	1.2E-12	1.2E-12	1.2E-12	1.2E-12	1.1E-12
ENE	1.5E-12	1.4E-12	1.3E-12	1.3E-12	1.3E-12	1.2E-12
NE	2.4E-12	2.2E-12	2.2E-12	2.1E-12	2.1E-12	2.0E-12
NNE	1.4E-12	1.3E-12	1.3E-12	1.2E-12	1.2E-12	1.2E-12

C-11B.SUM

C A P 8 8 - P C

Version 3.0

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment

Feb 20, 2008 02:30 pm

Facility: INL
Address: PO Box 1625
City: Idaho Falls
State: ID Zip: 83415

Source Category:
Source Type: Stack
Emission Year: 2008

Comments: TAN-TSF
Receptors 21-39

Dataset Name: RUNB
Dataset Date: 08/02/20 2:17:00 PM
Wind File: C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

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SUMMARY
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
Adrenals	5.72E-06
B Surfac	1.21E-05
Breasts	7.86E-06
St wall	6.87E-06
ULI wall	5.69E-06
Kidneys	6.09E-06
Lungs	8.55E-06
Ovaries	5.11E-06
R Marrow	6.57E-06
Spleen	6.20E-06
Thymus	6.34E-06
Uterus	5.25E-06

	C-11B.SUM
Bld wall	5.68E-06
Brain	7.26E-06
Esophagu	1.83E-05
SI wall	5.58E-06
LLI wall	5.49E-06
Liver	6.14E-06
Muscle	6.67E-06
Pancreas	5.39E-06
Skin	1.13E-05
Testes	6.85E-06
Thyroid	7.00E-06
EFPEC	7.18E-06

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	0.00E+00
INHALATION	6.47E-07
AIR IMMERSION	6.53E-06
GROUND SURFACE	0.00E+00
INTERNAL	6.47E-07
EXTERNAL	6.53E-06
TOTAL	7.18E-06

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SUMMARY
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NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
C-11	7.18E-06
TOTAL	7.18E-06

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SUMMARY
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CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
Esophagu	6.49E-14

Page 2

	C-11B.SUM
Stomach	2.89E-13
Colon	5.82E-13
Liver	9.31E-14
LUNG	8.44E-13
Bone	1.15E-14
Skin	1.13E-14
Breast	3.80E-13
Ovary	7.27E-14
Bladder	1.37E-13
Kidneys	3.18E-14
Thyroid	2.23E-14
Leukemia	3.70E-13
Residual	8.84E-13
Total	3.80E-12
TOTAL	7.59E-12

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	0.00E+00
INHALATION	2.47E-13
AIR IMMERSION	3.55E-12
GROUND SURFACE	0.00E+00
INTERNAL	2.47E-13
EXTERNAL	3.55E-12
TOTAL	3.80E-12

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SUMMARY
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NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
C-11	3.80E-12
TOTAL	3.80E-12

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SUMMARY
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INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)

Direction	C-11B.SUM						
	17035	17329	18607	18834	18860	18890	19860
N	1.4E-06	1.4E-06	1.2E-06	1.2E-06	1.2E-06	1.2E-06	1.1E-06
NNW	6.7E-07	6.5E-07	5.9E-07	5.8E-07	5.7E-07	5.7E-07	5.3E-07
NW	8.3E-07	8.1E-07	7.2E-07	7.1E-07	7.1E-07	7.1E-07	6.5E-07
WNW	1.1E-06	1.1E-06	9.6E-07	9.4E-07	9.4E-07	9.3E-07	8.6E-07
W	1.1E-06	1.1E-06	9.7E-07	9.6E-07	9.5E-07	9.5E-07	8.7E-07
WSW	1.8E-06	1.8E-06	1.6E-06	1.6E-06	1.5E-06	1.5E-06	1.4E-06
SW	3.2E-06	3.1E-06	2.8E-06	2.8E-06	2.8E-06	2.8E-06	2.6E-06
SSW	5.2E-06	5.0E-06	4.5E-06	4.4E-06	4.4E-06	4.4E-06	4.1E-06
S	7.2E-06	7.0E-06	6.2E-06	6.1E-06	6.1E-06	6.1E-06	5.6E-06
SSE	6.6E-06	6.4E-06	5.8E-06	5.7E-06	5.6E-06	5.6E-06	5.2E-06
SE	2.6E-06	2.5E-06	2.2E-06	2.2E-06	2.2E-06	2.2E-06	2.0E-06
ESE	1.6E-06	1.5E-06	1.4E-06	1.3E-06	1.3E-06	1.3E-06	1.2E-06
E	2.0E-06	1.9E-06	1.7E-06	1.7E-06	1.7E-06	1.7E-06	1.5E-06
ENE	2.2E-06	2.1E-06	1.9E-06	1.9E-06	1.9E-06	1.9E-06	1.7E-06
NE	3.6E-06	3.5E-06	3.1E-06	3.1E-06	3.1E-06	3.1E-06	2.8E-06
NNE	2.1E-06	2.0E-06	1.8E-06	1.8E-06	1.8E-06	1.7E-06	1.6E-06

Distance (m)

Direction	19891	20457	21314	21349	22159	23521	24430
N	1.1E-06	1.0E-06	9.7E-07	9.6E-07	8.9E-07	7.8E-07	7.0E-07
NNW	5.3E-07	5.1E-07	4.7E-07	4.7E-07	4.4E-07	3.9E-07	3.6E-07
NW	6.5E-07	6.2E-07	5.8E-07	5.8E-07	5.4E-07	4.7E-07	4.3E-07
WNW	8.6E-07	8.2E-07	7.6E-07	7.6E-07	7.1E-07	6.3E-07	5.7E-07
W	8.7E-07	8.3E-07	7.7E-07	7.7E-07	7.1E-07	6.3E-07	5.7E-07
WSW	1.4E-06	1.4E-06	1.3E-06	1.3E-06	1.2E-06	1.1E-06	9.6E-07
SW	2.5E-06	2.4E-06	2.3E-06	2.3E-06	2.1E-06	1.9E-06	1.7E-06
SSW	4.1E-06	3.9E-06	3.6E-06	3.6E-06	3.4E-06	3.0E-06	2.8E-06
S	5.6E-06	5.3E-06	5.0E-06	5.0E-06	4.6E-06	4.1E-06	3.8E-06
SSE	5.2E-06	5.0E-06	4.6E-06	4.6E-06	4.3E-06	3.9E-06	3.6E-06
SE	2.0E-06	1.9E-06	1.7E-06	1.7E-06	1.6E-06	1.4E-06	1.3E-06
ESE	1.2E-06	1.2E-06	1.1E-06	1.1E-06	9.8E-07	8.5E-07	7.6E-07
E	1.5E-06	1.4E-06	1.3E-06	1.3E-06	1.2E-06	1.0E-06	9.3E-07
ENE	1.7E-06	1.6E-06	1.5E-06	1.5E-06	1.4E-06	1.2E-06	1.1E-06
NE	2.8E-06	2.7E-06	2.5E-06	2.5E-06	2.3E-06	2.1E-06	1.9E-06
NNE	1.6E-06	1.5E-06	1.4E-06	1.4E-06	1.3E-06	1.2E-06	1.1E-06

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SUMMARY
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INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)					
Direction	24545	25171	26794	27275	27389
N	6.9E-07	6.4E-07	5.8E-07	5.7E-07	5.7E-07
NNW	3.6E-07	3.4E-07	3.1E-07	3.0E-07	3.0E-07

	C-11B.SUM				
NW	4.2E-07	4.0E-07	3.6E-07	3.5E-07	3.5E-07
WNW	5.6E-07	5.2E-07	4.8E-07	4.6E-07	4.6E-07
W	5.6E-07	5.2E-07	4.7E-07	4.6E-07	4.6E-07
WSW	9.5E-07	8.9E-07	8.1E-07	7.9E-07	7.9E-07
SW	1.7E-06	1.6E-06	1.5E-06	1.4E-06	1.4E-06
SSW	2.7E-06	2.6E-06	2.3E-06	2.3E-06	2.3E-06
S	3.7E-06	3.5E-06	3.2E-06	3.1E-06	3.1E-06
SSE	3.6E-06	3.4E-06	3.1E-06	3.0E-06	3.0E-06
SE	1.2E-06	1.1E-06	1.0E-06	1.0E-06	1.0E-06
ESE	7.4E-07	6.8E-07	6.2E-07	6.0E-07	6.0E-07
E	9.1E-07	8.3E-07	7.6E-07	7.4E-07	7.3E-07
ENE	1.1E-06	1.0E-06	9.5E-07	9.2E-07	9.2E-07
NE	1.9E-06	1.8E-06	1.6E-06	1.6E-06	1.6E-06
NNE	1.1E-06	9.8E-07	9.0E-07	8.8E-07	8.7E-07

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)						
Direction	17035	17329	18607	18834	18860	18890	19860
N	7.5E-13	7.3E-13	6.5E-13	6.4E-13	6.3E-13	6.3E-13	5.8E-13
NNW	3.5E-13	3.4E-13	3.1E-13	3.0E-13	3.0E-13	3.0E-13	2.8E-13
NW	4.4E-13	4.3E-13	3.8E-13	3.8E-13	3.7E-13	3.7E-13	3.4E-13
WNW	5.8E-13	5.6E-13	5.1E-13	5.0E-13	4.9E-13	4.9E-13	4.6E-13
W	5.9E-13	5.8E-13	5.2E-13	5.1E-13	5.0E-13	5.0E-13	4.6E-13
WSW	9.5E-13	9.3E-13	8.4E-13	8.2E-13	8.2E-13	8.2E-13	7.5E-13
SW	1.7E-12	1.7E-12	1.5E-12	1.5E-12	1.5E-12	1.5E-12	1.3E-12
SSW	2.7E-12	2.7E-12	2.4E-12	2.3E-12	2.3E-12	2.3E-12	2.2E-12
S	3.8E-12	3.7E-12	3.3E-12	3.2E-12	3.2E-12	3.2E-12	3.0E-12
SSE	3.5E-12	3.4E-12	3.0E-12	3.0E-12	3.0E-12	3.0E-12	2.8E-12
SE	1.4E-12	1.3E-12	1.2E-12	1.2E-12	1.1E-12	1.1E-12	1.1E-12
ESE	8.4E-13	8.1E-13	7.2E-13	7.1E-13	7.1E-13	7.0E-13	6.4E-13
E	1.0E-12	1.0E-12	9.0E-13	8.8E-13	8.8E-13	8.8E-13	8.0E-13
ENE	1.2E-12	1.1E-12	1.0E-12	9.9E-13	9.9E-13	9.9E-13	9.1E-13
NE	1.9E-12	1.9E-12	1.7E-12	1.6E-12	1.6E-12	1.6E-12	1.5E-12
NNE	1.1E-12	1.1E-12	9.5E-13	9.3E-13	9.3E-13	9.3E-13	8.5E-13

	Distance (m)						
Direction	19891	20457	21314	21349	22159	23521	24430
N	5.8E-13	5.5E-13	5.1E-13	5.1E-13	4.7E-13	4.1E-13	3.7E-13
NNW	2.8E-13	2.7E-13	2.5E-13	2.5E-13	2.3E-13	2.1E-13	1.9E-13
NW	3.4E-13	3.3E-13	3.1E-13	3.0E-13	2.8E-13	2.5E-13	2.3E-13
WNW	4.5E-13	4.3E-13	4.0E-13	4.0E-13	3.8E-13	3.3E-13	3.0E-13
W	4.6E-13	4.4E-13	4.1E-13	4.1E-13	3.8E-13	3.3E-13	3.0E-13
WSW	7.5E-13	7.2E-13	6.7E-13	6.7E-13	6.3E-13	5.6E-13	5.1E-13
SW	1.3E-12	1.3E-12	1.2E-12	1.2E-12	1.1E-12	1.0E-12	9.2E-13
SSW	2.1E-12	2.1E-12	1.9E-12	1.9E-12	1.8E-12	1.6E-12	1.5E-12

	C-11B.SUM						
S	3.0E-12	2.8E-12	2.6E-12	2.6E-12	2.5E-12	2.2E-12	2.0E-12
SSE	2.7E-12	2.6E-12	2.5E-12	2.5E-12	2.3E-12	2.1E-12	1.9E-12
SE	1.0E-12	1.0E-12	9.2E-13	9.2E-13	8.5E-13	7.4E-13	6.7E-13
ESE	6.4E-13	6.1E-13	5.6E-13	5.6E-13	5.2E-13	4.5E-13	4.0E-13
E	8.0E-13	7.6E-13	7.0E-13	7.0E-13	6.4E-13	5.5E-13	4.9E-13
ENE	9.1E-13	8.6E-13	8.0E-13	8.0E-13	7.5E-13	6.6E-13	6.0E-13
NE	1.5E-12	1.4E-12	1.3E-12	1.3E-12	1.2E-12	1.1E-12	1.0E-12
NNE	8.5E-13	8.1E-13	7.6E-13	7.5E-13	7.0E-13	6.2E-13	5.7E-13

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)				
Direction	24545	25171	26794	27275	27389
N	3.7E-13	3.4E-13	3.1E-13	3.0E-13	3.0E-13
NNW	1.9E-13	1.8E-13	1.6E-13	1.6E-13	1.6E-13
NW	2.2E-13	2.1E-13	1.9E-13	1.9E-13	1.9E-13
WNW	3.0E-13	2.8E-13	2.5E-13	2.5E-13	2.4E-13
W	3.0E-13	2.7E-13	2.5E-13	2.4E-13	2.4E-13
WSW	5.0E-13	4.7E-13	4.3E-13	4.2E-13	4.2E-13
SW	9.1E-13	8.6E-13	7.9E-13	7.7E-13	7.6E-13
SSW	1.4E-12	1.4E-12	1.2E-12	1.2E-12	1.2E-12
S	2.0E-12	1.9E-12	1.7E-12	1.6E-12	1.6E-12
SSE	1.9E-12	1.8E-12	1.6E-12	1.6E-12	1.6E-12
SE	6.6E-13	6.1E-13	5.5E-13	5.4E-13	5.4E-13
ESE	3.9E-13	3.6E-13	3.3E-13	3.2E-13	3.2E-13
E	4.8E-13	4.4E-13	4.0E-13	3.9E-13	3.9E-13
ENE	5.9E-13	5.5E-13	5.0E-13	4.9E-13	4.9E-13
NE	1.0E-12	9.4E-13	8.5E-13	8.3E-13	8.3E-13
NNE	5.6E-13	5.2E-13	4.8E-13	4.6E-13	4.6E-13

C-11C.SUM

C A P 8 8 - P C

Version 3.0

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment

Feb 20, 2008 02:31 pm

Facility: INL
Address: PO Box 1625
City: Idaho Falls
State: ID Zip: 83415

Source Category:
Source Type: Stack
Emission Year: 2008

Comments: TAN-TSF
Receptors 40-59

Dataset Name: RUNC
Dataset Date: 08/02/20 2:19:00 PM
Wind File: C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

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SUMMARY
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ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
Adrenals	2.42E-06
B Surfac	5.11E-06
Breasts	3.32E-06
St wall	2.90E-06
ULI wall	2.41E-06
Kidneys	2.58E-06
Lungs	3.61E-06
Ovaries	2.16E-06
R Marrow	2.78E-06
Spleen	2.62E-06
Thymus	2.68E-06
Uterus	2.22E-06

	C-11C.SUM
Bld wall	2.40E-06
Brain	3.07E-06
Esophagu	7.72E-06
SI wall	2.36E-06
LLI wall	2.32E-06
Liver	2.59E-06
Muscle	2.82E-06
Pancreas	2.28E-06
Skin	4.79E-06
Testes	2.89E-06
Thyroid	2.96E-06
EFEC	3.03E-06

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	0.00E+00
INHALATION	2.74E-07
AIR IMMERSION	2.76E-06
GROUND SURFACE	0.00E+00
INTERNAL	2.74E-07
EXTERNAL	2.76E-06
TOTAL	3.03E-06

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SUMMARY
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NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
C-11	3.03E-06
TOTAL	3.03E-06

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SUMMARY
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CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
Esophagu	2.74E-14

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	C-11C.SUM
Stomach	1.22E-13
Colon	2.46E-13
Liver	3.94E-14
LUNG	3.57E-13
Bone	4.85E-15
Skin	4.78E-15
Breast	1.60E-13
Ovary	3.07E-14
Bladder	5.81E-14
Kidneys	1.34E-14
Thyroid	9.42E-15
Leukemia	1.56E-13
Residual	3.74E-13
Total	1.61E-12
TOTAL	3.21E-12

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	0.00E+00
INHALATION	1.04E-13
AIR IMMERSION	1.50E-12
GROUND SURFACE	0.00E+00
INTERNAL	1.04E-13
EXTERNAL	1.50E-12
TOTAL	1.61E-12

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SUMMARY
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NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
C-11	1.61E-12
TOTAL	1.61E-12

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SUMMARY
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INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)

Direction	27715	28919	31060	C-11C.SUM 32802	34577	35279	35683
N	5.6E-07	5.2E-07	4.7E-07	4.3E-07	4.0E-07	3.8E-07	3.8E-07
NNW	2.9E-07	2.8E-07	2.5E-07	2.3E-07	2.1E-07	2.1E-07	2.1E-07
NW	3.5E-07	3.2E-07	2.9E-07	2.7E-07	2.5E-07	2.4E-07	2.4E-07
WNW	4.5E-07	4.3E-07	3.9E-07	3.6E-07	3.3E-07	3.2E-07	3.1E-07
W	4.5E-07	4.2E-07	3.8E-07	3.5E-07	3.2E-07	3.1E-07	3.1E-07
WSW	7.8E-07	7.3E-07	6.6E-07	6.1E-07	5.6E-07	5.4E-07	5.3E-07
SW	1.4E-06	1.3E-06	1.2E-06	1.1E-06	1.0E-06	9.9E-07	9.7E-07
SSW	2.2E-06	2.1E-06	1.9E-06	1.7E-06	1.6E-06	1.5E-06	1.5E-06
S	3.0E-06	2.8E-06	2.5E-06	2.3E-06	2.2E-06	2.1E-06	2.0E-06
SSE	2.9E-06	2.8E-06	2.5E-06	2.3E-06	2.1E-06	2.1E-06	2.0E-06
SE	1.0E-06	9.3E-07	8.4E-07	7.7E-07	7.0E-07	6.8E-07	6.7E-07
ESE	5.9E-07	5.5E-07	4.9E-07	4.5E-07	4.1E-07	4.0E-07	3.9E-07
E	7.2E-07	6.7E-07	6.0E-07	5.5E-07	5.0E-07	4.9E-07	4.8E-07
ENE	9.0E-07	8.5E-07	7.6E-07	7.0E-07	6.4E-07	6.2E-07	6.1E-07
NE	1.5E-06	1.4E-06	1.3E-06	1.2E-06	1.1E-06	1.1E-06	1.0E-06
NNE	8.6E-07	8.1E-07	7.2E-07	6.7E-07	6.2E-07	6.0E-07	5.9E-07

Distance (m)							
Direction	36721	36809	37729	39079	39220	39559	43584
N	3.6E-07	3.6E-07	3.5E-07	3.3E-07	3.2E-07	3.2E-07	2.7E-07
NNW	2.0E-07	2.0E-07	1.9E-07	1.8E-07	1.8E-07	1.8E-07	1.5E-07
NW	2.3E-07	2.3E-07	2.2E-07	2.1E-07	2.0E-07	2.0E-07	1.7E-07
WNW	3.0E-07	3.0E-07	2.9E-07	2.7E-07	2.7E-07	2.7E-07	2.3E-07
W	2.9E-07	2.9E-07	2.8E-07	2.6E-07	2.6E-07	2.6E-07	2.2E-07
WSW	5.1E-07	5.1E-07	4.9E-07	4.6E-07	4.6E-07	4.5E-07	3.9E-07
SW	9.3E-07	9.3E-07	8.9E-07	8.5E-07	8.4E-07	8.3E-07	7.1E-07
SSW	1.4E-06	1.4E-06	1.4E-06	1.3E-06	1.3E-06	1.3E-06	1.1E-06
S	2.0E-06	1.9E-06	1.9E-06	1.8E-06	1.8E-06	1.7E-06	1.5E-06
SSE	1.9E-06	1.9E-06	1.9E-06	1.8E-06	1.7E-06	1.7E-06	1.5E-06
SE	6.4E-07	6.3E-07	6.1E-07	5.7E-07	5.7E-07	5.6E-07	4.7E-07
ESE	3.7E-07	3.7E-07	3.6E-07	3.4E-07	3.3E-07	3.3E-07	2.7E-07
E	4.5E-07	4.5E-07	4.3E-07	4.1E-07	4.0E-07	4.0E-07	3.3E-07
ENE	5.9E-07	5.8E-07	5.6E-07	5.3E-07	5.3E-07	5.2E-07	4.4E-07
NE	1.0E-06	1.0E-06	9.6E-07	9.1E-07	9.0E-07	8.9E-07	7.6E-07
NNE	5.6E-07	5.6E-07	5.4E-07	5.1E-07	5.1E-07	5.0E-07	4.3E-07

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SUMMARY
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INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)						
Direction	45196	45275	45654	45677	46668	47969
N	2.5E-07	2.5E-07	2.5E-07	2.5E-07	2.4E-07	2.3E-07
NNW	1.4E-07	1.4E-07	1.4E-07	1.4E-07	1.3E-07	1.3E-07

	C-11C.SUM					
NW	1.6E-07	1.6E-07	1.6E-07	1.6E-07	1.5E-07	1.5E-07
WNW	2.1E-07	2.1E-07	2.1E-07	2.1E-07	2.0E-07	1.9E-07
W	2.1E-07	2.0E-07	2.0E-07	2.0E-07	1.9E-07	1.8E-07
WSW	3.6E-07	3.6E-07	3.6E-07	3.6E-07	3.4E-07	3.3E-07
SW	6.7E-07	6.7E-07	6.6E-07	6.6E-07	6.3E-07	6.0E-07
SSW	1.0E-06	1.0E-06	1.0E-06	1.0E-06	9.7E-07	9.2E-07
S	1.4E-06	1.4E-06	1.4E-06	1.3E-06	1.3E-06	1.2E-06
SSE	1.4E-06	1.4E-06	1.4E-06	1.4E-06	1.3E-06	1.3E-06
SE	4.4E-07	4.4E-07	4.3E-07	4.3E-07	4.1E-07	3.9E-07
ESE	2.6E-07	2.5E-07	2.5E-07	2.5E-07	2.4E-07	2.3E-07
E	3.1E-07	3.1E-07	3.0E-07	3.0E-07	2.9E-07	2.7E-07
ENE	4.1E-07	4.1E-07	4.0E-07	4.0E-07	3.9E-07	3.7E-07
NE	7.1E-07	7.1E-07	7.0E-07	7.0E-07	6.7E-07	6.4E-07
NNE	4.0E-07	4.0E-07	3.9E-07	3.9E-07	3.8E-07	3.6E-07

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)						
Direction	27715	28919	31060	32802	34577	35279	35683
N	2.9E-13	2.8E-13	2.5E-13	2.3E-13	2.1E-13	2.0E-13	2.0E-13
NNW	1.6E-13	1.5E-13	1.3E-13	1.2E-13	1.1E-13	1.1E-13	1.1E-13
NW	1.8E-13	1.7E-13	1.5E-13	1.4E-13	1.3E-13	1.3E-13	1.3E-13
WNW	2.4E-13	2.3E-13	2.0E-13	1.9E-13	1.7E-13	1.7E-13	1.7E-13
W	2.4E-13	2.2E-13	2.0E-13	1.8E-13	1.7E-13	1.6E-13	1.6E-13
WSW	4.1E-13	3.9E-13	3.5E-13	3.2E-13	3.0E-13	2.9E-13	2.8E-13
SW	7.5E-13	7.0E-13	6.3E-13	5.9E-13	5.4E-13	5.2E-13	5.2E-13
SSW	1.2E-12	1.1E-12	9.9E-13	9.1E-13	8.4E-13	8.2E-13	8.0E-13
S	1.6E-12	1.5E-12	1.3E-12	1.2E-12	1.1E-12	1.1E-12	1.1E-12
SSE	1.5E-12	1.5E-12	1.3E-12	1.2E-12	1.1E-12	1.1E-12	1.1E-12
SE	5.3E-13	4.9E-13	4.4E-13	4.1E-13	3.7E-13	3.6E-13	3.5E-13
ESE	3.1E-13	2.9E-13	2.6E-13	2.4E-13	2.2E-13	2.1E-13	2.1E-13
E	3.8E-13	3.6E-13	3.2E-13	2.9E-13	2.7E-13	2.6E-13	2.5E-13
ENE	4.8E-13	4.5E-13	4.0E-13	3.7E-13	3.4E-13	3.3E-13	3.2E-13
NE	8.1E-13	7.6E-13	6.9E-13	6.3E-13	5.8E-13	5.6E-13	5.5E-13
NNE	4.5E-13	4.3E-13	3.8E-13	3.5E-13	3.3E-13	3.2E-13	3.1E-13

	Distance (m)						
Direction	36721	36809	37729	39079	39220	39559	43584
N	1.9E-13	1.9E-13	1.8E-13	1.7E-13	1.7E-13	1.7E-13	1.4E-13
NNW	1.0E-13	1.0E-13	1.0E-13	9.5E-14	9.4E-14	9.3E-14	8.0E-14
NW	1.2E-13	1.2E-13	1.2E-13	1.1E-13	1.1E-13	1.1E-13	9.1E-14
WNW	1.6E-13	1.6E-13	1.5E-13	1.4E-13	1.4E-13	1.4E-13	1.2E-13
W	1.5E-13	1.5E-13	1.5E-13	1.4E-13	1.4E-13	1.4E-13	1.2E-13
WSW	2.7E-13	2.7E-13	2.6E-13	2.4E-13	2.4E-13	2.4E-13	2.0E-13
SW	4.9E-13	4.9E-13	4.7E-13	4.5E-13	4.5E-13	4.4E-13	3.8E-13
SSW	7.7E-13	7.6E-13	7.3E-13	6.9E-13	6.9E-13	6.8E-13	5.8E-13

	C-11C.SUM						
S	1.0E-12	1.0E-12	9.9E-13	9.3E-13	9.3E-13	9.2E-13	7.8E-13
SSE	1.0E-12	1.0E-12	9.8E-13	9.3E-13	9.2E-13	9.1E-13	7.8E-13
SE	3.4E-13	3.4E-13	3.2E-13	3.0E-13	3.0E-13	3.0E-13	2.5E-13
ESE	2.0E-13	2.0E-13	1.9E-13	1.8E-13	1.8E-13	1.7E-13	1.5E-13
E	2.4E-13	2.4E-13	2.3E-13	2.2E-13	2.1E-13	2.1E-13	1.8E-13
ENE	3.1E-13	3.1E-13	3.0E-13	2.8E-13	2.8E-13	2.7E-13	2.3E-13
NE	5.3E-13	5.3E-13	5.1E-13	4.8E-13	4.8E-13	4.7E-13	4.0E-13
NNE	3.0E-13	3.0E-13	2.8E-13	2.7E-13	2.7E-13	2.6E-13	2.3E-13

Feb 20, 2008 02:31 pm

SUMMARY
Page 8

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)					
Direction	45196	45275	45654	45677	46668	47969
N	1.3E-13	1.3E-13	1.3E-13	1.3E-13	1.3E-13	1.2E-13
NNW	7.5E-14	7.5E-14	7.4E-14	7.4E-14	7.1E-14	6.8E-14
NW	8.5E-14	8.5E-14	8.4E-14	8.4E-14	8.1E-14	7.7E-14
WNW	1.1E-13	1.1E-13	1.1E-13	1.1E-13	1.1E-13	1.0E-13
W	1.1E-13	1.1E-13	1.1E-13	1.1E-13	1.0E-13	9.7E-14
WSW	1.9E-13	1.9E-13	1.9E-13	1.9E-13	1.8E-13	1.7E-13
SW	3.5E-13	3.5E-13	3.5E-13	3.5E-13	3.3E-13	3.2E-13
SSW	5.4E-13	5.4E-13	5.3E-13	5.3E-13	5.1E-13	4.9E-13
S	7.3E-13	7.3E-13	7.1E-13	7.1E-13	6.9E-13	6.5E-13
SSE	7.4E-13	7.3E-13	7.2E-13	7.2E-13	7.0E-13	6.6E-13
SE	2.3E-13	2.3E-13	2.3E-13	2.3E-13	2.2E-13	2.1E-13
ESE	1.4E-13	1.3E-13	1.3E-13	1.3E-13	1.3E-13	1.2E-13
E	1.6E-13	1.6E-13	1.6E-13	1.6E-13	1.5E-13	1.4E-13
ENE	2.2E-13	2.2E-13	2.1E-13	2.1E-13	2.1E-13	1.9E-13
NE	3.8E-13	3.8E-13	3.7E-13	3.7E-13	3.6E-13	3.4E-13
NNE	2.1E-13	2.1E-13	2.1E-13	2.1E-13	2.0E-13	1.9E-13

C-11D.SUM

C A P 8 8 - P C

Version 3.0

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment

Feb 20, 2008 02:31 pm

Facility: INL
Address: PO Box 1625
City: Idaho Falls
State: ID Zip: 83415

Source Category:
Source Type: Stack
Emission Year: 2008

Comments: TAN-TSF
Receptors 60-62

Dataset Name: RUND
Dataset Date: 08/02/20 2:20:00 PM
Wind File: C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

Feb 20, 2008 02:31 pm

SUMMARY
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
Adrenals	9.28E-07
B Surfac	1.96E-06
Breasts	1.28E-06
St wall	1.12E-06
ULI wall	9.24E-07
Kidneys	9.89E-07
Lungs	1.39E-06
Ovaries	8.29E-07
R Marrow	1.07E-06
Spleen	1.01E-06
Thymus	1.03E-06
Uterus	8.51E-07

	C-11D.SUM
Bld wall	9.22E-07
Brain	1.18E-06
Esophagu	2.97E-06
SI wall	9.06E-07
LLI wall	8.91E-07
Liver	9.96E-07
Muscle	1.08E-06
Pancreas	8.75E-07
Skin	1.84E-06
Testes	1.11E-06
Thyroid	1.14E-06
EFEC	1.16E-06

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	0.00E+00
INHALATION	1.05E-07
AIR IMMERSION	1.06E-06
GROUND SURFACE	0.00E+00
INTERNAL	1.05E-07
EXTERNAL	1.06E-06
TOTAL	1.16E-06

Feb 20, 2008 02:31 pm

SUMMARY
Page 2

NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
C-11	1.16E-06
TOTAL	1.16E-06

Feb 20, 2008 02:31 pm

SUMMARY
Page 3

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
Esophagu	1.05E-14

Page 2

	C-11D.SUM
Stomach	4.69E-14
Colon	9.44E-14
Liver	1.51E-14
LUNG	1.37E-13
Bone	1.86E-15
Skin	1.84E-15
Breast	6.16E-14
Ovary	1.18E-14
Bladder	2.23E-14
Kidneys	5.16E-15
Thyroid	3.62E-15
Leukemia	6.00E-14
Residual	1.43E-13
Total	6.17E-13
TOTAL	1.23E-12

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	0.00E+00
INHALATION	4.01E-14
AIR IMMERSION	5.76E-13
GROUND SURFACE	0.00E+00
INTERNAL	4.01E-14
EXTERNAL	5.76E-13
TOTAL	6.17E-13

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SUMMARY
Page 4

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
C-11	6.17E-13
TOTAL	6.17E-13

Feb 20, 2008 02:31 pm

SUMMARY
Page 5

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)

Direction 50024 54611 58610

N	2.1E-07	1.7E-07	1.4E-07
NNW	1.2E-07	1.0E-07	8.4E-08
NW	1.3E-07	1.1E-07	9.0E-08
WNW	1.8E-07	1.5E-07	1.2E-07
W	1.7E-07	1.4E-07	1.1E-07
WSW	3.0E-07	2.5E-07	2.1E-07
SW	5.6E-07	4.7E-07	3.9E-07
SSW	8.5E-07	7.1E-07	5.8E-07
S	1.1E-06	9.4E-07	7.7E-07
SSE	1.2E-06	9.8E-07	8.2E-07
SE	3.6E-07	2.9E-07	2.3E-07
ESE	2.1E-07	1.6E-07	1.2E-07
E	2.5E-07	2.0E-07	1.5E-07
ENE	3.4E-07	2.8E-07	2.2E-07
NE	5.9E-07	5.0E-07	4.1E-07
NNE	3.3E-07	2.8E-07	2.3E-07

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SUMMARY
Page 6

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

Distance (m)

Direction 50024 54611 58610

N	1.1E-13	9.0E-14	7.2E-14
NNW	6.3E-14	5.3E-14	4.4E-14
NW	7.1E-14	5.9E-14	4.8E-14
WNW	9.3E-14	7.7E-14	6.2E-14
W	8.9E-14	7.4E-14	6.0E-14
WSW	1.6E-13	1.3E-13	1.1E-13
SW	3.0E-13	2.5E-13	2.1E-13
SSW	4.5E-13	3.8E-13	3.1E-13
S	6.0E-13	5.0E-13	4.1E-13
SSE	6.2E-13	5.2E-13	4.3E-13
SE	1.9E-13	1.5E-13	1.2E-13
ESE	1.1E-13	8.7E-14	6.6E-14
E	1.3E-13	1.0E-13	7.8E-14
ENE	1.8E-13	1.5E-13	1.2E-13
NE	3.1E-13	2.6E-13	2.2E-13
NNE	1.8E-13	1.5E-13	1.2E-13

08/02/20 2:16:00 PM Feb 20, 2008 02:30 pm
 RUNA RUNA.
 C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

INL
 PO Box 1625

Idaho Falls	ID	83415	2008				
TAN-TSF							
Receptors 1-20							
100.0000,500.0000							
0	0	0	0	0	20		
10344	10365	10472	10590	11103	11989	12522	13245
13286	13483	13612	13664	13959	14258	14374	15241
15441	15784	15844	16323				
800	280.20	16.30	3.54				
0	0						
1							
1.00	1.00	0.000E+00	0.000E+00				
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
1	0	1					
Cl-38	M	1	1.000e+00	1.000e+00	5.480e-05		0
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.630e-06	0.0018	0.000e+00					
unspecified	2.000E+01	1.000E+02	2.000E-02	4.000E-02	2.682E+01		
0.08	0.92	0.00	Urban				
0.00	1.00	0.00					
0.01	0.99	0.00					
T	T	T	T				
2.030e-01	4.560e-02	1.700e-02					
Cl-38	17	0					
00	00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00			
1							
Cl-38	M	1	1.000e+00	1.000e+00	5.480e-05		0
8.562E-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	0.000E+00	0.000E+00	0.000E+00		
1.010e-05	0.0018	0.000e+00					
unspecified	2.000E+01	1.000E+02	2.000E-02	4.000E-02	2.682E+01		
--DecayStep--1							
--LimitChildren--1							
--Children--5							

08/02/20 2:17:00 PM Feb 20, 2008 02:30 pm
 RUNB RUNB.
 C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

INL
 PO Box 1625

Idaho Falls ID 83415
 2008

TAN-TSF
 Receptors 21-39
 100.0000,500.0000

0	0	0	0	0	19		
17035	17329	18607	18834	18860	18890	19860	19891
20457	21314	21349	22159	23521	24430	24545	25171
26794	27275	27389	0				
800	280.20	16.30	3.54				
0	0						

1	1.00	0.000E+00	0.000E+00				
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
1	0	1					
Cl-38	M	1	1.000e+00	1.000e+00	5.480e-05		0
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.630e-06	0.0018	0.000e+00					
unspecified	2.000E+01	1.000E+02	2.000E-02	4.000E-02	2.682E+01		
0.08	0.92	0.00	Urban				
0.00	1.00	0.00					
0.01	0.99	0.00					

T	T	T	T				
2.030e-01	4.560e-02	1.700e-02					
Cl-38	17	0					
00	00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00			
1							
Cl-38	M	1	1.000e+00	1.000e+00	5.480e-05		0
8.562E-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	0.000E+00	0.000E+00	0.000E+00		
1.010e-05	0.0018	0.000e+00					
unspecified	2.000E+01	1.000E+02	2.000E-02	4.000E-02	2.682E+01		

--DecayStep--1
 --LimitChildren--1
 --Children--5

08/02/20 2:20:00 PM C:\-38D.dat
 RUND Feb 20, 2008 02:31 pm
 RUND.
 C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

INL
 PO Box 1625

Idaho Falls ID 83415
 2008

TAN-TSF
 Receptors 60-62
 100.0000,500.0000

0	0	0	0	0	3		
50024	54611	58610	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0			
800	280.20	16.30	3.54				
0	0						

1	1.00	0.000E+00	0.000E+00				
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
1	0	1					

Cl-38	M	1	1.000e+00	1.000e+00	5.480e-05		0
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.630e-06	0.0018	0.000e+00					
unspecified	2.000E+01	1.000E+02	2.000E-02	4.000E-02	2.682E+01		
0.08	0.92	0.00	Urban				
0.00	1.00	0.00					
0.01	0.99	0.00					

T	T	T	T				
2.030e-01	4.560e-02	1.700e-02					
Cl-38	17	0					
00	00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00			

1							
Cl-38	M	1	1.000e+00	1.000e+00	5.480e-05		0
8.562E-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	0.000E+00	0.000E+00	0.000E+00		
1.010e-05	0.0018	0.000e+00					
unspecified	2.000E+01	1.000E+02	2.000E-02	4.000E-02	2.682E+01		

--DecayStep--1
 --LimitChildren--1
 --Children--5

CL-38A.SUM

C A P 8 8 - P C

Version 3.0

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment
Feb 20, 2008 02:30 pm

Facility: INL
Address: PO Box 1625
City: Idaho Falls
State: ID Zip: 83415

Source Category:
Source Type: Stack
Emission Year: 2008

Comments: TAN-TSF
Receptors 1-20

Dataset Name: RUNA
Dataset Date: 08/02/20 2:16:00 PM
Wind File: C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

Feb 20, 2008 02:30 pm

SUMMARY
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
Adrenals	2.24E-05
B Surfac	3.55E-05
Breasts	2.90E-05
St wall	3.51E-05
ULI wall	2.30E-05
Kidneys	2.40E-05
Lungs	3.77E-05
Ovaries	2.26E-05
R Marrow	2.63E-05
Spleen	2.45E-05
Thymus	2.58E-05
Uterus	2.21E-05

	Cl-38A.SUM
Bld wall	2.31E-05
Brain	2.81E-05
Esophagu	6.30E-05
SI wall	2.26E-05
LLI wall	2.25E-05
Liver	2.44E-05
Muscle	2.57E-05
Pancreas	2.25E-05
Skin	6.54E-05
Testes	2.57E-05
Thyroid	2.68E-05
EFEC	2.94E-05

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	0.00E+00
INHALATION	3.88E-06
AIR IMMERSION	2.55E-05
GROUND SURFACE	0.00E+00
INTERNAL	3.88E-06
EXTERNAL	2.55E-05
TOTAL	2.94E-05

Feb 20, 2008 02:30 pm

SUMMARY
Page 2

NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
Cl-38	2.94E-05
TOTAL	2.94E-05

Feb 20, 2008 02:30 pm

SUMMARY
Page 3

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
Esophagu	2.68E-13

Page 2

	Cl-38A.SUM
Stomach	1.59E-12
Colon	2.36E-12
Liver	3.71E-13
LUNG	3.77E-12
Bone	3.38E-14
Skin	6.55E-14
Breast	1.41E-12
Ovary	3.22E-13
Bladder	5.59E-13
Kidneys	1.25E-13
Thyroid	8.53E-14
Leukemia	1.48E-12
Residual	3.52E-12
Total	1.59E-11
TOTAL	3.19E-11

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	0.00E+00
INHALATION	1.96E-12
AIR IMMERSION	1.40E-11
GROUND SURFACE	0.00E+00
INTERNAL	1.96E-12
EXTERNAL	1.40E-11
TOTAL	1.59E-11

Feb 20, 2008 02:30 pm

SUMMARY
Page 4

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
Cl-38	1.59E-11
TOTAL	1.59E-11

Feb 20, 2008 02:30 pm

SUMMARY
Page 5

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)

Direction	C1-38A.SUM						
	10344	10365	10472	10590	11103	11989	12522
N	5.7E-06	5.6E-06	5.6E-06	5.5E-06	5.1E-06	4.6E-06	4.4E-06
NNW	2.6E-06	2.6E-06	2.5E-06	2.5E-06	2.4E-06	2.1E-06	2.0E-06
NW	3.2E-06	3.2E-06	3.2E-06	3.1E-06	2.9E-06	2.7E-06	2.5E-06
WNW	4.3E-06	4.3E-06	4.2E-06	4.2E-06	3.9E-06	3.5E-06	3.3E-06
W	4.5E-06	4.5E-06	4.4E-06	4.3E-06	4.1E-06	3.7E-06	3.5E-06
WSW	7.2E-06	7.2E-06	7.1E-06	7.0E-06	6.5E-06	5.9E-06	5.5E-06
SW	1.3E-05	1.3E-05	1.3E-05	1.2E-05	1.2E-05	1.1E-05	9.9E-06
SSW	2.1E-05	2.1E-05	2.0E-05	2.0E-05	1.9E-05	1.7E-05	1.6E-05
S	2.9E-05	2.9E-05	2.9E-05	2.8E-05	2.7E-05	2.4E-05	2.2E-05
SSE	2.6E-05	2.6E-05	2.6E-05	2.5E-05	2.4E-05	2.1E-05	2.0E-05
SE	1.0E-05	1.0E-05	1.0E-05	1.0E-05	9.5E-06	8.5E-06	8.0E-06
ESE	6.5E-06	6.4E-06	6.3E-06	6.2E-06	5.9E-06	5.3E-06	5.0E-06
E	8.1E-06	8.1E-06	8.0E-06	7.8E-06	7.3E-06	6.6E-06	6.2E-06
ENE	8.8E-06	8.7E-06	8.6E-06	8.5E-06	8.0E-06	7.2E-06	6.8E-06
NE	1.5E-05	1.5E-05	1.4E-05	1.4E-05	1.3E-05	1.2E-05	1.1E-05
NNE	8.2E-06	8.2E-06	8.1E-06	8.0E-06	7.5E-06	6.7E-06	6.3E-06

Distance (m)

Direction	13245	13286	13483	13612	13664	13959	14258
N	4.0E-06	4.0E-06	3.9E-06	3.9E-06	3.9E-06	3.7E-06	3.6E-06
NNW	1.9E-06	1.9E-06	1.8E-06	1.8E-06	1.8E-06	1.7E-06	1.7E-06
NW	2.3E-06	2.3E-06	2.3E-06	2.2E-06	2.2E-06	2.2E-06	2.1E-06
WNW	3.1E-06	3.1E-06	3.0E-06	3.0E-06	3.0E-06	2.9E-06	2.8E-06
W	3.2E-06	3.2E-06	3.1E-06	3.1E-06	3.1E-06	3.0E-06	2.9E-06
WSW	5.1E-06	5.1E-06	5.0E-06	4.9E-06	4.9E-06	4.7E-06	4.6E-06
SW	9.1E-06	9.1E-06	8.9E-06	8.8E-06	8.7E-06	8.5E-06	8.2E-06
SSW	1.5E-05	1.5E-05	1.4E-05	1.4E-05	1.4E-05	1.4E-05	1.3E-05
S	2.1E-05	2.1E-05	2.0E-05	2.0E-05	2.0E-05	1.9E-05	1.9E-05
SSE	1.9E-05	1.9E-05	1.8E-05	1.8E-05	1.8E-05	1.7E-05	1.7E-05
SE	7.4E-06	7.4E-06	7.2E-06	7.1E-06	7.1E-06	6.9E-06	6.6E-06
ESE	4.6E-06	4.5E-06	4.5E-06	4.4E-06	4.4E-06	4.2E-06	4.1E-06
E	5.7E-06	5.7E-06	5.6E-06	5.5E-06	5.5E-06	5.3E-06	5.1E-06
ENE	6.2E-06	6.2E-06	6.1E-06	6.0E-06	6.0E-06	5.8E-06	5.6E-06
NE	1.0E-05	1.0E-05	1.0E-05	9.9E-06	9.8E-06	9.5E-06	9.2E-06
NNE	5.8E-06	5.8E-06	5.7E-06	5.6E-06	5.6E-06	5.4E-06	5.3E-06

