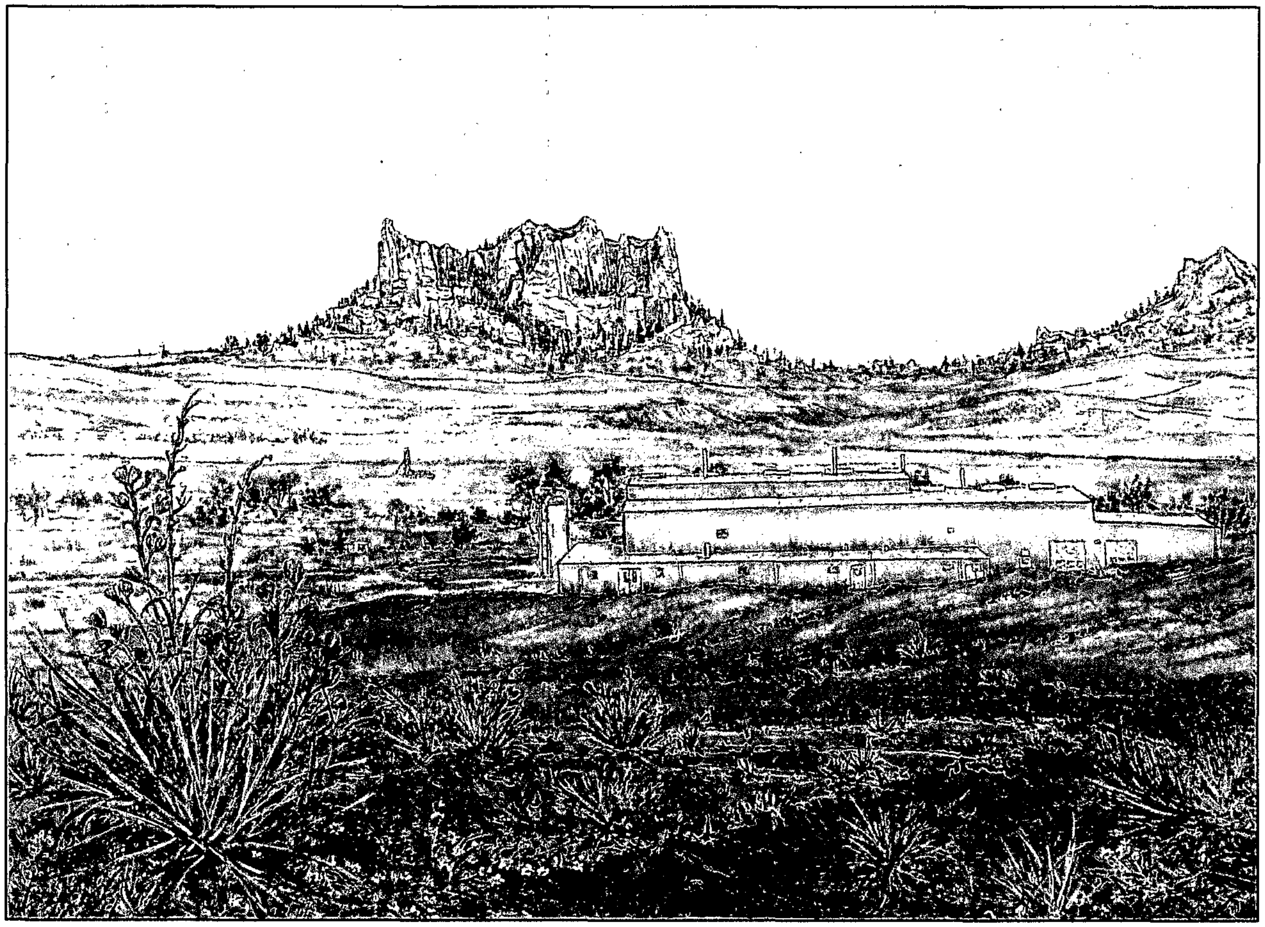
Application for Amendment of

USNRC Source Materials License SUA-1534

North Trend Expansion Area

Environmental Report – Volume II

Appendices A through E



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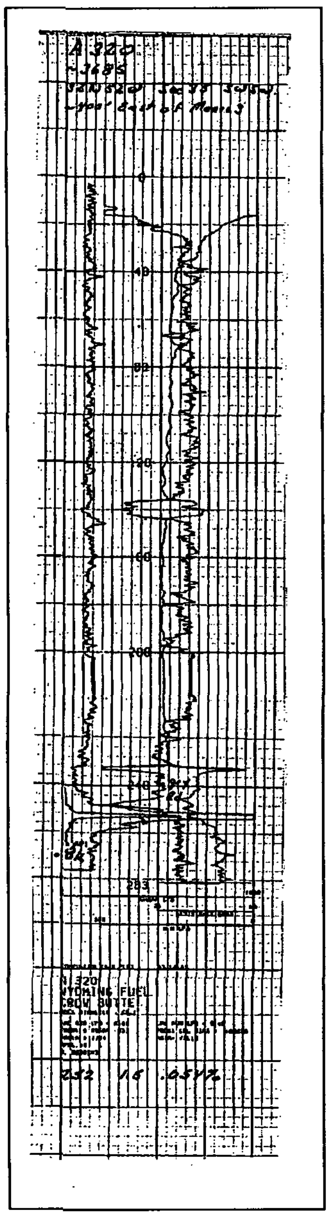
86 Crow Butte Road
Crawford, Nebraska 69339

North Trend Expansion Area
Environmental Report

Volume II

Appendices



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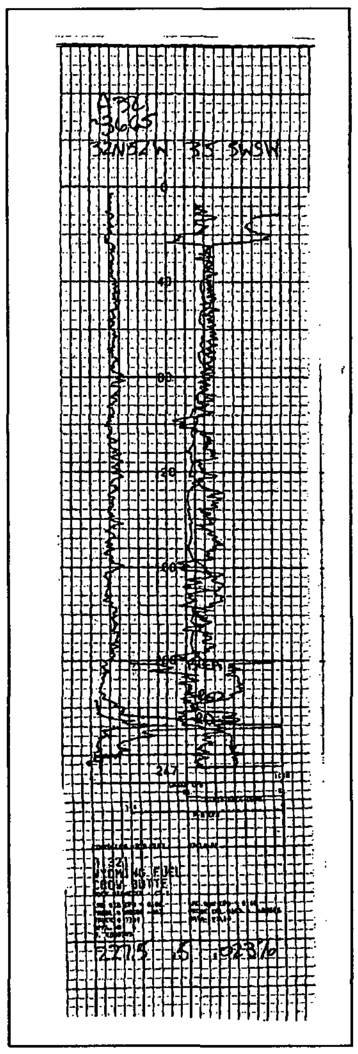

