# Nichols Ranch ISR Project U.S.N.R.C Source Material License Application

## Volume VIII

## Appendices D10-D11

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# APPENDIX D10:

# WETLANDS

**November 2007**

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## LIST OF ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| COE | Corps of Engineers |
| FAC | Facultative |
| FACU | Facultative upland |
| FACW | Facultative wetland |
| GPS | Global positioning system |
| ISR | In Situ Recovery |
| NI | Insufficient information |
| NRCS | Natural Resources Conservation Service |
| NWI | National Wetland Inventory |
| OBL | Obligate wetland |
| PEMC | Palustrine emergent seasonally flooded |
| PEMF | Palustrine emergent semipermanently flooded |
| UPL | Upland |
| USGS | U.S. Geological Survey |
| WDEQ/LQD | Wyoming Department of Environmental Quality, Land Quality Division |
| WUS | Waters of the U.S. |

## D10.1.0 INTRODUCTION

A survey for potential wetlands (and other waters of the U.S. [WUS]) within the Nichols Ranch ISR Project area was conducted as required by the Wyoming Department of Environmental Quality, Land Quality Division (WDEQ/LQD) Guideline No. 6 (1997).

The U.S. Army Corps of Engineers (COE) defines wetlands as "areas inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (COE 1987). Most WUS in the area are ephemeral channels so, for the purposes of this delineation, WUS were identified as those channels with a well-defined bed and bank. WUS boundaries extend to the ordinary high-water mark or to the boundaries of adjacent wetlands (COE 1987).

The purpose of the wetland survey is to establish the location and quantity of premine wetland habitats and WUS. The information presented herein includes a description of the wetland and WUS habitat, its distribution, and vegetative species composition.

### D10.1.1 LOCATION OF PROJECT

The Nichols Ranch ISR Project area is located in Campbell and Johnson Counties, Wyoming, and encompasses two production units--the Hank Unit and the Nichols Ranch Unit. The project area encompasses approximately 3,370.53 acres in portions of Sections 7, 8, 17, 18, and 20, T43N, R76W, and Sections 30 and 31, T44N, R75W, and Sections 5, 6, 7 and 8, T43N, R75W. Access to the project area is by way of the Van Buggenum Road off Wyoming Highway 50. The project area is within the 10- to 14-inch Northern Plains (10-14NP) zone of northeastern Wyoming (Natural Resources Conservation Service [NRCS] 1988). Topographic relief ranges from 4,670 to 4,900 ft above mean sea level in the Nichols Ranch Unit and from 5,055 to 5,209 ft above mean sea level in the Hank Unit. Annual precipitation varies from 10- to 14 inches, with approximately 35-41% falling during the normal growing season (NRCS 1988). Growth of native cool-season plants begins about April 1 and continues to about July 1. Growth

of native warm-season plants begins about May 15 and continues to about August 15. According to Wyoming Gap data, two primary vegetation types occur in the project area--sagebrush shrubland and mixed grassland (Wyoming Gap Analysis 2000).

Cottonwood Creek, an ephemeral stream, is the main drainage in the Nichols Ranch Unit. Several artesian springs are located in the Cottonwood Creek drainage east and west of the Nichols Ranch Unit. Within the project area, Cottonwood Creek has been altered by local ranches and a system of irrigation ditches has been constructed to supply water to the area for hay production; therefore, there is no typical pool-riffle riverine system in the project area. Within one drainage to Cottonwood Creek, two ponds with adjacent wetlands have been created by local ranches excavating to the water table. Two ephemeral streams--Dry Willow Creek and Willow Creek--are the main drainages of the Hank Unit. No springs or seeps occur in the Hank Unit. Current land use in the project area is primarily livestock grazing, wildlife habitat, and coalbed methane and natural gas development.

### D10.1.2 PERMITTING REQUIREMENTS

Protection of wetlands and other WUS is the responsibility of the COE. In order to comply with WDEQ/LQD permitting requirements and Section 404 of the federal *Clean Water Act*, a Nationwide Permit 44 from the COE may be required if there are discharges of dredged or fill material into a WUS that exceeds 0.5 acre in size. The Nationwide Permit 44 is specific to mining activities and requires the delineation and verification of jurisdictional wetlands and WUS in the affected area.

## D10.2.0 SURVEY METHODS

On-site inspections of the project area for potential jurisdictional wetlands and WUS were conducted throughout the 2006 growing season using procedures outlined in COE (1987). Prior to fieldwork, background information was obtained from National Wetland Inventory (NWI) maps, U.S. Geological Survey (USGS) topographic maps, and aerial photographs. Information from the NWI maps is presented in Figures D10-1 and D10-2. These sources were used to identify areas likely to contain wetlands and other WUS. Other areas not designated as wetlands on the NWI map were investigated if standing water or other primary or secondary hydrology indicators were present or if areas of hydrophytic vegetation were observed.

During the on-site inspection, geomorphic and hydrologic characteristics of the site were investigated to determine if primary wetland hydrology indicators were present, including inundation, saturation, water marks, sediment deposits, drainage patterns, and drift lines. Secondary indicators (e.g., oxidized root channels) were searched for only if no primary indicators were identified.

Dominant plant species were identified at each potential wetland site to determine if hydrophytic vegetation was present. Plant species were either identified on-site or taken to the Rocky Mountain Herbarium at the University of Wyoming in Laramie and identified. An ocular estimate of percent cover was used to determine dominant species at each wetland site. *The National List of Plant Species that Occur in Wetlands: North Plains (Region 4)* (Reed 1988) was used to determine the indicator status of dominant plants within each community, and plant species were classified as obligate wetland (OBL), facultative wetland (FACW), facultative (FAC), facultative upland (FACU), upland (UPL) species, or insufficient information is available to determine an indicator species (NI).

If vegetative and hydrologic wetland criteria were met, soil profiles were examined for hydric soil characteristics (e.g., mottling, gleying, saturation). Soil color was determined using a Munsell Soil Color Chart. Soil information was obtained from the Order 2 Soil Survey for the

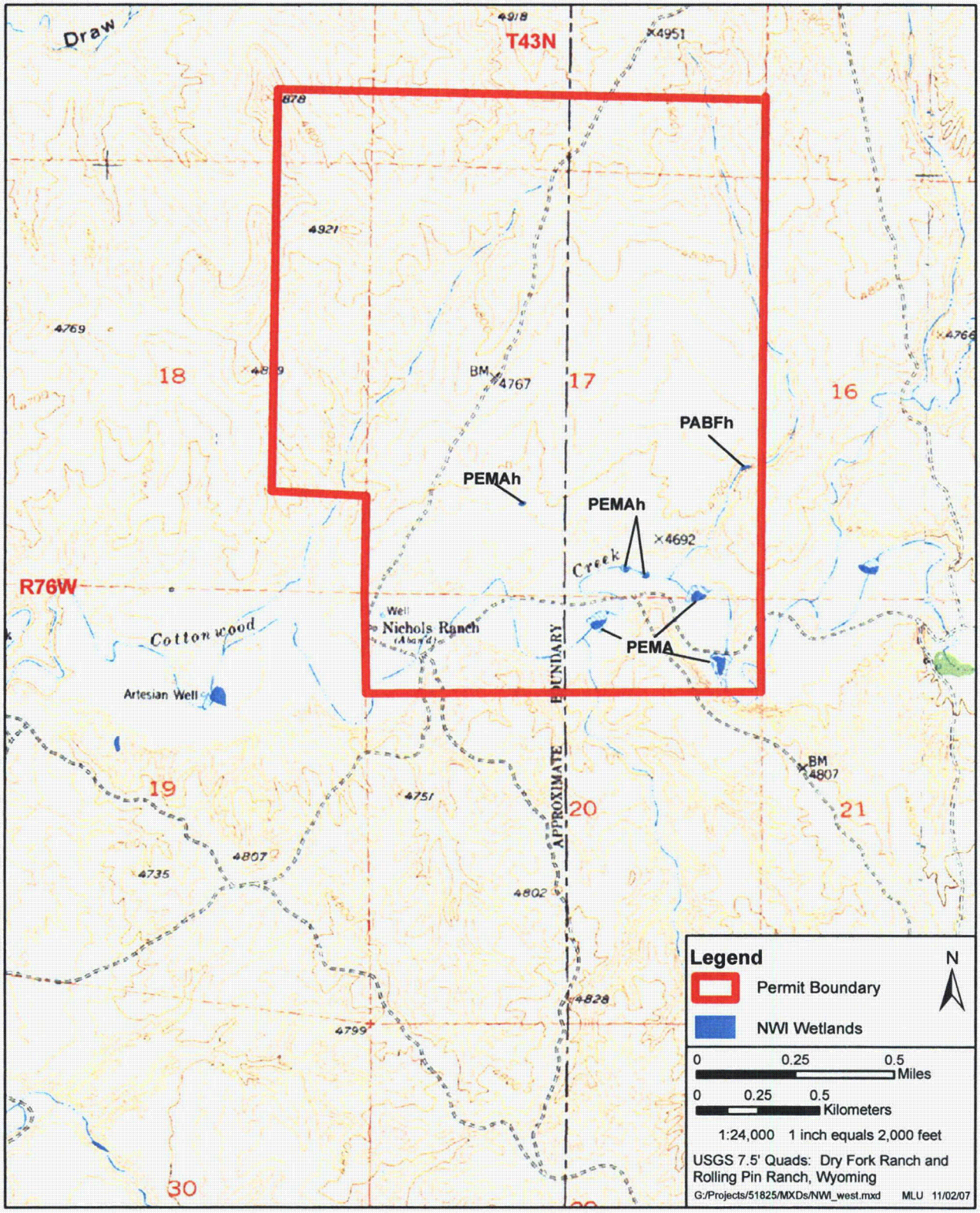



Figure D10-1 NWI Information, Nichols Ranch Unit, 2007.

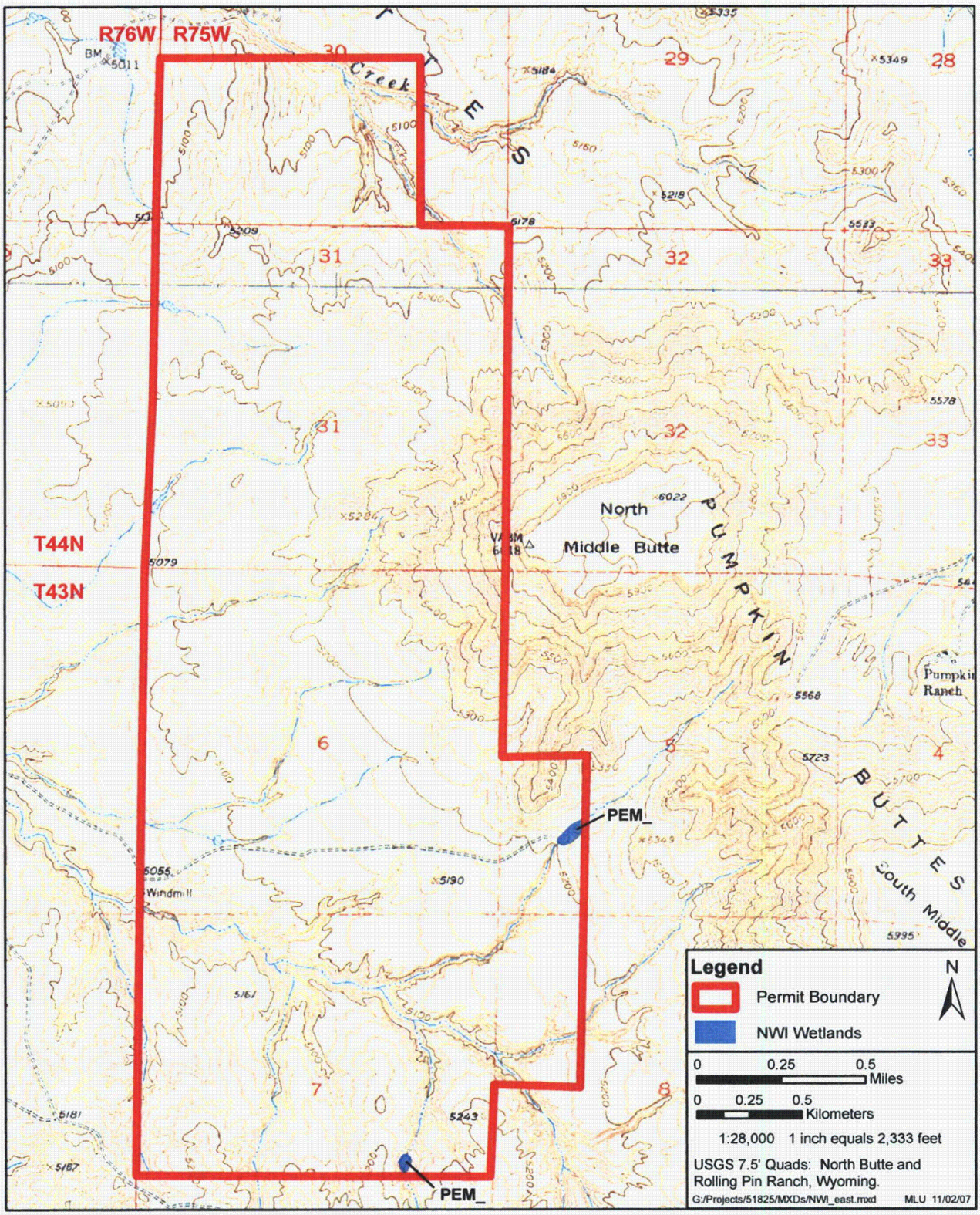



Figure D10-2 NWI Information, Hank Unit, 2007.

project (refer to Appendix D7). Wetland acreage was measured in the field and wetland boundaries were recorded with a Trimble Explorer 3 handheld Global Positioning System (GPS) unit. Relevant information about potential jurisdictional wetlands was then documented on appropriate COE-approved wetland delineation forms.

# D10.3.0 RESULTS

## D10.3.1 INTRODUCTION

The survey of potential jurisdictional wetlands and WUS was completed in June and July 2006 in accordance with the survey methods presented in Section D10.2. The survey was conducted by Ms. Jan Hart of TRC Environmental Corporation, Laramie, Wyoming. Ms. Hart is a COE-certified wetland delineator, has received formal wetland training from the Wetland Training Institute in 1998, and has been conducting jurisdictional wetland surveys since 1998.

NWI map information for each unit of the project area is presented on Figures D10-1 and D10-2. Photographs of wetland Sites 1-3 and WUS are presented in Addendum D10A. No photograph is available for wetland Site 4. Wetland delineation forms were completed for each site and are presented in Addendum D10B.

## D10.3.2 RESULTS FOR NICHOLS RANCH UNIT

### D10.3.2.1 Wetlands

Four jurisdictional wetland sites were delineated in the Nichols Ranch Unit of the project area (refer to Table D10-1 and Figure D10-3). Sites 1, 2, and 3 are linear palustrine type wetlands located in a drainage to Cottonwood Creek. Site 4 is below an overflowing stock tank located in the Cottonwood drainage. Sites 1, 3, and 4 were inundated, and water is supplied to these sites from groundwater (i.e., springs). Sites 1 and 3 were created prior to 1950 and are the result of excavation to the water table, thereby creating small ponds (personal communication March 1, 2007, with Patricia Clark, T-Chair Ranch). Site 2 has signs of inundation (i.e., water marks and salt deposits). Vegetation at all four wetland sites is composed of hydrophytic species such as cattail, four-square bulrush, Baltic rush, rabbitfoot grass, barnyard grass, and foxtail barley. Soils at all four wetland sites were determined to be hydric. None of the jurisdictional wetland sites in the Nichols Ranch Unit will be disturbed by mining activities.

Table D10-1 Wetland Sites, Nichols Ranch ISR Project Area, 2007.

| Site Number | NWI Designation[1] | Field Determination | Wetland Acres in Project Area | Wetland Acres Affected |
|---|---|---|---|---|
| 1 | PEMC | Wetland | 0.498 | 0 |
| 2 | PEMF | Wetland | 0.117 | 0 |
| 3 | PEMC | Wetland | 0.487 | 0 |
| 4 | -- | Wetland | 0.102 | 0 |
| Total | | | 1.20 | 0 |

[1] PEMC = Palustrine emergent seasonally flooded; PEMF = Palustrine emergent semipermanently flooded.

D10.3.2.2 WUS

Approximately 21,722 linear ft of WUS occur in the Nichols Ranch Unit, and all WUS were dry at the time of the site visits. In the Nichols Ranch Unit, drainage is to the southwest to Cottonwood Creek via small ephemeral moderately to deeply incised (1- to 15-ft banks) channels that range from 1 to 15 ft wide. WUS Segment 25 (refer to Figure D10-3) is deeply incised with 20- to 30-ft high banks. Within the Nichols Ranch Unit, Cottonwood Creek has been altered with a system of irrigation ditches and spreader dikes have been constructed to supply water to the area for hay production; therefore, there is no typical pool-riffle riverine system in the Nichols Ranch Unit. The spreader dikes are referred to in a 1927 description of the ranch (personal communication, March 1, 2007, with Patricia Clark, T-Chair Ranch).

## D10.3.3 RESULTS FOR THE HANK UNIT

### D10.3.3.1 Wetlands

Several palustrine wetlands are identified on the NWI map within the Hank Unit (refer to Figure D10-2); however, field investigation of these sites determined them to be non-wetlands based on the prevalence of upland plant species. Vegetation at these sites was composed of western wheatgrass, Wyoming big sagebrush, Sandberg bluegrass, cheatgrass, needle-and-thread

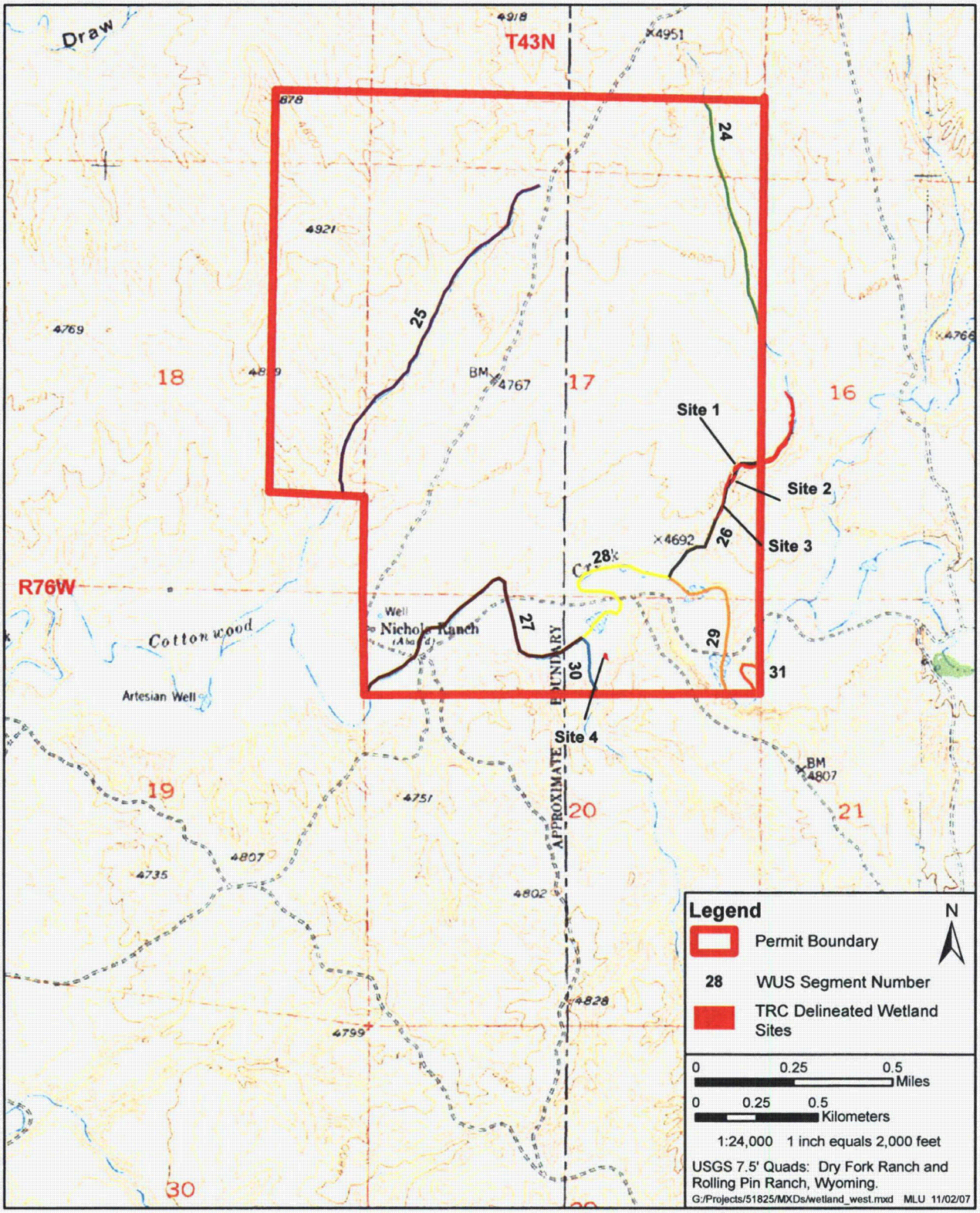



Figure D10-3 WUS Locations and Wetland Sites Delineated on the Nichols Ranch Unit, 2007.

grass, and threadleaf sedge. The sites were dry. The sites were not investigated for the presence of hydric soils due to the prevalence of upland plant species.

**D10.3.3.2 WUS**

Approximately 49,649 linear ft of WUS occur in the Hank Unit (Table D10-2 and Figure D10-4). In the Hank Unit, drainage generally is to the northwest and west off North Middle and South Middle Buttes via Dry Willow Creek and Willow Creek. Channel widths generally ranged from 1 to 2 ft in the headwater areas of these WUS and increased to 20 to 30 ft wide where the WUS leave the western edge of the Hank Unit. In general, the WUS are deeply incised with 10- to 50-ft high banks in the southern and northeastern portions of the Hank Unit and less incised in other parts of unit.

Table D10-2 Linear Feet of WUS, Nichols Ranch ISR Project Area, 2007.

| WUS Identification Number | Linear Feet |
|---|---|
| **Hank Unit** | |
| 1 | 620 |
| 2 | 1,262 |
| 3 | 2,329 |
| 4 | 641 |
| 5 | 1,712 |
| 6 | 2,650 |
| 7 | 3,701 |
| 8 | 4,601 |
| 9 | 190 |
| 10 | 5,850 |
| 11 | 4,391 |
| 12 | 4,587 |
| 13 | 2,712 |
| 14 | 1,745 |
| 15 | 772 |
| 16 | 1,451 |
| 17 | 2,642 |
| 18 | 3,775 |
| 19 | 1,443 |
| 20 | 700 |
| 21 | 1,261 |
| 22 | 156 |
| 23 | 458 |
| Subtotal | 49,649 |
| **Nichols Ranch Unit** | |
| 24 | 3,328 |
| 25 | 5,213 |
| 26 | 2,195 |
| 27 | 4,426 |
| 28 | 2,813 |
| 30 | 803 |
| 29 | 2,236 |
| 31 | 707 |
| Subtotal | 21,721 |
| Total | 71,370 |

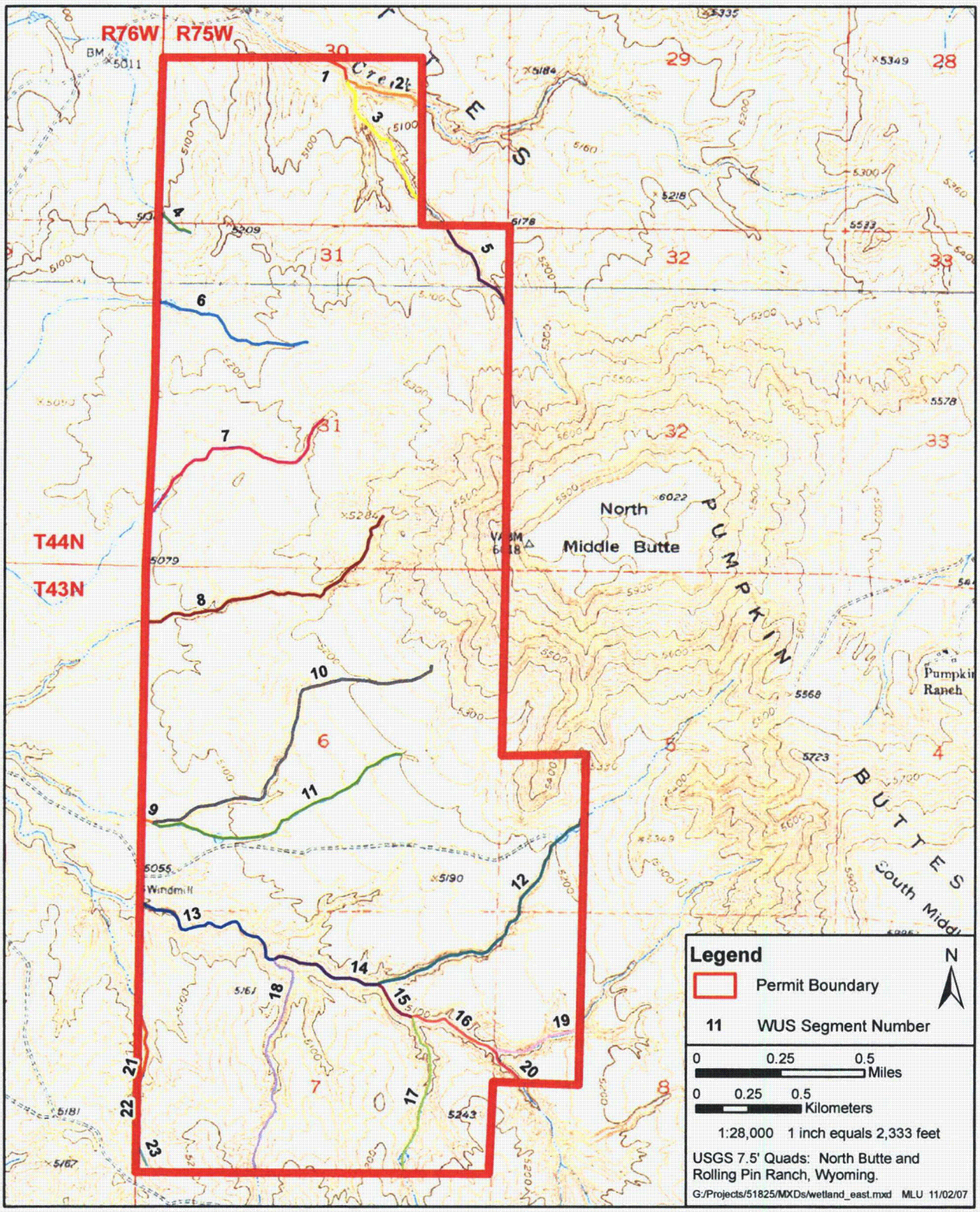



Figure D10-4 WUS Locations on the Hank Unit, 2007.

## D10.4.0 CONCLUSION AND RECOMMENDATIONS

No jurisdictional wetlands will be disturbed by mining activities. WUS will be crossed at established roads and the appropriate sized culverts will be installed as required for any new roads constructed for the project. A COE Nationwide Permit 44 is required if discharges of dredged or fill material into a wetland or WUS exceeds 0.5 acre. Consequently, based on the current mine plan, an individual or nationwide permit from the COE will not be required. In the event that further disturbance would occur in a wetland or other WUS, consultation with the COE will be initiated.

## D10.5.0 LITERATURE CITED

Analysis, Wyoming Gap. 2000. 19961201, Land Cover for Wyoming: University of Wyoming, Spatial Data and Visualization Center, Laramie, Wyoming. <http://www.sdvs.uwyo.edu/24k/landcov.html>. Accessed June 2006.

Natural Resource Conservation Service. 1988. Technical guide to range sites and range condition 10-14 inch, Northern Plains. Technical Guide Notice No. WY-99, Section IIB. U.S. Department of Agriculture, Natural Resources Conservation Service, Casper, Wyoming.

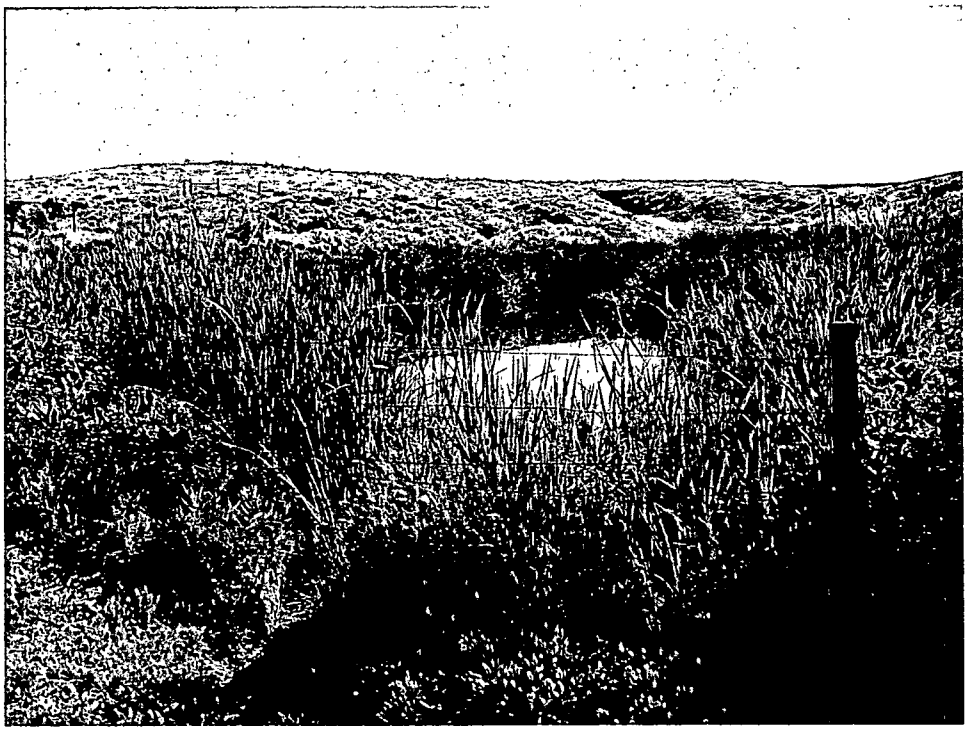
Reed, P.B., Jr. 1988. National list of plant species that occur in wetlands: North Plains (Region 4). U.S. Department of the Interior, Fish and Wildlife Service. Biological Report 88 (26.7). 66 pp.

U.S. Army Corps of Engineers. 1987. Wetland delineation manual, technical report V-87-1. U.S. Army Engineer Waterways Experiment Station, Vicksburg. Mississippi. 100 pp. + append.

Wyoming Department of Environmental Quality, Land Quality Division. 1997. Guideline no. 6.: organization and topic guideline for an application for a "permit to mine," or an amendment; noncoal. Cheyenne, Wyoming. 16 pp.

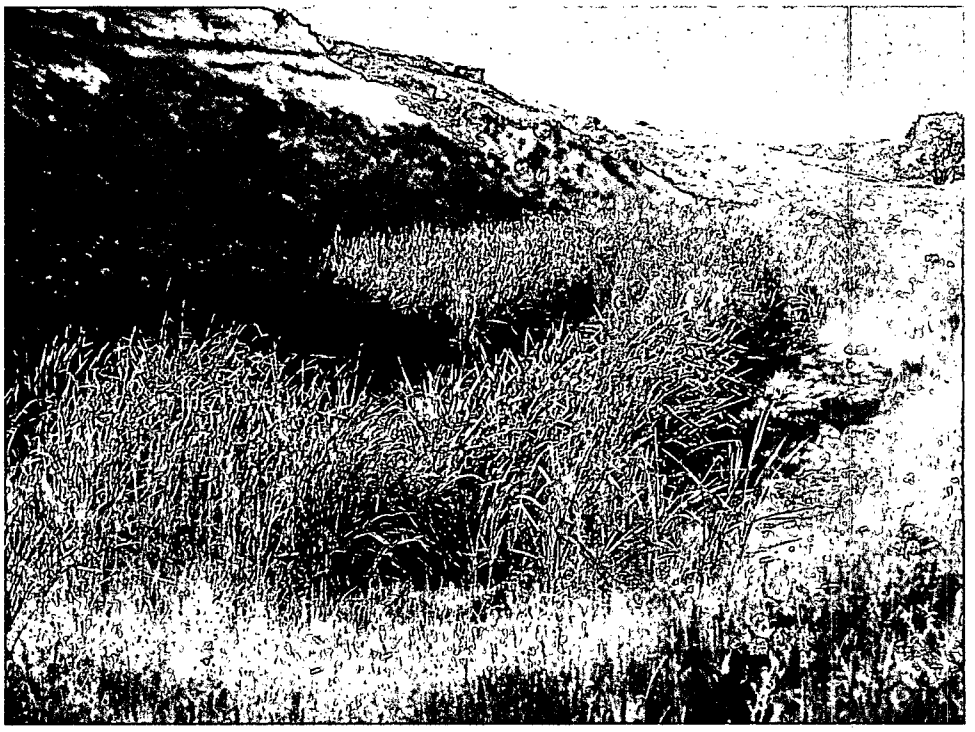
**ADDENDUM D10A:**

PHOTOGRAPHS OF WETLAND SITES

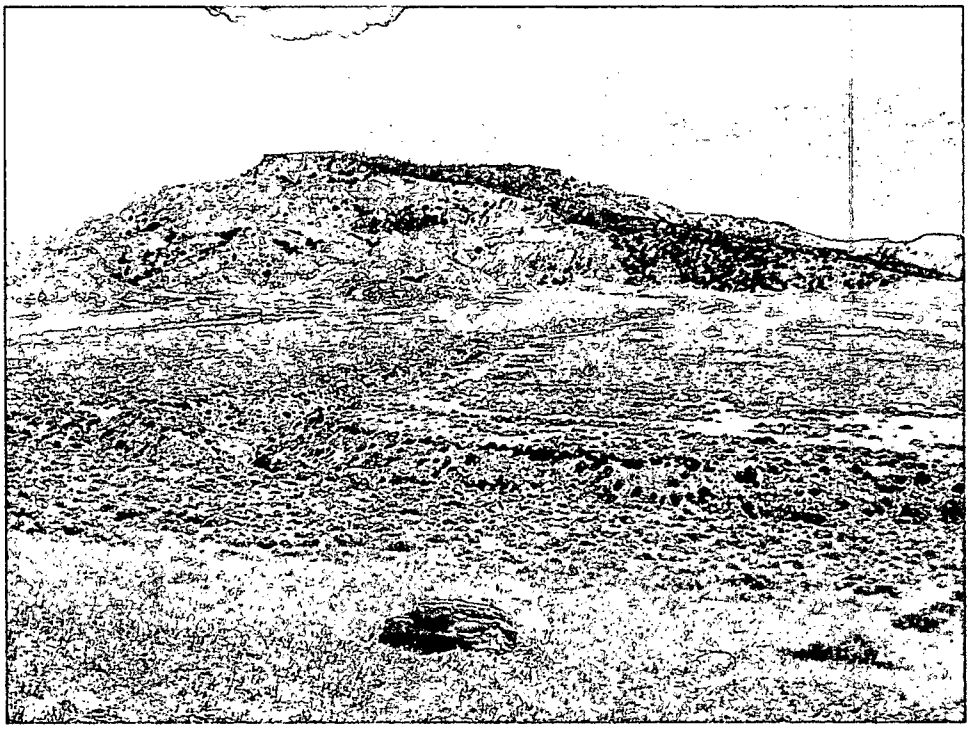


Photograph D10-1 Site 1, Jurisdictional Wetland.

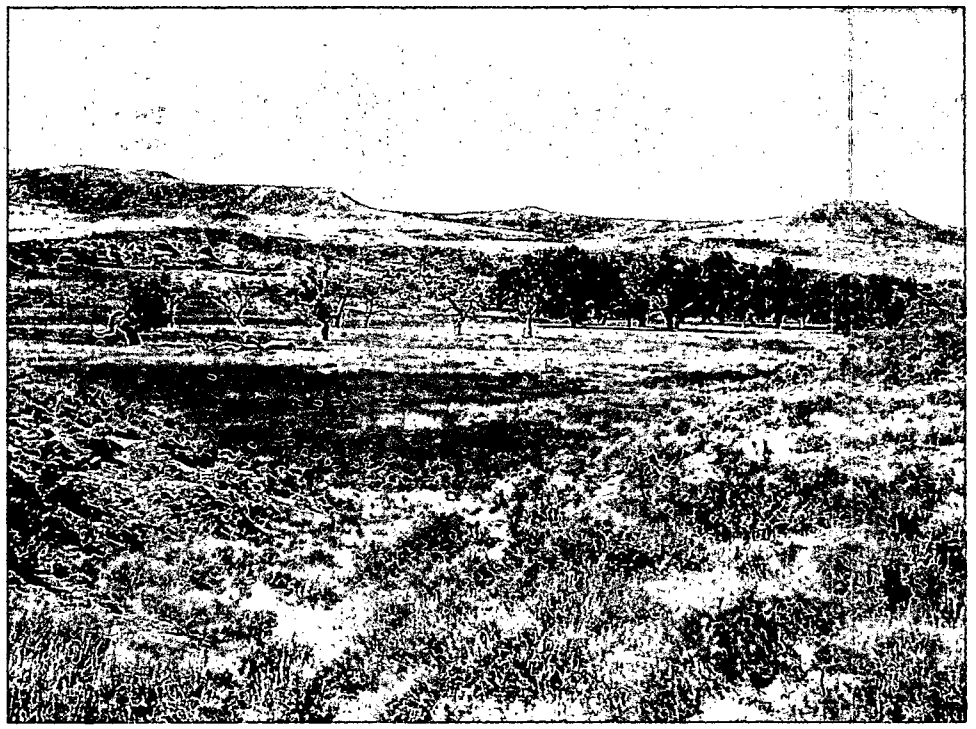
Photograph D10-2 Site 2, Jurisdictional Wetland.