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SUMMARY
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INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)						
Direction	14374	15241	15441	15784	15844	16323
N	3.6E-06	3.3E-06	3.2E-06	3.1E-06	3.1E-06	3.0E-06
NNW	1.7E-06	1.5E-06	1.5E-06	1.5E-06	1.5E-06	1.4E-06

	C1-38A.SUM					
NW	2.1E-06	1.9E-06	1.9E-06	1.8E-06	1.8E-06	1.7E-06
WNW	2.8E-06	2.5E-06	2.5E-06	2.4E-06	2.4E-06	2.3E-06
W	2.8E-06	2.6E-06	2.6E-06	2.5E-06	2.5E-06	2.4E-06
WSW	4.6E-06	4.2E-06	4.1E-06	4.0E-06	4.0E-06	3.8E-06
SW	8.1E-06	7.5E-06	7.4E-06	7.1E-06	7.1E-06	6.8E-06
SSW	1.3E-05	1.2E-05	1.2E-05	1.1E-05	1.1E-05	1.1E-05
S	1.8E-05	1.7E-05	1.6E-05	1.6E-05	1.6E-05	1.5E-05
SSE	1.7E-05	1.5E-05	1.5E-05	1.5E-05	1.4E-05	1.4E-05
SE	6.6E-06	6.0E-06	5.9E-06	5.7E-06	5.7E-06	5.4E-06
ESE	4.1E-06	3.7E-06	3.6E-06	3.5E-06	3.5E-06	3.3E-06
E	5.1E-06	4.7E-06	4.6E-06	4.4E-06	4.4E-06	4.2E-06
ENE	5.6E-06	5.1E-06	5.0E-06	4.9E-06	4.8E-06	4.6E-06
NE	9.1E-06	8.4E-06	8.2E-06	8.0E-06	7.9E-06	7.6E-06
NNE	5.2E-06	4.8E-06	4.7E-06	4.6E-06	4.5E-06	4.3E-06

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)						
Direction	10344	10365	10472	10590	11103	11989	12522
N	3.1E-12	3.1E-12	3.0E-12	3.0E-12	2.8E-12	2.5E-12	2.4E-12
NNW	1.4E-12	1.4E-12	1.4E-12	1.4E-12	1.3E-12	1.2E-12	1.1E-12
NW	1.8E-12	1.7E-12	1.7E-12	1.7E-12	1.6E-12	1.4E-12	1.4E-12
WNW	2.3E-12	2.3E-12	2.3E-12	2.3E-12	2.1E-12	1.9E-12	1.8E-12
W	2.4E-12	2.4E-12	2.4E-12	2.4E-12	2.2E-12	2.0E-12	1.9E-12
WSW	3.9E-12	3.9E-12	3.8E-12	3.8E-12	3.5E-12	3.2E-12	3.0E-12
SW	7.0E-12	7.0E-12	6.9E-12	6.8E-12	6.3E-12	5.7E-12	5.4E-12
SSW	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.0E-11	9.2E-12	8.7E-12
S	1.6E-11	1.6E-11	1.6E-11	1.5E-11	1.4E-11	1.3E-11	1.2E-11
SSE	1.4E-11	1.4E-11	1.4E-11	1.4E-11	1.3E-11	1.2E-11	1.1E-11
SE	5.7E-12	5.6E-12	5.6E-12	5.5E-12	5.1E-12	4.6E-12	4.3E-12
ESE	3.5E-12	3.5E-12	3.4E-12	3.4E-12	3.2E-12	2.9E-12	2.7E-12
E	4.4E-12	4.4E-12	4.3E-12	4.3E-12	4.0E-12	3.6E-12	3.4E-12
ENE	4.8E-12	4.7E-12	4.7E-12	4.6E-12	4.3E-12	3.9E-12	3.7E-12
NE	7.9E-12	7.9E-12	7.8E-12	7.7E-12	7.2E-12	6.4E-12	6.1E-12
NNE	4.5E-12	4.5E-12	4.4E-12	4.3E-12	4.1E-12	3.7E-12	3.4E-12

	Distance (m)						
Direction	13245	13286	13483	13612	13664	13959	14258
N	2.2E-12	2.2E-12	2.1E-12	2.1E-12	2.1E-12	2.0E-12	2.0E-12
NNW	1.0E-12	1.0E-12	9.9E-13	9.7E-13	9.7E-13	9.4E-13	9.2E-13
NW	1.3E-12	1.3E-12	1.2E-12	1.2E-12	1.2E-12	1.2E-12	1.1E-12
WNW	1.7E-12	1.7E-12	1.6E-12	1.6E-12	1.6E-12	1.6E-12	1.5E-12
W	1.7E-12	1.7E-12	1.7E-12	1.7E-12	1.7E-12	1.6E-12	1.6E-12
WSW	2.8E-12	2.8E-12	2.7E-12	2.7E-12	2.6E-12	2.6E-12	2.5E-12
SW	4.9E-12	4.9E-12	4.8E-12	4.8E-12	4.7E-12	4.6E-12	4.5E-12
SSW	8.0E-12	8.0E-12	7.8E-12	7.7E-12	7.7E-12	7.4E-12	7.2E-12

	Cl-38A.SUM						
S	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.0E-11	1.0E-11
SSE	1.0E-11	1.0E-11	9.8E-12	9.7E-12	9.7E-12	9.4E-12	9.1E-12
SE	4.0E-12	4.0E-12	3.9E-12	3.9E-12	3.8E-12	3.7E-12	3.6E-12
ESE	2.5E-12	2.5E-12	2.4E-12	2.4E-12	2.4E-12	2.3E-12	2.2E-12
E	3.1E-12	3.1E-12	3.0E-12	3.0E-12	3.0E-12	2.9E-12	2.8E-12
ENE	3.4E-12	3.4E-12	3.3E-12	3.3E-12	3.2E-12	3.1E-12	3.1E-12
NE	5.6E-12	5.5E-12	5.4E-12	5.4E-12	5.3E-12	5.2E-12	5.0E-12
NNE	3.2E-12	3.2E-12	3.1E-12	3.0E-12	3.0E-12	2.9E-12	2.9E-12

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)					
Direction	14374	15241	15441	15784	15844	16323
N	1.9E-12	1.8E-12	1.8E-12	1.7E-12	1.7E-12	1.6E-12
NNW	9.1E-13	8.4E-13	8.2E-13	8.0E-13	7.9E-13	7.6E-13
NW	1.1E-12	1.0E-12	1.0E-12	9.9E-13	9.8E-13	9.4E-13
WNW	1.5E-12	1.4E-12	1.4E-12	1.3E-12	1.3E-12	1.2E-12
W	1.5E-12	1.4E-12	1.4E-12	1.3E-12	1.3E-12	1.3E-12
WSW	2.5E-12	2.3E-12	2.2E-12	2.2E-12	2.2E-12	2.1E-12
SW	4.4E-12	4.1E-12	4.0E-12	3.9E-12	3.8E-12	3.7E-12
SSW	7.1E-12	6.5E-12	6.4E-12	6.2E-12	6.2E-12	5.9E-12
S	9.9E-12	9.1E-12	8.9E-12	8.7E-12	8.6E-12	8.2E-12
SSE	9.0E-12	8.3E-12	8.1E-12	7.9E-12	7.8E-12	7.5E-12
SE	3.6E-12	3.3E-12	3.2E-12	3.1E-12	3.1E-12	2.9E-12
ESE	2.2E-12	2.0E-12	2.0E-12	1.9E-12	1.9E-12	1.8E-12
E	2.8E-12	2.5E-12	2.5E-12	2.4E-12	2.4E-12	2.3E-12
ENE	3.0E-12	2.8E-12	2.7E-12	2.6E-12	2.6E-12	2.5E-12
NE	5.0E-12	4.5E-12	4.5E-12	4.3E-12	4.3E-12	4.1E-12
NNE	2.8E-12	2.6E-12	2.5E-12	2.5E-12	2.5E-12	2.3E-12

CL-38B.SUM

C A P 8 8 - P C

Version 3.0

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment
Feb 20, 2008 02:30 pm

Facility: INL
Address: PO Box 1625
City: Idaho Falls
State: ID Zip: 83415

Source Category:
Source Type: Stack
Emission Year: 2008

Comments: TAN-TSF
Receptors 21-39

Dataset Name: RUNB
Dataset Date: 08/02/20 2:17:00 PM
Wind File: C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

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SUMMARY
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ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
Adrenals	1.08E-05
B Surfac	1.72E-05
Breasts	1.40E-05
St wall	1.70E-05
ULI wall	1.11E-05
Kidneys	1.16E-05
Lungs	1.82E-05
Ovaries	1.09E-05
R Marrow	1.27E-05
Spleen	1.18E-05
Thymus	1.25E-05
Uterus	1.07E-05

	Cl-38B.SUM
Bld wall	1.12E-05
Brain	1.36E-05
Esophagu	3.05E-05
SI wall	1.09E-05
LLI wall	1.09E-05
Liver	1.18E-05
Muscle	1.24E-05
Pancreas	1.09E-05
Skin	3.17E-05
Testes	1.24E-05
Thyroid	1.29E-05
EFEC	1.42E-05

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	0.00E+00
INHALATION	1.87E-06
AIR IMMERSION	1.23E-05
GROUND SURFACE	0.00E+00
INTERNAL	1.87E-06
EXTERNAL	1.23E-05
TOTAL	1.42E-05

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SUMMARY
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NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
Cl-38	1.42E-05
TOTAL	1.42E-05

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SUMMARY
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CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
Esophagu	1.29E-13

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	Cl-38B.SUM
Stomach	7.68E-13
Colon	1.14E-12
Liver	1.79E-13
LUNG	1.82E-12
Bone	1.63E-14
Skin	3.17E-14
Breast	6.81E-13
Ovary	1.56E-13
Bladder	2.70E-13
Kidneys	6.07E-14
Thyroid	4.13E-14
Leukemia	7.16E-13
Residual	1.70E-12
Total	7.71E-12
TOTAL	1.54E-11

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	0.00E+00
INHALATION	9.51E-13
AIR IMMERSION	6.76E-12
GROUND SURFACE	0.00E+00
INTERNAL	9.51E-13
EXTERNAL	6.76E-12
TOTAL	7.71E-12

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SUMMARY
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NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
Cl-38	7.71E-12
TOTAL	7.71E-12

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SUMMARY
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INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)

Direction	C1-38B.SUM						
	17035	17329	18607	18834	18860	18890	19860
N	2.8E-06	2.7E-06	2.4E-06	2.4E-06	2.4E-06	2.4E-06	2.2E-06
NNW	1.3E-06	1.3E-06	1.2E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06
NW	1.6E-06	1.6E-06	1.4E-06	1.4E-06	1.4E-06	1.4E-06	1.3E-06
WNW	2.2E-06	2.1E-06	1.9E-06	1.9E-06	1.9E-06	1.8E-06	1.7E-06
W	2.2E-06	2.2E-06	1.9E-06	1.9E-06	1.9E-06	1.9E-06	1.7E-06
WSW	3.6E-06	3.5E-06	3.1E-06	3.1E-06	3.1E-06	3.1E-06	2.8E-06
SW	6.4E-06	6.2E-06	5.6E-06	5.5E-06	5.5E-06	5.5E-06	5.1E-06
SSW	1.0E-05	1.0E-05	8.9E-06	8.8E-06	8.8E-06	8.7E-06	8.1E-06
S	1.4E-05	1.4E-05	1.2E-05	1.2E-05	1.2E-05	1.2E-05	1.1E-05
SSE	1.3E-05	1.3E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.0E-05
SE	5.1E-06	4.9E-06	4.4E-06	4.3E-06	4.3E-06	4.3E-06	3.9E-06
ESE	3.1E-06	3.0E-06	2.7E-06	2.6E-06	2.6E-06	2.6E-06	2.4E-06
E	3.9E-06	3.8E-06	3.4E-06	3.3E-06	3.3E-06	3.3E-06	3.0E-06
ENE	4.3E-06	4.2E-06	3.8E-06	3.7E-06	3.7E-06	3.7E-06	3.4E-06
NE	7.1E-06	6.9E-06	6.2E-06	6.1E-06	6.1E-06	6.1E-06	5.6E-06
NNE	4.1E-06	4.0E-06	3.5E-06	3.5E-06	3.5E-06	3.5E-06	3.2E-06

Distance (m)

Direction	19891	20457	21314	21349	22159	23521	24430
N	2.2E-06	2.1E-06	1.9E-06	1.9E-06	1.8E-06	1.5E-06	1.4E-06
NNW	1.0E-06	1.0E-06	9.4E-07	9.3E-07	8.8E-07	7.8E-07	7.2E-07
NW	1.3E-06	1.2E-06	1.1E-06	1.1E-06	1.1E-06	9.4E-07	8.5E-07
WNW	1.7E-06	1.6E-06	1.5E-06	1.5E-06	1.4E-06	1.2E-06	1.1E-06
W	1.7E-06	1.6E-06	1.5E-06	1.5E-06	1.4E-06	1.2E-06	1.1E-06
WSW	2.8E-06	2.7E-06	2.5E-06	2.5E-06	2.3E-06	2.1E-06	1.9E-06
SW	5.0E-06	4.8E-06	4.5E-06	4.5E-06	4.2E-06	3.8E-06	3.5E-06
SSW	8.0E-06	7.7E-06	7.2E-06	7.1E-06	6.7E-06	5.9E-06	5.4E-06
S	1.1E-05	1.1E-05	9.9E-06	9.8E-06	9.2E-06	8.2E-06	7.5E-06
SSE	1.0E-05	9.8E-06	9.2E-06	9.2E-06	8.6E-06	7.7E-06	7.1E-06
SE	3.9E-06	3.7E-06	3.5E-06	3.4E-06	3.2E-06	2.8E-06	2.5E-06
ESE	2.4E-06	2.3E-06	2.1E-06	2.1E-06	1.9E-06	1.7E-06	1.5E-06
E	3.0E-06	2.8E-06	2.6E-06	2.6E-06	2.4E-06	2.1E-06	1.8E-06
ENE	3.4E-06	3.2E-06	3.0E-06	3.0E-06	2.8E-06	2.5E-06	2.2E-06
NE	5.6E-06	5.3E-06	5.0E-06	4.9E-06	4.6E-06	4.1E-06	3.8E-06
NNE	3.2E-06	3.0E-06	2.8E-06	2.8E-06	2.6E-06	2.3E-06	2.1E-06

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SUMMARY
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INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)					
Direction	24545	25171	26794	27275	27389
N	1.4E-06	1.3E-06	1.2E-06	1.1E-06	1.1E-06
NNW	7.1E-07	6.7E-07	6.1E-07	6.0E-07	5.9E-07

	Cl-38B.SUM				
NW	8.4E-07	7.8E-07	7.2E-07	7.0E-07	6.9E-07
WNW	1.1E-06	1.0E-06	9.4E-07	9.2E-07	9.2E-07
W	1.1E-06	1.0E-06	9.4E-07	9.1E-07	9.1E-07
WSW	1.9E-06	1.8E-06	1.6E-06	1.6E-06	1.6E-06
SW	3.4E-06	3.2E-06	2.9E-06	2.9E-06	2.9E-06
SSW	5.4E-06	5.1E-06	4.6E-06	4.5E-06	4.5E-06
S	7.4E-06	6.9E-06	6.3E-06	6.2E-06	6.1E-06
SSE	7.0E-06	6.6E-06	6.1E-06	5.9E-06	5.9E-06
SE	2.5E-06	2.3E-06	2.1E-06	2.0E-06	2.0E-06
ESE	1.5E-06	1.4E-06	1.2E-06	1.2E-06	1.2E-06
E	1.8E-06	1.6E-06	1.5E-06	1.5E-06	1.4E-06
ENE	2.2E-06	2.1E-06	1.9E-06	1.8E-06	1.8E-06
NE	3.7E-06	3.5E-06	3.2E-06	3.1E-06	3.1E-06
NNE	2.1E-06	1.9E-06	1.8E-06	1.7E-06	1.7E-06

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)						
Direction	17035	17329	18607	18834	18860	18890	19860
N	1.5E-12	1.5E-12	1.3E-12	1.3E-12	1.3E-12	1.3E-12	1.2E-12
NNW	7.2E-13	7.0E-13	6.3E-13	6.2E-13	6.2E-13	6.1E-13	5.7E-13
NW	8.9E-13	8.6E-13	7.8E-13	7.6E-13	7.6E-13	7.6E-13	7.0E-13
WNW	1.2E-12	1.1E-12	1.0E-12	1.0E-12	1.0E-12	1.0E-12	9.2E-13
W	1.2E-12	1.2E-12	1.0E-12	1.0E-12	1.0E-12	1.0E-12	9.4E-13
WSW	1.9E-12	1.9E-12	1.7E-12	1.7E-12	1.7E-12	1.7E-12	1.5E-12
SW	3.5E-12	3.4E-12	3.0E-12	3.0E-12	3.0E-12	3.0E-12	2.7E-12
SSW	5.6E-12	5.4E-12	4.8E-12	4.8E-12	4.7E-12	4.7E-12	4.4E-12
S	7.7E-12	7.5E-12	6.7E-12	6.6E-12	6.6E-12	6.5E-12	6.0E-12
SSE	7.1E-12	6.9E-12	6.2E-12	6.1E-12	6.1E-12	6.0E-12	5.6E-12
SE	2.8E-12	2.7E-12	2.4E-12	2.3E-12	2.3E-12	2.3E-12	2.1E-12
ESE	1.7E-12	1.7E-12	1.5E-12	1.4E-12	1.4E-12	1.4E-12	1.3E-12
E	2.1E-12	2.1E-12	1.8E-12	1.8E-12	1.8E-12	1.8E-12	1.6E-12
ENE	2.4E-12	2.3E-12	2.0E-12	2.0E-12	2.0E-12	2.0E-12	1.8E-12
NE	3.9E-12	3.8E-12	3.4E-12	3.3E-12	3.3E-12	3.3E-12	3.0E-12
NNE	2.2E-12	2.1E-12	1.9E-12	1.9E-12	1.9E-12	1.9E-12	1.7E-12

	Distance (m)						
Direction	19891	20457	21314	21349	22159	23521	24430
N	1.2E-12	1.1E-12	1.0E-12	1.0E-12	9.6E-13	8.4E-13	7.5E-13
NNW	5.7E-13	5.4E-13	5.1E-13	5.1E-13	4.8E-13	4.2E-13	3.9E-13
NW	7.0E-13	6.7E-13	6.2E-13	6.2E-13	5.8E-13	5.1E-13	4.6E-13
WNW	9.2E-13	8.8E-13	8.2E-13	8.2E-13	7.6E-13	6.7E-13	6.1E-13
W	9.4E-13	8.9E-13	8.3E-13	8.2E-13	7.7E-13	6.7E-13	6.1E-13
WSW	1.5E-12	1.5E-12	1.4E-12	1.4E-12	1.3E-12	1.1E-12	1.0E-12
SW	2.7E-12	2.6E-12	2.4E-12	2.4E-12	2.3E-12	2.0E-12	1.9E-12
SSW	4.4E-12	4.2E-12	3.9E-12	3.9E-12	3.6E-12	3.2E-12	3.0E-12

	Cl-38B.SUM						
S	6.0E-12	5.7E-12	5.3E-12	5.3E-12	5.0E-12	4.4E-12	4.1E-12
SSE	5.6E-12	5.3E-12	5.0E-12	5.0E-12	4.7E-12	4.2E-12	3.9E-12
SE	2.1E-12	2.0E-12	1.9E-12	1.9E-12	1.7E-12	1.5E-12	1.4E-12
ESE	1.3E-12	1.2E-12	1.1E-12	1.1E-12	1.1E-12	9.1E-13	8.1E-13
E	1.6E-12	1.5E-12	1.4E-12	1.4E-12	1.3E-12	1.1E-12	1.0E-12
ENE	1.8E-12	1.8E-12	1.6E-12	1.6E-12	1.5E-12	1.3E-12	1.2E-12
NE	3.0E-12	2.9E-12	2.7E-12	2.7E-12	2.5E-12	2.2E-12	2.0E-12
NNE	1.7E-12	1.6E-12	1.5E-12	1.5E-12	1.4E-12	1.3E-12	1.1E-12

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)				
Direction	24545	25171	26794	27275	27389
N	7.4E-13	6.9E-13	6.3E-13	6.1E-13	6.1E-13
NNW	3.8E-13	3.6E-13	3.3E-13	3.2E-13	3.2E-13
NW	4.6E-13	4.2E-13	3.9E-13	3.8E-13	3.8E-13
WNW	6.0E-13	5.6E-13	5.1E-13	5.0E-13	5.0E-13
W	6.0E-13	5.6E-13	5.1E-13	4.9E-13	4.9E-13
WSW	1.0E-12	9.6E-13	8.7E-13	8.5E-13	8.5E-13
SW	1.9E-12	1.7E-12	1.6E-12	1.6E-12	1.5E-12
SSW	2.9E-12	2.7E-12	2.5E-12	2.4E-12	2.4E-12
S	4.0E-12	3.8E-12	3.4E-12	3.3E-12	3.3E-12
SSE	3.8E-12	3.6E-12	3.3E-12	3.2E-12	3.2E-12
SE	1.3E-12	1.2E-12	1.1E-12	1.1E-12	1.1E-12
ESE	8.0E-13	7.3E-13	6.7E-13	6.5E-13	6.4E-13
E	9.8E-13	8.9E-13	8.1E-13	7.9E-13	7.9E-13
ENE	1.2E-12	1.1E-12	1.0E-12	9.9E-13	9.9E-13
NE	2.0E-12	1.9E-12	1.7E-12	1.7E-12	1.7E-12
NNE	1.1E-12	1.1E-12	9.7E-13	9.4E-13	9.4E-13

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Version 3.0

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment

Feb 20, 2008 02:31 pm

Facility: INL
Address: PO Box 1625
City: Idaho Falls
State: ID Zip: 83415

Source Category:
Source Type: Stack
Emission Year: 2008

Comments: TAN-TSF
Receptors 40-59

Dataset Name: RUNC
Dataset Date: 08/02/20 2:19:00 PM
Wind File: C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

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SUMMARY
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
Adrenals	4.58E-06
B Surfac	7.27E-06
Breasts	5.94E-06
St wall	7.17E-06
ULI wall	4.69E-06
Kidneys	4.92E-06
Lungs	7.71E-06
Ovaries	4.63E-06
R Marrow	5.39E-06
Spleen	5.00E-06
Thymus	5.28E-06
Uterus	4.51E-06

	Cl-38C.SUM
Bld wall	4.73E-06
Brain	5.76E-06
Esophagu	1.29E-05
SI wall	4.63E-06
LLI wall	4.60E-06
Liver	4.98E-06
Muscle	5.25E-06
Pancreas	4.60E-06
Skin	1.34E-05
Testes	5.26E-06
Thyroid	5.47E-06
EFEC	6.01E-06

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	0.00E+00
INHALATION	7.93E-07
AIR IMMERSION	5.22E-06
GROUND SURFACE	0.00E+00
INTERNAL	7.93E-07
EXTERNAL	5.22E-06
TOTAL	6.01E-06

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SUMMARY
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NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
Cl-38	6.01E-06
TOTAL	6.01E-06

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SUMMARY
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CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
Esophagu	5.47E-14

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	Cl-38C.SUM
Stomach	3.25E-13
Colon	4.83E-13
Liver	7.58E-14
LUNG	7.70E-13
Bone	6.91E-15
Skin	1.34E-14
Breast	2.88E-13
Ovary	6.59E-14
Bladder	1.14E-13
Kidneys	2.56E-14
Thyroid	1.75E-14
Leukemia	3.03E-13
Residual	7.20E-13
Total	3.26E-12
TOTAL	6.52E-12

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	0.00E+00
INHALATION	4.02E-13
AIR IMMERSION	2.86E-12
GROUND SURFACE	0.00E+00
INTERNAL	4.02E-13
EXTERNAL	2.86E-12
TOTAL	3.26E-12

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SUMMARY
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NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
Cl-38	3.26E-12
TOTAL	3.26E-12

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SUMMARY
Page 5

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)

Direction	27715	28919	31060	Cl-38C.SUM 32802	34577	35279	35683
N	1.1E-06	1.0E-06	9.3E-07	8.5E-07	7.9E-07	7.6E-07	7.5E-07
NNW	5.8E-07	5.5E-07	5.0E-07	4.6E-07	4.3E-07	4.1E-07	4.1E-07
NW	6.8E-07	6.4E-07	5.8E-07	5.3E-07	4.9E-07	4.8E-07	4.7E-07
WNW	9.0E-07	8.5E-07	7.6E-07	7.0E-07	6.5E-07	6.3E-07	6.2E-07
W	8.9E-07	8.4E-07	7.5E-07	6.9E-07	6.4E-07	6.2E-07	6.1E-07
WSW	1.5E-06	1.4E-06	1.3E-06	1.2E-06	1.1E-06	1.1E-06	1.1E-06
SW	2.8E-06	2.6E-06	2.4E-06	2.2E-06	2.0E-06	2.0E-06	1.9E-06
SSW	4.4E-06	4.1E-06	3.7E-06	3.4E-06	3.2E-06	3.1E-06	3.0E-06
S	6.0E-06	5.6E-06	5.0E-06	4.6E-06	4.3E-06	4.1E-06	4.1E-06
SSE	5.8E-06	5.5E-06	4.9E-06	4.5E-06	4.2E-06	4.1E-06	4.0E-06
SE	2.0E-06	1.8E-06	1.7E-06	1.5E-06	1.4E-06	1.3E-06	1.3E-06
ESE	1.2E-06	1.1E-06	9.8E-07	8.9E-07	8.2E-07	7.9E-07	7.8E-07
E	1.4E-06	1.3E-06	1.2E-06	1.1E-06	1.0E-06	9.6E-07	9.5E-07
ENE	1.8E-06	1.7E-06	1.5E-06	1.4E-06	1.3E-06	1.2E-06	1.2E-06
NE	3.0E-06	2.9E-06	2.6E-06	2.4E-06	2.2E-06	2.1E-06	2.1E-06
NNE	1.7E-06	1.6E-06	1.4E-06	1.3E-06	1.2E-06	1.2E-06	1.2E-06

Distance (m)

Direction	36721	36809	37729	39079	39220	39559	43584
N	7.1E-07	7.1E-07	6.8E-07	6.5E-07	6.4E-07	6.3E-07	5.3E-07
NNW	3.9E-07	3.9E-07	3.7E-07	3.5E-07	3.5E-07	3.5E-07	3.0E-07
NW	4.5E-07	4.5E-07	4.3E-07	4.1E-07	4.1E-07	4.0E-07	3.4E-07
WNW	5.9E-07	5.9E-07	5.7E-07	5.4E-07	5.3E-07	5.3E-07	4.5E-07
W	5.8E-07	5.8E-07	5.5E-07	5.2E-07	5.2E-07	5.1E-07	4.3E-07
WSW	1.0E-06	1.0E-06	9.7E-07	9.2E-07	9.1E-07	9.0E-07	7.7E-07
SW	1.8E-06	1.8E-06	1.8E-06	1.7E-06	1.7E-06	1.6E-06	1.4E-06
SSW	2.9E-06	2.9E-06	2.7E-06	2.6E-06	2.6E-06	2.5E-06	2.2E-06
S	3.9E-06	3.9E-06	3.7E-06	3.5E-06	3.5E-06	3.4E-06	2.9E-06
SSE	3.8E-06	3.8E-06	3.7E-06	3.5E-06	3.5E-06	3.4E-06	2.9E-06
SE	1.3E-06	1.3E-06	1.2E-06	1.1E-06	1.1E-06	1.1E-06	9.4E-07
ESE	7.4E-07	7.4E-07	7.1E-07	6.6E-07	6.6E-07	6.5E-07	5.4E-07
E	9.0E-07	9.0E-07	8.6E-07	8.1E-07	8.0E-07	7.9E-07	6.6E-07
ENE	1.2E-06	1.2E-06	1.1E-06	1.0E-06	1.0E-06	1.0E-06	8.7E-07
NE	2.0E-06	2.0E-06	1.9E-06	1.8E-06	1.8E-06	1.8E-06	1.5E-06
NNE	1.1E-06	1.1E-06	1.1E-06	1.0E-06	1.0E-06	9.9E-07	8.4E-07

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SUMMARY
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INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Direction	45196	45275	45654	45677	46668	47969
N	5.0E-07	5.0E-07	4.9E-07	4.9E-07	4.7E-07	4.5E-07
NNW	2.8E-07	2.8E-07	2.8E-07	2.8E-07	2.7E-07	2.5E-07

	Cl-38C.SUM					
NW	3.2E-07	3.2E-07	3.1E-07	3.1E-07	3.0E-07	2.9E-07
WNW	4.2E-07	4.2E-07	4.1E-07	4.1E-07	4.0E-07	3.8E-07
W	4.1E-07	4.0E-07	4.0E-07	4.0E-07	3.8E-07	3.6E-07
WSW	7.2E-07	7.2E-07	7.1E-07	7.1E-07	6.8E-07	6.5E-07
SW	1.3E-06	1.3E-06	1.3E-06	1.3E-06	1.3E-06	1.2E-06
SSW	2.0E-06	2.0E-06	2.0E-06	2.0E-06	1.9E-06	1.8E-06
S	2.7E-06	2.7E-06	2.7E-06	2.7E-06	2.6E-06	2.4E-06
SSE	2.8E-06	2.7E-06	2.7E-06	2.7E-06	2.6E-06	2.5E-06
SE	8.7E-07	8.7E-07	8.6E-07	8.6E-07	8.2E-07	7.8E-07
ESE	5.1E-07	5.0E-07	5.0E-07	4.9E-07	4.7E-07	4.5E-07
E	6.1E-07	6.1E-07	6.0E-07	6.0E-07	5.7E-07	5.4E-07
ENE	8.1E-07	8.1E-07	8.0E-07	8.0E-07	7.7E-07	7.3E-07
NE	1.4E-06	1.4E-06	1.4E-06	1.4E-06	1.3E-06	1.3E-06
NNE	7.9E-07	7.9E-07	7.8E-07	7.8E-07	7.5E-07	7.1E-07

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)						
Direction	27715	28919	31060	32802	34577	35279	35683
N	6.0E-13	5.6E-13	5.0E-13	4.6E-13	4.3E-13	4.1E-13	4.1E-13
NNW	3.2E-13	3.0E-13	2.7E-13	2.5E-13	2.3E-13	2.2E-13	2.2E-13
NW	3.7E-13	3.5E-13	3.1E-13	2.9E-13	2.7E-13	2.6E-13	2.6E-13
WNW	4.9E-13	4.6E-13	4.1E-13	3.8E-13	3.5E-13	3.4E-13	3.4E-13
W	4.8E-13	4.5E-13	4.1E-13	3.7E-13	3.5E-13	3.3E-13	3.3E-13
WSW	8.3E-13	7.8E-13	7.1E-13	6.5E-13	6.0E-13	5.8E-13	5.7E-13
SW	1.5E-12	1.4E-12	1.3E-12	1.2E-12	1.1E-12	1.1E-12	1.0E-12
SSW	2.4E-12	2.2E-12	2.0E-12	1.9E-12	1.7E-12	1.7E-12	1.6E-12
S	3.3E-12	3.1E-12	2.7E-12	2.5E-12	2.3E-12	2.2E-12	2.2E-12
SSE	3.1E-12	3.0E-12	2.7E-12	2.5E-12	2.3E-12	2.2E-12	2.2E-12
SE	1.1E-12	1.0E-12	9.0E-13	8.2E-13	7.6E-13	7.3E-13	7.2E-13
ESE	6.3E-13	5.9E-13	5.3E-13	4.8E-13	4.4E-13	4.3E-13	4.2E-13
E	7.7E-13	7.2E-13	6.4E-13	5.9E-13	5.4E-13	5.2E-13	5.1E-13
ENE	9.7E-13	9.1E-13	8.2E-13	7.5E-13	6.9E-13	6.7E-13	6.6E-13
NE	1.6E-12	1.5E-12	1.4E-12	1.3E-12	1.2E-12	1.1E-12	1.1E-12
NNE	9.2E-13	8.6E-13	7.8E-13	7.2E-13	6.6E-13	6.4E-13	6.3E-13

	Distance (m)						
Direction	36721	36809	37729	39079	39220	39559	43584
N	3.9E-13	3.9E-13	3.7E-13	3.5E-13	3.5E-13	3.4E-13	2.9E-13
NNW	2.1E-13	2.1E-13	2.0E-13	1.9E-13	1.9E-13	1.9E-13	1.6E-13
NW	2.4E-13	2.4E-13	2.3E-13	2.2E-13	2.2E-13	2.2E-13	1.8E-13
WNW	3.2E-13	3.2E-13	3.1E-13	2.9E-13	2.9E-13	2.9E-13	2.4E-13
W	3.1E-13	3.1E-13	3.0E-13	2.8E-13	2.8E-13	2.8E-13	2.4E-13
WSW	5.5E-13	5.5E-13	5.3E-13	5.0E-13	4.9E-13	4.9E-13	4.2E-13
SW	1.0E-12	1.0E-12	9.6E-13	9.1E-13	9.0E-13	8.9E-13	7.6E-13
SSW	1.6E-12	1.6E-12	1.5E-12	1.4E-12	1.4E-12	1.4E-12	1.2E-12

	Cl-38C.SUM						
S	2.1E-12	2.1E-12	2.0E-12	1.9E-12	1.9E-12	1.9E-12	1.6E-12
SSE	2.1E-12	2.1E-12	2.0E-12	1.9E-12	1.9E-12	1.8E-12	1.6E-12
SE	6.8E-13	6.8E-13	6.5E-13	6.2E-13	6.1E-13	6.0E-13	5.1E-13
ESE	4.0E-13	4.0E-13	3.8E-13	3.6E-13	3.6E-13	3.5E-13	2.9E-13
E	4.9E-13	4.9E-13	4.7E-13	4.4E-13	4.3E-13	4.3E-13	3.6E-13
ENE	6.3E-13	6.3E-13	6.0E-13	5.7E-13	5.6E-13	5.6E-13	4.7E-13
NE	1.1E-12	1.1E-12	1.0E-12	9.7E-13	9.7E-13	9.5E-13	8.1E-13
NNE	6.0E-13	6.0E-13	5.8E-13	5.5E-13	5.4E-13	5.4E-13	4.6E-13

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SUMMARY
Page 8

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)					
Direction	45196	45275	45654	45677	46668	47969
N	2.7E-13	2.7E-13	2.7E-13	2.7E-13	2.6E-13	2.4E-13
NNW	1.5E-13	1.5E-13	1.5E-13	1.5E-13	1.4E-13	1.4E-13
NW	1.7E-13	1.7E-13	1.7E-13	1.7E-13	1.6E-13	1.6E-13
WNW	2.3E-13	2.3E-13	2.2E-13	2.2E-13	2.2E-13	2.0E-13
W	2.2E-13	2.2E-13	2.2E-13	2.2E-13	2.1E-13	2.0E-13
WSW	3.9E-13	3.9E-13	3.8E-13	3.8E-13	3.7E-13	3.5E-13
SW	7.2E-13	7.1E-13	7.0E-13	7.0E-13	6.8E-13	6.5E-13
SSW	1.1E-12	1.1E-12	1.1E-12	1.1E-12	1.0E-12	9.9E-13
S	1.5E-12	1.5E-12	1.4E-12	1.4E-12	1.4E-12	1.3E-12
SSE	1.5E-12	1.5E-12	1.5E-12	1.5E-12	1.4E-12	1.3E-12
SE	4.7E-13	4.7E-13	4.6E-13	4.6E-13	4.5E-13	4.2E-13
ESE	2.7E-13	2.7E-13	2.7E-13	2.7E-13	2.6E-13	2.4E-13
E	3.3E-13	3.3E-13	3.2E-13	3.2E-13	3.1E-13	2.9E-13
ENE	4.4E-13	4.4E-13	4.3E-13	4.3E-13	4.2E-13	3.9E-13
NE	7.6E-13	7.6E-13	7.5E-13	7.5E-13	7.2E-13	6.9E-13
NNE	4.3E-13	4.3E-13	4.2E-13	4.2E-13	4.1E-13	3.9E-13

CL-38D.SUM

C A P 8 8 - P C

Version 3.0

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment
Feb 20, 2008 02:31 pm

Facility: INL
Address: PO Box 1625
City: Idaho Falls
State: ID Zip: 83415

Source Category:
Source Type: Stack
Emission Year: 2008

Comments: TAN-TSF
Receptors 60-62

Dataset Name: RUND
Dataset Date: 08/02/20 2:20:00 PM
Wind File: C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

Feb 20, 2008 02:31 pm

SUMMARY
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
Adrenals	1.76E-06
B Surfac	2.79E-06
Breasts	2.28E-06
St wall	2.75E-06
ULI wall	1.80E-06
Kidneys	1.89E-06
Lungs	2.96E-06
Ovaries	1.78E-06
R Marrow	2.07E-06
Spleen	1.92E-06
Thymus	2.03E-06
Uterus	1.73E-06

	Cl-38D.SUM
Bld wall	1.82E-06
Brain	2.21E-06
Esophagu	4.95E-06
SI wall	1.78E-06
LLI wall	1.77E-06
Liver	1.91E-06
Muscle	2.02E-06
Pancreas	1.77E-06
Skin	5.14E-06
Testes	2.02E-06
Thyroid	2.10E-06
EFEC	2.31E-06

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	0.00E+00
INHALATION	3.04E-07
AIR IMMERSION	2.00E-06
GROUND SURFACE	0.00E+00
INTERNAL	3.04E-07
EXTERNAL	2.00E-06
TOTAL	2.31E-06

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SUMMARY
Page 2

NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
Cl-38	2.31E-06
TOTAL	2.31E-06

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SUMMARY
Page 3

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
Esophagu	2.10E-14

Page 2

	Cl-38D.SUM
Stomach	1.25E-13
Colon	1.85E-13
Liver	2.91E-14
LUNG	2.96E-13
Bone	2.65E-15
Skin	5.14E-15
Breast	1.11E-13
Ovary	2.53E-14
Bladder	4.39E-14
Kidneys	9.85E-15
Thyroid	6.70E-15
Leukemia	1.16E-13
Residual	2.76E-13
Total	1.25E-12
TOTAL	2.50E-12

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	0.00E+00
INHALATION	1.54E-13
AIR IMMERSION	1.10E-12
GROUND SURFACE	0.00E+00
INTERNAL	1.54E-13
EXTERNAL	1.10E-12
TOTAL	1.25E-12

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SUMMARY
Page 4

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
Cl-38	1.25E-12
TOTAL	1.25E-12

Feb 20, 2008 02:31 pm

SUMMARY
Page 5

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)

Direction	50024	54611	58610
-----------	-------	-------	-------

N	4.1E-07	3.4E-07	2.7E-07
NNW	2.4E-07	2.0E-07	1.7E-07
NW	2.7E-07	2.2E-07	1.8E-07
WNW	3.5E-07	2.9E-07	2.3E-07
W	3.3E-07	2.8E-07	2.2E-07
WSW	6.0E-07	5.0E-07	4.1E-07
SW	1.1E-06	9.3E-07	7.7E-07
SSW	1.7E-06	1.4E-06	1.2E-06
S	2.3E-06	1.9E-06	1.5E-06
SSE	2.3E-06	1.9E-06	1.6E-06
SE	7.1E-07	5.8E-07	4.5E-07
ESE	4.1E-07	3.3E-07	2.5E-07
E	4.9E-07	3.9E-07	2.9E-07
ENE	6.7E-07	5.5E-07	4.4E-07
NE	1.2E-06	9.8E-07	8.1E-07
NNE	6.6E-07	5.5E-07	4.5E-07

Feb 20, 2008 02:31 pm

SUMMARY
Page 6

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

Distance (m)

Direction	50024	54611	58610
-----------	-------	-------	-------

N	2.2E-13	1.8E-13	1.5E-13
NNW	1.3E-13	1.1E-13	9.0E-14
NW	1.4E-13	1.2E-13	9.6E-14
WNW	1.9E-13	1.6E-13	1.3E-13
W	1.8E-13	1.5E-13	1.2E-13
WSW	3.3E-13	2.7E-13	2.2E-13
SW	6.0E-13	5.0E-13	4.2E-13
SSW	9.2E-13	7.7E-13	6.3E-13
S	1.2E-12	1.0E-12	8.3E-13
SSE	1.3E-12	1.1E-12	8.8E-13
SE	3.9E-13	3.1E-13	2.4E-13
ESE	2.2E-13	1.8E-13	1.3E-13
E	2.7E-13	2.1E-13	1.6E-13
ENE	3.6E-13	3.0E-13	2.4E-13
NE	6.4E-13	5.3E-13	4.4E-13
NNE	3.6E-13	3.0E-13	2.4E-13

08/02/20 2:16:00 PM Feb 20, 2008 02:30 pm
 RUNA RUNA.
 C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

INL
 PO Box 1625

Idaho Falls	ID	83415	2008				
TAN-TSF							
Receptors 1-20							
100.0000,500.0000							
0	0	0	0	0	20		
10344	10365	10472	10590	11103	11989	12522	13245
13286	13483	13612	13664	13959	14258	14374	15241
15441	15784	15844	16323				
800	280.20	16.30	3.54				
0	0						
1							
1.00	1.00	0.000E+00	0.000E+00				
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
2	0	1					
Cl-39	M	1	1.000e+00	1.000e+00	5.480e-05		1
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.630e-06	0.0018	0.000e+00					
unspecified		2.000E+01	1.000E+02	2.000E-02	4.000E-02	1.795E+01	
Ar-39	G	0	0.000e+00	0.000e+00	5.480e-05		1
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified		0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.053E-06	
0.08	0.92	0.00	Urban				
0.00	1.00	0.00					
0.01	0.99	0.00					
T	T	T	T				
2.030e-01	4.560e-02	1.700e-02					
Cl-39	17	0					
00	00	00	00	00	00		
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00			
Ar-39	18	0					
00	00	00	00	00	00		
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00			
2							
Cl-39	M	1	1.000e+00	1.000e+00	5.480e-05		0
9.013E-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	0.000E+00	0.000E+00	0.000E+00		
1.010e-05	0.0018	0.000e+00					
unspecified		2.000E+01	1.000E+02	2.000E-02	4.000E-02	1.795E+01	
Ar-39	G	0	0.000e+00	0.000e+00	5.480e-05		0
3.877E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.810E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified		0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.053E-06	
--DecayStep--1							
--LimitChildren--1							
--Children--5							

08/02/20 2:17:00 PM Feb 20, 2008 02:30 pm
 RUNB RUNB.
 C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

INL
 PO Box 1625

Idaho Falls ID 83415 2008

TAN-TSF
 Receptors 21-39
 100.0000,500.0000

0	0	0	0	0	19		
17035	17329	18607	18834	18860	18890	19860	19891
20457	21314	21349	22159	23521	24430	24545	25171
26794	27275	27389	0				
800	280.20	16.30	3.54				
0	0						
1							
1.00	1.00	0.000E+00	0.000E+00				
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
2	0	1					
Cl-39	M	1	1.000e+00	1.000e+00	5.480e-05		1
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.630e-06	0.0018	0.000e+00					
unspecified		2.000E+01	1.000E+02	2.000E-02	4.000E-02	1.795E+01	
Ar-39	G	0	0.000e+00	0.000e+00	5.480e-05		1
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified		0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.053E-06	
0.08	0.92	0.00	Urban				
0.00	1.00	0.00					
0.01	0.99	0.00					
T	T	T	T				
2.030e-01	4.560e-02	1.700e-02					
Cl-39	17	0					
00	00	00	00	00	00		
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00			
Ar-39	18	0					
00	00	00	00	00	00		
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00			
2							
Cl-39	M	1	1.000e+00	1.000e+00	5.480e-05		0
9.013E-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	0.000E+00	0.000E+00	0.000E+00		
1.010e-05	0.0018	0.000e+00					
unspecified		2.000E+01	1.000E+02	2.000E-02	4.000E-02	1.795E+01	
Ar-39	G	0	0.000e+00	0.000e+00	5.480e-05		0
3.877E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.810E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified		0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.053E-06	