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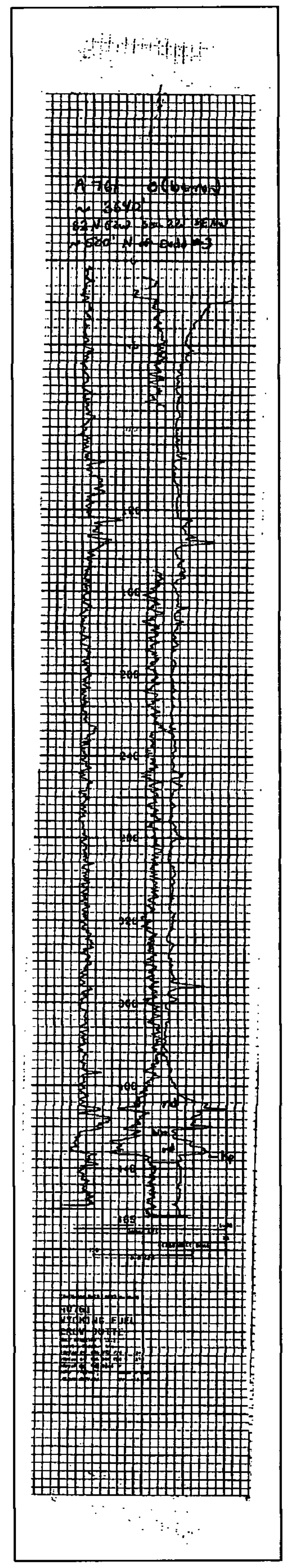

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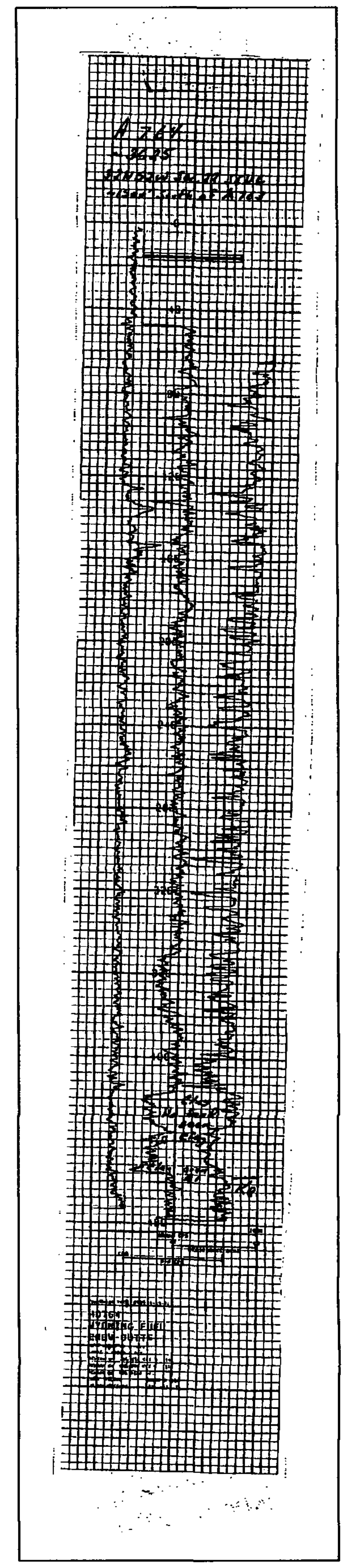

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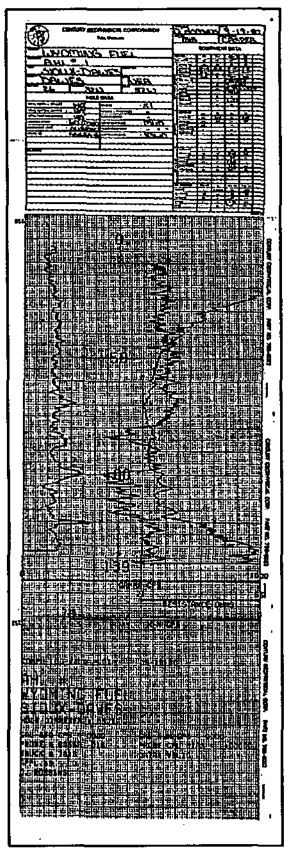
APPENDIX A

Boreholes Used in Cross Section Construction



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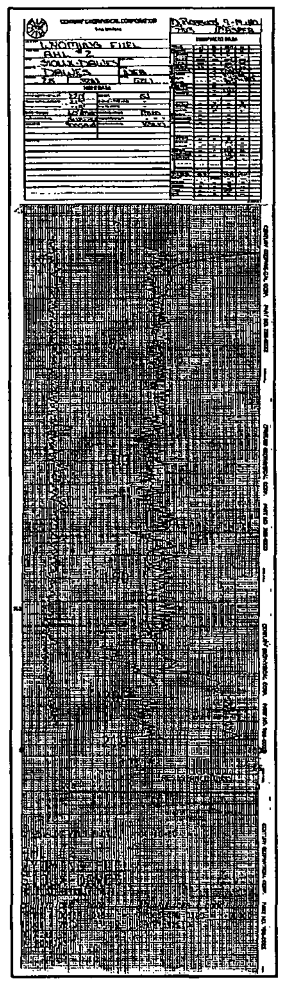

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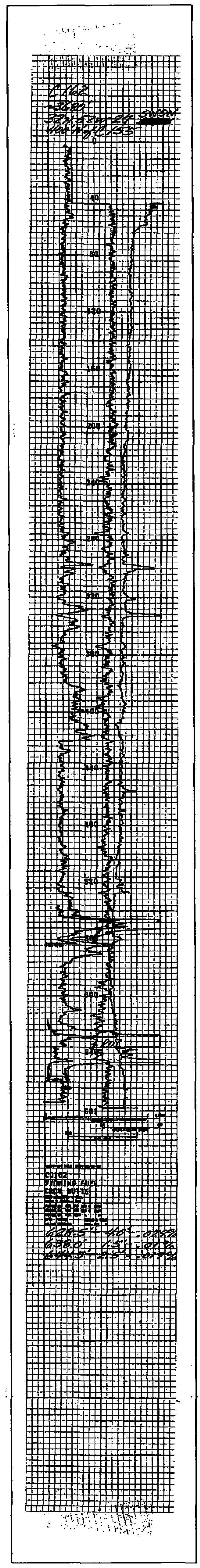

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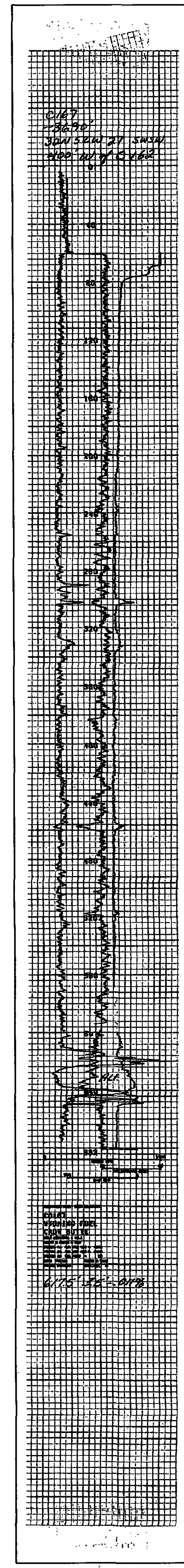

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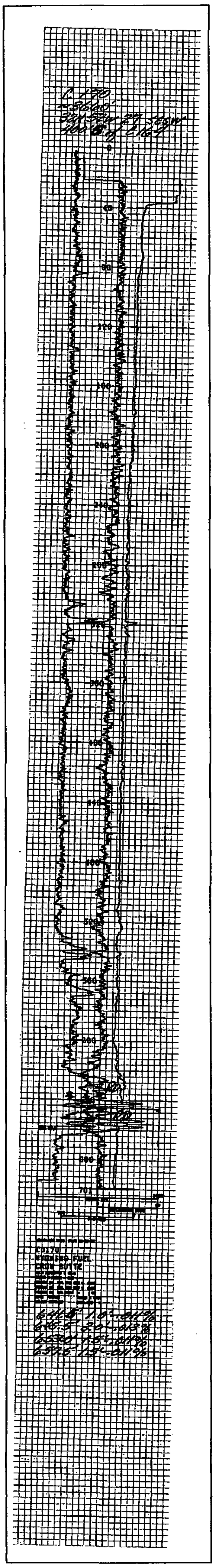
APPENDIX A