Photograph D10-3 Site 3, Jurisdictional Wetland.



Photograph D10-4 Typical WUS, Hank Unit.



Photograph D10-5 Cottonwood Creek Drainage, Nichols Ranch Unit.

**ADDENDUM D10B:**

WETLAND DELINEATION FORMS

**DATA FORM**
**ROUTINE WETLAND DETERMINATION**
**(1987 Corps of Engineers Manual)**

| | | | |
|---|---|---|---|
| Project/Site: | Nichols Ranch Unit | Date: | 6/28/06 |
| Applicant/Owner: | Uranerz Energy Corporation | County: | Campbell |
| Investigator: | Jan Hart/Waylon Hiler | State: | Wyoming |

| | | | |
|---|---|---|---|
| Do Normal Circumstances exist on the site? | [ X] Yes [ ] No | Community ID: | |
| Is the site significantly disturbed (Atypical Situation)? | [ ] Yes [ X] No | Transect ID: | |
| Is the area a potential Problem Area? | [ ] Yes [ X] No | Plot ID: | Site 1 |

## VEGETATION

| Dominant Plant Species | Stratum | Indicator | Dominant Plant Species | Stratum | Indicator |
|---|---|---|---|---|---|
| 1. *Typha augustifolia* | Herb | OBL | 7. | | |
| 2. *Scirpus pungens* | Herb | OBL | 8. | | |
| 3. *Cirsium arvense* | Herb | FACU | 9. | | |
| 4. *Scirpus acutus* | Feb | OBL | 10. | | |
| 5. *Asclepias speciosa* | Herb | FAC | 11. | | |
| 6. *Juncus balticus* | Herb | OBL | 12. | | |

Percent of Dominant Species that are OBL, FACW, and/or FAC (exclude FAC- species). 5/6 = 83%

Remarks: This site is dominated by cattails. The perimeter of this site has some species diversity while the center is primarily cattails.

## HYDROLOGY

[ ] Recorded Data (Describe in Remarks)
[ ] Stream, Lake, or Tide Gauge
[ ] Aerial Photographs
[ ] Other - USGS Topographic Map
[ X] No Known Recorded Data

Field Observations:

Depth of Surface Water: 0-24 inches

Depth to Free Water in Pit: 10 inches

Depth to Saturated Soil: 2 inches

Wetland Hydrology Indicators:
Primary Indicators:
[ X] Inundated
[ X] Saturated in Upper 12 inches
[ ] Water Marks
[ ] Drift Lines
[ ] Sediment Deposits
[ ] Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
[ ] Oxidized Root Channels in Upper 12 inches
[ ] Water-stained Leaves
[ ] Local Soil Survey Data
[ ] FAC-Neutral Test
[ ] Other (Explain in Remarks)

Remarks: This site is within the Cottonwood Creek drainage. An impoundment contains the water on site. There are springs in the area. Based on the lack of rain this year, it is assumed that this site's hydrology is dependant on ground water.

## SOILS

| | | | |
|---|---|---|---|
| Map Unit Name (Series and Phase): | Haverdad-Clarken complex, 0-4 percent slopes | Drainage Class: | |
| Taxonomy (Subgroup): | | Field Observations Confirm Map Type? | [ X] Yes [ ] No |

Profile Description:

| Depth (inches) | Horizon | Matrix Color (Munsell Moist) | Mottle Colors (Munsell Moist) | Mottle Abundance/Contrast | Texture, Concretions, Structure, etc. |
|---|---|---|---|---|---|
| 0-6 | | 10YR4/2 | None | n/a | Sandy loam |
| 6-14 | | 10YR3/2 | 7.5YR5/6 | 20%/good | Sandy clay loam |
| | | | | | |
| | | | | | |
| | | | | | |

Hydric Soil Indicators:

[ ] Histosol
[ ] Histic Epipedon
[ X] Sulfidic Odor
[ ] Aquic Moisture Regime
[ ] Reducing Conditions (test required)
[ ] Gleyed or Low-Chroma Colors
[ ] Concretions
[ ] High Organic Content in Surface Layer of Sandy Soils
[ ] Organic Streaking in Sandy Soils
[ ] Listed on Local Hydric Soils List
[ ] Listed on National Hydric Soils List
[ X] Other (Explain in Remarks)

Remarks: Soils were mottled approximately 6 inches below the surface.

## WETLAND DETERMINATION

| | | |
|---|---|---|
| Hydrophytic Vegetation Present? | [ X] Yes [ ] No | Is this Sampling Point within a Wetland? [ X] Yes [ ] No |
| Wetland Hydrology Present? | [ X] Yes [ ] No | |
| Hydric Soils Present? | [ X] Yes [ ] No | |

Remarks: This site is a jurisdictional wetland within a WUS.

**DATA FORM**
**ROUTINE WETLAND DETERMINATION**
**(1987 Corps of Engineers Manual)**

| | | | |
|---|---|---|---|
| Project/Site: | Nichols Ranch Unit | Date: | 6/28/06 |
| Applicant/Owner: | Uranerz Energy Corporation | County: | Campbell |
| Investigator: | Jan Hart/Waylon Hiler | State: | Wyoming |

| | | | |
|---|---|---|---|
| Do Normal Circumstances exist on the site? | [ X] Yes [ ] No | Community ID: | |
| Is the site significantly disturbed (Atypical Situation)? | [ ] Yes [ X] No | Transect ID: | |
| Is the area a potential Problem Area? | [ ] Yes [ X] No | Plot ID: | Site 2 |

## VEGETATION

| Dominant Plant Species | Stratum | Indicator | Dominant Plant Species | Stratum | Indicator |
|---|---|---|---|---|---|
| 1. *Polypogon monospeliensis* | Herb | OBL | 7. | | |
| 2. *Typha angustifolia* | Herb | OBL | 8. | | |
| 3. *Scirpus pungens* | Herb | OBL | 9. | | |
| 4. *Juncus* spp. | Herb | OBL | 10. | | |
| 5. *Hordeum jubatum* | Herb | FACW | 11. | | |
| 6. *Spartina pectinata* | Herb | FACW | 12. | | |

Percent of Dominant Species that are OBL, FACW, and/or FAC (exclude FAC- species). 6/6 = 100%

Remarks:

## HYDROLOGY

[ ] Recorded Data (Describe in Remarks)
[ ] Stream, Lake, or Tide Gauge
[ ] Aerial Photographs
[ ] Other - USGS Topographic Map
[ X] No Known Recorded Data

Field Observations:

Depth of Surface Water: 0 inches

Depth to Free Water in Pit: >12 inches

Depth to Saturated Soil: >12 inches

Wetland Hydrology Indicators:
Primary Indicators:
[ ] Inundated
[ ] Saturated in Upper 12 inches
[ X] Water Marks
[ ] Drift Lines
[ ] Sediment Deposits
[ X] Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
[ ] Oxidized Root Channels in Upper 12 inches
[ ] Water-stained Leaves
[ ] Local Soil Survey Data
[ ] FAC-Neutral Test
[ ] Other (Explain in Remarks)

Remarks: This site was dry but there are indicators of wetland hydrology. This site is located in the Cottonwood Creek drainage.

## SOILS

| | | | |
|---|---|---|---|
| Map Unit Name (Series and Phase): | Haverdad-Clarken complex, 0-4 percent slopes | Drainage Class: | |
| Taxonomy (Subgroup): | | Field Observations Confirm Map Type? | [ X] Yes [ ] No |

Profile Description:

| Depth (inches) | Horizon | Matrix Color (Munsell Moist) | Mottle Colors (Munsell Moist) | Mottle Abundance/Contrast | Texture, Concretions, Structure, etc. |
|---|---|---|---|---|---|
| 0-3 | | 10YR3/1 | None | n/a | Sandy loam |
| 3-14 | | 10YR3/1 | 10YR5/8 | 30%/good | Sandy loam |
| | | | | | |
| | | | | | |

Hydric Soil Indicators:

[ ] Histosol
[ ] Histic Epipedon
[ ] Sulfidic Odor
[ ] Aquic Moisture Regime
[ ] Reducing Conditions (test required)
[ ] Gleyed or Low-Chroma Colors
[ ] Concretions
[ ] High Organic Content in Surface Layer of Sandy Soils
[ ] Organic Streaking in Sandy Soils
[ ] Listed on Local Hydric Soils List
[ ] Listed on National Hydric Soils List
[ X] Other (Explain in Remarks)

Remarks: Soil mottles observed.

## WETLAND DETERMINATION

| | |
|---|---|
| Hydrophytic Vegetation Present? [ X] Yes [ ] No<br>Wetland Hydrology Present? [ X] Yes [ ] No<br>Hydric Soils Present? [ X] Yes [ ] No | Is this Sampling Point within a Wetland? [ X] Yes [ ] No |

Remarks: This site is a jurisdictional wetland within the Cottonwood Creek drainage.

**DATA FORM**
**ROUTINE WETLAND DETERMINATION**
**(1987 Corps of Engineers Manual)**

| | | | |
|---|---|---|---|
| Project/Site: | Nichols Ranch Unit | Date: | 6/28/06 |
| Applicant/Owner: | Uranerz Energy Corporation | County: | Campbell |
| Investigator: | Jan Hart/Waylon Hiler | State: | Wyoming |

| | | | |
|---|---|---|---|
| Do Normal Circumstances exist on the site? | [ X] Yes [ ] No | Community ID: | |
| Is the site significantly disturbed (Atypical Situation)? | [ ] Yes [ X] No | Transect ID: | |
| Is the area a potential Problem Area? | [ ] Yes [ X] No | Plot ID: | Site 3 |

## VEGETATION

| Dominant Plant Species | Stratum | Indicator | Dominant Plant Species | Stratum | Indicator |
|---|---|---|---|---|---|
| 1. *Typha angustifolia* | Herb | OBL | 7. *Asclepias speciosa* | Herb | FAC |
| 2. *Scirpus pungens* | Herb | OBL | 8. | | |
| 3. *Scirpus acutus* | Herb | OBL | 9. | | |
| 4. *Juncus* spp. | Herb | FACW or wetter | 10. | | |
| 5. *Hordeum jubatum* | Herb | FACW | 11. | | |
| 6. *Polopogon monospeliensis* | Herb | OBL | 12. | | |

Percent of Dominant Species that are OBL, FACW, and/or FAC (exclude FAC- species). 7/7 = 100%

Remarks:

## HYDROLOGY

[ ] Recorded Data (Describe in Remarks)
[ ] Stream, Lake, or Tide Gauge
[ ] Aerial Photographs
[ ] Other - USGS Topographic Map
[ X] No Known Recorded Data

Field Observations:

Depth of Surface Water: 0-18 inches

Depth to Free Water in Pit: 0 inches

Depth to Saturated Soil: 0 inches

Wetland Hydrology Indicators:
Primary Indicators:
[ X] Inundated
[ X] Saturated in Upper 12 inches
[ ] Water Marks
[ ] Drift Lines
[ ] Sediment Deposits
[ X] Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
[ ] Oxidized Root Channels in Upper 12 inches
[ ] Water-stained Leaves
[ ] Local Soil Survey Data
[ ] FAC-Neutral Test
[ ] Other (Explain in Remarks)

Remarks: This site is located in the Cottonwood Creek drainage.

## SOILS

| | | | |
|---|---|---|---|
| Map Unit Name (Series and Phase): | Haverdad-Clarken complex, 0-4 percent slopes | Drainage Class: | |
| Taxonomy (Subgroup): | | Field Observations Confirm Map Type? | [ X] Yes [ ] No |

Profile Description:

| Depth (inches) | Horizon | Matrix Color (Munsell Moist) | Mottle Colors (Munsell Moist) | Mottle Abundance/Contrast | Texture, Concretions, Structure, etc. |
|---|---|---|---|---|---|
| 0-2 | | 10YR5/4 | None | n/a | Sand |
| 2-14 | | 10YR2/1 | w/gleying - 5GY | | Sandy loam |
| | | | 7.5YR5/6 | 15%/fair | Sandy clay loam |
| | | | | | |

Hydric Soil Indicators:

[ ] Histosol
[ ] Histic Epipedon
[ X] Sulfidic Odor
[ ] Aquic Moisture Regime
[ ] Reducing Conditions (test required)
[ ] Gleyed or Low-Chroma Colors
[ ] Concretions
[ ] High Organic Content in Surface Layer of Sandy Soils
[ ] Organic Streaking in Sandy Soils
[ ] Listed on Local Hydric Soils List
[ ] Listed on National Hydric Soils List
[ X] Other (Explain in Remarks)

Remarks: Gleyed soils are mixed with mottled.

## WETLAND DETERMINATION

| | | |
|---|---|---|
| Hydrophytic Vegetation Present? | [ X] Yes [ ] No | Is this Sampling Point within a Wetland? [ X] Yes [ ] No |
| Wetland Hydrology Present? | [ X] Yes [ ] No | |
| Hydric Soils Present? | [ X] Yes [ ] No | |

Remarks: This site is a jurisdictional wetland located in a WUS.

**DATA FORM**
**ROUTINE WETLAND DETERMINATION**
**(1987 Corps of Engineers Manual)**

| | | | |
|---|---|---|---|
| Project/Site: | Nichols Ranch Unit | Date: | 7/21/06 |
| Applicant/Owner: | Uranerz Energy Corporation | County: | Campbell |
| Investigator: | Jan Hart | State: | Wyoming |

| | | | |
|---|---|---|---|
| Do Normal Circumstances exist on the site? | [ X] Yes [ ] No | Community ID: | |
| Is the site significantly disturbed (Atypical Situation)? | [ ] Yes [ X] No | Transect ID: | |
| Is the area a potential Problem Area? | [ ] Yes [ X] No | Plot ID: | Site 4 |

## VEGETATION

| Dominant Plant Species | Stratum | Indicator | Dominant Plant Species | Stratum | Indicator |
|---|---|---|---|---|---|
| 1. *Scirpus acutus* | Herb | OBL | 7. | | |
| 2. *Eleocharis palustris* | Herb | OBL | 8. | | |
| 3. *Echinochloa crusgalli* | Herb | FACW | 9. | | |
| 4. *Typha angustifolia* | Herb | OBL | 10. | | |
| 5. *Beckmannia syzigache* | Herb | OBL | 11. | | |
| 6. | | | 12. | | |

Percent of Dominant Species that are OBL, FACW, and/or FAC (exclude FAC- species). 5/5 = 100%

Remarks: Upland vegetation surrounds this site. Water supplied by an overflowing stock tank has created a site suitable to support hydrophytic vegetation.

## HYDROLOGY

[ ] Recorded Data (Describe in Remarks)
[ ] Stream, Lake, or Tide Gauge
[ ] Aerial Photographs
[ ] Other - USGS Topographic Map
[ X] No Known Recorded Data

Field Observations:

Depth of Surface Water: 1-14 inches

Depth to Free Water in Pit: 3 inches

Depth to Saturated Soil: 1 inches

Wetland Hydrology Indicators:
Primary Indicators:
[ X] Inundated
[ X] Saturated in Upper 12 inches
[ ] Water Marks
[ ] Drift Lines
[ ] Sediment Deposits
[ ] Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
[ ] Oxidized Root Channels in Upper 12 inches
[ ] Water-stained Leaves
[ ] Local Soil Survey Data
[ ] FAC-Neutral Test
[ ] Other (Explain in Remarks)

Remarks: Water is supplied to this site by an overflowing stock tank. The stream (as designated on the USGS quadrangle) that occurs in the floodplain is dry, with no defined bed/bank. A series of irrigation canals, also dry, occur in the floodplain, which surrounds this site. A stock tank occurs upstream from the wetland, and the water overflows from tank to site.

## SOILS

| | | | |
|---|---|---|---|
| Map Unit Name (Series and Phase): | Haverdad-Clarken complex, 0-4 percent slopes | Drainage Class: | |
| Taxonomy (Subgroup): | | Field Observations Confirm Map Type? | [ X] Yes [ ] No |

Profile Description:

| Depth (inches) | Horizon | Matrix Color (Munsell Moist) | Mottle Colors (Munsell Moist) | Mottle Abundance/Contrast | Texture, Concretions, Structure, etc. |
|---|---|---|---|---|---|
| 0-4 | | 10YR5/2 | 7.5YR6/6 | 50%/good | Sandy loam |
| 4-12 | | 10YR2/1 | -- | | Sandy loam |
| | | | | | |
| | | | | | |

Hydric Soil Indicators:

[ ] Histosol
[ ] Histic Epipedon
[ X] Sulfidic Odor
[ ] Aquic Moisture Regime
[ ] Reducing Conditions (test required)
[ X] Gleyed or Low-Chroma Colors
[ ] Concretions
[ ] High Organic Content in Surface Layer of Sandy Soils
[ ] Organic Streaking in Sandy Soils
[ ] Listed on Local Hydric Soils List
[ ] Listed on National Hydric Soils List
[ ] Other (Explain in Remarks)

Remarks: The soils emitted a very strong sulfidic odor when the soil pit was dug.

## WETLAND DETERMINATION

| | | |
|---|---|---|
| Hydrophytic Vegetation Present? | [ X] Yes [ ] No | Is this Sampling Point within a Wetland? [ X] Yes [ ] No |
| Wetland Hydrology Present? | [ X] Yes [ ] No | |
| Hydric Soils Present? | [ X] Yes [ ] No | |

Remarks: This site is a created wetland located in the floodplain of Cottonwood Creek below an overflowing stock watering tank.

# APPENDIX D11:

# BACKGROUND RADIOLOGICAL SURVEYS

**November 2007**

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Exhibit D11-4 Hank Unit Gamma Sample Location Map ..... Map Pocket

# D11.1.0 BACKGROUND RADIOLOGICAL CHARACTERISTICS

## D11.1 SURFACE SOILS, SUBSURFACE SOILS, AND SEDIMENT

### D11.1.1 Purpose and Procedure

In June of 2007, an extensive soil and sediment sampling program was completed for the Nichols Ranch and Hank Units of the Nichols Ranch ISR Project. The purpose of the effort was to develop a representative radiological baseline for surface and subsurface soils and sediments.

Prior to conducting a field reconnaissance and collecting the samples, a map was prepared on a large-scale U.S. Geological Survey (USGS) topographic base showing the license boundary, plant site location and ore zone footprint (in as much as it was known at the time). Because of their importance in an assessment such as this, the location of cultural features (residences, ranches, water wells, water impoundments, roads, etc.) with respect to the future process facility, production areas and license boundary were considered in the sampling design.

After completing the base map described above, a field reconnaissance was conducted to visually inspect the project area. All of the features just noted were considered in terms of their respective locations to the license boundary. Following the reconnaissance, a sample site map was prepared. Coordinates for each sample site were included with the map.

In determining the number, type (surface, subsurface and sediment) and areal distribution of sampling locations, pertinent NRC documents were used, along with judgment based on many years of experience developing pre-operational and operational environmental monitoring programs for in situ recovery (ISR) operations. The primary documents included: (1) NRC Regulatory Guide 4.14, "Radiological Effluent and Environmental Monitoring at Uranium Mills," USNRC, April 25, 1980; (2) NUREG-1569, Standard Review Plan for In Situ Leach Uranium Extraction License Applications," Final Report, USNRC, June 2003; and (3) NUREG-1748 "Environmental Review Guidance for Licensing Actions Associated with NMISS Programs," Final Report, USNRC, August 2003.

Regulatory Guide 4.14 is the document that outlines the specifics of a pre-operational radiological monitoring program. Table 1 in the guide, for example, lists the suggested number, type, location and frequency of samples. Because of the age of the guide, and because it primarily addresses conventional mills, Uranerz employed a modified baseline sampling program designed for a modern ISR facility. From a standpoint of physical disturbance and radiological alteration, it is widely recognized that a modern-day ISR operation has minimal impact on surface and subsurface soils.

There are three major reasons why the impacts are insignificant: (1) the recovery technique does not require the removal of overburden nor does it require the physical removal of the ore zone; (2) it is a wet process up to the stage of drying and packaging; and (3) modern dryers and packaging systems do not have significant particulate discharges. Thus in the absence of significant particulate sources, radiological impacts on soils and sediments through aerial dispersal and subsequent deposition are not associated with modern ISR operations.

Experience shows that potential radiological impacts are almost exclusively associated with accidental spills from pipe leaks or ruptures that occur off of the process facility pad (i.e., within the wellfields and between the wellfields and the process facility). Spills occurring on the process pad are fully contained by the curbed volume of the pad and its sump system. It should be noted that an accidental spill from a pipe break in a wellfield does not necessarily result in a major impact on soils or sediments. Engineering controls and a management program based on the principles of ALARA provide a high degree of assurance that impacts will be minimal. To illustrate, a pipeline break would cause a loss in pressure and this would be quickly detected by the monitoring system. In addition to engineering controls, employees who are in the wellfields on a daily basis are trained to observe routinely the condition pipelines and wellheads. Leaks or breaks would be reported immediately. In the event of a break, the wetted area would be surveyed, sampled and recorded on a spill map. Soils with significantly elevated levels of uranium and radium-226 would be removed and disposed at a licensed site.

Knowing that potential impacts are attributed to pipeline ruptures and leaks, the pre-operational sampling program was designed to thoroughly characterize radiological baseline conditions in

the areas most likely to experience potential impacts. A review of Exhibit D11-1, Nichols Unit-Soil and Sediment Sample Location Map, and Exhibit D11-2 (see map pocket), Hank Unit Soil and Sediment Sample Location Map clearly shows that the focus of the baseline characterization was on the wellfield areas and the intermittent/ephemeral streams passing through the license area. A close examination of the map shows that sediment samples were collected from upstream and downstream locations in all of the streambeds. In addition to thoroughly sampling the wellfields and water courses, the radiological baseline was supplemented by including samples from areas within the license area (see sample sites labeled LAS on the map), the process facility location and the Rn-222/Gamma monitoring stations. Again, using Regulatory Guide 4.14 for general guidance, all soils and sediments were analyzed for Ra-226 and a large percentage of the total number of samples included analyses for U, Pb-210 and Th-230. In brief, the extensive coverage of the sampling effort provides a representative radiological baseline against which operational activities can be measured.

### D11.1.2 Sampling Methodology

The sample site map and coordinates described above, guided field personnel to the sample site locations. Surface and subsurface soils were collected with a 3-inch diameter bucket auger. Surface soils were collected from surface to a depth of 6-inches, and subsurface soils were collected in 12-inch increments to a total depth of 36 inches. The depth increments generally follow Regulatory Guide 4.14.

To avoid cross-contamination, the sampler and other tools were cleaned after each use using paper towels and de-ionized water. Samples were placed in 1-gallon plastic freezer bags and stored in ice chests prior to delivery to the laboratory. While collecting the soil samples, gamma measurements were taken using a Ludlum Model 19 μR Survey Meter. The calibration date on the meter for the June 2007 survey was June 8, 2007. While holding the meter at waist level, the area at and proximate to the sample point was surveyed for approximately two minutes. Gamma levels were recorded along with the GPS coordinates for each site.

The procedure for collecting sediment samples varied slightly from the soil sampling methodology. Instead of a single incremental sample, several samples were taken around each site to form a composite sample. As with the soil samples, sediments were placed in 1-gallon plastic freezer bags and placed in ice chests prior to delivery to the laboratory. Gamma measurements were taken following the protocol just described.

### D11.1.3 Nichols Ranch Unit Results

Table D11-1, Radiological Background in Surface and Subsurface Soil - Nichols Ranch Unit, provides a summary of the analyses for each sample point as well as some basic statistical measures (minimum, maximum, average and standard deviation).

Most of the surface soil sample and all of the subsurface samples have typical background radiological characteristics (approximately 1 pCi/g or less). For comparison purposes, normal soils typically have a Ra-226 content of 1 pCi/g (NCRP Report No.78). With the exception of one site, (LAS-5), which had a Ra-226 level of 26 pCi/g, the table shows normal background levels. The elevated level at LAS-5 might be attributed to old exploration activities.

With respect to sediment, Table D11-2 Radiological Background in Sediment - Nichols Ranch Unit shows that 40% of the samples exceed normal background levels of 1 pCi/g for Ra-226. Elevated levels were detected at sample sites SD-1, 8, 9 and 10. A possible explanation for this departure could be that earlier exploration activities may have left ore zone cuttings on the surface.

Because a significant percentage of the sites have elevated Ra-226, the average value of 9.6 pCi/g is well in excess of normal background. Pb-210 was also detected at higher than normal background levels at two of the sites, resulting in a slightly higher than normal average.

Table D11-1 Radiological Background in Surface and Subsurface Soil - Nichols Ranch Unit.

| Sample Site | Depth Inches | Uranium mg/kg* | Pb-210 pCi/g | Precision Plus/Minus | Ra-226 pCi/g | Precision Plus/Minus | Th-230 pCi/g | Precision Plus/Minus |
|---|---|---|---|---|---|---|---|---|
| R-1 | 0-6 | 1.85 | 2.1 | 0.3 | 0.8 | 0.2 | 0.7 | 0.1 |
| R-2 | 0-6 | 1.42 | 0.9 | 0.2 | 0.8 | 0.2 | ND | |
| R-3 | 0-6 | 1.93 | 1.1 | 0.2 | 0.7 | 0.2 | ND | |
| R-4 | 0-6 | 2.58 | 1.1 | 0.2 | 1.2 | 0.2 | ND | |
| R-5 | 0-6 | 1.66 | 0.1 | 0.1 | 0.6 | 0.1 | ND | |
| SS-6 | 0-6 | | | | 0.8 | 0.2 | | |
| SS-7 | 0-6 | | | | 1.3 | 0.2 | | |
| SS-8 | 0-6 | 1.12 | 0.7 | 0.1 | 0.6 | 0.2 | ND | |
| SS-9 | 0-6 | | | | 0.8 | 0.2 | | |
| SS-10 | 0-6 | | | | 0.9 | 0.2 | | |
| SS-11 | 0-6 | 1.39 | ND | | 0.9 | 0.2 | ND | |
| SS-12 | 0-6 | | | | 0.3 | 0.2 | | |
| SS-13 | 0-6 | | | | 0.8 | 0.2 | | |
| SS-14 | 0-6 | | | | 0.9 | 0.2 | | |
| SS-15 | 0-6 | | | | 0.6 | 0.2 | | |
| SS-16 | 0-6 | | | | 1.5 | 0.2 | | |
| SS-17 | 0-6 | | | | 0.8 | 0.2 | | |
| SS-18 | 0-6 | | | | 0.8 | 0.2 | | |
| SS-19 | 0-6 | 1.64 | ND | | 1.4 | 0.2 | 0.1 | 0.1 |
| SS-20 | 0-6 | | | | 0.8 | 0.1 | | |
| SS-21 | 0-6 | | | | 2.4 | 0.2 | | |
| SS-22 | 0-6 | 1.89 | ND | | 0.9 | 0.1 | 0.8 | 0.6 |
| SS-23 | 0-6 | | | | 0.6 | 0.1 | | |
| SS-24 | 0-6 | | | | 0.4 | 0.1 | | |
| SS-25 | 0-6 | | | | 0.5 | 0.1 | | |
| SS-26 | 0-6 | | | | 0.7 | 0.1 | | |
| SS-27 | 0-6 | | | | 0.7 | 0.1 | | |
| SS-28 | 0-6 | | | | 0.7 | 0.1 | | |
| SS-29 | 0-6 | | | | 0.8 | 0.1 | | |
| SS-30 | 0-6 | | | | 1.2 | 0.1 | | |
| LAS-1 | 0-6 | 0.97 | ND | | 0.4 | 0.1 | 0.3 | 0.1 |
| LAS-2 | 0-6 | 2.96 | ND | | 0.9 | 0.2 | 0.7 | 0.1 |
| LAS-3 | 0-6 | 2.58 | ND | | 0.8 | 0.2 | 0.3 | 0.1 |
| LAS-4 | 0-6 | 1.37 | ND | | 1.0 | 0.2 | 0.7 | 0.1 |
| LAS-5** | 0-6 | 4.72 | ND | | 26.4 | 3.9 | 0.6 | 0.1 |
| LAS-6 | 0-6 | 2.19 | ND | | 1.3 | 0.2 | 0.6 | 0.1 |
| LAS-7 | 0-6 | 1.73 | 1.0 | 0.4 | 1.0 | 0.2 | 0.5 | 0.1 |
| LAS-8 | 0-6 | 1.51 | ND | | 1.0 | 0.2 | 0.5 | 0.1 |

Table D11-1 (Continued)

| Sample Site | Depth Inches | Uranium mg/kg* | Pb-210 pCi/g | Precision Plus/Minus | Ra-226 pCi/g | Precision Plus/Minus | Th-230 pCi/g | Precision Plus/Minus |
|---|---|---|---|---|---|---|---|---|
| **Plant Site** | | | | | | | | |
| Center | 0-12 | 1.43 | ND | | 1.0 | 0.2 | 0.5 | 0.1 |
| | 12-24 | 1.22 | 0.5 | 0.4 | 1.0 | 0.2 | 0.4 | 0.1 |
| | 24-36 | 1.37 | ND | | 0.7 | 0.2 | 0.6 | 0.1 |
| NW | 0-6 | 1.43 | 0.4 | 0.1 | 1.2 | 0.2 | ND | |
| NE | 0-6 | 1.42 | 0.6 | 0.1 | 0.9 | 0.2 | ND | |
| SE | 0-6 | 1.2 | 0.3 | 0.1 | 1.1 | 0.2 | ND | |
| SW | 0-6 | 1.45 | 1.0 | 0.2 | 1.0 | 0.2 | 1.1 | 0.6 |
| SB-4 | 0-12 | 2.7 | ND | | 1.0 | 0.1 | 0.5 | 0.1 |
| | 12-24 | 3.95 | ND | | 1.0 | 0.1 | 0.6 | 0.1 |
| | 24-36 | 2.34 | ND | | 0.8 | 0.1 | 0.4 | 0.1 |
| SB-5 | 0-12 | 1.00 | ND | | 0.7 | 0.1 | 0.4 | 0.1 |
| | 12-24 | 1.35 | 1.6 | 0.4 | 0.6 | 0.1 | 0.4 | 0.1 |
| | 24-36 | 1.91 | 0.7 | 0.3 | 0.7 | 0.1 | 0.2 | 0.1 |
| SB-6 | 0-12 | 1.29 | ND | | 0.8 | 0.2 | 0.5 | 0.1 |
| | 12-24 | 1.8 | 0.5 | 0.4 | 1.6 | 0.2 | 0.4 | 0.1 |
| | 24-36 | 2.05 | 0.4 | 0.4 | 0.8 | 0.2 | 0.5 | 0.1 |
| SB-7 | 0-12 | 1.01 | ND | | 0.8 | 0.1 | 0.3 | 0.1 |
| | 12-24 | 1.45 | ND | | 0.9 | 0.2 | 0.4 | 0.1 |
| | 24-36 | 1.73 | ND | | 0.9 | 0.2 | 0.6 | 0.1 |
| SB-8 | 0-12 | 1.88 | ND | | 1.1 | 0.2 | 0.7 | 0.1 |
| | 12-24 | 2.23 | ND | | 1.0 | 0.1 | 0.7 | 0.1 |
| | 24-36 | 2.59 | ND | | 1.0 | 0.1 | 0.5 | 0.1 |

Table D11-1 (Continued)

| Sample Site | | Uranium mg/kg* | Pb-210 pCi/g | Precision Plus/Minus | Ra-226 pCi/g | Precision Plus/Minus | Th-230 pCi/g | Precision Plus/Minus |
|---|---|---|---|---|---|---|---|---|
| **Surface Soil:** | | | | | | | | |
| **Minimum** | | **0.97** | **0.1** | | **0.3** | | **0.1** | |
| **Maximum** | | **4.72** | **1.1** | | **26.4** | | **1.1** | |
| **Average** | | **1.69** | **0.7** | | **0.9** | | **0.6** | |
| **Standard Deviation** | | **0.52** | **0.3** | | **0.4** | | **0.2** | |
| **Subsurface Soil:** | | | | | | | | |
| **Minimum** | | **1.00** | **0.4** | | **0.6** | | **0.2** | |
| **Maximum** | | **3.95** | **1.6** | | **1.6** | | **0.7** | |
| **Average** | **0-12** | **1.55** | **ND** | | **0.9** | | **0.5** | |
| | **12-24** | **2.00** | **0.4** | | **1.0** | | **0.5** | |
| | **24-36** | **2.00** | **0.2** | | **0.8** | | **0.5** | |

Notes:
R-1: Nearest Residence. R-1 through R-4: Rn-222 and Gamma Monitoring Locations.
*Reporting Limit: 0.50.
SS: Surface Soil.
SB: Subsurface Soil.
LAS: License Area Sample.
ND: Not Detected
See Exhibit D11-1 for sample site locations.
**U and Ra-226 values for LAS-5 appear to be anomalies and were not used in the statistics.

Table D11-2 Radiological Background in Sediment - Nichols Ranch Unit.

| Sample Site | Uranium mg/kg* | Pb-210 pCi/g | Precision Plus/Minus | Ra-226 pCi/g | Precision Plus/Minus | Th-230 pCi/g | Precision Plus/Minus |
|---|---|---|---|---|---|---|---|
| SD-1 | 2.1 | ND | | 16.2 | 3.0 | 0.5 | 0.1 |
| SD-2 | 2.02 | ND | | 0.6 | 0.1 | 0.5 | 0.1 |
| SD-3 | 1.84 | 0.7 | 0.3 | 0.7 | 0.1 | 0.5 | 0.1 |
| SD-4 | 1.77 | ND | | 0.7 | 0.1 | 0.4 | 0.1 |
| SD-5 | 1.96 | 2.0 | 0.4 | 1.0 | 0.2 | 0.4 | 0.1 |
| SD-6 | 0.95 | ND | | 0.5 | 0.1 | 0.2 | 0.1 |
| SD-7 | 3.07 | 0.5 | 0.4 | 1.0 | 0.2 | 0.6 | 0.1 |
| SD-8 | 2.67 | 1.8 | 0.4 | 32.2 | 4.2 | 1.0 | 0.2 |
| SD-9 | 3.03 | ND | | 23.5 | 3.6 | 0.6 | 0.1 |
| SD-10 | 4.02 | ND | | 19.4 | 3.3 | 0.9 | 0.1 |
| **Minimum** | **0.95** | **ND** | | **0.5** | | **0.2** | |
| **Maximum** | **4.02** | **2.0** | | **32.2** | | **1.0** | |
| **Average** | **2.34** | **1.3** | | **9.6** | | **0.6** | |
| **Standard Deviation** | **0.87** | **0.8** | | **12.1** | | **0.2** | |

Notes:
SD: Sediment.
*Reporting Limit: 0.50.
ND: Not Detected.
See Exhibit D-11-1 for sample site locations.

## D11.1.4 Hank Unit Results

Table D11-3 Radiological Background in Surface and Subsurface Soil - Hank Unit provides a summary of the analyses for each sample point as well as some basic statistical measures (minimum, maximum, average and standard deviation). With just a few exceptions, the values in the table are within the expected ranges. Briefly, the average value for Ra-226 is 1.1 pCi/g, and this nearly matches the reference radium concentration of 1 pCi/g in normal soil (NCRP Report No. 78). Similarly, values for U, Th-230 and Pb-210 also fall within expected background ranges. One site, LAS-2, had the highest values for uranium (8.4 mg/kg), Pb-210 (1.2 pCi/g), Ra-226 (3.8 pCi/g) and Th-230 (2.5 pCi/g).