--DecayStep--1
 --LimitChildren--1
 --Children--5

08/02/20 2:19:00 PM Feb 20, 2008 02:31 pm
 RUNC RUNC.
 C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

INL
 PO Box 1625

Idaho Falls	ID	83415	2008				
TAN-TSF							
Receptors 40-59							
100.0000,500.0000							
0	0	0	0	0	20		
27715	28919	31060	32802	34577	35279	35683	36721
36809	37729	39079	39220	39559	43584	45196	45275
45654	45677	46668	47969				
800	280.20	16.30	3.54				
0	0						
1							
1.00	1.00	0.000E+00	0.000E+00				
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
2	0	1					
Cl-39	M	1	1.000e+00	1.000e+00	5.480e-05		1
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.630e-06	0.0018	0.000e+00					
unspecified		2.000E+01	1.000E+02	2.000E-02	4.000E-02	1.795E+01	
Ar-39	G	0	0.000e+00	0.000e+00	5.480e-05		1
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified		0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.053E-06	
0.08	0.92	0.00	Urban				
0.00	1.00	0.00					
0.01	0.99	0.00					
T	T	T	T				
2.030e-01	4.560e-02	1.700e-02					
Cl-39	17	0					
00	00	00	00	00	00		
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00			
Ar-39	18	0					
00	00	00	00	00	00		
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00			
2							
Cl-39	M	1	1.000e+00	1.000e+00	5.480e-05		0
9.013E-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	0.000E+00	0.000E+00	0.000E+00		
1.010e-05	0.0018	0.000e+00					
unspecified		2.000E+01	1.000E+02	2.000E-02	4.000E-02	1.795E+01	
Ar-39	G	0	0.000e+00	0.000e+00	5.480e-05		0
3.877E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.810E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified		0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.053E-06	
--DecayStep--1							
--LimitChildren--1							
--Children--5							

08/02/20 2:20:00 PM Feb 20, 2008 02:31 pm
 RUND RUND.
 C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

INL
 PO Box 1625

Idaho Falls	ID	83415					
		2008					

TAN-TSF
 Receptors 60-62
 100.0000,500.0000

0	0	0	0	0	3		
50024	54611	58610	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0				
800	280.20	16.30	3.54				
0	0						
1							
1.00	1.00	0.000E+00	0.000E+00				
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
2	0	1					
Cl-39	M	1	1.000e+00	1.000e+00	5.480e-05		1
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.630e-06	0.0018	0.000e+00					
unspecified		2.000E+01	1.000E+02	2.000E-02	4.000E-02	1.795E+01	
Ar-39	G	0	0.000e+00	0.000e+00	5.480e-05		1
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified		0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.053E-06	
0.08	0.92	0.00	Urban				
0.00	1.00	0.00					
0.01	0.99	0.00					

T	T	T	T				
2.030e-01	4.560e-02	1.700e-02					
Cl-39	17	0					
00	00	00	00	00	00		
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00			
Ar-39	18	0					
00	00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00			

2							
Cl-39	M	1	1.000e+00	1.000e+00	5.480e-05		0
9.013E-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	0.000E+00	0.000E+00	0.000E+00		
1.010e-05	0.0018	0.000e+00					
unspecified		2.000E+01	1.000E+02	2.000E-02	4.000E-02	1.795E+01	
Ar-39	G	0	0.000e+00	0.000e+00	5.480e-05		0
3.877E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.810E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified		0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.053E-06	

--DecayStep--1
 --LimitChildren--1
 --Children--5

CL-39A.SUM

C A P 8 8 - P C

Version 3.0

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment
Feb 20, 2008 02:30 pm

Facility: INL
Address: PO Box 1625
City: Idaho Falls
State: ID Zip: 83415

Source Category:
Source Type: Stack
Emission Year: 2008

Comments: TAN-TSF
Receptors 1-20

Dataset Name: RUNA
Dataset Date: 08/02/20 2:16:00 PM
Wind File: C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

Feb 20, 2008 02:30 pm

SUMMARY
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
Adrenals	2.15E-05
B Surfac	3.78E-05
Breasts	2.88E-05
St wall	3.16E-05
ULI wall	2.19E-05
Kidneys	2.31E-05
Lungs	3.84E-05
Ovaries	2.18E-05
R Marrow	2.53E-05
Spleen	2.36E-05
Thymus	2.45E-05
Uterus	2.07E-05

	Cl-39A.SUM
Bld wall	2.15E-05
Brain	2.74E-05
Esophagu	7.55E-05
SI wall	2.14E-05
LLI wall	2.15E-05
Liver	2.34E-05
Muscle	2.50E-05
Pancreas	2.13E-05
Skin	4.84E-05
Testes	2.53E-05
Thyroid	2.62E-05
EFEC	2.87E-05

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	0.00E+00
INHALATION	4.18E-06
AIR IMMERSION	2.45E-05
GROUND SURFACE	0.00E+00
INTERNAL	4.18E-06
EXTERNAL	2.45E-05
TOTAL	2.87E-05

Feb 20, 2008 02:30 pm

SUMMARY
Page 2

NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
Cl-39	2.87E-05
Ar-39	2.83E-15
TOTAL	2.87E-05

Feb 20, 2008 02:30 pm

SUMMARY
Page 3

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
--------	--

	Cl-39A.SUM
Esophagu	2.57E-13
Stomach	1.41E-12
Colon	2.26E-12
Liver	3.56E-13
LUNG	3.84E-12
Bone	3.61E-14
Skin	4.84E-14
Breast	1.39E-12
Ovary	3.10E-13
Bladder	5.22E-13
Kidneys	1.21E-13
Thyroid	8.34E-14
Leukemia	1.42E-12
Residual	3.38E-12
Total	1.54E-11
TOTAL	3.09E-11

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	0.00E+00
INHALATION	2.04E-12
AIR IMMERSION	1.34E-11
GROUND SURFACE	0.00E+00
INTERNAL	2.04E-12
EXTERNAL	1.34E-11
TOTAL	1.54E-11

Feb 20, 2008 02:30 pm

SUMMARY
Page 4

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
Cl-39	1.54E-11
Ar-39	3.59E-22
TOTAL	1.54E-11

Feb 20, 2008 02:30 pm

SUMMARY
Page 5

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

C1-39A.SUM

Direction	10344	10365	10472	10590	11103	11989	12522
N	5.5E-06	5.5E-06	5.4E-06	5.3E-06	5.0E-06	4.5E-06	4.3E-06
NNW	2.5E-06	2.5E-06	2.5E-06	2.4E-06	2.3E-06	2.1E-06	2.0E-06
NW	3.2E-06	3.1E-06	3.1E-06	3.1E-06	2.9E-06	2.6E-06	2.5E-06
WNW	4.2E-06	4.2E-06	4.1E-06	4.0E-06	3.8E-06	3.4E-06	3.2E-06
W	4.4E-06	4.4E-06	4.3E-06	4.2E-06	4.0E-06	3.6E-06	3.4E-06
WSW	7.0E-06	7.0E-06	6.9E-06	6.8E-06	6.4E-06	5.7E-06	5.4E-06
SW	1.3E-05	1.3E-05	1.2E-05	1.2E-05	1.1E-05	1.0E-05	9.7E-06
SSW	2.0E-05	2.0E-05	2.0E-05	2.0E-05	1.8E-05	1.7E-05	1.6E-05
S	2.9E-05	2.9E-05	2.8E-05	2.8E-05	2.6E-05	2.3E-05	2.2E-05
SSE	2.5E-05	2.5E-05	2.5E-05	2.5E-05	2.3E-05	2.1E-05	2.0E-05
SE	1.0E-05	1.0E-05	1.0E-05	9.9E-06	9.2E-06	8.3E-06	7.8E-06
ESE	6.3E-06	6.3E-06	6.2E-06	6.1E-06	5.7E-06	5.1E-06	4.8E-06
E	7.9E-06	7.9E-06	7.8E-06	7.6E-06	7.2E-06	6.4E-06	6.1E-06
ENE	8.6E-06	8.5E-06	8.4E-06	8.3E-06	7.8E-06	7.0E-06	6.6E-06
NE	1.4E-05	1.4E-05	1.4E-05	1.4E-05	1.3E-05	1.2E-05	1.1E-05
NNE	8.0E-06	8.0E-06	7.9E-06	7.8E-06	7.3E-06	6.6E-06	6.2E-06

Distance (m)

Direction	13245	13286	13483	13612	13664	13959	14258
N	3.9E-06	3.9E-06	3.8E-06	3.8E-06	3.8E-06	3.7E-06	3.5E-06
NNW	1.8E-06	1.8E-06	1.8E-06	1.8E-06	1.7E-06	1.7E-06	1.6E-06
NW	2.3E-06	2.3E-06	2.2E-06	2.2E-06	2.2E-06	2.1E-06	2.1E-06
WNW	3.0E-06	3.0E-06	2.9E-06	2.9E-06	2.9E-06	2.8E-06	2.7E-06
W	3.1E-06	3.1E-06	3.0E-06	3.0E-06	3.0E-06	2.9E-06	2.8E-06
WSW	5.0E-06	4.9E-06	4.9E-06	4.8E-06	4.8E-06	4.6E-06	4.5E-06
SW	8.9E-06	8.9E-06	8.7E-06	8.6E-06	8.5E-06	8.3E-06	8.0E-06
SSW	1.4E-05	1.4E-05	1.4E-05	1.4E-05	1.4E-05	1.3E-05	1.3E-05
S	2.0E-05	2.0E-05	2.0E-05	1.9E-05	1.9E-05	1.9E-05	1.8E-05
SSE	1.8E-05	1.8E-05	1.8E-05	1.7E-05	1.7E-05	1.7E-05	1.6E-05
SE	7.2E-06	7.2E-06	7.0E-06	6.9E-06	6.9E-06	6.7E-06	6.5E-06
ESE	4.5E-06	4.4E-06	4.3E-06	4.3E-06	4.3E-06	4.1E-06	4.0E-06
E	5.6E-06	5.6E-06	5.4E-06	5.4E-06	5.3E-06	5.2E-06	5.0E-06
ENE	6.1E-06	6.1E-06	5.9E-06	5.9E-06	5.8E-06	5.7E-06	5.5E-06
NE	1.0E-05	1.0E-05	9.8E-06	9.6E-06	9.6E-06	9.3E-06	9.0E-06
NNE	5.7E-06	5.7E-06	5.6E-06	5.5E-06	5.5E-06	5.3E-06	5.1E-06

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SUMMARY
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INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)						
Direction	14374	15241	15441	15784	15844	16323

	C1-39A.SUM					
N	3.5E-06	3.2E-06	3.2E-06	3.1E-06	3.0E-06	2.9E-06
NNW	1.6E-06	1.5E-06	1.5E-06	1.4E-06	1.4E-06	1.4E-06
NW	2.0E-06	1.9E-06	1.8E-06	1.8E-06	1.8E-06	1.7E-06
WNW	2.7E-06	2.5E-06	2.4E-06	2.4E-06	2.3E-06	2.2E-06
W	2.8E-06	2.6E-06	2.5E-06	2.4E-06	2.4E-06	2.3E-06
WSW	4.4E-06	4.1E-06	4.0E-06	3.9E-06	3.9E-06	3.7E-06
SW	7.9E-06	7.3E-06	7.2E-06	6.9E-06	6.9E-06	6.6E-06
SSW	1.3E-05	1.2E-05	1.2E-05	1.1E-05	1.1E-05	1.1E-05
S	1.8E-05	1.6E-05	1.6E-05	1.6E-05	1.5E-05	1.5E-05
SSE	1.6E-05	1.5E-05	1.5E-05	1.4E-05	1.4E-05	1.4E-05
SE	6.4E-06	5.9E-06	5.8E-06	5.6E-06	5.5E-06	5.3E-06
ESE	4.0E-06	3.6E-06	3.6E-06	3.4E-06	3.4E-06	3.3E-06
E	5.0E-06	4.5E-06	4.4E-06	4.3E-06	4.3E-06	4.1E-06
ENE	5.4E-06	5.0E-06	4.9E-06	4.7E-06	4.7E-06	4.5E-06
NE	8.9E-06	8.2E-06	8.0E-06	7.8E-06	7.7E-06	7.4E-06
NNE	5.1E-06	4.7E-06	4.6E-06	4.4E-06	4.4E-06	4.2E-06

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)						
Direction	10344	10365	10472	10590	11103	11989	12522
N	3.0E-12	3.0E-12	2.9E-12	2.9E-12	2.7E-12	2.4E-12	2.3E-12
NNW	1.4E-12	1.4E-12	1.3E-12	1.3E-12	1.2E-12	1.1E-12	1.1E-12
NW	1.7E-12	1.7E-12	1.7E-12	1.6E-12	1.5E-12	1.4E-12	1.3E-12
WNW	2.2E-12	2.2E-12	2.2E-12	2.2E-12	2.0E-12	1.9E-12	1.7E-12
W	2.4E-12	2.4E-12	2.3E-12	2.3E-12	2.1E-12	1.9E-12	1.8E-12
WSW	3.8E-12	3.8E-12	3.7E-12	3.7E-12	3.4E-12	3.1E-12	2.9E-12
SW	6.8E-12	6.8E-12	6.7E-12	6.6E-12	6.1E-12	5.5E-12	5.2E-12
SSW	1.1E-11	1.1E-11	1.1E-11	1.1E-11	9.9E-12	8.9E-12	8.4E-12
S	1.5E-11	1.5E-11	1.5E-11	1.5E-11	1.4E-11	1.3E-11	1.2E-11
SSE	1.4E-11	1.4E-11	1.3E-11	1.3E-11	1.2E-11	1.1E-11	1.1E-11
SE	5.5E-12	5.5E-12	5.4E-12	5.3E-12	5.0E-12	4.5E-12	4.2E-12
ESE	3.4E-12	3.4E-12	3.3E-12	3.3E-12	3.1E-12	2.8E-12	2.6E-12
E	4.3E-12	4.2E-12	4.2E-12	4.1E-12	3.9E-12	3.5E-12	3.3E-12
ENE	4.6E-12	4.6E-12	4.5E-12	4.5E-12	4.2E-12	3.8E-12	3.6E-12
NE	7.7E-12	7.7E-12	7.5E-12	7.4E-12	6.9E-12	6.2E-12	5.9E-12
NNE	4.3E-12	4.3E-12	4.3E-12	4.2E-12	3.9E-12	3.5E-12	3.3E-12

	Distance (m)						
Direction	13245	13286	13483	13612	13664	13959	14258
N	2.1E-12	2.1E-12	2.1E-12	2.0E-12	2.0E-12	2.0E-12	1.9E-12
NNW	9.8E-13	9.8E-13	9.6E-13	9.4E-13	9.4E-13	9.1E-13	8.9E-13
NW	1.2E-12	1.2E-12	1.2E-12	1.2E-12	1.2E-12	1.1E-12	1.1E-12
WNW	1.6E-12	1.6E-12	1.6E-12	1.6E-12	1.6E-12	1.5E-12	1.5E-12
W	1.7E-12	1.7E-12	1.6E-12	1.6E-12	1.6E-12	1.6E-12	1.5E-12
WSW	2.7E-12	2.7E-12	2.6E-12	2.6E-12	2.6E-12	2.5E-12	2.4E-12

	C1-39A.SUM						
SW	4.8E-12	4.8E-12	4.7E-12	4.6E-12	4.6E-12	4.5E-12	4.3E-12
SSW	7.7E-12	7.7E-12	7.6E-12	7.5E-12	7.4E-12	7.2E-12	7.0E-12
S	1.1E-11	1.1E-11	1.1E-11	1.0E-11	1.0E-11	1.0E-11	9.7E-12
SSE	9.8E-12	9.7E-12	9.5E-12	9.4E-12	9.4E-12	9.1E-12	8.8E-12
SE	3.9E-12	3.9E-12	3.8E-12	3.7E-12	3.7E-12	3.6E-12	3.5E-12
ESE	2.4E-12	2.4E-12	2.3E-12	2.3E-12	2.3E-12	2.2E-12	2.2E-12
E	3.0E-12	3.0E-12	2.9E-12	2.9E-12	2.9E-12	2.8E-12	2.7E-12
ENE	3.3E-12	3.3E-12	3.2E-12	3.2E-12	3.1E-12	3.0E-12	3.0E-12
NE	5.4E-12	5.4E-12	5.3E-12	5.2E-12	5.2E-12	5.0E-12	4.9E-12
NNE	3.1E-12	3.1E-12	3.0E-12	3.0E-12	2.9E-12	2.9E-12	2.8E-12

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)					
Direction	14374	15241	15441	15784	15844	16323
N	1.9E-12	1.7E-12	1.7E-12	1.6E-12	1.6E-12	1.6E-12
NNW	8.8E-13	8.1E-13	8.0E-13	7.7E-13	7.7E-13	7.4E-13
NW	1.1E-12	1.0E-12	9.9E-13	9.6E-13	9.5E-13	9.1E-13
WNW	1.4E-12	1.3E-12	1.3E-12	1.3E-12	1.3E-12	1.2E-12
W	1.5E-12	1.4E-12	1.3E-12	1.3E-12	1.3E-12	1.2E-12
WSW	2.4E-12	2.2E-12	2.2E-12	2.1E-12	2.1E-12	2.0E-12
SW	4.3E-12	3.9E-12	3.9E-12	3.7E-12	3.7E-12	3.6E-12
SSW	6.9E-12	6.3E-12	6.2E-12	6.0E-12	6.0E-12	5.7E-12
S	9.6E-12	8.8E-12	8.7E-12	8.4E-12	8.3E-12	8.0E-12
SSE	8.7E-12	8.0E-12	7.9E-12	7.6E-12	7.6E-12	7.3E-12
SE	3.4E-12	3.2E-12	3.1E-12	3.0E-12	3.0E-12	2.8E-12
ESE	2.1E-12	2.0E-12	1.9E-12	1.9E-12	1.8E-12	1.8E-12
E	2.7E-12	2.4E-12	2.4E-12	2.3E-12	2.3E-12	2.2E-12
ENE	2.9E-12	2.7E-12	2.6E-12	2.6E-12	2.5E-12	2.4E-12
NE	4.8E-12	4.4E-12	4.3E-12	4.2E-12	4.2E-12	4.0E-12
NNE	2.7E-12	2.5E-12	2.5E-12	2.4E-12	2.4E-12	2.3E-12

CL-39B.SUM

C A P 8 8 - P C

Version 3.0

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment

Feb 20, 2008 02:30 pm

Facility: INL
Address: PO Box 1625
City: Idaho Falls
State: ID Zip: 83415

Source Category:
Source Type: Stack
Emission Year: 2008

Comments: TAN-TSF
Receptors 21-39

Dataset Name: RUNB
Dataset Date: 08/02/20 2:17:00 PM
Wind File: C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

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SUMMARY
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ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
Adrenals	1.04E-05
B Surfac	1.83E-05
Breasts	1.39E-05
St wall	1.53E-05
ULI wall	1.06E-05
Kidneys	1.12E-05
Lungs	1.86E-05
Ovaries	1.05E-05
R Marrow	1.22E-05
Spleen	1.14E-05
Thymus	1.19E-05
Uterus	1.00E-05

	Cl-39B.SUM
Bld wall	1.04E-05
Brain	1.32E-05
Esophagu	3.65E-05
SI wall	1.03E-05
LLI wall	1.04E-05
Liver	1.13E-05
Muscle	1.21E-05
Pancreas	1.03E-05
Skin	2.34E-05
Testes	1.22E-05
Thyroid	1.27E-05
EFEC	1.39E-05

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	0.00E+00
INHALATION	2.02E-06
AIR IMMERSION	1.18E-05
GROUND SURFACE	0.00E+00
INTERNAL	2.02E-06
EXTERNAL	1.18E-05
TOTAL	1.39E-05

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SUMMARY
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NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
Cl-39	1.39E-05
Ar-39	1.55E-15
TOTAL	1.39E-05

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SUMMARY
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CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
--------	--

	Cl-39B.SUM
Esophagu	1.24E-13
Stomach	6.81E-13
Colon	1.09E-12
Liver	1.72E-13
LUNG	1.86E-12
Bone	1.75E-14
Skin	2.34E-14
Breast	6.75E-13
Ovary	1.50E-13
Bladder	2.53E-13
Kidneys	5.84E-14
Thyroid	4.04E-14
Leukemia	6.88E-13
Residual	1.64E-12
Total	7.46E-12
TOTAL	1.49E-11

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	0.00E+00
INHALATION	9.88E-13
AIR IMMERSION	6.48E-12
GROUND SURFACE	0.00E+00
INTERNAL	9.88E-13
EXTERNAL	6.48E-12
TOTAL	7.46E-12

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SUMMARY
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NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
Cl-39	7.46E-12
Ar-39	1.96E-22
TOTAL	7.46E-12

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SUMMARY
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INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Cl-39B.SUM

Direction	17035	17329	18607	18834	18860	18890	19860
N	2.7E-06	2.7E-06	2.4E-06	2.3E-06	2.3E-06	2.3E-06	2.1E-06
NNW	1.3E-06	1.3E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.0E-06
NW	1.6E-06	1.6E-06	1.4E-06	1.4E-06	1.4E-06	1.4E-06	1.3E-06
WNW	2.1E-06	2.1E-06	1.8E-06	1.8E-06	1.8E-06	1.8E-06	1.7E-06
W	2.2E-06	2.1E-06	1.9E-06	1.8E-06	1.8E-06	1.8E-06	1.7E-06
WSW	3.5E-06	3.4E-06	3.1E-06	3.0E-06	3.0E-06	3.0E-06	2.8E-06
SW	6.2E-06	6.1E-06	5.5E-06	5.4E-06	5.3E-06	5.3E-06	4.9E-06
SSW	1.0E-05	9.7E-06	8.7E-06	8.6E-06	8.5E-06	8.5E-06	7.9E-06
S	1.4E-05	1.4E-05	1.2E-05	1.2E-05	1.2E-05	1.2E-05	1.1E-05
SSE	1.3E-05	1.2E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.0E-05
SE	5.0E-06	4.8E-06	4.3E-06	4.2E-06	4.2E-06	4.2E-06	3.8E-06
ESE	3.1E-06	3.0E-06	2.6E-06	2.6E-06	2.6E-06	2.6E-06	2.4E-06
E	3.8E-06	3.7E-06	3.3E-06	3.2E-06	3.2E-06	3.2E-06	2.9E-06
ENE	4.2E-06	4.1E-06	3.7E-06	3.6E-06	3.6E-06	3.6E-06	3.3E-06
NE	6.9E-06	6.8E-06	6.1E-06	5.9E-06	5.9E-06	5.9E-06	5.5E-06
NNE	4.0E-06	3.9E-06	3.5E-06	3.4E-06	3.4E-06	3.4E-06	3.1E-06

Distance (m)

Direction	19891	20457	21314	21349	22159	23521	24430
N	2.1E-06	2.0E-06	1.9E-06	1.9E-06	1.7E-06	1.5E-06	1.4E-06
NNW	1.0E-06	9.8E-07	9.1E-07	9.1E-07	8.5E-07	7.6E-07	7.0E-07
NW	1.3E-06	1.2E-06	1.1E-06	1.1E-06	1.0E-06	9.2E-07	8.3E-07
WNW	1.7E-06	1.6E-06	1.5E-06	1.5E-06	1.4E-06	1.2E-06	1.1E-06
W	1.7E-06	1.6E-06	1.5E-06	1.5E-06	1.4E-06	1.2E-06	1.1E-06
WSW	2.7E-06	2.6E-06	2.4E-06	2.4E-06	2.3E-06	2.0E-06	1.9E-06
SW	4.9E-06	4.7E-06	4.4E-06	4.4E-06	4.1E-06	3.7E-06	3.4E-06
SSW	7.8E-06	7.5E-06	7.0E-06	7.0E-06	6.5E-06	5.8E-06	5.3E-06
S	1.1E-05	1.0E-05	9.6E-06	9.6E-06	9.0E-06	8.0E-06	7.3E-06
SSE	1.0E-05	9.6E-06	9.0E-06	8.9E-06	8.4E-06	7.5E-06	6.9E-06
SE	3.8E-06	3.6E-06	3.4E-06	3.4E-06	3.1E-06	2.7E-06	2.4E-06
ESE	2.3E-06	2.2E-06	2.1E-06	2.0E-06	1.9E-06	1.6E-06	1.5E-06
E	2.9E-06	2.8E-06	2.6E-06	2.5E-06	2.3E-06	2.0E-06	1.8E-06
ENE	3.3E-06	3.2E-06	2.9E-06	2.9E-06	2.7E-06	2.4E-06	2.2E-06
NE	5.4E-06	5.2E-06	4.8E-06	4.8E-06	4.5E-06	4.0E-06	3.7E-06
NNE	3.1E-06	3.0E-06	2.8E-06	2.8E-06	2.6E-06	2.3E-06	2.1E-06

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SUMMARY
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INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)					
Direction	24545	25171	26794	27275	27389

	C1-39B.SUM				
N	1.3E-06	1.2E-06	1.1E-06	1.1E-06	1.1E-06
NNW	6.9E-07	6.5E-07	6.0E-07	5.8E-07	5.8E-07
NW	8.2E-07	7.6E-07	7.0E-07	6.8E-07	6.8E-07
WNW	1.1E-06	1.0E-06	9.2E-07	9.0E-07	8.9E-07
W	1.1E-06	1.0E-06	9.1E-07	8.9E-07	8.8E-07
WSW	1.8E-06	1.7E-06	1.6E-06	1.5E-06	1.5E-06
SW	3.3E-06	3.1E-06	2.9E-06	2.8E-06	2.8E-06
SSW	5.3E-06	4.9E-06	4.5E-06	4.4E-06	4.4E-06
S	7.2E-06	6.8E-06	6.2E-06	6.0E-06	6.0E-06
SSE	6.9E-06	6.5E-06	5.9E-06	5.8E-06	5.8E-06
SE	2.4E-06	2.2E-06	2.0E-06	2.0E-06	2.0E-06
ESE	1.4E-06	1.3E-06	1.2E-06	1.2E-06	1.2E-06
E	1.8E-06	1.6E-06	1.5E-06	1.4E-06	1.4E-06
ENE	2.2E-06	2.0E-06	1.8E-06	1.8E-06	1.8E-06
NE	3.6E-06	3.4E-06	3.1E-06	3.0E-06	3.0E-06
NNE	2.0E-06	1.9E-06	1.7E-06	1.7E-06	1.7E-06

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)						
Direction	17035	17329	18607	18834	18860	18890	19860
N	1.5E-12	1.4E-12	1.3E-12	1.3E-12	1.2E-12	1.2E-12	1.1E-12
NNW	6.9E-13	6.8E-13	6.1E-13	6.0E-13	6.0E-13	6.0E-13	5.5E-13
NW	8.6E-13	8.4E-13	7.5E-13	7.4E-13	7.4E-13	7.3E-13	6.8E-13
WNW	1.1E-12	1.1E-12	9.9E-13	9.7E-13	9.7E-13	9.7E-13	9.0E-13
W	1.2E-12	1.1E-12	1.0E-12	9.9E-13	9.9E-13	9.9E-13	9.1E-13
WSW	1.9E-12	1.8E-12	1.6E-12	1.6E-12	1.6E-12	1.6E-12	1.5E-12
SW	3.3E-12	3.3E-12	2.9E-12	2.9E-12	2.9E-12	2.9E-12	2.7E-12
SSW	5.4E-12	5.2E-12	4.7E-12	4.6E-12	4.6E-12	4.6E-12	4.2E-12
S	7.5E-12	7.3E-12	6.5E-12	6.4E-12	6.4E-12	6.3E-12	5.8E-12
SSE	6.8E-12	6.7E-12	6.0E-12	5.9E-12	5.9E-12	5.9E-12	5.4E-12
SE	2.7E-12	2.6E-12	2.3E-12	2.3E-12	2.3E-12	2.3E-12	2.1E-12
ESE	1.6E-12	1.6E-12	1.4E-12	1.4E-12	1.4E-12	1.4E-12	1.3E-12
E	2.1E-12	2.0E-12	1.8E-12	1.7E-12	1.7E-12	1.7E-12	1.6E-12
ENE	2.3E-12	2.2E-12	2.0E-12	1.9E-12	1.9E-12	1.9E-12	1.8E-12
NE	3.7E-12	3.6E-12	3.3E-12	3.2E-12	3.2E-12	3.2E-12	2.9E-12
NNE	2.1E-12	2.1E-12	1.9E-12	1.8E-12	1.8E-12	1.8E-12	1.7E-12

	Distance (m)						
Direction	19891	20457	21314	21349	22159	23521	24430
N	1.1E-12	1.1E-12	1.0E-12	1.0E-12	9.3E-13	8.1E-13	7.3E-13
NNW	5.5E-13	5.3E-13	4.9E-13	4.9E-13	4.6E-13	4.1E-13	3.8E-13
NW	6.8E-13	6.4E-13	6.0E-13	6.0E-13	5.6E-13	4.9E-13	4.5E-13
WNW	8.9E-13	8.5E-13	7.9E-13	7.9E-13	7.4E-13	6.5E-13	5.9E-13
W	9.1E-13	8.6E-13	8.0E-13	8.0E-13	7.4E-13	6.5E-13	5.9E-13
WSW	1.5E-12	1.4E-12	1.3E-12	1.3E-12	1.2E-12	1.1E-12	1.0E-12

	Cl-39B.SUM						
SW	2.6E-12	2.5E-12	2.4E-12	2.4E-12	2.2E-12	2.0E-12	1.8E-12
SSW	4.2E-12	4.0E-12	3.8E-12	3.7E-12	3.5E-12	3.1E-12	2.9E-12
S	5.8E-12	5.6E-12	5.2E-12	5.2E-12	4.8E-12	4.3E-12	3.9E-12
SSE	5.4E-12	5.2E-12	4.8E-12	4.8E-12	4.5E-12	4.0E-12	3.7E-12
SE	2.1E-12	2.0E-12	1.8E-12	1.8E-12	1.7E-12	1.5E-12	1.3E-12
ESE	1.3E-12	1.2E-12	1.1E-12	1.1E-12	1.0E-12	8.8E-13	7.9E-13
E	1.6E-12	1.5E-12	1.4E-12	1.4E-12	1.3E-12	1.1E-12	9.7E-13
ENE	1.8E-12	1.7E-12	1.6E-12	1.6E-12	1.5E-12	1.3E-12	1.2E-12
NE	2.9E-12	2.8E-12	2.6E-12	2.6E-12	2.4E-12	2.2E-12	2.0E-12
NNE	1.7E-12	1.6E-12	1.5E-12	1.5E-12	1.4E-12	1.2E-12	1.1E-12

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)				
Direction	24545	25171	26794	27275	27389
N	7.2E-13	6.7E-13	6.1E-13	5.9E-13	5.9E-13
NNW	3.7E-13	3.5E-13	3.2E-13	3.1E-13	3.1E-13
NW	4.4E-13	4.1E-13	3.8E-13	3.7E-13	3.6E-13
WNW	5.8E-13	5.4E-13	5.0E-13	4.8E-13	4.8E-13
W	5.8E-13	5.4E-13	4.9E-13	4.8E-13	4.8E-13
WSW	9.9E-13	9.3E-13	8.5E-13	8.3E-13	8.2E-13
SW	1.8E-12	1.7E-12	1.5E-12	1.5E-12	1.5E-12
SSW	2.8E-12	2.7E-12	2.4E-12	2.4E-12	2.4E-12
S	3.9E-12	3.6E-12	3.3E-12	3.2E-12	3.2E-12
SSE	3.7E-12	3.5E-12	3.2E-12	3.1E-12	3.1E-12
SE	1.3E-12	1.2E-12	1.1E-12	1.1E-12	1.1E-12
ESE	7.7E-13	7.1E-13	6.5E-13	6.3E-13	6.2E-13
E	9.5E-13	8.7E-13	7.9E-13	7.7E-13	7.6E-13
ENE	1.2E-12	1.1E-12	9.9E-13	9.6E-13	9.5E-13
NE	2.0E-12	1.8E-12	1.7E-12	1.6E-12	1.6E-12
NNE	1.1E-12	1.0E-12	9.4E-13	9.1E-13	9.1E-13

CL-39C.SUM

C A P 8 8 - P C

Version 3.0

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment
Feb 20, 2008 02:31 pm

Facility: INL
Address: PO Box 1625
City: Idaho Falls
State: ID Zip: 83415

Source Category:
Source Type: Stack
Emission Year: 2008

Comments: TAN-TSF
Receptors 40-59

Dataset Name: RUNC
Dataset Date: 08/02/20 2:19:00 PM
Wind File: C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

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SUMMARY
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ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
Adrenals	4.40E-06
B Surfac	7.74E-06
Breasts	5.88E-06
St wall	6.47E-06
ULI wall	4.47E-06
Kidneys	4.73E-06
Lungs	7.86E-06
Ovaries	4.45E-06
R Marrow	5.17E-06
Spleen	4.82E-06
Thymus	5.02E-06
Uterus	4.23E-06

	Cl-39C.SUM
Bld wall	4.40E-06
Brain	5.60E-06
Esophagu	1.54E-05
SI wall	4.37E-06
LLI wall	4.39E-06
Liver	4.78E-06
Muscle	5.11E-06
Pancreas	4.35E-06
Skin	9.89E-06
Testes	5.16E-06
Thyroid	5.35E-06
EFPEC	5.86E-06

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	0.00E+00
INHALATION	8.55E-07
AIR IMMERSION	5.01E-06
GROUND SURFACE	0.00E+00
INTERNAL	8.55E-07
EXTERNAL	5.01E-06
TOTAL	5.86E-06

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SUMMARY
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NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
Cl-39	5.86E-06
Ar-39	8.64E-16
TOTAL	5.86E-06

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SUMMARY
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CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
--------	--

	Cl-39C.SUM
Esophagu	5.26E-14
Stomach	2.88E-13
Colon	4.61E-13
Liver	7.27E-14
LUNG	7.85E-13
Bone	7.38E-15
Skin	9.91E-15
Breast	2.85E-13
Ovary	6.34E-14
Bladder	1.07E-13
Kidneys	2.47E-14
Thyroid	1.71E-14
Leukemia	2.91E-13
Residual	6.91E-13
Total	3.16E-12
TOTAL	6.31E-12

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	0.00E+00
INHALATION	4.17E-13
AIR IMMERSION	2.74E-12
GROUND SURFACE	0.00E+00
INTERNAL	4.17E-13
EXTERNAL	2.74E-12
TOTAL	3.16E-12

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SUMMARY
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NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
Cl-39	3.16E-12
Ar-39	1.10E-22
TOTAL	3.16E-12

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SUMMARY
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INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Cl-39C.SUM

Direction	27715	28919	31060	32802	34577	35279	35683
N	1.1E-06	1.0E-06	9.1E-07	8.3E-07	7.7E-07	7.4E-07	7.3E-07
NNW	5.7E-07	5.4E-07	4.9E-07	4.5E-07	4.2E-07	4.0E-07	4.0E-07
NW	6.7E-07	6.3E-07	5.7E-07	5.2E-07	4.8E-07	4.7E-07	4.6E-07
WNW	8.8E-07	8.3E-07	7.4E-07	6.9E-07	6.3E-07	6.1E-07	6.0E-07
W	8.7E-07	8.2E-07	7.3E-07	6.7E-07	6.2E-07	6.0E-07	5.9E-07
WSW	1.5E-06	1.4E-06	1.3E-06	1.2E-06	1.1E-06	1.0E-06	1.0E-06
SW	2.7E-06	2.6E-06	2.3E-06	2.1E-06	2.0E-06	1.9E-06	1.9E-06
SSW	4.3E-06	4.0E-06	3.6E-06	3.3E-06	3.1E-06	3.0E-06	2.9E-06
S	5.9E-06	5.5E-06	4.9E-06	4.5E-06	4.2E-06	4.0E-06	4.0E-06
SSE	5.7E-06	5.3E-06	4.8E-06	4.4E-06	4.1E-06	4.0E-06	3.9E-06
SE	1.9E-06	1.8E-06	1.6E-06	1.5E-06	1.4E-06	1.3E-06	1.3E-06
ESE	1.1E-06	1.1E-06	9.5E-07	8.7E-07	8.0E-07	7.7E-07	7.6E-07
E	1.4E-06	1.3E-06	1.2E-06	1.1E-06	9.7E-07	9.4E-07	9.2E-07
ENE	1.7E-06	1.6E-06	1.5E-06	1.4E-06	1.2E-06	1.2E-06	1.2E-06
NE	3.0E-06	2.8E-06	2.5E-06	2.3E-06	2.1E-06	2.1E-06	2.0E-06
NNE	1.7E-06	1.6E-06	1.4E-06	1.3E-06	1.2E-06	1.2E-06	1.1E-06

Distance (m)

Direction	36721	36809	37729	39079	39220	39559	43584
N	7.0E-07	6.9E-07	6.7E-07	6.3E-07	6.3E-07	6.2E-07	5.2E-07
NNW	3.8E-07	3.8E-07	3.6E-07	3.5E-07	3.4E-07	3.4E-07	2.9E-07
NW	4.4E-07	4.4E-07	4.2E-07	4.0E-07	4.0E-07	3.9E-07	3.3E-07
WNW	5.8E-07	5.8E-07	5.5E-07	5.2E-07	5.2E-07	5.1E-07	4.4E-07
W	5.6E-07	5.6E-07	5.4E-07	5.1E-07	5.1E-07	5.0E-07	4.2E-07
WSW	9.9E-07	9.8E-07	9.4E-07	8.9E-07	8.9E-07	8.8E-07	7.5E-07
SW	1.8E-06	1.8E-06	1.7E-06	1.6E-06	1.6E-06	1.6E-06	1.4E-06
SSW	2.8E-06	2.8E-06	2.7E-06	2.5E-06	2.5E-06	2.5E-06	2.1E-06
S	3.8E-06	3.8E-06	3.6E-06	3.4E-06	3.4E-06	3.3E-06	2.8E-06
SSE	3.7E-06	3.7E-06	3.6E-06	3.4E-06	3.4E-06	3.3E-06	2.8E-06
SE	1.2E-06	1.2E-06	1.2E-06	1.1E-06	1.1E-06	1.1E-06	9.1E-07
ESE	7.2E-07	7.2E-07	6.9E-07	6.5E-07	6.4E-07	6.3E-07	5.3E-07
E	8.8E-07	8.7E-07	8.4E-07	7.9E-07	7.8E-07	7.7E-07	6.4E-07
ENE	1.1E-06	1.1E-06	1.1E-06	1.0E-06	1.0E-06	1.0E-06	8.5E-07
NE	1.9E-06	1.9E-06	1.9E-06	1.8E-06	1.7E-06	1.7E-06	1.5E-06
NNE	1.1E-06	1.1E-06	1.0E-06	9.8E-07	9.8E-07	9.6E-07	8.2E-07

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SUMMARY
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INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)						
Direction	45196	45275	45654	45677	46668	47969

	C1-39C.SUM					
N	4.9E-07	4.9E-07	4.8E-07	4.8E-07	4.6E-07	4.4E-07
NNW	2.7E-07	2.7E-07	2.7E-07	2.7E-07	2.6E-07	2.5E-07
NW	3.1E-07	3.1E-07	3.1E-07	3.1E-07	2.9E-07	2.8E-07
WNW	4.1E-07	4.1E-07	4.0E-07	4.0E-07	3.9E-07	3.7E-07
W	4.0E-07	3.9E-07	3.9E-07	3.9E-07	3.7E-07	3.5E-07
WSW	7.0E-07	7.0E-07	6.9E-07	6.9E-07	6.6E-07	6.3E-07
SW	1.3E-06	1.3E-06	1.3E-06	1.3E-06	1.2E-06	1.2E-06
SSW	2.0E-06	2.0E-06	2.0E-06	2.0E-06	1.9E-06	1.8E-06
S	2.7E-06	2.6E-06	2.6E-06	2.6E-06	2.5E-06	2.4E-06
SSE	2.7E-06	2.7E-06	2.6E-06	2.6E-06	2.5E-06	2.4E-06
SE	8.5E-07	8.5E-07	8.4E-07	8.4E-07	8.0E-07	7.6E-07
ESE	4.9E-07	4.9E-07	4.8E-07	4.8E-07	4.6E-07	4.4E-07
E	6.0E-07	5.9E-07	5.8E-07	5.8E-07	5.6E-07	5.3E-07
ENE	7.9E-07	7.9E-07	7.8E-07	7.8E-07	7.5E-07	7.1E-07
NE	1.4E-06	1.4E-06	1.4E-06	1.4E-06	1.3E-06	1.2E-06
NNE	7.7E-07	7.7E-07	7.6E-07	7.6E-07	7.3E-07	7.0E-07

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)						
Direction	27715	28919	31060	32802	34577	35279	35683
N	5.8E-13	5.4E-13	4.9E-13	4.5E-13	4.1E-13	4.0E-13	3.9E-13
NNW	3.1E-13	2.9E-13	2.6E-13	2.4E-13	2.2E-13	2.2E-13	2.1E-13
NW	3.6E-13	3.4E-13	3.0E-13	2.8E-13	2.6E-13	2.5E-13	2.5E-13
WNW	4.7E-13	4.4E-13	4.0E-13	3.7E-13	3.4E-13	3.3E-13	3.3E-13
W	4.7E-13	4.4E-13	3.9E-13	3.6E-13	3.3E-13	3.2E-13	3.2E-13
WSW	8.1E-13	7.6E-13	6.8E-13	6.3E-13	5.8E-13	5.6E-13	5.5E-13
SW	1.5E-12	1.4E-12	1.2E-12	1.2E-12	1.1E-12	1.0E-12	1.0E-12
SSW	2.3E-12	2.2E-12	2.0E-12	1.8E-12	1.7E-12	1.6E-12	1.6E-12
S	3.2E-12	3.0E-12	2.7E-12	2.4E-12	2.2E-12	2.2E-12	2.1E-12
SSE	3.0E-12	2.9E-12	2.6E-12	2.4E-12	2.2E-12	2.1E-12	2.1E-12
SE	1.0E-12	9.7E-13	8.7E-13	8.0E-13	7.3E-13	7.1E-13	7.0E-13
ESE	6.1E-13	5.7E-13	5.1E-13	4.7E-13	4.3E-13	4.2E-13	4.1E-13
E	7.5E-13	7.0E-13	6.2E-13	5.7E-13	5.2E-13	5.1E-13	5.0E-13
ENE	9.4E-13	8.8E-13	7.9E-13	7.3E-13	6.7E-13	6.5E-13	6.4E-13
NE	1.6E-12	1.5E-12	1.3E-12	1.2E-12	1.1E-12	1.1E-12	1.1E-12
NNE	8.9E-13	8.4E-13	7.5E-13	6.9E-13	6.4E-13	6.2E-13	6.1E-13

	Distance (m)						
Direction	36721	36809	37729	39079	39220	39559	43584
N	3.8E-13	3.7E-13	3.6E-13	3.4E-13	3.4E-13	3.3E-13	2.8E-13
NNW	2.0E-13	2.0E-13	2.0E-13	1.9E-13	1.8E-13	1.8E-13	1.6E-13
NW	2.4E-13	2.4E-13	2.3E-13	2.1E-13	2.1E-13	2.1E-13	1.8E-13
WNW	3.1E-13	3.1E-13	3.0E-13	2.8E-13	2.8E-13	2.8E-13	2.4E-13
W	3.0E-13	3.0E-13	2.9E-13	2.7E-13	2.7E-13	2.7E-13	2.3E-13
WSW	5.3E-13	5.3E-13	5.1E-13	4.8E-13	4.8E-13	4.7E-13	4.0E-13