Boreholes Used in Cross Section Construction



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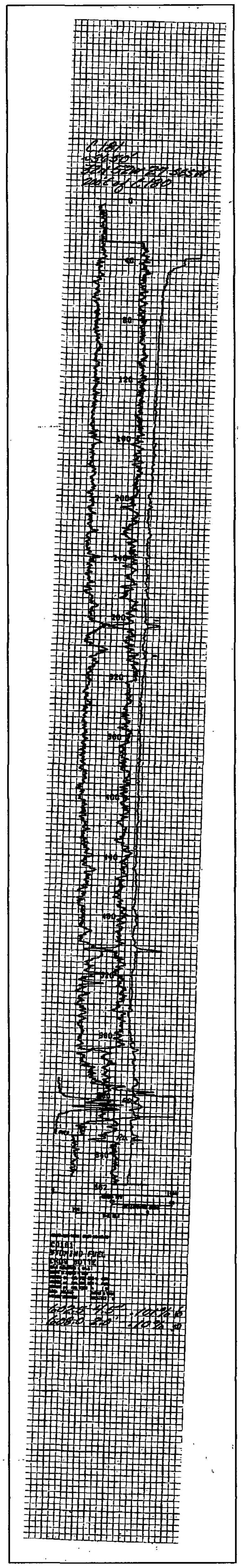

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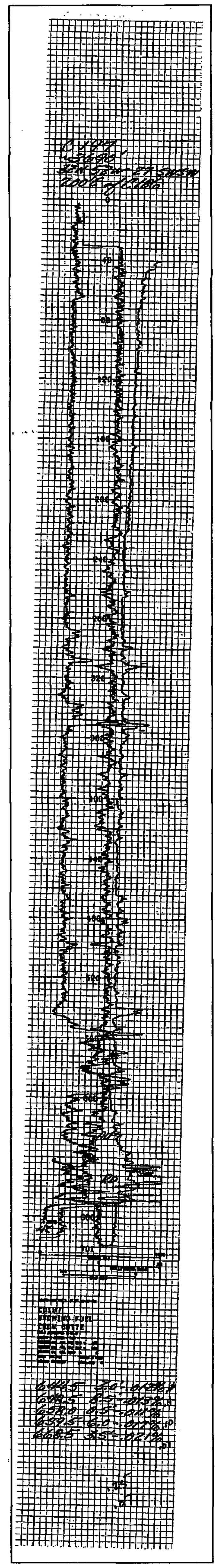

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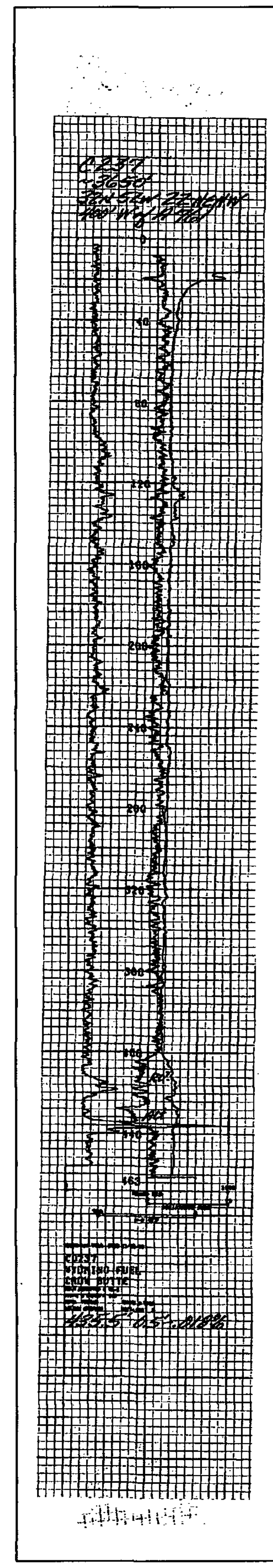

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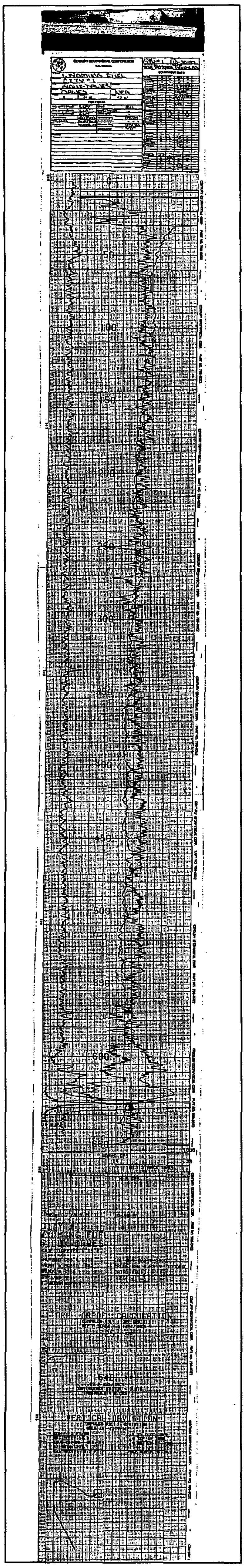
APPENDIX A

Boreholes Used in Cross Section Construction



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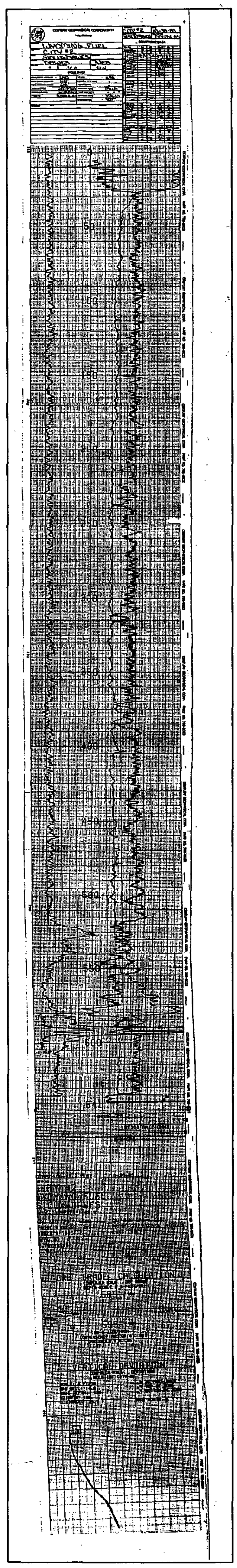