Table D11-3 Radiological Background in Surface and Subsurface Soil - Hank Unit.

| Sample Site | Depth Inches | Uranium mg/kg* | Pb-210 pCi/g | Precision Plus/Minus | Ra-226 pCi/g | Precision Plus/Minus | Th-230 pCi/g | Precision Plus/Minus |
|---|---|---|---|---|---|---|---|---|
| R-1 | 0-6 | 1.26 | 3.9 | 0.4 | 1.3 | 0.2 | 0.9 | 0.2 |
| R-2 | 0-6 | 1.71 | ND | | 0.5 | 0.1 | ND | |
| R-3 | 0-6 | 1.04 | ND | | 0.4 | 0.1 | ND | |
| R-4 | 0-6 | 2.77 | 0.3 | 0.2 | 0.3 | 0.1 | ND | |
| R-5 | 0-6 | 2.46 | ND | | 1.0 | 0.2 | ND | |
| SS-6 | 0-6 | | | | 1.5 | 0.1 | | |
| SS-7 | 0-6 | 2.19 | ND | | 1.7 | 0.2 | 1.2 | 0.6 |
| SS-8 | 0-6 | | | | 1.2 | 0.1 | | |
| SS-9 | 0-6 | | | | 1.1 | 0.1 | | |
| SS-10 | 0-6 | | | | 2.1 | 0.1 | | |
| SS-11 | 0-6 | | | | 1.1 | 0.1 | | |
| SS-12 | 0-6 | | | | 1.0 | 0.1 | | |
| SS-13 | 0-6 | | | | 0.9 | 0.1 | | |
| SS-14 | 0-6 | | | | 1.3 | 0.1 | | |
| SS-15 | 0-6 | | | | 1.1 | 0.1 | | |
| SS-16 | 0-6 | 1.37 | ND | | 1.3 | 0.2 | ND | |
| SS-17 | 0-6 | | | | 1.3 | 0.1 | | |
| SS-18 | 0-6 | | | | 0.8 | 0.1 | | |
| SS-19 | 0-6 | | | | 0.9 | 0.1 | | |
| SS-20 | 0-6 | | | | 1.2 | 0.1 | | |
| SS-21 | 0-6 | | | | 1.1 | 0.2 | | |
| SS-22 | 0-6 | | | | 1.3 | 0.2 | | |
| SS-23 | 0-6 | | | | 0.9 | 0.2 | | |
| SS-24 | 0-6 | | | | 1.1 | 0.2 | | |
| SS-25 | 0-6 | 1.81 | ND | | 1.0 | 0.2 | 1.2 | 0.6 |
| SS-26 | 0-6 | | | | 0.7 | 0.1 | | |
| SS-27 | 0-6 | | | | 0.7 | 0.1 | | |
| SS-28 | 0-6 | | | | 0.9 | 0.2 | | |
| SS-29 | 0-6 | | | | 1.1 | 0.2 | | |
| SS-30 | 0-6 | | | | 1.2 | 0.2 | | |
| SS-31 | 0-6 | | | | 0.7 | 0.2 | | |
| SS-32 | 0-6 | | | | 1.2 | 0.2 | | |
| SS-33 | 0-6 | | | | 0.9 | 0.2 | | |
| SS-34 | 0-6 | 2.10 | ND | | 1.3 | 0.2 | 1.2 | 0.5 |
| SS-35 | 0-6 | | | | 1.1 | 0.2 | | |
| LAS-1 | 0-6 | 1.60 | 0.5 | 0.1 | 0.9 | 0.1 | 0.3 | 0.1 |
| LAS-2** | 0-6 | 8.40 | 1.2 | 0.1 | 3.8 | 0.1 | 2.5 | 0.1 |
| LAS-3 | 0-6 | 1.40 | ND | | 0.8 | 0.1 | 0.4 | 0.1 |
| LAS-4 | 0-6 | 1.00 | ND | | 0.8 | 0.1 | 0.2 | 0.1 |
| LAS-5 | 0-6 | 1.60 | 0.6 | 0.1 | 1.1 | 0.1 | 0.5 | 0.1 |
| LAS-6 | 0-6 | 1.50 | ND | | 0.9 | 0.1 | 0.4 | 0.1 |
| LAS-7 | 0-6 | 1.00 | 0.3 | 0.1 | 0.6 | 0.1 | 0.3 | 0.1 |
| LAS-8 | 0-6 | 1.10 | ND | | 0.6 | 0.1 | 0.5 | 0.1 |

Table D11-3 (Continued)

| Sample Site | Depth Inches | Uranium mg/kg* | Pb-210 pCi/g | Precision Plus/Minus | Ra-226 pCi/g | Precision Plus/Minus | Th-230 pCi/g | Precision Plus/Minus |
|---|---|---|---|---|---|---|---|---|
| LAS-9 | 0-6 | 1.39 | ND | | 1.3 | 0.2 | 0.7 | 0.2 |
| LAS-10 | 0-6 | 1.47 | ND | | 1.2 | 0.2 | 0.7 | 0.2 |
| LAS-11 | 0-6 | 2.35 | ND | | 1.0 | 0.2 | 0.5 | 0.2 |
| LAS-12 | 0-6 | 2.40 | ND | | 1.3 | 0.1 | 0.6 | 0.1 |
| LAS-13 | 0-6 | 1.90 | ND | | 1.2 | 0.1 | 0.8 | 0.1 |
| LAS-14 | 0-6 | 1.50 | 0.3 | 0.1 | 1.0 | 0.1 | 0.5 | 0.1 |
| SB-4 | 0-12 | 2.30 | 0.9 | 0.1 | 1.6 | 0.1 | 0.9 | 0.1 |
| | 12-24 | 2.00 | 0.7 | 0.1 | 1.1 | 0.1 | 0.5 | 0.1 |
| | 24-36 | 1.70 | ND | | 0.8 | 0.1 | 0.4 | 0.1 |
| SB-5 | 0-12 | 1.30 | ND | | 0.9 | 0.1 | 0.5 | 0.1 |
| | 12-24 | ND | 0.7 | 0.1 | 1.1 | 0.1 | 0.4 | 0.1 |
| | 24-36 | 1.80 | 0.6 | 0.1 | 1.1 | 0.1 | 0.4 | 0.1 |
| SB-6 | 0-12 | 1.60 | 0.3 | 0.1 | 1.2 | 0.1 | 0.5 | 0.1 |
| | 12-24 | 1.40 | 0.2 | 0.1 | 1.2 | 0.1 | 0.7 | 0.1 |
| | 24-36 | 1.60 | ND | | 1.2 | | 0.7 | 0.1 |
| SB-7 | 0-12 | 3.11 | ND | | 0.9 | 0.1 | 0.4 | 0.1 |
| | 12-24 | 2.33 | ND | | 0.9 | 0.2 | 0.6 | 0.1 |
| | 24-36 | 3.62 | ND | | 1.1 | 0.2 | 0.7 | 0.2 |
| SB-8 | 0-12 | 1.43 | ND | | 1.3 | 0.2 | 0.4 | 0.1 |
| | 12-24 | 1.42 | ND | | 1.2 | 0.2 | 0.4 | 0.1 |
| | 24-36 | 1.60 | ND | | 0.8 | 0.2 | 0.6 | 0.2 |
| SB-9 | 0-12 | 1.13 | ND | | 0.9 | 0.2 | 0.5 | 0.3 |
| | 12-24 | 1.30 | ND | | 0.8 | 0.2 | 0.2 | 0.1 |
| | 24-36 | 1.43 | ND | | 1.0 | 0.2 | 0.6 | 0.3 |

Table D11-3 (Continued)

| Sample Site | Depth Inches | Uranium mg/kg* | Pb-210 pCi/g | Precision Plus/Minus | Ra-226 pCi/g | Precision Plus/Minus | Th-230 pCi/g | Precision Plus/Minus |
|---|---|---|---|---|---|---|---|---|
| **Plant Site** | | | | | | | | |
| Center | 0-12 | 1.35 | ND | | 1.0 | 0.2 | 0.5 | 0.1 |
| | 12-24 | 1.28 | ND | | 0.9 | 0.2 | 0.7 | 0.1 |
| | 24-36 | 1.57 | 0.7 | 0.04 | 0.9 | 0.2 | 0.5 | 0.1 |
| NW | 0-6 | 1.83 | ND | | 1.0 | 0.2 | ND | |
| NE | 0-6 | 2.18 | | | 1.0 | 0.2 | 0.9 | 0.5 |
| SE | 0-6 | 1.82 | ND | | 1.2 | 0.2 | ND | |
| SW | 0-6 | 1.67 | 0.3 | 0.2 | 1.0 | 0.2 | ND | |
| **Surface Soil:** | | | | | | | | |
| **Minimum** | | **1.00** | **0.3** | | **0.3** | | **0.2** | |
| **Maximum** | | **8.40** | **0.6** | | **2.1** | | **1.2** | |
| **Average** | | **1.73** | **0.4** | | **1.0** | | **0.6** | |
| **Standard Deviation** | | **0.48** | **0.1** | | **0.3** | | **0.3** | |
| **Subsurface Soil:** | | | | | | | | |
| **Minium** | | | | | **0.8** | | **0.2** | |
| **Maximum** | | | | | **1.6** | | **0.9** | |
| **Average** | **0-12** | **1.75** | **0.2** | | **1.1** | | **0.5** | |
| | **12-24** | **1.39** | **0.2** | | **1.0** | | **0.5** | |
| | **24-36** | **1.90** | **0.2** | | **0.8** | | **0.6** | |

Notes:
R-1: Nearest Residence. R-1, 2, 3, 4 and 5: Rn-222 and Gamma Monitoring Locations.
*Reporting Limit: 0.50.
SS: Surface Soil.
SB: Subsurface Soil.
LAS: License Area Sample.
ND: Not Detected
See Exhibit D11-2 for sample site locations.
**Values for LAS-2 appear to be anomalies and were not used in the statistics.

Radiological background levels were measured at 26 different sediment sample sites at the Hank Unit. Table D11-4 Radiological Background in Sediment - Hank Unit summarizes the individual values and provides basic statistical information (minimum, maximum, average and standard deviation). Sample site SD-25 has a Pb-210 value (2.5 pCi/g) that is a few times higher than normal background but the rest of the sites are typical of what one would normally expect to find.

Table D11-4 Radiological Background in Sediment - Hank Unit.

| | Uranium mg/kg* | Pb-210 pCi/g | Precision Plus/Minus | Ra-226 pCi/g | Precision Plus/Minus | Th-230 pCi/g | Precision Plus/Minus |
|---|---|---|---|---|---|---|---|
| SD-1 | 2.8 | ND | | 1.3 | 0.2 | 0.7 | 0.1 |
| SD-2 | 3.5 | ND | | 1.1 | 0.2 | 0.5 | 0.1 |
| SD-3 | 2.5 | 0.4 | 0.2 | 1.0 | 0.2 | 0.6 | 0.1 |
| SD-4 | 1.3 | 0.5 | 0.2 | 1.1 | 0.2 | 0.6 | 0.1 |
| SD-5 | 1.8 | 1.8 | 0.3 | 1.0 | 0.2 | 0.6 | 0.1 |
| SD-6 | 1.8 | 0.7 | 0.2 | 1.6 | 0.2 | 0.8 | 0.1 |
| SD-7 | 2.6 | ND | | 1.4 | 0.2 | 0.8 | 0.1 |
| SD-8 | 3.1 | 0.6 | 0.1 | 1.4 | 0.2 | 0.7 | 0.1 |
| SD-9 | 2.7 | 0.9 | 0.1 | 1.6 | 0.2 | 1.0 | 0.2 |
| SD-10 | 2.6 | 0.6 | 0.1 | 0.8 | 0.2 | 0.5 | 0.1 |
| SD-11 | 2.5 | ND | | 1.1 | 0.2 | 0.5 | 0.1 |
| SD-12 | 2.1 | ND | | 1.2 | 0.2 | 0.7 | 0.1 |
| SD-13 | 1.91 | ND | | 0.9 | 0.2 | 0.5 | 0.2 |
| SD-14 | 2.80 | ND | | 1.4 | 0.2 | 0.6 | 0.2 |
| SD-15 | 2.92 | ND | | 2.2 | 0.2 | 0.6 | 0.2 |
| SD-16 | 2.52 | ND | | 1.0 | 0.2 | 0.3 | 0.1 |
| SD-17 | 1.98 | ND | | 1.0 | 0.2 | 0.5 | 0.1 |
| SD-18 | 3.46 | ND | | 1.2 | 0.2 | 0.9 | 0.2 |
| SD-19 | 2.23 | ND | | 0.9 | 0.2 | 0.3 | 0.1 |
| SD-20 | 1.85 | ND | | 0.8 | 0.2 | 0.2 | 0.1 |
| SD-21 | 2.17 | ND | | 1.2 | 0.2 | 0.4 | 0.1 |
| SD-22 | 3.74 | ND | | 1.9 | 0.2 | 1.1 | 0.2 |
| SD-23 | 1.91 | ND | | 1.3 | 0.2 | 1.0 | 0.2 |
| SD-24 | 2.08 | ND | | 0.9 | 0.2 | 0.3 | 0.1 |
| SD-25 | 1.18 | 2.5 | 0.5 | 1.0 | 0.2 | 0.6 | 0.1 |
| SD-26 | 1.79 | ND | | 1.0 | 0.2 | 0.4 | 0.2 |
| **Minium** | **1.18** | **ND** | | **0.8** | | **0.2** | |
| **Maximum** | **3.74** | **2.5** | | **2.2** | | **1.1** | |
| **Average** | **2.38** | **1.0** | | **1.2** | | **0.6** | |
| **Standard Deviation** | **0.65** | **0.7** | | **0.3** | | **0.2** | |

Notes:
SD: Sediment.
*Reporting Limit: 0.50.
ND: Not Detected.
See Exhibit D11-2 for sample locations.

## D11.2 BASELINE GAMMA SURVEY

### D11.2.1 Purpose and Procedure

The purpose of a gamma survey is the same as it is for establishing other radiological levels; namely to characterize baseline conditions. Baselines serve as a backdrop against which operational impacts can be measured.

The gamma survey that was performed for the project site differs in pattern from the survey described in Regulatory Guide 4.14. The layout of the pattern given in the guide is based on a conventional mine and mill, which have significant particulate source terms. Particulate sources at ISR facilities are negligible. Because of the vast difference between ISR and conventional mining and milling, a procedure was developed to measure baseline gamma levels in a more concentrated pattern in the areas where operational activities will occur. Since the operational areas are the most likely targets for potential impacts, these areas were given a higher degree of sampling. Referring back to the discussion in the soils section, it was noted that potential impacts on soils and sediments from ISR operations is attributed to accidental spills from pipeline breaks or leaks.

This aspect of potential impact played a major part in the baseline sampling pattern for soils, sediments and gamma. In addition to the large number of gamma readings taken throughout the future production area and process site, readings were also taken in the drainages passing through the license area; at the nearest residence; and near the license boundary. Exhibit D11-3 (see map pocket), Nichols Ranch Unit - Gamma Sample Location Map, shows the sample sites within and near the license boundary.

### D11.2.2 Survey Methodology

A Ludlum Model 19 μR Survey Meter was the instrument used in the gamma survey. The calibration date on the meter for the June 2007 survey was June 8, 2007. As described in the soils section of the application, a sample site map was developed prior to conducting the survey.

Gamma measurements were recorded by holding the meter at waist level and slowly passing it over each soil/sediment sample point and over the area proximate to the sample location.

**D11.2.3 Nichols Ranch Unit Results**

Table D11-5 summarizes the gamma readings and cross-references the gamma sites with the soil and sediment sample locations. A total of 57 gamma measurements were taken over an area of approximately 116 acres. The 116 acre-area consisted of the future production areas (113 acres) and the plant site (3 acres). On a per acre basis, the density of the survey was 1 reading per 2 acres.

As can be readily seen from Table D11-5, gamma readings are for the most part tightly grouped between 12 to 13 μR/hr. The average, minimum and maximum values are not unusual for this part of the U.S. To illustrate, the values recorded at the Nichols Ranch Unit are very much in line with earlier surveys completed at nearby North Butte. In brief, the detailed gamma survey completed at the North Butte ISL project site in 1979 was compared to a verification survey conducted by Uranerz in 1992. The mean gamma reading in the verification study was 11.7 μR/hr and the range was 11 to 13 μR/hr. These values were consistent with the North Butte survey. When compared to the average natural background range for the U.S. (8 to 15 μR/hr), it can be seen that the Nichols project site falls near the high end of the average.

There are a few sites with slightly elevated gamma levels of 15 μ R/hr. Some of the 15 μ R/hr values correspond with some of the soil and sediments sites that had elevated levels of Ra-226. For example, SS-21 has a radium value of 2.4 pCi/g; SD-8 radium is 32 pCi/g; and SD-9 radium is 23.5 pCi/g.

Table D11-5 Nichols Ranch Unit Gamma/Soil and Sediment Sample Locations.

| Sample Site | µR/hr | Gamma Site |
|---|---|---|
| R-1 Dry Fork Ranch | 13 | G-54 |
| R-2 | 14 | G-55 |
| R-3 | 12 | G-56 |
| R-4 | 13 | G-57 |
| | | |
| SS-6 Nichols URZ | 15 | G-45 |
| SS-7 Nichols URZ | 15 | G-40 |
| SS-8 Nichols URZ | 12 | G-36 |
| SS-9 Nichols URZ | 12 | G-32 |
| SS-10 Nichols URZ | 13 | G-20 |
| SS-11 Nichols URZ | 13 | G-17 |
| SS-12 Nichols URZ | 14 | G-14 |
| SS-13 Nichols URZ | 13 | G-12 |
| SS-14 Nichols URZ | 13 | G-11 |
| SS-15 Nichols URZ | 13 | G-8 |
| SS-16 Nichols URZ | 13 | G-7 |
| SS-17 Nichols URZ | 13 | G-5 |
| SS-18 Nichols URZ | 13 | G-4 |
| SS-19 Nichols URZ | 14 | G-1 |
| SS-20 Nichols URZ | 12 | G-2 |
| SS-21 Nichols URZ | 15 | G-6 |
| SS-22 Nichols URZ | 13 | G-9 |
| SS-23 Nichols URZ | 12 | G-13 |
| SS-24 Nichols URZ | 11 | G-16 |
| SS-25 Nichols URZ | 12 | G-18 |
| SS-26 Nichols URZ | 13 | G-24 |
| SS-27 Nichols URZ | 13 | G-33 |
| SS-28 Nichols URZ | 12 | G-37 |
| SS-29 Nichols URZ | 14 | G-41 |
| SS-30 Nichols URZ | 13 | G-47 |
| | | |
| LAS-1 Nichols URZ | 12 | G-21 |
| LAS-2 Nichols URZ | 11 | G-23 |
| LAS-3 Nichols URZ | 13 | G-35 |
| LAS-4 Nichols URZ | 13 | G-44 |
| LAS-5 Nichols URZ | 13 | G-51 |
| LAS-6 Nichols URZ | 13 | G-46 |
| LAS-7 Nichols URZ | 14 | G-38 |
| LAS-8 Nichols URZ | 13 | G-25 |

Table D11-5 (Continued)

| Sample Site | | Gamma Site |
|---|---|---|
| SB-4 Nichols URZ | 12 | G-3 |
| SB-5 Nichols URZ | 11 | G-26 |
| SB-6 Nichols URZ | 12 | G-43 |
| SB-7 Nichols URZ | 13 | G-42 |
| SB-8 Nichols URZ | 13 | G-22 |
| | | |
| **Plant Site:** | | |
| Center | 13 | G-29 |
| Northwest | 13 | G-27 |
| Northeast | 13 | G-28 |
| Southeast | 13 | G-31 |
| Southwest | 13 | G-30 |
| **Minimum** | **11** | |
| **Maximum** | **15** | |
| **Average** | **13** | |
| **Standard Deviation** | **1** | |
| | | |
| SD-1 Nichols URZ | 13 | G-53 |
| SD-2 Nichols URZ | 13 | G-10 |
| SD-3 Nichols URZ | 12 | G-15 |
| SD-4 Nichols URZ | 13 | G-19 |
| SD-5 Nichols URZ | 13 | G-39 |
| SD-6 Nichols URZ | 11 | G-34 |
| SD-7 Nichols URZ | 14 | G-48 |
| SD-8 Nichols URZ | 15 | G-49 |
| SD-9 Nichols URZ | 15 | G-50 |
| SD-10 Nichols URZ | 13 | G-52 |
| **Minimum** | **11** | |
| **Maximum** | **15** | |
| **Average** | **13** | |
| **Standard Deviation** | **1** | |

Notes:
R-1through R-4 are the locations of the baseline Rn-222 and Gamma monitors.
SS: Surface Soil Site.
SB: Subsurface Soil Site.
SD: Sediment Sample Site.
LAS: License Area Sample.
See Exhibits D-11-1 and D11-3 for sample site locations.

Although it is well known that gamma readings taken with a general survey-type meter do not have a high degree of correspondence with chemically measured radium content, a higher-than-background gamma reading (usually 2.5 to 3 times background) can serve as a first level screening test for detecting sites that might have elevated levels of radionuclides. In summary, the density of the survey and its consistent values provide reasonable assurance that a representative baseline was established.

### D11.2.4 Hank Unit Results

Table D11-6 summarizes the gamma readings and cross-references the gamma sites with the soil and sediment sample locations. A total of 86 gamma readings were recorded across the site (see Exhibit D11-4). Although the survey was designed to thoroughly characterize baseline conditions in the areas where activities will occur (production areas and process facility site), it also provided background levels for sites at the license boundary, nearest residence and numerous stream courses passing through and near the site. Based on the approximate 156 acres in the production areas and the 3-acre process facility site, the resulting survey density is 1 reading per 2 acres.

Table D11-6 Hank Unit Gamma/Soil and Sediment Sample Locations.

| Sample Site | µR/hr | Gamma Site |
|---|---|---|
| R-1 Pfsister Ranch Hank URZ | 13 | G-82 |
| R-2 | 13 | G-83 |
| R-3 | 12 | G-84 |
| R-4 | 11 | G-85 |
| R-5 | 14 | G-86 |
| | | |
| SS-6 Hank URZ | 15 | G-5 |
| SS-7 Hank URZ | 15 | G-7 |
| SS-8 Hank URZ | 12 | G-9 |
| SS-9 Hank URZ | 12 | G-10 |
| SS-10 Hank URZ | 14 | G-11 |
| SS-11 Hank URZ | 13 | G-14 |
| SS-12 Hank URZ | 13 | G-15 |
| SS-13 Hank URZ | 13 | G-20 |
| SS-14 Hank URZ | 13 | G-21 |
| SS-15 Hank URZ | 13 | G-23 |
| SS-16 Hank URZ | 13 | G-28 |
| SS-17 Hank URZ | 12 | G-32 |
| SS-18 Hank URZ | 13 | G-40 |
| SS-19 Hank URZ | 13 | G-41 |
| SS-20 Hank URZ | 14 | G-44 |
| SS-21 Hank URZ | 14 | G-48 |
| SS-22 Hank URZ | 14 | G-50 |
| SS-23 Hank URZ | 12 | G-52 |
| SS-24 Hank URZ | 14 | G-53 |
| SS-25 Hank URZ | 12 | G-81 |
| SS-26 Hank URZ | 13 | G-57 |
| SS-27 Hank URZ | 12 | G-61 |
| SS-28 Hank URZ | 13 | G-62 |
| SS-29 Hank URZ | 14 | G-64 |
| SS-30 Hank URZ | 13 | G-66 |
| SS-31 Hank URZ | 13 | G-67 |
| SS-32 Hank URZ | 14 | G-68 |
| SS-33 Hank URZ | 15 | G-71 |
| SS-34 Hank URZ | 13 | G-75 |
| SS-35 Hank URZ | 13 | G-76 |
| | | |
| LAS-1 Hank URZ | 14 | G-17 |
| LAS-2 Hank URZ | 18 | G-25 |
| LAS-3 Hank URZ | 13 | G-18 |
| LAS-4 Hank URZ | 12 | G-24 |
| LAS-5 Hank URZ | 13 | G-30 |
| LAS-6 Hank URZ | 13 | G-31 |

Table D11-6 (Continued)

| Sample Site | µR/hr | Gamma Site |
|---|---|---|
| LAS-7 Hank URZ | 11 | G-46 |
| LAS-8 Hank URZ | 12 | G-42 |
| LAS-9 Hank URZ | 14 | G-59 |
| LAS-10 Hank URZ | 13 | G-47 |
| LAS-11 Hank URZ | 15 | G-55 |
| LAS-12 Hank URZ | 13 | G-43 |
| LAS-13 Hank URZ | 14 | G-34 |
| LAS-14 Hank URZ | 14 | G-29 |
| | | |
| SB-4 | 16 | G-6 |
| SB-5 | 12 | G-16 |
| SB-6 | 13 | G-33 |
| SB-7 | 14 | G-51 |
| SB-8 | 12 | G-65 |
| SB-9 | 13 | G-77 |
| | | |
| **Plant Site:** | | |
| Center | 13 | G-37 |
| Northwest | 15 | G-35 |
| Northeast | 13 | G-36 |
| Southeast | 13 | G-39 |
| Southwest | 13 | G-38 |
| **Minimum** | **11** | |
| **Maximum** | **18** | |
| **Average** | **13** | |
| **Standard Deviation** | **1** | |
| | | |
| SD-1 Hank URZ | 14 | G-1 |
| SD-2 Hank URZ | 16 | G-3 |
| SD-3 Hank URZ | 14 | G-2 |
| SD-4 Hank URZ | 11 | G-4 |
| SD-5 Hank URZ | 13 | G-12 |
| SD-6 Hank URZ | 13 | G-13 |
| SD-7 Hank URZ | 15 | G-8 |
| SD-8 Hank URZ | 15 | G-19 |
| SD-9 Hank URZ | 14 | G-22 |
| SD-10 Hank URZ | 14 | G-27 |
| SD-11 Hank URZ | 15 | G-26 |
| SD-12 Hank URZ | 14 | G-80 |
| SD-13 Hank URZ | 16 | G-49 |
| SD-14 Hank URZ | 13 | G-45 |
| SD-15 Hank URZ | 18 | G-54 |
| SD-16 Hank URZ | 17 | G-58 |

Table D11-6 (Continued)

| Sample Site | µR/hr | Gamma Site |
|---|---|---|
| SD17 Hank URZ | 15 | G-60 |
| SD-18 Hank URZ | 17 | G-56 |
| SD-19 Hank URZ | 16 | G-63 |
| SD-20 Hank URZ | 15 | G-70 |
| SD-21 Hank URZ | 17 | G-72 |
| SD-22 Hank URZ | 16 | G-73 |
| SD-23 Hank URZ | 14 | G-69 |
| SD-24 Hank URZ | 14 | G-74 |
| SD-25 Hank URZ | 13 | G-79 |
| SD-26 Hank URZ | 13 | G-78 |
| **Minimum** | **11** | |
| **Maximum** | **18** | |
| **Average** | **15** | |
| **Standard Deviation** | **2** | |

Notes:
R-1 through R-5 are the locations of the baseline Rn-222 and Gammma monitors.
SS: Surface Soil Site.
SB: Subsurface Soil Site.
SD: Sediment Sample Site.
LAS: License Area Site.
See Exhibits D11-2 and D11-4 for sample site locations.

As can be seen from Table D11-6, gamma readings do not vary significantly across the area. However, there are a few sites with elevated gamma (16 to 18 µ R/hr levels). Comparing the elevated gamma levels with the soil and sediment analyses show some correspondence. Sample site LAS-2, for example, has the highest gamma level of 18 µ R/hr and it also has the highest U (8.4 mg/kg), Pb-210 (1.2 pCi/g), Ra-226 (3.8 pCi/g) and Th-230 (2.5 pCi/g) values.

As shown below, the minimum, maximum and average values recorded at the Hank Unit compare favorably with those measured at the Nichols Ranch Unit.

| | Nichols Ranch Unit (µR/hr) | Hank Unit (µR/hr) |
|---|---|---|
| Minimum | 11 | 11 |
| Maximum | 15 | 18 |
| Average | 13 | 13 |

Between the Hank Unit and the Nichols Ranch Unit, there are 143 gamma sample points. With a combined area of 275 acres (production areas and plant site areas), the overall survey density is 1 sample per 2 acres. This density, coupled with the close agreement between the measurements taken at both sites, provides a good baseline for gamma levels.

## D11.3 BASELINE RADON-222 AND DIRECT GAMMA EXPOSURE RATES

### D11.3.1 Purpose and Procedure

As noted in the discussion on soil and sediment baseline sampling, ISR operations do not generate significant levels of particulates, but they do have Rn-222 emissions, which include radon daughter products with varying half-lives. For this reason, ambient baseline Rn-222 levels should be established. In establishing the baseline, the monitoring procedure outlined in Regulatory Guide 4.14 was followed, and it involved deploying Rn-222 detectors and gamma dosimeters at suggested locations.

### D11.3.2 Survey Methodology

The detectors that were used in the one-year monitoring program were Landauer Extra Sensitive Outdoor Rn-222 Detectors and X-9 Gamma Dosimeters. Prior to installing the detectors, the prevailing wind direction was obtained from the National Climatic Data Center for Gillette. The data covered a period from 1996 through 2005. Data from this period was compared to data from Casper and to a data collected between 1978 and 1979 by AeroVironment for Cleveland Cliffs Iron Company (CCI), who operated a meteorological station near North Butte (Pathfinder Mines Corporation, 1988). CCI's baseline data was used in support of their NRC license application for the North Butte ISL Project. A comparison of the databases showed that Casper has a stronger southwest/west-southwest/south-southwest component, while North Butte and Gillette have a component from the south/southwest/southeast.

The detectors were deployed and retrieved at the same time for each location. Exposure time was on a quarterly basis. Detector locations included: (1) the nearest residence or structure that

could be occupied; (2) locations at or near the license boundary; and (3) a control point to reflect background (upwind of the site). Exhibits D11-3 and D11-4 show the locations of the Rn-222 and gamma dosimeters.

Given that the prevailing wind direction is from the south, two monitoring stations were placed in the northern parts of both sites (see previously referenced Exhibits D11-3 and D11-4 [see map pocket). In contrast, control detectors were placed in the extreme southern parts of the license areas. During operations, the downwind monitors will reflect the maximum change from baseline while the control detectors will measure the minimum change. In addition to these placements, two monitors were placed near the license boundary on the east and west side of the Hank Unit and one was placed at a nearest residence (Dry Fork Ranch), which is approximately 1.3 mi to the southwest of the process facility location.

**D11.3.3 Nichols Ranch Unit Results**

The one-year monitoring results are given in Table D11-7. A comparison of the values shows background levels to be within the expected range. When compared to historical radon levels measured over a one year period (1988-1989) at the nearby North Butte Project site, it can be seen that values at Nichols are not surprisingly different. North Butte's annualized average was 0.8 pCi/l compared to Nichols' 1.2 pCi/l average. Because radon levels are known to vary widely from place to place, the difference between 0.8 pCi/l and 1.2 pCi/l is not significant. It must also be remembered that some of difference between the two annual averages can be attributed to the detectors. Significant improvements have been made in this area over the past 10 years. As noted above, Extra Sensitive detectors were used in the monitoring program at the Nichols and Hank Units. Differences in the prevailing weather conditions at the two sites would also play a role in the background concentrations.

Both sites have ambient radon levels that are much above the U.S. average. According to EPA, the U.S. outdoor average radon concentration is 0.4 pCi/l. The higher-than-background levels are not surprising given that with the exception of two counties, Weston and Platte, indoor radon

Table D11-7 Ambient Radon-222 Levels - Nichols Ranch Unit.

| | | Fourth Quarter (10/06 to 1/07) pCi/l | First Quarter (1/07 to 3/07) pCi/l | Second Quarter (4/07 to 7/07) pCi/l | Third Quarter (7/07 to 10/07) pCi/l |
|---|---|---|---|---|---|
| R-1 | Nearest Residence | 1.2 | 0.7 | 0.9 | 1.1 |
| R-2 | Upwind Control | 0.9 | 0.8 | 1.1 | 1.7 |
| R-3 | Downwind Boundary | 0.6 | 27.7* | 2.3 | 1.4 |
| R-4 | Downwind Boundary | 0.7 | 0.8 | 1.9 | 1.4 |
| Site Averages | | 0.9 | 0.8 | 1.6 | 1.4 |

1. *The adhesive that holds the detector within the protective housing failed and the detector was found on the ground. The anomalous value was not used in the average.
2. The annualized average for all sites combined is 1.2 pC/l.
3. The annualized average measured between 1988 and 1989 at the nearby North Butte; Project was 0.8 pCi/l.
4. The U.S. average outdoor Rn-222 level is 0.4 pCi/l (U.S. EPA).

levels in Wyoming are at or above the EPA Action Level of 4 pCi/l (EPA, 2007). The indoor average for the U.S. is 1.3 pCi/l--this puts Wyoming at 3 times the average.

Background gamma exposure rates from the one year monitoring program are summarized in Table D11-8. The averages range from 35 mrem to 48 mrem. When compared to the gamma survey results from the North Butte Project mentioned earlier, the values are similar. The North Butte quarterly averages ranged from 32.3 mrem to 39.7 mrem. To put these values into perspective, the following exposure rates are given.

- Average dose to the U.S. Public from natural sources: 300 mrem.
- Background radiation (total) in the Colorado Plateau: 75 to 140 mrem.
- Terrestrial background (Rock Mountains): 40 mrem.
- Average dose to the public from all sources: 360 mrem.

Table D11-8 Background Gamma Exposure Rate - Nichols Ranch Unit.

| | | Fourth Quarter (10/06 to 1/07) mrems | First Quarter (1/07 to 3/07) mrems | Second Quarter (4/07 to 7/07) mrems | Third Quarter (7/07 to 10/07) mrems |
|---|---|---|---|---|---|
| R-1 | Nearest Residence (Dry Fork Ranch) | 34.7 | 41.1 | 49.3 | 37.4 |
| R-2 | Downwind Boundary (Northwest) | 36.4 | 41.9 | 48.2 | 38.0 |
| R-3 | Boundary (Northeast) | 35.2 | 49.4 | 41.1 | 39.1 |
| R-4 | Upwind Control (South) | 33.6 | 57.6 | 52.8 (LP) | 44.0 |
| Site Averages | | 35.0 | 47.5 | 47.9 | 39.6 |

Notes: LP: Low energy photon.

## D11.3.4 Hank Unit Results

Not unexpectedly, Rn-222 levels measured at the Hank Unit match up well with those just discussed for the Nichols Ranch Unit. The one high value (9.2 pCi/l) was caused by the detector being on the ground for some unknown period of time. This value was not used in calculating the average shown on Table D11-9.

Table D11-9 Ambient Radon-222 Levels - Hank Unit.

| | | Fourth Quarter (10/06 to 1/07) pCi/l | First Quarter (1/07 to 3/07) pCi/l | Second Quarter (4/07 to 7/07) pCi/l | Third Quarter (7/07 to 10/07) pCi/l |
|---|---|---|---|---|---|
| R-1 | Nearest Residence | 1.2 | 1.2 | 1.4 | 2.2 |
| R-2 | Downwind Boundary | 0.4 | 0.6 | 0.7 | 3.4 |
| R-3 | Boundary | 0.5 | 0.3 | 0.9 | 1.4 |
| R-4 | Upwind Control | 0.3 | 9.2* | 1.0 | 1.0 |
| R-5 | Boundary | 0.4 | 0.5 | 0.8 | 1.7 |
| Site Averages | | 0.6 | 0.6 | 1.0 | 1.9 |

Notes:
1. *The adhesive that holds the detector within the protective housing failed and the detector was found on the ground. The anomalous value was not used in the average.
2. The annualized average for all sites combined is 1.0 pC/l.
3. The annualized average measured between 1988 and 1989 at the nearby North Butte; Project was 0.8 pCi/l.
4. The U.S. average outdoor Rn-222 level is 0.4 pCi/l (U.S. EPA).

Table D11-10 Background Gamma Exposure Rate - Hank Unit.

| | | Fourth Quarter (10/06 to 1/07) mrems | First Quarter (1/07 to 3/07) mrems | Second Quarter (4/07 to 7/07) mrems | Third Quarter (7/07 to 10/07) mrems |
|---|---|---|---|---|---|
| R-1 | Nearest Residence (Pfister Ranch) | 33.5 | 39.0 | 45.1 | H |
| R-2 | Downwind Boundary (North) | 33.5 | 50.0 (LP) | 49.9 | H |
| R-3 | Boundary (Northwest) | 33.5 | 40.5 | 53.9 | 44.0 |
| R-4 | Upwind Control (South) | 34.1 | 114.5 (LP) | 51.8 | 39.1 |
| R-5 | Boundary (Southeast) | 37.5 | 31.3 | 52.0 | 41.4 |
| Site Averages | | 34.4 | 55.0 | 50.5 | 41.5 |

Notes: LP = Low energy photon

## D11.4 FLORA AND FAUNA

### D11.4.1 Purpose and Procedure

The purpose of establishing baseline radiological conditions prior to initiating operations is to have a reference for comparing potential impacts. When designing a pre-operational baseline sampling program, the operational features of the activity should be kept in mind. In other words, particular attention should be given to the pathways through which contaminants could enter the environment. In developing the baseline sampling program, pathways were considered in conjunction with guidance given in Regulatory Guide 4.14.