	Cl-39C.SUM						
SW	9.7E-13	9.7E-13	9.3E-13	8.8E-13	8.7E-13	8.6E-13	7.4E-13
SSW	1.5E-12	1.5E-12	1.4E-12	1.4E-12	1.4E-12	1.3E-12	1.1E-12
S	2.0E-12	2.0E-12	1.9E-12	1.8E-12	1.8E-12	1.8E-12	1.5E-12
SSE	2.0E-12	2.0E-12	1.9E-12	1.8E-12	1.8E-12	1.8E-12	1.5E-12
SE	6.6E-13	6.6E-13	6.3E-13	6.0E-13	5.9E-13	5.8E-13	4.9E-13
ESE	3.9E-13	3.9E-13	3.7E-13	3.5E-13	3.5E-13	3.4E-13	2.9E-13
E	4.7E-13	4.7E-13	4.5E-13	4.2E-13	4.2E-13	4.1E-13	3.5E-13
ENE	6.1E-13	6.1E-13	5.8E-13	5.5E-13	5.5E-13	5.4E-13	4.6E-13
NE	1.0E-12	1.0E-12	1.0E-12	9.4E-13	9.4E-13	9.2E-13	7.9E-13
NNE	5.8E-13	5.8E-13	5.6E-13	5.3E-13	5.3E-13	5.2E-13	4.4E-13

Feb 20, 2008 02:31 pm

SUMMARY
Page 8

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)					
Direction	45196	45275	45654	45677	46668	47969
N	2.6E-13	2.6E-13	2.6E-13	2.6E-13	2.5E-13	2.4E-13
NNW	1.5E-13	1.5E-13	1.5E-13	1.4E-13	1.4E-13	1.3E-13
NW	1.7E-13	1.7E-13	1.7E-13	1.6E-13	1.6E-13	1.5E-13
WNW	2.2E-13	2.2E-13	2.2E-13	2.2E-13	2.1E-13	2.0E-13
W	2.1E-13	2.1E-13	2.1E-13	2.1E-13	2.0E-13	1.9E-13
WSW	3.8E-13	3.8E-13	3.7E-13	3.7E-13	3.6E-13	3.4E-13
SW	6.9E-13	6.9E-13	6.8E-13	6.8E-13	6.6E-13	6.3E-13
SSW	1.1E-12	1.1E-12	1.1E-12	1.1E-12	1.0E-12	9.6E-13
S	1.4E-12	1.4E-12	1.4E-12	1.4E-12	1.3E-12	1.3E-12
SSE	1.4E-12	1.4E-12	1.4E-12	1.4E-12	1.4E-12	1.3E-12
SE	4.6E-13	4.6E-13	4.5E-13	4.5E-13	4.3E-13	4.1E-13
ESE	2.7E-13	2.6E-13	2.6E-13	2.6E-13	2.5E-13	2.3E-13
E	3.2E-13	3.2E-13	3.1E-13	3.1E-13	3.0E-13	2.8E-13
ENE	4.3E-13	4.3E-13	4.2E-13	4.2E-13	4.0E-13	3.8E-13
NE	7.4E-13	7.4E-13	7.3E-13	7.3E-13	7.0E-13	6.7E-13
NNE	4.2E-13	4.1E-13	4.1E-13	4.1E-13	3.9E-13	3.7E-13

CL-39D.SUM

C A P 8 8 - P C

Version 3.0

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment

Feb 20, 2008 02:31 pm

Facility: INL
Address: PO Box 1625
City: Idaho Falls
State: ID Zip: 83415

Source Category:
Source Type: Stack
Emission Year: 2008

Comments: TAN-TSF
Receptors 60-62

Dataset Name: RUND
Dataset Date: 08/02/20 2:20:00 PM
Wind File: C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

Feb 20, 2008 02:31 pm

SUMMARY
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
Adrenals	1.69E-06
B Surfac	2.97E-06
Breasts	2.26E-06
St wall	2.48E-06
ULI wall	1.72E-06
Kidneys	1.82E-06
Lungs	3.02E-06
Ovaries	1.71E-06
R Marrow	1.99E-06
Spleen	1.85E-06
Thymus	1.93E-06
Uterus	1.62E-06

	Cl-39D.SUM
Bld wall	1.69E-06
Brain	2.15E-06
Esophagu	5.93E-06
SI wall	1.68E-06
LLI wall	1.68E-06
Liver	1.84E-06
Muscle	1.96E-06
Pancreas	1.67E-06
Skin	3.80E-06
Testes	1.98E-06
Thyroid	2.05E-06
EFPEC	2.25E-06

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	0.00E+00
INHALATION	3.28E-07
AIR IMMERSION	1.92E-06
GROUND SURFACE	0.00E+00
INTERNAL	3.28E-07
EXTERNAL	1.92E-06
TOTAL	2.25E-06

Feb 20, 2008 02:31 pm

SUMMARY
Page 2

NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
Cl-39	2.25E-06
Ar-39	3.65E-16
TOTAL	2.25E-06

Feb 20, 2008 02:31 pm

SUMMARY
Page 3

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
--------	--

	Cl-39D.SUM
Esophagu	2.02E-14
Stomach	1.10E-13
Colon	1.77E-13
Liver	2.79E-14
LUNG	3.01E-13
Bone	2.84E-15
Skin	3.80E-15
Breast	1.10E-13
Ovary	2.43E-14
Bladder	4.10E-14
Kidneys	9.48E-15
Thyroid	6.55E-15
Leukemia	1.12E-13
Residual	2.65E-13
Total	1.21E-12
TOTAL	2.42E-12

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	0.00E+00
INHALATION	1.60E-13
AIR IMMERSION	1.05E-12
GROUND SURFACE	0.00E+00
INTERNAL	1.60E-13
EXTERNAL	1.05E-12
TOTAL	1.21E-12

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SUMMARY
Page 4

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
Cl-39	1.21E-12
Ar-39	4.64E-23
TOTAL	1.21E-12

Feb 20, 2008 02:31 pm

SUMMARY
Page 5

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Direction	50024	54611	58610
<hr/>			
N	4.0E-07	3.3E-07	2.6E-07
NNW	2.3E-07	1.9E-07	1.6E-07
NW	2.6E-07	2.1E-07	1.7E-07
WNW	3.4E-07	2.8E-07	2.3E-07
W	3.3E-07	2.7E-07	2.2E-07
WSW	5.8E-07	4.9E-07	4.0E-07
SW	1.1E-06	9.1E-07	7.5E-07
SSW	1.7E-06	1.4E-06	1.1E-06
S	2.2E-06	1.8E-06	1.5E-06
SSE	2.3E-06	1.9E-06	1.6E-06
SE	6.9E-07	5.6E-07	4.4E-07
ESE	4.0E-07	3.2E-07	2.4E-07
E	4.8E-07	3.8E-07	2.8E-07
ENE	6.5E-07	5.4E-07	4.3E-07
NE	1.1E-06	9.6E-07	7.9E-07
NNE	6.4E-07	5.4E-07	4.4E-07

Feb 20, 2008 02:31 pm

SUMMARY
Page 6

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Dis		
Direction	50024	54611	58610
N	2.2E-13	1.8E-13	1.4E-13
NNW	1.2E-13	1.0E-13	8.7E-14
NW	1.4E-13	1.2E-13	9.3E-14
WNW	1.8E-13	1.5E-13	1.2E-13
W	1.8E-13	1.5E-13	1.2E-13
WSW	3.1E-13	2.6E-13	2.2E-13
SW	5.8E-13	4.9E-13	4.0E-13
SSW	8.9E-13	7.4E-13	6.1E-13
S	1.2E-12	9.8E-13	8.1E-13
SSE	1.2E-12	1.0E-12	8.5E-13
SE	3.7E-13	3.0E-13	2.4E-13
ESE	2.1E-13	1.7E-13	1.3E-13
E	2.6E-13	2.0E-13	1.5E-13
ENE	3.5E-13	2.9E-13	2.3E-13
NE	6.2E-13	5.2E-13	4.3E-13
NNE	3.5E-13	2.9E-13	2.4E-13

08/02/20 2:16:00 PM H-3A.dat
 Feb 20, 2008 02:30 pm
 RUNA RUNA.
 C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

INL
 PO Box 1625

Idaho Falls ID 83415
 2008

TAN-TSF
 Receptors 1-20
 100.0000,500.0000

0	0	0	0	0	20		
10344	10365	10472	10590	11103	11989	12522	13245
13286	13483	13612	13664	13959	14258	14374	15241
15441	15784	15844	16323				
800	280.20	16.30	3.54				

0	0						
1	1.00	0.000E+00	0.000E+00				
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
1	0	1					
H-3	v	0	1.000e+00	1.000e+00	5.480e-05		0
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
	vapor	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.536E-04	
0.08	0.92	0.00	Urban				
0.00	1.00	0.00					
0.01	0.99	0.00					

T	T	T	T				
2.030e-01	4.560e-02	1.700e-02					
H-3	1	0					
00	00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00			
1							
H-3	v	0	1.000e+00	1.000e+00	5.480e-05		0
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
4.534E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
	vapor	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.536E-04	

--DecayStep--1
 --LimitChildren--1
 --Children--5

08/02/20 2:17:00 PM H-3B.dat
 Feb 20, 2008 02:30 pm
 RUNB RUNB.
 C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

INL
 PO Box 1625

Idaho Falls ID 83415
 2008

TAN-TSF
 Receptors 21-39
 100.0000,500.0000

0	0	0	0	0	19		
17035	17329	18607	18834	18860	18890	19860	19891
20457	21314	21349	22159	23521	24430	24545	25171
26794	27275	27389	0				
800	280.20	16.30	3.54				

0	0						
1	1	0.000E+00	0.000E+00				
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	

1	0	1					
H-3	v	0	1.000e+00	1.000e+00	5.480e-05		0
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
	vapor	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.536E-04	
0.08	0.92	0.00	Urban				
0.00	1.00	0.00					
0.01	0.99	0.00					

T	T	T	T				
2.030e-01	4.560e-02	1.700e-02					
H-3	1	0					
00	00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00			

1							
H-3	v	0	1.000e+00	1.000e+00	5.480e-05		0
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
4.534E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
	vapor	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.536E-04	

--DecayStep--1
 --LimitChildren--1
 --Children--5

08/02/20 2:19:00 PM H-3C.dat
 Feb 20, 2008 02:31 pm
 RUNC RUNC.
 C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

INL
 PO Box 1625

Idaho Falls ID 83415
 2008

TAN-TSF
 Receptors 40-59
 100.0000,500.0000

0	0	0	0	0	20		
27715	28919	31060	32802	34577	35279	35683	36721
36809	37729	39079	39220	39559	43584	45196	45275
45654	45677	46668	47969				
800	280.20	16.30	3.54				

0	0						
1	1.00	0.000E+00	0.000E+00				
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
1	0	1					
H-3	v	0	1.000e+00	1.000e+00	5.480e-05		0
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
	vapor	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.536E-04	
0.08	0.92	0.00	Urban				
0.00	1.00	0.00					
0.01	0.99	0.00					

T	T	T	T				
2.030e-01	4.560e-02	1.700e-02					
H-3	1	0					
00	00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00			
1							
H-3	v	0	1.000e+00	1.000e+00	5.480e-05		0
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
4.534E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
	vapor	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.536E-04	

--DecayStep--1
 --LimitChildren--1
 --Children--5

08/02/20 2:20:00 PM H-3D.dat
 Feb 20, 2008 02:31 pm
 RUND RUND.
 C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

INL
 PO Box 1625

Idaho Falls ID 83415
 2008

TAN-TSF
 Receptors 60-62
 100.0000,500.0000

0	0	0	0	0	3		
50024	54611	58610	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0			
800	280.20	16.30	3.54				
0	0						

1	1.00	0.000E+00	0.000E+00				
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
1	0	1					

H-3	v	0	1.000e+00	1.000e+00	5.480e-05	0	
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
	vapor	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.536E-04	
0.08	0.92	0.00	Urban				
0.00	1.00	0.00					
0.01	0.99	0.00					

T	T	T	T			
2.030e-01	4.560e-02	1.700e-02				
H-3	1	0				
00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00		

1						
H-3	v	0	1.000e+00	1.000e+00	5.480e-05	0
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
4.534E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
0.000e+00	0	0.000e+00				
	vapor	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.536E-04

--DecayStep--1
 --LimitChildren--1
 --Children--5

H-3A.SUM

C A P 8 8 - P C

Version 3.0

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment

Feb 20, 2008 02:30 pm

Facility: INL
Address: PO Box 1625
City: Idaho Falls
State: ID Zip: 83415

Source Category:
Source Type: Stack
Emission Year: 2008

Comments: TAN-TSF
Receptors 1-20

Dataset Name: RUNA
Dataset Date: 08/02/20 2:16:00 PM
Wind File: C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

Feb 20, 2008 02:30 pm

SUMMARY
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
Adrenals	1.20E-05
B Surfac	1.20E-05
Breasts	1.20E-05
St wall	1.53E-05
ULI wall	1.25E-05
Kidneys	1.20E-05
Lungs	1.20E-05
Ovaries	1.20E-05
R Marrow	1.20E-05
Spleen	1.20E-05
Thymus	1.20E-05
Uterus	1.20E-05

	H-3A.SUM
Bld wall	1.20E-05
Brain	1.20E-05
Esophagu	1.20E-05
SI wall	1.21E-05
LLI wall	1.35E-05
Liver	1.20E-05
Muscle	1.20E-05
Pancreas	1.20E-05
Skin	1.20E-05
Testes	1.20E-05
Thyroid	1.20E-05
EFEC	2.36E-05

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	1.91E-05
INHALATION	4.46E-06
AIR IMMERSION	0.00E+00
GROUND SURFACE	0.00E+00
INTERNAL	2.36E-05
EXTERNAL	0.00E+00
TOTAL	2.36E-05

Feb 20, 2008 02:30 pm

SUMMARY
Page 2

NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
H-3	2.36E-05
TOTAL	2.36E-05

Feb 20, 2008 02:30 pm

SUMMARY
Page 3

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
Esophagu	2.72E-13

Page 2

	H-3A.SUM
Stomach	1.37E-12
Colon	2.80E-12
Liver	3.81E-13
LUNG	2.31E-12
Bone	2.31E-14
Skin	2.45E-14
Breast	1.09E-12
Ovary	3.12E-13
Bladder	6.12E-13
Kidneys	1.31E-13
Thyroid	7.55E-14
Leukemia	1.40E-12
Residual	3.69E-12
Total	1.45E-11
TOTAL	2.90E-11

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	1.20E-11
INHALATION	2.53E-12
AIR IMMERSION	0.00E+00
GROUND SURFACE	0.00E+00
INTERNAL	1.45E-11
EXTERNAL	0.00E+00
TOTAL	1.45E-11

Feb 20, 2008 02:30 pm

SUMMARY
Page 4

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
H-3	1.45E-11
TOTAL	1.45E-11

Feb 20, 2008 02:30 pm

SUMMARY
Page 5

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)

Direction	10344	10365	10472	H-3A.SUM 10590	11103	11989	12522
N	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05
NNW	1.7E-05	1.7E-05	1.7E-05	1.7E-05	1.7E-05	1.7E-05	1.7E-05
NW	1.7E-05	1.7E-05	1.7E-05	1.7E-05	1.7E-05	1.7E-05	1.7E-05
WNW	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05
W	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05
WSW	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05
SW	2.0E-05	2.0E-05	2.0E-05	1.9E-05	1.9E-05	1.9E-05	1.9E-05
SSW	2.2E-05	2.2E-05	2.1E-05	2.1E-05	2.1E-05	2.1E-05	2.1E-05
S	2.4E-05	2.4E-05	2.3E-05	2.3E-05	2.3E-05	2.2E-05	2.2E-05
SSE	2.2E-05	2.2E-05	2.2E-05	2.2E-05	2.2E-05	2.1E-05	2.1E-05
SE	2.0E-05	2.0E-05	2.0E-05	2.0E-05	1.9E-05	1.9E-05	1.9E-05
ESE	1.9E-05	1.9E-05	1.9E-05	1.9E-05	1.8E-05	1.8E-05	1.8E-05
E	1.9E-05	1.9E-05	1.9E-05	1.9E-05	1.9E-05	1.9E-05	1.9E-05
ENE	1.9E-05	1.9E-05	1.9E-05	1.9E-05	1.9E-05	1.8E-05	1.8E-05
NE	2.0E-05	2.0E-05	2.0E-05	2.0E-05	2.0E-05	1.9E-05	1.9E-05
NNE	1.9E-05	1.9E-05	1.9E-05	1.9E-05	1.9E-05	1.8E-05	1.8E-05

Distance (m)

Direction	13245	13286	13483	13612	13664	13959	14258
N	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05
NNW	1.7E-05	1.7E-05	1.7E-05	1.7E-05	1.7E-05	1.7E-05	1.7E-05
NW	1.7E-05	1.7E-05	1.7E-05	1.7E-05	1.7E-05	1.7E-05	1.7E-05
WNW	1.7E-05	1.7E-05	1.7E-05	1.7E-05	1.7E-05	1.7E-05	1.7E-05
W	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05
WSW	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05
SW	1.9E-05	1.9E-05	1.9E-05	1.9E-05	1.9E-05	1.9E-05	1.9E-05
SSW	2.0E-05	2.0E-05	2.0E-05	2.0E-05	2.0E-05	2.0E-05	2.0E-05
S	2.2E-05	2.2E-05	2.2E-05	2.2E-05	2.2E-05	2.1E-05	2.1E-05
SSE	2.1E-05	2.1E-05	2.1E-05	2.1E-05	2.1E-05	2.1E-05	2.1E-05
SE	1.9E-05	1.9E-05	1.9E-05	1.9E-05	1.9E-05	1.9E-05	1.9E-05
ESE	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05
E	1.9E-05	1.9E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05
ENE	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05
NE	1.9E-05	1.9E-05	1.9E-05	1.9E-05	1.9E-05	1.9E-05	1.9E-05
NNE	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05

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SUMMARY
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INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Direction	14374	15241	15441	15784	15844	16323
N	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05
NNW	1.7E-05	1.7E-05	1.7E-05	1.7E-05	1.7E-05	1.7E-05

	H-3A.SUM					
NW	1.7E-05	1.7E-05	1.7E-05	1.7E-05	1.7E-05	1.7E-05
WNW	1.7E-05	1.7E-05	1.7E-05	1.7E-05	1.7E-05	1.7E-05
W	1.8E-05	1.7E-05	1.7E-05	1.7E-05	1.7E-05	1.7E-05
WSW	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05
SW	1.9E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05
SSW	2.0E-05	2.0E-05	2.0E-05	2.0E-05	2.0E-05	1.9E-05
S	2.1E-05	2.1E-05	2.1E-05	2.1E-05	2.1E-05	2.1E-05
SSE	2.0E-05	2.0E-05	2.0E-05	2.0E-05	2.0E-05	2.0E-05
SE	1.9E-05	1.9E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05
ESE	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05
E	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05
ENE	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05
NE	1.9E-05	1.9E-05	1.9E-05	1.9E-05	1.9E-05	1.9E-05
NNE	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)						
Direction	10344	10365	10472	10590	11103	11989	12522
N	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11
NNW	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11
NW	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11
WNW	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11
W	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11
WSW	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11
SW	1.2E-11	1.2E-11	1.2E-11	1.2E-11	1.2E-11	1.2E-11	1.2E-11
SSW	1.3E-11	1.3E-11	1.3E-11	1.3E-11	1.3E-11	1.3E-11	1.3E-11
S	1.4E-11	1.4E-11	1.4E-11	1.4E-11	1.4E-11	1.4E-11	1.4E-11
SSE	1.4E-11	1.4E-11	1.4E-11	1.4E-11	1.4E-11	1.3E-11	1.3E-11
SE	1.2E-11	1.2E-11	1.2E-11	1.2E-11	1.2E-11	1.2E-11	1.2E-11
ESE	1.2E-11	1.2E-11	1.2E-11	1.2E-11	1.1E-11	1.1E-11	1.1E-11
E	1.2E-11	1.2E-11	1.2E-11	1.2E-11	1.2E-11	1.2E-11	1.2E-11
ENE	1.2E-11	1.2E-11	1.2E-11	1.2E-11	1.2E-11	1.1E-11	1.1E-11
NE	1.2E-11	1.2E-11	1.2E-11	1.2E-11	1.2E-11	1.2E-11	1.2E-11
NNE	1.2E-11	1.2E-11	1.2E-11	1.2E-11	1.2E-11	1.1E-11	1.1E-11

	Distance (m)						
Direction	13245	13286	13483	13612	13664	13959	14258
N	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11
NNW	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11
NW	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11
WNW	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11
W	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11
WSW	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11
SW	1.2E-11	1.2E-11	1.2E-11	1.2E-11	1.2E-11	1.2E-11	1.2E-11
SSW	1.3E-11	1.3E-11	1.2E-11	1.2E-11	1.2E-11	1.2E-11	1.2E-11

	H-3A.SUM						
S	1.3E-11	1.3E-11	1.3E-11	1.3E-11	1.3E-11	1.3E-11	1.3E-11
SSE	1.3E-11	1.3E-11	1.3E-11	1.3E-11	1.3E-11	1.3E-11	1.3E-11
SE	1.2E-11	1.2E-11	1.2E-11	1.2E-11	1.2E-11	1.2E-11	1.2E-11
ESE	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11
E	1.2E-11	1.2E-11	1.2E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11
ENE	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11
NE	1.2E-11	1.2E-11	1.2E-11	1.2E-11	1.2E-11	1.2E-11	1.2E-11
NNE	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)					
Direction	14374	15241	15441	15784	15844	16323
N	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11
NNW	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11
NW	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11
WNW	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11
W	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11
WSW	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11
SW	1.2E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11
SSW	1.2E-11	1.2E-11	1.2E-11	1.2E-11	1.2E-11	1.2E-11
S	1.3E-11	1.3E-11	1.3E-11	1.3E-11	1.3E-11	1.3E-11
SSE	1.3E-11	1.3E-11	1.2E-11	1.2E-11	1.2E-11	1.2E-11
SE	1.2E-11	1.2E-11	1.2E-11	1.1E-11	1.1E-11	1.1E-11
ESE	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11
E	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11
ENE	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11
NE	1.2E-11	1.2E-11	1.2E-11	1.2E-11	1.2E-11	1.2E-11
NNE	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11

H-3B.SUM

C A P 8 8 - P C

Version 3.0

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment

Feb 20, 2008 02:30 pm

Facility: INL
Address: PO Box 1625
City: Idaho Falls
State: ID Zip: 83415

Source Category:
Source Type: Stack
Emission Year: 2008

Comments: TAN-TSF
Receptors 21-39

Dataset Name: RUNB
Dataset Date: 08/02/20 2:17:00 PM
Wind File: C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

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SUMMARY
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
Adrenals	6.70E-06
B Surfac	6.70E-06
Breasts	6.70E-06
St wall	8.53E-06
ULI wall	6.97E-06
Kidneys	6.70E-06
Lungs	6.70E-06
Ovaries	6.70E-06
R Marrow	6.70E-06
Spleen	6.70E-06
Thymus	6.70E-06
Uterus	6.70E-06

	H-3B.SUM
Bld wall	6.70E-06
Brain	6.70E-06
Esophagu	6.70E-06
SI wall	6.74E-06
LLI wall	7.51E-06
Liver	6.70E-06
Muscle	6.70E-06
Pancreas	6.70E-06
Skin	6.70E-06
Testes	6.70E-06
Thyroid	6.70E-06
EFPEC	1.31E-05

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	1.07E-05
INHALATION	2.43E-06
AIR IMMERSION	0.00E+00
GROUND SURFACE	0.00E+00
INTERNAL	1.31E-05
EXTERNAL	0.00E+00
TOTAL	1.31E-05

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SUMMARY
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NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
H-3	1.31E-05
TOTAL	1.31E-05

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SUMMARY
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CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
Esophagu	1.52E-13

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	H-3B.SUM
Stomach	7.64E-13
Colon	1.56E-12
Liver	2.12E-13
LUNG	1.29E-12
Bone	1.29E-14
Skin	1.37E-14
Breast	6.09E-13
Ovary	1.74E-13
Bladder	3.41E-13
Kidneys	7.31E-14
Thyroid	4.21E-14
Leukemia	7.79E-13
Residual	2.06E-12
Total	8.09E-12
TOTAL	1.62E-11

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	6.71E-12
INHALATION	1.38E-12
AIR IMMERSION	0.00E+00
GROUND SURFACE	0.00E+00
INTERNAL	8.09E-12
EXTERNAL	0.00E+00
TOTAL	8.09E-12

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SUMMARY
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NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
H-3	8.09E-12
TOTAL	8.09E-12

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SUMMARY
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INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)

Direction	17035	17329	18607	H-3B.SUM 18834	18860	18890	19860
N	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05
NNW	9.7E-06	9.7E-06	9.7E-06	9.7E-06	9.7E-06	9.7E-06	9.6E-06
NW	9.8E-06	9.8E-06	9.8E-06	9.8E-06	9.8E-06	9.8E-06	9.8E-06
WNW	1.0E-05	1.0E-05	9.9E-06	9.9E-06	9.9E-06	9.9E-06	9.9E-06
W	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05
WSW	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05
SW	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05
SSW	1.2E-05	1.2E-05	1.2E-05	1.2E-05	1.2E-05	1.2E-05	1.2E-05
S	1.3E-05	1.3E-05	1.3E-05	1.3E-05	1.3E-05	1.3E-05	1.3E-05
SSE	1.3E-05	1.2E-05	1.2E-05	1.2E-05	1.2E-05	1.2E-05	1.2E-05
SE	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05
ESE	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05
E	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05
ENE	1.1E-05	1.1E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05
NE	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05
NNE	1.1E-05	1.1E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05

Distance (m)

Direction	19891	20457	21314	21349	22159	23521	24430
N	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05
NNW	9.6E-06	9.6E-06	9.6E-06	9.6E-06	9.6E-06	9.6E-06	9.6E-06
NW	9.8E-06	9.7E-06	9.7E-06	9.7E-06	9.7E-06	9.7E-06	9.7E-06
WNW	9.9E-06	9.9E-06	9.9E-06	9.9E-06	9.8E-06	9.8E-06	9.8E-06
W	1.0E-05	1.0E-05	9.9E-06	9.9E-06	9.9E-06	9.9E-06	9.8E-06
WSW	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05
SW	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.0E-05	1.0E-05
SSW	1.2E-05	1.2E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05
S	1.2E-05	1.2E-05	1.2E-05	1.2E-05	1.2E-05	1.2E-05	1.2E-05
SSE	1.2E-05	1.2E-05	1.2E-05	1.2E-05	1.2E-05	1.2E-05	1.1E-05
SE	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.0E-05
ESE	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05
E	1.1E-05	1.1E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05
ENE	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05
NE	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05
NNE	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05

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SUMMARY
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INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Direction	24545	25171	26794	27275	27389
N	1.0E-05	1.0E-05	9.9E-06	9.9E-06	9.9E-06
NNW	9.6E-06	9.6E-06	9.5E-06	9.5E-06	9.5E-06

	H-3B.SUM				
NW	9.7E-06	9.7E-06	9.6E-06	9.6E-06	9.6E-06
WNW	9.8E-06	9.8E-06	9.7E-06	9.7E-06	9.7E-06
W	9.8E-06	9.8E-06	9.8E-06	9.8E-06	9.8E-06
WSW	1.0E-05	1.0E-05	9.9E-06	9.9E-06	9.9E-06
SW	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05
SSW	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05
S	1.2E-05	1.2E-05	1.2E-05	1.2E-05	1.1E-05
SSE	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05
SE	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05
ESE	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05
E	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05
ENE	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05
NE	1.1E-05	1.1E-05	1.0E-05	1.0E-05	1.0E-05
NNE	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)						
Direction	17035	17329	18607	18834	18860	18890	19860
N	6.4E-12	6.4E-12	6.4E-12	6.4E-12	6.4E-12	6.3E-12	6.3E-12
NNW	6.1E-12	6.1E-12	6.0E-12	6.0E-12	6.0E-12	6.0E-12	6.0E-12
NW	6.1E-12	6.1E-12	6.1E-12	6.1E-12	6.1E-12	6.1E-12	6.1E-12
WNW	6.2E-12	6.2E-12	6.2E-12	6.2E-12	6.2E-12	6.2E-12	6.2E-12
W	6.3E-12	6.3E-12	6.3E-12	6.2E-12	6.2E-12	6.2E-12	6.2E-12
WSW	6.4E-12	6.4E-12	6.4E-12	6.4E-12	6.4E-12	6.4E-12	6.3E-12
SW	6.8E-12	6.8E-12	6.7E-12	6.7E-12	6.7E-12	6.7E-12	6.6E-12
SSW	7.5E-12	7.4E-12	7.3E-12	7.3E-12	7.3E-12	7.3E-12	7.2E-12
S	8.1E-12	8.0E-12	7.9E-12	7.8E-12	7.8E-12	7.8E-12	7.7E-12
SSE	7.7E-12	7.7E-12	7.5E-12	7.5E-12	7.5E-12	7.5E-12	7.4E-12
SE	6.9E-12	6.8E-12	6.8E-12	6.7E-12	6.7E-12	6.7E-12	6.7E-12
ESE	6.5E-12	6.5E-12	6.5E-12	6.4E-12	6.4E-12	6.4E-12	6.4E-12
E	6.7E-12	6.7E-12	6.6E-12	6.6E-12	6.6E-12	6.6E-12	6.6E-12
ENE	6.6E-12	6.6E-12	6.5E-12	6.5E-12	6.5E-12	6.5E-12	6.5E-12
NE	6.9E-12	6.9E-12	6.8E-12	6.8E-12	6.8E-12	6.8E-12	6.8E-12
NNE	6.6E-12	6.5E-12	6.5E-12	6.5E-12	6.5E-12	6.5E-12	6.4E-12

	Distance (m)						
Direction	19891	20457	21314	21349	22159	23521	24430
N	6.3E-12	6.3E-12	6.3E-12	6.3E-12	6.3E-12	6.2E-12	6.2E-12
NNW	6.0E-12	6.0E-12	6.0E-12	6.0E-12	6.0E-12	6.0E-12	6.0E-12
NW	6.1E-12	6.1E-12	6.1E-12	6.1E-12	6.1E-12	6.1E-12	6.0E-12
WNW	6.2E-12	6.2E-12	6.2E-12	6.2E-12	6.1E-12	6.1E-12	6.1E-12
W	6.2E-12	6.2E-12	6.2E-12	6.2E-12	6.2E-12	6.2E-12	6.1E-12
WSW	6.3E-12	6.3E-12	6.3E-12	6.3E-12	6.3E-12	6.3E-12	6.2E-12
SW	6.6E-12	6.6E-12	6.6E-12	6.6E-12	6.6E-12	6.5E-12	6.5E-12
SSW	7.2E-12	7.1E-12	7.1E-12	7.1E-12	7.0E-12	6.9E-12	6.9E-12

	H-3B.SUM						
S	7.7E-12	7.6E-12	7.6E-12	7.6E-12	7.5E-12	7.4E-12	7.3E-12
SSE	7.4E-12	7.4E-12	7.3E-12	7.3E-12	7.2E-12	7.1E-12	7.1E-12
SE	6.7E-12	6.7E-12	6.6E-12	6.6E-12	6.6E-12	6.5E-12	6.5E-12
ESE	6.4E-12	6.4E-12	6.4E-12	6.4E-12	6.3E-12	6.3E-12	6.3E-12
E	6.6E-12	6.6E-12	6.5E-12	6.5E-12	6.5E-12	6.4E-12	6.4E-12
ENE	6.5E-12	6.4E-12	6.4E-12	6.4E-12	6.4E-12	6.4E-12	6.3E-12
NE	6.8E-12	6.7E-12	6.7E-12	6.7E-12	6.6E-12	6.6E-12	6.6E-12
NNE	6.4E-12	6.4E-12	6.4E-12	6.4E-12	6.4E-12	6.3E-12	6.3E-12

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)				
Direction	24545	25171	26794	27275	27389
N	6.2E-12	6.2E-12	6.2E-12	6.2E-12	6.2E-12
NNW	6.0E-12	6.0E-12	6.0E-12	6.0E-12	6.0E-12
NW	6.0E-12	6.0E-12	6.0E-12	6.0E-12	6.0E-12
WNW	6.1E-12	6.1E-12	6.1E-12	6.1E-12	6.1E-12
W	6.1E-12	6.1E-12	6.1E-12	6.1E-12	6.1E-12
WSW	6.2E-12	6.2E-12	6.2E-12	6.2E-12	6.2E-12
SW	6.5E-12	6.5E-12	6.4E-12	6.4E-12	6.4E-12
SSW	6.9E-12	6.9E-12	6.8E-12	6.8E-12	6.8E-12
S	7.3E-12	7.3E-12	7.1E-12	7.1E-12	7.1E-12
SSE	7.1E-12	7.0E-12	6.9E-12	6.9E-12	6.9E-12
SE	6.5E-12	6.5E-12	6.4E-12	6.4E-12	6.4E-12
ESE	6.3E-12	6.3E-12	6.2E-12	6.2E-12	6.2E-12
E	6.4E-12	6.4E-12	6.4E-12	6.4E-12	6.4E-12
ENE	6.3E-12	6.3E-12	6.3E-12	6.3E-12	6.3E-12
NE	6.6E-12	6.5E-12	6.5E-12	6.5E-12	6.5E-12
NNE	6.3E-12	6.3E-12	6.3E-12	6.3E-12	6.3E-12

H-3C.SUM

C A P 8 8 - P C

Version 3.0

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment

Feb 20, 2008 02:31 pm

Facility: INL
Address: PO Box 1625
City: Idaho Falls
State: ID Zip: 83415

Source Category:
Source Type: Stack
Emission Year: 2008

Comments: TAN-TSF
Receptors 40-59

Dataset Name: RUNC
Dataset Date: 08/02/20 2:19:00 PM
Wind File: C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

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SUMMARY
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ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
Adrenals	3.56E-06
B Surfac	3.56E-06
Breasts	3.56E-06
St wall	4.51E-06
ULI wall	3.70E-06
Kidneys	3.56E-06
Lungs	3.56E-06
Ovaries	3.56E-06
R Marrow	3.56E-06
Spleen	3.56E-06
Thymus	3.56E-06
Uterus	3.56E-06

	H-3C.SUM
Bld wall	3.56E-06
Brain	3.56E-06
Esophagu	3.56E-06
SI wall	3.58E-06
LLI wall	3.98E-06
Liver	3.56E-06
Muscle	3.56E-06
Pancreas	3.56E-06
Skin	3.56E-06
Testes	3.56E-06
Thyroid	3.56E-06
EFPEC	6.95E-06

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	5.59E-06
INHALATION	1.36E-06
AIR IMMERSION	0.00E+00
GROUND SURFACE	0.00E+00
INTERNAL	6.95E-06
EXTERNAL	0.00E+00
TOTAL	6.95E-06

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SUMMARY
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NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
H-3	6.95E-06
TOTAL	6.95E-06

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SUMMARY
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CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
Esophagu	8.02E-14

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	H-3C.SUM
Stomach	4.02E-13
Colon	8.25E-13
Liver	1.12E-13
LUNG	6.82E-13
Bone	6.82E-15
Skin	7.22E-15
Breast	3.22E-13
Ovary	9.20E-14
Bladder	1.81E-13
Kidneys	3.86E-14
Thyroid	2.23E-14
Leukemia	4.12E-13
Residual	1.09E-12
Total	4.27E-12
TOTAL	8.55E-12

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	3.50E-12
INHALATION	7.71E-13
AIR IMMERSION	0.00E+00
GROUND SURFACE	0.00E+00
INTERNAL	4.27E-12
EXTERNAL	0.00E+00
TOTAL	4.27E-12

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SUMMARY
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NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
H-3	4.27E-12
TOTAL	4.27E-12

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SUMMARY
Page 5

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)

Direction	27715	28919	31060	H-3C.SUM 32802	34577	35279	35683
N	5.4E-06	5.4E-06	5.3E-06	5.3E-06	5.3E-06	5.2E-06	5.2E-06
NNW	5.0E-06	5.0E-06	5.0E-06	5.0E-06	5.0E-06	5.0E-06	5.0E-06
NW	5.1E-06	5.1E-06	5.1E-06	5.1E-06	5.1E-06	5.0E-06	5.0E-06
WNW	5.2E-06	5.2E-06	5.2E-06	5.1E-06	5.1E-06	5.1E-06	5.1E-06
W	5.3E-06	5.2E-06	5.2E-06	5.2E-06	5.2E-06	5.2E-06	5.2E-06
WSW	5.4E-06	5.4E-06	5.3E-06	5.3E-06	5.3E-06	5.3E-06	5.3E-06
SW	5.8E-06	5.7E-06	5.6E-06	5.6E-06	5.5E-06	5.5E-06	5.5E-06
SSW	6.4E-06	6.3E-06	6.2E-06	6.1E-06	6.0E-06	6.0E-06	6.0E-06
S	7.0E-06	6.8E-06	6.7E-06	6.6E-06	6.5E-06	6.4E-06	6.4E-06
SSE	6.6E-06	6.5E-06	6.4E-06	6.3E-06	6.2E-06	6.2E-06	6.2E-06
SE	5.8E-06	5.8E-06	5.7E-06	5.6E-06	5.6E-06	5.6E-06	5.6E-06
ESE	5.5E-06	5.5E-06	5.4E-06	5.4E-06	5.3E-06	5.3E-06	5.3E-06
E	5.7E-06	5.6E-06	5.6E-06	5.5E-06	5.5E-06	5.5E-06	5.5E-06
ENE	5.5E-06	5.5E-06	5.5E-06	5.4E-06	5.4E-06	5.4E-06	5.4E-06
NE	5.9E-06	5.8E-06	5.7E-06	5.7E-06	5.6E-06	5.6E-06	5.6E-06
NNE	5.5E-06	5.5E-06	5.4E-06	5.4E-06	5.4E-06	5.3E-06	5.3E-06

Distance (m)

Direction	36721	36809	37729	39079	39220	39559	43584
N	5.2E-06	5.2E-06	5.2E-06	5.2E-06	5.2E-06	5.2E-06	5.2E-06
NNW	5.0E-06	5.0E-06	5.0E-06	5.0E-06	5.0E-06	5.0E-06	4.9E-06
NW	5.0E-06	5.0E-06	5.0E-06	5.0E-06	5.0E-06	5.0E-06	5.0E-06
WNW	5.1E-06	5.1E-06	5.1E-06	5.1E-06	5.1E-06	5.1E-06	5.1E-06
W	5.1E-06	5.1E-06	5.1E-06	5.1E-06	5.1E-06	5.1E-06	5.1E-06
WSW	5.3E-06	5.2E-06	5.2E-06	5.2E-06	5.2E-06	5.2E-06	5.2E-06
SW	5.5E-06	5.5E-06	5.5E-06	5.4E-06	5.4E-06	5.4E-06	5.4E-06
SSW	5.9E-06	5.9E-06	5.9E-06	5.9E-06	5.8E-06	5.8E-06	5.7E-06
S	6.3E-06	6.3E-06	6.3E-06	6.2E-06	6.2E-06	6.2E-06	6.1E-06
SSE	6.1E-06	6.1E-06	6.1E-06	6.0E-06	6.0E-06	6.0E-06	5.9E-06
SE	5.5E-06	5.5E-06	5.5E-06	5.5E-06	5.5E-06	5.5E-06	5.4E-06
ESE	5.3E-06	5.3E-06	5.3E-06	5.3E-06	5.3E-06	5.3E-06	5.2E-06
E	5.4E-06	5.4E-06	5.4E-06	5.4E-06	5.4E-06	5.4E-06	5.3E-06
ENE	5.3E-06	5.3E-06	5.3E-06	5.3E-06	5.3E-06	5.3E-06	5.3E-06
NE	5.6E-06	5.6E-06	5.5E-06	5.5E-06	5.5E-06	5.5E-06	5.4E-06
NNE	5.3E-06	5.3E-06	5.3E-06	5.3E-06	5.3E-06	5.3E-06	5.2E-06

□

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SUMMARY
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INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Direction	45196	45275	45654	45677	46668	47969
N	5.1E-06	5.1E-06	5.1E-06	5.1E-06	5.1E-06	5.1E-06
NNW	4.9E-06	4.9E-06	4.9E-06	4.9E-06	4.9E-06	4.9E-06

	H-3C.SUM					
NW	5.0E-06	5.0E-06	5.0E-06	5.0E-06	5.0E-06	5.0E-06
WNW	5.1E-06	5.1E-06	5.0E-06	5.0E-06	5.0E-06	5.0E-06
W	5.1E-06	5.1E-06	5.1E-06	5.1E-06	5.1E-06	5.1E-06
WSW	5.2E-06	5.2E-06	5.2E-06	5.2E-06	5.1E-06	5.1E-06
SW	5.4E-06	5.3E-06	5.3E-06	5.3E-06	5.3E-06	5.3E-06
SSW	5.7E-06	5.7E-06	5.7E-06	5.7E-06	5.7E-06	5.6E-06
S	6.0E-06	6.0E-06	6.0E-06	6.0E-06	6.0E-06	5.9E-06
SSE	5.8E-06	5.8E-06	5.8E-06	5.8E-06	5.8E-06	5.8E-06
SE	5.4E-06	5.4E-06	5.4E-06	5.4E-06	5.4E-06	5.4E-06
ESE	5.2E-06	5.2E-06	5.2E-06	5.2E-06	5.2E-06	5.2E-06
E	5.3E-06	5.3E-06	5.3E-06	5.3E-06	5.3E-06	5.3E-06
ENE	5.2E-06	5.2E-06	5.2E-06	5.2E-06	5.2E-06	5.2E-06
NE	5.4E-06	5.4E-06	5.4E-06	5.4E-06	5.4E-06	5.4E-06
NNE	5.2E-06	5.2E-06	5.2E-06	5.2E-06	5.2E-06	5.2E-06

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)						
Direction	27715	28919	31060	32802	34577	35279	35683
N	3.3E-12	3.3E-12	3.3E-12	3.3E-12	3.3E-12	3.3E-12	3.3E-12
NNW	3.1E-12	3.1E-12	3.1E-12	3.1E-12	3.1E-12	3.1E-12	3.1E-12
NW	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12
WNW	3.3E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12
W	3.3E-12	3.3E-12	3.3E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12
WSW	3.4E-12	3.4E-12	3.3E-12	3.3E-12	3.3E-12	3.3E-12	3.3E-12
SW	3.6E-12	3.5E-12	3.5E-12	3.5E-12	3.4E-12	3.4E-12	3.4E-12
SSW	3.9E-12	3.9E-12	3.8E-12	3.8E-12	3.7E-12	3.7E-12	3.7E-12
S	4.3E-12	4.2E-12	4.1E-12	4.0E-12	4.0E-12	4.0E-12	3.9E-12
SSE	4.1E-12	4.0E-12	3.9E-12	3.9E-12	3.8E-12	3.8E-12	3.8E-12
SE	3.6E-12	3.6E-12	3.5E-12	3.5E-12	3.5E-12	3.5E-12	3.5E-12
ESE	3.4E-12	3.4E-12	3.4E-12	3.3E-12	3.3E-12	3.3E-12	3.3E-12
E	3.5E-12	3.5E-12	3.5E-12	3.4E-12	3.4E-12	3.4E-12	3.4E-12
ENE	3.4E-12	3.4E-12	3.4E-12	3.4E-12	3.3E-12	3.3E-12	3.3E-12
NE	3.6E-12	3.6E-12	3.6E-12	3.5E-12	3.5E-12	3.5E-12	3.5E-12
NNE	3.4E-12	3.4E-12	3.4E-12	3.4E-12	3.3E-12	3.3E-12	3.3E-12

	Distance (m)						
Direction	36721	36809	37729	39079	39220	39559	43584
N	3.3E-12	3.3E-12	3.3E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12
NNW	3.1E-12	3.1E-12	3.1E-12	3.1E-12	3.1E-12	3.1E-12	3.1E-12
NW	3.1E-12	3.1E-12	3.1E-12	3.1E-12	3.1E-12	3.1E-12	3.1E-12
WNW	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12
W	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12
WSW	3.3E-12	3.3E-12	3.3E-12	3.3E-12	3.3E-12	3.3E-12	3.2E-12
SW	3.4E-12	3.4E-12	3.4E-12	3.4E-12	3.4E-12	3.4E-12	3.3E-12
SSW	3.7E-12	3.7E-12	3.7E-12	3.6E-12	3.6E-12	3.6E-12	3.6E-12