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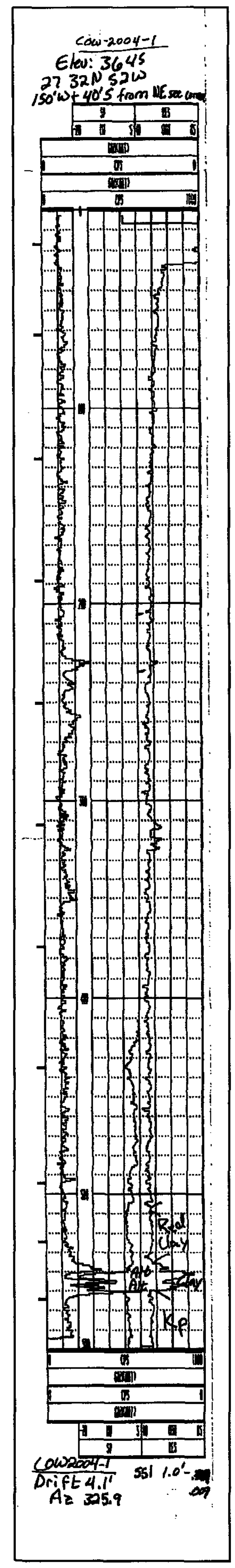

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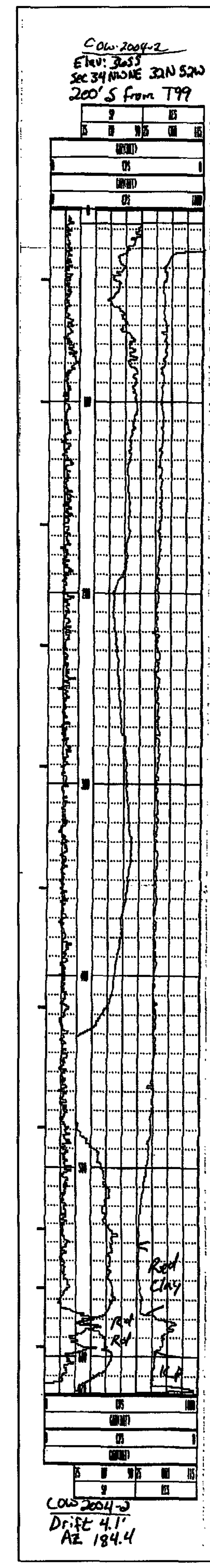

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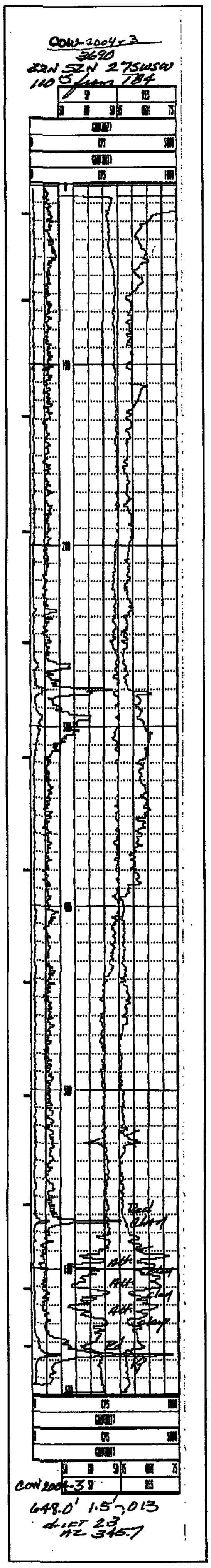
(COW-2)

APPENDIX A

Boreholes Used in Cross Section Construction



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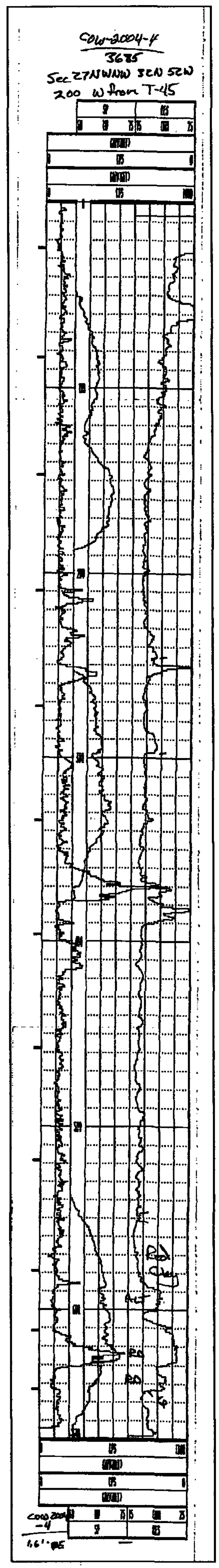

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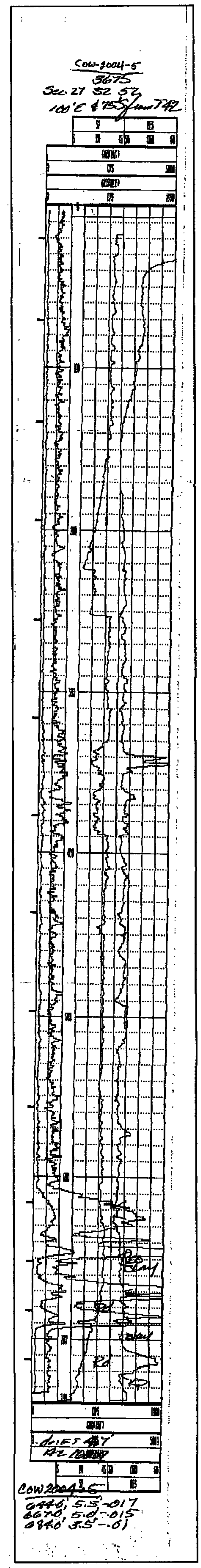
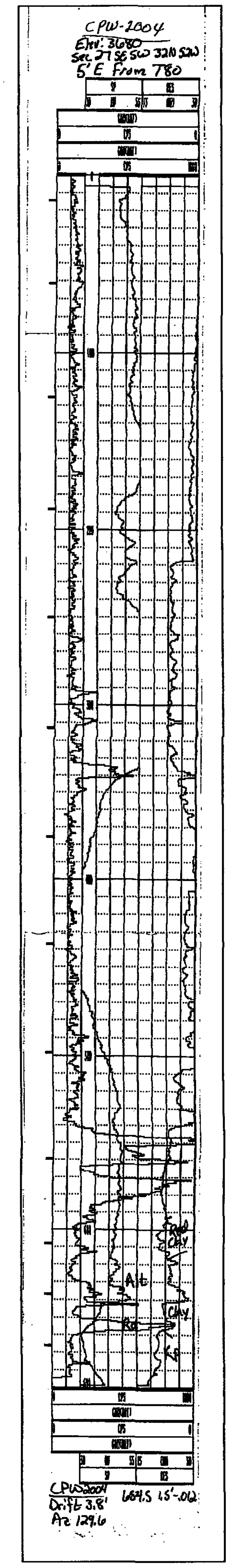


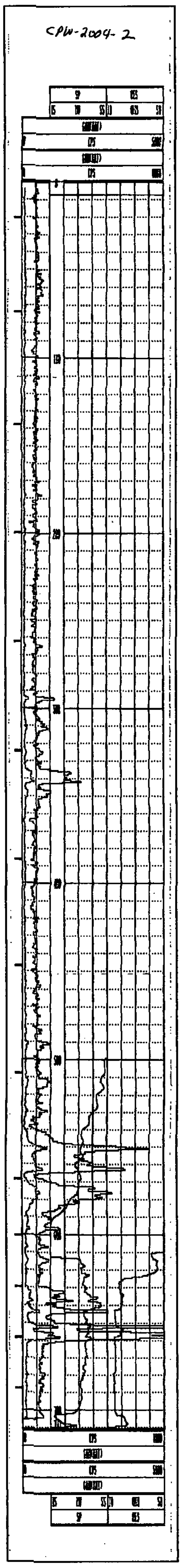


CPW 2004 - 1
(CPW-1)