According to Section 2.1.4 in Regulatory Guide 4.14, vegetation, food and fish samples should be collected if, in individual licensing cases, a significant pathway to man is identified. As discussed in Sections D11.1.1 and D11.5, pathways for radiological contaminants to enter the environment from modern ISR operations have been markedly reduced or virtually eliminated. ISR operations do not have fluid discharges nor do they generate significant particulate emissions. The main avenue for radiological constituents to enter the environment is limited to

the emission of Rn-222. Because emissions are restricted to nearly-particulate-free Rn-222, significant build up of radionuclides in soil, vegetation and other media is not likely to occur. The minimal accumulation of radionuclides is supported by MILDOS modeling results, and is borne out in operational monitoring data that had been collected at various ISR facilities over the past 25 years.

The baseline sampling program was modified somewhat from the guidance given in Regulatory Guide 4.14. Departure from the guide is discussed in the Methods Section below. While developing the pre-operational baseline studies, it was understood through experience and through the evolution of ISR, that pathways to flora and fauna and hence to human populations are not significant. The reasons supporting this assertion were given above and are discussed in other sections of this application.

Even though potential impacts from ISR operations on flora, fauna and the food chain have been shown to be insignificant, good baseline characterizations continue to be an important part of a RML application. Measured baseline values can be compared to values during actual operations to validate the minimal to no-impact prediction of the MILDOS model. Additionally, having baseline data to compare with values recorded during operations, underscores the fact that modern ISR activities do not have a significant impact on human health and the environment. Following is a description of the baseline sampling program that was performed at the Nichols Ranch Unit and the Hank Unit.

## D11.4.2 Methods

Regulatory Guide 4.14 suggests that vegetation, crops, livestock and fish samples should be collected and analyzed for Ra-226 and Pb-210. According to the field reconnaissance, no permanent surface water exists at or immediately adjacent to the sites. Given the absence of water, fish too are absent. The sites were surveyed for the presence a crop-growing areas and none was found. Agricultural activities appear to be limited to cattle grazing. Although the guide suggests sacrificing livestock to obtain samples, it is Uranerz's opinion that this is not necessary for ISR operations. To reiterate, ISR operations do not cause significant build up of

radionuclides in soil or vegetation and therefore a significant pathway for exposure does not exist. In addition, since operational monitoring will include routine sampling of vegetation, food crops (if they are grown in the area) and grazing/forage foods, a mechanism will be in place to monitor this pathway to local fauna.

Given this setting, baseline sampling included samples from grazing areas and vegetation from the nearest residences and Rn-222/gamma monitoring locations. Grab samples were collected in mid-August. While collecting the samples, care was taken to clip the vegetation approximately one inch above the ground to avoid mixing with surface soil. Samples were placed in large plastic bags and transported to the laboratory with 24 hours of collection. All samples were analyzed for Ra-226, Pb-210, Po-210, Th-230, Uranium, Arsenic and Selenium.

### D11.4.3 Nichols Ranch Unit Results

Table D11-11 summarizes the radiological and nonradiological (arsenic and selenium) background concentrations found in the samples. Although there is the usual variation in concentrations for the radiometric parameters, the values are within normal background ranges. The same generalization can be made for the arsenic and selenium values.

### D11.4.4 Hank Unit Results

Background values for the Hank Unit are given in Table D11-12. A comparison of the concentrations with those reported for the Nichols Ranch Unit shows a great deal of consistency. In brief, the values are not unusual for baseline conditions.

## D11.5 MILDOS

Release rates of airborne radioactivity were estimated for the Nichols Ranch ISR Project. Dose commitments received by individuals and the general population within an 80 km radius of site were estimated from atmospheric dispersal of such radioactivity with respect to regional meteorological data. Only airborne releases of radon are considered. Particulate emissions are

Table D11-11 Radiological and Nonradiological Background Levels in Vegetation Nichols Ranch Unit.

| | Radiological Elements | | | | |
|---|---|---|---|---|---|
| Sample Location | Ra-226 (µCi/kg) | Pb-210 (µCi/kg) | Po-210 (µCi/kg) | Th-230 (µCi/kg) | Uranium (µCi/kg) |
| R-1 Dry Fork Ranch | 3.7E-04 | 4.2E-04 | 9.3E-05 | 3.7E-06 | 1.1E-04 |
| +/- | 5.1E-06 | 2.9E-05 | 2.7E-05 | 1.8E-06 | 4.6E-07* |
| R-2 Control Upwind | 8.8E-05 | 4.5E-04 | 1.5E-04 | 2.8E-06 | 6.6E-05* |
| +/- | 6.0E-06 | 2.3E-05 | 2.3E-05 | 4.2E-06 | 3.0E-07* |
| R-3 Downwind NE | 1.4E-04 | 7.5E-04 | 1.1E-04 | 3.6E-05 | 9.5E-05* |
| +/- | 8.0E-06 | 3.0E-05 | 2.3E-05 | 4.4E-04 | 3.3E-07* |
| R-4 Downwind NW | 2.7E-04 | 6.6E-04 | 9.9E-05 | 1.4E-04 | 2.4E-04* |
| +/- | 1.1E-05 | 2.6E-04 | 2.2E-05 | 9.9E-06 | 2.8E-07* |
| Grazing Area | 6.7E-05 | 4.3E-04 | 7.2E-05 | 2.4E-05 | 8.3E-05* |
| +/- | 4.2E-06 | 1.8E-05 | 1.7E-05 | 3.6E-05 | 2.1E-07* |

| | Non-radiological Elements | | | |
|---|---|---|---|---|
| Sample Location | c (mg/kg-dry) | RL* | m (mg/kg-dry) | RL* |
| R-1 Dry Fork Ranch | ND | 0.5 | ND | 0.5 |
| R-2 Control Upwind | ND | 0.5 | ND | 0.5 |
| R-3 Downwind NE | 1.0 | 0.5 | 0.7 | 0.5 |
| R-4 Downwind NW | 0.7 | 0.5 | 1.3 | 0.5 |
| Grazing Area | ND | 0.5 | 1.2 | 0.5 |

Notes: *RL is the reporting limit for U.
+/- is the counting error.

Table D11-12 Radiological and Non-radiological Background Levels in Vegetation Hank Unit.

| | Radiological Elements | | | | |
|---|---|---|---|---|---|
| Sample Location | Ra-226 (µCi/kg) | Pb-210 (µCi/kg) | Po-210 (µCi/kg) | Th-230 (µCi/kg) | Uranium (µCi/kg) |
| R-1 Pfister Ranch | 7.5E-05 | 4.0E-04 | 4.1E-05 | 2.3E-06 | 4.5E-05 |
| +/- | 5.7E-06 | 2.1E-05 | 1.3E-05 | 3.6E-06 | 2.8E-07* |
| R-2 Downwind | 4.6E-05 | 5.8E-04 | 2.9E-05 | 2.0E-05 | 4.9E-05* |
| +/- | 2.0E-06 | 2.1E-05 | 8.5E-06 | 4.5E-06 | 2.1E-07* |
| R-3 West Boundary | 6.3E-05 | 2.5E-04 | 1.5E-04 | 6.8E-06 | 1.5E-05* |
| +/- | 6.1E-06 | 2.1E-05 | 2.9E-05 | 2.1E-06 | 3.9E-07* |
| R-4 Control South | 7.3E-05 | 2.6E-04 | 4.9E-05 | 2.4E-05 | 4.5E-05* |
| +/- | 5.4E-06 | 1.8E-05 | 1.3E-05 | 4.2E-06 | 2.8E-07* |
| R-5 East Boundary | 9.6E-05 | 5.9E-04 | 1.1E-04 | 3.5E-05 | 7.1E-07* |
| +/- | 6.9E-06 | 2.8E-05 | 2.8E-05 | 4.9E-06 | 3.4E-07 |
| Grazing Area | 6.7E-05 | 2.5E-04 | 5.9E-05 | 8.1E-06 | 4.0E-05* |
| +/- | 7.0E-06 | 2.4E-05 | 2.3E-05 | 2.7E-06 | 4.5E-07* |

| | Non-radiological Elements | | | |
|---|---|---|---|---|
| Sample Location | Arsenic (mg/kg-dry) | RL* | Selenium (mg/kg-dry) | RL* |
| R-1 Pfister Ranch | ND | 0.5 | 0.8 | 0.5 |
| R-2 Downwind | ND | 0.5 | 0.6 | 0.5 |
| R-3 West Boundary | 1.0 | 0.5 | ND | 0.5 |
| R-4 Control South | ND | 0.5 | ND | 0.5 |
| R-5 East Boundary | ND | 0.5 | 1.7 | 0.5 |
| Grazing Area | ND | 0.5 | 1.0 | 0.5 |

Notes: *RL is the reporting limit for U.
+/- is the counting error.

not considered since such releases are not expected under normal operating conditions for vacuum dryers.

The computer code MILDOS-Area (MILDOS) was used to calculate both the release rates (source terms) and the dose commitments. The dose commitments include contribution from each of the Nichols Ranch and Hank Unit sites. Extra-regional population doses are also estimated as a result of transport of radon. The results are provided as total effective dose equivalent per year.

### D11.5.1 Site Description

The physical description of the sites is provided in the Mine Plan. The location of the sites is described in Figure D11-1 (see map pocket). The dose estimates are provided for intervals, directions, and elevations relative to the drying/packaging location at the Nichols Ranch facility; this location is subsequently referred to as the Nichols Ranch Central Processing Plant (mill center).

### D11.5.2 Population Distribution

The population distribution within 80 km of the mill center is provided in Table D11-13. Figure D11-2 (see map pocket) shows the locations of the cities within 80 km of the mill center.

The population dose beyond 80 km is estimated using the code's predetermined population dose for year 1978. The population dose is adjusted for population growth by the ratio of estimated United States population for year 2000 of 268 million to the estimated United States population for year 1980 of 228 million, or 1.2.

Table D11-13 Population Distribution Within 80 km of Nichols Ranch Central Processing Plant.

| Cities Within 80 km of Mill Center | Population | Distance from Mill Center (km) | Direction from Mill Center |
|---|---|---|---|
| Gillette | 19,646 | 74 | NE |
| Kaycee | 249 | 56 | W |
| Midwest | 408 | 40 | SW |
| Edgerton | 169 | 37 | SW |
| Wright | 1,347 | 35 | E |

## D11.5.3 Individual Receptor Locations

The locations of the nearest residents to the Nichols Ranch Central Processing Plant are provided in Table D11-14. Locations of site boundaries to the Nichols Ranch Central Processing Plant are provided in Table D11-15. Figure D11-1 (see map pocket) shows the locations of the nearest residents to the mill center.

Table D11-14 Nearest Residents to Nichols Ranch Central Processing Plant.

| Nearest Residence | Number of Inhabitants | Distance from mill center km x(E) | Distance from mill center km y(N) | Elevation from mill center z m |
|---|---|---|---|---|
| T-Chair (Rolling Pin) Ranch | 5 | 3.7 | -2.2 | -7 |
| Dry Fork Ranch | 3 | -2.7 | -1.1 | -58 |
| Christensen Ranch | 1 | 1.8 | 7.8 | -1 |
| Pfister Ranch | 3 | 7.8 | 7.4 | 78 |
| Pumpkin Butte Ranch | 2 | 11.1 | 3.6 | 218 |
| Van Buggenum Ranch | 0 | 15.4 | 5.3 | 130 |
| Ruby Ranch | 2 | 19.0 | 2.9 | 101 |
| Hank Satellite Plant | 0 | 7.9 | 3.5 | 121 |

Table D11-15 Center of Site Boundary from Nichols Ranch Central Processing Plant.

| Location | Distance from mill center km x(E) | Distance from mill center km y(N) | Elevation from mill center z m |
|---|---|---|---|
| **Nichols Ranch** | | | |
| - north central | -0.4 | 1.3 | 57 |
| - east central | 0.6 | 0.2 | -2 |
| - south central | -0.3 | -1.1 | -18 |
| - west central | -1.4 | 0.5 | 12 |
| **Hank** | | | |
| - north central | 7.9 | 6.6 | 86 |
| - east central | 8.8 | 3.3 | 160 |
| - south central | 7.9 | 1.3 | 139 |
| - west central | 7.1 | 4.2 | 102 |

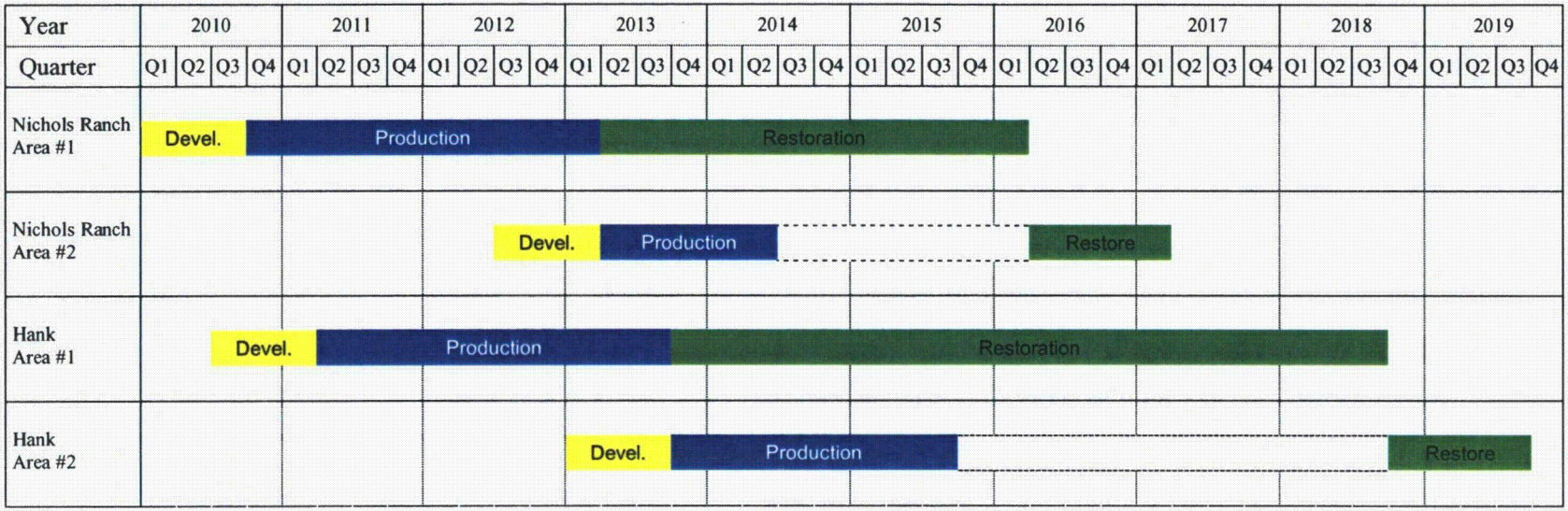
## D11.5.4 Time Parameters

The dose commitments were completed for development, production, and restoration of wellfields for the operating years 2011 through 2019. The respective schedule is provided in Table D11-16.

The time parameters were input as:

- Beginning Year: 2011.
- Number of Time Steps: 9.
- Time Increment: 1 year.
- Population Adjustment: 1.2 (see above "Population Distribution")
- Source Adjustment: varied per source to reflect development, production, and restoration schedule of Table D11-16.

Table D11-16 Development, Production, and Restoration Schedule.



## D11.5.5 Food Pathway Parameters

The MILDOS code requires four inputs to describe the feeding habits of livestock near the sites. The inputs used to describe the fraction of total annual livestock feed requirements are:

- Pasture Grass/Individual: 0.5 (default)
- Pasture Grass/Population: 0.5 (default)
- Hay/Individual: 0.5 (default)
- Hay/Population: 0.5 (default)

The MILDOS code also requires input of the areal food-production rate per unit area around the facility. The inputs used are:

- Vegetables: 3120 kg/y-m2
- Meat: 345 kg/y-m2
- Milk: 134 kg/y-m2

## D11.5.6 Meteorological Parameters

The meteorological parameters for the MILDOS code were input as:

- The annual average morning and afternoon mixing heights each as the code default of 100 m
- The Briggs height cutoff vertical dispersion coefficient as the code default of 50 m
- The fractional joint frequency distribution of wind speed, direction and stability for Gillette, Wyoming for years 1996 through 2005. Atmospheric stability class G was summed with class F.

## D11.5.7 Source Terms

The parameters and values used to develop the source terms and the resulting annual releases are listed in Tables D11-17 and D11-18 for Nichols Ranch and Hank Units, respectively. The respective source terms determined by MILDOS are included in these tables.

Table D11-17 MILDOS Input Parameters - Nichols Ranch Unit.

| | (values in gray are calculated by MILDOS)* | | |
|---|---|---|---|
| | **Common Parameters** (each wellfield) | Units | |
| Location | X (location relative to the plant which is considered (0,0,0) | -0.9 | km |
| | Y (location relative to the plant which is considered (0,0,0) | 0.4 | km |
| | Z (location relative to the plant which is considered (0,0,0) | 6 | m |
| | area of active drilling (ore zone) | 228644 | $m^2$ |
| | emanation fraction | 0.2 | |
| | Ra concentration in ore | 311 | pCi/g |
| | thickness | 2.2 | m |
| | density | 1.9 | g/cm3 |
| | porosity | 0.3 | |
| | fraction of Rn | 0.75 | |
| | rate of Rn venting | 0.01 | /d |
| | volume in circulation | 149068 519 | L |
| | **New Wellfield Source Parameters** (each wellfield) | | |
| Mud pits | storage time in pit | 30 | d |
| | ore material into pit | 136534 | g/y |
| | number of mud pits | 966 | |
| | Total amount of Rn-222 released from drilling activities | 0.045 | Ci/yr |
| | **Production Wellfield Source Parameters** (each wellfield) | | |
| Ore zone | Rn-222 source | 1.1 E+13 | pCi/d |
| Process water | treated water purge rate | 190779 | L/d |
| | Rn-222 release from purge water | 20 | Ci/yr |
| | Rn-222 release from well venting | 150 | Ci/yr |
| Ion exchange columns | column volume | 14158 | L |
| | column unloading rate | 2 | /d |
| | porosity of resin | 0.4 | |
| | Rn-222 release from ion exchange column | 1.2 | Ci/yr |
| | Total amount of Rn-222 released from production activities | 170 | Ci/yr |
| | **Restoration Wellfield Source Parameters** (each wellfield) | | |
| Ore zone | Rn-222 source | 1.1 E+13 | pCi/d |
| Process water | treated water purge rate | 310698 | L/d |
| | operating days | 360 | d/yr |
| | Rn-222 release from purge water | 31 | Ci/yr |
| | Rn-222 release from well venting | 150 | Ci/yr |
| | Total Rn-222 released from restoration activities | 180 | Ci/yr |

* Values may not sum within table due to rounding.

Table D11-18 MILDOS Input Parameters - Hank Unit.

| | (values in gray are calculated by MILDOS)* | | |
|---|---|---|---|
| | **Common Parameters** (each wellfield) | Units | |
| Location | X (location relative to the plant which is considered (0,0,0) | 8.2 | km |
| | Y (location relative to the plant which is considered (0,0,0) | 3.5 | km |
| | Z (location relative to the plant which is considered (0,0,0) | 142 | m |
| | area of active drilling (ore zone) | 313627 | $m^2$ |
| | emanation fraction | 0.2 | |
| | Ra concentration in ore | 277 | pCi/g |
| | thickness | 2.6 | m |
| | density | 1.9 | g/cm3 |
| | porosity | 0.3 | |
| | fraction of Rn | 0.75 | |
| | rate of Rn venting | 0.01 | /d |
| | volume in circulation | 245770913 | L |
| | **New Wellfield Source Parameters** (each wellfield) | | |
| Mud pits | storage time in pit | 30 | d |
| | ore material into pit | 160949 | g/y |
| | number of mud pits | 776 | |
| | Total amount of Rn-222 released from drilling activities | 0.038 | Ci/yr |
| | **Production Wellfield Source Parameters** (each wellfield) | | |
| Ore zone | Rn-222 source | 1.6 E+13 | pCi/d |
| Process water | treated water purge rate | 408813 | L/d |
| | Rn-222 release from purge water | 37 | Ci/yr |
| | Rn-222 release from well venting | 220 | Ci/yr |
| Ion exchange columns | column volume | 14158 | L |
| | column unloading rate | 2 | /d |
| | porosity of resin | 0.4 | |
| | Rn-222 release from ion exchange column | 1.0 | Ci/yr |
| | Total amount of Rn-222 released from production activities | 260 | Ci/yr |
| | **Restoration Wellfield Source Parameters** (each wellfield) | | |
| Ore zone | Rn-222 source | 1.6 E+13 | pCi/d |
| Process water | treated water purge rate | 119918 | L/d |
| | operating days | 360 | d/yr |
| | Rn-222 release from purge water | 11 | Ci/yr |
| | Rn-222 release from well venting | 220 | Ci/yr |
| | Total Rn-222 released from restoration activities | 230 | Ci/yr |

* Values may not sum within table due to rounding.

The fraction of radon attributable to the site was input as one for Casper, Wyoming.

A source term for release of particulates from drying and packaging activities was not developed since no particulate emissions are expected under normal operating conditions for vacuum dryers.

## D11.5.8 Results

Dose modeling was completed as described above for the primary years of operation of the Nichols Ranch ISR Project, Nichols Ranch and Hank sites. The operations modeled included wellfield development, production, and wellfield restoration. The source terms were adjusted to reflect actual periods of activity per year. The results of the dose modeling are summarized below with respect to the nearest residents, site boundaries, and the surrounding population. The 40 CFR 190 doses are zero because does from radon is excluded from the scope of the standard. The report of the MILDOS code execution is provided as Addendum D11A.

### D11.5.8.1 Individual Receptor Dose

Estimated annual doses at individual receptor locations are shown in Table D11-19. The estimated doses result exclusively from radon daughters, since there are no particulate releases from the facility. The total effective dose equivalent (TEDE) is at least 100 times less than the dose limit to individual members of the public in 10 CFR 20 of 100 mrem/y.

Estimated annual doses at site boundary locations are shown in Table D11-20. The estimated doses result exclusively from radon daughters, since there are no particulate releases from the facility. The total effective dose equivalent (TEDE) is substantially less than the dose limit to individual members of the public in 10 CFR 20 of 100 mrem/y.

Table D11-19 Summary of Total Effective Dose Equivalent to Individual Receptors, mrem/year.

| | Year | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Receptor | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
| T-Chair Ranch | 0.09 | 0.1 | 0.1 | 0.2 | 0.1 | 0.1 | 0.05 | 0.03 | 0.03 |
| Dry Fork Ranch | 0.04 | 0.04 | 0.06 | 0.07 | 0.05 | 0.04 | 0.02 | 0.01 | 0.008 |
| Christensen Ranch | 0.1 | 0.1 | 0.2 | 0.2 | 0.2 | 0.1 | 0.08 | 0.06 | 0.04 |
| Pfister Ranch | 0.4 | 0.5 | 0.6 | 0.9 | 0.8 | 0.4 | 0.4 | 0.04 | 0.3 |
| Pumpkin Butte Ranch | 0.3 | 0.4 | 0.5 | 0.7 | 0.6 | 0.4 | 0.3 | 0.3 | 0.2 |
| Van Buggenum Ranch | 0.09 | 0.1 | 0.1 | 0.2 | 0.2 | 0.1 | 0.09 | 0.08 | 0.06 |
| Ruby Ranch | 0.07 | 0.08 | 0.1 | 0.1 | 0.1 | 0.08 | 0.06 | 0.05 | 0.04 |

Table D11-20 Summary of Total Effective Dose Equivalent Site Boundary, mrem/year.

| | Year | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Boundary Location | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
| Nichols Ranch | | | | | | | | | |
| central | 1 | 1 | 2 | 2 | 2 | 2 | 0.4 | 0.03 | 0.02 |
| entral | 0.5 | 0.6 | 0.9 | 0.9 | 0.6 | 0.6 | 0.2 | 0.02 | 0.02 |
| central | 0.3 | 0.3 | 0.4 | 0.5 | 0.3 | 0.3 | 0.09 | 0.02 | 0.01 |
| entral | 2 | 2 | 3 | 3 | 2 | 2 | 0.6 | 0.02 | 0.02 |
| Hank | | | | | | | | | |
| central | 0.5 | 0.7 | 0.8 | 1 | 1 | 0.6 | 0.6 | 0.5 | 0.4 |
| entral | 2 | 3 | 3 | 5 | 5 | 3 | 2 | 2 | 2 |
| central | 0.3 | 0.4 | 0.6 | 0.8 | 0.7 | 0.4 | 0.4 | 0.3 | 0.3 |
| entral | 0.6 | 0.8 | 1 | 2 | 1 | 0.7 | 0.7 | 0.7 | 0.5 |

## D11.5.8.2 Population Dose

Estimated annual doses populations are shown in Table D11-21. The estimated doses result exclusively from radon daughters, since there are no particulate releases from the facility. There is no regulatory limit for population dose. The TEDE for the population within 80 km of the mill center is about 162,500 to 32,500 times less than the dose to this population attributable to natural background radon of 300 mrem/y (21819 persons x 0.3 rem/y = 6500 person-rem/y).

Table D11-21 Summary of Total Effective Dose Equivalent to Populations, person-rem/year.

| | Year | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Receptor | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
| Population within 80 km | 0.09 | 0.1 | 0.1 | 0.2 | 0.1 | 0.1 | 0.07 | 0.06 | 0.04 |
| Population beyond 80 km | 4 | 4 | 6 | 8 | 6 | 4 | 3 | 2 | 2 |
| All populations | 4 | 4 | 6 | 8 | 6 | 4 | 3 | 2 | 2 |

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**ADDENDUM D11A:**

MILDOS REPORT

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1P[illegible]N: Uranerz - Nichols Ranch CODE: MILDOS-AREA (02/97) PAGE 2
[illegible]: Gillette, WY DATA: URANERZ.MIL 11/17/07
[illegible]OINT FREQUENCY IN PERCENT, DIRECTION INDICATES WHERE WIND IS FROM FREQWS=0.15373,0.18910,0.27937,0.26362,0.08151,0.03286

| MPH | N | NNE | NE | ENE | E | ESE | SE | SSE | S | SSW | SW | WSW | W | WNW | NW | NNW | TOTALS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| STABILITY CLASS 1 | | | | | | | | | | | | | | | | | |
| 1.5 | 0.0470 | 0.0340 | 0.0310 | 0.0300 | 0.0390 | 0.0190 | 0.0190 | 0.0390 | 0.0330 | 0.0240 | 0.0110 | 0.0240 | 0.0280 | 0.0090 | 0.0270 | 0.0400 | 0.4540 |
| 5.5 | 0.0210 | 0.0160 | 0.0090 | 0.0130 | 0.0150 | 0.0060 | 0.0060 | 0.0110 | 0.0060 | 0.0050 | 0.0040 | 0.0050 | 0.0070 | 0.0050 | 0.0090 | 0.0100 | 0.1480 |
| 10.0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 15.5 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 21.5 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 28.0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| ALL | 0.0680 | 0.0500 | 0.0400 | 0.0430 | 0.0540 | 0.0250 | 0.0250 | 0.0500 | 0.0390 | 0.0290 | 0.0150 | 0.0290 | 0.0350 | 0.0140 | 0.0360 | 0.0500 | 0.6020 |
| STABILITY CLASS 2 | | | | | | | | | | | | | | | | | |
| 1.5 | 0.1590 | 0.1100 | 0.0910 | 0.0970 | 0.1130 | 0.1090 | 0.1130 | 0.0950 | 0.1250 | 0.0880 | 0.0930 | 0.0840 | 0.1050 | 0.0820 | 0.0890 | 0.1070 | 1.6600 |
| 5.5 | 0.1940 | 0.1220 | 0.0760 | 0.0610 | 0.1040 | 0.0930 | 0.0880 | 0.0960 | 0.1220 | 0.0690 | 0.0600 | 0.0710 | 0.1300 | 0.0960 | 0.1040 | 0.1210 | 1.6070 |
| 10.0 | 0.1430 | 0.0770 | 0.0610 | 0.0330 | 0.0820 | 0.0520 | 0.0890 | 0.0960 | 0.1520 | 0.0650 | 0.0760 | 0.0620 | 0.0880 | 0.0870 | 0.1020 | 0.0930 | 1.3580 |
| 15.5 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 21.5 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 28.0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| ALL | 0.4960 | 0.3090 | 0.2280 | 0.1910 | 0.2990 | 0.2540 | 0.2900 | 0.2870 | 0.3990 | 0.2220 | 0.2290 | 0.2170 | 0.3230 | 0.2650 | 0.2950 | 0.3210 | 4.6250 |
| STABILITY CLASS 3 | | | | | | | | | | | | | | | | | |
| 1.5 | 0.1270 | 0.0810 | 0.0500 | 0.0570 | 0.0910 | 0.0720 | 0.0770 | 0.0950 | 0.1260 | 0.0500 | 0.0750 | 0.0610 | 0.0990 | 0.0640 | 0.0840 | 0.0640 | 1.2730 |
| 5.5 | 0.2450 | 0.1150 | 0.0870 | 0.0770 | 0.1270 | 0.1050 | 0.1360 | 0.1580 | 0.2270 | 0.1110 | 0.1350 | 0.1360 | 0.2500 | 0.1390 | 0.1460 | 0.1320 | 2.3260 |
| 10.0 | 0.6060 | 0.2130 | 0.1410 | 0.0980 | 0.1790 | 0.1940 | 0.2810 | 0.4470 | 0.6190 | 0.2830 | 0.4030 | 0.4280 | 0.4720 | 0.4060 | 0.4370 | 0.3950 | 5.6020 |
| 15.5 | 0.1120 | 0.0430 | 0.0210 | 0.0180 | 0.0200 | 0.0340 | 0.0820 | 0.1230 | 0.1660 | 0.0740 | 0.0570 | 0.0460 | 0.0450 | 0.0690 | 0.1270 | 0.1070 | 1.1440 |
| 21.5 | 0.0050 | 0.0000 | 0.0000 | 0.0000 | 0.0010 | 0.0040 | 0.0070 | 0.0230 | 0.0170 | 0.0090 | 0.0130 | 0.0020 | 0.0010 | 0.0060 | 0.0220 | 0.0220 | 0.1320 |
| 28.0 | 0.0020 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0050 | 0.0150 | 0.0060 | 0.0000 | 0.0010 | 0.0010 | 0.0000 | 0.0020 | 0.0090 | 0.0050 | 0.0460 |
| ALL | 1.0970 | 0.4520 | 0.2990 | 0.2500 | 0.4180 | 0.4090 | 0.5880 | 0.8610 | 1.1610 | 0.5270 | 0.6840 | 0.6740 | 0.8670 | 0.6860 | 0.8250 | 0.7250 | 10.5230 |
| STABILITY CLASS 4 | | | | | | | | | | | | | | | | | |
| 1.5 | 0.2430 | 0.0810 | 0.0910 | 0.0690 | 0.0960 | 0.0580 | 0.0750 | 0.0820 | 0.1120 | 0.0420 | 0.0500 | 0.0620 | 0.1210 | 0.1020 | 0.1190 | 0.1620 | 1.5650 |
| 5.5 | 0.7100 | 0.2630 | 0.2390 | 0.1820 | 0.2210 | 0.1750 | 0.2300 | 0.2300 | 0.3200 | 0.1490 | 0.1570 | 0.1770 | 0.3580 | 0.2990 | 0.3120 | 0.4410 | 4.4630 |
| 10.0 | 1.6800 | 0.5180 | 0.3390 | 0.1500 | 0.2610 | 0.2950 | 0.5560 | 0.8760 | 1.1530 | 0.3750 | 0.5970 | 1.0680 | 1.6340 | 1.1100 | 1.1210 | 1.2380 | 12.9710 |
| 15.5 | 2.0100 | 0.5690 | 0.2080 | 0.1100 | 0.1540 | 0.3720 | 1.3640 | 2.2850 | 3.7060 | 1.4170 | 2.7070 | 1.8160 | 1.6480 | 1.8440 | 2.6120 | 2.3960 | 25.2180 |
| 21.5 | 0.4150 | 0.0690 | 0.0270 | 0.0040 | 0.0150 | 0.1220 | 0.3570 | 0.8130 | 1.1400 | 0.5850 | 1.3330 | 0.3830 | 0.2100 | 0.4140 | 1.2440 | 0.8880 | 8.0190 |
| 28.0 | 0.0660 | 0.0070 | 0.0050 | 0.0060 | 0.0040 | 0.0350 | 0.0820 | 0.3030 | 0.2690 | 0.2140 | 0.7470 | 0.1340 | 0.0630 | 0.1880 | 0.7370 | 0.3800 | 3.2400 |
| ALL | 5.1240 | 1.5070 | 0.9090 | 0.5210 | 0.7510 | 1.0570 | 2.6640 | 4.5890 | 6.7000 | 2.7820 | 5.5910 | 3.6400 | 4.0340 | 3.9570 | 6.1450 | 5.5050 | 55.4760 |
| [illegible]LITY CLASS 5 | | | | | | | | | | | | | | | | | |
| [illegible] | [illegible].0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 5.5 | 0.3690 | 0.0850 | 0.1260 | 0.0840 | 0.1210 | 0.1550 | 0.2470 | 0.3020 | 0.6160 | 0.2680 | 0.2130 | 0.1910 | 0.3590 | 0.2630 | 0.2720 | 0.3290 | 4.0000 |
| 10.0 | 0.2330 | 0.1150 | 0.1010 | 0.0720 | 0.1320 | 0.1500 | 0.5600 | 0.7820 | 1.6670 | 0.3160 | 0.6460 | 0.7090 | 1.4050 | 0.4910 | 0.3390 | 0.2880 | 8.0060 |
| 15.5 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 21.5 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 28.0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| ALL | 0.6020 | 0.2000 | 0.2270 | 0.1560 | 0.2530 | 0.3050 | 0.8070 | 1.0840 | 2.2830 | 0.5840 | 0.8590 | 0.9000 | 1.7640 | 0.7540 | 0.6110 | 0.6170 | 12.0060 |
| STABILITY CLASS 6 | | | | | | | | | | | | | | | | | |
| 1.5 | 0.5870 | 0.2620 | 0.2440 | 0.2170 | 0.4850 | 0.4380 | 0.6480 | 0.8560 | 1.9040 | 1.2400 | 0.9480 | 0.7020 | 0.6790 | 0.3630 | 0.4160 | 0.4320 | 10.4210 |
| 5.5 | 0.2290 | 0.1110 | 0.1390 | 0.1210 | 0.2300 | 0.2360 | 0.3740 | 0.5990 | 1.4240 | 0.6270 | 0.4960 | 0.4110 | 0.5560 | 0.2520 | 0.2840 | 0.2770 | 6.3660 |
| 10.0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 15.5 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 21.5 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 28.0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| ALL | 0.8160 | 0.3730 | 0.3830 | 0.3380 | 0.7150 | 0.6740 | 1.0220 | 1.4550 | 3.3280 | 1.8670 | 1.4440 | 1.1130 | 1.2350 | 0.6150 | 0.7000 | 0.7090 | 16.7870 |
| ALL | 8.2030 | 2.8910 | 2.0860 | 1.4990 | 2.4900 | 2.7240 | 5.3960 | 8.326013.9100 | 6.0110 | 8.8220 | 6.5730 | 8.2580 | 6.2910 | 8.6120 | 7.9270 | 100.0190 | |

INDIVIDUAL RECEPTOR LOCATION DATA, 15 LOCATIONS INPUT THIS RUN

| I | LOCATION NAMES | X(KM) | Y(KM) | Z(M) | DIST(KM) | TYPE | I | LOCATION NAMES | X(KM) | Y(KM) | Z(M) | DIST(KM) | TYPE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | T-Chair Ranch | 3.70 | -2.20 | -7.00 | 4.30 | 1 | 9 | Nichols-east central | 0.60 | 0.20 | -2.00 | 0.63 | 1 |
| 2 | Dry Fork Ranch | -2.70 | -1.10 | -58.00 | 2.92 | 1 | 10 | Nichols-south centra | -0.30 | -1.10 | -18.00 | 1.14 | 1 |
| 3 | Christensen Ranch | 1.80 | 7.80 | -1.00 | 8.00 | 1 | 11 | Nichols-west central | -1.40 | 0.50 | 12.00 | 1.49 | 1 |
| 4 | Pfister Ranch | 7.80 | 7.40 | 78.00 | 10.75 | 1 | 12 | Hank-north central | 7.90 | 6.60 | 86.00 | 10.29 | 1 |
| 5 | Pumpkin Butte Ranch | 11.10 | 3.60 | 218.00 | 11.67 | 1 | 13 | Hank-east central | 8.80 | 3.30 | 160.00 | 9.40 | 1 |
| 6 | Van Buggenum Ranch | 15.40 | 5.30 | 130.00 | 16.29 | 1 | 14 | Hank-south central | 7.90 | 1.30 | 139.00 | 8.01 | 1 |
| 7 | Ruby Ranch | 19.00 | 2.90 | 101.00 | 19.22 | 1 | 15 | Hank-west central | 7.10 | 4.20 | 102.00 | 8.25 | 1 |
| 8 | Nichols-north centra | -0.40 | 1.30 | 57.00 | 1.36 | 1 | | | | | | | |