	H-3C.SUM						
S	3.9E-12	3.9E-12	3.9E-12	3.9E-12	3.9E-12	3.8E-12	3.8E-12
SSE	3.8E-12	3.8E-12	3.8E-12	3.7E-12	3.7E-12	3.7E-12	3.6E-12
SE	3.4E-12	3.4E-12	3.4E-12	3.4E-12	3.4E-12	3.4E-12	3.4E-12
ESE	3.3E-12	3.3E-12	3.3E-12	3.3E-12	3.3E-12	3.3E-12	3.3E-12
E	3.4E-12	3.4E-12	3.4E-12	3.4E-12	3.4E-12	3.4E-12	3.3E-12
ENE	3.3E-12	3.3E-12	3.3E-12	3.3E-12	3.3E-12	3.3E-12	3.3E-12
NE	3.5E-12	3.5E-12	3.4E-12	3.4E-12	3.4E-12	3.4E-12	3.4E-12
NNE	3.3E-12	3.3E-12	3.3E-12	3.3E-12	3.3E-12	3.3E-12	3.3E-12

Feb 20, 2008 02:31 pm

SUMMARY
Page 8

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)					
Direction	45196	45275	45654	45677	46668	47969
N	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12
NNW	3.1E-12	3.1E-12	3.1E-12	3.1E-12	3.1E-12	3.1E-12
NW	3.1E-12	3.1E-12	3.1E-12	3.1E-12	3.1E-12	3.1E-12
WNW	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.1E-12	3.1E-12
W	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12
WSW	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12
SW	3.3E-12	3.3E-12	3.3E-12	3.3E-12	3.3E-12	3.3E-12
SSW	3.5E-12	3.5E-12	3.5E-12	3.5E-12	3.5E-12	3.5E-12
S	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12
SSE	3.6E-12	3.6E-12	3.6E-12	3.6E-12	3.6E-12	3.6E-12
SE	3.4E-12	3.4E-12	3.3E-12	3.3E-12	3.3E-12	3.3E-12
ESE	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12
E	3.3E-12	3.3E-12	3.3E-12	3.3E-12	3.3E-12	3.3E-12
ENE	3.3E-12	3.3E-12	3.3E-12	3.3E-12	3.3E-12	3.2E-12
NE	3.4E-12	3.4E-12	3.4E-12	3.4E-12	3.4E-12	3.3E-12
NNE	3.3E-12	3.3E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12

H-3D.SUM

C A P 8 8 - P C

Version 3.0

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment

Feb 20, 2008 02:31 pm

Facility: INL
Address: PO Box 1625
City: Idaho Falls
State: ID Zip: 83415

Source Category:
Source Type: Stack
Emission Year: 2008

Comments: TAN-TSF
Receptors 60-62

Dataset Name: RUND
Dataset Date: 08/02/20 2:20:00 PM
Wind File: C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

Feb 20, 2008 02:31 pm

SUMMARY
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
Adrenals	2.14E-06
B Surfac	2.14E-06
Breasts	2.14E-06
St wall	2.75E-06
ULI wall	2.24E-06
Kidneys	2.14E-06
Lungs	2.14E-06
Ovaries	2.14E-06
R Marrow	2.14E-06
Spleen	2.14E-06
Thymus	2.14E-06
Uterus	2.14E-06

	H-3D.SUM
Bld wall	2.14E-06
Brain	2.14E-06
Esophagu	2.14E-06
SI wall	2.16E-06
LLI wall	2.41E-06
Liver	2.14E-06
Muscle	2.14E-06
Pancreas	2.14E-06
Skin	2.14E-06
Testes	2.14E-06
Thyroid	2.14E-06
EFEC	4.25E-06

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	3.57E-06
INHALATION	6.78E-07
AIR IMMERSION	0.00E+00
GROUND SURFACE	0.00E+00
INTERNAL	4.25E-06
EXTERNAL	0.00E+00
TOTAL	4.25E-06

Feb 20, 2008 02:31 pm

SUMMARY
Page 2

NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
H-3	4.25E-06
TOTAL	4.25E-06

Feb 20, 2008 02:31 pm

SUMMARY
Page 3

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
Esophagu	4.89E-14

Page 2

	H-3D.SUM
Stomach	2.49E-13
Colon	5.08E-13
Liver	6.87E-14
LUNG	4.17E-13
Bone	4.17E-15
Skin	4.42E-15
Breast	1.97E-13
Ovary	5.61E-14
Bladder	1.10E-13
Kidneys	2.36E-14
Thyroid	1.36E-14
Leukemia	2.52E-13
Residual	6.67E-13
Total	2.62E-12
TOTAL	5.24E-12

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	2.24E-12
INHALATION	3.84E-13
AIR IMMERSION	0.00E+00
GROUND SURFACE	0.00E+00
INTERNAL	2.62E-12
EXTERNAL	0.00E+00
TOTAL	2.62E-12

Feb 20, 2008 02:31 pm

SUMMARY
Page 4

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
H-3	2.62E-12
TOTAL	2.62E-12

Feb 20, 2008 02:31 pm

SUMMARY
Page 5

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)

Direction	50024	54611	58610
-----------	-------	-------	-------

N	3.5E-06	3.4E-06	3.4E-06
NNW	3.3E-06	3.3E-06	3.3E-06
NW	3.3E-06	3.3E-06	3.3E-06
WNW	3.4E-06	3.4E-06	3.4E-06
W	3.4E-06	3.4E-06	3.4E-06
WSW	3.5E-06	3.5E-06	3.4E-06
SW	3.7E-06	3.6E-06	3.6E-06
SSW	4.0E-06	3.9E-06	3.8E-06
S	4.2E-06	4.1E-06	4.1E-06
SSE	4.1E-06	4.0E-06	3.9E-06
SE	3.7E-06	3.6E-06	3.6E-06
ESE	3.5E-06	3.5E-06	3.5E-06
E	3.6E-06	3.6E-06	3.6E-06
ENE	3.6E-06	3.5E-06	3.5E-06
NE	3.7E-06	3.7E-06	3.6E-06
NNE	3.5E-06	3.5E-06	3.5E-06

□

Feb 20, 2008 02:31 pm

SUMMARY
Page 6

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

Distance (m)

Direction	50024	54611	58610
-----------	-------	-------	-------

N	2.2E-12	2.2E-12	2.1E-12
NNW	2.1E-12	2.1E-12	2.0E-12
NW	2.1E-12	2.1E-12	2.1E-12
WNW	2.1E-12	2.1E-12	2.1E-12
W	2.1E-12	2.1E-12	2.1E-12
WSW	2.2E-12	2.2E-12	2.1E-12
SW	2.3E-12	2.2E-12	2.2E-12
SSW	2.5E-12	2.4E-12	2.4E-12
S	2.6E-12	2.6E-12	2.5E-12
SSE	2.5E-12	2.5E-12	2.4E-12
SE	2.3E-12	2.3E-12	2.2E-12
ESE	2.2E-12	2.2E-12	2.2E-12
E	2.3E-12	2.2E-12	2.2E-12
ENE	2.2E-12	2.2E-12	2.2E-12
NE	2.3E-12	2.3E-12	2.3E-12
NNE	2.2E-12	2.2E-12	2.2E-12

08/02/20 2:16:00 PM N-13A.dat
 Feb 20, 2008 02:30 pm
 RUNA RUNA.
 C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

INL
 PO Box 1625

Idaho Falls ID 83415
 2008

TAN-TSF
 Receptors 1-20
 100.0000,500.0000

0	0	0	0	0	20		
10344	10365	10472	10590	11103	11989	12522	13245
13286	13483	13612	13664	13959	14258	14374	15241
15441	15784	15844	16323				
800	280.20	16.30	3.54				
0	0						

1	1.00	0.000E+00	0.000E+00				
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
1	0	1					
N-13	G	0	0.000e+00	0.000e+00	5.480e-05		0
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified	7.500E+00	2.000E+01	1.000E-02	1.000E-02	1.001E+02		
0.08	0.92	0.00	Urban				
0.00	1.00	0.00					
0.01	0.99	0.00					

T	T	T	T				
2.030e-01	4.560e-02	1.700e-02					
N-13	7	0					
00	00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00			
1							
N-13	G	0	0.000e+00	0.000e+00	5.480e-05		0
5.602E-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	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified	7.500E+00	2.000E+01	1.000E-02	1.000E-02	1.001E+02		
--DecayStep--1							
--LimitChildren--1							
--Children--5							

08/02/20 2:17:00 PM Feb 20, 2008 02:30 pm
 RUNB RUNB.
 C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

INL
 PO Box 1625

Idaho Falls ID 83415
 2008

TAN-TSF
 Receptors 21-39
 100.0000,500.0000

0	0	0	0	0	19		
17035	17329	18607	18834	18860	18890	19860	19891
20457	21314	21349	22159	23521	24430	24545	25171
26794	27275	27389	0				
800	280.20	16.30	3.54				
0	0						

1	1.00	0.000E+00	0.000E+00				
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	

1	0	1					
N-13	G	0	0.000e+00	0.000e+00	5.480e-05		0
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified	7.500E+00	2.000E+01	1.000E-02	1.000E-02	1.001E+02		
0.08	0.92	0.00	Urban				
0.00	1.00	0.00					
0.01	0.99	0.00					

T	T	T	T				
2.030e-01	4.560e-02	1.700e-02					
N-13	7	0					
00	00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00			

1							
N-13	G	0	0.000e+00	0.000e+00	5.480e-05		0
5.602E-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	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified	7.500E+00	2.000E+01	1.000E-02	1.000E-02	1.001E+02		

--DecayStep--1
 --LimitChildren--1
 --Children--5

08/02/20 2:19:00 PM N-13C.dat
 Feb 20, 2008 02:31 pm
 RUNC RUNC.
 C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

INL
 PO Box 1625

Idaho Falls ID 83415
 2008

TAN-TSF
 Receptors 40-59
 100.0000,500.0000

0	0	0	0	0	20		
27715	28919	31060	32802	34577	35279	35683	36721
36809	37729	39079	39220	39559	43584	45196	45275
45654	45677	46668	47969				
800	280.20	16.30	3.54				
0	0						

1	1.00	0.000E+00	0.000E+00				
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
1	0	1					
N-13	G	0	0.000e+00	0.000e+00	5.480e-05		0
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified	7.500E+00	2.000E+01	1.000E-02	1.000E-02	1.001E+02		
0.08	0.92	0.00	Urban				
0.00	1.00	0.00					
0.01	0.99	0.00					

T	T	T	T				
2.030e-01	4.560e-02	1.700e-02					
N-13	7	0					
00	00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00			
1							
N-13	G	0	0.000e+00	0.000e+00	5.480e-05		0
5.602E-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	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified	7.500E+00	2.000E+01	1.000E-02	1.000E-02	1.001E+02		
--DecayStep--1							
--LimitChildren--1							
--Children--5							

08/02/20 2:20:00 PM N-13D.dat
 Feb 20, 2008 02:31 pm
 RUND RUND.
 C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

INL
 PO Box 1625

Idaho Falls ID 83415
 2008

TAN-TSF
 Receptors 60-62
 100.0000,500.0000

0	0	0	0	0	3		
50024	54611	58610	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0			
800	280.20	16.30	3.54				
0	0						

1	1.00	0.000E+00	0.000E+00				
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
1	0	1					

N-13	G	0	0.000e+00	0.000e+00	5.480e-05		0
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified	7.500E+00	2.000E+01	1.000E-02	1.000E-02	1.001E+02		
0.08	0.92	0.00	Urban				
0.00	1.00	0.00					
0.01	0.99	0.00					

T	T	T	T				
2.030e-01	4.560e-02	1.700e-02					
N-13	7	0					
00	00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00			

1							
N-13	G	0	0.000e+00	0.000e+00	5.480e-05		0
5.602E-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	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified	7.500E+00	2.000E+01	1.000E-02	1.000E-02	1.001E+02		

--DecayStep--1
 --LimitChildren--1
 --Children--5

N-13A.SUM

C A P 8 8 - P C

Version 3.0

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment

Feb 20, 2008 02:30 pm

Facility: INL
Address: PO Box 1625
City: Idaho Falls
State: ID Zip: 83415

Source Category:
Source Type: Stack
Emission Year: 2008

Comments: TAN-TSF
Receptors 1-20

Dataset Name: RUNA
Dataset Date: 08/02/20 2:16:00 PM
Wind File: C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

Feb 20, 2008 02:30 pm

SUMMARY
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
Adrenals	1.42E-05
B Surfac	3.00E-05
Breasts	1.95E-05
St wall	1.50E-05
ULI wall	1.39E-05
Kidneys	1.51E-05
Lungs	1.69E-05
Ovaries	1.26E-05
R Marrow	1.63E-05
Spleen	1.53E-05
Thymus	1.57E-05
Uterus	1.30E-05

	N-13A.SUM
Bld wall	1.41E-05
Brain	1.80E-05
Esophagu	1.39E-05
SI wall	1.33E-05
LLI wall	1.36E-05
Liver	1.52E-05
Muscle	1.65E-05
Pancreas	1.33E-05
Skin	3.09E-05
Testes	1.70E-05
Thyroid	1.73E-05
EFEC	1.63E-05

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	0.00E+00
INHALATION	0.00E+00
AIR IMMERSION	1.63E-05
GROUND SURFACE	0.00E+00
INTERNAL	0.00E+00
EXTERNAL	1.63E-05
TOTAL	1.63E-05

Feb 20, 2008 02:30 pm

SUMMARY
Page 2

NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
N-13	1.63E-05
TOTAL	1.63E-05

Feb 20, 2008 02:30 pm

SUMMARY
Page 3

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
Esophagu	1.60E-13

Page 2

	N-13A.SUM
Stomach	6.08E-13
Colon	1.42E-12
Liver	2.30E-13
LUNG	1.65E-12
Bone	2.85E-14
Skin	3.08E-14
Breast	9.39E-13
Ovary	1.80E-13
Bladder	3.41E-13
Kidneys	7.86E-14
Thyroid	5.51E-14
Leukemia	9.14E-13
Residual	2.18E-12
Total	8.82E-12
TOTAL	1.76E-11

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	0.00E+00
INHALATION	0.00E+00
AIR IMMERSION	8.82E-12
GROUND SURFACE	0.00E+00
INTERNAL	0.00E+00
EXTERNAL	8.82E-12
TOTAL	8.82E-12

Feb 20, 2008 02:30 pm

SUMMARY
Page 4

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
N-13	8.82E-12
TOTAL	8.82E-12

Feb 20, 2008 02:30 pm

SUMMARY
Page 5

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)

Direction	10344	10365	10472	N-13A.SUM 10590	11103	11989	12522
N	3.9E-06	3.9E-06	3.9E-06	3.8E-06	3.6E-06	3.3E-06	3.2E-06
NNW	1.5E-06	1.5E-06	1.5E-06	1.4E-06	1.4E-06	1.3E-06	1.2E-06
NW	2.1E-06	2.1E-06	2.0E-06	2.0E-06	1.9E-06	1.7E-06	1.7E-06
WNW	2.8E-06	2.7E-06	2.7E-06	2.7E-06	2.5E-06	2.3E-06	2.2E-06
W	3.1E-06	3.1E-06	3.1E-06	3.1E-06	2.9E-06	2.7E-06	2.5E-06
WSW	4.2E-06	4.2E-06	4.2E-06	4.1E-06	3.9E-06	3.6E-06	3.4E-06
SW	6.9E-06	6.9E-06	6.8E-06	6.7E-06	6.4E-06	5.8E-06	5.5E-06
SSW	1.2E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05	9.7E-06	9.2E-06
S	1.6E-05	1.6E-05	1.6E-05	1.6E-05	1.5E-05	1.4E-05	1.3E-05
SSE	1.4E-05	1.3E-05	1.3E-05	1.3E-05	1.2E-05	1.1E-05	1.1E-05
SE	7.1E-06	7.1E-06	7.0E-06	6.9E-06	6.5E-06	6.0E-06	5.7E-06
ESE	4.7E-06	4.7E-06	4.6E-06	4.6E-06	4.3E-06	4.0E-06	3.8E-06
E	6.0E-06	6.0E-06	6.0E-06	5.9E-06	5.6E-06	5.1E-06	4.9E-06
ENE	5.2E-06	5.2E-06	5.2E-06	5.1E-06	4.8E-06	4.4E-06	4.2E-06
NE	7.9E-06	7.9E-06	7.8E-06	7.7E-06	7.3E-06	6.6E-06	6.3E-06
NNE	5.0E-06	5.0E-06	4.9E-06	4.9E-06	4.6E-06	4.2E-06	4.0E-06

Distance (m)

Direction	13245	13286	13483	13612	13664	13959	14258
N	3.0E-06	3.0E-06	2.9E-06	2.9E-06	2.9E-06	2.8E-06	2.8E-06
NNW	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.0E-06
NW	1.6E-06	1.6E-06	1.5E-06	1.5E-06	1.5E-06	1.5E-06	1.4E-06
WNW	2.1E-06	2.1E-06	2.0E-06	2.0E-06	2.0E-06	2.0E-06	1.9E-06
W	2.4E-06	2.4E-06	2.3E-06	2.3E-06	2.3E-06	2.2E-06	2.2E-06
WSW	3.2E-06	3.2E-06	3.1E-06	3.1E-06	3.1E-06	3.0E-06	2.9E-06
SW	5.1E-06	5.1E-06	5.0E-06	5.0E-06	4.9E-06	4.8E-06	4.7E-06
SSW	8.6E-06	8.5E-06	8.4E-06	8.3E-06	8.3E-06	8.0E-06	7.8E-06
S	1.2E-05	1.2E-05	1.2E-05	1.2E-05	1.2E-05	1.1E-05	1.1E-05
SSE	1.0E-05	1.0E-05	9.8E-06	9.7E-06	9.7E-06	9.4E-06	9.2E-06
SE	5.3E-06	5.3E-06	5.2E-06	5.2E-06	5.2E-06	5.0E-06	4.9E-06
ESE	3.5E-06	3.5E-06	3.5E-06	3.4E-06	3.4E-06	3.3E-06	3.3E-06
E	4.6E-06	4.6E-06	4.5E-06	4.4E-06	4.4E-06	4.3E-06	4.2E-06
ENE	3.9E-06	3.9E-06	3.8E-06	3.8E-06	3.8E-06	3.7E-06	3.6E-06
NE	5.9E-06	5.8E-06	5.7E-06	5.7E-06	5.7E-06	5.5E-06	5.4E-06
NNE	3.7E-06	3.7E-06	3.7E-06	3.6E-06	3.6E-06	3.5E-06	3.4E-06

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SUMMARY
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INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Direction	14374	15241	15441	15784	15844	16323
N	2.7E-06	2.6E-06	2.5E-06	2.5E-06	2.4E-06	2.4E-06
NNW	1.0E-06	9.6E-07	9.4E-07	9.2E-07	9.2E-07	8.9E-07

	N-13A.SUM					
NW	1.4E-06	1.3E-06	1.3E-06	1.3E-06	1.3E-06	1.2E-06
WNW	1.9E-06	1.8E-06	1.8E-06	1.7E-06	1.7E-06	1.7E-06
W	2.2E-06	2.0E-06	2.0E-06	2.0E-06	2.0E-06	1.9E-06
WSW	2.9E-06	2.7E-06	2.7E-06	2.6E-06	2.6E-06	2.5E-06
SW	4.7E-06	4.3E-06	4.3E-06	4.2E-06	4.2E-06	4.0E-06
SSW	7.8E-06	7.3E-06	7.1E-06	7.0E-06	6.9E-06	6.7E-06
S	1.1E-05	1.0E-05	1.0E-05	9.7E-06	9.7E-06	9.3E-06
SSE	9.1E-06	8.5E-06	8.4E-06	8.1E-06	8.1E-06	7.8E-06
SE	4.9E-06	4.5E-06	4.5E-06	4.4E-06	4.3E-06	4.2E-06
ESE	3.2E-06	3.0E-06	3.0E-06	2.9E-06	2.9E-06	2.8E-06
E	4.2E-06	3.9E-06	3.8E-06	3.7E-06	3.7E-06	3.6E-06
ENE	3.6E-06	3.3E-06	3.3E-06	3.2E-06	3.2E-06	3.1E-06
NE	5.3E-06	5.0E-06	4.9E-06	4.8E-06	4.7E-06	4.6E-06
NNE	3.4E-06	3.2E-06	3.1E-06	3.1E-06	3.0E-06	2.9E-06

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)						
Direction	10344	10365	10472	10590	11103	11989	12522
N	2.1E-12	2.1E-12	2.1E-12	2.1E-12	2.0E-12	1.8E-12	1.7E-12
NNW	8.1E-13	8.0E-13	8.0E-13	7.9E-13	7.4E-13	6.8E-13	6.5E-13
NW	1.1E-12	1.1E-12	1.1E-12	1.1E-12	1.0E-12	9.5E-13	9.0E-13
WNW	1.5E-12	1.5E-12	1.5E-12	1.5E-12	1.4E-12	1.3E-12	1.2E-12
W	1.7E-12	1.7E-12	1.7E-12	1.7E-12	1.6E-12	1.4E-12	1.4E-12
WSW	2.3E-12	2.3E-12	2.3E-12	2.2E-12	2.1E-12	1.9E-12	1.8E-12
SW	3.8E-12	3.7E-12	3.7E-12	3.7E-12	3.4E-12	3.1E-12	3.0E-12
SSW	6.3E-12	6.2E-12	6.2E-12	6.1E-12	5.7E-12	5.2E-12	5.0E-12
S	8.8E-12	8.8E-12	8.7E-12	8.6E-12	8.1E-12	7.4E-12	7.0E-12
SSE	7.3E-12	7.3E-12	7.2E-12	7.1E-12	6.7E-12	6.1E-12	5.8E-12
SE	3.8E-12	3.8E-12	3.8E-12	3.7E-12	3.5E-12	3.2E-12	3.1E-12
ESE	2.5E-12	2.5E-12	2.5E-12	2.5E-12	2.3E-12	2.2E-12	2.1E-12
E	3.3E-12	3.3E-12	3.2E-12	3.2E-12	3.0E-12	2.8E-12	2.6E-12
ENE	2.8E-12	2.8E-12	2.8E-12	2.8E-12	2.6E-12	2.4E-12	2.3E-12
NE	4.3E-12	4.3E-12	4.2E-12	4.2E-12	4.0E-12	3.6E-12	3.4E-12
NNE	2.7E-12	2.7E-12	2.7E-12	2.6E-12	2.5E-12	2.3E-12	2.2E-12

	Distance (m)						
Direction	13245	13286	13483	13612	13664	13959	14258
N	1.6E-12	1.6E-12	1.6E-12	1.6E-12	1.6E-12	1.5E-12	1.5E-12
NNW	6.1E-13	6.1E-13	6.0E-13	5.9E-13	5.9E-13	5.7E-13	5.6E-13
NW	8.5E-13	8.4E-13	8.3E-13	8.2E-13	8.2E-13	8.0E-13	7.8E-13
WNW	1.1E-12	1.1E-12	1.1E-12	1.1E-12	1.1E-12	1.1E-12	1.0E-12
W	1.3E-12	1.3E-12	1.3E-12	1.3E-12	1.2E-12	1.2E-12	1.2E-12
WSW	1.7E-12	1.7E-12	1.7E-12	1.7E-12	1.7E-12	1.6E-12	1.6E-12
SW	2.8E-12	2.8E-12	2.7E-12	2.7E-12	2.7E-12	2.6E-12	2.6E-12
SSW	4.6E-12	4.6E-12	4.5E-12	4.5E-12	4.5E-12	4.4E-12	4.3E-12

	N-13A.SUM						
S	6.5E-12	6.5E-12	6.4E-12	6.3E-12	6.3E-12	6.1E-12	6.0E-12
SSE	5.4E-12	5.4E-12	5.3E-12	5.3E-12	5.3E-12	5.1E-12	5.0E-12
SE	2.9E-12	2.9E-12	2.8E-12	2.8E-12	2.8E-12	2.7E-12	2.7E-12
ESE	1.9E-12	1.9E-12	1.9E-12	1.9E-12	1.9E-12	1.8E-12	1.8E-12
E	2.5E-12	2.5E-12	2.4E-12	2.4E-12	2.4E-12	2.3E-12	2.3E-12
ENE	2.1E-12	2.1E-12	2.1E-12	2.1E-12	2.1E-12	2.0E-12	2.0E-12
NE	3.2E-12	3.2E-12	3.1E-12	3.1E-12	3.1E-12	3.0E-12	2.9E-12
NNE	2.0E-12	2.0E-12	2.0E-12	2.0E-12	2.0E-12	1.9E-12	1.9E-12

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)					
Direction	14374	15241	15441	15784	15844	16323
N	1.5E-12	1.4E-12	1.4E-12	1.3E-12	1.3E-12	1.3E-12
NNW	5.6E-13	5.2E-13	5.1E-13	5.0E-13	5.0E-13	4.8E-13
NW	7.7E-13	7.3E-13	7.1E-13	7.0E-13	6.9E-13	6.7E-13
WNW	1.0E-12	9.7E-13	9.6E-13	9.3E-13	9.3E-13	9.0E-13
W	1.2E-12	1.1E-12	1.1E-12	1.1E-12	1.1E-12	1.0E-12
WSW	1.6E-12	1.5E-12	1.4E-12	1.4E-12	1.4E-12	1.4E-12
SW	2.5E-12	2.4E-12	2.3E-12	2.3E-12	2.3E-12	2.2E-12
SSW	4.2E-12	3.9E-12	3.9E-12	3.8E-12	3.8E-12	3.6E-12
S	5.9E-12	5.5E-12	5.4E-12	5.3E-12	5.3E-12	5.1E-12
SSE	4.9E-12	4.6E-12	4.5E-12	4.4E-12	4.4E-12	4.2E-12
SE	2.6E-12	2.5E-12	2.4E-12	2.4E-12	2.4E-12	2.3E-12
ESE	1.8E-12	1.6E-12	1.6E-12	1.6E-12	1.6E-12	1.5E-12
E	2.3E-12	2.1E-12	2.1E-12	2.0E-12	2.0E-12	2.0E-12
ENE	1.9E-12	1.8E-12	1.8E-12	1.7E-12	1.7E-12	1.7E-12
NE	2.9E-12	2.7E-12	2.7E-12	2.6E-12	2.6E-12	2.5E-12
NNE	1.9E-12	1.7E-12	1.7E-12	1.7E-12	1.7E-12	1.6E-12

N-13B.SUM

C A P 8 8 - P C

Version 3.0

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment

Feb 20, 2008 02:30 pm

Facility: INL
Address: PO Box 1625
City: Idaho Falls
State: ID Zip: 83415

Source Category:
Source Type: Stack
Emission Year: 2008

Comments: TAN-TSF
Receptors 21-39

Dataset Name: RUNB
Dataset Date: 08/02/20 2:17:00 PM
Wind File: C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

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SUMMARY
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ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
Adrenals	7.73E-06
B Surfac	1.64E-05
Breasts	1.06E-05
St wall	8.22E-06
ULI wall	7.61E-06
Kidneys	8.25E-06
Lungs	9.23E-06
Ovaries	6.89E-06
R Marrow	8.90E-06
Spleen	8.35E-06
Thymus	8.55E-06
Uterus	7.11E-06

	N-13B.SUM
Bld wall	7.69E-06
Brain	9.83E-06
Esophagu	7.57E-06
SI wall	7.28E-06
LLI wall	7.42E-06
Liver	8.29E-06
Muscle	9.01E-06
Pancreas	7.24E-06
Skin	1.69E-05
Testes	9.28E-06
Thyroid	9.46E-06
EFEC	8.88E-06

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	0.00E+00
INHALATION	0.00E+00
AIR IMMERSION	8.88E-06
GROUND SURFACE	0.00E+00
INTERNAL	0.00E+00
EXTERNAL	8.88E-06
TOTAL	8.88E-06

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SUMMARY
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NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
N-13	8.88E-06
TOTAL	8.88E-06

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SUMMARY
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CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
Esophagu	8.72E-14

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	N-13B.SUM
Stomach	3.32E-13
Colon	7.77E-13
Liver	1.26E-13
LUNG	9.01E-13
Bone	1.56E-14
Skin	1.68E-14
Breast	5.13E-13
Ovary	9.81E-14
Bladder	1.86E-13
Kidneys	4.29E-14
Thyroid	3.01E-14
Leukemia	4.99E-13
Residual	1.19E-12
Total	4.82E-12
TOTAL	9.63E-12

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	0.00E+00
INHALATION	0.00E+00
AIR IMMERSION	4.82E-12
GROUND SURFACE	0.00E+00
INTERNAL	0.00E+00
EXTERNAL	4.82E-12
TOTAL	4.82E-12

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SUMMARY
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NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
N-13	4.82E-12
TOTAL	4.82E-12

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SUMMARY
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INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)

Direction	17035	17329	18607	N-13B.SUM 18834	18860	18890	19860
N	2.3E-06	2.2E-06	2.0E-06	2.0E-06	2.0E-06	2.0E-06	1.9E-06
NNW	8.5E-07	8.3E-07	7.7E-07	7.6E-07	7.5E-07	7.5E-07	7.1E-07
NW	1.2E-06	1.2E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.0E-06
WNW	1.6E-06	1.6E-06	1.4E-06	1.4E-06	1.4E-06	1.4E-06	1.3E-06
W	1.8E-06	1.8E-06	1.6E-06	1.6E-06	1.6E-06	1.6E-06	1.5E-06
WSW	2.4E-06	2.3E-06	2.2E-06	2.1E-06	2.1E-06	2.1E-06	2.0E-06
SW	3.8E-06	3.7E-06	3.4E-06	3.4E-06	3.4E-06	3.4E-06	3.2E-06
SSW	6.4E-06	6.2E-06	5.7E-06	5.6E-06	5.6E-06	5.6E-06	5.3E-06
S	8.9E-06	8.7E-06	8.0E-06	7.9E-06	7.9E-06	7.8E-06	7.4E-06
SSE	7.4E-06	7.3E-06	6.7E-06	6.6E-06	6.6E-06	6.6E-06	6.2E-06
SE	4.0E-06	3.9E-06	3.6E-06	3.6E-06	3.6E-06	3.6E-06	3.4E-06
ESE	2.7E-06	2.6E-06	2.4E-06	2.4E-06	2.4E-06	2.4E-06	2.2E-06
E	3.4E-06	3.4E-06	3.1E-06	3.1E-06	3.1E-06	3.1E-06	2.9E-06
ENE	2.9E-06	2.9E-06	2.7E-06	2.6E-06	2.6E-06	2.6E-06	2.5E-06
NE	4.3E-06	4.3E-06	3.9E-06	3.9E-06	3.8E-06	3.8E-06	3.6E-06
NNE	2.8E-06	2.8E-06	2.5E-06	2.5E-06	2.5E-06	2.5E-06	2.4E-06

Distance (m)

Direction	19891	20457	21314	21349	22159	23521	24430
N	1.9E-06	1.8E-06	1.8E-06	1.8E-06	1.7E-06	1.6E-06	1.5E-06
NNW	7.1E-07	6.9E-07	6.6E-07	6.6E-07	6.3E-07	5.9E-07	5.7E-07
NW	1.0E-06	9.6E-07	9.2E-07	9.2E-07	8.8E-07	8.3E-07	7.9E-07
WNW	1.3E-06	1.3E-06	1.2E-06	1.2E-06	1.2E-06	1.1E-06	1.1E-06
W	1.5E-06	1.5E-06	1.4E-06	1.4E-06	1.3E-06	1.3E-06	1.2E-06
WSW	2.0E-06	1.9E-06	1.8E-06	1.8E-06	1.8E-06	1.7E-06	1.6E-06
SW	3.2E-06	3.1E-06	2.9E-06	2.9E-06	2.8E-06	2.6E-06	2.5E-06
SSW	5.3E-06	5.1E-06	4.9E-06	4.9E-06	4.7E-06	4.4E-06	4.2E-06
S	7.4E-06	7.1E-06	6.8E-06	6.8E-06	6.5E-06	6.0E-06	5.8E-06
SSE	6.2E-06	6.0E-06	5.7E-06	5.7E-06	5.4E-06	5.1E-06	4.9E-06
SE	3.4E-06	3.2E-06	3.1E-06	3.1E-06	3.0E-06	2.8E-06	2.7E-06
ESE	2.2E-06	2.2E-06	2.1E-06	2.1E-06	2.0E-06	1.9E-06	1.8E-06
E	2.9E-06	2.8E-06	2.7E-06	2.7E-06	2.6E-06	2.4E-06	2.3E-06
ENE	2.5E-06	2.4E-06	2.3E-06	2.3E-06	2.2E-06	2.0E-06	1.9E-06
NE	3.6E-06	3.5E-06	3.3E-06	3.3E-06	3.2E-06	3.0E-06	2.8E-06
NNE	2.3E-06	2.3E-06	2.2E-06	2.2E-06	2.1E-06	1.9E-06	1.9E-06

□

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SUMMARY
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INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Direction	24545	25171	26794	27275	27389
N	1.5E-06	1.5E-06	1.4E-06	1.3E-06	1.3E-06
NNW	5.6E-07	5.5E-07	5.1E-07	5.0E-07	5.0E-07

	N-13B.SUM				
NW	7.9E-07	7.7E-07	7.2E-07	7.0E-07	7.0E-07
WNW	1.1E-06	1.0E-06	9.6E-07	9.4E-07	9.4E-07
W	1.2E-06	1.2E-06	1.1E-06	1.1E-06	1.1E-06
WSW	1.6E-06	1.5E-06	1.4E-06	1.4E-06	1.4E-06
SW	2.5E-06	2.4E-06	2.3E-06	2.2E-06	2.2E-06
SSW	4.1E-06	4.0E-06	3.7E-06	3.7E-06	3.6E-06
S	5.7E-06	5.6E-06	5.2E-06	5.1E-06	5.0E-06
SSE	4.8E-06	4.7E-06	4.4E-06	4.3E-06	4.2E-06
SE	2.6E-06	2.6E-06	2.4E-06	2.3E-06	2.3E-06
ESE	1.8E-06	1.7E-06	1.6E-06	1.6E-06	1.6E-06
E	2.3E-06	2.2E-06	2.1E-06	2.0E-06	2.0E-06
ENE	1.9E-06	1.9E-06	1.7E-06	1.7E-06	1.7E-06
NE	2.8E-06	2.7E-06	2.5E-06	2.5E-06	2.5E-06
NNE	1.8E-06	1.8E-06	1.7E-06	1.6E-06	1.6E-06

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)						
Direction	17035	17329	18607	18834	18860	18890	19860
N	1.2E-12	1.2E-12	1.1E-12	1.1E-12	1.1E-12	1.1E-12	1.0E-12
NNW	4.6E-13	4.5E-13	4.2E-13	4.1E-13	4.1E-13	4.1E-13	3.9E-13
NW	6.4E-13	6.3E-13	5.8E-13	5.7E-13	5.7E-13	5.7E-13	5.4E-13
WNW	8.6E-13	8.4E-13	7.8E-13	7.7E-13	7.7E-13	7.7E-13	7.2E-13
W	9.8E-13	9.6E-13	8.8E-13	8.7E-13	8.7E-13	8.7E-13	8.2E-13
WSW	1.3E-12	1.3E-12	1.2E-12	1.2E-12	1.2E-12	1.2E-12	1.1E-12
SW	2.1E-12	2.0E-12	1.9E-12	1.8E-12	1.8E-12	1.8E-12	1.7E-12
SSW	3.4E-12	3.4E-12	3.1E-12	3.1E-12	3.1E-12	3.1E-12	2.9E-12
S	4.8E-12	4.7E-12	4.3E-12	4.3E-12	4.3E-12	4.3E-12	4.0E-12
SSE	4.0E-12	4.0E-12	3.6E-12	3.6E-12	3.6E-12	3.6E-12	3.4E-12
SE	2.2E-12	2.1E-12	2.0E-12	1.9E-12	1.9E-12	1.9E-12	1.8E-12
ESE	1.4E-12	1.4E-12	1.3E-12	1.3E-12	1.3E-12	1.3E-12	1.2E-12
E	1.9E-12	1.8E-12	1.7E-12	1.7E-12	1.7E-12	1.7E-12	1.6E-12
ENE	1.6E-12	1.6E-12	1.4E-12	1.4E-12	1.4E-12	1.4E-12	1.3E-12
NE	2.4E-12	2.3E-12	2.1E-12	2.1E-12	2.1E-12	2.1E-12	2.0E-12
NNE	1.5E-12	1.5E-12	1.4E-12	1.4E-12	1.4E-12	1.4E-12	1.3E-12

	Distance (m)						
Direction	19891	20457	21314	21349	22159	23521	24430
N	1.0E-12	1.0E-12	9.5E-13	9.5E-13	9.1E-13	8.5E-13	8.2E-13
NNW	3.9E-13	3.7E-13	3.6E-13	3.6E-13	3.4E-13	3.2E-13	3.1E-13
NW	5.4E-13	5.2E-13	5.0E-13	5.0E-13	4.8E-13	4.5E-13	4.3E-13
WNW	7.2E-13	7.0E-13	6.7E-13	6.7E-13	6.4E-13	6.0E-13	5.8E-13
W	8.2E-13	8.0E-13	7.6E-13	7.6E-13	7.3E-13	6.8E-13	6.5E-13
WSW	1.1E-12	1.1E-12	1.0E-12	1.0E-12	9.6E-13	9.0E-13	8.6E-13
SW	1.7E-12	1.7E-12	1.6E-12	1.6E-12	1.5E-12	1.4E-12	1.4E-12
SSW	2.9E-12	2.8E-12	2.6E-12	2.6E-12	2.5E-12	2.4E-12	2.3E-12

	N-13B.SUM						
S	4.0E-12	3.9E-12	3.7E-12	3.7E-12	3.5E-12	3.3E-12	3.1E-12
SSE	3.4E-12	3.2E-12	3.1E-12	3.1E-12	3.0E-12	2.8E-12	2.6E-12
SE	1.8E-12	1.8E-12	1.7E-12	1.7E-12	1.6E-12	1.5E-12	1.4E-12
ESE	1.2E-12	1.2E-12	1.1E-12	1.1E-12	1.1E-12	1.0E-12	9.7E-13
E	1.6E-12	1.5E-12	1.5E-12	1.4E-12	1.4E-12	1.3E-12	1.2E-12
ENE	1.3E-12	1.3E-12	1.2E-12	1.2E-12	1.2E-12	1.1E-12	1.1E-12
NE	2.0E-12	1.9E-12	1.8E-12	1.8E-12	1.7E-12	1.6E-12	1.5E-12
NNE	1.3E-12	1.2E-12	1.2E-12	1.2E-12	1.1E-12	1.1E-12	1.0E-12

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)				
Direction	24545	25171	26794	27275	27389
N	8.1E-13	7.9E-13	7.4E-13	7.2E-13	7.2E-13
NNW	3.1E-13	3.0E-13	2.8E-13	2.7E-13	2.7E-13
NW	4.3E-13	4.2E-13	3.9E-13	3.8E-13	3.8E-13
WNW	5.7E-13	5.6E-13	5.2E-13	5.1E-13	5.1E-13
W	6.5E-13	6.3E-13	5.9E-13	5.8E-13	5.8E-13
WSW	8.6E-13	8.3E-13	7.8E-13	7.6E-13	7.6E-13
SW	1.4E-12	1.3E-12	1.2E-12	1.2E-12	1.2E-12
SSW	2.2E-12	2.2E-12	2.0E-12	2.0E-12	2.0E-12
S	3.1E-12	3.0E-12	2.8E-12	2.7E-12	2.7E-12
SSE	2.6E-12	2.5E-12	2.4E-12	2.3E-12	2.3E-12
SE	1.4E-12	1.4E-12	1.3E-12	1.3E-12	1.3E-12
ESE	9.6E-13	9.3E-13	8.7E-13	8.5E-13	8.5E-13
E	1.2E-12	1.2E-12	1.1E-12	1.1E-12	1.1E-12
ENE	1.0E-12	1.0E-12	9.5E-13	9.3E-13	9.2E-13
NE	1.5E-12	1.5E-12	1.4E-12	1.3E-12	1.3E-12
NNE	1.0E-12	9.7E-13	9.1E-13	8.9E-13	8.8E-13

N-13C.SUM

C A P 8 8 - P C

Version 3.0

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment

Feb 20, 2008 02:31 pm

Facility: INL
Address: PO Box 1625
City: Idaho Falls
State: ID Zip: 83415

Source Category:
Source Type: Stack
Emission Year: 2008

Comments: TAN-TSF
Receptors 40-59

Dataset Name: RUNC
Dataset Date: 08/02/20 2:19:00 PM
Wind File: C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

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SUMMARY
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ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
Adrenals	4.32E-06
B Surfac	9.16E-06
Breasts	5.94E-06
St wall	4.59E-06
ULI wall	4.26E-06
Kidneys	4.61E-06
Lungs	5.16E-06
Ovaries	3.85E-06
R Marrow	4.97E-06
Spleen	4.67E-06
Thymus	4.78E-06
Uterus	3.97E-06

	N-13C.SUM
Bld wall	4.30E-06
Brain	5.49E-06
Esophagu	4.23E-06
SI wall	4.07E-06
LLI wall	4.15E-06
Liver	4.64E-06
Muscle	5.04E-06
Pancreas	4.05E-06
Skin	9.43E-06
Testes	5.19E-06
Thyroid	5.29E-06
EFPEC	4.96E-06

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	0.00E+00
INHALATION	0.00E+00
AIR IMMERSION	4.96E-06
GROUND SURFACE	0.00E+00
INTERNAL	0.00E+00
EXTERNAL	4.96E-06
TOTAL	4.96E-06

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SUMMARY
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NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
N-13	4.96E-06
TOTAL	4.96E-06

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SUMMARY
Page 3

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
Esophagu	4.88E-14

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	N-13C.SUM
Stomach	1.86E-13
Colon	4.34E-13
Liver	7.03E-14
LUNG	5.04E-13
Bone	8.70E-15
Skin	9.40E-15
Breast	2.87E-13
Ovary	5.48E-14
Bladder	1.04E-13
Kidneys	2.40E-14
Thyroid	1.68E-14
Leukemia	2.79E-13
Residual	6.66E-13
Total	2.69E-12
TOTAL	5.39E-12

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	0.00E+00
INHALATION	0.00E+00
AIR IMMERSION	2.69E-12
GROUND SURFACE	0.00E+00
INTERNAL	0.00E+00
EXTERNAL	2.69E-12
TOTAL	2.69E-12

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SUMMARY
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NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
N-13	2.69E-12
TOTAL	2.69E-12

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SUMMARY
Page 5

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)

Direction	27715	28919	31060	N-13C.SUM 32802	34577	35279	35683
N	1.3E-06	1.2E-06	1.2E-06	1.1E-06	1.0E-06	1.0E-06	9.9E-07
NNW	4.9E-07	4.7E-07	4.3E-07	4.1E-07	3.8E-07	3.8E-07	3.7E-07
NW	6.9E-07	6.6E-07	6.1E-07	5.7E-07	5.4E-07	5.3E-07	5.2E-07
WNW	9.2E-07	8.8E-07	8.1E-07	7.7E-07	7.2E-07	7.1E-07	7.0E-07
W	1.0E-06	1.0E-06	9.2E-07	8.7E-07	8.2E-07	8.0E-07	7.9E-07
WSW	1.4E-06	1.3E-06	1.2E-06	1.1E-06	1.1E-06	1.0E-06	1.0E-06
SW	2.2E-06	2.1E-06	1.9E-06	1.8E-06	1.7E-06	1.6E-06	1.6E-06
SSW	3.6E-06	3.4E-06	3.1E-06	2.9E-06	2.8E-06	2.7E-06	2.7E-06
S	5.0E-06	4.7E-06	4.3E-06	4.1E-06	3.8E-06	3.7E-06	3.7E-06
SSE	4.2E-06	4.0E-06	3.7E-06	3.4E-06	3.2E-06	3.2E-06	3.1E-06
SE	2.3E-06	2.2E-06	2.0E-06	1.9E-06	1.8E-06	1.7E-06	1.7E-06
ESE	1.5E-06	1.5E-06	1.4E-06	1.3E-06	1.2E-06	1.2E-06	1.2E-06
E	2.0E-06	1.9E-06	1.8E-06	1.6E-06	1.6E-06	1.5E-06	1.5E-06
ENE	1.7E-06	1.6E-06	1.5E-06	1.4E-06	1.3E-06	1.3E-06	1.3E-06
NE	2.4E-06	2.3E-06	2.1E-06	2.0E-06	1.9E-06	1.8E-06	1.8E-06
NNE	1.6E-06	1.5E-06	1.4E-06	1.3E-06	1.3E-06	1.2E-06	1.2E-06