COW 2004 - 5
(COW-5)

APPENDIX A

Boreholes Used in Cross Section Construction



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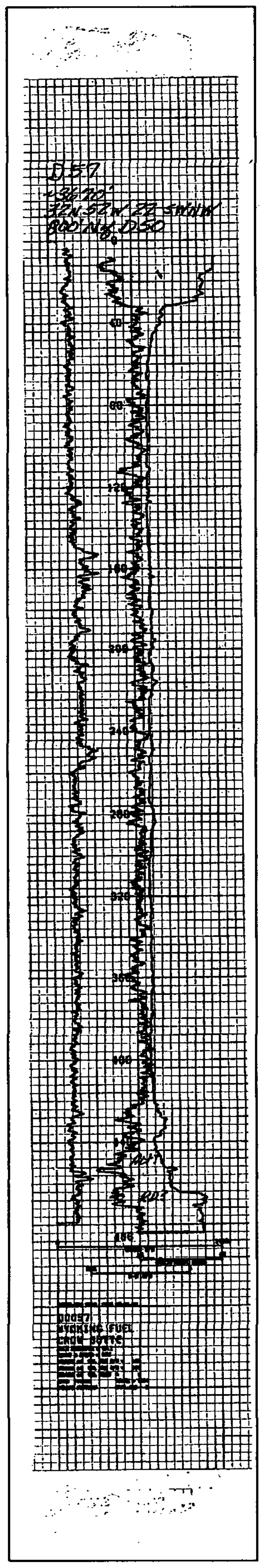

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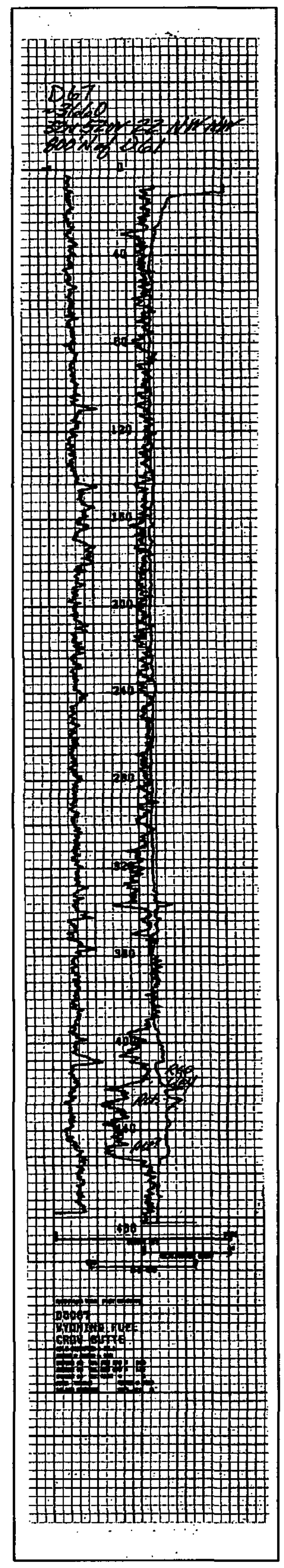

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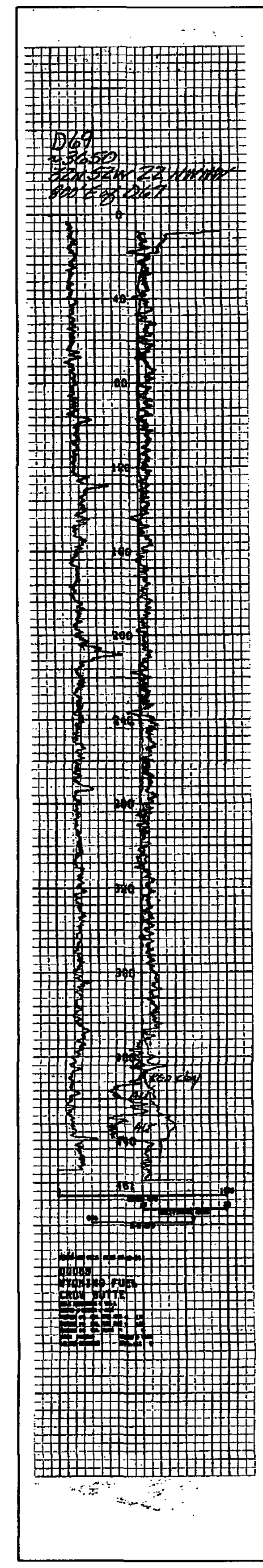

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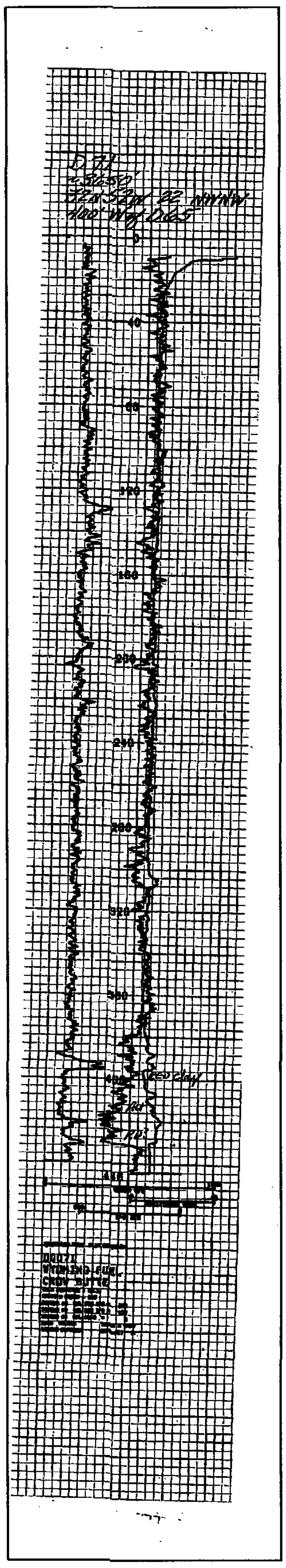
APPENDIX A

Boreholes Used in Cross Section Construction



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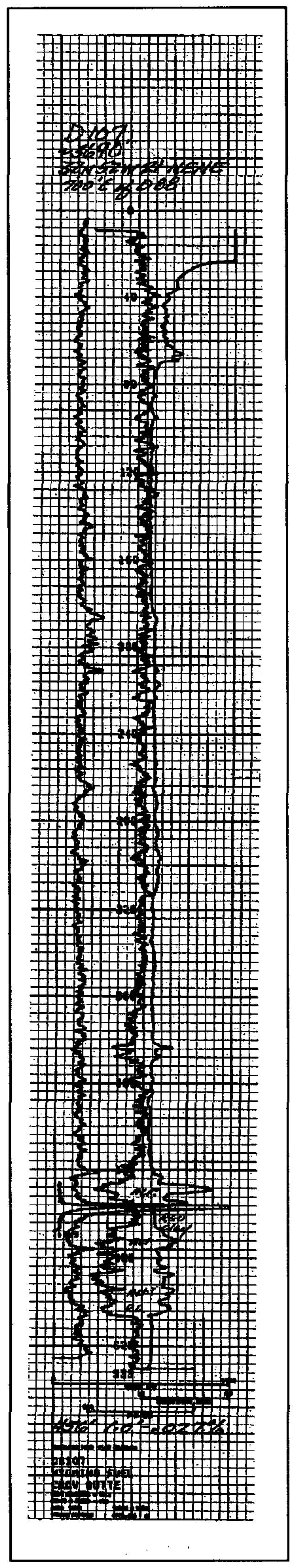