MISCELLANEOUS INPUTABLE PARAMETER VALUES

| DMM | DMA | TSTART | FFORI | FHAYI | FFORP | FHAYP | FPR(1) | FPR(2) | FPR(3) | ACTRAT |
|---|---|---|---|---|---|---|---|---|---|---|
| 100.0 | 100.0 | 2011.00 | 0.50 | 0.50 | 0.50 | 0.50 | 3120.00 | 345.00 | 134.00 | 2.50 |

IPACT EQUALS 0, 0, 0, 0, 0, 0, 0,

JC EQUALS 0, 0, 0, 0, 0, 0, 0, 0, 0, 0

TIME STEP DATA....

| | STEP NAMES | LENGTH, YRS | IFTODO |
|---|---|---|---|
| 1 | 2011 | 1.00 | 1 |
| 2 | 2012 | 1.00 | 1 |
| 3 | 2013 | 1.00 | 1 |
| 4 | 2014 | 1.00 | 1 |
| 5 | 2015 | 1.00 | 1 |
| 6 | 2016 | 1.00 | 1 |
| 7 | 2017 | 1.00 | 1 |
| 8 | 2018 | 1.00 | 1 |
| 9 | 2019 | 1.00 | 1 |

XRHO EQUALS 1.5, 2.5, 3.5, 4.5, 7.5, 15.0, 25.0, 35.0, 45.0, 55.0, 65.0, 75.0,

HDP EQUALS 50.0

POPULATION DISTRIBUTION

| KILOMETERS | N 0.0 | NNE 22.5 | NE 45.0 | ENE 67.5 | E 90.0 | ESE 112.5 | SE 135.0 | SSE 157.5 | S 180.0 | SSW 202.5 | SW 225.0 | WSW 247.5 | W 270.0 | WNW 292.5 | NW 315.0 | NNW 337.5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.0- 2.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2.0- 3.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3.0- 4.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4.0- 5.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5.0-10.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10.0-20.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20.0-30.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30.0-40.0 | 0 | 0 | 0 | 0 | 1347 | 0 | 0 | 0 | 0 | 0 | 169 | 0 | 0 | 0 | 0 | 0 |
| 40.0-50.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 408 | 0 | 0 | 0 | 0 | 0 |
| 50.0-60.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 249 | 0 | 0 | 0 |
| 60.0-70.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 70.0-80.0 | 0 | 0 | 19646 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.0-80.0 | 0 | 0 | 19646 | 0 | 1347 | 0 | 0 | 0 | 0 | 0 | 577 | 0 | 249 | 0 | 0 | 0 |

TOTAL 1-80 KM POPULATION IS 21819 PERSONS

NUMBER OF SOURCES= 7

| NO. | KM X | KM Y | M Z | KM2 AREA | U-238 | Th-230 | CI/YEAR Ra-226 | Pb-210 | Rn-222 | ID | PSIZE SET | M/SEC EXIT VEL | SOURCE NAME |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1001 | 1 | 0.00E+00 | drying/packaging |
| 2 | -0.90 | 0.40 | 6.00 | 0.0000 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 4.47E-02 | 1002 | 1 | 0.00E+00 | Nichols development |
| 3 | -0.90 | 0.40 | 6.00 | 0.0000 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.74E+02 | 1003 | 1 | 0.00E+00 | Nichols production |
| 4 | -0.90 | 0.40 | 6.00 | 0.0000 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.82E+02 | 1004 | 1 | 0.00E+00 | Nichols restoration |
| 5 | 8.20 | 3.50 | 9.99 | 0.0000 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.76E-02 | 1005 | 1 | 0.00E+00 | Hank development |
| 6 | 8.20 | 3.50 | 9.99 | 0.0000 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.59E+02 | 1006 | 1 | 0.00E+00 | Hank production |
| 7 | 8.20 | 3.50 | 9.99 | 0.0000 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.30E+02 | 1007 | 1 | 0.00E+00 | Hank restoration |

INPUT TAILS ACTIVITIES, PCI/G

| SET | URANIUM | THORIUM | RADIUM | LEAD |
|---|---|---|---|---|
| 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 3 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

AMAD AND FRACTIONAL DISTRIBUTION

| SET | 1.5 | 3.0 | 7.7 | 54.0 |
|---|---|---|---|---|
| 1 | 0.000 | 1.000 | 0.000 | 0.000 |
| 2 | 1.000 | 0.000 | 0.000 | 0.000 |
| 3 | 0.000 | 0.000 | 0.300 | 0.700 |

PARTICULATE SOURCE STRENGTH MULTIPLIERS BY TIME STEP, 9 TIME STEP(S) USED FOR THIS RUN

| SOURCE NUMBER | TSTEP 1 1.00YRS | TSTEP 2 1.00YRS | TSTEP 3 1.00YRS | TSTEP 4 1.00YRS | TSTEP 5 1.00YRS | TSTEP 6 1.00YRS | TSTEP 7 1.00YRS | TSTEP 8 1.00YRS | TSTEP 9 1.00YRS | TSTEP10 5.00YRS |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 |
| 2 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 |
| 3 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 |
| 4 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 |
| 5 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 |
| 6 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 |
| 7 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 |

RADON SOURCE STRENGTH MULTIPLIERS BY TIME STEP, 9 TIME STEP(S) USED FOR THIS RUN

| SOURCE NUMBER | TSTEP 1 1.00YRS | TSTEP 2 1.00YRS | TSTEP 3 1.00YRS | TSTEP 4 1.00YRS | TSTEP 5 1.00YRS | TSTEP 6 1.00YRS | TSTEP 7 1.00YRS | TSTEP 8 1.00YRS | TSTEP 9 1.00YRS | TSTEP10 5.00YRS |
|---|---|---|---|---|---|---|---|---|---|---|
| [illegible] | 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 | 1.000E+00 |
| [illegible] | 0.000E+00 | 5.000E-01 | 2.500E-01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.000E+00 |
| [illegible] | 1.000E+00 | 1.000E+00 | 7.500E-01 | 5.000E-01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.000E+00 |
| 4 | 0.000E+00 | 0.000E+00 | 7.500E-01 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 2.500E-01 | 0.000E+00 | 0.000E+00 | 1.000E+00 |
| 5 | 2.500E-01 | 0.000E+00 | 7.500E-01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.000E+00 |
| 6 | 7.500E-01 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 7.500E-01 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 1.000E+00 |
| 7 | 0.000E+00 | 0.000E+00 | 2.500E-01 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 1.000E+00 | 7.500E-01 | 1.000E+00 |

TIME STEP NUMBER 1, 2011 DURATION IN YRS IS... 1.0

SUMMARY PRINT OF POPULATION DOSES COMPUTED FOR TSTEP 1--DOSES SHOWN ARE ANNUAL POPULATION DOSE COMMITMENTS, PERSON-REM PER YEAR

DOSES RECEIVED BY PEOPLE WITHIN 80 KILOMETERS

| PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|
| INHAL. | 1.043E-02 | 8.438E-02 | 1.400E-03 | 6.329E-02 | 3.044E-02 | 3.103E+00 |
| GROUND | 3.763E-04 | 3.763E-04 | 3.763E-04 | 3.763E-04 | 3.763E-04 | 3.763E-04 |
| CLOUD | 2.665E-02 | 2.665E-02 | 2.665E-02 | 2.665E-02 | 2.665E-02 | 2.665E-02 |
| VEG. ING | 4.919E-02 | 5.684E-01 | 4.919E-02 | 1.689E-01 | 1.376E-01 | 4.919E-02 |
| MEAT ING | 2.589E-03 | 2.992E-02 | 2.589E-03 | 8.892E-03 | 7.243E-03 | 2.589E-03 |
| MILK ING | 5.255E-04 | 6.073E-03 | 5.255E-04 | 1.805E-03 | 1.470E-03 | 5.255E-04 |
| RNPLUS50 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| TOTALS | 8.976E-02 | 7.158E-01 | 8.073E-02 | 2.699E-01 | 2.038E-01 | 3.183E+00 |

DOSES RECEIVED BY PEOPLE BEYOND 80 KILOMETERS

| PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|
| INHAL. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| GROUND | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| CLOUD | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| VEG. ING | 4.618E-01 | 5.336E+00 | 4.618E-01 | 1.586E+00 | 1.292E+00 | 4.618E-01 |
| MEAT ING | 5.417E-03 | 6.259E-02 | 5.417E-03 | 1.860E-02 | 1.515E-02 | 5.417E-03 |
| MILK ING | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| RNPLUS50 | 3.889E+00 | 5.303E+01 | 8.838E-01 | 3.889E+00 | 3.889E+00 | 2.475E+01 |
| TOTALS | 4.356E+00 | 5.842E+01 | 1.351E+00 | 5.493E+00 | 5.196E+00 | 2.521E+01 |

TOTAL DOSES COMPUTED OVER ALL POPULATIONS

| PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|
| INHAL. | 1.043E-02 | 8.438E-02 | 1.400E-03 | 6.329E-02 | 3.044E-02 | 3.103E+00 |
| GROUND | 3.763E-04 | 3.763E-04 | 3.763E-04 | 3.763E-04 | 3.763E-04 | 3.763E-04 |
| CLOUD | 2.665E-02 | 2.665E-02 | 2.665E-02 | 2.665E-02 | 2.665E-02 | 2.665E-02 |
| VEG. ING | 5.110E-01 | 5.905E+00 | 5.110E-01 | 1.755E+00 | 1.429E+00 | 5.110E-01 |
| MEAT ING | 8.006E-03 | 9.251E-02 | 8.006E-03 | 2.750E-02 | 2.240E-02 | 8.006E-03 |
| MILK ING | 5.255E-04 | 6.073E-03 | 5.255E-04 | 1.805E-03 | 1.470E-03 | 5.255E-04 |
| RNPLUS50 | 3.889E+00 | 5.303E+01 | 8.838E-01 | 3.889E+00 | 3.889E+00 | 2.475E+01 |
| TOTALS | 4.446E+00 | 5.914E+01 | 1.432E+00 | 5.763E+00 | 5.399E+00 | 2.840E+01 |

TIME STEP NUMBER 1, 2011 DURATION IN YRS IS... 1.0

NUMBER 1 NAME=T-Chair Ranch X= 3.7KM, Y= -2.2KM, Z= -7.0M, DIST= 4.3KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 9.47E-02 | 9.35E-03 | 7.87E-03 | 1.62E-02 | 1.10E-02 | 1.45E+00 |
| CHILD | TOTALS | 9.45E-02 | 1.04E-02 | 8.22E-03 | 1.19E-02 | 9.62E-03 | 1.45E+00 |
| TEENAGE | TOTALS | 9.46E-02 | 1.32E-02 | 8.46E-03 | 1.00E-02 | 9.07E-03 | 1.45E+00 |
| ADULT | TOTALS | 9.47E-02 | 1.29E-02 | 8.76E-03 | 1.01E-02 | 9.19E-03 | 1.45E+00 |

NUMBER 2 NAME=Dry Fork Ranch X= -2.7KM, Y= -1.1KM, Z= -58.0M, DIST= 2.9KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 4.11E-02 | 3.05E-03 | 2.49E-03 | 5.61E-03 | 3.67E-03 | 6.44E-01 |
| CHILD | TOTALS | 4.11E-02 | 3.44E-03 | 2.62E-03 | 4.01E-03 | 3.15E-03 | 6.44E-01 |
| TEENAGE | TOTALS | 4.11E-02 | 4.47E-03 | 2.71E-03 | 3.31E-03 | 2.94E-03 | 6.44E-01 |
| ADULT | TOTALS | 4.11E-02 | 4.38E-03 | 2.82E-03 | 3.32E-03 | 2.99E-03 | 6.44E-01 |

TIME STEP NUMBER 1, 2011 DURATION IN YRS IS... 1.0

NUMBER 3 NAME=Christensen Ranch X= 1.8KM, Y= 7.8KM, Z= -1.0M, DIST= 8.0KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 1.25E-01 | 1.71E-02 | 1.33E-02 | 3.45E-02 | 2.13E-02 | 1.85E+00 |
| CHILD | TOTALS | 1.24E-01 | 1.97E-02 | 1.42E-02 | 2.36E-02 | 1.77E-02 | 1.85E+00 |
| TEENAGE | TOTALS | 1.24E-01 | 2.67E-02 | 1.48E-02 | 1.88E-02 | 1.64E-02 | 1.85E+00 |
| ADULT | TOTALS | 1.25E-01 | 2.61E-02 | 1.56E-02 | 1.89E-02 | 1.67E-02 | 1.85E+00 |

NUMBER 4 NAME=Pfister Ranch X= 7.8KM, Y= 7.4KM, Z= 78.0M, DIST= 10.8KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 3.70E-01 | 3.44E-02 | 2.97E-02 | 5.57E-02 | 3.96E-02 | 5.67E+00 |
| CHILD | TOTALS | 3.69E-01 | 3.76E-02 | 3.08E-02 | 4.24E-02 | 3.52E-02 | 5.67E+00 |
| TEENAGE | TOTALS | 3.69E-01 | 4.62E-02 | 3.16E-02 | 3.65E-02 | 3.35E-02 | 5.67E+00 |
| ADULT | TOTALS | 3.70E-01 | 4.55E-02 | 3.25E-02 | 3.66E-02 | 3.38E-02 | 5.67E+00 |

TIME STEP NUMBER 1, 2011 DURATION IN YRS IS... 1.0

NUMBER 5 NAME=Pumpkin Butte Ranch X= 11.1KM, Y= 3.6KM, Z= 218.0M, DIST= 11.7KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 2.90E-01 | 2.02E-02 | 1.77E-02 | 3.22E-02 | 2.31E-02 | 4.55E+00 |
| CHILD | TOTALS | 2.90E-01 | 2.21E-02 | 1.83E-02 | 2.47E-02 | 2.07E-02 | 4.55E+00 |
| TEENAGE | TOTALS | 2.90E-01 | 2.69E-02 | 1.87E-02 | 2.14E-02 | 1.97E-02 | 4.55E+00 |
| ADULT | TOTALS | 2.90E-01 | 2.65E-02 | 1.92E-02 | 2.15E-02 | 1.99E-02 | 4.55E+00 |

NUMBER 6 NAME=Van Buggenum Ranch X= 15.4KM, Y= 5.3KM, Z= 130.0M, DIST= 16.3KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 9.32E-02 | 1.25E-02 | 9.23E-03 | 2.74E-02 | 1.61E-02 | 1.39E+00 |
| CHILD | TOTALS | 9.28E-02 | 1.48E-02 | 9.99E-03 | 1.81E-02 | 1.30E-02 | 1.39E+00 |
| TEENAGE | TOTALS | 9.30E-02 | 2.08E-02 | 1.05E-02 | 1.40E-02 | 1.19E-02 | 1.39E+00 |
| ADULT | TOTALS | 9.31E-02 | 2.03E-02 | 1.12E-02 | 1.40E-02 | 1.21E-02 | 1.39E+00 |

TIME STEP NUMBER 1, 2011 DURATION IN YRS IS... 1.0

NUMBER 7 NAME=Ruby Ranch X= 19.0KM, Y= 2.9KM, Z= 101.0M, DIST= 19.2KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 6.60E-02 | 1.04E-02 | 7.04E-03 | 2.60E-02 | 1.42E-02 | 9.75E-01 |
| CHILD | TOTALS | 6.57E-02 | 1.28E-02 | 7.82E-03 | 1.62E-02 | 1.10E-02 | 9.75E-01 |
| TEENAGE | TOTALS | 6.58E-02 | 1.91E-02 | 8.37E-03 | 1.20E-02 | 9.76E-03 | 9.75E-01 |
| ADULT | TOTALS | 6.59E-02 | 1.85E-02 | 9.05E-03 | 1.21E-02 | 1.00E-02 | 9.75E-01 |

NUMBER 8 NAME=Nichols-north centra X= -0.4KM, Y= 1.3KM, Z= 57.0M, DIST= 1.4KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 1.45E+00 | 3.26E-02 | 3.12E-02 | 3.89E-02 | 3.41E-02 | 2.37E+01 |
| CHILD | TOTALS | 1.45E+00 | 3.35E-02 | 3.15E-02 | 3.49E-02 | 3.28E-02 | 2.37E+01 |
| TEENAGE | TOTALS | 1.45E+00 | 3.61E-02 | 3.17E-02 | 3.32E-02 | 3.23E-02 | 2.37E+01 |
| ADULT | TOTALS | 1.45E+00 | 3.59E-02 | 3.20E-02 | 3.32E-02 | 3.24E-02 | 2.37E+01 |

TIME STEP NUMBER 1, 2011 DURATION IN YRS IS... 1.0

NUMBER 9 NAME=Nichols-east central X= 0.6KM, Y= 0.2KM, Z= -2.0M, DIST= 0.6KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 5.44E-01 | 1.67E-02 | 1.56E-02 | 2.14E-02 | 1.78E-02 | 8.82E+00 |
| CHILD | TOTALS | 5.44E-01 | 1.74E-02 | 1.59E-02 | 1.85E-02 | 1.69E-02 | 8.82E+00 |
| TEENAGE | TOTALS | 5.44E-01 | 1.93E-02 | 1.61E-02 | 1.72E-02 | 1.65E-02 | 8.82E+00 |
| ADULT | TOTALS | 5.44E-01 | 1.92E-02 | 1.63E-02 | 1.72E-02 | 1.66E-02 | 8.82E+00 |

NUMBER 10 NAME=Nichols-south centra X= -0.3KM, Y= -1.1KM, Z= -18.0M, DIST= 1.1KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 2.87E-01 | 9.38E-03 | 8.52E-03 | 1.34E-02 | 1.03E-02 | 4.64E+00 |
| CHILD | TOTALS | 2.87E-01 | 9.99E-03 | 8.72E-03 | 1.09E-02 | 9.54E-03 | 4.64E+00 |
| TEENAGE | TOTALS | 2.87E-01 | 1.16E-02 | 8.86E-03 | 9.78E-03 | 9.22E-03 | 4.64E+00 |
| ADULT | TOTALS | 2.87E-01 | 1.15E-02 | 9.04E-03 | 9.80E-03 | 9.29E-03 | 4.64E+00 |

TIME STEP NUMBER 1, 2011 DURATION IN YRS IS... 1.0

NUMBER 11 NAME=Nichols-west central X= -1.4KM, Y= 0.5KM, Z= 12.0M, DIST= 1.5KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 2.19E+00 | 1.87E-02 | 1.77E-02 | 2.30E-02 | 1.97E-02 | 3.62E+01 |
| CHILD | TOTALS | 2.19E+00 | 1.93E-02 | 1.79E-02 | 2.03E-02 | 1.88E-02 | 3.62E+01 |
| TEENAGE | TOTALS | 2.19E+00 | 2.10E-02 | 1.81E-02 | 1.91E-02 | 1.85E-02 | 3.62E+01 |
| ADULT | TOTALS | 2.19E+00 | 2.09E-02 | 1.83E-02 | 1.91E-02 | 1.86E-02 | 3.62E+01 |

NUMBER 12 NAME=Hank-north central X= 7.9KM, Y= 6.6KM, Z= 86.0M, DIST= 10.3KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 5.00E-01 | 3.86E-02 | 3.44E-02 | 5.78E-02 | 4.33E-02 | 7.77E+00 |
| CHILD | TOTALS | 4.99E-01 | 4.15E-02 | 3.54E-02 | 4.58E-02 | 3.93E-02 | 7.77E+00 |
| TEENAGE | TOTALS | 5.00E-01 | 4.93E-02 | 3.61E-02 | 4.05E-02 | 3.78E-02 | 7.77E+00 |
| ADULT | TOTALS | 5.00E-01 | 4.86E-02 | 3.69E-02 | 4.06E-02 | 3.81E-02 | 7.77E+00 |

TIME STEP NUMBER 1, 2011 DURATION IN YRS IS... 1.0

NUMBER 13 NAME=Hank-east central X= 8.8KM, Y= 3.3KM, Z= 160.0M, DIST= 9.4KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 2.13E+00 | 2.13E-02 | 1.96E-02 | 2.89E-02 | 2.31E-02 | 3.51E+01 |
| CHILD | TOTALS | 2.13E+00 | 2.24E-02 | 2.00E-02 | 2.41E-02 | 2.16E-02 | 3.51E+01 |
| TEENAGE | TOTALS | 2.13E+00 | 2.55E-02 | 2.03E-02 | 2.20E-02 | 2.09E-02 | 3.51E+01 |
| ADULT | TOTALS | 2.13E+00 | 2.52E-02 | 2.06E-02 | 2.21E-02 | 2.11E-02 | 3.51E+01 |

NUMBER 14 NAME=Hank-south central X= 7.9KM, Y= 1.3KM, Z= 139.0M, DIST= 8.0KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 3.45E-01 | 2.06E-02 | 1.83E-02 | 3.07E-02 | 2.30E-02 | 5.46E+00 |
| CHILD | TOTALS | 3.45E-01 | 2.21E-02 | 1.89E-02 | 2.44E-02 | 2.09E-02 | 5.46E+00 |
| TEENAGE | TOTALS | 3.45E-01 | 2.62E-02 | 1.92E-02 | 2.16E-02 | 2.01E-02 | 5.46E+00 |
| ADULT | TOTALS | 3.45E-01 | 2.59E-02 | 1.97E-02 | 2.16E-02 | 2.03E-02 | 5.46E+00 |

TIME STEP NUMBER 1, 2011 DURATION IN YRS IS... 1.0

NUMBER 15 NAME=Hank-west central X= 7.1KM, Y= 4.2KM, Z= 102.0M, DIST= 8.2KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 6.18E-01 | 2.14E-02 | 1.96E-02 | 3.00E-02 | 2.35E-02 | 9.99E+00 |
| CHILD | TOTALS | 6.18E-01 | 2.27E-02 | 2.00E-02 | 2.46E-02 | 2.18E-02 | 9.99E+00 |
| TEENAGE | TOTALS | 6.18E-01 | 2.62E-02 | 2.03E-02 | 2.23E-02 | 2.11E-02 | 9.99E+00 |
| ADULT | TOTALS | 6.18E-01 | 2.59E-02 | 2.07E-02 | 2.23E-02 | 2.12E-02 | 9.99E+00 |

TIME STEP NUMBER 2, 2012 DURATION IN YRS IS... 1.0

SUMMARY PRINT OF POPULATION DOSES COMPUTED FOR TSTEP 2--DOSES SHOWN ARE ANNUAL POPULATION DOSE COMMITMENTS, PERSON-REM PER YEAR

DOSES RECEIVED BY PEOPLE WITHIN 80 KILOMETERS

| PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|
| INHAL. | 1.228E-02 | 9.942E-02 | 1.647E-03 | 7.456E-02 | 3.586E-02 | 3.690E+00 |
| GROUND | 4.707E-04 | 4.707E-04 | 4.707E-04 | 4.707E-04 | 4.707E-04 | 4.707E-04 |
| CLOUD | 3.166E-02 | 3.166E-02 | 3.166E-02 | 3.166E-02 | 3.166E-02 | 3.166E-02 |
| VEG. ING | 5.789E-02 | 6.690E-01 | 5.789E-02 | 1.988E-01 | 1.620E-01 | 5.789E-02 |
| MEAT ING | 3.076E-03 | 3.554E-02 | 3.076E-03 | 1.056E-02 | 8.605E-03 | 3.076E-03 |
| MILK ING | 6.244E-04 | 7.215E-03 | 6.244E-04 | 2.144E-03 | 1.747E-03 | 6.244E-04 |
| RNPLUS50 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| TOTALS | 1.060E-01 | 8.433E-01 | 9.537E-02 | 3.182E-01 | 2.403E-01 | 3.783E+00 |

DOSES RECEIVED BY PEOPLE BEYOND 80 KILOMETERS

| PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|
| INHAL. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| GROUND | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| CLOUD | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| VEG. ING | 5.435E-01 | 6.281E+00 | 5.435E-01 | 1.867E+00 | 1.521E+00 | 5.435E-01 |
| MEAT ING | 6.435E-03 | 7.436E-02 | 6.435E-03 | 2.210E-02 | 1.800E-02 | 6.435E-03 |
| MILK ING | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| RNPLUS50 | 3.810E+00 | 5.195E+01 | 8.658E-01 | 3.810E+00 | 3.810E+00 | 2.424E+01 |
| TOTALS | 4.360E+00 | 5.831E+01 | 1.416E+00 | 5.699E+00 | 5.348E+00 | 2.479E+01 |

TOTAL DOSES COMPUTED OVER ALL POPULATIONS

| PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|
| INHAL. | 1.228E-02 | 9.942E-02 | 1.647E-03 | 7.456E-02 | 3.586E-02 | 3.690E+00 |
| GROUND | 4.707E-04 | 4.707E-04 | 4.707E-04 | 4.707E-04 | 4.707E-04 | 4.707E-04 |
| CLOUD | 3.166E-02 | 3.166E-02 | 3.166E-02 | 3.166E-02 | 3.166E-02 | 3.166E-02 |
| VEG. ING | 6.014E-01 | 6.950E+00 | 6.014E-01 | 2.066E+00 | 1.683E+00 | 6.014E-01 |
| MEAT ING | 9.511E-03 | 1.099E-01 | 9.511E-03 | 3.267E-02 | 2.661E-02 | 9.511E-03 |
| MILK ING | 6.244E-04 | 7.215E-03 | 6.244E-04 | 2.144E-03 | 1.747E-03 | 6.244E-04 |
| RNPLUS50 | 3.810E+00 | 5.195E+01 | 8.658E-01 | 3.810E+00 | 3.810E+00 | 2.424E+01 |
| TOTALS | 4.466E+00 | 5.915E+01 | 1.511E+00 | 6.017E+00 | 5.589E+00 | 2.858E+01 |

TIME STEP NUMBER 2, 2012 DURATION IN YRS IS... 1.0

NUMBER 1 NAME=T-Chair Ranch X= 3.7KM, Y= -2.2KM, Z= -7.0M, DIST= 4.3KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 1.04E-01 | 1.06E-02 | 8.84E-03 | 1.85E-02 | 1.25E-02 | 1.59E+00 |
| CHILD | TOTALS | 1.04E-01 | 1.18E-02 | 9.25E-03 | 1.36E-02 | 1.09E-02 | 1.59E+00 |
| TEENAGE | TOTALS | 1.04E-01 | 1.50E-02 | 9.53E-03 | 1.14E-02 | 1.02E-02 | 1.59E+00 |
| ADULT | TOTALS | 1.04E-01 | 1.48E-02 | 9.88E-03 | 1.14E-02 | 1.04E-02 | 1.59E+00 |

NUMBER 2 NAME=Dry Fork Ranch X= -2.7KM, Y= -1.1KM, Z= -58.0M, DIST= 2.9KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 4.42E-02 | 3.57E-03 | 2.85E-03 | 6.87E-03 | 4.37E-03 | 6.89E-01 |
| CHILD | TOTALS | 4.42E-02 | 4.08E-03 | 3.02E-03 | 4.81E-03 | 3.70E-03 | 6.89E-01 |
| TEENAGE | TOTALS | 4.42E-02 | 5.41E-03 | 3.14E-03 | 3.90E-03 | 3.43E-03 | 6.89E-01 |
| ADULT | TOTALS | 4.42E-02 | 5.30E-03 | 3.28E-03 | 3.92E-03 | 3.49E-03 | 6.89E-01 |

TIME STEP NUMBER 2, 2012 DURATION IN YRS IS... 1.0

NUMBER 3 NAME=Christensen Ranch X= 1.8KM, Y= 7.8KM, Z= -1.0M, DIST= 8.0KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 1.41E-01 | 1.92E-02 | 1.50E-02 | 3.86E-02 | 2.39E-02 | 2.09E+00 |
| CHILD | TOTALS | 1.40E-01 | 2.22E-02 | 1.60E-02 | 2.65E-02 | 1.99E-02 | 2.09E+00 |
| TEENAGE | TOTALS | 1.40E-01 | 3.00E-02 | 1.66E-02 | 2.11E-02 | 1.84E-02 | 2.09E+00 |
| ADULT | TOTALS | 1.40E-01 | 2.94E-02 | 1.75E-02 | 2.12E-02 | 1.87E-02 | 2.09E+00 |

NUMBER 4 NAME=Pfister Ranch X= 7.8KM, Y= 7.4KM, Z= 78.0M, DIST= 10.8KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 4.79E-01 | 4.37E-02 | 3.82E-02 | 6.93E-02 | 4.99E-02 | 7.36E+00 |
| CHILD | TOTALS | 4.78E-01 | 4.77E-02 | 3.95E-02 | 5.33E-02 | 4.47E-02 | 7.36E+00 |
| TEENAGE | TOTALS | 4.79E-01 | 5.80E-02 | 4.04E-02 | 4.63E-02 | 4.27E-02 | 7.36E+00 |
| ADULT | TOTALS | 4.79E-01 | 5.72E-02 | 4.15E-02 | 4.65E-02 | 4.31E-02 | 7.36E+00 |

TIME STEP NUMBER 2, 2012 DURATION IN YRS IS... 1.0

NUMBER 5 NAME=Pumpkin Butte Ranch X= 11.1KM, Y= 3.6KM, Z= 218.0M, DIST= 11.7KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 3.76E-01 | 2.53E-02 | 2.23E-02 | 3.87E-02 | 2.85E-02 | 5.90E+00 |
| CHILD | TOTALS | 3.76E-01 | 2.73E-02 | 2.30E-02 | 3.03E-02 | 2.58E-02 | 5.90E+00 |
| TEENAGE | TOTALS | 3.76E-01 | 3.28E-02 | 2.35E-02 | 2.66E-02 | 2.47E-02 | 5.90E+00 |
| ADULT | TOTALS | 3.76E-01 | 3.23E-02 | 2.41E-02 | 2.67E-02 | 2.49E-02 | 5.90E+00 |

NUMBER 6 NAME=Van Buggenum Ranch X= 15.4KM, Y= 5.3KM, Z= 130.0M, DIST= 16.3KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 1.17E-01 | 1.52E-02 | 1.15E-02 | 3.27E-02 | 1.95E-02 | 1.75E+00 |
| CHILD | TOTALS | 1.16E-01 | 1.79E-02 | 1.24E-02 | 2.18E-02 | 1.59E-02 | 1.75E+00 |
| TEENAGE | TOTALS | 1.17E-01 | 2.50E-02 | 1.30E-02 | 1.70E-02 | 1.45E-02 | 1.75E+00 |
| ADULT | TOTALS | 1.17E-01 | 2.44E-02 | 1.37E-02 | 1.71E-02 | 1.48E-02 | 1.75E+00 |

TIME STEP NUMBER 2, 2012 DURATION IN YRS IS... 1.0

NUMBER 7 NAME=Ruby Ranch X= 19.0KM, Y= 2.9KM, Z= 101.0M, DIST= 19.2KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 8.13E-02 | 1.25E-02 | 8.59E-03 | 3.08E-02 | 1.70E-02 | 1.20E+00 |
| CHILD | TOTALS | 8.09E-02 | 1.54E-02 | 9.52E-03 | 1.94E-02 | 1.32E-02 | 1.20E+00 |
| TEENAGE | TOTALS | 8.11E-02 | 2.27E-02 | 1.02E-02 | 1.44E-02 | 1.18E-02 | 1.20E+00 |
| ADULT | TOTALS | 8.12E-02 | 2.21E-02 | 1.10E-02 | 1.45E-02 | 1.21E-02 | 1.20E+00 |

NUMBER 8 NAME=Nichols-north centra X= -0.4KM, Y= 1.3KM, Z= 57.0M, DIST= 1.4KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 1.46E+00 | 3.38E-02 | 3.21E-02 | 4.16E-02 | 3.57E-02 | 2.39E+01 |
| CHILD | TOTALS | 1.46E+00 | 3.50E-02 | 3.25E-02 | 3.68E-02 | 3.41E-02 | 2.39E+01 |
| TEENAGE | TOTALS | 1.46E+00 | 3.82E-02 | 3.28E-02 | 3.46E-02 | 3.35E-02 | 2.39E+01 |
| ADULT | TOTALS | 1.46E+00 | 3.79E-02 | 3.32E-02 | 3.47E-02 | 3.36E-02 | 2.39E+01 |

TIME STEP NUMBER 2, 2012 DURATION IN YRS IS... 1.0

NUMBER 9 NAME=Nichols-east central X= 0.6KM, Y= 0.2KM, Z= -2.0M, DIST= 0.6KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 5.51E-01 | 1.76E-02 | 1.64E-02 | 2.34E-02 | 1.90E-02 | 8.92E+00 |
| CHILD | TOTALS | 5.51E-01 | 1.85E-02 | 1.67E-02 | 1.98E-02 | 1.79E-02 | 8.92E+00 |
| TEENAGE | TOTALS | 5.51E-01 | 2.09E-02 | 1.69E-02 | 1.82E-02 | 1.74E-02 | 8.92E+00 |
| ADULT | TOTALS | 5.51E-01 | 2.07E-02 | 1.71E-02 | 1.83E-02 | 1.75E-02 | 8.92E+00 |

NUMBER 10 NAME=Nichols-south centra X= -0.3KM, Y= -1.1KM, Z= -18.0M, DIST= 1.1KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 2.92E-01 | 1.02E-02 | 9.14E-03 | 1.52E-02 | 1.14E-02 | 4.72E+00 |
| CHILD | TOTALS | 2.92E-01 | 1.10E-02 | 9.40E-03 | 1.21E-02 | 1.04E-02 | 4.72E+00 |
| TEENAGE | TOTALS | 2.92E-01 | 1.30E-02 | 9.57E-03 | 1.07E-02 | 1.00E-02 | 4.72E+00 |
| ADULT | TOTALS | 2.92E-01 | 1.28E-02 | 9.79E-03 | 1.08E-02 | 1.01E-02 | 4.72E+00 |

TIME STEP NUMBER 2, 2012 DURATION IN YRS IS... 1.0

NUMBER 11 NAME=Nichols-west central X= -1.4KM, Y= 0.5KM, Z= 12.0M, DIST= 1.5KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 2.20E+00 | 1.97E-02 | 1.85E-02 | 2.53E-02 | 2.11E-02 | 3.63E+01 |
| CHILD | TOTALS | 2.20E+00 | 2.06E-02 | 1.88E-02 | 2.18E-02 | 1.99E-02 | 3.63E+01 |
| TEENAGE | TOTALS | 2.20E+00 | 2.28E-02 | 1.90E-02 | 2.03E-02 | 1.95E-02 | 3.63E+01 |
| ADULT | TOTALS | 2.20E+00 | 2.27E-02 | 1.92E-02 | 2.03E-02 | 1.96E-02 | 3.63E+01 |

NUMBER 12 NAME=Hank-north central X= 7.9KM, Y= 6.6KM, Z= 86.0M, DIST= 10.3KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 6.52E-01 | 4.93E-02 | 4.44E-02 | 7.22E-02 | 5.49E-02 | 1.02E+01 |
| CHILD | TOTALS | 6.52E-01 | 5.29E-02 | 4.56E-02 | 5.79E-02 | 5.02E-02 | 1.02E+01 |
| TEENAGE | TOTALS | 6.52E-01 | 6.21E-02 | 4.64E-02 | 5.17E-02 | 4.84E-02 | 1.02E+01 |
| ADULT | TOTALS | 6.52E-01 | 6.13E-02 | 4.74E-02 | 5.18E-02 | 4.88E-02 | 1.02E+01 |

TIME STEP NUMBER 2, 2012 DURATION IN YRS IS... 1.0

NUMBER 13 NAME=Hank-east central X= 8.8KM, Y= 3.3KM, Z= 160.0M, DIST= 9.4KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 2.82E+00 | 2.64E-02 | 2.47E-02 | 3.42E-02 | 2.83E-02 | 4.66E+01 |
| CHILD | TOTALS | 2.82E+00 | 2.76E-02 | 2.51E-02 | 2.93E-02 | 2.67E-02 | 4.66E+01 |
| TEENAGE | TOTALS | 2.82E+00 | 3.07E-02 | 2.54E-02 | 2.72E-02 | 2.61E-02 | 4.66E+01 |
| ADULT | TOTALS | 2.82E+00 | 3.05E-02 | 2.57E-02 | 2.72E-02 | 2.62E-02 | 4.66E+01 |

NUMBER 14 NAME=Hank-south central X= 7.9KM, Y= 1.3KM, Z= 139.0M, DIST= 8.0KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 4.43E-01 | 2.51E-02 | 2.27E-02 | 3.63E-02 | 2.78E-02 | 7.01E+00 |
| CHILD | TOTALS | 4.42E-01 | 2.69E-02 | 2.33E-02 | 2.93E-02 | 2.56E-02 | 7.01E+00 |
| TEENAGE | TOTALS | 4.43E-01 | 3.14E-02 | 2.37E-02 | 2.63E-02 | 2.47E-02 | 7.01E+00 |
| ADULT | TOTALS | 4.43E-01 | 3.10E-02 | 2.42E-02 | 2.63E-02 | 2.49E-02 | 7.01E+00 |