Distance (m)

Direction	36721	36809	37729	39079	39220	39559	43584
N	9.6E-07	9.5E-07	9.3E-07	8.9E-07	8.9E-07	8.8E-07	7.9E-07
NNW	3.6E-07	3.6E-07	3.5E-07	3.4E-07	3.3E-07	3.3E-07	3.0E-07
NW	5.1E-07	5.0E-07	4.9E-07	4.7E-07	4.7E-07	4.7E-07	4.2E-07
WNW	6.8E-07	6.8E-07	6.6E-07	6.3E-07	6.3E-07	6.2E-07	5.6E-07
W	7.7E-07	7.6E-07	7.4E-07	7.2E-07	7.1E-07	7.1E-07	6.3E-07
WSW	1.0E-06	1.0E-06	9.7E-07	9.4E-07	9.3E-07	9.2E-07	8.3E-07
SW	1.6E-06	1.6E-06	1.5E-06	1.5E-06	1.5E-06	1.4E-06	1.3E-06
SSW	2.6E-06	2.6E-06	2.5E-06	2.4E-06	2.4E-06	2.4E-06	2.1E-06
S	3.6E-06	3.5E-06	3.4E-06	3.3E-06	3.3E-06	3.3E-06	2.9E-06
SSE	3.0E-06	3.0E-06	2.9E-06	2.8E-06	2.8E-06	2.8E-06	2.5E-06
SE	1.7E-06	1.7E-06	1.6E-06	1.6E-06	1.6E-06	1.5E-06	1.4E-06
ESE	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.0E-06	1.0E-06	9.3E-07
E	1.5E-06	1.4E-06	1.4E-06	1.4E-06	1.3E-06	1.3E-06	1.2E-06
ENE	1.2E-06	1.2E-06	1.2E-06	1.1E-06	1.1E-06	1.1E-06	1.0E-06
NE	1.8E-06	1.7E-06	1.7E-06	1.6E-06	1.6E-06	1.6E-06	1.4E-06
NNE	1.2E-06	1.2E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06	9.6E-07

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SUMMARY
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INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Direction	45196	45275	45654	45677	46668	47969
N	7.6E-07	7.6E-07	7.5E-07	7.5E-07	7.3E-07	7.1E-07
NNW	2.9E-07	2.8E-07	2.8E-07	2.8E-07	2.8E-07	2.7E-07

	N-13C.SUM					
NW	4.0E-07	4.0E-07	4.0E-07	4.0E-07	3.9E-07	3.8E-07
WNW	5.4E-07	5.4E-07	5.3E-07	5.3E-07	5.2E-07	5.0E-07
W	6.1E-07	6.1E-07	6.0E-07	6.0E-07	5.9E-07	5.7E-07
WSW	7.9E-07	7.9E-07	7.9E-07	7.9E-07	7.7E-07	7.4E-07
SW	1.2E-06	1.2E-06	1.2E-06	1.2E-06	1.2E-06	1.2E-06
SSW	2.0E-06	2.0E-06	2.0E-06	2.0E-06	2.0E-06	1.9E-06
S	2.8E-06	2.8E-06	2.8E-06	2.8E-06	2.7E-06	2.6E-06
SSE	2.4E-06	2.4E-06	2.3E-06	2.3E-06	2.3E-06	2.2E-06
SE	1.3E-06	1.3E-06	1.3E-06	1.3E-06	1.3E-06	1.2E-06
ESE	8.9E-07	8.9E-07	8.8E-07	8.8E-07	8.6E-07	8.4E-07
E	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06
ENE	9.6E-07	9.6E-07	9.5E-07	9.5E-07	9.3E-07	9.0E-07
NE	1.4E-06	1.4E-06	1.4E-06	1.4E-06	1.3E-06	1.3E-06
NNE	9.2E-07	9.2E-07	9.1E-07	9.1E-07	8.9E-07	8.6E-07

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)						
Direction	27715	28919	31060	32802	34577	35279	35683
N	7.1E-13	6.8E-13	6.2E-13	5.9E-13	5.5E-13	5.4E-13	5.4E-13
NNW	2.7E-13	2.5E-13	2.3E-13	2.2E-13	2.1E-13	2.0E-13	2.0E-13
NW	3.7E-13	3.6E-13	3.3E-13	3.1E-13	2.9E-13	2.9E-13	2.8E-13
WNW	5.0E-13	4.8E-13	4.4E-13	4.2E-13	3.9E-13	3.8E-13	3.8E-13
W	5.7E-13	5.4E-13	5.0E-13	4.7E-13	4.4E-13	4.3E-13	4.3E-13
WSW	7.5E-13	7.1E-13	6.6E-13	6.2E-13	5.8E-13	5.7E-13	5.6E-13
SW	1.2E-12	1.1E-12	1.0E-12	9.7E-13	9.1E-13	8.9E-13	8.8E-13
SSW	1.9E-12	1.9E-12	1.7E-12	1.6E-12	1.5E-12	1.5E-12	1.5E-12
S	2.7E-12	2.6E-12	2.4E-12	2.2E-12	2.1E-12	2.0E-12	2.0E-12
SSE	2.3E-12	2.2E-12	2.0E-12	1.9E-12	1.8E-12	1.7E-12	1.7E-12
SE	1.2E-12	1.2E-12	1.1E-12	1.0E-12	9.7E-13	9.5E-13	9.4E-13
ESE	8.4E-13	8.0E-13	7.4E-13	6.9E-13	6.5E-13	6.4E-13	6.3E-13
E	1.1E-12	1.0E-12	9.5E-13	8.9E-13	8.4E-13	8.2E-13	8.1E-13
ENE	9.1E-13	8.7E-13	8.0E-13	7.5E-13	7.1E-13	6.9E-13	6.8E-13
NE	1.3E-12	1.3E-12	1.2E-12	1.1E-12	1.0E-12	1.0E-12	9.8E-13
NNE	8.7E-13	8.3E-13	7.7E-13	7.2E-13	6.8E-13	6.6E-13	6.5E-13

	Distance (m)						
Direction	36721	36809	37729	39079	39220	39559	43584
N	5.2E-13	5.2E-13	5.0E-13	4.8E-13	4.8E-13	4.8E-13	4.3E-13
NNW	1.9E-13	1.9E-13	1.9E-13	1.8E-13	1.8E-13	1.8E-13	1.6E-13
NW	2.7E-13	2.7E-13	2.7E-13	2.6E-13	2.6E-13	2.5E-13	2.3E-13
WNW	3.7E-13	3.7E-13	3.6E-13	3.4E-13	3.4E-13	3.4E-13	3.0E-13
W	4.2E-13	4.1E-13	4.0E-13	3.9E-13	3.9E-13	3.8E-13	3.4E-13
WSW	5.4E-13	5.4E-13	5.3E-13	5.1E-13	5.1E-13	5.0E-13	4.5E-13
SW	8.5E-13	8.5E-13	8.2E-13	7.9E-13	7.9E-13	7.8E-13	7.0E-13
SSW	1.4E-12	1.4E-12	1.4E-12	1.3E-12	1.3E-12	1.3E-12	1.2E-12

	N-13C.SUM						
S	1.9E-12	1.9E-12	1.9E-12	1.8E-12	1.8E-12	1.8E-12	1.6E-12
SSE	1.6E-12	1.6E-12	1.6E-12	1.5E-12	1.5E-12	1.5E-12	1.3E-12
SE	9.1E-13	9.0E-13	8.8E-13	8.5E-13	8.4E-13	8.3E-13	7.5E-13
ESE	6.1E-13	6.1E-13	5.9E-13	5.7E-13	5.7E-13	5.6E-13	5.0E-13
E	7.9E-13	7.9E-13	7.6E-13	7.3E-13	7.3E-13	7.2E-13	6.5E-13
ENE	6.6E-13	6.6E-13	6.4E-13	6.2E-13	6.1E-13	6.1E-13	5.4E-13
NE	9.5E-13	9.5E-13	9.2E-13	8.8E-13	8.8E-13	8.7E-13	7.8E-13
NNE	6.3E-13	6.3E-13	6.1E-13	5.9E-13	5.9E-13	5.8E-13	5.2E-13

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SUMMARY
Page 8

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)					
Direction	45196	45275	45654	45677	46668	47969
N	4.1E-13	4.1E-13	4.1E-13	4.1E-13	4.0E-13	3.9E-13
NNW	1.5E-13	1.5E-13	1.5E-13	1.5E-13	1.5E-13	1.4E-13
NW	2.2E-13	2.2E-13	2.2E-13	2.2E-13	2.1E-13	2.0E-13
WNW	2.9E-13	2.9E-13	2.9E-13	2.9E-13	2.8E-13	2.7E-13
W	3.3E-13	3.3E-13	3.3E-13	3.3E-13	3.2E-13	3.1E-13
WSW	4.3E-13	4.3E-13	4.3E-13	4.3E-13	4.2E-13	4.0E-13
SW	6.7E-13	6.7E-13	6.6E-13	6.6E-13	6.5E-13	6.3E-13
SSW	1.1E-12	1.1E-12	1.1E-12	1.1E-12	1.1E-12	1.0E-12
S	1.5E-12	1.5E-12	1.5E-12	1.5E-12	1.5E-12	1.4E-12
SSE	1.3E-12	1.3E-12	1.3E-12	1.3E-12	1.2E-12	1.2E-12
SE	7.2E-13	7.2E-13	7.1E-13	7.1E-13	6.9E-13	6.7E-13
ESE	4.8E-13	4.8E-13	4.8E-13	4.8E-13	4.7E-13	4.5E-13
E	6.2E-13	6.2E-13	6.2E-13	6.2E-13	6.0E-13	5.8E-13
ENE	5.2E-13	5.2E-13	5.2E-13	5.2E-13	5.0E-13	4.9E-13
NE	7.5E-13	7.4E-13	7.4E-13	7.4E-13	7.2E-13	7.0E-13
NNE	5.0E-13	5.0E-13	5.0E-13	4.9E-13	4.8E-13	4.7E-13

N-13D.SUM

C A P 8 8 - P C

Version 3.0

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment

Feb 20, 2008 02:31 pm

Facility: INL
Address: PO Box 1625
City: Idaho Falls
State: ID Zip: 83415

Source Category:
Source Type: Stack
Emission Year: 2008

Comments: TAN-TSF
Receptors 60-62

Dataset Name: RUND
Dataset Date: 08/02/20 2:20:00 PM
Wind File: C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

Feb 20, 2008 02:31 pm

SUMMARY
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
Adrenals	2.15E-06
B Surfac	4.57E-06
Breasts	2.96E-06
St wall	2.29E-06
ULI wall	2.12E-06
Kidneys	2.30E-06
Lungs	2.57E-06
Ovaries	1.92E-06
R Marrow	2.48E-06
Spleen	2.33E-06
Thymus	2.38E-06
Uterus	1.98E-06

	N-13D.SUM
Bld wall	2.14E-06
Brain	2.74E-06
Esophagu	2.11E-06
SI wall	2.03E-06
LLI wall	2.07E-06
Liver	2.31E-06
Muscle	2.51E-06
Pancreas	2.02E-06
Skin	4.70E-06
Testes	2.59E-06
Thyroid	2.63E-06
EFEC	2.47E-06

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	0.00E+00
INHALATION	0.00E+00
AIR IMMERSION	2.47E-06
GROUND SURFACE	0.00E+00
INTERNAL	0.00E+00
EXTERNAL	2.47E-06
TOTAL	2.47E-06

Feb 20, 2008 02:31 pm

SUMMARY
Page 2

NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
N-13	2.47E-06
TOTAL	2.47E-06

Feb 20, 2008 02:31 pm

SUMMARY
Page 3

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
Esophagu	2.43E-14

Page 2

	N-13D.SUM
Stomach	9.25E-14
Colon	2.16E-13
Liver	3.50E-14
LUNG	2.51E-13
Bone	4.33E-15
Skin	4.68E-15
Breast	1.43E-13
Ovary	2.73E-14
Bladder	5.18E-14
Kidneys	1.20E-14
Thyroid	8.38E-15
Leukemia	1.39E-13
Residual	3.32E-13
Total	1.34E-12
TOTAL	2.68E-12

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	0.00E+00
INHALATION	0.00E+00
AIR IMMERSION	1.34E-12
GROUND SURFACE	0.00E+00
INTERNAL	0.00E+00
EXTERNAL	1.34E-12
TOTAL	1.34E-12

Feb 20, 2008 02:31 pm

SUMMARY
Page 4

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
N-13	1.34E-12
TOTAL	1.34E-12

Feb 20, 2008 02:31 pm

SUMMARY
Page 5

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)

Direction	50024	54611	58610
-----------	-------	-------	-------

N	6.8E-07	6.1E-07	5.7E-07
NNW	2.6E-07	2.3E-07	2.1E-07
NW	3.6E-07	3.3E-07	3.0E-07
WNW	4.8E-07	4.4E-07	4.0E-07
W	5.4E-07	4.9E-07	4.6E-07
WSW	7.1E-07	6.4E-07	5.9E-07
SW	1.1E-06	1.0E-06	9.2E-07
SSW	1.8E-06	1.6E-06	1.5E-06
S	2.5E-06	2.2E-06	2.1E-06
SSE	2.1E-06	1.9E-06	1.7E-06
SE	1.2E-06	1.1E-06	9.9E-07
ESE	8.0E-07	7.2E-07	6.7E-07
E	1.0E-06	9.3E-07	8.6E-07
ENE	8.6E-07	7.8E-07	7.2E-07
NE	1.2E-06	1.1E-06	1.0E-06
NNE	8.2E-07	7.5E-07	6.9E-07

Feb 20, 2008 02:31 pm

SUMMARY
Page 6

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

Distance (m)

Direction	50024	54611	58610
-----------	-------	-------	-------

N	3.7E-13	3.3E-13	3.1E-13
NNW	1.4E-13	1.3E-13	1.2E-13
NW	2.0E-13	1.8E-13	1.6E-13
WNW	2.6E-13	2.4E-13	2.2E-13
W	3.0E-13	2.7E-13	2.5E-13
WSW	3.9E-13	3.5E-13	3.2E-13
SW	6.0E-13	5.4E-13	5.0E-13
SSW	9.8E-13	8.9E-13	8.2E-13
S	1.3E-12	1.2E-12	1.1E-12
SSE	1.1E-12	1.0E-12	9.5E-13
SE	6.4E-13	5.8E-13	5.3E-13
ESE	4.3E-13	3.9E-13	3.6E-13
E	5.6E-13	5.0E-13	4.7E-13
ENE	4.7E-13	4.2E-13	3.9E-13
NE	6.6E-13	6.0E-13	5.5E-13
NNE	4.5E-13	4.0E-13	3.7E-13

O-15A.dat
 08/02/20 2:16:00 PM Feb 20, 2008 02:30 pm
 RUNA RUNA.
 C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

INL
 PO Box 1625

Idaho Falls ID 83415
 2008

TAN-TSF
 Receptors 1-20
 100.0000,500.0000

0	0	0	0	0	20		
10344	10365	10472	10590	11103	11989	12522	13245
13286	13483	13612	13664	13959	14258	14374	15241
15441	15784	15844	16323				
800	280.20	16.30	3.54				
0	0						

1	1.00	0.000E+00	0.000E+00				
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
1	0	1					
O-15	G	0	0.000e+00	0.000e+00	5.480e-05		0
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified	6.000E-01	2.000E+00	2.000E-02	2.000E-01	4.898E+02		
0.08	0.92	0.00	Urban				
0.00	1.00	0.00					
0.01	0.99	0.00					

T	T	T	T				
2.030e-01	4.560e-02	1.700e-02					
O-15	8	0					
00	00	00	00	00	00		
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00			
1							
O-15	G	0	0.000e+00	0.000e+00	5.480e-05		0
5.874E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified	6.000E-01	2.000E+00	2.000E-02	2.000E-01	4.898E+02		
--DecayStep--1							
--LimitChildren--1							
--Children--5							

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 08/02/20 2:17:00 PM Feb 20, 2008 02:30 pm
 RUNB RUNB.
 C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

INL
 PO Box 1625

Idaho Falls ID 83415
 2008

TAN-TSF
 Receptors 21-39
 100.0000,500.0000

0	0	0	0	0	19		
17035	17329	18607	18834	18860	18890	19860	19891
20457	21314	21349	22159	23521	24430	24545	25171
26794	27275	27389	0				
800	280.20	16.30	3.54				

0	0						
1	1	0.000E+00	0.000E+00				
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	

1	0	1					
O-15	G	0	0.000e+00	0.000e+00	5.480e-05		0
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified	6.000E-01	2.000E+00	2.000E-02	2.000E-01	4.898E+02		
0.08	0.92	0.00	Urban				
0.00	1.00	0.00					
0.01	0.99	0.00					

T	T	T	T				
2.030e-01	4.560e-02	1.700e-02					
O-15	8	0					
00	00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00			

1							
O-15	G	0	0.000e+00	0.000e+00	5.480e-05		0
5.874E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified	6.000E-01	2.000E+00	2.000E-02	2.000E-01	4.898E+02		

--DecayStep--1
 --LimitChildren--1
 --Children--5

08/02/20 2:19:00 PM Feb 20, 2008 02:31 pm
 RUNC RUNC.
 C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

INL
 PO Box 1625

Idaho Falls ID 83415
 2008

TAN-TSF
 Receptors 40-59
 100.0000,500.0000

0	0	0	0	0	20		
27715	28919	31060	32802	34577	35279	35683	36721
36809	37729	39079	39220	39559	43584	45196	45275
45654	45677	46668	47969				
800	280.20	16.30	3.54				

0	0						
1	1.00	0.000E+00	0.000E+00				
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	

1	0	1					
0-15	G	0	0.000e+00	0.000e+00	5.480e-05		0
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified	6.000E-01	2.000E+00	2.000E-02	2.000E-01	4.898E+02		
0.08	0.92	0.00	Urban				
0.00	1.00	0.00					
0.01	0.99	0.00					

T	T	T	T				
2.030e-01	4.560e-02	1.700e-02					
0-15	8	0					
00	00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00			

1							
0-15	G	0	0.000e+00	0.000e+00	5.480e-05		0
5.874E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified	6.000E-01	2.000E+00	2.000E-02	2.000E-01	4.898E+02		

--DecayStep--1
 --LimitChildren--1
 --Children--5

O-15D.dat
 08/02/20 2:20:00 PM Feb 20, 2008 02:31 pm
 RUND RUND.
 C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

INL
 PO Box 1625

Idaho Falls ID 83415
 2008

TAN-TSF
 Receptors 60-62
 100.0000,500.0000

0	0	0	0	0	3		
50024	54611	58610	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0			
800	280.20	16.30	3.54				
0	0						

1	1.00	0.000E+00	0.000E+00				
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
1	0	1					

O-15	G	0	0.000e+00	0.000e+00	5.480e-05		0
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified	6.000E-01	2.000E+00	2.000E-02	2.000E-01	4.898E+02		
0.08	0.92	0.00	Urban				
0.00	1.00	0.00					
0.01	0.99	0.00					

T	T	T	T				
2.030e-01	4.560e-02	1.700e-02					
O-15	8	0					
00	00	00	00	00	00		
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00			
1							
O-15	G	0	0.000e+00	0.000e+00	5.480e-05		0
5.874E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified	6.000E-01	2.000E+00	2.000E-02	2.000E-01	4.898E+02		

--DecayStep--1
 --LimitChildren--1
 --Children--5

O-15A.SUM

C A P 8 8 - P C

Version 3.0

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment

Feb 20, 2008 02:30 pm

Facility: INL
Address: PO Box 1625
City: Idaho Falls
State: ID Zip: 83415

Source Category:
Source Type: Stack
Emission Year: 2008

Comments: TAN-TSF
Receptors 1-20

Dataset Name: RUNA
Dataset Date: 08/02/20 2:16:00 PM
Wind File: C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

Feb 20, 2008 02:30 pm

SUMMARY
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
Adrenals	1.48E-06
B Surfac	3.16E-06
Breasts	2.04E-06
St wall	1.58E-06
ULI wall	1.47E-06
Kidneys	1.59E-06
Lungs	1.78E-06
Ovaries	1.33E-06
R Marrow	1.71E-06
Spleen	1.61E-06
Thymus	1.64E-06
Uterus	1.37E-06

	O-15A.SUM
Bld wall	1.48E-06
Brain	1.89E-06
Esophagu	1.46E-06
SI wall	1.40E-06
LLI wall	1.43E-06
Liver	1.60E-06
Muscle	1.73E-06
Pancreas	1.39E-06
Skin	3.88E-06
Testes	1.79E-06
Thyroid	1.82E-06
EFEC	1.72E-06

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	0.00E+00
INHALATION	0.00E+00
AIR IMMERSION	1.72E-06
GROUND SURFACE	0.00E+00
INTERNAL	0.00E+00
EXTERNAL	1.72E-06
TOTAL	1.72E-06

Feb 20, 2008 02:30 pm

SUMMARY
Page 2

NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
O-15	1.72E-06
TOTAL	1.72E-06

Feb 20, 2008 02:30 pm

SUMMARY
Page 3

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
Esophagu	1.68E-14

Page 2

	O-15A.SUM
Stomach	6.38E-14
Colon	1.50E-13
Liver	2.42E-14
LUNG	1.73E-13
Bone	3.00E-15
Skin	3.88E-15
Breast	9.88E-14
Ovary	1.89E-14
Bladder	3.58E-14
Kidneys	8.24E-15
Thyroid	5.78E-15
Leukemia	9.62E-14
Residual	2.29E-13
Total	9.29E-13
TOTAL	1.86E-12

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	0.00E+00
INHALATION	0.00E+00
AIR IMMERSION	9.29E-13
GROUND SURFACE	0.00E+00
INTERNAL	0.00E+00
EXTERNAL	9.29E-13
TOTAL	9.29E-13

Feb 20, 2008 02:30 pm

SUMMARY
Page 4

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
O-15	9.29E-13
TOTAL	9.29E-13

Feb 20, 2008 02:30 pm

SUMMARY
Page 5

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)

Direction	10344	10365	10472	O-15A.SUM 10590	11103	11989	12522
N	4.2E-07	4.2E-07	4.1E-07	4.1E-07	3.8E-07	3.5E-07	3.4E-07
NNW	1.6E-07	1.6E-07	1.5E-07	1.5E-07	1.4E-07	1.3E-07	1.3E-07
NW	2.2E-07	2.2E-07	2.1E-07	2.1E-07	2.0E-07	1.8E-07	1.8E-07
WNW	2.9E-07	2.9E-07	2.9E-07	2.8E-07	2.7E-07	2.5E-07	2.3E-07
W	3.3E-07	3.3E-07	3.3E-07	3.2E-07	3.1E-07	2.8E-07	2.7E-07
WSW	4.5E-07	4.5E-07	4.4E-07	4.4E-07	4.1E-07	3.8E-07	3.6E-07
SW	7.3E-07	7.3E-07	7.2E-07	7.1E-07	6.7E-07	6.1E-07	5.8E-07
SSW	1.2E-06	1.2E-06	1.2E-06	1.2E-06	1.1E-06	1.0E-06	9.7E-07
S	1.7E-06	1.7E-06	1.7E-06	1.7E-06	1.6E-06	1.4E-06	1.4E-06
SSE	1.4E-06	1.4E-06	1.4E-06	1.4E-06	1.3E-06	1.2E-06	1.1E-06
SE	7.5E-07	7.5E-07	7.4E-07	7.3E-07	6.9E-07	6.3E-07	6.0E-07
ESE	5.0E-07	4.9E-07	4.9E-07	4.8E-07	4.6E-07	4.2E-07	4.0E-07
E	6.4E-07	6.4E-07	6.3E-07	6.2E-07	5.9E-07	5.4E-07	5.1E-07
ENE	5.5E-07	5.5E-07	5.4E-07	5.4E-07	5.1E-07	4.7E-07	4.4E-07
NE	8.4E-07	8.4E-07	8.3E-07	8.1E-07	7.7E-07	7.0E-07	6.6E-07
NNE	5.3E-07	5.3E-07	5.2E-07	5.1E-07	4.9E-07	4.5E-07	4.2E-07

Distance (m)

Direction	13245	13286	13483	13612	13664	13959	14258
N	3.2E-07	3.1E-07	3.1E-07	3.1E-07	3.0E-07	3.0E-07	2.9E-07
NNW	1.2E-07	1.2E-07	1.2E-07	1.1E-07	1.1E-07	1.1E-07	1.1E-07
NW	1.6E-07	1.6E-07	1.6E-07	1.6E-07	1.6E-07	1.6E-07	1.5E-07
WNW	2.2E-07	2.2E-07	2.2E-07	2.1E-07	2.1E-07	2.1E-07	2.0E-07
W	2.5E-07	2.5E-07	2.5E-07	2.4E-07	2.4E-07	2.4E-07	2.3E-07
WSW	3.3E-07	3.3E-07	3.3E-07	3.2E-07	3.2E-07	3.2E-07	3.1E-07
SW	5.4E-07	5.4E-07	5.3E-07	5.2E-07	5.2E-07	5.1E-07	5.0E-07
SSW	9.0E-07	9.0E-07	8.8E-07	8.7E-07	8.7E-07	8.5E-07	8.3E-07
S	1.3E-06	1.3E-06	1.2E-06	1.2E-06	1.2E-06	1.2E-06	1.2E-06
SSE	1.1E-06	1.1E-06	1.0E-06	1.0E-06	1.0E-06	1.0E-06	9.7E-07
SE	5.6E-07	5.6E-07	5.5E-07	5.5E-07	5.4E-07	5.3E-07	5.2E-07
ESE	3.7E-07	3.7E-07	3.7E-07	3.6E-07	3.6E-07	3.5E-07	3.4E-07
E	4.8E-07	4.8E-07	4.7E-07	4.7E-07	4.7E-07	4.5E-07	4.4E-07
ENE	4.1E-07	4.1E-07	4.1E-07	4.0E-07	4.0E-07	3.9E-07	3.8E-07
NE	6.2E-07	6.2E-07	6.1E-07	6.0E-07	6.0E-07	5.8E-07	5.7E-07
NNE	4.0E-07	3.9E-07	3.9E-07	3.8E-07	3.8E-07	3.7E-07	3.6E-07

□

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SUMMARY
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INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Direction	14374	15241	15441	15784	15844	16323
N	2.9E-07	2.7E-07	2.7E-07	2.6E-07	2.6E-07	2.5E-07
NNW	1.1E-07	1.0E-07	1.0E-07	9.7E-08	9.7E-08	9.4E-08

	O-15A.SUM					
NW	1.5E-07	1.4E-07	1.4E-07	1.4E-07	1.4E-07	1.3E-07
WNW	2.0E-07	1.9E-07	1.9E-07	1.8E-07	1.8E-07	1.7E-07
W	2.3E-07	2.1E-07	2.1E-07	2.1E-07	2.1E-07	2.0E-07
WSW	3.0E-07	2.9E-07	2.8E-07	2.7E-07	2.7E-07	2.6E-07
SW	4.9E-07	4.6E-07	4.5E-07	4.4E-07	4.4E-07	4.2E-07
SSW	8.2E-07	7.7E-07	7.5E-07	7.3E-07	7.3E-07	7.1E-07
S	1.1E-06	1.1E-06	1.1E-06	1.0E-06	1.0E-06	9.9E-07
SSE	9.6E-07	9.0E-07	8.8E-07	8.6E-07	8.6E-07	8.3E-07
SE	5.1E-07	4.8E-07	4.7E-07	4.6E-07	4.6E-07	4.4E-07
ESE	3.4E-07	3.2E-07	3.1E-07	3.1E-07	3.1E-07	3.0E-07
E	4.4E-07	4.1E-07	4.1E-07	4.0E-07	3.9E-07	3.8E-07
ENE	3.8E-07	3.5E-07	3.5E-07	3.4E-07	3.4E-07	3.3E-07
NE	5.6E-07	5.2E-07	5.2E-07	5.0E-07	5.0E-07	4.8E-07
NNE	3.6E-07	3.4E-07	3.3E-07	3.2E-07	3.2E-07	3.1E-07

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)						
Direction	10344	10365	10472	10590	11103	11989	12522
N	2.3E-13	2.3E-13	2.2E-13	2.2E-13	2.1E-13	1.9E-13	1.8E-13
NNW	8.5E-14	8.5E-14	8.4E-14	8.3E-14	7.8E-14	7.2E-14	6.8E-14
NW	1.2E-13	1.2E-13	1.2E-13	1.1E-13	1.1E-13	1.0E-13	9.5E-14
WNW	1.6E-13	1.6E-13	1.6E-13	1.5E-13	1.5E-13	1.3E-13	1.3E-13
W	1.8E-13	1.8E-13	1.8E-13	1.8E-13	1.7E-13	1.5E-13	1.5E-13
WSW	2.4E-13	2.4E-13	2.4E-13	2.4E-13	2.2E-13	2.0E-13	1.9E-13
SW	4.0E-13	3.9E-13	3.9E-13	3.8E-13	3.6E-13	3.3E-13	3.1E-13
SSW	6.6E-13	6.6E-13	6.5E-13	6.4E-13	6.0E-13	5.5E-13	5.2E-13
S	9.3E-13	9.3E-13	9.1E-13	9.0E-13	8.5E-13	7.8E-13	7.4E-13
SSE	7.7E-13	7.7E-13	7.6E-13	7.5E-13	7.1E-13	6.5E-13	6.1E-13
SE	4.1E-13	4.0E-13	4.0E-13	3.9E-13	3.7E-13	3.4E-13	3.3E-13
ESE	2.7E-13	2.7E-13	2.6E-13	2.6E-13	2.5E-13	2.3E-13	2.2E-13
E	3.5E-13	3.4E-13	3.4E-13	3.4E-13	3.2E-13	2.9E-13	2.8E-13
ENE	3.0E-13	3.0E-13	2.9E-13	2.9E-13	2.8E-13	2.5E-13	2.4E-13
NE	4.5E-13	4.5E-13	4.5E-13	4.4E-13	4.2E-13	3.8E-13	3.6E-13
NNE	2.9E-13	2.9E-13	2.8E-13	2.8E-13	2.6E-13	2.4E-13	2.3E-13

	Distance (m)						
Direction	13245	13286	13483	13612	13664	13959	14258
N	1.7E-13	1.7E-13	1.7E-13	1.7E-13	1.6E-13	1.6E-13	1.6E-13
NNW	6.4E-14	6.4E-14	6.3E-14	6.2E-14	6.2E-14	6.0E-14	5.9E-14
NW	8.9E-14	8.9E-14	8.7E-14	8.7E-14	8.6E-14	8.4E-14	8.2E-14
WNW	1.2E-13	1.2E-13	1.2E-13	1.2E-13	1.2E-13	1.1E-13	1.1E-13
W	1.4E-13	1.4E-13	1.3E-13	1.3E-13	1.3E-13	1.3E-13	1.3E-13
WSW	1.8E-13	1.8E-13	1.8E-13	1.8E-13	1.7E-13	1.7E-13	1.7E-13
SW	2.9E-13	2.9E-13	2.9E-13	2.8E-13	2.8E-13	2.8E-13	2.7E-13
SSW	4.9E-13	4.9E-13	4.8E-13	4.7E-13	4.7E-13	4.6E-13	4.5E-13

	O-15A.SUM						
S	6.9E-13	6.8E-13	6.7E-13	6.6E-13	6.6E-13	6.4E-13	6.3E-13
SSE	5.7E-13	5.7E-13	5.6E-13	5.6E-13	5.5E-13	5.4E-13	5.3E-13
SE	3.0E-13	3.0E-13	3.0E-13	3.0E-13	2.9E-13	2.9E-13	2.8E-13
ESE	2.0E-13	2.0E-13	2.0E-13	2.0E-13	2.0E-13	1.9E-13	1.9E-13
E	2.6E-13	2.6E-13	2.6E-13	2.5E-13	2.5E-13	2.5E-13	2.4E-13
ENE	2.2E-13	2.2E-13	2.2E-13	2.2E-13	2.2E-13	2.1E-13	2.1E-13
NE	3.4E-13	3.3E-13	3.3E-13	3.2E-13	3.2E-13	3.1E-13	3.1E-13
NNE	2.1E-13	2.1E-13	2.1E-13	2.1E-13	2.1E-13	2.0E-13	2.0E-13

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)					
Direction	14374	15241	15441	15784	15844	16323
N	1.6E-13	1.5E-13	1.4E-13	1.4E-13	1.4E-13	1.4E-13
NNW	5.8E-14	5.5E-14	5.4E-14	5.3E-14	5.2E-14	5.1E-14
NW	8.1E-14	7.6E-14	7.5E-14	7.3E-14	7.3E-14	7.1E-14
WNW	1.1E-13	1.0E-13	1.0E-13	9.8E-14	9.8E-14	9.5E-14
W	1.2E-13	1.2E-13	1.1E-13	1.1E-13	1.1E-13	1.1E-13
WSW	1.7E-13	1.5E-13	1.5E-13	1.5E-13	1.5E-13	1.4E-13
SW	2.7E-13	2.5E-13	2.4E-13	2.4E-13	2.4E-13	2.3E-13
SSW	4.4E-13	4.1E-13	4.1E-13	4.0E-13	4.0E-13	3.8E-13
S	6.2E-13	5.8E-13	5.7E-13	5.6E-13	5.5E-13	5.3E-13
SSE	5.2E-13	4.9E-13	4.8E-13	4.7E-13	4.6E-13	4.5E-13
SE	2.8E-13	2.6E-13	2.6E-13	2.5E-13	2.5E-13	2.4E-13
ESE	1.8E-13	1.7E-13	1.7E-13	1.7E-13	1.7E-13	1.6E-13
E	2.4E-13	2.2E-13	2.2E-13	2.1E-13	2.1E-13	2.1E-13
ENE	2.0E-13	1.9E-13	1.9E-13	1.8E-13	1.8E-13	1.8E-13
NE	3.0E-13	2.8E-13	2.8E-13	2.7E-13	2.7E-13	2.6E-13
NNE	1.9E-13	1.8E-13	1.8E-13	1.8E-13	1.7E-13	1.7E-13

O-15B.SUM

C A P 8 8 - P C

Version 3.0

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment

Feb 20, 2008 02:30 pm

Facility: INL
Address: PO Box 1625
City: Idaho Falls
State: ID Zip: 83415

Source Category:
Source Type: Stack
Emission Year: 2008

Comments: TAN-TSF
Receptors 21-39

Dataset Name: RUNB
Dataset Date: 08/02/20 2:17:00 PM
Wind File: C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

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SUMMARY
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ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
Adrenals	8.11E-07
B Surfac	1.72E-06
Breasts	1.12E-06
St wall	8.61E-07
ULI wall	8.00E-07
Kidneys	8.65E-07
Lungs	9.69E-07
Ovaries	7.25E-07
R Marrow	9.35E-07
Spleen	8.78E-07
Thymus	8.98E-07
Uterus	7.45E-07

	O-15B.SUM
Bld wall	8.08E-07
Brain	1.03E-06
Esophagu	7.96E-07
SI wall	7.66E-07
LLI wall	7.80E-07
Liver	8.72E-07
Muscle	9.47E-07
Pancreas	7.60E-07
Skin	2.12E-06
Testes	9.75E-07
Thyroid	9.94E-07
EFEC	9.37E-07

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	0.00E+00
INHALATION	0.00E+00
AIR IMMERSION	9.37E-07
GROUND SURFACE	0.00E+00
INTERNAL	0.00E+00
EXTERNAL	9.37E-07
TOTAL	9.37E-07

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SUMMARY
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NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
O-15	9.37E-07
TOTAL	9.37E-07

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SUMMARY
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CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
Esophagu	9.16E-15

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	O-15B.SUM
Stomach	3.48E-14
Colon	8.17E-14
Liver	1.32E-14
LUNG	9.47E-14
Bone	1.64E-15
Skin	2.12E-15
Breast	5.40E-14
Ovary	1.03E-14
Bladder	1.95E-14
Kidneys	4.50E-15
Thyroid	3.16E-15
Leukemia	5.25E-14
Residual	1.25E-13
Total	5.07E-13
TOTAL	1.01E-12

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	0.00E+00
INHALATION	0.00E+00
AIR IMMERSION	5.07E-13
GROUND SURFACE	0.00E+00
INTERNAL	0.00E+00
EXTERNAL	5.07E-13
TOTAL	5.07E-13

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SUMMARY
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NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
O-15	5.07E-13
TOTAL	5.07E-13

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SUMMARY
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INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)

Direction	O-15B.SUM						
	17035	17329	18607	18834	18860	18890	19860
N	2.4E-07	2.3E-07	2.2E-07	2.1E-07	2.1E-07	2.1E-07	2.0E-07
NNW	8.9E-08	8.8E-08	8.1E-08	8.0E-08	8.0E-08	8.0E-08	7.5E-08
NW	1.2E-07	1.2E-07	1.1E-07	1.1E-07	1.1E-07	1.1E-07	1.1E-07
WNW	1.7E-07	1.6E-07	1.5E-07	1.5E-07	1.5E-07	1.5E-07	1.4E-07
W	1.9E-07	1.9E-07	1.7E-07	1.7E-07	1.7E-07	1.7E-07	1.6E-07
WSW	2.5E-07	2.5E-07	2.3E-07	2.2E-07	2.2E-07	2.2E-07	2.1E-07
SW	4.0E-07	4.0E-07	3.6E-07	3.6E-07	3.6E-07	3.6E-07	3.4E-07
SSW	6.7E-07	6.6E-07	6.0E-07	6.0E-07	6.0E-07	5.9E-07	5.6E-07
S	9.4E-07	9.2E-07	8.4E-07	8.3E-07	8.3E-07	8.3E-07	7.8E-07
SSE	7.9E-07	7.7E-07	7.1E-07	7.0E-07	7.0E-07	6.9E-07	6.5E-07
SE	4.2E-07	4.1E-07	3.8E-07	3.8E-07	3.8E-07	3.8E-07	3.5E-07
ESE	2.8E-07	2.8E-07	2.6E-07	2.5E-07	2.5E-07	2.5E-07	2.4E-07
E	3.6E-07	3.6E-07	3.3E-07	3.2E-07	3.2E-07	3.2E-07	3.1E-07
ENE	3.1E-07	3.0E-07	2.8E-07	2.8E-07	2.8E-07	2.8E-07	2.6E-07
NE	4.6E-07	4.5E-07	4.1E-07	4.1E-07	4.1E-07	4.1E-07	3.8E-07
NNE	3.0E-07	2.9E-07	2.7E-07	2.6E-07	2.6E-07	2.6E-07	2.5E-07

Distance (m)

Direction	19891	20457	21314	21349	22159	23521	24430
N	2.0E-07	1.9E-07	1.9E-07	1.8E-07	1.8E-07	1.7E-07	1.6E-07
NNW	7.5E-08	7.3E-08	6.9E-08	6.9E-08	6.7E-08	6.2E-08	6.0E-08
NW	1.1E-07	1.0E-07	9.7E-08	9.7E-08	9.3E-08	8.7E-08	8.4E-08
WNW	1.4E-07	1.4E-07	1.3E-07	1.3E-07	1.2E-07	1.2E-07	1.1E-07
W	1.6E-07	1.5E-07	1.5E-07	1.5E-07	1.4E-07	1.3E-07	1.3E-07
WSW	2.1E-07	2.0E-07	2.0E-07	1.9E-07	1.9E-07	1.7E-07	1.7E-07
SW	3.4E-07	3.3E-07	3.1E-07	3.1E-07	3.0E-07	2.8E-07	2.6E-07
SSW	5.6E-07	5.4E-07	5.2E-07	5.1E-07	4.9E-07	4.6E-07	4.4E-07
S	7.8E-07	7.5E-07	7.2E-07	7.1E-07	6.8E-07	6.4E-07	6.1E-07
SSE	6.5E-07	6.3E-07	6.0E-07	6.0E-07	5.8E-07	5.4E-07	5.1E-07
SE	3.5E-07	3.4E-07	3.3E-07	3.3E-07	3.1E-07	2.9E-07	2.8E-07
ESE	2.4E-07	2.3E-07	2.2E-07	2.2E-07	2.1E-07	2.0E-07	1.9E-07
E	3.0E-07	3.0E-07	2.8E-07	2.8E-07	2.7E-07	2.5E-07	2.4E-07
ENE	2.6E-07	2.5E-07	2.4E-07	2.4E-07	2.3E-07	2.1E-07	2.1E-07
NE	3.8E-07	3.7E-07	3.5E-07	3.5E-07	3.4E-07	3.1E-07	3.0E-07
NNE	2.5E-07	2.4E-07	2.3E-07	2.3E-07	2.2E-07	2.0E-07	2.0E-07

□

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SUMMARY
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INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)					
Direction	24545	25171	26794	27275	27389
N	1.6E-07	1.5E-07	1.4E-07	1.4E-07	1.4E-07
NNW	5.9E-08	5.8E-08	5.4E-08	5.3E-08	5.3E-08

	O-15B.SUM				
NW	8.3E-08	8.1E-08	7.6E-08	7.4E-08	7.4E-08
WNW	1.1E-07	1.1E-07	1.0E-07	9.9E-08	9.9E-08
W	1.3E-07	1.2E-07	1.1E-07	1.1E-07	1.1E-07
WSW	1.7E-07	1.6E-07	1.5E-07	1.5E-07	1.5E-07
SW	2.6E-07	2.6E-07	2.4E-07	2.3E-07	2.3E-07
SSW	4.4E-07	4.2E-07	3.9E-07	3.9E-07	3.8E-07
S	6.1E-07	5.9E-07	5.5E-07	5.3E-07	5.3E-07
SSE	5.1E-07	4.9E-07	4.6E-07	4.5E-07	4.5E-07
SE	2.8E-07	2.7E-07	2.5E-07	2.5E-07	2.5E-07
ESE	1.9E-07	1.8E-07	1.7E-07	1.7E-07	1.7E-07
E	2.4E-07	2.3E-07	2.2E-07	2.1E-07	2.1E-07
ENE	2.0E-07	2.0E-07	1.8E-07	1.8E-07	1.8E-07
NE	3.0E-07	2.9E-07	2.7E-07	2.6E-07	2.6E-07
NNE	1.9E-07	1.9E-07	1.8E-07	1.7E-07	1.7E-07