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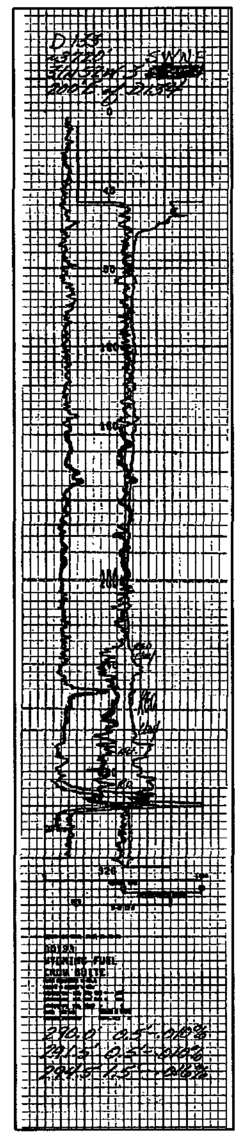

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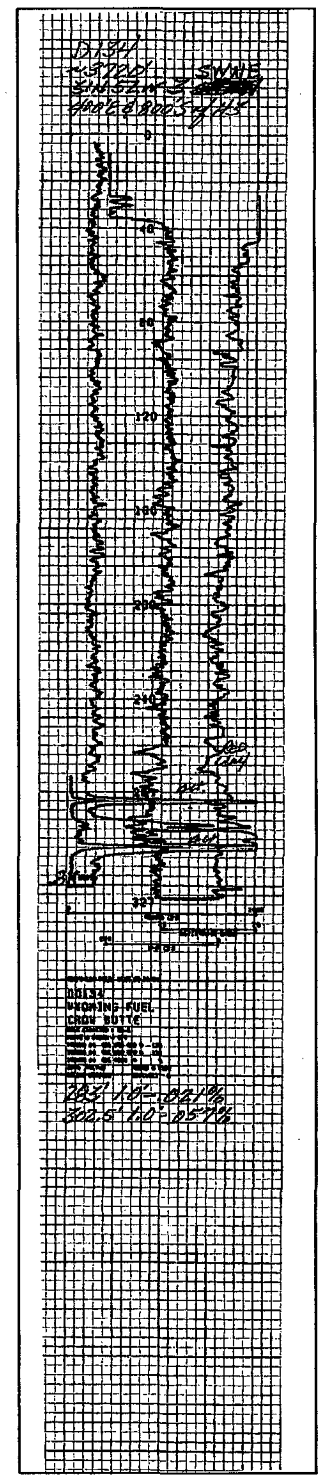

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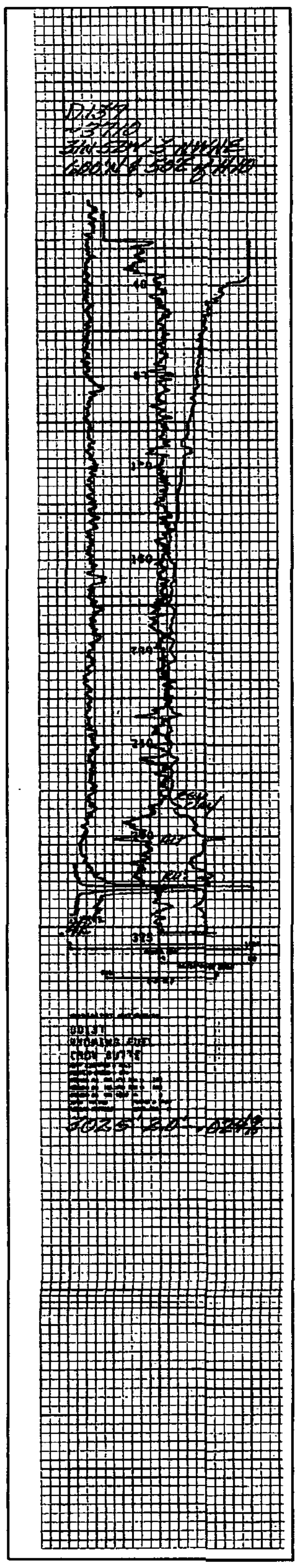
APPENDIX A

Boreholes Used in Cross Section Construction



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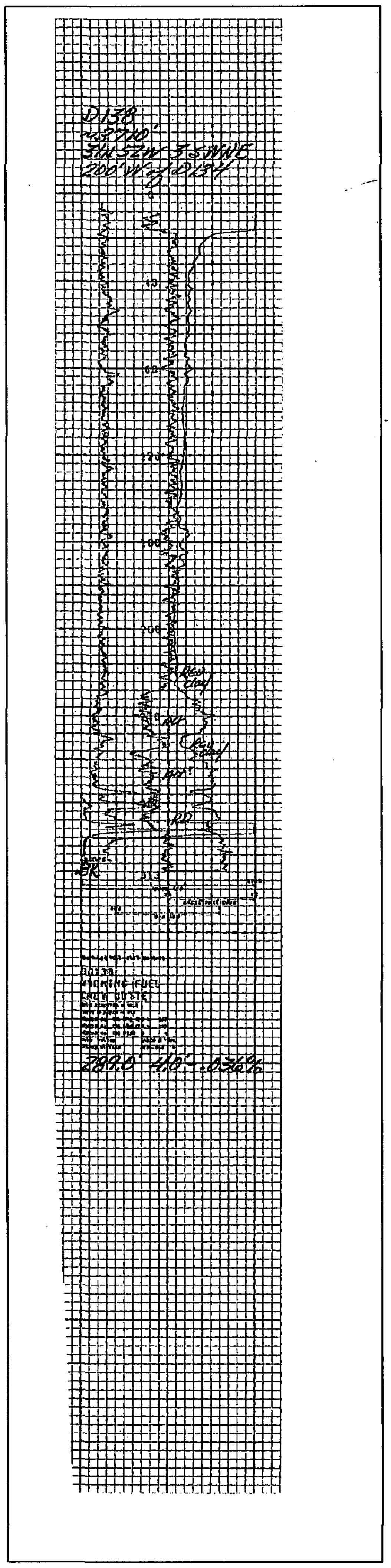