TIME STEP NUMBER 2, 2012 DURATION IN YRS IS... 1.0

NUMBER 15 NAME=Hank-west central X= 7.1KM, Y= 4.2KM, Z= 102.0M, DIST= 8.2KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 8.08E-01 | 2.65E-02 | 2.45E-02 | 3.55E-02 | 2.87E-02 | 1.31E+01 |
| CHILD | TOTALS | 8.08E-01 | 2.79E-02 | 2.50E-02 | 2.99E-02 | 2.68E-02 | 1.31E+01 |
| TEENAGE | TOTALS | 8.08E-01 | 3.15E-02 | 2.53E-02 | 2.74E-02 | 2.61E-02 | 1.31E+01 |
| ADULT | TOTALS | 8.08E-01 | 3.12E-02 | 2.57E-02 | 2.74E-02 | 2.63E-02 | 1.31E+01 |

TIME STEP NUMBER 3, 2013 DURATION IN YRS IS... 1.0

SUMMARY PRINT OF POPULATION DOSES COMPUTED FOR TSTEP 3--DOSES SHOWN ARE ANNUAL POPULATION DOSE COMMITMENTS, PERSON-REM PER YEAR

DOSES RECEIVED BY PEOPLE WITHIN 80 KILOMETERS

| PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|
| INHAL. | 1.652E-02 | 1.337E-01 | 2.218E-03 | 1.003E-01 | 4.823E-02 | 4.927E+00 |
| GROUND | 6.477E-04 | 6.477E-04 | 6.477E-04 | 6.477E-04 | 6.477E-04 | 6.477E-04 |
| CLOUD | 4.231E-02 | 4.231E-02 | 4.231E-02 | 4.231E-02 | 4.231E-02 | 4.231E-02 |
| VEG. ING | 7.825E-02 | 9.042E-01 | 7.825E-02 | 2.687E-01 | 2.189E-01 | 7.825E-02 |
| MEAT ING | 4.180E-03 | 4.830E-02 | 4.180E-03 | 1.436E-02 | 1.169E-02 | 4.180E-03 |
| MILK ING | 8.485E-04 | 9.804E-03 | 8.485E-04 | 2.914E-03 | 2.374E-03 | 8.485E-04 |
| RNPLUS50 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| TOTALS | 1.428E-01 | 1.139E+00 | 1.285E-01 | 4.293E-01 | 3.242E-01 | 5.053E+00 |

DOSES RECEIVED BY PEOPLE BEYOND 80 KILOMETERS

| PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|
| INHAL. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| GROUND | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| CLOUD | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| VEG. ING | 7.347E-01 | 8.489E+00 | 7.347E-01 | 2.523E+00 | 2.055E+00 | 7.347E-01 |
| MEAT ING | 8.745E-03 | 1.010E-01 | 8.745E-03 | 3.003E-02 | 2.446E-02 | 8.745E-03 |
| MILK ING | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| RNPLUS50 | 5.132E+00 | 6.998E+01 | 1.166E+00 | 5.132E+00 | 5.132E+00 | 3.266E+01 |
| TOTALS | 5.876E+00 | 7.857E+01 | 1.910E+00 | 7.685E+00 | 7.212E+00 | 3.340E+01 |

TOTAL DOSES COMPUTED OVER ALL POPULATIONS

| PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|
| INHAL. | 1.652E-02 | 1.337E-01 | 2.218E-03 | 1.003E-01 | 4.823E-02 | 4.927E+00 |
| GROUND | 6.477E-04 | 6.477E-04 | 6.477E-04 | 6.477E-04 | 6.477E-04 | 6.477E-04 |
| CLOUD | 4.231E-02 | 4.231E-02 | 4.231E-02 | 4.231E-02 | 4.231E-02 | 4.231E-02 |
| VEG. ING | 8.129E-01 | 9.394E+00 | 8.129E-01 | 2.792E+00 | 2.274E+00 | 8.129E-01 |
| MEAT ING | 1.292E-02 | 1.493E-01 | 1.292E-02 | 4.439E-02 | 3.616E-02 | 1.292E-02 |
| MILK ING | 8.485E-04 | 9.804E-03 | 8.485E-04 | 2.914E-03 | 2.374E-03 | 8.485E-04 |
| RNPLUS50 | 5.132E+00 | 6.998E+01 | 1.166E+00 | 5.132E+00 | 5.132E+00 | 3.266E+01 |
| TOTALS | 6.018E+00 | 7.971E+01 | 2.038E+00 | 8.115E+00 | 7.536E+00 | 3.846E+01 |

TIME STEP NUMBER 3, 2013 DURATION IN YRS IS... 1.0

NUMBER 1 NAME=T-Chair Ranch X= 3.7KM, Y= -2.2KM, Z= -7.0M, DIST= 4.3KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 1.48E-01 | 1.47E-02 | 1.23E-02 | 2.56E-02 | 1.73E-02 | 2.26E+00 |
| CHILD | TOTALS | 1.48E-01 | 1.64E-02 | 1.29E-02 | 1.88E-02 | 1.51E-02 | 2.26E+00 |
| TEENAGE | TOTALS | 1.48E-01 | 2.08E-02 | 1.33E-02 | 1.58E-02 | 1.43E-02 | 2.26E+00 |
| ADULT | TOTALS | 1.48E-01 | 2.04E-02 | 1.38E-02 | 1.59E-02 | 1.44E-02 | 2.26E+00 |

NUMBER 2 NAME=Dry Fork Ranch X= -2.7KM, Y= -1.1KM, Z= -58.0M, DIST= 2.9KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 6.40E-02 | 4.82E-03 | 3.93E-03 | 8.97E-03 | 5.83E-03 | 1.00E+00 |
| CHILD | TOTALS | 6.39E-02 | 5.47E-03 | 4.14E-03 | 6.38E-03 | 4.99E-03 | 1.00E+00 |
| TEENAGE | TOTALS | 6.39E-02 | 7.14E-03 | 4.29E-03 | 5.24E-03 | 4.66E-03 | 1.00E+00 |
| ADULT | TOTALS | 6.40E-02 | 7.01E-03 | 4.47E-03 | 5.27E-03 | 4.73E-03 | 1.00E+00 |

TIME STEP NUMBER 3, 2013 DURATION IN YRS IS... 1.0

NUMBER 3 NAME=Christensen Ranch X= 1.8KM, Y= 7.8KM, Z= -1.0M, DIST= 8.0KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 1.96E-01 | 2.68E-02 | 2.09E-02 | 5.40E-02 | 3.34E-02 | 2.91E+00 |
| CHILD | TOTALS | 1.95E-01 | 3.10E-02 | 2.23E-02 | 3.70E-02 | 2.79E-02 | 2.91E+00 |
| TEENAGE | TOTALS | 1.95E-01 | 4.20E-02 | 2.32E-02 | 2.95E-02 | 2.57E-02 | 2.91E+00 |
| ADULT | TOTALS | 1.96E-01 | 4.11E-02 | 2.44E-02 | 2.97E-02 | 2.62E-02 | 2.91E+00 |

NUMBER 4 NAME=Pfister Ranch X= 7.8KM, Y= 7.4KM, Z= 78.0M, DIST= 10.8KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 5.98E-01 | 5.54E-02 | 4.80E-02 | 8.94E-02 | 6.36E-02 | 9.19E+00 |
| CHILD | TOTALS | 5.98E-01 | 6.07E-02 | 4.98E-02 | 6.81E-02 | 5.67E-02 | 9.19E+00 |
| TEENAGE | TOTALS | 5.98E-01 | 7.44E-02 | 5.10E-02 | 5.88E-02 | 5.40E-02 | 9.19E+00 |
| ADULT | TOTALS | 5.98E-01 | 7.33E-02 | 5.25E-02 | 5.90E-02 | 5.46E-02 | 9.19E+00 |

TIME STEP NUMBER 3, 2013 DURATION IN YRS IS... 1.0

NUMBER 5 NAME=Pumpkin Butte Ranch X= 11.1KM, Y= 3.6KM, Z= 218.0M, DIST= 11.7KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 4.70E-01 | 3.25E-02 | 2.84E-02 | 5.12E-02 | 3.70E-02 | 7.36E+00 |
| CHILD | TOTALS | 4.69E-01 | 3.54E-02 | 2.94E-02 | 3.95E-02 | 3.32E-02 | 7.36E+00 |
| TEENAGE | TOTALS | 4.69E-01 | 4.29E-02 | 3.00E-02 | 3.44E-02 | 3.17E-02 | 7.36E+00 |
| ADULT | TOTALS | 4.70E-01 | 4.23E-02 | 3.09E-02 | 3.45E-02 | 3.20E-02 | 7.36E+00 |

NUMBER 6 NAME=Van Buggenum Ranch X= 15.4KM, Y= 5.3KM, Z= 130.0M, DIST= 16.3KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 1.50E-01 | 1.99E-02 | 1.48E-02 | 4.36E-02 | 2.57E-02 | 2.24E+00 |
| CHILD | TOTALS | 1.49E-01 | 2.36E-02 | 1.60E-02 | 2.88E-02 | 2.08E-02 | 2.24E+00 |
| TEENAGE | TOTALS | 1.49E-01 | 3.31E-02 | 1.68E-02 | 2.23E-02 | 1.90E-02 | 2.24E+00 |
| ADULT | TOTALS | 1.50E-01 | 3.24E-02 | 1.79E-02 | 2.25E-02 | 1.94E-02 | 2.24E+00 |

TIME STEP NUMBER 3, 2013 DURATION IN YRS IS... 1.0

NUMBER 7 NAME=Ruby Ranch X= 19.0KM, Y= 2.9KM, Z= 101.0M, DIST= 19.2KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 1.06E-01 | 1.66E-02 | 1.12E-02 | 4.13E-02 | 2.26E-02 | 1.56E+00 |
| CHILD | TOTALS | 1.05E-01 | 2.04E-02 | 1.25E-02 | 2.58E-02 | 1.75E-02 | 1.56E+00 |
| TEENAGE | TOTALS | 1.05E-01 | 3.04E-02 | 1.34E-02 | 1.91E-02 | 1.56E-02 | 1.56E+00 |
| ADULT | TOTALS | 1.06E-01 | 2.96E-02 | 1.45E-02 | 1.92E-02 | 1.60E-02 | 1.56E+00 |

NUMBER 8 NAME=Nichols-north centra X= -0.4KM, Y= 1.3KM, Z= 57.0M, DIST= 1.4KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 2.23E+00 | 5.03E-02 | 4.81E-02 | 6.04E-02 | 5.27E-02 | 3.64E+01 |
| CHILD | TOTALS | 2.23E+00 | 5.19E-02 | 4.86E-02 | 5.41E-02 | 5.07E-02 | 3.64E+01 |
| TEENAGE | TOTALS | 2.23E+00 | 5.60E-02 | 4.90E-02 | 5.13E-02 | 4.99E-02 | 3.64E+01 |
| ADULT | TOTALS | 2.23E+00 | 5.56E-02 | 4.94E-02 | 5.14E-02 | 5.00E-02 | 3.64E+01 |

TIME STEP NUMBER 3, 2013 DURATION IN YRS IS... 1.0

NUMBER 9 NAME=Nichols-east central X= 0.6KM, Y= 0.2KM, Z= -2.0M, DIST= 0.6KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 8.36E-01 | 2.58E-02 | 2.42E-02 | 3.34E-02 | 2.77E-02 | 1.36E+01 |
| CHILD | TOTALS | 8.36E-01 | 2.70E-02 | 2.46E-02 | 2.87E-02 | 2.61E-02 | 1.36E+01 |
| TEENAGE | TOTALS | 8.36E-01 | 3.01E-02 | 2.49E-02 | 2.66E-02 | 2.55E-02 | 1.36E+01 |
| ADULT | TOTALS | 8.36E-01 | 2.98E-02 | 2.52E-02 | 2.67E-02 | 2.57E-02 | 1.36E+01 |

NUMBER 10 NAME=Nichols-south centra X= -0.3KM, Y= -1.1KM, Z= -18.0M, DIST= 1.1KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 4.41E-01 | 1.46E-02 | 1.32E-02 | 2.10E-02 | 1.62E-02 | 7.14E+00 |
| CHILD | TOTALS | 4.41E-01 | 1.56E-02 | 1.36E-02 | 1.70E-02 | 1.49E-02 | 7.14E+00 |
| TEENAGE | TOTALS | 4.41E-01 | 1.82E-02 | 1.38E-02 | 1.53E-02 | 1.44E-02 | 7.14E+00 |
| ADULT | TOTALS | 4.41E-01 | 1.80E-02 | 1.41E-02 | 1.53E-02 | 1.45E-02 | 7.14E+00 |

TIME STEP NUMBER 3, 2013 DURATION IN YRS IS... 1.0

NUMBER 11 NAME=Nichols-west central X= -1.4KM, Y= 0.5KM, Z= 12.0M, DIST= 1.5KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 3.36E+00 | 2.89E-02 | 2.74E-02 | 3.59E-02 | 3.06E-02 | 5.55E+01 |
| CHILD | TOTALS | 3.36E+00 | 3.00E-02 | 2.78E-02 | 3.15E-02 | 2.92E-02 | 5.55E+01 |
| TEENAGE | TOTALS | 3.36E+00 | 3.28E-02 | 2.80E-02 | 2.96E-02 | 2.86E-02 | 5.55E+01 |
| ADULT | TOTALS | 3.36E+00 | 3.26E-02 | 2.83E-02 | 2.97E-02 | 2.87E-02 | 5.55E+01 |

NUMBER 12 NAME=Hank-north central X= 7.9KM, Y= 6.6KM, Z= 86.0M, DIST= 10.3KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 8.10E-01 | 6.23E-02 | 5.57E-02 | 9.28E-02 | 6.97E-02 | 1.26E+01 |
| CHILD | TOTALS | 8.10E-01 | 6.70E-02 | 5.72E-02 | 7.37E-02 | 6.35E-02 | 1.26E+01 |
| TEENAGE | TOTALS | 8.10E-01 | 7.93E-02 | 5.83E-02 | 6.54E-02 | 6.10E-02 | 1.26E+01 |
| ADULT | TOTALS | 8.10E-01 | 7.83E-02 | 5.96E-02 | 6.55E-02 | 6.16E-02 | 1.26E+01 |

TIME STEP NUMBER 3, 2013 DURATION IN YRS IS... 1.0

NUMBER 13 NAME=Hank-east central X= 8.8KM, Y= 3.3KM, Z= 160.0M, DIST= 9.4KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 3.46E+00 | 3.41E-02 | 3.15E-02 | 4.58E-02 | 3.69E-02 | 5.72E+01 |
| CHILD | TOTALS | 3.46E+00 | 3.59E-02 | 3.21E-02 | 3.85E-02 | 3.45E-02 | 5.72E+01 |
| TEENAGE | TOTALS | 3.46E+00 | 4.06E-02 | 3.26E-02 | 3.53E-02 | 3.36E-02 | 5.72E+01 |
| ADULT | TOTALS | 3.46E+00 | 4.03E-02 | 3.31E-02 | 3.53E-02 | 3.38E-02 | 5.72E+01 |

NUMBER 14 NAME=Hank-south central X= 7.9KM, Y= 1.3KM, Z= 139.0M, DIST= 8.0KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 5.58E-01 | 3.28E-02 | 2.94E-02 | 4.87E-02 | 3.67E-02 | 8.82E+00 |
| CHILD | TOTALS | 5.57E-01 | 3.53E-02 | 3.02E-02 | 3.88E-02 | 3.35E-02 | 8.82E+00 |
| TEENAGE | TOTALS | 5.58E-01 | 4.17E-02 | 3.08E-02 | 3.45E-02 | 3.22E-02 | 8.82E+00 |
| ADULT | TOTALS | 5.58E-01 | 4.12E-02 | 3.15E-02 | 3.45E-02 | 3.25E-02 | 8.82E+00 |

TIME STEP NUMBER 3, 2013 DURATION IN YRS IS... 1.0

NUMBER 15 NAME=Hank-west central X= 7.1KM, Y= 4.2KM, Z= 102.0M, DIST= 8.2KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 1.00E+00 | 3.43E-02 | 3.14E-02 | 4.76E-02 | 3.75E-02 | 1.62E+01 |
| CHILD | TOTALS | 1.00E+00 | 3.64E-02 | 3.21E-02 | 3.93E-02 | 3.48E-02 | 1.62E+01 |
| TEENAGE | TOTALS | 1.00E+00 | 4.17E-02 | 3.26E-02 | 3.57E-02 | 3.38E-02 | 1.62E+01 |
| ADULT | TOTALS | 1.00E+00 | 4.13E-02 | 3.32E-02 | 3.57E-02 | 3.40E-02 | 1.62E+01 |

TIME STEP NUMBER 4, 2014 DURATION IN YRS IS... 1.0

SUMMARY PRINT OF POPULATION DOSES COMPUTED FOR TSTEP 4--DOSES SHOWN ARE ANNUAL POPULATION DOSE COMMITMENTS, PERSON-REM PER YEAR

DOSES RECEIVED BY PEOPLE WITHIN 80 KILOMETERS

| PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|
| INHAL. | 2.152E-02 | 1.742E-01 | 2.883E-03 | 1.306E-01 | 6.283E-02 | 6.503E+00 |
| GROUND | 8.733E-04 | 8.733E-04 | 8.733E-04 | 8.733E-04 | 8.733E-04 | 8.733E-04 |
| CLOUD | 5.576E-02 | 5.576E-02 | 5.576E-02 | 5.576E-02 | 5.576E-02 | 5.576E-02 |
| VEG. ING | 1.015E-01 | 1.173E+00 | 1.015E-01 | 3.485E-01 | 2.839E-01 | 1.015E-01 |
| MEAT ING | 5.445E-03 | 6.292E-02 | 5.445E-03 | 1.870E-02 | 1.523E-02 | 5.445E-03 |
| MILK ING | 1.105E-03 | 1.277E-02 | 1.105E-03 | 3.796E-03 | 3.092E-03 | 1.105E-03 |
| RNPLUS50 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| TOTALS | 1.862E-01 | 1.479E+00 | 1.676E-01 | 5.583E-01 | 4.217E-01 | 6.667E+00 |

DOSES RECEIVED BY PEOPLE BEYOND 80 KILOMETERS

| PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|
| INHAL. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| GROUND | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| CLOUD | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| VEG. ING | 9.528E-01 | 1.101E+01 | 9.528E-01 | 3.272E+00 | 2.665E+00 | 9.528E-01 |
| MEAT ING | 1.139E-02 | 1.316E-01 | 1.139E-02 | 3.913E-02 | 3.187E-02 | 1.139E-02 |
| MILK ING | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| RNPLUS50 | 6.665E+00 | 9.088E+01 | 1.515E+00 | 6.665E+00 | 6.665E+00 | 4.241E+01 |
| TOTALS | 7.629E+00 | 1.020E+02 | 2.479E+00 | 9.976E+00 | 9.362E+00 | 4.338E+01 |

TOTAL DOSES COMPUTED OVER ALL POPULATIONS

| PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|
| INHAL. | 2.152E-02 | 1.742E-01 | 2.883E-03 | 1.306E-01 | 6.283E-02 | 6.503E+00 |
| GROUND | 8.733E-04 | 8.733E-04 | 8.733E-04 | 8.733E-04 | 8.733E-04 | 8.733E-04 |
| CLOUD | 5.576E-02 | 5.576E-02 | 5.576E-02 | 5.576E-02 | 5.576E-02 | 5.576E-02 |
| VEG. ING | 1.054E+00 | 1.218E+01 | 1.054E+00 | 3.621E+00 | 2.949E+00 | 1.054E+00 |
| MEAT ING | 1.684E-02 | 1.946E-01 | 1.684E-02 | 5.783E-02 | 4.710E-02 | 1.684E-02 |
| MILK ING | 1.105E-03 | 1.277E-02 | 1.105E-03 | 3.796E-03 | 3.092E-03 | 1.105E-03 |
| RNPLUS50 | 6.665E+00 | 9.088E+01 | 1.515E+00 | 6.665E+00 | 6.665E+00 | 4.241E+01 |
| TOTALS | 7.815E+00 | 1.035E+02 | 2.646E+00 | 1.053E+01 | 9.784E+00 | 5.004E+01 |

TIME STEP NUMBER 4, 2014 DURATION IN YRS IS... 1.0

NUMBER 1 NAME=T-Chair Ranch X= 3.7KM, Y= -2.2KM, Z= -7.0M, DIST= 4.3KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 1.74E-01 | 1.80E-02 | 1.50E-02 | 3.18E-02 | 2.13E-02 | 2.65E+00 |
| CHILD | TOTALS | 1.74E-01 | 2.01E-02 | 1.57E-02 | 2.32E-02 | 1.85E-02 | 2.65E+00 |
| TEENAGE | TOTALS | 1.74E-01 | 2.57E-02 | 1.62E-02 | 1.94E-02 | 1.74E-02 | 2.65E+00 |
| ADULT | TOTALS | 1.74E-01 | 2.53E-02 | 1.68E-02 | 1.95E-02 | 1.77E-02 | 2.65E+00 |

NUMBER 2 NAME=Dry Fork Ranch X= -2.7KM, Y= -1.1KM, Z= -58.0M, DIST= 2.9KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 7.25E-02 | 6.22E-03 | 4.89E-03 | 1.24E-02 | 7.71E-03 | 1.13E+00 |
| CHILD | TOTALS | 7.24E-02 | 7.17E-03 | 5.21E-03 | 8.52E-03 | 6.46E-03 | 1.13E+00 |
| TEENAGE | TOTALS | 7.24E-02 | 9.65E-03 | 5.43E-03 | 6.84E-03 | 5.97E-03 | 1.13E+00 |
| ADULT | TOTALS | 7.25E-02 | 9.45E-03 | 5.70E-03 | 6.88E-03 | 6.08E-03 | 1.13E+00 |

TIME STEP NUMBER 4, 2014 DURATION IN YRS IS... 1.0

NUMBER 3 NAME=Christensen Ranch X= 1.8KM, Y= 7.8KM, Z= -1.0M, DIST= 8.0KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 2.39E-01 | 3.25E-02 | 2.54E-02 | 6.53E-02 | 4.04E-02 | 3.55E+00 |
| CHILD | TOTALS | 2.38E-01 | 3.76E-02 | 2.71E-02 | 4.48E-02 | 3.38E-02 | 3.55E+00 |
| TEENAGE | TOTALS | 2.39E-01 | 5.09E-02 | 2.82E-02 | 3.58E-02 | 3.11E-02 | 3.55E+00 |
| ADULT | TOTALS | 2.39E-01 | 4.98E-02 | 2.97E-02 | 3.60E-02 | 3.17E-02 | 3.55E+00 |

NUMBER 4 NAME=Pfister Ranch X= 7.8KM, Y= 7.4KM, Z= 78.0M, DIST= 10.8KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 8.90E-01 | 8.04E-02 | 7.05E-02 | 1.26E-01 | 9.14E-02 | 1.37E+01 |
| CHILD | TOTALS | 8.89E-01 | 8.75E-02 | 7.29E-02 | 9.74E-02 | 8.22E-02 | 1.37E+01 |
| TEENAGE | TOTALS | 8.89E-01 | 1.06E-01 | 7.45E-02 | 8.50E-02 | 7.86E-02 | 1.37E+01 |
| ADULT | TOTALS | 8.90E-01 | 1.04E-01 | 7.65E-02 | 8.53E-02 | 7.94E-02 | 1.37E+01 |

TIME STEP NUMBER 4, 2014 DURATION IN YRS IS... 1.0

NUMBER 5 NAME=Pumpkin Butte Ranch X= 11.1KM, Y= 3.6KM, Z= 218.0M, DIST= 11.7KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 6.98E-01 | 4.59E-02 | 4.10E-02 | 6.88E-02 | 5.15E-02 | 1.10E+01 |
| CHILD | TOTALS | 6.98E-01 | 4.95E-02 | 4.21E-02 | 5.45E-02 | 4.68E-02 | 1.10E+01 |
| TEENAGE | TOTALS | 6.98E-01 | 5.87E-02 | 4.29E-02 | 4.82E-02 | 4.50E-02 | 1.10E+01 |
| ADULT | TOTALS | 6.98E-01 | 5.80E-02 | 4.40E-02 | 4.84E-02 | 4.54E-02 | 1.10E+01 |

NUMBER 6 NAME=Van Buggenum Ranch X= 15.4KM, Y= 5.3KM, Z= 130.0M, DIST= 16.3KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 2.13E-01 | 2.73E-02 | 2.08E-02 | 5.79E-02 | 3.48E-02 | 3.19E+00 |
| CHILD | TOTALS | 2.12E-01 | 3.21E-02 | 2.23E-02 | 3.88E-02 | 2.86E-02 | 3.19E+00 |
| TEENAGE | TOTALS | 2.13E-01 | 4.45E-02 | 2.34E-02 | 3.05E-02 | 2.61E-02 | 3.19E+00 |
| ADULT | TOTALS | 2.13E-01 | 4.35E-02 | 2.48E-02 | 3.07E-02 | 2.67E-02 | 3.19E+00 |

TIME STEP NUMBER 4, 2014 DURATION IN YRS IS... 1.0

NUMBER 7 NAME=Ruby Ranch X= 19.0KM, Y= 2.9KM, Z= 101.0M, DIST= 19.2KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 1.47E-01 | 2.23E-02 | 1.54E-02 | 5.42E-02 | 3.00E-02 | 2.17E+00 |
| CHILD | TOTALS | 1.46E-01 | 2.72E-02 | 1.70E-02 | 3.42E-02 | 2.35E-02 | 2.17E+00 |
| TEENAGE | TOTALS | 1.46E-01 | 4.01E-02 | 1.82E-02 | 2.55E-02 | 2.10E-02 | 2.17E+00 |
| ADULT | TOTALS | 1.46E-01 | 3.91E-02 | 1.96E-02 | 2.57E-02 | 2.16E-02 | 2.17E+00 |

NUMBER 8 NAME=Nichols-north centra X= -0.4KM, Y= 1.3KM, Z= 57.0M, DIST= 1.4KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 2.27E+00 | 5.40E-02 | 5.09E-02 | 6.80E-02 | 5.74E-02 | 3.70E+01 |
| CHILD | TOTALS | 2.27E+00 | 5.62E-02 | 5.17E-02 | 5.92E-02 | 5.45E-02 | 3.70E+01 |
| TEENAGE | TOTALS | 2.27E+00 | 6.18E-02 | 5.22E-02 | 5.54E-02 | 5.34E-02 | 3.70E+01 |
| ADULT | TOTALS | 2.27E+00 | 6.14E-02 | 5.28E-02 | 5.55E-02 | 5.37E-02 | 3.70E+01 |

TIME STEP NUMBER 4, 2014 DURATION IN YRS IS... 1.0

NUMBER 9 NAME=Nichols-east central X= 0.6KM, Y= 0.2KM, Z= -2.0M, DIST= 0.6KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 8.60E-01 | 2.85E-02 | 2.63E-02 | 3.89E-02 | 3.11E-02 | 1.39E+01 |
| CHILD | TOTALS | 8.59E-01 | 3.01E-02 | 2.68E-02 | 3.24E-02 | 2.89E-02 | 1.39E+01 |
| TEENAGE | TOTALS | 8.59E-01 | 3.43E-02 | 2.72E-02 | 2.96E-02 | 2.81E-02 | 1.39E+01 |
| ADULT | TOTALS | 8.59E-01 | 3.40E-02 | 2.76E-02 | 2.97E-02 | 2.83E-02 | 1.39E+01 |

NUMBER 10 NAME=Nichols-south centra X= -0.3KM, Y= -1.1KM, Z= -18.0M, DIST= 1.1KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 4.59E-01 | 1.69E-02 | 1.50E-02 | 2.61E-02 | 1.92E-02 | 7.40E+00 |
| CHILD | TOTALS | 4.59E-01 | 1.84E-02 | 1.54E-02 | 2.04E-02 | 1.73E-02 | 7.40E+00 |
| TEENAGE | TOTALS | 4.59E-01 | 2.21E-02 | 1.58E-02 | 1.79E-02 | 1.66E-02 | 7.40E+00 |
| ADULT | TOTALS | 4.59E-01 | 2.18E-02 | 1.62E-02 | 1.79E-02 | 1.67E-02 | 7.40E+00 |

TIME STEP NUMBER 4, 2014 DURATION IN YRS IS... 1.0

NUMBER 11 NAME=Nichols-west central X= -1.4KM, Y= 0.5KM, Z= 12.0M, DIST= 1.5KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 3.40E+00 | 3.18E-02 | 2.96E-02 | 4.24E-02 | 3.44E-02 | 5.62E+01 |
| CHILD | TOTALS | 3.40E+00 | 3.35E-02 | 3.01E-02 | 3.58E-02 | 3.23E-02 | 5.62E+01 |
| TEENAGE | TOTALS | 3.40E+00 | 3.77E-02 | 3.05E-02 | 3.29E-02 | 3.14E-02 | 5.62E+01 |
| ADULT | TOTALS | 3.40E+00 | 3.74E-02 | 3.10E-02 | 3.30E-02 | 3.16E-02 | 5.62E+01 |

NUMBER 12 NAME=Hank-north central X= 7.9KM, Y= 6.6KM, Z= 86.0M, DIST= 10.3KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 1.22E+00 | 9.10E-02 | 8.23E-02 | 1.31E-01 | 1.01E-01 | 1.89E+01 |
| CHILD | TOTALS | 1.22E+00 | 9.73E-02 | 8.44E-02 | 1.06E-01 | 9.26E-02 | 1.89E+01 |
| TEENAGE | TOTALS | 1.22E+00 | 1.14E-01 | 8.58E-02 | 9.51E-02 | 8.94E-02 | 1.89E+01 |
| ADULT | TOTALS | 1.22E+00 | 1.12E-01 | 8.76E-02 | 9.53E-02 | 9.01E-02 | 1.89E+01 |

TIME STEP NUMBER 4, 2014 DURATION IN YRS IS... 1.0

NUMBER 13 NAME=Hank-east central X= 8.8KM, Y= 3.3KM, Z= 160.0M, DIST= 9.4KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 5.31E+00 | 4.78E-02 | 4.52E-02 | 6.01E-02 | 5.08E-02 | 8.79E+01 |
| CHILD | TOTALS | 5.31E+00 | 4.98E-02 | 4.58E-02 | 5.24E-02 | 4.83E-02 | 8.79E+01 |
| TEENAGE | TOTALS | 5.31E+00 | 5.47E-02 | 4.63E-02 | 4.91E-02 | 4.74E-02 | 8.79E+01 |
| ADULT | TOTALS | 5.31E+00 | 5.43E-02 | 4.68E-02 | 4.92E-02 | 4.76E-02 | 8.79E+01 |

NUMBER 14 NAME=Hank-south central X= 7.9KM, Y= 1.3KM, Z= 139.0M, DIST= 8.0KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 8.17E-01 | 4.51E-02 | 4.11E-02 | 6.37E-02 | 4.96E-02 | 1.30E+01 |
| CHILD | TOTALS | 8.17E-01 | 4.80E-02 | 4.21E-02 | 5.21E-02 | 4.59E-02 | 1.30E+01 |
| TEENAGE | TOTALS | 8.17E-01 | 5.55E-02 | 4.27E-02 | 4.70E-02 | 4.44E-02 | 1.30E+01 |
| ADULT | TOTALS | 8.17E-01 | 5.49E-02 | 4.35E-02 | 4.71E-02 | 4.47E-02 | 1.30E+01 |

TIME STEP NUMBER 4, 2014 DURATION IN YRS IS... 1.0

NUMBER 15 NAME=Hank-west central X= 7.1KM, Y= 4.2KM, Z= 102.0M, DIST= 8.2KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 1.51E+00 | 4.78E-02 | 4.47E-02 | 6.25E-02 | 5.14E-02 | 2.44E+01 |
| CHILD | TOTALS | 1.51E+00 | 5.01E-02 | 4.54E-02 | 5.33E-02 | 4.84E-02 | 2.44E+01 |
| TEENAGE | TOTALS | 1.51E+00 | 5.60E-02 | 4.59E-02 | 4.93E-02 | 4.72E-02 | 2.44E+01 |
| ADULT | TOTALS | 1.51E+00 | 5.56E-02 | 4.66E-02 | 4.94E-02 | 4.75E-02 | 2.44E+01 |

TIME STEP NUMBER 5, 2015 DURATION IN YRS IS... 1.0

SUMMARY PRINT OF POPULATION DOSES COMPUTED FOR TSTEP 5--DOSES SHOWN ARE ANNUAL POPULATION DOSE COMMITMENTS, PERSON-REM PER YEAR

DOSES RECEIVED BY PEOPLE WITHIN 80 KILOMETERS

| PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|
| INHAL. | 1.723E-02 | 1.395E-01 | 2.307E-03 | 1.046E-01 | 5.032E-02 | 5.244E+00 |
| GROUND | 7.655E-04 | 7.655E-04 | 7.655E-04 | 7.655E-04 | 7.655E-04 | 7.655E-04 |
| CLOUD | 4.494E-02 | 4.494E-02 | 4.494E-02 | 4.494E-02 | 4.494E-02 | 4.494E-02 |
| VEG. ING | 8.149E-02 | 9.417E-01 | 8.149E-02 | 2.799E-01 | 2.280E-01 | 8.149E-02 |
| MEAT ING | 4.447E-03 | 5.139E-02 | 4.447E-03 | 1.527E-02 | 1.244E-02 | 4.447E-03 |
| MILK ING | 9.028E-04 | 1.043E-02 | 9.028E-04 | 3.101E-03 | 2.525E-03 | 9.028E-04 |
| RNPLUS50 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| TOTALS | 1.498E-01 | 1.189E+00 | 1.349E-01 | 4.486E-01 | 3.390E-01 | 5.377E+00 |

DOSES RECEIVED BY PEOPLE BEYOND 80 KILOMETERS

| PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|
| INHAL. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| GROUND | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| CLOUD | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| VEG. ING | 7.651E-01 | 8.841E+00 | 7.651E-01 | 2.628E+00 | 2.140E+00 | 7.651E-01 |
| MEAT ING | 9.305E-03 | 1.075E-01 | 9.305E-03 | 3.196E-02 | 2.603E-02 | 9.305E-03 |
| MILK ING | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| RNPLUS50 | 5.329E+00 | 7.267E+01 | 1.211E+00 | 5.329E+00 | 5.329E+00 | 3.391E+01 |
| TOTALS | 6.104E+00 | 8.162E+01 | 1.986E+00 | 7.989E+00 | 7.496E+00 | 3.469E+01 |

TOTAL DOSES COMPUTED OVER ALL POPULATIONS

| PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|
| INHAL. | 1.723E-02 | 1.395E-01 | 2.307E-03 | 1.046E-01 | 5.032E-02 | 5.244E+00 |
| GROUND | 7.655E-04 | 7.655E-04 | 7.655E-04 | 7.655E-04 | 7.655E-04 | 7.655E-04 |
| CLOUD | 4.494E-02 | 4.494E-02 | 4.494E-02 | 4.494E-02 | 4.494E-02 | 4.494E-02 |
| VEG. ING | 8.466E-01 | 9.783E+00 | 8.466E-01 | 2.908E+00 | 2.368E+00 | 8.466E-01 |
| MEAT ING | 1.375E-02 | 1.589E-01 | 1.375E-02 | 4.723E-02 | 3.847E-02 | 1.375E-02 |
| MILK ING | 9.028E-04 | 1.043E-02 | 9.028E-04 | 3.101E-03 | 2.525E-03 | 9.028E-04 |
| RNPLUS50 | 5.329E+00 | 7.267E+01 | 1.211E+00 | 5.329E+00 | 5.329E+00 | 3.391E+01 |
| TOTALS | 6.253E+00 | 8.281E+01 | 2.120E+00 | 8.438E+00 | 7.835E+00 | 4.006E+01 |

TIME STEP NUMBER 5, 2015 DURATION IN YRS IS... 1.0

NUMBER 1 NAME=T-Chair Ranch X= 3.7KM, Y= -2.2KM, Z= -7.0M, DIST= 4.3KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 1.31E-01 | 1.39E-02 | 1.15E-02 | 2.49E-02 | 1.66E-02 | 2.00E+00 |
| CHILD | TOTALS | 1.31E-01 | 1.56E-02 | 1.21E-02 | 1.80E-02 | 1.43E-02 | 2.00E+00 |
| TEENAGE | TOTALS | 1.31E-01 | 2.01E-02 | 1.25E-02 | 1.50E-02 | 1.35E-02 | 2.00E+00 |
| ADULT | TOTALS | 1.31E-01 | 1.98E-02 | 1.30E-02 | 1.51E-02 | 1.37E-02 | 2.00E+00 |

NUMBER 2 NAME=Dry Fork Ranch X= -2.7KM, Y= -1.1KM, Z= -58.0M, DIST= 2.9KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 5.35E-02 | 4.95E-03 | 3.83E-03 | 1.02E-02 | 6.22E-03 | 8.26E-01 |
| CHILD | TOTALS | 5.34E-02 | 5.78E-03 | 4.10E-03 | 6.92E-03 | 5.16E-03 | 8.26E-01 |
| TEENAGE | TOTALS | 5.34E-02 | 7.90E-03 | 4.28E-03 | 5.49E-03 | 4.75E-03 | 8.26E-01 |
| ADULT | TOTALS | 5.35E-02 | 7.74E-03 | 4.52E-03 | 5.53E-03 | 4.84E-03 | 8.26E-01 |