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)						
Direction	17035	17329	18607	18834	18860	18890	19860
N	1.3E-13	1.3E-13	1.2E-13	1.2E-13	1.1E-13	1.1E-13	1.1E-13
NNW	4.8E-14	4.7E-14	4.4E-14	4.3E-14	4.3E-14	4.3E-14	4.1E-14
NW	6.7E-14	6.6E-14	6.1E-14	6.0E-14	6.0E-14	6.0E-14	5.7E-14
WNW	9.0E-14	8.9E-14	8.2E-14	8.1E-14	8.1E-14	8.1E-14	7.6E-14
W	1.0E-13	1.0E-13	9.3E-14	9.2E-14	9.2E-14	9.2E-14	8.7E-14
WSW	1.4E-13	1.3E-13	1.2E-13	1.2E-13	1.2E-13	1.2E-13	1.1E-13
SW	2.2E-13	2.1E-13	2.0E-13	1.9E-13	1.9E-13	1.9E-13	1.8E-13
SSW	3.6E-13	3.6E-13	3.3E-13	3.2E-13	3.2E-13	3.2E-13	3.0E-13
S	5.1E-13	5.0E-13	4.6E-13	4.5E-13	4.5E-13	4.5E-13	4.2E-13
SSE	4.3E-13	4.2E-13	3.8E-13	3.8E-13	3.8E-13	3.8E-13	3.5E-13
SE	2.3E-13	2.2E-13	2.1E-13	2.0E-13	2.0E-13	2.0E-13	1.9E-13
ESE	1.5E-13	1.5E-13	1.4E-13	1.4E-13	1.4E-13	1.4E-13	1.3E-13
E	2.0E-13	1.9E-13	1.8E-13	1.8E-13	1.8E-13	1.7E-13	1.7E-13
ENE	1.7E-13	1.6E-13	1.5E-13	1.5E-13	1.5E-13	1.5E-13	1.4E-13
NE	2.5E-13	2.4E-13	2.2E-13	2.2E-13	2.2E-13	2.2E-13	2.1E-13
NNE	1.6E-13	1.6E-13	1.4E-13	1.4E-13	1.4E-13	1.4E-13	1.3E-13

	Distance (m)						
Direction	19891	20457	21314	21349	22159	23521	24430
N	1.1E-13	1.0E-13	1.0E-13	1.0E-13	9.6E-14	9.0E-14	8.6E-14
NNW	4.1E-14	3.9E-14	3.8E-14	3.8E-14	3.6E-14	3.4E-14	3.2E-14
NW	5.7E-14	5.5E-14	5.3E-14	5.3E-14	5.0E-14	4.7E-14	4.5E-14
WNW	7.6E-14	7.4E-14	7.1E-14	7.0E-14	6.8E-14	6.3E-14	6.1E-14
W	8.6E-14	8.4E-14	8.0E-14	8.0E-14	7.7E-14	7.2E-14	6.9E-14
WSW	1.1E-13	1.1E-13	1.1E-13	1.1E-13	1.0E-13	9.5E-14	9.1E-14
SW	1.8E-13	1.8E-13	1.7E-13	1.7E-13	1.6E-13	1.5E-13	1.4E-13
SSW	3.0E-13	2.9E-13	2.8E-13	2.8E-13	2.7E-13	2.5E-13	2.4E-13

	O-15B.SUM						
S	4.2E-13	4.1E-13	3.9E-13	3.9E-13	3.7E-13	3.4E-13	3.3E-13
SSE	3.5E-13	3.4E-13	3.3E-13	3.3E-13	3.1E-13	2.9E-13	2.8E-13
SE	1.9E-13	1.9E-13	1.8E-13	1.8E-13	1.7E-13	1.6E-13	1.5E-13
ESE	1.3E-13	1.2E-13	1.2E-13	1.2E-13	1.1E-13	1.1E-13	1.0E-13
E	1.7E-13	1.6E-13	1.5E-13	1.5E-13	1.5E-13	1.4E-13	1.3E-13
ENE	1.4E-13	1.4E-13	1.3E-13	1.3E-13	1.2E-13	1.2E-13	1.1E-13
NE	2.1E-13	2.0E-13	1.9E-13	1.9E-13	1.8E-13	1.7E-13	1.6E-13
NNE	1.3E-13	1.3E-13	1.2E-13	1.2E-13	1.2E-13	1.1E-13	1.1E-13

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)				
Direction	24545	25171	26794	27275	27389
N	8.6E-14	8.3E-14	7.8E-14	7.6E-14	7.6E-14
NNW	3.2E-14	3.1E-14	2.9E-14	2.9E-14	2.8E-14
NW	4.5E-14	4.4E-14	4.1E-14	4.0E-14	4.0E-14
WNW	6.0E-14	5.9E-14	5.5E-14	5.4E-14	5.3E-14
W	6.8E-14	6.7E-14	6.2E-14	6.1E-14	6.1E-14
WSW	9.0E-14	8.8E-14	8.2E-14	8.0E-14	8.0E-14
SW	1.4E-13	1.4E-13	1.3E-13	1.3E-13	1.3E-13
SSW	2.4E-13	2.3E-13	2.1E-13	2.1E-13	2.1E-13
S	3.3E-13	3.2E-13	3.0E-13	2.9E-13	2.9E-13
SSE	2.8E-13	2.7E-13	2.5E-13	2.4E-13	2.4E-13
SE	1.5E-13	1.5E-13	1.4E-13	1.3E-13	1.3E-13
ESE	1.0E-13	9.8E-14	9.2E-14	9.0E-14	8.9E-14
E	1.3E-13	1.3E-13	1.2E-13	1.2E-13	1.2E-13
ENE	1.1E-13	1.1E-13	1.0E-13	9.8E-14	9.7E-14
NE	1.6E-13	1.6E-13	1.5E-13	1.4E-13	1.4E-13
NNE	1.1E-13	1.0E-13	9.6E-14	9.4E-14	9.3E-14

O-15C.SUM

C A P 8 8 - P C

Version 3.0

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment

Feb 20, 2008 02:31 pm

Facility: INL
Address: PO Box 1625
City: Idaho Falls
State: ID Zip: 83415

Source Category:
Source Type: Stack
Emission Year: 2008

Comments: TAN-TSF
Receptors 40-59

Dataset Name: RUNC
Dataset Date: 08/02/20 2:19:00 PM
Wind File: C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

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SUMMARY
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ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
Adrenals	4.53E-07
B Surfac	9.63E-07
Breasts	6.24E-07
St wall	4.82E-07
ULI wall	4.47E-07
Kidneys	4.84E-07
Lungs	5.42E-07
Ovaries	4.05E-07
R Marrow	5.23E-07
Spleen	4.91E-07
Thymus	5.02E-07
Uterus	4.17E-07

	O-15C.SUM
Bld wall	4.52E-07
Brain	5.77E-07
Esophagu	4.45E-07
SI wall	4.28E-07
LLI wall	4.36E-07
Liver	4.87E-07
Muscle	5.29E-07
Pancreas	4.25E-07
Skin	1.18E-06
Testes	5.45E-07
Thyroid	5.56E-07
EFPEC	5.24E-07

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	0.00E+00
INHALATION	0.00E+00
AIR IMMERSION	5.24E-07
GROUND SURFACE	0.00E+00
INTERNAL	0.00E+00
EXTERNAL	5.24E-07
TOTAL	5.24E-07

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SUMMARY
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NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
O-15	5.24E-07
TOTAL	5.24E-07

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SUMMARY
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CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
Esophagu	5.12E-15

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	O-15C.SUM
Stomach	1.95E-14
Colon	4.57E-14
Liver	7.39E-15
LUNG	5.29E-14
Bone	9.14E-16
Skin	1.18E-15
Breast	3.02E-14
Ovary	5.76E-15
Bladder	1.09E-14
Kidneys	2.52E-15
Thyroid	1.76E-15
Leukemia	2.94E-14
Residual	6.98E-14
Total	2.84E-13
TOTAL	5.67E-13

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	0.00E+00
INHALATION	0.00E+00
AIR IMMERSION	2.84E-13
GROUND SURFACE	0.00E+00
INTERNAL	0.00E+00
EXTERNAL	2.84E-13
TOTAL	2.84E-13

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SUMMARY
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NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
O-15	2.84E-13
TOTAL	2.84E-13

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SUMMARY
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INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)

Direction	27715	28919	31060	O-15C.SUM 32802	34577	35279	35683
N	1.4E-07	1.3E-07	1.2E-07	1.1E-07	1.1E-07	1.1E-07	1.0E-07
NNW	5.2E-08	4.9E-08	4.6E-08	4.3E-08	4.1E-08	4.0E-08	3.9E-08
NW	7.3E-08	6.9E-08	6.4E-08	6.0E-08	5.7E-08	5.6E-08	5.5E-08
WNW	9.8E-08	9.3E-08	8.6E-08	8.1E-08	7.6E-08	7.5E-08	7.4E-08
W	1.1E-07	1.1E-07	9.7E-08	9.2E-08	8.6E-08	8.5E-08	8.4E-08
WSW	1.5E-07	1.4E-07	1.3E-07	1.2E-07	1.1E-07	1.1E-07	1.1E-07
SW	2.3E-07	2.2E-07	2.0E-07	1.9E-07	1.8E-07	1.7E-07	1.7E-07
SSW	3.8E-07	3.6E-07	3.3E-07	3.1E-07	2.9E-07	2.9E-07	2.8E-07
S	5.2E-07	5.0E-07	4.6E-07	4.3E-07	4.0E-07	3.9E-07	3.9E-07
SSE	4.4E-07	4.2E-07	3.9E-07	3.6E-07	3.4E-07	3.3E-07	3.3E-07
SE	2.4E-07	2.3E-07	2.1E-07	2.0E-07	1.9E-07	1.8E-07	1.8E-07
ESE	1.6E-07	1.6E-07	1.4E-07	1.3E-07	1.3E-07	1.2E-07	1.2E-07
E	2.1E-07	2.0E-07	1.8E-07	1.7E-07	1.6E-07	1.6E-07	1.6E-07
ENE	1.8E-07	1.7E-07	1.6E-07	1.5E-07	1.4E-07	1.3E-07	1.3E-07
NE	2.6E-07	2.4E-07	2.3E-07	2.1E-07	2.0E-07	1.9E-07	1.9E-07
NNE	1.7E-07	1.6E-07	1.5E-07	1.4E-07	1.3E-07	1.3E-07	1.3E-07

Distance (m)

Direction	36721	36809	37729	39079	39220	39559	43584
N	1.0E-07	1.0E-07	9.8E-08	9.4E-08	9.4E-08	9.3E-08	8.3E-08
NNW	3.8E-08	3.8E-08	3.7E-08	3.5E-08	3.5E-08	3.5E-08	3.1E-08
NW	5.3E-08	5.3E-08	5.2E-08	5.0E-08	5.0E-08	4.9E-08	4.4E-08
WNW	7.2E-08	7.1E-08	6.9E-08	6.7E-08	6.6E-08	6.6E-08	5.9E-08
W	8.1E-08	8.1E-08	7.9E-08	7.6E-08	7.5E-08	7.4E-08	6.7E-08
WSW	1.1E-07	1.1E-07	1.0E-07	9.9E-08	9.8E-08	9.7E-08	8.7E-08
SW	1.7E-07	1.7E-07	1.6E-07	1.5E-07	1.5E-07	1.5E-07	1.4E-07
SSW	2.7E-07	2.7E-07	2.6E-07	2.5E-07	2.5E-07	2.5E-07	2.2E-07
S	3.8E-07	3.7E-07	3.6E-07	3.5E-07	3.5E-07	3.4E-07	3.1E-07
SSE	3.2E-07	3.2E-07	3.1E-07	3.0E-07	2.9E-07	2.9E-07	2.6E-07
SE	1.8E-07	1.8E-07	1.7E-07	1.6E-07	1.6E-07	1.6E-07	1.5E-07
ESE	1.2E-07	1.2E-07	1.2E-07	1.1E-07	1.1E-07	1.1E-07	9.8E-08
E	1.5E-07	1.5E-07	1.5E-07	1.4E-07	1.4E-07	1.4E-07	1.3E-07
ENE	1.3E-07	1.3E-07	1.2E-07	1.2E-07	1.2E-07	1.2E-07	1.1E-07
NE	1.9E-07	1.8E-07	1.8E-07	1.7E-07	1.7E-07	1.7E-07	1.5E-07
NNE	1.2E-07	1.2E-07	1.2E-07	1.1E-07	1.1E-07	1.1E-07	1.0E-07

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SUMMARY
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INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Direction	45196	45275	45654	45677	46668	47969
N	8.0E-08	8.0E-08	7.9E-08	7.9E-08	7.7E-08	7.5E-08
NNW	3.0E-08	3.0E-08	3.0E-08	3.0E-08	2.9E-08	2.8E-08

	O-15C.SUM					
NW	4.2E-08	4.2E-08	4.2E-08	4.2E-08	4.1E-08	4.0E-08
WNW	5.7E-08	5.7E-08	5.6E-08	5.6E-08	5.5E-08	5.3E-08
W	6.4E-08	6.4E-08	6.4E-08	6.4E-08	6.2E-08	6.0E-08
WSW	8.4E-08	8.4E-08	8.3E-08	8.3E-08	8.1E-08	7.8E-08
SW	1.3E-07	1.3E-07	1.3E-07	1.3E-07	1.3E-07	1.2E-07
SSW	2.1E-07	2.1E-07	2.1E-07	2.1E-07	2.1E-07	2.0E-07
S	2.9E-07	2.9E-07	2.9E-07	2.9E-07	2.8E-07	2.7E-07
SSE	2.5E-07	2.5E-07	2.5E-07	2.5E-07	2.4E-07	2.3E-07
SE	1.4E-07	1.4E-07	1.4E-07	1.4E-07	1.3E-07	1.3E-07
ESE	9.4E-08	9.4E-08	9.3E-08	9.3E-08	9.1E-08	8.8E-08
E	1.2E-07	1.2E-07	1.2E-07	1.2E-07	1.2E-07	1.1E-07
ENE	1.0E-07	1.0E-07	1.0E-07	1.0E-07	9.8E-08	9.5E-08
NE	1.5E-07	1.4E-07	1.4E-07	1.4E-07	1.4E-07	1.4E-07
NNE	9.7E-08	9.7E-08	9.6E-08	9.6E-08	9.4E-08	9.1E-08

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)						
Direction	27715	28919	31060	32802	34577	35279	35683
N	7.5E-14	7.1E-14	6.6E-14	6.2E-14	5.8E-14	5.7E-14	5.6E-14
NNW	2.8E-14	2.7E-14	2.5E-14	2.3E-14	2.2E-14	2.1E-14	2.1E-14
NW	3.9E-14	3.8E-14	3.5E-14	3.3E-14	3.1E-14	3.0E-14	3.0E-14
WNW	5.3E-14	5.0E-14	4.7E-14	4.4E-14	4.1E-14	4.0E-14	4.0E-14
W	6.0E-14	5.7E-14	5.3E-14	5.0E-14	4.7E-14	4.6E-14	4.5E-14
WSW	7.9E-14	7.5E-14	6.9E-14	6.5E-14	6.1E-14	6.0E-14	5.9E-14
SW	1.2E-13	1.2E-13	1.1E-13	1.0E-13	9.6E-14	9.4E-14	9.3E-14
SSW	2.1E-13	2.0E-13	1.8E-13	1.7E-13	1.6E-13	1.5E-13	1.5E-13
S	2.8E-13	2.7E-13	2.5E-13	2.3E-13	2.2E-13	2.1E-13	2.1E-13
SSE	2.4E-13	2.3E-13	2.1E-13	2.0E-13	1.8E-13	1.8E-13	1.8E-13
SE	1.3E-13	1.3E-13	1.2E-13	1.1E-13	1.0E-13	1.0E-13	9.9E-14
ESE	8.8E-14	8.4E-14	7.8E-14	7.3E-14	6.9E-14	6.7E-14	6.6E-14
E	1.1E-13	1.1E-13	1.0E-13	9.4E-14	8.9E-14	8.7E-14	8.6E-14
ENE	9.6E-14	9.2E-14	8.4E-14	7.9E-14	7.5E-14	7.3E-14	7.2E-14
NE	1.4E-13	1.3E-13	1.2E-13	1.1E-13	1.1E-13	1.0E-13	1.0E-13
NNE	9.2E-14	8.8E-14	8.1E-14	7.6E-14	7.1E-14	7.0E-14	6.9E-14

	Distance (m)						
Direction	36721	36809	37729	39079	39220	39559	43584
N	5.5E-14	5.4E-14	5.3E-14	5.1E-14	5.1E-14	5.0E-14	4.5E-14
NNW	2.1E-14	2.0E-14	2.0E-14	1.9E-14	1.9E-14	1.9E-14	1.7E-14
NW	2.9E-14	2.9E-14	2.8E-14	2.7E-14	2.7E-14	2.7E-14	2.4E-14
WNW	3.9E-14	3.9E-14	3.8E-14	3.6E-14	3.6E-14	3.6E-14	3.2E-14
W	4.4E-14	4.4E-14	4.2E-14	4.1E-14	4.1E-14	4.0E-14	3.6E-14
WSW	5.7E-14	5.7E-14	5.6E-14	5.3E-14	5.3E-14	5.3E-14	4.7E-14
SW	9.0E-14	8.9E-14	8.7E-14	8.3E-14	8.3E-14	8.2E-14	7.4E-14
SSW	1.5E-13	1.5E-13	1.4E-13	1.4E-13	1.4E-13	1.4E-13	1.2E-13

	O-15C.SUM						
S	2.0E-13	2.0E-13	2.0E-13	1.9E-13	1.9E-13	1.9E-13	1.7E-13
SSE	1.7E-13	1.7E-13	1.7E-13	1.6E-13	1.6E-13	1.6E-13	1.4E-13
SE	9.5E-14	9.5E-14	9.3E-14	8.9E-14	8.9E-14	8.8E-14	7.9E-14
ESE	6.4E-14	6.4E-14	6.2E-14	6.0E-14	6.0E-14	5.9E-14	5.3E-14
E	8.3E-14	8.3E-14	8.0E-14	7.7E-14	7.7E-14	7.6E-14	6.8E-14
ENE	7.0E-14	7.0E-14	6.8E-14	6.5E-14	6.5E-14	6.4E-14	5.7E-14
NE	1.0E-13	1.0E-13	9.7E-14	9.3E-14	9.3E-14	9.2E-14	8.2E-14
NNE	6.7E-14	6.7E-14	6.5E-14	6.2E-14	6.2E-14	6.1E-14	5.5E-14

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SUMMARY
Page 8

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)					
Direction	45196	45275	45654	45677	46668	47969
N	4.3E-14	4.3E-14	4.3E-14	4.3E-14	4.2E-14	4.1E-14
NNW	1.6E-14	1.6E-14	1.6E-14	1.6E-14	1.6E-14	1.5E-14
NW	2.3E-14	2.3E-14	2.3E-14	2.3E-14	2.2E-14	2.2E-14
WNW	3.1E-14	3.1E-14	3.0E-14	3.0E-14	3.0E-14	2.9E-14
W	3.5E-14	3.5E-14	3.4E-14	3.4E-14	3.4E-14	3.3E-14
WSW	4.5E-14	4.5E-14	4.5E-14	4.5E-14	4.4E-14	4.2E-14
SW	7.1E-14	7.0E-14	7.0E-14	7.0E-14	6.8E-14	6.6E-14
SSW	1.2E-13	1.2E-13	1.1E-13	1.1E-13	1.1E-13	1.1E-13
S	1.6E-13	1.6E-13	1.6E-13	1.6E-13	1.5E-13	1.5E-13
SSE	1.3E-13	1.3E-13	1.3E-13	1.3E-13	1.3E-13	1.3E-13
SE	7.5E-14	7.5E-14	7.5E-14	7.5E-14	7.3E-14	7.1E-14
ESE	5.1E-14	5.1E-14	5.0E-14	5.0E-14	4.9E-14	4.8E-14
E	6.6E-14	6.6E-14	6.5E-14	6.5E-14	6.3E-14	6.1E-14
ENE	5.5E-14	5.5E-14	5.4E-14	5.4E-14	5.3E-14	5.1E-14
NE	7.9E-14	7.8E-14	7.8E-14	7.8E-14	7.6E-14	7.3E-14
NNE	5.3E-14	5.3E-14	5.2E-14	5.2E-14	5.1E-14	4.9E-14

O-15D.SUM

C A P 8 8 - P C

Version 3.0

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment

Feb 20, 2008 02:31 pm

Facility: INL
Address: PO Box 1625
City: Idaho Falls
State: ID Zip: 83415

Source Category:
Source Type: Stack
Emission Year: 2008

Comments: TAN-TSF
Receptors 60-62

Dataset Name: RUND
Dataset Date: 08/02/20 2:20:00 PM
Wind File: C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

Feb 20, 2008 02:31 pm

SUMMARY
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
Adrenals	2.26E-07
B Surfac	4.80E-07
Breasts	3.11E-07
St wall	2.40E-07
ULI wall	2.23E-07
Kidneys	2.41E-07
Lungs	2.70E-07
Ovaries	2.02E-07
R Marrow	2.60E-07
Spleen	2.44E-07
Thymus	2.50E-07
Uterus	2.08E-07

	O-15D.SUM
Bld wall	2.25E-07
Brain	2.88E-07
Esophagu	2.22E-07
SI wall	2.13E-07
LLI wall	2.17E-07
Liver	2.43E-07
Muscle	2.64E-07
Pancreas	2.12E-07
Skin	5.90E-07
Testes	2.72E-07
Thyroid	2.77E-07
EFPEC	2.61E-07

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	0.00E+00
INHALATION	0.00E+00
AIR IMMERSION	2.61E-07
GROUND SURFACE	0.00E+00
INTERNAL	0.00E+00
EXTERNAL	2.61E-07
TOTAL	2.61E-07

Feb 20, 2008 02:31 pm

SUMMARY
Page 2

NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
O-15	2.61E-07
TOTAL	2.61E-07

Feb 20, 2008 02:31 pm

SUMMARY
Page 3

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
Esophagu	2.55E-15

Page 2

	O-15D.SUM
Stomach	9.70E-15
Colon	2.27E-14
Liver	3.68E-15
LUNG	2.64E-14
Bone	4.55E-16
Skin	5.90E-16
Breast	1.50E-14
Ovary	2.87E-15
Bladder	5.45E-15
Kidneys	1.25E-15
Thyroid	8.79E-16
Leukemia	1.46E-14
Residual	3.48E-14
Total	1.41E-13
TOTAL	2.82E-13

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	0.00E+00
INHALATION	0.00E+00
AIR IMMERSION	1.41E-13
GROUND SURFACE	0.00E+00
INTERNAL	0.00E+00
EXTERNAL	1.41E-13
TOTAL	1.41E-13

Feb 20, 2008 02:31 pm

SUMMARY
Page 4

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
O-15	1.41E-13
TOTAL	1.41E-13

Feb 20, 2008 02:31 pm

SUMMARY
Page 5

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)

Direction 50024 54611 58610 O-15D.SUM

N	7.1E-08	6.5E-08	6.0E-08
NNW	2.7E-08	2.4E-08	2.3E-08
NW	3.8E-08	3.4E-08	3.2E-08
WNW	5.1E-08	4.6E-08	4.3E-08
W	5.7E-08	5.2E-08	4.8E-08
WSW	7.5E-08	6.8E-08	6.3E-08
SW	1.2E-07	1.1E-07	9.7E-08
SSW	1.9E-07	1.7E-07	1.6E-07
S	2.6E-07	2.4E-07	2.2E-07
SSE	2.2E-07	2.0E-07	1.8E-07
SE	1.2E-07	1.1E-07	1.0E-07
ESE	8.4E-08	7.6E-08	7.0E-08
E	1.1E-07	9.8E-08	9.1E-08
ENE	9.1E-08	8.2E-08	7.6E-08
NE	1.3E-07	1.2E-07	1.1E-07
NNE	8.7E-08	7.9E-08	7.3E-08

Feb 20, 2008 02:31 pm

SUMMARY
Page 6

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

Distance (m)

Direction	50024	54611	58610
N	3.9E-14	3.5E-14	3.2E-14
NNW	1.5E-14	1.3E-14	1.2E-14
NW	2.1E-14	1.9E-14	1.7E-14
WNW	2.8E-14	2.5E-14	2.3E-14
W	3.1E-14	2.8E-14	2.6E-14
WSW	4.1E-14	3.7E-14	3.4E-14
SW	6.3E-14	5.7E-14	5.2E-14
SSW	1.0E-13	9.3E-14	8.6E-14
S	1.4E-13	1.3E-13	1.2E-13
SSE	1.2E-13	1.1E-13	1.0E-13
SE	6.7E-14	6.1E-14	5.6E-14
ESE	4.6E-14	4.1E-14	3.8E-14
E	5.9E-14	5.3E-14	4.9E-14
ENE	4.9E-14	4.4E-14	4.1E-14
NE	7.0E-14	6.3E-14	5.8E-14
NNE	4.7E-14	4.3E-14	3.9E-14

08/02/20 2:16:00 PM Feb 20, 2008 02:30 pm
 RUNA RUNA.
 C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

INL
 PO Box 1625

Idaho Falls ID 83415
 2008

TAN-TSF
 Receptors 1-20
 100.0000,500.0000

0	0	0	0	0	20		
10344	10365	10472	10590	11103	11989	12522	13245
13286	13483	13612	13664	13959	14258	14374	15241
15441	15784	15844	16323				
800	280.20	16.30	3.54				
0	0						

1	1.00	1.00	0.000E+00	0.000E+00			
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
6	0	1					
Rn-220	G	0	0.000e+00	0.000e+00	5.480e-05		2
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified		0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.077E+03	
Po-216	M	1	1.000e-01	1.000e-01	5.480e-05		2
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.630e-06	0.0018	0.000e+00					
inorganic		1.000E-03	1.000E-01	4.000E-04	5.000E-03	3.992E+05	
Pb-212	M	1	2.000e-01	2.000e-01	5.480e-05		2
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.630e-06	0.0018	0.000e+00					
unspecified		4.000E-03	1.000E-01	3.000E-04	8.000E-04	1.563E+00	
Bi-212	M	1	5.000e-02	5.000e-02	5.480e-05		2
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.630e-06	0.0018	0.000e+00					
unspecified		1.000E-01	5.000E-01	1.000E-03	2.000E-03	1.648E+01	
Po-212	M	1	1.000e-01	1.000e-01	5.480e-05		2
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.630e-06	0.0018	0.000e+00					
inorganic		1.000E-03	1.000E-01	4.000E-04	5.000E-03	1.963E+11	
Tl-208	M	1	1.000e+00	1.000e+00	5.480e-05		2
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.630e-06	0.0018	0.000e+00					
unspecified		2.000E-01	6.000E-01	3.000E-03	2.000E-02	3.251E+02	
0.08	0.92	0.00	Urban				
0.00	1.00	0.00					
0.01	0.99	0.00					

T	T	T	T		
2.030e-01	4.560e-02	1.700e-02			
Rn-220	86	0			
00	00	00	00	00	00
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	
Po-216	84	0			
00	00	00	00	00	00
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	
Pb-212	82	0			
00	00	00	00	00	00
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	
Bi-212	83	0			
00	00	00	00	00	00
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	

Rn-220A.dat							
Po-212	84	0					
00	00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00		
Tl-208	81	0					
00	00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00		
6							
Rn-220	G	0	0.000e+00	0.000e+00	5.480e-05		0
1.965E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified		0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.077E+03	
Po-216	M	1	1.000e-01	1.000e-01	5.480e-05		0
1.971E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.010e-05	0.0018	0.000e+00					
inorganic		1.000E-03	1.000E-01	4.000E-04	5.000E-03	3.992E+05	
Pb-212	M	1	2.000e-01	2.000e-01	5.480e-05		0
1.438E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.054E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.010e-05	0.0018	0.000e+00					
unspecified		4.000E-03	1.000E-01	3.000E-04	8.000E-04	1.563E+00	
Bi-212	M	1	5.000e-02	5.000e-02	5.480e-05		0
1.111E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.165E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.010e-05	0.0018	0.000e+00					
unspecified		1.000E-01	5.000E-01	1.000E-03	2.000E-03	1.648E+01	
Po-212	M	1	1.000e-01	1.000e-01	5.480e-05		0
7.117E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
7.461E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.010e-05	0.0018	0.000e+00					
inorganic		1.000E-03	1.000E-01	4.000E-04	5.000E-03	1.963E+11	
Tl-208	M	1	1.000e+00	1.000e+00	5.480e-05		0
2.036E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
4.198E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.010e-05	0.0018	0.000e+00					
unspecified		2.000E-01	6.000E-01	3.000E-03	2.000E-02	3.251E+02	
--DecayStep--1							
--LimitChildren--1							
--Children--5							

08/02/20 2:17:00 PM Feb 20, 2008 02:30 pm
 RUNB RUNB.
 C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

INL
 PO Box 1625

Idaho Falls ID 83415
 2008

TAN-TSF
 Receptors 21-39
 100.0000,500.0000

0	0	0	0	0	19		
17035	17329	18607	18834	18860	18890	19860	19891
20457	21314	21349	22159	23521	24430	24545	25171
26794	27275	27389	0				
800	280.20	16.30	3.54				
0	0						

1	1.00	1.00	0.000E+00	0.000E+00			
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
6	0	1					
Rn-220	G	0	0.000e+00	0.000e+00	5.480e-05		2
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified		0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.077E+03	
Po-216	M	1	1.000e-01	1.000e-01	5.480e-05		2
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.630e-06	0.0018	0.000e+00					
inorganic		1.000E-03	1.000E-01	4.000E-04	5.000E-03	3.992E+05	
Pb-212	M	1	2.000e-01	2.000e-01	5.480e-05		2
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.630e-06	0.0018	0.000e+00					
unspecified		4.000E-03	1.000E-01	3.000E-04	8.000E-04	1.563E+00	
Bi-212	M	1	5.000e-02	5.000e-02	5.480e-05		2
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.630e-06	0.0018	0.000e+00					
unspecified		1.000E-01	5.000E-01	1.000E-03	2.000E-03	1.648E+01	
Po-212	M	1	1.000e-01	1.000e-01	5.480e-05		2
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.630e-06	0.0018	0.000e+00					
inorganic		1.000E-03	1.000E-01	4.000E-04	5.000E-03	1.963E+11	
Tl-208	M	1	1.000e+00	1.000e+00	5.480e-05		2
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.630e-06	0.0018	0.000e+00					
unspecified		2.000E-01	6.000E-01	3.000E-03	2.000E-02	3.251E+02	
0.08	0.92	0.00	Urban				
0.00	1.00	0.00					
0.01	0.99	0.00					

T	T	T	T			
2.030e-01	4.560e-02	1.700e-02				
Rn-220	86	0				
00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00		
Po-216	84	0				
00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00		
Pb-212	82	0				
00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00		
Bi-212	83	0				
00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00		

Rn-220B.dat

Po-212	84	0					
00	00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00		
Tl-208	81	0					
00	00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00		
6							
Rn-220	G	0	0.000e+00	0.000e+00	5.480e-05		0
1.965E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified		0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.077E+03	
Po-216	M	1	1.000e-01	1.000e-01	5.480e-05		0
1.971E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.010e-05	0.0018	0.000e+00					
inorganic		1.000E-03	1.000E-01	4.000E-04	5.000E-03	3.992E+05	
Pb-212	M	1	2.000e-01	2.000e-01	5.480e-05		0
1.438E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.054E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.010e-05	0.0018	0.000e+00					
unspecified		4.000E-03	1.000E-01	3.000E-04	8.000E-04	1.563E+00	
Bi-212	M	1	5.000e-02	5.000e-02	5.480e-05		0
1.111E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.165E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.010e-05	0.0018	0.000e+00					
unspecified		1.000E-01	5.000E-01	1.000E-03	2.000E-03	1.648E+01	
Po-212	M	1	1.000e-01	1.000e-01	5.480e-05		0
7.117E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
7.461E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.010e-05	0.0018	0.000e+00					
inorganic		1.000E-03	1.000E-01	4.000E-04	5.000E-03	1.963E+11	
Tl-208	M	1	1.000e+00	1.000e+00	5.480e-05		0
2.036E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
4.198E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.010e-05	0.0018	0.000e+00					
unspecified		2.000E-01	6.000E-01	3.000E-03	2.000E-02	3.251E+02	

--DecayStep--1
--LimitChildren--1
--Children--5

08/02/20 2:19:00 PM Feb 20, 2008 02:31 pm
 RUNC RUNC.
 C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

INL
 PO Box 1625

Idaho Falls ID 83415
 2008

TAN-TSF
 Receptors 40-59
 100.0000,500.0000

0	0	0	0	0	20		
27715	28919	31060	32802	34577	35279	35683	36721
36809	37729	39079	39220	39559	43584	45196	45275
45654	45677	46668	47969				
800	280.20	16.30	3.54				
0	0						

1	1.00	1.00	0.000E+00	0.000E+00			
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
6	0	1					
Rn-220	G	0	0.000e+00	0.000e+00	5.480e-05		2
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified		0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.077E+03	
Po-216	M	1	1.000e-01	1.000e-01	5.480e-05		2
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.630e-06	0.0018	0.000e+00					
inorganic		1.000E-03	1.000E-01	4.000E-04	5.000E-03	3.992E+05	
Pb-212	M	1	2.000e-01	2.000e-01	5.480e-05		2
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.630e-06	0.0018	0.000e+00					
unspecified		4.000E-03	1.000E-01	3.000E-04	8.000E-04	1.563E+00	
Bi-212	M	1	5.000e-02	5.000e-02	5.480e-05		2
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.630e-06	0.0018	0.000e+00					
unspecified		1.000E-01	5.000E-01	1.000E-03	2.000E-03	1.648E+01	
Po-212	M	1	1.000e-01	1.000e-01	5.480e-05		2
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.630e-06	0.0018	0.000e+00					
inorganic		1.000E-03	1.000E-01	4.000E-04	5.000E-03	1.963E+11	
Tl-208	M	1	1.000e+00	1.000e+00	5.480e-05		2
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.630e-06	0.0018	0.000e+00					
unspecified		2.000E-01	6.000E-01	3.000E-03	2.000E-02	3.251E+02	
0.08	0.92	0.00	Urban				
0.00	1.00	0.00					
0.01	0.99	0.00					

T	T	T	T			
2.030e-01	4.560e-02	1.700e-02				
Rn-220	86	0				
00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00		
Po-216	84	0				
00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00		
Pb-212	82	0				
00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00		
Bi-212	83	0				
00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00		

Rn-220C.dat							
Po-212	84	0					
00	00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00		
Tl-208	81	0					
00	00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00		
6							
Rn-220	G	0	0.000e+00	0.000e+00	5.480e-05		0
1.965E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified		0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.077E+03	
Po-216	M	1	1.000e-01	1.000e-01	5.480e-05		0
1.971E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.010e-05	0.0018	0.000e+00					
inorganic		1.000E-03	1.000E-01	4.000E-04	5.000E-03	3.992E+05	
Pb-212	M	1	2.000e-01	2.000e-01	5.480e-05		0
1.438E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.054E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.010e-05	0.0018	0.000e+00					
unspecified		4.000E-03	1.000E-01	3.000E-04	8.000E-04	1.563E+00	
Bi-212	M	1	5.000e-02	5.000e-02	5.480e-05		0
1.111E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.165E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.010e-05	0.0018	0.000e+00					
unspecified		1.000E-01	5.000E-01	1.000E-03	2.000E-03	1.648E+01	
Po-212	M	1	1.000e-01	1.000e-01	5.480e-05		0
7.117E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
7.461E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.010e-05	0.0018	0.000e+00					
inorganic		1.000E-03	1.000E-01	4.000E-04	5.000E-03	1.963E+11	
Tl-208	M	1	1.000e+00	1.000e+00	5.480e-05		0
2.036E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
4.198E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.010e-05	0.0018	0.000e+00					
unspecified		2.000E-01	6.000E-01	3.000E-03	2.000E-02	3.251E+02	
--DecayStep--	1						
--LimitChildren--	1						
--Children--	5						

08/02/20 2:20:00 PM Rn-220D.dat
 Feb 20, 2008 02:31 pm
 RUND RUND.
 C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

INL
 PO Box 1625

Idaho Falls ID 83415
 2008

TAN-TSF
 Receptors 60-62
 100.0000,500.0000

0	0	0	0	0	3		
50024	54611	58610	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0			
800	280.20	16.30	3.54				
0	0						

1	1.00	1.00	0.000E+00	0.000E+00			
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
6	0	1					
Rn-220	G	0	0.000e+00	0.000e+00	5.480e-05		2
1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified		0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.077E+03	
Po-216	M	1	1.000e-01	1.000e-01	5.480e-05		2
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.630e-06	0.0018	0.000e+00					
inorganic		1.000E-03	1.000E-01	4.000E-04	5.000E-03	3.992E+05	
Pb-212	M	1	2.000e-01	2.000e-01	5.480e-05		2
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.630e-06	0.0018	0.000e+00					
unspecified		4.000E-03	1.000E-01	3.000E-04	8.000E-04	1.563E+00	
Bi-212	M	1	5.000e-02	5.000e-02	5.480e-05		2
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.630e-06	0.0018	0.000e+00					
unspecified		1.000E-01	5.000E-01	1.000E-03	2.000E-03	1.648E+01	
Po-212	M	1	1.000e-01	1.000e-01	5.480e-05		2
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.630e-06	0.0018	0.000e+00					
inorganic		1.000E-03	1.000E-01	4.000E-04	5.000E-03	1.963E+11	
Tl-208	M	1	1.000e+00	1.000e+00	5.480e-05		2
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.630e-06	0.0018	0.000e+00					
unspecified		2.000E-01	6.000E-01	3.000E-03	2.000E-02	3.251E+02	
0.08	0.92	0.00	Urban				
0.00	1.00	0.00					
0.01	0.99	0.00					

T	T	T	T		
2.030e-01	4.560e-02	1.700e-02			
Rn-220	86	0			
00	00	00	00	00	00
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	
Po-216	84	0			
00	00	00	00	00	00
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	
Pb-212	82	0			
00	00	00	00	00	00
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	
Bi-212	83	0			
00	00	00	00	00	00
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	

Rn-220D.dat

Po-212	84	0					
00	00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00		
Tl-208	81	0					
00	00	00	00	00	00	00	
0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00		
6							
Rn-220	G	0	0.000e+00	0.000e+00	5.480e-05		0
1.965E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000e+00	0	0.000e+00					
unspecified		0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.077E+03	
Po-216	M	1	1.000e-01	1.000e-01	5.480e-05		0
1.971E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.010e-05	0.0018	0.000e+00					
inorganic		1.000E-03	1.000E-01	4.000E-04	5.000E-03	3.992E+05	
Pb-212	M	1	2.000e-01	2.000e-01	5.480e-05		0
1.438E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.054E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.010e-05	0.0018	0.000e+00					
unspecified		4.000E-03	1.000E-01	3.000E-04	8.000E-04	1.563E+00	
Bi-212	M	1	5.000e-02	5.000e-02	5.480e-05		0
1.111E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.165E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.010e-05	0.0018	0.000e+00					
unspecified		1.000E-01	5.000E-01	1.000E-03	2.000E-03	1.648E+01	
Po-212	M	1	1.000e-01	1.000e-01	5.480e-05		0
7.117E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
7.461E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.010e-05	0.0018	0.000e+00					
inorganic		1.000E-03	1.000E-01	4.000E-04	5.000E-03	1.963E+11	
Tl-208	M	1	1.000e+00	1.000e+00	5.480e-05		0
2.036E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
4.198E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1.010e-05	0.0018	0.000e+00					
unspecified		2.000E-01	6.000E-01	3.000E-03	2.000E-02	3.251E+02	

--DecayStep--1
--LimitChildren--1
--Children--5

Rn-220A.SUM

C A P 8 8 - P C

Version 3.0

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment

Feb 20, 2008 02:30 pm

Facility: INL
Address: PO Box 1625
City: Idaho Falls
State: ID Zip: 83415

Source Category:
Source Type: Stack
Emission Year: 2008

Comments: TAN-TSF
Receptors 1-20

Dataset Name: RUNA
Dataset Date: 08/02/20 2:16:00 PM
Wind File: C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

Feb 20, 2008 02:30 pm

SUMMARY
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
Adrenals	3.39E-08
B Surfac	1.47E-07
Breasts	4.02E-08
St wall	3.77E-08
ULI wall	5.08E-08
Kidneys	1.15E-07
Lungs	1.04E-05
Ovaries	3.54E-08
R Marrow	4.67E-08
Spleen	3.67E-08
Thymus	3.71E-08
Uterus	3.54E-08

	Rn-220A.SUM
Bld wall	3.85E-08
Brain	3.70E-08
Esophagu	3.83E-06
SI wall	3.96E-08
LLI wall	5.36E-08
Liver	5.73E-08
Muscle	4.03E-08
Pancreas	3.46E-08
Skin	2.14E-07
Testes	4.08E-08
Thyroid	3.77E-08
EFPEC	2.51E-05

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	2.08E-13
INHALATION	2.51E-05
AIR IMMERSION	5.30E-09
GROUND SURFACE	3.12E-08
INTERNAL	2.51E-05
EXTERNAL	3.65E-08
TOTAL	2.51E-05

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SUMMARY
Page 2

NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
Rn-220	2.15E-11
Po-216	6.00E-13
Pb-212	2.48E-05
Bi-212	3.49E-07
Po-212	0.00E+00
Tl-208	2.49E-08
TOTAL	2.51E-05

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SUMMARY
Page 3

CANCER RISK SUMMARY

Selected Individual
Page 2

Rn-220A.SUM
Total Lifetime
Fatal Cancer Risk

Cancer	
Esophagu	1.41E-15
Stomach	7.63E-15
Colon	1.01E-13
Liver	9.14E-15
LUNG	2.14E-11
Bone	2.95E-15
Skin	3.05E-16
Breast	4.26E-15
Ovary	1.83E-15
Bladder	3.24E-15
Kidneys	9.88E-15
Thyroid	4.26E-16
Leukemia	3.18E-15
Residual	1.96E-14
Total	2.16E-11
TOTAL	4.31E-11

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	2.07E-19
INHALATION	2.16E-11
AIR IMMERSION	2.84E-15
GROUND SURFACE	1.65E-14
INTERNAL	2.16E-11
EXTERNAL	1.94E-14
TOTAL	2.16E-11

Feb 20, 2008 02:30 pm

SUMMARY
Page 4

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
Rn-220	1.17E-17
Po-216	3.28E-19
Pb-212	2.13E-11
Bi-212	2.24E-13
Po-212	0.00E+00
Tl-208	1.36E-14
TOTAL	2.16E-11

Feb 20, 2008 02:30 pm

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SUMMARY

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Direction	Distance (m)						
	10344	10365	10472	10590	11103	11989	12522
N	4.8E-06	4.8E-06	4.8E-06	4.7E-06	4.4E-06	4.0E-06	3.7E-06
NNW	2.2E-06	2.2E-06	2.2E-06	2.1E-06	2.0E-06	1.8E-06	1.7E-06
NW	2.8E-06	2.8E-06	2.7E-06	2.7E-06	2.5E-06	2.3E-06	2.2E-06
WNW	3.7E-06	3.7E-06	3.6E-06	3.6E-06	3.3E-06	3.0E-06	2.8E-06
W	3.8E-06	3.8E-06	3.8E-06	3.7E-06	3.5E-06	3.1E-06	3.0E-06
WSW	6.1E-06	6.1E-06	6.0E-06	6.0E-06	5.6E-06	5.0E-06	4.7E-06
SW	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.0E-05	9.0E-06	8.5E-06
SSW	1.8E-05	1.8E-05	1.8E-05	1.7E-05	1.6E-05	1.5E-05	1.4E-05
S	2.5E-05	2.5E-05	2.5E-05	2.4E-05	2.3E-05	2.0E-05	1.9E-05
SSE	2.2E-05	2.2E-05	2.2E-05	2.2E-05	2.0E-05	1.8E-05	1.7E-05
SE	8.9E-06	8.9E-06	8.8E-06	8.6E-06	8.1E-06	7.3E-06	6.9E-06
ESE	5.5E-06	5.5E-06	5.4E-06	5.3E-06	5.0E-06	4.5E-06	4.2E-06
E	6.9E-06	6.9E-06	6.8E-06	6.7E-06	6.3E-06	5.6E-06	5.3E-06
ENE	7.5E-06	7.5E-06	7.4E-06	7.3E-06	6.8E-06	6.1E-06	5.8E-06
NE	1.2E-05	1.2E-05	1.2E-05	1.2E-05	1.1E-05	1.0E-05	9.5E-06
NNE	7.1E-06	7.0E-06	6.9E-06	6.8E-06	6.4E-06	5.8E-06	5.4E-06