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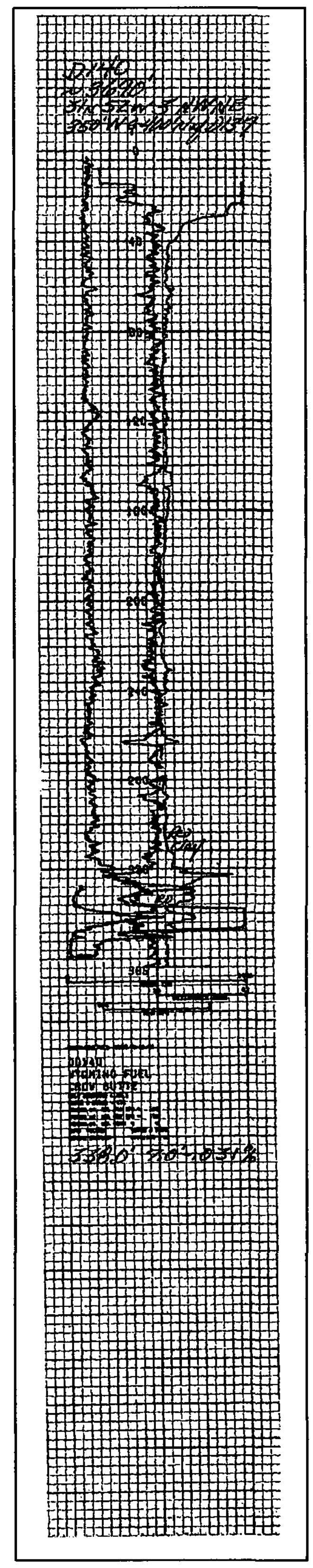

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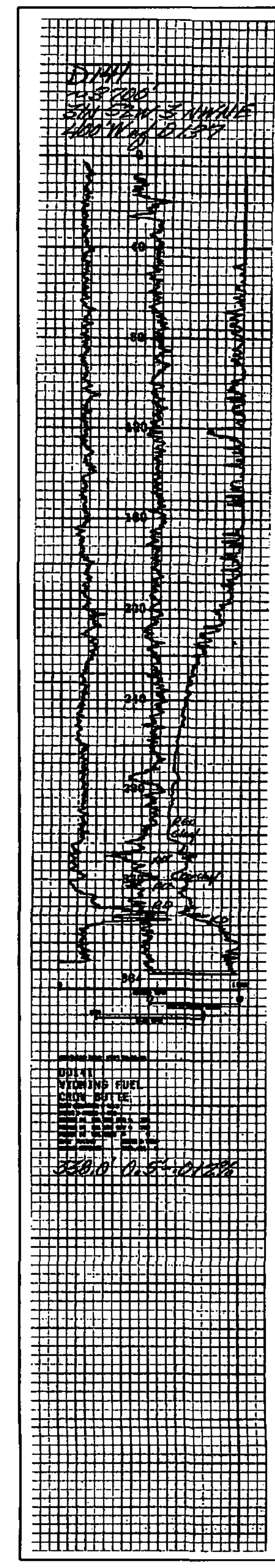

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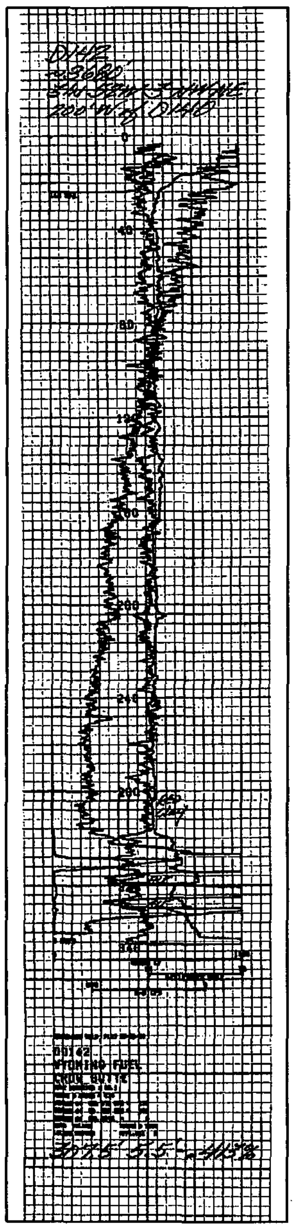
APPENDIX A

Boreholes Used in Cross Section Construction



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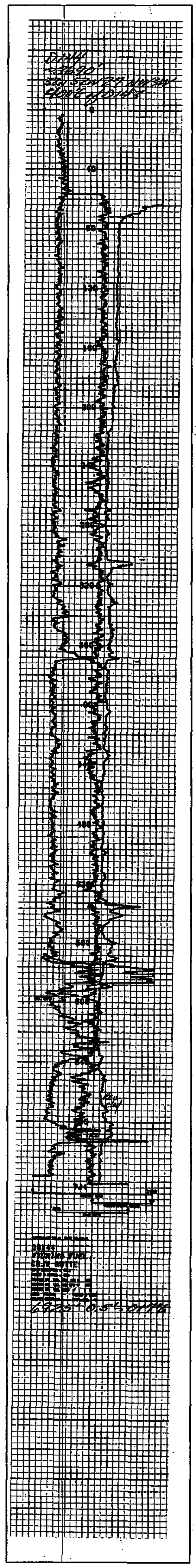

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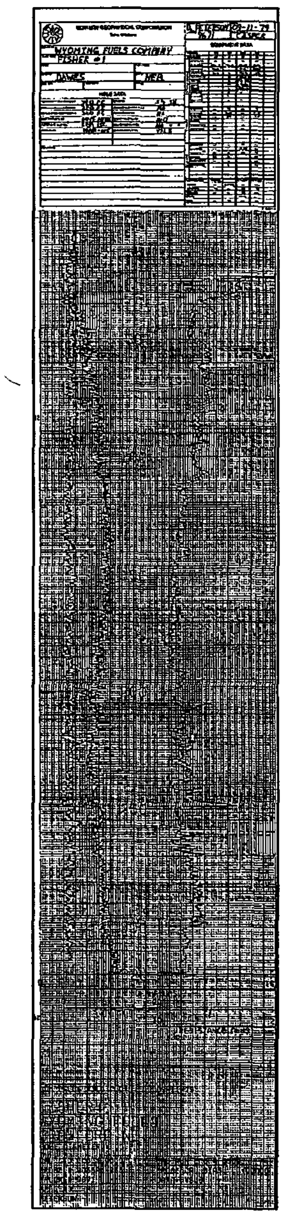
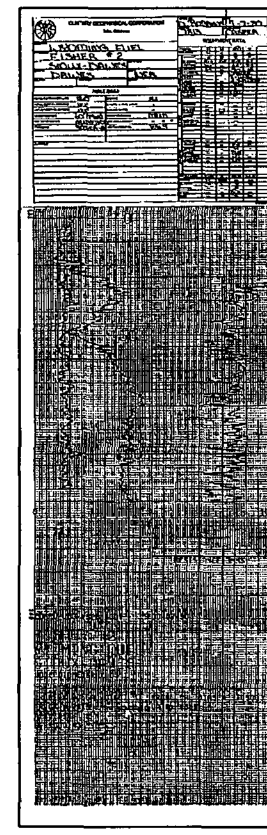


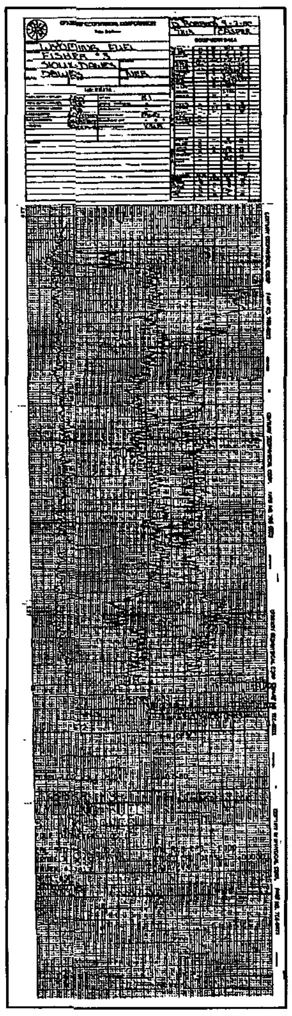
Fisher - 1
(F i-1)