TIME STEP NUMBER 5, 2015 DURATION IN YRS IS... 1.0

NUMBER 3 NAME=Christensen Ranch X= 1.8KM, Y= 7.8KM, Z= -1.0M, DIST= 8.0KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 1.84E-01 | 2.50E-02 | 1.95E-02 | 5.01E-02 | 3.11E-02 | 2.75E+00 |
| CHILD | TOTALS | 1.84E-01 | 2.90E-02 | 2.08E-02 | 3.44E-02 | 2.60E-02 | 2.75E+00 |
| TEENAGE | TOTALS | 1.84E-01 | 3.92E-02 | 2.18E-02 | 2.76E-02 | 2.40E-02 | 2.75E+00 |
| ADULT | TOTALS | 1.84E-01 | 3.85E-02 | 2.29E-02 | 2.77E-02 | 2.45E-02 | 2.75E+00 |

NUMBER 4 NAME=Pfister Ranch X= 7.8KM, Y= 7.4KM, Z= 78.0M, DIST= 10.8KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 7.60E-01 | 6.79E-02 | 5.99E-02 | 1.05E-01 | 7.68E-02 | 1.17E+01 |
| CHILD | TOTALS | 7.59E-01 | 7.37E-02 | 6.18E-02 | 8.17E-02 | 6.94E-02 | 1.17E+01 |
| TEENAGE | TOTALS | 7.59E-01 | 8.87E-02 | 6.32E-02 | 7.17E-02 | 6.64E-02 | 1.17E+01 |
| ADULT | TOTALS | 7.60E-01 | 8.76E-02 | 6.48E-02 | 7.19E-02 | 6.71E-02 | 1.17E+01 |

TIME STEP NUMBER 5, 2015 DURATION IN YRS IS... 1.0

NUMBER 5 NAME=Pumpkin Butte Ranch X= 11.1KM, Y= 3.6KM, Z= 218.0M, DIST= 11.7KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 5.96E-01 | 3.83E-02 | 3.45E-02 | 5.60E-02 | 4.26E-02 | 9.37E+00 |
| CHILD | TOTALS | 5.95E-01 | 4.11E-02 | 3.54E-02 | 4.49E-02 | 3.90E-02 | 9.37E+00 |
| TEENAGE | TOTALS | 5.96E-01 | 4.83E-02 | 3.60E-02 | 4.01E-02 | 3.76E-02 | 9.37E+00 |
| ADULT | TOTALS | 5.96E-01 | 4.78E-02 | 3.68E-02 | 4.02E-02 | 3.79E-02 | 9.37E+00 |

NUMBER 6 NAME=Van Buggenum Ranch X= 15.4KM, Y= 5.3KM, Z= 130.0M, DIST= 16.3KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 1.78E-01 | 2.25E-02 | 1.72E-02 | 4.69E-02 | 2.84E-02 | 2.67E+00 |
| CHILD | TOTALS | 1.78E-01 | 2.64E-02 | 1.85E-02 | 3.17E-02 | 2.35E-02 | 2.67E+00 |
| TEENAGE | TOTALS | 1.78E-01 | 3.63E-02 | 1.94E-02 | 2.50E-02 | 2.16E-02 | 2.67E+00 |
| ADULT | TOTALS | 1.78E-01 | 3.55E-02 | 2.05E-02 | 2.52E-02 | 2.20E-02 | 2.67E+00 |

TIME STEP NUMBER 5, 2015 DURATION IN YRS IS... 1.0

NUMBER 7 NAME=Ruby Ranch X= 19.0KM, Y= 2.9KM, Z= 101.0M, DIST= 19.2KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 1.21E-01 | 1.81E-02 | 1.26E-02 | 4.36E-02 | 2.43E-02 | 1.80E+00 |
| CHILD | TOTALS | 1.21E-01 | 2.22E-02 | 1.40E-02 | 2.77E-02 | 1.92E-02 | 1.80E+00 |
| TEENAGE | TOTALS | 1.21E-01 | 3.25E-02 | 1.49E-02 | 2.08E-02 | 1.71E-02 | 1.80E+00 |
| ADULT | TOTALS | 1.21E-01 | 3.17E-02 | 1.60E-02 | 2.09E-02 | 1.76E-02 | 1.80E+00 |

NUMBER 8 NAME=Nichols-north centra X= -0.4KM, Y= 1.3KM, Z= 57.0M, DIST= 1.4KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 1.55E+00 | 3.83E-02 | 3.58E-02 | 4.99E-02 | 4.11E-02 | 2.52E+01 |
| CHILD | TOTALS | 1.55E+00 | 4.02E-02 | 3.64E-02 | 4.27E-02 | 3.88E-02 | 2.52E+01 |
| TEENAGE | TOTALS | 1.55E+00 | 4.49E-02 | 3.68E-02 | 3.95E-02 | 3.79E-02 | 2.52E+01 |
| ADULT | TOTALS | 1.55E+00 | 4.45E-02 | 3.74E-02 | 3.96E-02 | 3.81E-02 | 2.52E+01 |

TIME STEP NUMBER 5, 2015 DURATION IN YRS IS... 1.0

NUMBER 9 NAME=Nichols-east central X= 0.6KM, Y= 0.2KM, Z= -2.0M, DIST= 0.6KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 5.91E-01 | 2.07E-02 | 1.88E-02 | 2.92E-02 | 2.27E-02 | 9.54E+00 |
| CHILD | TOTALS | 5.90E-01 | 2.20E-02 | 1.93E-02 | 2.39E-02 | 2.10E-02 | 9.54E+00 |
| TEENAGE | TOTALS | 5.91E-01 | 2.55E-02 | 1.96E-02 | 2.16E-02 | 2.03E-02 | 9.54E+00 |
| ADULT | TOTALS | 5.91E-01 | 2.52E-02 | 2.00E-02 | 2.16E-02 | 2.05E-02 | 9.54E+00 |

NUMBER 10 NAME=Nichols-south centra X= -0.3KM, Y= -1.1KM, Z= -18.0M, DIST= 1.1KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 3.18E-01 | 1.27E-02 | 1.10E-02 | 2.03E-02 | 1.45E-02 | 5.12E+00 |
| CHILD | TOTALS | 3.18E-01 | 1.39E-02 | 1.14E-02 | 1.55E-02 | 1.30E-02 | 5.12E+00 |
| TEENAGE | TOTALS | 3.18E-01 | 1.70E-02 | 1.17E-02 | 1.35E-02 | 1.24E-02 | 5.12E+00 |
| ADULT | TOTALS | 3.18E-01 | 1.68E-02 | 1.20E-02 | 1.35E-02 | 1.25E-02 | 5.12E+00 |

TIME STEP NUMBER 5, 2015 DURATION IN YRS IS... 1.0

NUMBER 11 NAME=Nichols-west central X= -1.4KM, Y= 0.5KM, Z= 12.0M, DIST= 1.5KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 2.31E+00 | 2.30E-02 | 2.11E-02 | 3.21E-02 | 2.52E-02 | 3.81E+01 |
| CHILD | TOTALS | 2.31E+00 | 2.45E-02 | 2.16E-02 | 2.64E-02 | 2.34E-02 | 3.81E+01 |
| TEENAGE | TOTALS | 2.31E+00 | 2.81E-02 | 2.19E-02 | 2.40E-02 | 2.27E-02 | 3.81E+01 |
| ADULT | TOTALS | 2.31E+00 | 2.79E-02 | 2.23E-02 | 2.40E-02 | 2.28E-02 | 3.81E+01 |

NUMBER 12 NAME=Hank-north central X= 7.9KM, Y= 6.6KM, Z= 86.0M, DIST= 10.3KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 1.04E+00 | 7.71E-02 | 7.01E-02 | 1.10E-01 | 8.50E-02 | 1.63E+01 |
| CHILD | TOTALS | 1.04E+00 | 8.22E-02 | 7.18E-02 | 8.93E-02 | 7.84E-02 | 1.63E+01 |
| TEENAGE | TOTALS | 1.04E+00 | 9.54E-02 | 7.29E-02 | 8.05E-02 | 7.58E-02 | 1.63E+01 |
| ADULT | TOTALS | 1.04E+00 | 9.45E-02 | 7.44E-02 | 8.07E-02 | 7.64E-02 | 1.63E+01 |

TIME STEP NUMBER 5, 2015 DURATION IN YRS IS... 1.0

NUMBER 13 NAME=Hank-east central X= 8.8KM, Y= 3.3KM, Z= 160.0M, DIST= 9.4KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 4.60E+00 | 3.98E-02 | 3.79E-02 | 4.83E-02 | 4.18E-02 | 7.60E+01 |
| CHILD | TOTALS | 4.60E+00 | 4.11E-02 | 3.84E-02 | 4.30E-02 | 4.01E-02 | 7.60E+01 |
| TEENAGE | TOTALS | 4.60E+00 | 4.46E-02 | 3.87E-02 | 4.07E-02 | 3.95E-02 | 7.60E+01 |
| ADULT | TOTALS | 4.60E+00 | 4.43E-02 | 3.91E-02 | 4.07E-02 | 3.96E-02 | 7.60E+01 |

NUMBER 14 NAME=Hank-south central X= 7.9KM, Y= 1.3KM, Z= 139.0M, DIST= 8.0KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 6.93E-01 | 3.71E-02 | 3.41E-02 | 5.11E-02 | 4.05E-02 | 1.10E+01 |
| CHILD | TOTALS | 6.93E-01 | 3.94E-02 | 3.48E-02 | 4.24E-02 | 3.77E-02 | 1.10E+01 |
| TEENAGE | TOTALS | 6.93E-01 | 4.50E-02 | 3.53E-02 | 3.86E-02 | 3.66E-02 | 1.10E+01 |
| ADULT | TOTALS | 6.93E-01 | 4.46E-02 | 3.60E-02 | 3.87E-02 | 3.68E-02 | 1.10E+01 |

TIME STEP NUMBER 5, 2015 DURATION IN YRS IS... 1.0

NUMBER 15 NAME=Hank-west central X= 7.1KM, Y= 4.2KM, Z= 102.0M, DIST= 8.2KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 1.30E+00 | 3.96E-02 | 3.73E-02 | 5.03E-02 | 4.22E-02 | 2.10E+01 |
| CHILD | TOTALS | 1.30E+00 | 4.13E-02 | 3.79E-02 | 4.36E-02 | 4.01E-02 | 2.10E+01 |
| TEENAGE | TOTALS | 1.30E+00 | 4.56E-02 | 3.83E-02 | 4.07E-02 | 3.92E-02 | 2.10E+01 |
| ADULT | TOTALS | 1.30E+00 | 4.53E-02 | 3.88E-02 | 4.08E-02 | 3.94E-02 | 2.10E+01 |

TIME STEP NUMBER 6, 2016 DURATION IN YRS IS... 1.0

SUMMARY PRINT OF POPULATION DOSES COMPUTED FOR TSTEP 6--DOSES SHOWN ARE ANNUAL POPULATION DOSE COMMITMENTS, PERSON-REM PER YEAR

DOSES RECEIVED BY PEOPLE WITHIN 80 KILOMETERS

| PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|
| INHAL. | 1.166E-02 | 9.440E-02 | 1.565E-03 | 7.080E-02 | 3.405E-02 | 3.486E+00 |
| GROUND | 5.864E-04 | 5.864E-04 | 5.864E-04 | 5.864E-04 | 5.864E-04 | 5.864E-04 |
| CLOUD | 2.993E-02 | 2.993E-02 | 2.993E-02 | 2.993E-02 | 2.993E-02 | 2.993E-02 |
| VEG. ING | 5.617E-02 | 6.491E-01 | 5.617E-02 | 1.929E-01 | 1.571E-01 | 5.617E-02 |
| MEAT ING | 3.155E-03 | 3.645E-02 | 3.155E-03 | 1.083E-02 | 8.825E-03 | 3.155E-03 |
| MILK ING | 6.403E-04 | 7.399E-03 | 6.403E-04 | 2.199E-03 | 1.791E-03 | 6.403E-04 |
| RNPLUS50 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| TOTALS | 1.021E-01 | 8.179E-01 | 9.205E-02 | 3.073E-01 | 2.323E-01 | 3.576E+00 |

DOSES RECEIVED BY PEOPLE BEYOND 80 KILOMETERS

| PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|
| INHAL. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| GROUND | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| CLOUD | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| VEG. ING | 5.274E-01 | 6.094E+00 | 5.274E-01 | 1.811E+00 | 1.475E+00 | 5.274E-01 |
| MEAT ING | 6.600E-03 | 7.626E-02 | 6.600E-03 | 2.267E-02 | 1.846E-02 | 6.600E-03 |
| MILK ING | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| RNPLUS50 | 3.622E+00 | 4.939E+01 | 8.231E-01 | 3.622E+00 | 3.622E+00 | 2.305E+01 |
| TOTALS | 4.156E+00 | 5.556E+01 | 1.357E+00 | 5.456E+00 | 5.116E+00 | 2.358E+01 |

TOTAL DOSES COMPUTED OVER ALL POPULATIONS

| PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|
| INHAL. | 1.166E-02 | 9.440E-02 | 1.565E-03 | 7.080E-02 | 3.405E-02 | 3.486E+00 |
| GROUND | 5.864E-04 | 5.864E-04 | 5.864E-04 | 5.864E-04 | 5.864E-04 | 5.864E-04 |
| CLOUD | 2.993E-02 | 2.993E-02 | 2.993E-02 | 2.993E-02 | 2.993E-02 | 2.993E-02 |
| VEG. ING | 5.836E-01 | 6.743E+00 | 5.836E-01 | 2.004E+00 | 1.633E+00 | 5.836E-01 |
| MEAT ING | 9.754E-03 | 1.127E-01 | 9.754E-03 | 3.350E-02 | 2.729E-02 | 9.754E-03 |
| MILK ING | 6.403E-04 | 7.399E-03 | 6.403E-04 | 2.199E-03 | 1.791E-03 | 6.403E-04 |
| RNPLUS50 | 3.622E+00 | 4.939E+01 | 8.231E-01 | 3.622E+00 | 3.622E+00 | 2.305E+01 |
| TOTALS | 4.258E+00 | 5.638E+01 | 1.449E+00 | 5.763E+00 | 5.348E+00 | 2.716E+01 |

TIME STEP NUMBER 6, 2016 DURATION IN YRS IS... 1.0

NUMBER 1 NAME=T-Chair Ranch X= 3.7KM, Y= -2.2KM, Z= -7.0M, DIST= 4.3KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 1.03E-01 | 1.03E-02 | 8.62E-03 | 1.79E-02 | 1.21E-02 | 1.57E+00 |
| CHILD | TOTALS | 1.03E-01 | 1.15E-02 | 9.03E-03 | 1.32E-02 | 1.06E-02 | 1.57E+00 |
| TEENAGE | TOTALS | 1.03E-01 | 1.46E-02 | 9.31E-03 | 1.11E-02 | 9.99E-03 | 1.57E+00 |
| ADULT | TOTALS | 1.03E-01 | 1.44E-02 | 9.67E-03 | 1.11E-02 | 1.01E-02 | 1.57E+00 |

NUMBER 2 NAME=Dry Fork Ranch X= -2.7KM, Y= -1.1KM, Z= -58.0M, DIST= 2.9KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 4.42E-02 | 3.40E-03 | 2.75E-03 | 6.39E-03 | 4.13E-03 | 6.91E-01 |
| CHILD | TOTALS | 4.42E-02 | 3.89E-03 | 2.92E-03 | 4.53E-03 | 3.53E-03 | 6.91E-01 |
| TEENAGE | TOTALS | 4.42E-02 | 5.11E-03 | 3.03E-03 | 3.72E-03 | 3.29E-03 | 6.91E-01 |
| ADULT | TOTALS | 4.42E-02 | 5.04E-03 | 3.16E-03 | 3.74E-03 | 3.35E-03 | 6.91E-01 |

TIME STEP NUMBER 6, 2016 DURATION IN YRS IS... 1.0

NUMBER 3 NAME=Christensen Ranch X= 1.8KM, Y= 7.8KM, Z= -1.0M, DIST= 8.0KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 1.37E-01 | 1.87E-02 | 1.46E-02 | 3.77E-02 | 2.33E-02 | 2.03E+00 |
| CHILD | TOTALS | 1.36E-01 | 2.18E-02 | 1.56E-02 | 2.59E-02 | 1.95E-02 | 2.03E+00 |
| TEENAGE | TOTALS | 1.37E-01 | 2.96E-02 | 1.63E-02 | 2.07E-02 | 1.80E-02 | 2.03E+00 |
| ADULT | TOTALS | 1.37E-01 | 2.91E-02 | 1.72E-02 | 2.09E-02 | 1.84E-02 | 2.03E+00 |

NUMBER 4 NAME=Pfister Ranch X= 7.8KM, Y= 7.4KM, Z= 78.0M, DIST= 10.8KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 4.32E-01 | 3.98E-02 | 3.46E-02 | 6.39E-02 | 4.57E-02 | 6.63E+00 |
| CHILD | TOTALS | 4.31E-01 | 4.38E-02 | 3.59E-02 | 4.89E-02 | 4.08E-02 | 6.63E+00 |
| TEENAGE | TOTALS | 4.32E-01 | 5.36E-02 | 3.68E-02 | 4.24E-02 | 3.89E-02 | 6.63E+00 |
| ADULT | TOTALS | 4.32E-01 | 5.30E-02 | 3.79E-02 | 4.25E-02 | 3.94E-02 | 6.63E+00 |

TIME STEP NUMBER 6, 2016 DURATION IN YRS IS... 1.0

NUMBER 5 NAME=Pumpkin Butte Ranch X= 11.1KM, Y= 3.6KM, Z= 218.0M, DIST= 11.7KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 3.39E-01 | 2.32E-02 | 2.04E-02 | 3.63E-02 | 2.64E-02 | 5.32E+00 |
| CHILD | TOTALS | 3.39E-01 | 2.54E-02 | 2.11E-02 | 2.82E-02 | 2.38E-02 | 5.32E+00 |
| TEENAGE | TOTALS | 3.39E-01 | 3.07E-02 | 2.16E-02 | 2.46E-02 | 2.27E-02 | 5.32E+00 |
| ADULT | TOTALS | 3.39E-01 | 3.04E-02 | 2.22E-02 | 2.47E-02 | 2.30E-02 | 5.32E+00 |

NUMBER 6 NAME=Van Buggenum Ranch X= 15.4KM, Y= 5.3KM, Z= 130.0M, DIST= 16.3KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 1.07E-01 | 1.42E-02 | 1.06E-02 | 3.09E-02 | 1.82E-02 | 1.60E+00 |
| CHILD | TOTALS | 1.07E-01 | 1.69E-02 | 1.15E-02 | 2.05E-02 | 1.49E-02 | 1.60E+00 |
| TEENAGE | TOTALS | 1.07E-01 | 2.37E-02 | 1.21E-02 | 1.59E-02 | 1.36E-02 | 1.60E+00 |
| ADULT | TOTALS | 1.07E-01 | 2.33E-02 | 1.29E-02 | 1.61E-02 | 1.39E-02 | 1.60E+00 |

TIME STEP NUMBER 6, 2016 DURATION IN YRS IS... 1.0

NUMBER 7 NAME=Ruby Ranch X= 19.0KM, Y= 2.9KM, Z= 101.0M, DIST= 19.2KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 7.53E-02 | 1.18E-02 | 8.00E-03 | 2.92E-02 | 1.60E-02 | 1.11E+00 |
| CHILD | TOTALS | 7.50E-02 | 1.46E-02 | 8.94E-03 | 1.83E-02 | 1.25E-02 | 1.11E+00 |
| TEENAGE | TOTALS | 7.52E-02 | 2.17E-02 | 9.57E-03 | 1.36E-02 | 1.11E-02 | 1.11E+00 |
| ADULT | TOTALS | 7.53E-02 | 2.13E-02 | 1.04E-02 | 1.37E-02 | 1.15E-02 | 1.11E+00 |

NUMBER 8 NAME=Nichols-north centra X= -0.4KM, Y= 1.3KM, Z= 57.0M, DIST= 1.4KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 1.52E+00 | 3.45E-02 | 3.30E-02 | 4.18E-02 | 3.63E-02 | 2.48E+01 |
| CHILD | TOTALS | 1.52E+00 | 3.57E-02 | 3.33E-02 | 3.73E-02 | 3.48E-02 | 2.48E+01 |
| TEENAGE | TOTALS | 1.52E+00 | 3.87E-02 | 3.36E-02 | 3.53E-02 | 3.43E-02 | 2.48E+01 |
| ADULT | TOTALS | 1.52E+00 | 3.85E-02 | 3.39E-02 | 3.53E-02 | 3.44E-02 | 2.48E+01 |

TIME STEP NUMBER 6, 2016 DURATION IN YRS IS... 1.0

NUMBER 9 NAME=Nichols-east central X= 0.6KM, Y= 0.2KM, Z= -2.0M, DIST= 0.6KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 5.71E-01 | 1.78E-02 | 1.66E-02 | 2.32E-02 | 1.91E-02 | 9.25E+00 |
| CHILD | TOTALS | 5.71E-01 | 1.87E-02 | 1.69E-02 | 1.99E-02 | 1.80E-02 | 9.25E+00 |
| TEENAGE | TOTALS | 5.71E-01 | 2.09E-02 | 1.71E-02 | 1.84E-02 | 1.76E-02 | 9.25E+00 |
| ADULT | TOTALS | 5.71E-01 | 2.08E-02 | 1.74E-02 | 1.84E-02 | 1.77E-02 | 9.25E+00 |

NUMBER 10 NAME=Nichols-south centra X= -0.3KM, Y= -1.1KM, Z= -18.0M, DIST= 1.1KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 3.02E-01 | 1.01E-02 | 9.16E-03 | 1.47E-02 | 1.13E-02 | 4.88E+00 |
| CHILD | TOTALS | 3.02E-01 | 1.09E-02 | 9.40E-03 | 1.19E-02 | 1.03E-02 | 4.88E+00 |
| TEENAGE | TOTALS | 3.02E-01 | 1.28E-02 | 9.57E-03 | 1.06E-02 | 9.98E-03 | 4.88E+00 |
| ADULT | TOTALS | 3.02E-01 | 1.27E-02 | 9.78E-03 | 1.07E-02 | 1.01E-02 | 4.88E+00 |

TIME STEP NUMBER 6, 2016 DURATION IN YRS IS... 1.0

NUMBER 11 NAME=Nichols-west central X= -1.4KM, Y= 0.5KM, Z= 12.0M, DIST= 1.5KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 2.29E+00 | 1.99E-02 | 1.88E-02 | 2.50E-02 | 2.11E-02 | 3.78E+01 |
| CHILD | TOTALS | 2.29E+00 | 2.07E-02 | 1.91E-02 | 2.18E-02 | 2.01E-02 | 3.78E+01 |
| TEENAGE | TOTALS | 2.29E+00 | 2.28E-02 | 1.93E-02 | 2.05E-02 | 1.97E-02 | 3.78E+01 |
| ADULT | TOTALS | 2.29E+00 | 2.27E-02 | 1.95E-02 | 2.05E-02 | 1.98E-02 | 3.78E+01 |

NUMBER 12 NAME=Hank-north central X= 7.9KM, Y= 6.6KM, Z= 86.0M, DIST= 10.3KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 5.86E-01 | 4.48E-02 | 4.01E-02 | 6.64E-02 | 5.01E-02 | 9.11E+00 |
| CHILD | TOTALS | 5.85E-01 | 4.83E-02 | 4.13E-02 | 5.30E-02 | 4.57E-02 | 9.11E+00 |
| TEENAGE | TOTALS | 5.86E-01 | 5.72E-02 | 4.21E-02 | 4.71E-02 | 4.40E-02 | 9.11E+00 |
| ADULT | TOTALS | 5.86E-01 | 5.66E-02 | 4.31E-02 | 4.73E-02 | 4.44E-02 | 9.11E+00 |

TIME STEP NUMBER 6, 2016 DURATION IN YRS IS... 1.0

NUMBER 13 NAME=Hank-east central X= 8.8KM, Y= 3.3KM, Z= 160.0M, DIST= 9.4KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 2.51E+00 | 2.44E-02 | 2.26E-02 | 3.24E-02 | 2.63E-02 | 4.15E+01 |
| CHILD | TOTALS | 2.51E+00 | 2.57E-02 | 2.31E-02 | 2.74E-02 | 2.47E-02 | 4.15E+01 |
| TEENAGE | TOTALS | 2.51E+00 | 2.89E-02 | 2.33E-02 | 2.52E-02 | 2.41E-02 | 4.15E+01 |
| ADULT | TOTALS | 2.51E+00 | 2.87E-02 | 2.37E-02 | 2.53E-02 | 2.42E-02 | 4.15E+01 |

NUMBER 14 NAME=Hank-south central X= 7.9KM, Y= 1.3KM, Z= 139.0M, DIST= 8.0KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 4.01E-01 | 2.34E-02 | 2.10E-02 | 3.44E-02 | 2.61E-02 | 6.35E+00 |
| CHILD | TOTALS | 4.01E-01 | 2.52E-02 | 2.16E-02 | 2.76E-02 | 2.38E-02 | 6.35E+00 |
| TEENAGE | TOTALS | 4.01E-01 | 2.97E-02 | 2.20E-02 | 2.45E-02 | 2.30E-02 | 6.35E+00 |
| ADULT | TOTALS | 4.01E-01 | 2.94E-02 | 2.25E-02 | 2.46E-02 | 2.32E-02 | 6.35E+00 |

TIME STEP NUMBER 6, 2016 DURATION IN YRS IS... 1.0

NUMBER 15 NAME=Hank-west central X= 7.1KM, Y= 4.2KM, Z= 102.0M, DIST= 8.2KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 7.25E-01 | 2.45E-02 | 2.25E-02 | 3.36E-02 | 2.67E-02 | 1.17E+01 |
| CHILD | TOTALS | 7.25E-01 | 2.60E-02 | 2.30E-02 | 2.79E-02 | 2.49E-02 | 1.17E+01 |
| TEENAGE | TOTALS | 7.25E-01 | 2.97E-02 | 2.33E-02 | 2.55E-02 | 2.42E-02 | 1.17E+01 |
| ADULT | TOTALS | 7.25E-01 | 2.95E-02 | 2.38E-02 | 2.55E-02 | 2.43E-02 | 1.17E+01 |

TIME STEP NUMBER 7, 2017 DURATION IN YRS IS... 1.0

SUMMARY PRINT OF POPULATION DOSES COMPUTED FOR TSTEP 7--DOSES SHOWN ARE ANNUAL POPULATION DOSE COMMITMENTS, PERSON-REM PER YEAR

DOSES RECEIVED BY PEOPLE WITHIN 80 KILOMETERS

| PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|
| INHAL. | 7.863E-03 | 6.364E-02 | 1.050E-03 | 4.773E-02 | 2.296E-02 | 2.433E+00 |
| GROUND | 4.773E-04 | 4.773E-04 | 4.773E-04 | 4.773E-04 | 4.773E-04 | 4.773E-04 |
| CLOUD | 2.081E-02 | 2.081E-02 | 2.081E-02 | 2.081E-02 | 2.081E-02 | 2.081E-02 |
| VEG. ING | 3.783E-02 | 4.372E-01 | 3.783E-02 | 1.299E-01 | 1.058E-01 | 3.783E-02 |
| MEAT ING | 2.213E-03 | 2.557E-02 | 2.213E-03 | 7.599E-03 | 6.190E-03 | 2.213E-03 |
| MILK ING | 4.491E-04 | 5.190E-03 | 4.491E-04 | 1.543E-03 | 1.256E-03 | 4.491E-04 |
| RNPLUS50 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| TOTALS | 6.965E-02 | 5.529E-01 | 6.284E-02 | 2.081E-01 | 1.575E-01 | 2.495E+00 |

DOSES RECEIVED BY PEOPLE BEYOND 80 KILOMETERS

| PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|
| INHAL. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| GROUND | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| CLOUD | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| VEG. ING | 3.552E-01 | 4.105E+00 | 3.552E-01 | 1.220E+00 | 9.937E-01 | 3.552E-01 |
| MEAT ING | 4.629E-03 | 5.349E-02 | 4.629E-03 | 1.590E-02 | 1.295E-02 | 4.629E-03 |
| MILK ING | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| RNPLUS50 | 2.422E+00 | 3.302E+01 | 5.504E-01 | 2.422E+00 | 2.422E+00 | 1.541E+01 |
| TOTALS | 2.782E+00 | 3.718E+01 | 9.103E-01 | 3.658E+00 | 3.428E+00 | 1.577E+01 |

TOTAL DOSES COMPUTED OVER ALL POPULATIONS

| PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|
| INHAL. | 7.863E-03 | 6.364E-02 | 1.050E-03 | 4.773E-02 | 2.296E-02 | 2.433E+00 |
| GROUND | 4.773E-04 | 4.773E-04 | 4.773E-04 | 4.773E-04 | 4.773E-04 | 4.773E-04 |
| CLOUD | 2.081E-02 | 2.081E-02 | 2.081E-02 | 2.081E-02 | 2.081E-02 | 2.081E-02 |
| VEG. ING | 3.931E-01 | 4.542E+00 | 3.931E-01 | 1.350E+00 | 1.100E+00 | 3.931E-01 |
| MEAT ING | 6.842E-03 | 7.906E-02 | 6.842E-03 | 2.350E-02 | 1.914E-02 | 6.842E-03 |
| MILK ING | 4.491E-04 | 5.190E-03 | 4.491E-04 | 1.543E-03 | 1.256E-03 | 4.491E-04 |
| RNPLUS50 | 2.422E+00 | 3.302E+01 | 5.504E-01 | 2.422E+00 | 2.422E+00 | 1.541E+01 |
| TOTALS | 2.851E+00 | 3.773E+01 | 9.731E-01 | 3.866E+00 | 3.586E+00 | 1.827E+01 |

TIME STEP NUMBER 7, 2017 DURATION IN YRS IS... 1.0

NUMBER 1 NAME=T-Chair Ranch X= 3.7KM, Y= -2.2KM, Z= -7.0M, DIST= 4.3KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 5.11E-02 | 5.79E-03 | 4.74E-03 | 1.07E-02 | 6.97E-03 | 7.74E-01 |
| CHILD | TOTALS | 5.11E-02 | 6.62E-03 | 5.01E-03 | 7.64E-03 | 6.00E-03 | 7.74E-01 |
| TEENAGE | TOTALS | 5.11E-02 | 8.63E-03 | 5.20E-03 | 6.32E-03 | 5.63E-03 | 7.74E-01 |
| ADULT | TOTALS | 5.12E-02 | 8.54E-03 | 5.43E-03 | 6.37E-03 | 5.73E-03 | 7.74E-01 |

NUMBER 2 NAME=Dry Fork Ranch X= -2.7KM, Y= -1.1KM, Z= -58.0M, DIST= 2.9KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 1.92E-02 | 2.23E-03 | 1.64E-03 | 4.96E-03 | 2.89E-03 | 2.92E-01 |
| CHILD | TOTALS | 1.92E-02 | 2.69E-03 | 1.79E-03 | 3.26E-03 | 2.35E-03 | 2.92E-01 |
| TEENAGE | TOTALS | 1.92E-02 | 3.81E-03 | 1.89E-03 | 2.52E-03 | 2.13E-03 | 2.92E-01 |
| ADULT | TOTALS | 1.92E-02 | 3.74E-03 | 2.02E-03 | 2.55E-03 | 2.19E-03 | 2.92E-01 |

TIME STEP NUMBER 7, 2017 DURATION IN YRS IS... 1.0

NUMBER 3 NAME=Christensen Ranch X= 1.8KM, Y= 7.8KM, Z= -1.0M, DIST= 8.0KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 7.66E-02 | 1.02E-02 | 8.04E-03 | 2.05E-02 | 1.27E-02 | 1.14E+00 |
| CHILD | TOTALS | 7.64E-02 | 1.20E-02 | 8.62E-03 | 1.41E-02 | 1.07E-02 | 1.14E+00 |
| TEENAGE | TOTALS | 7.65E-02 | 1.63E-02 | 9.01E-03 | 1.14E-02 | 9.91E-03 | 1.14E+00 |
| ADULT | TOTALS | 7.66E-02 | 1.61E-02 | 9.51E-03 | 1.15E-02 | 1.01E-02 | 1.14E+00 |

NUMBER 4 NAME=Pfister Ranch X= 7.8KM, Y= 7.4KM, Z= 78.0M, DIST= 10.8KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 3.99E-01 | 3.49E-02 | 3.11E-02 | 5.22E-02 | 3.91E-02 | 6.15E+00 |
| CHILD | TOTALS | 3.99E-01 | 3.78E-02 | 3.21E-02 | 4.15E-02 | 3.56E-02 | 6.15E+00 |
| TEENAGE | TOTALS | 3.99E-01 | 4.50E-02 | 3.28E-02 | 3.68E-02 | 3.43E-02 | 6.15E+00 |
| ADULT | TOTALS | 3.99E-01 | 4.46E-02 | 3.36E-02 | 3.69E-02 | 3.46E-02 | 6.15E+00 |

TIME STEP NUMBER 7, 2017 DURATION IN YRS IS... 1.0

NUMBER 5 NAME=Pumpkin Butte Ranch X= 11.1KM, Y= 3.6KM, Z= 218.0M, DIST= 11.7KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 3.13E-01 | 1.92E-02 | 1.76E-02 | 2.65E-02 | 2.10E-02 | 4.93E+00 |
| CHILD | TOTALS | 3.13E-01 | 2.05E-02 | 1.80E-02 | 2.20E-02 | 1.95E-02 | 4.93E+00 |
| TEENAGE | TOTALS | 3.13E-01 | 2.35E-02 | 1.83E-02 | 2.00E-02 | 1.90E-02 | 4.93E+00 |
| ADULT | TOTALS | 3.13E-01 | 2.34E-02 | 1.87E-02 | 2.01E-02 | 1.91E-02 | 4.93E+00 |

NUMBER 6 NAME=Van Buggenum Ranch X= 15.4KM, Y= 5.3KM, Z= 130.0M, DIST= 16.3KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 8.97E-02 | 1.09E-02 | 8.57E-03 | 2.19E-02 | 1.36E-02 | 1.35E+00 |
| CHILD | TOTALS | 8.95E-02 | 1.28E-02 | 9.19E-03 | 1.51E-02 | 1.14E-02 | 1.35E+00 |
| TEENAGE | TOTALS | 8.96E-02 | 1.74E-02 | 9.61E-03 | 1.21E-02 | 1.06E-02 | 1.35E+00 |
| ADULT | TOTALS | 8.97E-02 | 1.71E-02 | 1.01E-02 | 1.22E-02 | 1.08E-02 | 1.35E+00 |

TIME STEP NUMBER 7, 2017 DURATION IN YRS IS... 1.0

NUMBER 7 NAME=Ruby Ranch X= 19.0KM, Y= 2.9KM, Z= 101.0M, DIST= 19.2KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 5.96E-02 | 8.61E-03 | 6.13E-03 | 2.01E-02 | 1.14E-02 | 8.86E-01 |
| CHILD | TOTALS | 5.94E-02 | 1.06E-02 | 6.77E-03 | 1.30E-02 | 9.11E-03 | 8.86E-01 |
| TEENAGE | TOTALS | 5.95E-02 | 1.53E-02 | 7.21E-03 | 9.86E-03 | 8.22E-03 | 8.86E-01 |
| ADULT | TOTALS | 5.96E-02 | 1.51E-02 | 7.75E-03 | 9.97E-03 | 8.45E-03 | 8.86E-01 |

NUMBER 8 NAME=Nichols-north centra X= -0.4KM, Y= 1.3KM, Z= 57.0M, DIST= 1.4KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 4.02E-01 | 1.20E-02 | 1.08E-02 | 1.77E-02 | 1.34E-02 | 6.53E+00 |
| CHILD | TOTALS | 4.02E-01 | 1.30E-02 | 1.11E-02 | 1.42E-02 | 1.23E-02 | 6.53E+00 |
| TEENAGE | TOTALS | 4.02E-01 | 1.53E-02 | 1.13E-02 | 1.26E-02 | 1.18E-02 | 6.53E+00 |
| ADULT | TOTALS | 4.02E-01 | 1.52E-02 | 1.16E-02 | 1.27E-02 | 1.19E-02 | 6.53E+00 |

TIME STEP NUMBER 7, 2017 DURATION IN YRS IS... 1.0

NUMBER 9 NAME=Nichols-east central X= 0.6KM, Y= 0.2KM, Z= -2.0M, DIST= 0.6KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 1.60E-01 | 7.00E-03 | 6.11E-03 | 1.11E-02 | 7.99E-03 | 2.57E+00 |
| CHILD | TOTALS | 1.60E-01 | 7.69E-03 | 6.34E-03 | 8.55E-03 | 7.17E-03 | 2.57E+00 |
| TEENAGE | TOTALS | 1.60E-01 | 9.38E-03 | 6.49E-03 | 7.44E-03 | 6.85E-03 | 2.57E+00 |
| ADULT | TOTALS | 1.60E-01 | 9.29E-03 | 6.68E-03 | 7.48E-03 | 6.94E-03 | 2.57E+00 |