Direction	Distance (m)						
	13245	13286	13483	13612	13664	13959	14258
N	3.5E-06	3.4E-06	3.4E-06	3.3E-06	3.3E-06	3.2E-06	3.1E-06
NNW	1.6E-06	1.6E-06	1.6E-06	1.5E-06	1.5E-06	1.5E-06	1.4E-06
NW	2.0E-06	2.0E-06	1.9E-06	1.9E-06	1.9E-06	1.9E-06	1.8E-06
WNW	2.6E-06	2.6E-06	2.6E-06	2.5E-06	2.5E-06	2.5E-06	2.4E-06
W	2.7E-06	2.7E-06	2.7E-06	2.6E-06	2.6E-06	2.5E-06	2.5E-06
WSW	4.4E-06	4.3E-06	4.3E-06	4.2E-06	4.2E-06	4.1E-06	3.9E-06
SW	7.8E-06	7.8E-06	7.6E-06	7.5E-06	7.5E-06	7.3E-06	7.0E-06
SSW	1.3E-05	1.3E-05	1.2E-05	1.2E-05	1.2E-05	1.2E-05	1.1E-05
S	1.8E-05	1.8E-05	1.7E-05	1.7E-05	1.7E-05	1.6E-05	1.6E-05
SSE	1.6E-05	1.6E-05	1.6E-05	1.5E-05	1.5E-05	1.5E-05	1.4E-05
SE	6.3E-06	6.3E-06	6.2E-06	6.1E-06	6.0E-06	5.9E-06	5.7E-06
ESE	3.9E-06	3.9E-06	3.8E-06	3.8E-06	3.7E-06	3.6E-06	3.5E-06
E	4.9E-06	4.9E-06	4.8E-06	4.7E-06	4.7E-06	4.5E-06	4.4E-06
ENE	5.3E-06	5.3E-06	5.2E-06	5.1E-06	5.1E-06	5.0E-06	4.8E-06
NE	8.8E-06	8.7E-06	8.6E-06	8.4E-06	8.4E-06	8.1E-06	7.9E-06
NNE	5.0E-06	5.0E-06	4.9E-06	4.8E-06	4.8E-06	4.6E-06	4.5E-06

□

Feb 20, 2008 02:30 pm

SUMMARY
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INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

	Distance (m)					
Direction	14374	15241	15441	15784	15844	16323
N	3.1E-06	2.8E-06	2.8E-06	2.7E-06	2.7E-06	2.5E-06
NNW	1.4E-06	1.3E-06	1.3E-06	1.3E-06	1.3E-06	1.2E-06
NW	1.8E-06	1.6E-06	1.6E-06	1.6E-06	1.6E-06	1.5E-06
WNW	2.4E-06	2.2E-06	2.1E-06	2.1E-06	2.1E-06	2.0E-06
W	2.4E-06	2.2E-06	2.2E-06	2.1E-06	2.1E-06	2.0E-06
WSW	3.9E-06	3.6E-06	3.5E-06	3.4E-06	3.4E-06	3.3E-06
SW	7.0E-06	6.4E-06	6.3E-06	6.1E-06	6.1E-06	5.8E-06
SSW	1.1E-05	1.0E-05	1.0E-05	9.8E-06	9.8E-06	9.3E-06
S	1.6E-05	1.4E-05	1.4E-05	1.4E-05	1.4E-05	1.3E-05
SSE	1.4E-05	1.3E-05	1.3E-05	1.2E-05	1.2E-05	1.2E-05
SE	5.6E-06	5.1E-06	5.0E-06	4.9E-06	4.9E-06	4.6E-06
ESE	3.5E-06	3.2E-06	3.1E-06	3.0E-06	3.0E-06	2.9E-06
E	4.3E-06	4.0E-06	3.9E-06	3.8E-06	3.7E-06	3.6E-06
ENE	4.8E-06	4.4E-06	4.3E-06	4.2E-06	4.1E-06	4.0E-06
NE	7.8E-06	7.2E-06	7.0E-06	6.8E-06	6.8E-06	6.5E-06
NNE	4.5E-06	4.1E-06	4.0E-06	3.9E-06	3.9E-06	3.7E-06

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)						
Direction	10344	10365	10472	10590	11103	11989	12522
N	4.2E-12	4.1E-12	4.1E-12	4.0E-12	3.8E-12	3.4E-12	3.2E-12
NNW	1.9E-12	1.9E-12	1.9E-12	1.8E-12	1.7E-12	1.6E-12	1.5E-12
NW	2.4E-12	2.4E-12	2.3E-12	2.3E-12	2.2E-12	2.0E-12	1.8E-12
WNW	3.1E-12	3.1E-12	3.1E-12	3.0E-12	2.9E-12	2.6E-12	2.4E-12
W	3.3E-12	3.3E-12	3.2E-12	3.2E-12	3.0E-12	2.7E-12	2.5E-12
WSW	5.3E-12	5.3E-12	5.2E-12	5.1E-12	4.8E-12	4.3E-12	4.1E-12
SW	9.5E-12	9.4E-12	9.3E-12	9.2E-12	8.6E-12	7.7E-12	7.3E-12
SSW	1.5E-11	1.5E-11	1.5E-11	1.5E-11	1.4E-11	1.2E-11	1.2E-11
S	2.2E-11	2.2E-11	2.1E-11	2.1E-11	2.0E-11	1.8E-11	1.6E-11
SSE	1.9E-11	1.9E-11	1.9E-11	1.9E-11	1.7E-11	1.6E-11	1.5E-11
SE	7.7E-12	7.6E-12	7.5E-12	7.4E-12	7.0E-12	6.3E-12	5.9E-12
ESE	4.7E-12	4.7E-12	4.7E-12	4.6E-12	4.3E-12	3.9E-12	3.6E-12
E	5.9E-12	5.9E-12	5.8E-12	5.8E-12	5.4E-12	4.8E-12	4.6E-12
ENE	6.4E-12	6.4E-12	6.3E-12	6.2E-12	5.9E-12	5.3E-12	5.0E-12
NE	1.1E-11	1.1E-11	1.1E-11	1.0E-11	9.7E-12	8.7E-12	8.2E-12
NNE	6.1E-12	6.0E-12	6.0E-12	5.9E-12	5.5E-12	4.9E-12	4.7E-12

	Distance (m)						
Direction	13245	13286	13483	13612	13664	13959	14258

Rn-220A.SUM

N	3.0E-12	2.9E-12	2.9E-12	2.9E-12	2.8E-12	2.8E-12	2.7E-12
NNW	1.4E-12	1.4E-12	1.3E-12	1.3E-12	1.3E-12	1.3E-12	1.2E-12
NW	1.7E-12	1.7E-12	1.7E-12	1.6E-12	1.6E-12	1.6E-12	1.5E-12
WNW	2.3E-12	2.3E-12	2.2E-12	2.2E-12	2.2E-12	2.1E-12	2.0E-12
W	2.3E-12	2.3E-12	2.3E-12	2.3E-12	2.2E-12	2.2E-12	2.1E-12
WSW	3.7E-12	3.7E-12	3.7E-12	3.6E-12	3.6E-12	3.5E-12	3.4E-12
SW	6.7E-12	6.7E-12	6.5E-12	6.4E-12	6.4E-12	6.2E-12	6.0E-12
SSW	1.1E-11	1.1E-11	1.1E-11	1.0E-11	1.0E-11	1.0E-11	9.8E-12
S	1.5E-11	1.5E-11	1.5E-11	1.5E-11	1.4E-11	1.4E-11	1.4E-11
SSE	1.4E-11	1.4E-11	1.3E-11	1.3E-11	1.3E-11	1.3E-11	1.2E-11
SE	5.4E-12	5.4E-12	5.3E-12	5.2E-12	5.2E-12	5.0E-12	4.9E-12
ESE	3.4E-12	3.3E-12	3.3E-12	3.2E-12	3.2E-12	3.1E-12	3.0E-12
E	4.2E-12	4.2E-12	4.1E-12	4.0E-12	4.0E-12	3.9E-12	3.8E-12
ENE	4.6E-12	4.6E-12	4.5E-12	4.4E-12	4.4E-12	4.3E-12	4.1E-12
NE	7.5E-12	7.5E-12	7.4E-12	7.3E-12	7.2E-12	7.0E-12	6.8E-12
NNE	4.3E-12	4.3E-12	4.2E-12	4.1E-12	4.1E-12	4.0E-12	3.9E-12

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)					
Direction	14374	15241	15441	15784	15844	16323
N	2.6E-12	2.4E-12	2.4E-12	2.3E-12	2.3E-12	2.2E-12
NNW	1.2E-12	1.1E-12	1.1E-12	1.1E-12	1.1E-12	1.0E-12
NW	1.5E-12	1.4E-12	1.4E-12	1.3E-12	1.3E-12	1.3E-12
WNW	2.0E-12	1.9E-12	1.8E-12	1.8E-12	1.8E-12	1.7E-12
W	2.1E-12	1.9E-12	1.9E-12	1.8E-12	1.8E-12	1.7E-12
WSW	3.3E-12	3.1E-12	3.0E-12	2.9E-12	2.9E-12	2.8E-12
SW	6.0E-12	5.5E-12	5.4E-12	5.2E-12	5.2E-12	5.0E-12
SSW	9.6E-12	8.9E-12	8.7E-12	8.4E-12	8.4E-12	8.0E-12
S	1.3E-11	1.2E-11	1.2E-11	1.2E-11	1.2E-11	1.1E-11
SSE	1.2E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.0E-11
SE	4.8E-12	4.4E-12	4.3E-12	4.2E-12	4.2E-12	4.0E-12
ESE	3.0E-12	2.7E-12	2.7E-12	2.6E-12	2.6E-12	2.5E-12
E	3.7E-12	3.4E-12	3.3E-12	3.2E-12	3.2E-12	3.1E-12
ENE	4.1E-12	3.8E-12	3.7E-12	3.6E-12	3.5E-12	3.4E-12
NE	6.7E-12	6.2E-12	6.0E-12	5.9E-12	5.8E-12	5.6E-12
NNE	3.8E-12	3.5E-12	3.5E-12	3.3E-12	3.3E-12	3.2E-12

Rn-220B.SUM

C A P 8 8 - P C

Version 3.0

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment

Feb 20, 2008 02:30 pm

Facility: INL
Address: PO Box 1625
City: Idaho Falls
State: ID Zip: 83415

Source Category:
Source Type: Stack
Emission Year: 2008

Comments: TAN-TSF
Receptors 21-39

Dataset Name: RUNB
Dataset Date: 08/02/20 2:17:00 PM
Wind File: C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

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SUMMARY
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
Adrenals	1.73E-08
B Surfac	7.27E-08
Breasts	2.05E-08
St wall	1.92E-08
ULI wall	2.55E-08
Kidneys	5.66E-08
Lungs	5.01E-06
Ovaries	1.81E-08
R Marrow	2.37E-08
Spleen	1.87E-08
Thymus	1.89E-08
Uterus	1.81E-08

	Rn-220B.SUM
Bld wall	1.97E-08
Brain	1.88E-08
Esophagu	1.86E-06
SI wall	2.01E-08
LLI wall	2.69E-08
Liver	2.87E-08
Muscle	2.06E-08
Pancreas	1.77E-08
Skin	1.10E-07
Testes	2.09E-08
Thyroid	1.92E-08
EFEC	1.22E-05

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	1.05E-13
INHALATION	1.21E-05
AIR IMMERSION	2.57E-09
GROUND SURFACE	1.62E-08
INTERNAL	1.21E-05
EXTERNAL	1.87E-08
TOTAL	1.22E-05

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SUMMARY
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NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
Rn-220	1.17E-11
Po-216	2.90E-13
Pb-212	1.20E-05
Bi-212	1.69E-07
Po-212	0.00E+00
Tl-208	1.29E-08
TOTAL	1.22E-05

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SUMMARY
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CANCER RISK SUMMARY

Selected Individual
Page 2

Rn-220B.SUM
Total Lifetime
Fatal Cancer Risk

Cancer	
Esophagu	6.92E-16
Stomach	3.73E-15
Colon	4.90E-14
Liver	4.44E-15
LUNG	1.04E-11
Bone	1.43E-15
Skin	1.54E-16
Breast	2.11E-15
Ovary	8.99E-16
Bladder	1.59E-15
Kidneys	4.78E-15
Thyroid	2.09E-16
Leukemia	1.60E-15
Residual	9.63E-15
Total	1.04E-11
TOTAL	2.09E-11

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	1.05E-19
INHALATION	1.04E-11
AIR IMMERSION	1.37E-15
GROUND SURFACE	8.57E-15
INTERNAL	1.04E-11
EXTERNAL	9.94E-15
TOTAL	1.04E-11

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SUMMARY
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NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
Rn-220	6.40E-18
Po-216	1.59E-19
Pb-212	1.03E-11
Bi-212	1.08E-13
Po-212	0.00E+00
Tl-208	7.02E-15
TOTAL	1.04E-11

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SUMMARY

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Direction	Distance (m)						
	17035	17329	18607	18834	18860	18890	19860
N	2.4E-06	2.3E-06	2.1E-06	2.0E-06	2.0E-06	2.0E-06	1.9E-06
NNW	1.1E-06	1.1E-06	9.9E-07	9.7E-07	9.7E-07	9.7E-07	9.0E-07
NW	1.4E-06	1.4E-06	1.2E-06	1.2E-06	1.2E-06	1.2E-06	1.1E-06
WNW	1.9E-06	1.8E-06	1.6E-06	1.6E-06	1.6E-06	1.6E-06	1.5E-06
W	1.9E-06	1.8E-06	1.7E-06	1.6E-06	1.6E-06	1.6E-06	1.5E-06
WSW	3.1E-06	3.0E-06	2.7E-06	2.6E-06	2.6E-06	2.6E-06	2.4E-06
SW	5.5E-06	5.3E-06	4.8E-06	4.7E-06	4.7E-06	4.7E-06	4.3E-06
SSW	8.8E-06	8.5E-06	7.7E-06	7.5E-06	7.5E-06	7.5E-06	6.9E-06
S	1.2E-05	1.2E-05	1.1E-05	1.0E-05	1.0E-05	1.0E-05	9.5E-06
SSE	1.1E-05	1.1E-05	9.8E-06	9.6E-06	9.6E-06	9.5E-06	8.8E-06
SE	4.3E-06	4.2E-06	3.8E-06	3.7E-06	3.7E-06	3.7E-06	3.4E-06
ESE	2.7E-06	2.6E-06	2.3E-06	2.3E-06	2.3E-06	2.3E-06	2.1E-06
E	3.3E-06	3.3E-06	2.9E-06	2.8E-06	2.8E-06	2.8E-06	2.6E-06
ENE	3.7E-06	3.6E-06	3.2E-06	3.2E-06	3.2E-06	3.2E-06	2.9E-06
NE	6.1E-06	5.9E-06	5.3E-06	5.2E-06	5.2E-06	5.2E-06	4.8E-06
NNE	3.5E-06	3.4E-06	3.0E-06	3.0E-06	3.0E-06	3.0E-06	2.7E-06

Direction	Distance (m)						
	19891	20457	21314	21349	22159	23521	24430
N	1.9E-06	1.8E-06	1.6E-06	1.6E-06	1.5E-06	1.3E-06	1.2E-06
NNW	9.0E-07	8.6E-07	8.0E-07	8.0E-07	7.5E-07	6.7E-07	6.1E-07
NW	1.1E-06	1.1E-06	9.8E-07	9.8E-07	9.1E-07	8.0E-07	7.3E-07
WNW	1.5E-06	1.4E-06	1.3E-06	1.3E-06	1.2E-06	1.1E-06	9.6E-07
W	1.5E-06	1.4E-06	1.3E-06	1.3E-06	1.2E-06	1.1E-06	9.6E-07
WSW	2.4E-06	2.3E-06	2.1E-06	2.1E-06	2.0E-06	1.8E-06	1.6E-06
SW	4.3E-06	4.1E-06	3.8E-06	3.8E-06	3.6E-06	3.2E-06	3.0E-06
SSW	6.9E-06	6.6E-06	6.1E-06	6.1E-06	5.7E-06	5.1E-06	4.7E-06
S	9.5E-06	9.1E-06	8.4E-06	8.4E-06	7.9E-06	7.0E-06	6.4E-06
SSE	8.8E-06	8.4E-06	7.9E-06	7.8E-06	7.4E-06	6.6E-06	6.1E-06
SE	3.4E-06	3.2E-06	3.0E-06	2.9E-06	2.7E-06	2.4E-06	2.1E-06
ESE	2.1E-06	2.0E-06	1.8E-06	1.8E-06	1.7E-06	1.4E-06	1.3E-06
E	2.6E-06	2.4E-06	2.2E-06	2.2E-06	2.1E-06	1.8E-06	1.6E-06
ENE	2.9E-06	2.8E-06	2.6E-06	2.6E-06	2.4E-06	2.1E-06	1.9E-06
NE	4.8E-06	4.6E-06	4.2E-06	4.2E-06	4.0E-06	3.5E-06	3.2E-06
NNE	2.7E-06	2.6E-06	2.4E-06	2.4E-06	2.3E-06	2.0E-06	1.8E-06

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SUMMARY
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INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)					
Direction	24545	25171	26794	27275	27389
N	1.2E-06	1.1E-06	9.9E-07	9.6E-07	9.6E-07
NNW	6.1E-07	5.7E-07	5.2E-07	5.1E-07	5.1E-07
NW	7.2E-07	6.7E-07	6.1E-07	6.0E-07	5.9E-07
WNW	9.5E-07	8.8E-07	8.1E-07	7.9E-07	7.8E-07
W	9.5E-07	8.8E-07	8.0E-07	7.8E-07	7.8E-07
WSW	1.6E-06	1.5E-06	1.4E-06	1.3E-06	1.3E-06
SW	2.9E-06	2.8E-06	2.5E-06	2.5E-06	2.4E-06
SSW	4.6E-06	4.3E-06	4.0E-06	3.9E-06	3.8E-06
S	6.3E-06	5.9E-06	5.4E-06	5.3E-06	5.2E-06
SSE	6.0E-06	5.7E-06	5.2E-06	5.1E-06	5.0E-06
SE	2.1E-06	1.9E-06	1.8E-06	1.7E-06	1.7E-06
ESE	1.3E-06	1.2E-06	1.1E-06	1.0E-06	1.0E-06
E	1.5E-06	1.4E-06	1.3E-06	1.2E-06	1.2E-06
ENE	1.9E-06	1.8E-06	1.6E-06	1.6E-06	1.6E-06
NE	3.2E-06	3.0E-06	2.7E-06	2.7E-06	2.6E-06
NNE	1.8E-06	1.7E-06	1.5E-06	1.5E-06	1.5E-06

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

Distance (m)							
Direction	17035	17329	18607	18834	18860	18890	19860
N	2.1E-12	2.0E-12	1.8E-12	1.7E-12	1.7E-12	1.7E-12	1.6E-12
NNW	9.7E-13	9.5E-13	8.5E-13	8.4E-13	8.3E-13	8.3E-13	7.7E-13
NW	1.2E-12	1.2E-12	1.1E-12	1.0E-12	1.0E-12	1.0E-12	9.5E-13
WNW	1.6E-12	1.5E-12	1.4E-12	1.4E-12	1.4E-12	1.4E-12	1.3E-12
W	1.6E-12	1.6E-12	1.4E-12	1.4E-12	1.4E-12	1.4E-12	1.3E-12
WSW	2.6E-12	2.6E-12	2.3E-12	2.3E-12	2.3E-12	2.2E-12	2.1E-12
SW	4.7E-12	4.6E-12	4.1E-12	4.0E-12	4.0E-12	4.0E-12	3.7E-12
SSW	7.5E-12	7.3E-12	6.6E-12	6.4E-12	6.4E-12	6.4E-12	5.9E-12
S	1.0E-11	1.0E-11	9.1E-12	8.9E-12	8.9E-12	8.9E-12	8.2E-12
SSE	9.6E-12	9.3E-12	8.4E-12	8.2E-12	8.2E-12	8.2E-12	7.6E-12
SE	3.7E-12	3.6E-12	3.2E-12	3.2E-12	3.2E-12	3.1E-12	2.9E-12
ESE	2.3E-12	2.2E-12	2.0E-12	1.9E-12	1.9E-12	1.9E-12	1.8E-12
E	2.9E-12	2.8E-12	2.5E-12	2.4E-12	2.4E-12	2.4E-12	2.2E-12
ENE	3.2E-12	3.1E-12	2.8E-12	2.7E-12	2.7E-12	2.7E-12	2.5E-12
NE	5.2E-12	5.1E-12	4.6E-12	4.5E-12	4.5E-12	4.4E-12	4.1E-12
NNE	3.0E-12	2.9E-12	2.6E-12	2.6E-12	2.6E-12	2.5E-12	2.3E-12

Distance (m)							
Direction	19891	20457	21314	21349	22159	23521	24430

Rn-220B.SUM

N	1.6E-12	1.5E-12	1.4E-12	1.4E-12	1.3E-12	1.1E-12	1.0E-12
NNW	7.7E-13	7.4E-13	6.9E-13	6.9E-13	6.4E-13	5.7E-13	5.3E-13
NW	9.5E-13	9.0E-13	8.4E-13	8.4E-13	7.8E-13	6.9E-13	6.3E-13
WNW	1.2E-12	1.2E-12	1.1E-12	1.1E-12	1.0E-12	9.1E-13	8.3E-13
W	1.3E-12	1.2E-12	1.1E-12	1.1E-12	1.0E-12	9.1E-13	8.2E-13
WSW	2.1E-12	2.0E-12	1.8E-12	1.8E-12	1.7E-12	1.5E-12	1.4E-12
SW	3.7E-12	3.5E-12	3.3E-12	3.3E-12	3.1E-12	2.8E-12	2.5E-12
SSW	5.9E-12	5.6E-12	5.3E-12	5.2E-12	4.9E-12	4.4E-12	4.0E-12
S	8.1E-12	7.8E-12	7.2E-12	7.2E-12	6.7E-12	6.0E-12	5.5E-12
SSE	7.6E-12	7.2E-12	6.8E-12	6.7E-12	6.3E-12	5.7E-12	5.2E-12
SE	2.9E-12	2.7E-12	2.5E-12	2.5E-12	2.3E-12	2.0E-12	1.8E-12
ESE	1.8E-12	1.7E-12	1.5E-12	1.5E-12	1.4E-12	1.2E-12	1.1E-12
E	2.2E-12	2.1E-12	1.9E-12	1.9E-12	1.8E-12	1.5E-12	1.4E-12
ENE	2.5E-12	2.4E-12	2.2E-12	2.2E-12	2.1E-12	1.8E-12	1.6E-12
NE	4.1E-12	3.9E-12	3.6E-12	3.6E-12	3.4E-12	3.0E-12	2.8E-12
NNE	2.3E-12	2.2E-12	2.1E-12	2.1E-12	1.9E-12	1.7E-12	1.6E-12

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SUMMARY
Page 8

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)				
Direction	24545	25171	26794	27275	27389
N	1.0E-12	9.3E-13	8.5E-13	8.3E-13	8.2E-13
NNW	5.2E-13	4.9E-13	4.5E-13	4.4E-13	4.4E-13
NW	6.2E-13	5.7E-13	5.3E-13	5.1E-13	5.1E-13
WNW	8.1E-13	7.6E-13	6.9E-13	6.8E-13	6.7E-13
W	8.1E-13	7.5E-13	6.9E-13	6.7E-13	6.7E-13
WSW	1.4E-12	1.3E-12	1.2E-12	1.2E-12	1.1E-12
SW	2.5E-12	2.4E-12	2.2E-12	2.1E-12	2.1E-12
SSW	4.0E-12	3.7E-12	3.4E-12	3.3E-12	3.3E-12
S	5.4E-12	5.1E-12	4.6E-12	4.5E-12	4.5E-12
SSE	5.2E-12	4.9E-12	4.5E-12	4.4E-12	4.3E-12
SE	1.8E-12	1.7E-12	1.5E-12	1.5E-12	1.5E-12
ESE	1.1E-12	9.9E-13	9.0E-13	8.8E-13	8.7E-13
E	1.3E-12	1.2E-12	1.1E-12	1.1E-12	1.1E-12
ENE	1.6E-12	1.5E-12	1.4E-12	1.3E-12	1.3E-12
NE	2.7E-12	2.6E-12	2.3E-12	2.3E-12	2.3E-12
NNE	1.5E-12	1.4E-12	1.3E-12	1.3E-12	1.3E-12

Rn-220C.SUM

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Version 3.0

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment

Feb 20, 2008 02:31 pm

Facility: INL
Address: PO Box 1625
City: Idaho Falls
State: ID Zip: 83415

Source Category:
Source Type: Stack
Emission Year: 2008

Comments: TAN-TSF
Receptors 40-59

Dataset Name: RUNC
Dataset Date: 08/02/20 2:19:00 PM
Wind File: C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

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SUMMARY
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
Adrenals	8.00E-09
B Surfac	3.18E-08
Breasts	9.47E-09
St wall	8.87E-09
ULI wall	1.15E-08
Kidneys	2.47E-08
Lungs	2.12E-06
Ovaries	8.37E-09
R Marrow	1.08E-08
Spleen	8.66E-09
Thymus	8.75E-09
Uterus	8.38E-09

	Rn-220C.SUM
Bld wall	9.12E-09
Brain	8.70E-09
Esophagu	7.85E-07
SI wall	9.25E-09
LLI wall	1.21E-08
Liver	1.29E-08
Muscle	9.52E-09
Pancreas	8.18E-09
Skin	5.19E-08
Testes	9.66E-09
Thyroid	8.88E-09
EFEC	5.14E-06

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	4.53E-14
INHALATION	5.13E-06
AIR IMMERSION	1.09E-09
GROUND SURFACE	7.66E-09
INTERNAL	5.13E-06
EXTERNAL	8.75E-09
TOTAL	5.14E-06

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SUMMARY
Page 2

NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
Rn-220	6.55E-12
Po-216	1.23E-13
Pb-212	5.06E-06
Bi-212	7.15E-08
Po-212	0.00E+00
Tl-208	6.06E-09
TOTAL	5.14E-06

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SUMMARY
Page 3

CANCER RISK SUMMARY

Selected Individual
Page 2

Rn-220C.SUM	
Cancer	Total Lifetime Fatal Cancer Risk
Esophagu	3.00E-16
Stomach	1.61E-15
Colon	2.08E-14
Liver	1.89E-15
LUNG	4.38E-12
Bone	6.05E-16
Skin	7.05E-17
Breast	9.32E-16
Ovary	3.90E-16
Bladder	6.93E-16
Kidneys	2.03E-15
Thyroid	9.09E-17
Leukemia	7.20E-16
Residual	4.18E-15
Total	4.41E-12
TOTAL	8.82E-12

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	4.50E-20
INHALATION	4.41E-12
AIR IMMERSION	5.82E-16
GROUND SURFACE	4.06E-15
INTERNAL	4.41E-12
EXTERNAL	4.64E-15
TOTAL	4.41E-12

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SUMMARY
Page 4

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
Rn-220	3.58E-18
Po-216	6.72E-20
Pb-212	4.36E-12
Bi-212	4.59E-14
Po-212	0.00E+00
Tl-208	3.31E-15
TOTAL	4.41E-12

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Page 3

SUMMARY

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Direction	Distance (m)						
	27715	28919	31060	32802	34577	35279	35683
N	9.4E-07	8.8E-07	7.9E-07	7.3E-07	6.7E-07	6.5E-07	6.4E-07
NNW	5.0E-07	4.7E-07	4.3E-07	3.9E-07	3.6E-07	3.5E-07	3.5E-07
NW	5.8E-07	5.5E-07	5.0E-07	4.6E-07	4.2E-07	4.1E-07	4.0E-07
WNW	7.7E-07	7.2E-07	6.5E-07	6.0E-07	5.6E-07	5.4E-07	5.3E-07
W	7.6E-07	7.2E-07	6.4E-07	5.9E-07	5.5E-07	5.3E-07	5.2E-07
WSW	1.3E-06	1.2E-06	1.1E-06	1.0E-06	9.5E-07	9.2E-07	9.0E-07
SW	2.4E-06	2.3E-06	2.0E-06	1.9E-06	1.7E-06	1.7E-06	1.7E-06
SSW	3.8E-06	3.5E-06	3.2E-06	2.9E-06	2.7E-06	2.6E-06	2.6E-06
S	5.1E-06	4.8E-06	4.3E-06	4.0E-06	3.6E-06	3.5E-06	3.5E-06
SSE	5.0E-06	4.7E-06	4.2E-06	3.9E-06	3.6E-06	3.5E-06	3.4E-06
SE	1.7E-06	1.6E-06	1.4E-06	1.3E-06	1.2E-06	1.2E-06	1.1E-06
ESE	1.0E-06	9.3E-07	8.4E-07	7.7E-07	7.0E-07	6.8E-07	6.7E-07
E	1.2E-06	1.1E-06	1.0E-06	9.3E-07	8.5E-07	8.2E-07	8.1E-07
ENE	1.5E-06	1.4E-06	1.3E-06	1.2E-06	1.1E-06	1.1E-06	1.0E-06
NE	2.6E-06	2.4E-06	2.2E-06	2.0E-06	1.9E-06	1.8E-06	1.8E-06
NNE	1.5E-06	1.4E-06	1.2E-06	1.1E-06	1.0E-06	1.0E-06	1.0E-06

Direction	Distance (m)						
	36721	36809	37729	39079	39220	39559	43584
N	6.1E-07	6.1E-07	5.9E-07	5.5E-07	5.5E-07	5.4E-07	4.6E-07
NNW	3.3E-07	3.3E-07	3.2E-07	3.0E-07	3.0E-07	3.0E-07	2.6E-07
NW	3.9E-07	3.8E-07	3.7E-07	3.5E-07	3.5E-07	3.4E-07	2.9E-07
WNW	5.1E-07	5.1E-07	4.9E-07	4.6E-07	4.6E-07	4.5E-07	3.8E-07
W	5.0E-07	4.9E-07	4.7E-07	4.5E-07	4.4E-07	4.4E-07	3.7E-07
WSW	8.6E-07	8.6E-07	8.3E-07	7.8E-07	7.8E-07	7.7E-07	6.6E-07
SW	1.6E-06	1.6E-06	1.5E-06	1.4E-06	1.4E-06	1.4E-06	1.2E-06
SSW	2.5E-06	2.4E-06	2.4E-06	2.2E-06	2.2E-06	2.2E-06	1.9E-06
S	3.3E-06	3.3E-06	3.2E-06	3.0E-06	3.0E-06	2.9E-06	2.5E-06
SSE	3.3E-06	3.3E-06	3.1E-06	3.0E-06	3.0E-06	2.9E-06	2.5E-06
SE	1.1E-06	1.1E-06	1.0E-06	9.7E-07	9.7E-07	9.5E-07	8.0E-07
ESE	6.3E-07	6.3E-07	6.0E-07	5.7E-07	5.6E-07	5.6E-07	4.6E-07
E	7.7E-07	7.7E-07	7.3E-07	6.9E-07	6.8E-07	6.7E-07	5.6E-07
ENE	9.9E-07	9.9E-07	9.5E-07	9.0E-07	8.9E-07	8.8E-07	7.4E-07
NE	1.7E-06	1.7E-06	1.6E-06	1.5E-06	1.5E-06	1.5E-06	1.3E-06
NNE	9.5E-07	9.5E-07	9.1E-07	8.6E-07	8.6E-07	8.5E-07	7.2E-07

□

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SUMMARY
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INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Rn-220C.SUM

Distance (m)						
Direction	45196	45275	45654	45677	46668	47969
N	4.3E-07	4.3E-07	4.2E-07	4.2E-07	4.0E-07	3.8E-07
NNW	2.4E-07	2.4E-07	2.4E-07	2.4E-07	2.3E-07	2.2E-07
NW	2.7E-07	2.7E-07	2.7E-07	2.7E-07	2.6E-07	2.5E-07
WNW	3.6E-07	3.6E-07	3.5E-07	3.5E-07	3.4E-07	3.2E-07
W	3.5E-07	3.5E-07	3.4E-07	3.4E-07	3.3E-07	3.1E-07
WSW	6.2E-07	6.1E-07	6.1E-07	6.1E-07	5.8E-07	5.5E-07
SW	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.0E-06
SSW	1.7E-06	1.7E-06	1.7E-06	1.7E-06	1.6E-06	1.6E-06
S	2.3E-06	2.3E-06	2.3E-06	2.3E-06	2.2E-06	2.1E-06
SSE	2.4E-06	2.3E-06	2.3E-06	2.3E-06	2.2E-06	2.1E-06
SE	7.5E-07	7.4E-07	7.3E-07	7.3E-07	7.0E-07	6.6E-07
ESE	4.3E-07	4.3E-07	4.2E-07	4.2E-07	4.1E-07	3.8E-07
E	5.2E-07	5.2E-07	5.1E-07	5.1E-07	4.9E-07	4.6E-07
ENE	7.0E-07	6.9E-07	6.8E-07	6.8E-07	6.6E-07	6.2E-07
NE	1.2E-06	1.2E-06	1.2E-06	1.2E-06	1.1E-06	1.1E-06
NNE	6.8E-07	6.8E-07	6.7E-07	6.7E-07	6.4E-07	6.1E-07

□

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SUMMARY
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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

Distance (m)							
Direction	27715	28919	31060	32802	34577	35279	35683
N	8.1E-13	7.6E-13	6.8E-13	6.3E-13	5.8E-13	5.6E-13	5.5E-13
NNW	4.3E-13	4.0E-13	3.7E-13	3.4E-13	3.1E-13	3.0E-13	3.0E-13
NW	5.0E-13	4.7E-13	4.3E-13	3.9E-13	3.6E-13	3.5E-13	3.5E-13
WNW	6.6E-13	6.2E-13	5.6E-13	5.2E-13	4.8E-13	4.6E-13	4.5E-13
W	6.5E-13	6.1E-13	5.5E-13	5.1E-13	4.7E-13	4.5E-13	4.5E-13
WSW	1.1E-12	1.1E-12	9.6E-13	8.8E-13	8.1E-13	7.9E-13	7.8E-13
SW	2.1E-12	1.9E-12	1.7E-12	1.6E-12	1.5E-12	1.4E-12	1.4E-12
SSW	3.2E-12	3.0E-12	2.7E-12	2.5E-12	2.3E-12	2.2E-12	2.2E-12
S	4.4E-12	4.1E-12	3.7E-12	3.4E-12	3.1E-12	3.0E-12	3.0E-12
SSE	4.3E-12	4.0E-12	3.6E-12	3.3E-12	3.1E-12	3.0E-12	2.9E-12
SE	1.4E-12	1.4E-12	1.2E-12	1.1E-12	1.0E-12	9.9E-13	9.7E-13
ESE	8.6E-13	8.0E-13	7.2E-13	6.6E-13	6.0E-13	5.8E-13	5.7E-13
E	1.0E-12	9.8E-13	8.7E-13	8.0E-13	7.3E-13	7.1E-13	6.9E-13
ENE	1.3E-12	1.2E-12	1.1E-12	1.0E-12	9.4E-13	9.1E-13	8.9E-13
NE	2.2E-12	2.1E-12	1.9E-12	1.7E-12	1.6E-12	1.6E-12	1.5E-12
NNE	1.2E-12	1.2E-12	1.1E-12	9.7E-13	9.0E-13	8.7E-13	8.5E-13

Distance (m)						
Direction	36721	36809	37729	39079	39220	39559
				43584		

Rn-220C.SUM

N	5.2E-13	5.2E-13	5.0E-13	4.7E-13	4.7E-13	4.6E-13	3.9E-13
NNW	2.9E-13	2.8E-13	2.7E-13	2.6E-13	2.6E-13	2.6E-13	2.2E-13
NW	3.3E-13	3.3E-13	3.2E-13	3.0E-13	3.0E-13	2.9E-13	2.5E-13
WNW	4.4E-13	4.3E-13	4.2E-13	3.9E-13	3.9E-13	3.9E-13	3.3E-13
W	4.3E-13	4.2E-13	4.1E-13	3.8E-13	3.8E-13	3.8E-13	3.2E-13
WSW	7.4E-13	7.4E-13	7.1E-13	6.7E-13	6.7E-13	6.6E-13	5.6E-13
SW	1.4E-12	1.4E-12	1.3E-12	1.2E-12	1.2E-12	1.2E-12	1.0E-12
SSW	2.1E-12	2.1E-12	2.0E-12	1.9E-12	1.9E-12	1.9E-12	1.6E-12
S	2.8E-12	2.8E-12	2.7E-12	2.6E-12	2.6E-12	2.5E-12	2.1E-12
SSE	2.8E-12	2.8E-12	2.7E-12	2.6E-12	2.5E-12	2.5E-12	2.1E-12
SE	9.3E-13	9.2E-13	8.9E-13	8.3E-13	8.3E-13	8.2E-13	6.9E-13
ESE	5.4E-13	5.4E-13	5.2E-13	4.9E-13	4.8E-13	4.8E-13	4.0E-13
E	6.6E-13	6.6E-13	6.3E-13	5.9E-13	5.9E-13	5.8E-13	4.8E-13
ENE	8.5E-13	8.5E-13	8.1E-13	7.7E-13	7.6E-13	7.5E-13	6.4E-13
NE	1.5E-12	1.5E-12	1.4E-12	1.3E-12	1.3E-12	1.3E-12	1.1E-12
NNE	8.2E-13	8.1E-13	7.8E-13	7.4E-13	7.4E-13	7.3E-13	6.2E-13

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SUMMARY
Page 8

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)					
Direction	45196	45275	45654	45677	46668	47969
N	3.7E-13	3.7E-13	3.6E-13	3.6E-13	3.5E-13	3.3E-13
NNW	2.1E-13	2.1E-13	2.0E-13	2.0E-13	2.0E-13	1.9E-13
NW	2.3E-13	2.3E-13	2.3E-13	2.3E-13	2.2E-13	2.1E-13
WNW	3.1E-13	3.1E-13	3.0E-13	3.0E-13	2.9E-13	2.8E-13
W	3.0E-13	3.0E-13	2.9E-13	2.9E-13	2.8E-13	2.7E-13
WSW	5.3E-13	5.3E-13	5.2E-13	5.2E-13	5.0E-13	4.8E-13
SW	9.7E-13	9.7E-13	9.5E-13	9.5E-13	9.2E-13	8.8E-13
SSW	1.5E-12	1.5E-12	1.5E-12	1.5E-12	1.4E-12	1.3E-12
S	2.0E-12	2.0E-12	2.0E-12	2.0E-12	1.9E-12	1.8E-12
SSE	2.0E-12	2.0E-12	2.0E-12	2.0E-12	1.9E-12	1.8E-12
SE	6.4E-13	6.4E-13	6.3E-13	6.3E-13	6.0E-13	5.7E-13
ESE	3.7E-13	3.7E-13	3.6E-13	3.6E-13	3.5E-13	3.3E-13
E	4.5E-13	4.5E-13	4.4E-13	4.4E-13	4.2E-13	4.0E-13
ENE	6.0E-13	6.0E-13	5.9E-13	5.9E-13	5.6E-13	5.3E-13
NE	1.0E-12	1.0E-12	1.0E-12	1.0E-12	9.8E-13	9.3E-13
NNE	5.8E-13	5.8E-13	5.7E-13	5.7E-13	5.5E-13	5.2E-13

Rn-220D.SUM

C A P 8 8 - P C

Version 3.0

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment

Feb 20, 2008 02:31 pm

Facility: INL
Address: PO Box 1625
City: Idaho Falls
State: ID Zip: 83415

Source Category:
Source Type: Stack
Emission Year: 2008

Comments: TAN-TSF
Receptors 60-62

Dataset Name: RUND
Dataset Date: 08/02/20 2:20:00 PM
Wind File: C:\projects\fy2008\SMAccelerator\windFiles\LOFL08.WND

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SUMMARY
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ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
Adrenals	3.16E-09
B Surfac	1.24E-08
Breasts	3.74E-09
St wall	3.51E-09
ULI wall	4.53E-09
Kidneys	9.57E-09
Lungs	8.14E-07
Ovaries	3.31E-09
R Marrow	4.25E-09
Spleen	3.42E-09
Thymus	3.46E-09
Uterus	3.32E-09

	Rn-220D.SUM
Bld wall	3.61E-09
Brain	3.44E-09
Esophagu	3.02E-07
SI wall	3.65E-09
LLI wall	4.76E-09
Liver	5.04E-09
Muscle	3.77E-09
Pancreas	3.23E-09
Skin	2.06E-08
Testes	3.82E-09
Thyroid	3.51E-09
EFEC	1.97E-06

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	2.56E-14
INHALATION	1.97E-06
AIR IMMERSION	4.18E-10
GROUND SURFACE	3.05E-09
INTERNAL	1.97E-06
EXTERNAL	3.47E-09
TOTAL	1.97E-06

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SUMMARY
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NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
Rn-220	2.77E-12
Po-216	4.71E-14
Pb-212	1.94E-06
Bi-212	2.75E-08
Po-212	0.00E+00
Tl-208	2.41E-09
TOTAL	1.97E-06

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SUMMARY
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CANCER RISK SUMMARY

Selected Individual
Page 2

Rn-220D.SUM	
Cancer	Total Lifetime Fatal Cancer Risk
Esophagu	1.16E-16
Stomach	6.21E-16
Colon	8.00E-15
Liver	7.26E-16
LUNG	1.68E-12
Bone	2.32E-16
Skin	2.78E-17
Breast	3.63E-16
Ovary	1.51E-16
Bladder	2.69E-16
Kidneys	7.79E-16
Thyroid	3.52E-17
Leukemia	2.82E-16
Residual	1.62E-15
Total	1.69E-12
TOTAL	3.39E-12

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	2.55E-20
INHALATION	1.69E-12
AIR IMMERSION	2.23E-16
GROUND SURFACE	1.62E-15
INTERNAL	1.69E-12
EXTERNAL	1.84E-15
TOTAL	1.69E-12

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NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
Rn-220	1.51E-18
Po-216	2.58E-20
Pb-212	1.68E-12
Bi-212	1.76E-14
Po-212	0.00E+00
Tl-208	1.32E-15
TOTAL	1.69E-12

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SUMMARY

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)			
Direction	50024	54611	58610
N	3.5E-07	2.9E-07	2.3E-07
NNW	2.0E-07	1.7E-07	1.4E-07
NW	2.3E-07	1.9E-07	1.5E-07
WNW	3.0E-07	2.5E-07	2.0E-07
W	2.9E-07	2.4E-07	1.9E-07
WSW	5.1E-07	4.3E-07	3.5E-07
SW	9.5E-07	7.9E-07	6.6E-07
SSW	1.4E-06	1.2E-06	9.9E-07
S	1.9E-06	1.6E-06	1.3E-06
SSE	2.0E-06	1.7E-06	1.4E-06
SE	6.1E-07	4.9E-07	3.9E-07
ESE	3.5E-07	2.8E-07	2.1E-07
E	4.2E-07	3.3E-07	2.5E-07
ENE	5.7E-07	4.7E-07	3.7E-07
NE	1.0E-06	8.4E-07	7.0E-07
NNE	5.6E-07	4.7E-07	3.9E-07

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INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

Distance (m)			
Direction	50024	54611	58610
N	3.0E-13	2.5E-13	2.0E-13
NNW	1.7E-13	1.5E-13	1.2E-13
NW	1.9E-13	1.6E-13	1.3E-13
WNW	2.6E-13	2.1E-13	1.7E-13
W	2.5E-13	2.0E-13	1.6E-13
WSW	4.4E-13	3.7E-13	3.0E-13
SW	8.1E-13	6.8E-13	5.7E-13
SSW	1.2E-12	1.0E-12	8.5E-13
S	1.7E-12	1.4E-12	1.1E-12
SSE	1.7E-12	1.4E-12	1.2E-12
SE	5.2E-13	4.2E-13	3.3E-13
ESE	3.0E-13	2.4E-13	1.8E-13
E	3.6E-13	2.9E-13	2.1E-13
ENE	4.9E-13	4.0E-13	3.2E-13
NE	8.6E-13	7.2E-13	6.0E-13
NNE	4.8E-13	4.0E-13	3.3E-13