NUMBER 10 NAME=Nichols-south centra X= -0.3KM, Y= -1.1KM, Z= -18.0M, DIST= 1.1KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 9.00E-02 | 4.78E-03 | 3.94E-03 | 8.65E-03 | 5.72E-03 | 1.44E+00 |
| CHILD | TOTALS | 9.00E-02 | 5.43E-03 | 4.15E-03 | 6.25E-03 | 4.94E-03 | 1.44E+00 |
| TEENAGE | TOTALS | 9.00E-02 | 7.02E-03 | 4.30E-03 | 5.19E-03 | 4.64E-03 | 1.44E+00 |
| ADULT | TOTALS | 9.00E-02 | 6.93E-03 | 4.48E-03 | 5.23E-03 | 4.72E-03 | 1.44E+00 |

TIME STEP NUMBER 7, 2017 DURATION IN YRS IS... 1.0

NUMBER 11 NAME=Nichols-west central X= -1.4KM, Y= 0.5KM, Z= 12.0M, DIST= 1.5KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 5.89E-01 | 7.75E-03 | 6.71E-03 | 1.26E-02 | 8.92E-03 | 9.71E+00 |
| CHILD | TOTALS | 5.89E-01 | 8.55E-03 | 6.98E-03 | 9.57E-03 | 7.96E-03 | 9.71E+00 |
| TEENAGE | TOTALS | 5.89E-01 | 1.05E-02 | 7.16E-03 | 8.27E-03 | 7.58E-03 | 9.71E+00 |
| ADULT | TOTALS | 5.89E-01 | 1.04E-02 | 7.38E-03 | 8.31E-03 | 7.68E-03 | 9.71E+00 |

NUMBER 12 NAME=Hank-north central X= 7.9KM, Y= 6.6KM, Z= 86.0M, DIST= 10.3KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 5.52E-01 | 3.99E-02 | 3.66E-02 | 5.50E-02 | 4.35E-02 | 8.62E+00 |
| CHILD | TOTALS | 5.52E-01 | 4.24E-02 | 3.75E-02 | 4.56E-02 | 4.05E-02 | 8.62E+00 |
| TEENAGE | TOTALS | 5.52E-01 | 4.87E-02 | 3.80E-02 | 4.15E-02 | 3.94E-02 | 8.62E+00 |
| ADULT | TOTALS | 5.52E-01 | 4.83E-02 | 3.88E-02 | 4.17E-02 | 3.97E-02 | 8.62E+00 |

TIME STEP NUMBER 7, 2017 DURATION IN YRS IS... 1.0

NUMBER 13 NAME=Hank-east central X= 8.8KM, Y= 3.3KM, Z= 160.0M, DIST= 9.4KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 2.48E+00 | 1.98E-02 | 1.93E-02 | 2.22E-02 | 2.04E-02 | 4.10E+01 |
| CHILD | TOTALS | 2.48E+00 | 2.02E-02 | 1.94E-02 | 2.07E-02 | 1.99E-02 | 4.10E+01 |
| TEENAGE | TOTALS | 2.48E+00 | 2.13E-02 | 1.95E-02 | 2.01E-02 | 1.97E-02 | 4.10E+01 |
| ADULT | TOTALS | 2.48E+00 | 2.12E-02 | 1.96E-02 | 2.01E-02 | 1.98E-02 | 4.10E+01 |

NUMBER 14 NAME=Hank-south central X= 7.9KM, Y= 1.3KM, Z= 139.0M, DIST= 8.0KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 3.59E-01 | 1.81E-02 | 1.69E-02 | 2.34E-02 | 1.94E-02 | 5.72E+00 |
| CHILD | TOTALS | 3.59E-01 | 1.90E-02 | 1.72E-02 | 2.01E-02 | 1.83E-02 | 5.72E+00 |
| TEENAGE | TOTALS | 3.59E-01 | 2.12E-02 | 1.74E-02 | 1.87E-02 | 1.79E-02 | 5.72E+00 |
| ADULT | TOTALS | 3.59E-01 | 2.11E-02 | 1.77E-02 | 1.87E-02 | 1.80E-02 | 5.72E+00 |

TIME STEP NUMBER 7, 2017 DURATION IN YRS IS... 1.0

NUMBER 15 NAME=Hank-west central X= 7.1KM, Y= 4.2KM, Z= 102.0M, DIST= 8.2KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 6.88E-01 | 1.96E-02 | 1.88E-02 | 2.32E-02 | 2.04E-02 | 1.12E+01 |
| CHILD | TOTALS | 6.88E-01 | 2.02E-02 | 1.90E-02 | 2.10E-02 | 1.97E-02 | 1.12E+01 |
| TEENAGE | TOTALS | 6.88E-01 | 2.17E-02 | 1.91E-02 | 2.00E-02 | 1.95E-02 | 1.12E+01 |
| ADULT | TOTALS | 6.88E-01 | 2.17E-02 | 1.93E-02 | 2.00E-02 | 1.95E-02 | 1.12E+01 |

TIME STEP NUMBER 8, 2018 DURATION IN YRS IS... 1.0

SUMMARY PRINT OF POPULATION DOSES COMPUTED FOR TSTEP 8--DOSES SHOWN ARE ANNUAL POPULATION DOSE COMMITMENTS, PERSON-REM PER YEAR

DOSES RECEIVED BY PEOPLE WITHIN 80 KILOMETERS

| PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|
| INHAL. | 6.596E-03 | 5.339E-02 | 8.778E-04 | 4.004E-02 | 1.926E-02 | 2.082E+00 |
| GROUND | 4.443E-04 | 4.443E-04 | 4.443E-04 | 4.443E-04 | 4.443E-04 | 4.443E-04 |
| CLOUD | 1.778E-02 | 1.778E-02 | 1.778E-02 | 1.778E-02 | 1.778E-02 | 1.778E-02 |
| VEG. ING | 3.175E-02 | 3.668E-01 | 3.175E-02 | 1.090E-01 | 8.881E-02 | 3.175E-02 |
| MEAT ING | 1.904E-03 | 2.200E-02 | 1.904E-03 | 6.538E-03 | 5.325E-03 | 1.904E-03 |
| MILK ING | 3.864E-04 | 4.465E-03 | 3.864E-04 | 1.327E-03 | 1.081E-03 | 3.864E-04 |
| RNPLUS50 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| TOTALS | 5.885E-02 | 4.649E-01 | 5.313E-02 | 1.752E-01 | 1.327E-01 | 2.134E+00 |

DOSES RECEIVED BY PEOPLE BEYOND 80 KILOMETERS

| PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|
| INHAL. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| GROUND | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| CLOUD | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| VEG. ING | 2.981E-01 | 3.444E+00 | 2.981E-01 | 1.024E+00 | 8.338E-01 | 2.981E-01 |
| MEAT ING | 3.983E-03 | 4.602E-02 | 3.983E-03 | 1.368E-02 | 1.114E-02 | 3.983E-03 |
| MILK ING | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| RNPLUS50 | 2.022E+00 | 2.757E+01 | 4.595E-01 | 2.022E+00 | 2.022E+00 | 1.287E+01 |
| TOTALS | 2.324E+00 | 3.106E+01 | 7.615E-01 | 3.059E+00 | 2.867E+00 | 1.317E+01 |

TOTAL DOSES COMPUTED OVER ALL POPULATIONS

| PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|
| INHAL. | 6.596E-03 | 5.339E-02 | 8.778E-04 | 4.004E-02 | 1.926E-02 | 2.082E+00 |
| GROUND | 4.443E-04 | 4.443E-04 | 4.443E-04 | 4.443E-04 | 4.443E-04 | 4.443E-04 |
| CLOUD | 1.778E-02 | 1.778E-02 | 1.778E-02 | 1.778E-02 | 1.778E-02 | 1.778E-02 |
| VEG. ING | 3.298E-01 | 3.811E+00 | 3.298E-01 | 1.133E+00 | 9.226E-01 | 3.298E-01 |
| MEAT ING | 5.886E-03 | 6.802E-02 | 5.886E-03 | 2.022E-02 | 1.647E-02 | 5.886E-03 |
| MILK ING | 3.864E-04 | 4.465E-03 | 3.864E-04 | 1.327E-03 | 1.081E-03 | 3.864E-04 |
| RNPLUS50 | 2.022E+00 | 2.757E+01 | 4.595E-01 | 2.022E+00 | 2.022E+00 | 1.287E+01 |
| TOTALS | 2.383E+00 | 3.152E+01 | 8.147E-01 | 3.234E+00 | 2.999E+00 | 1.530E+01 |

TIME STEP NUMBER 8, 2018 DURATION IN YRS IS... 1.0

NUMBER 1 NAME=T-Chair Ranch X= 3.7KM, Y= -2.2KM, Z= -7.0M, DIST= 4.3KM, IRTYPE= 1

*40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR*

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 3.39E-02 | 4.30E-03 | 3.45E-03 | 8.23E-03 | 5.25E-03 | 5.07E-01 |
| CHILD | TOTALS | 3.38E-02 | 4.99E-03 | 3.67E-03 | 5.80E-03 | 4.47E-03 | 5.07E-01 |
| TEENAGE | TOTALS | 3.39E-02 | 6.63E-03 | 3.83E-03 | 4.74E-03 | 4.17E-03 | 5.07E-01 |
| ADULT | TOTALS | 3.39E-02 | 6.57E-03 | 4.02E-03 | 4.78E-03 | 4.26E-03 | 5.07E-01 |

NUMBER 2 NAME=Dry Fork Ranch X= -2.7KM, Y= -1.1KM, Z= -58.0M, DIST= 2.9KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 1.09E-02 | 1.84E-03 | 1.27E-03 | 4.48E-03 | 2.48E-03 | 1.60E-01 |
| CHILD | TOTALS | 1.09E-02 | 2.29E-03 | 1.42E-03 | 2.84E-03 | 1.95E-03 | 1.60E-01 |
| TEENAGE | TOTALS | 1.09E-02 | 3.37E-03 | 1.52E-03 | 2.13E-03 | 1.75E-03 | 1.60E-01 |
| ADULT | TOTALS | 1.09E-02 | 3.31E-03 | 1.64E-03 | 2.15E-03 | 1.80E-03 | 1.60E-01 |

TIME STEP NUMBER 8, 2018 DURATION IN YRS IS... 1.0

NUMBER 3 NAME=Christensen Ranch X= 1.8KM, Y= 7.8KM, Z= -1.0M, DIST= 8.0KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 5.65E-02 | 7.43E-03 | 5.85E-03 | 1.47E-02 | 9.20E-03 | 8.43E-01 |
| CHILD | TOTALS | 5.64E-02 | 8.77E-03 | 6.29E-03 | 1.02E-02 | 7.77E-03 | 8.43E-01 |
| TEENAGE | TOTALS | 5.65E-02 | 1.18E-02 | 6.58E-03 | 8.27E-03 | 7.22E-03 | 8.43E-01 |
| ADULT | TOTALS | 5.65E-02 | 1.18E-02 | 6.95E-03 | 8.36E-03 | 7.38E-03 | 8.43E-01 |

NUMBER 4 NAME=Pfister Ranch X= 7.8KM, Y= 7.4KM, Z= 78.0M, DIST= 10.8KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 3.88E-01 | 3.32E-02 | 3.00E-02 | 4.83E-02 | 3.69E-02 | 5.99E+00 |
| CHILD | TOTALS | 3.88E-01 | 3.59E-02 | 3.08E-02 | 3.90E-02 | 3.39E-02 | 5.99E+00 |
| TEENAGE | TOTALS | 3.88E-01 | 4.21E-02 | 3.14E-02 | 3.49E-02 | 3.27E-02 | 5.99E+00 |
| ADULT | TOTALS | 3.88E-01 | 4.18E-02 | 3.21E-02 | 3.51E-02 | 3.31E-02 | 5.99E+00 |

TIME STEP NUMBER 8, 2018 DURATION IN YRS IS... 1.0

NUMBER 5 NAME=Pumpkin Butte Ranch X= 11.1KM, Y= 3.6KM, Z= 218.0M, DIST= 11.7KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 3.04E-01 | 1.78E-02 | 1.67E-02 | 2.32E-02 | 1.92E-02 | 4.80E+00 |
| CHILD | TOTALS | 3.04E-01 | 1.88E-02 | 1.70E-02 | 1.99E-02 | 1.81E-02 | 4.80E+00 |
| TEENAGE | TOTALS | 3.04E-01 | 2.11E-02 | 1.72E-02 | 1.85E-02 | 1.77E-02 | 4.80E+00 |
| ADULT | TOTALS | 3.04E-01 | 2.10E-02 | 1.75E-02 | 1.85E-02 | 1.78E-02 | 4.80E+00 |

NUMBER 6 NAME=Van Buggenum Ranch X= 15.4KM, Y= 5.3KM, Z= 130.0M, DIST= 16.3KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 8.39E-02 | 9.87E-03 | 7.91E-03 | 1.89E-02 | 1.21E-02 | 1.27E+00 |
| CHILD | TOTALS | 8.37E-02 | 1.15E-02 | 8.43E-03 | 1.33E-02 | 1.03E-02 | 1.27E+00 |
| TEENAGE | TOTALS | 8.38E-02 | 1.52E-02 | 8.78E-03 | 1.09E-02 | 9.58E-03 | 1.27E+00 |
| ADULT | TOTALS | 8.39E-02 | 1.51E-02 | 9.22E-03 | 1.10E-02 | 9.77E-03 | 1.27E+00 |

TIME STEP NUMBER 8, 2018 DURATION IN YRS IS... 1.0

NUMBER 7 NAME=Ruby Ranch X= 19.0KM, Y= 2.9KM, Z= 101.0M, DIST= 19.2KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 5.43E-02 | 7.56E-03 | 5.51E-03 | 1.70E-02 | 9.86E-03 | 8.10E-01 |
| CHILD | TOTALS | 5.41E-02 | 9.22E-03 | 6.05E-03 | 1.12E-02 | 7.98E-03 | 8.10E-01 |
| TEENAGE | TOTALS | 5.43E-02 | 1.32E-02 | 6.42E-03 | 8.62E-03 | 7.25E-03 | 8.10E-01 |
| ADULT | TOTALS | 5.43E-02 | 1.30E-02 | 6.88E-03 | 8.71E-03 | 7.45E-03 | 8.10E-01 |

NUMBER 8 NAME=Nichols-north centra X= -0.4KM, Y= 1.3KM, Z= 57.0M, DIST= 1.4KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 2.98E-02 | 4.51E-03 | 3.40E-03 | 9.66E-03 | 5.76E-03 | 4.39E-01 |
| CHILD | TOTALS | 2.97E-02 | 5.39E-03 | 3.69E-03 | 6.47E-03 | 4.73E-03 | 4.39E-01 |
| TEENAGE | TOTALS | 2.98E-02 | 7.52E-03 | 3.88E-03 | 5.07E-03 | 4.34E-03 | 4.39E-01 |
| ADULT | TOTALS | 2.98E-02 | 7.41E-03 | 4.13E-03 | 5.12E-03 | 4.44E-03 | 4.39E-01 |

TIME STEP NUMBER 8, 2018 DURATION IN YRS IS... 1.0

NUMBER 9 NAME=Nichols-east central X= 0.6KM, Y= 0.2KM, Z= -2.0M, DIST= 0.6KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 2.32E-02 | 3.39E-03 | 2.60E-03 | 7.06E-03 | 4.28E-03 | 3.43E-01 |
| CHILD | TOTALS | 2.32E-02 | 4.02E-03 | 2.81E-03 | 4.79E-03 | 3.55E-03 | 3.43E-01 |
| TEENAGE | TOTALS | 2.32E-02 | 5.54E-03 | 2.95E-03 | 3.80E-03 | 3.27E-03 | 3.43E-01 |
| ADULT | TOTALS | 2.32E-02 | 5.47E-03 | 3.12E-03 | 3.83E-03 | 3.34E-03 | 3.43E-01 |

NUMBER 10 NAME=Nichols-south centra X= -0.3KM, Y= -1.1KM, Z= -18.0M, DIST= 1.1KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 1.95E-02 | 2.99E-03 | 2.20E-03 | 6.62E-03 | 3.87E-03 | 2.87E-01 |
| CHILD | TOTALS | 1.94E-02 | 3.60E-03 | 2.40E-03 | 4.37E-03 | 3.14E-03 | 2.87E-01 |
| TEENAGE | TOTALS | 1.95E-02 | 5.10E-03 | 2.54E-03 | 3.38E-03 | 2.86E-03 | 2.87E-01 |
| ADULT | TOTALS | 1.95E-02 | 5.02E-03 | 2.71E-03 | 3.41E-03 | 2.94E-03 | 2.87E-01 |

TIME STEP NUMBER 8, 2018 DURATION IN YRS IS... 1.0

NUMBER 11 NAME=Nichols-west central X= -1.4KM, Y= 0.5KM, Z= 12.0M, DIST= 1.5KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 2.30E-02 | 3.70E-03 | 2.68E-03 | 8.42E-03 | 4.85E-03 | 3.37E-01 |
| CHILD | TOTALS | 2.29E-02 | 4.49E-03 | 2.94E-03 | 5.49E-03 | 3.90E-03 | 3.37E-01 |
| TEENAGE | TOTALS | 2.29E-02 | 6.43E-03 | 3.11E-03 | 4.21E-03 | 3.53E-03 | 3.37E-01 |
| ADULT | TOTALS | 2.30E-02 | 6.32E-03 | 3.34E-03 | 4.25E-03 | 3.63E-03 | 3.37E-01 |

NUMBER 12 NAME=Hank-north central X= 7.9KM, Y= 6.6KM, Z= 86.0M, DIST= 10.3KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 5.41E-01 | 3.82E-02 | 3.55E-02 | 5.11E-02 | 4.14E-02 | 8.45E+00 |
| CHILD | TOTALS | 5.41E-01 | 4.05E-02 | 3.62E-02 | 4.32E-02 | 3.88E-02 | 8.45E+00 |
| TEENAGE | TOTALS | 5.41E-01 | 4.58E-02 | 3.67E-02 | 3.97E-02 | 3.78E-02 | 8.45E+00 |
| ADULT | TOTALS | 5.41E-01 | 4.56E-02 | 3.73E-02 | 3.98E-02 | 3.81E-02 | 8.45E+00 |

TIME STEP NUMBER 8, 2018 DURATION IN YRS IS... 1.0

NUMBER 13 NAME=Hank-east central X= 8.8KM, Y= 3.3KM, Z= 160.0M, DIST= 9.4KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 2.47E+00 | 1.83E-02 | 1.82E-02 | 1.88E-02 | 1.84E-02 | 4.09E+01 |
| CHILD | TOTALS | 2.47E+00 | 1.84E-02 | 1.82E-02 | 1.85E-02 | 1.83E-02 | 4.09E+01 |
| TEENAGE | TOTALS | 2.47E+00 | 1.87E-02 | 1.82E-02 | 1.84E-02 | 1.83E-02 | 4.09E+01 |
| ADULT | TOTALS | 2.47E+00 | 1.87E-02 | 1.83E-02 | 1.84E-02 | 1.83E-02 | 4.09E+01 |

NUMBER 14 NAME=Hank-south central X= 7.9KM, Y= 1.3KM, Z= 139.0M, DIST= 8.0KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 3.45E-01 | 1.63E-02 | 1.55E-02 | 1.97E-02 | 1.71E-02 | 5.51E+00 |
| CHILD | TOTALS | 3.45E-01 | 1.69E-02 | 1.58E-02 | 1.76E-02 | 1.64E-02 | 5.51E+00 |
| TEENAGE | TOTALS | 3.45E-01 | 1.84E-02 | 1.59E-02 | 1.67E-02 | 1.62E-02 | 5.51E+00 |
| ADULT | TOTALS | 3.45E-01 | 1.84E-02 | 1.61E-02 | 1.67E-02 | 1.63E-02 | 5.51E+00 |

TIME STEP NUMBER 8, 2018 DURATION IN YRS IS... 1.0

NUMBER 15 NAME=Hank-west central X= 7.1KM, Y= 4.2KM, Z= 102.0M, DIST= 8.2KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 6.76E-01 | 1.79E-02 | 1.75E-02 | 1.97E-02 | 1.84E-02 | 1.10E+01 |
| CHILD | TOTALS | 6.76E-01 | 1.83E-02 | 1.77E-02 | 1.86E-02 | 1.80E-02 | 1.10E+01 |
| TEENAGE | TOTALS | 6.76E-01 | 1.91E-02 | 1.77E-02 | 1.82E-02 | 1.79E-02 | 1.10E+01 |
| ADULT | TOTALS | 6.76E-01 | 1.91E-02 | 1.78E-02 | 1.82E-02 | 1.79E-02 | 1.10E+01 |

TIME STEP NUMBER 9, 2019 DURATION IN YRS IS... 1.0

SUMMARY PRINT OF POPULATION DOSES COMPUTED FOR TSTEP 9--DOSES SHOWN ARE ANNUAL POPULATION DOSE COMMITMENTS, PERSON-REM PER YEAR

DOSES RECEIVED BY PEOPLE WITHIN 80 KILOMETERS

| PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|
| INHAL. | 4.947E-03 | 4.004E-02 | 6.583E-04 | 3.003E-02 | 1.444E-02 | 1.561E+00 |
| GROUND | 3.879E-04 | 3.879E-04 | 3.879E-04 | 3.879E-04 | 3.879E-04 | 3.879E-04 |
| CLOUD | 1.333E-02 | 1.333E-02 | 1.333E-02 | 1.333E-02 | 1.333E-02 | 1.333E-02 |
| VEG. ING | 2.422E-02 | 2.799E-01 | 2.422E-02 | 8.319E-02 | 6.776E-02 | 2.422E-02 |
| MEAT ING | 1.515E-03 | 1.751E-02 | 1.515E-03 | 5.203E-03 | 4.238E-03 | 1.515E-03 |
| MILK ING | 3.075E-04 | 3.554E-03 | 3.075E-04 | 1.056E-03 | 8.603E-04 | 3.075E-04 |
| RNPLUS50 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| TOTALS | 4.471E-02 | 3.547E-01 | 4.042E-02 | 1.332E-01 | 1.010E-01 | 1.601E+00 |

DOSES RECEIVED BY PEOPLE BEYOND 80 KILOMETERS

| PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|
| INHAL. | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| GROUND | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| CLOUD | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| VEG. ING | 2.274E-01 | 2.628E+00 | 2.274E-01 | 7.811E-01 | 6.362E-01 | 2.274E-01 |
| MEAT ING | 3.170E-03 | 3.663E-02 | 3.170E-03 | 1.089E-02 | 8.867E-03 | 3.170E-03 |
| MILK ING | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| RNPLUS50 | 1.516E+00 | 2.068E+01 | 3.446E-01 | 1.516E+00 | 1.516E+00 | 9.649E+00 |
| TOTALS | 1.747E+00 | 2.334E+01 | 5.752E-01 | 2.308E+00 | 2.161E+00 | 9.880E+00 |

TOTAL DOSES COMPUTED OVER ALL POPULATIONS

| PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|
| INHAL. | 4.947E-03 | 4.004E-02 | 6.583E-04 | 3.003E-02 | 1.444E-02 | 1.561E+00 |
| GROUND | 3.879E-04 | 3.879E-04 | 3.879E-04 | 3.879E-04 | 3.879E-04 | 3.879E-04 |
| CLOUD | 1.333E-02 | 1.333E-02 | 1.333E-02 | 1.333E-02 | 1.333E-02 | 1.333E-02 |
| VEG. ING | 2.517E-01 | 2.908E+00 | 2.517E-01 | 8.643E-01 | 7.040E-01 | 2.517E-01 |
| MEAT ING | 4.685E-03 | 5.413E-02 | 4.685E-03 | 1.609E-02 | 1.311E-02 | 4.685E-03 |
| MILK ING | 3.075E-04 | 3.554E-03 | 3.075E-04 | 1.056E-03 | 8.603E-04 | 3.075E-04 |
| RNPLUS50 | 1.516E+00 | 2.068E+01 | 3.446E-01 | 1.516E+00 | 1.516E+00 | 9.649E+00 |
| TOTALS | 1.792E+00 | 2.370E+01 | 6.156E-01 | 2.441E+00 | 2.262E+00 | 1.148E+01 |

TIME STEP NUMBER 9, 2019 DURATION IN YRS IS... 1.0

NUMBER 1 NAME=T-Chair Ranch X= 3.7KM, Y= -2.2KM, Z= -7.0M, DIST= 4.3KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 2.54E-02 | 3.22E-03 | 2.59E-03 | 6.17E-03 | 3.94E-03 | 3.81E-01 |
| CHILD | TOTALS | 2.54E-02 | 3.77E-03 | 2.76E-03 | 4.36E-03 | 3.36E-03 | 3.81E-01 |
| TEENAGE | TOTALS | 2.54E-02 | 5.02E-03 | 2.88E-03 | 3.57E-03 | 3.14E-03 | 3.81E-01 |
| ADULT | TOTALS | 2.54E-02 | 4.99E-03 | 3.03E-03 | 3.60E-03 | 3.21E-03 | 3.81E-01 |

NUMBER 2 NAME=Dry Fork Ranch X= -2.7KM, Y= -1.1KM, Z= -58.0M, DIST= 2.9KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 8.19E-03 | 1.38E-03 | 9.54E-04 | 3.36E-03 | 1.86E-03 | 1.20E-01 |
| CHILD | TOTALS | 8.15E-03 | 1.73E-03 | 1.07E-03 | 2.14E-03 | 1.47E-03 | 1.20E-01 |
| TEENAGE | TOTALS | 8.18E-03 | 2.55E-03 | 1.14E-03 | 1.60E-03 | 1.32E-03 | 1.20E-01 |
| ADULT | TOTALS | 8.19E-03 | 2.52E-03 | 1.24E-03 | 1.62E-03 | 1.36E-03 | 1.20E-01 |

TIME STEP NUMBER 9, 2019 DURATION IN YRS IS... 1.0

NUMBER 3 NAME=Christensen Ranch X= 1.8KM, Y= 7.8KM, Z= -1.0M, DIST= 8.0KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 4.24E-02 | 5.57E-03 | 4.39E-03 | 1.10E-02 | 6.90E-03 | 6.33E-01 |
| CHILD | TOTALS | 4.23E-02 | 6.64E-03 | 4.74E-03 | 7.69E-03 | 5.84E-03 | 6.33E-01 |
| TEENAGE | TOTALS | 4.24E-02 | 8.97E-03 | 4.97E-03 | 6.23E-03 | 5.44E-03 | 6.33E-01 |
| ADULT | TOTALS | 4.24E-02 | 8.96E-03 | 5.26E-03 | 6.31E-03 | 5.57E-03 | 6.33E-01 |

NUMBER 4 NAME=Pfister Ranch X= 7.8KM, Y= 7.4KM, Z= 78.0M, DIST= 10.8KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 2.91E-01 | 2.49E-02 | 2.25E-02 | 3.62E-02 | 2.77E-02 | 4.49E+00 |
| CHILD | TOTALS | 2.91E-01 | 2.70E-02 | 2.32E-02 | 2.93E-02 | 2.55E-02 | 4.49E+00 |
| TEENAGE | TOTALS | 2.91E-01 | 3.17E-02 | 2.36E-02 | 2.62E-02 | 2.46E-02 | 4.49E+00 |
| ADULT | TOTALS | 2.91E-01 | 3.16E-02 | 2.42E-02 | 2.64E-02 | 2.48E-02 | 4.49E+00 |

TIME STEP NUMBER 9, 2019 DURATION IN YRS IS... 1.0

NUMBER 5 NAME=Pumpkin Butte Ranch X= 11.1KM, Y= 3.6KM, Z= 218.0M, DIST= 11.7KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 2.28E-01 | 1.34E-02 | 1.25E-02 | 1.74E-02 | 1.44E-02 | 3.60E+00 |
| CHILD | TOTALS | 2.28E-01 | 1.42E-02 | 1.28E-02 | 1.49E-02 | 1.36E-02 | 3.60E+00 |
| TEENAGE | TOTALS | 2.28E-01 | 1.59E-02 | 1.29E-02 | 1.39E-02 | 1.33E-02 | 3.60E+00 |
| ADULT | TOTALS | 2.28E-01 | 1.59E-02 | 1.31E-02 | 1.39E-02 | 1.34E-02 | 3.60E+00 |

NUMBER 6 NAME=Van Buggenum Ranch X= 15.4KM, Y= 5.3KM, Z= 130.0M, DIST= 16.3KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 6.29E-02 | 7.40E-03 | 5.93E-03 | 1.42E-02 | 9.06E-03 | 9.49E-01 |
| CHILD | TOTALS | 6.28E-02 | 8.66E-03 | 6.34E-03 | 1.00E-02 | 7.72E-03 | 9.49E-01 |
| TEENAGE | TOTALS | 6.29E-02 | 1.15E-02 | 6.61E-03 | 8.19E-03 | 7.21E-03 | 9.49E-01 |
| ADULT | TOTALS | 6.29E-02 | 1.15E-02 | 6.96E-03 | 8.27E-03 | 7.36E-03 | 9.49E-01 |

TIME STEP NUMBER 9, 2019 DURATION IN YRS IS... 1.0

NUMBER 7 NAME=Ruby Ranch X= 19.0KM, Y= 2.9KM, Z= 101.0M, DIST= 19.2KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 4.07E-02 | 5.67E-03 | 4.13E-03 | 1.28E-02 | 7.40E-03 | 6.08E-01 |
| CHILD | TOTALS | 4.06E-02 | 6.98E-03 | 4.56E-03 | 8.40E-03 | 6.00E-03 | 6.08E-01 |
| TEENAGE | TOTALS | 4.07E-02 | 9.98E-03 | 4.85E-03 | 6.49E-03 | 5.46E-03 | 6.08E-01 |
| ADULT | TOTALS | 4.08E-02 | 9.90E-03 | 5.21E-03 | 6.58E-03 | 5.63E-03 | 6.08E-01 |

NUMBER 8 NAME=Nichols-north centra X= -0.4KM, Y= 1.3KM, Z= 57.0M, DIST= 1.4KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 2.23E-02 | 3.38E-03 | 2.55E-03 | 7.25E-03 | 4.32E-03 | 3.29E-01 |
| CHILD | TOTALS | 2.23E-02 | 4.07E-03 | 2.77E-03 | 4.86E-03 | 3.56E-03 | 3.29E-01 |
| TEENAGE | TOTALS | 2.23E-02 | 5.69E-03 | 2.93E-03 | 3.82E-03 | 3.26E-03 | 3.29E-01 |
| ADULT | TOTALS | 2.24E-02 | 5.63E-03 | 3.12E-03 | 3.86E-03 | 3.35E-03 | 3.29E-01 |

TIME STEP NUMBER 9, 2019 DURATION IN YRS IS:.. 1.0

NUMBER 9 NAME=Nichols-east central X= 0.6KM, Y= 0.2KM, Z= -2.0M, DIST= 0.6KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 1.74E-02 | 2.54E-03 | 1.95E-03 | 5.30E-03 | 3.21E-03 | 2.57E-01 |
| CHILD | TOTALS | 1.74E-02 | 3.04E-03 | 2.11E-03 | 3.60E-03 | 2.67E-03 | 2.57E-01 |
| TEENAGE | TOTALS | 1.74E-02 | 4.19E-03 | 2.22E-03 | 2.86E-03 | 2.46E-03 | 2.57E-01 |
| ADULT | TOTALS | 1.74E-02 | 4.15E-03 | 2.36E-03 | 2.89E-03 | 2.52E-03 | 2.57E-01 |

NUMBER 10 NAME=Nichols-south centra X= -0.3KM, Y= -1.1KM, Z= -18.0M, DIST= 1.1KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 1.46E-02 | 2.24E-03 | 1.65E-03 | 4.97E-03 | 2.90E-03 | 2.15E-01 |
| CHILD | TOTALS | 1.46E-02 | 2.72E-03 | 1.81E-03 | 3.28E-03 | 2.36E-03 | 2.15E-01 |
| TEENAGE | TOTALS | 1.46E-02 | 3.86E-03 | 1.92E-03 | 2.55E-03 | 2.15E-03 | 2.15E-01 |
| ADULT | TOTALS | 1.46E-02 | 3.81E-03 | 2.05E-03 | 2.57E-03 | 2.21E-03 | 2.15E-01 |

TIME STEP NUMBER 9, 2019 DURATION IN YRS IS... 1.0

NUMBER 11 NAME=Nichols-west central X= -1.4KM, Y= 0.5KM, Z= 12.0M, DIST= 1.5KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 1.72E-02 | 2.77E-03 | 2.01E-03 | 6.32E-03 | 3.64E-03 | 2.52E-01 |
| CHILD | TOTALS | 1.72E-02 | 3.39E-03 | 2.21E-03 | 4.12E-03 | 2.93E-03 | 2.52E-01 |
| TEENAGE | TOTALS | 1.72E-02 | 4.86E-03 | 2.35E-03 | 3.17E-03 | 2.66E-03 | 2.52E-01 |
| ADULT | TOTALS | 1.72E-02 | 4.80E-03 | 2.52E-03 | 3.20E-03 | 2.73E-03 | 2.52E-01 |

NUMBER 12 NAME=Hank-north central X= 7.9KM, Y= 6.6KM, Z= 86.0M, DIST= 10.3KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 4.06E-01 | 2.87E-02 | 2.66E-02 | 3.84E-02 | 3.10E-02 | 6.34E+00 |
| CHILD | TOTALS | 4.06E-01 | 3.04E-02 | 2.72E-02 | 3.24E-02 | 2.91E-02 | 6.34E+00 |
| TEENAGE | TOTALS | 4.06E-01 | 3.45E-02 | 2.76E-02 | 2.98E-02 | 2.84E-02 | 6.34E+00 |
| ADULT | TOTALS | 4.06E-01 | 3.44E-02 | 2.80E-02 | 2.99E-02 | 2.86E-02 | 6.34E+00 |

TIME STEP NUMBER 9, 2019 DURATION IN YRS IS... 1.0

NUMBER 13 NAME=Hank-east central X= 8.8KM, Y= 3.3KM, Z= 160.0M, DIST= 9.4KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 1.85E+00 | 1.37E-02 | 1.36E-02 | 1.41E-02 | 1.38E-02 | 3.07E+01 |
| CHILD | TOTALS | 1.85E+00 | 1.38E-02 | 1.37E-02 | 1.39E-02 | 1.37E-02 | 3.07E+01 |
| TEENAGE | TOTALS | 1.85E+00 | 1.41E-02 | 1.37E-02 | 1.38E-02 | 1.37E-02 | 3.07E+01 |
| ADULT | TOTALS | 1.85E+00 | 1.41E-02 | 1.37E-02 | 1.38E-02 | 1.37E-02 | 3.07E+01 |

NUMBER 14 NAME=Hank-south central X= 7.9KM, Y= 1.3KM, Z= 139.0M, DIST= 8.0KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 2.59E-01 | 1.22E-02 | 1.17E-02 | 1.48E-02 | 1.28E-02 | 4.13E+00 |
| CHILD | TOTALS | 2.59E-01 | 1.27E-02 | 1.18E-02 | 1.32E-02 | 1.23E-02 | 4.13E+00 |
| TEENAGE | TOTALS | 2.59E-01 | 1.38E-02 | 1.19E-02 | 1.25E-02 | 1.22E-02 | 4.13E+00 |
| ADULT | TOTALS | 2.59E-01 | 1.39E-02 | 1.21E-02 | 1.26E-02 | 1.22E-02 | 4.13E+00 |

TIME STEP NUMBER 9, 2019 DURATION IN YRS IS... 1.0

NUMBER 15 NAME=Hank-west central X= 7.1KM, Y= 4.2KM, Z= 102.0M, DIST= 8.2KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CHILD | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TEENAGE | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADULT | TOTALS | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

| AGE | PATHWAY | EFFECTIV | BONE | AVG.LUNG | LIVER | KIDNEY | BRONCHI |
|---|---|---|---|---|---|---|---|
| INFANT | TOTALS | 5.07E-01 | 1.34E-02 | 1.32E-02 | 1.48E-02 | 1.38E-02 | 8.24E+00 |
| CHILD | TOTALS | 5.07E-01 | 1.37E-02 | 1.33E-02 | 1.40E-02 | 1.35E-02 | 8.24E+00 |
| TEENAGE | TOTALS | 5.07E-01 | 1.43E-02 | 1.33E-02 | 1.36E-02 | 1.34E-02 | 8.24E+00 |
| ADULT | TOTALS | 5.07E-01 | 1.44E-02 | 1.34E-02 | 1.37E-02 | 1.35E-02 | 8.24E+00 |

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**D-01**

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**D-04**