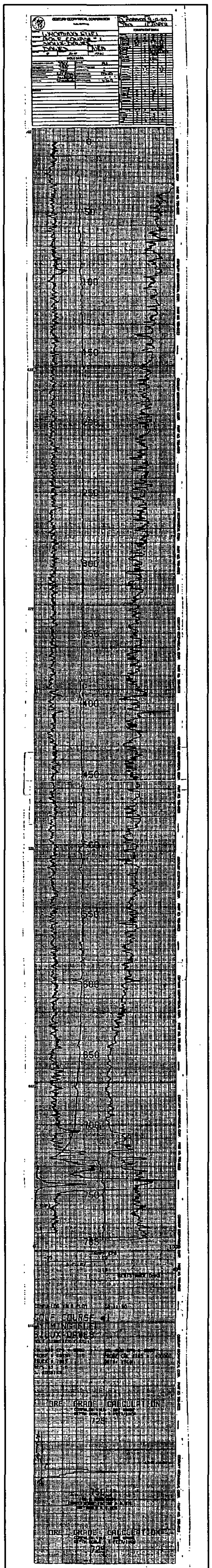
Fisher - 2
(F i-2)

APPENDIX A

Boreholes Used in Cross Section Construction



Fisher - 3
(F i-3)



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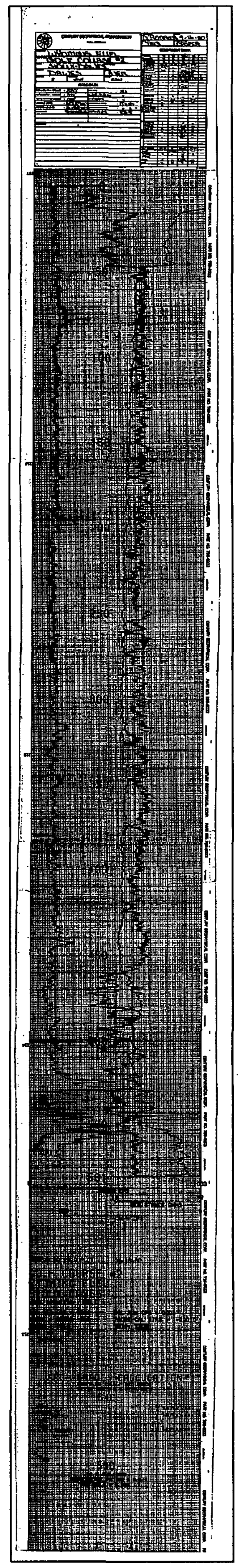
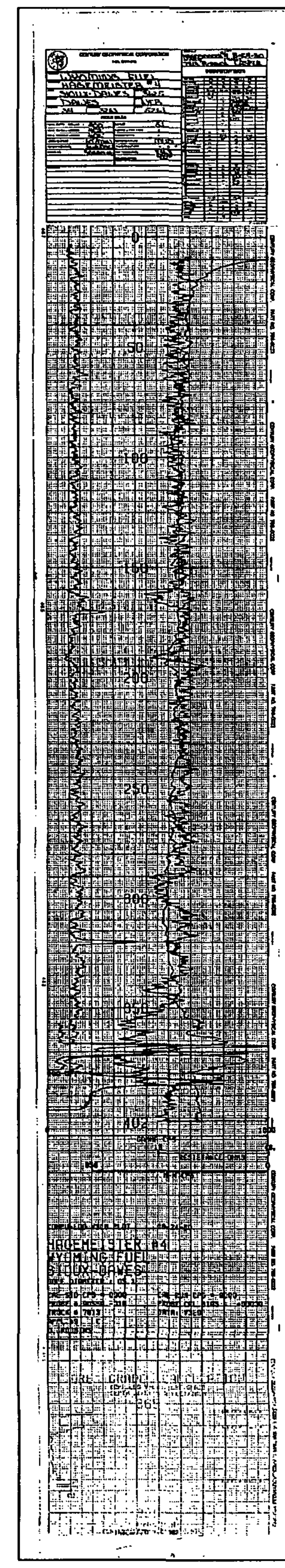


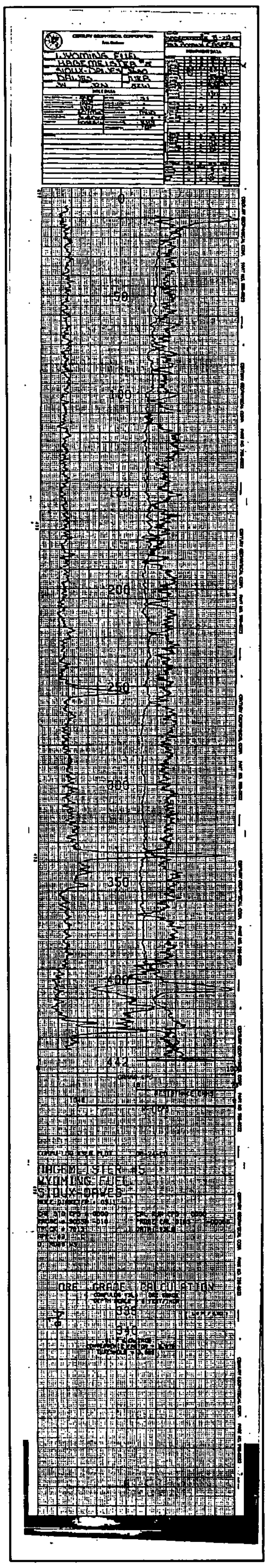
Golf - 2



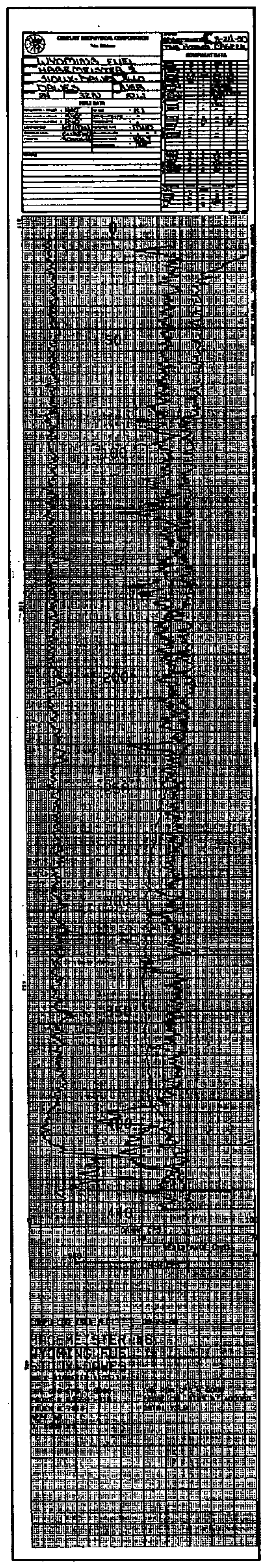
Hagemiester - 4
(Ha-4)

APPENDIX A

Boreholes Used in Cross Section Construction



Hagemiester - 5
(Ha-5)



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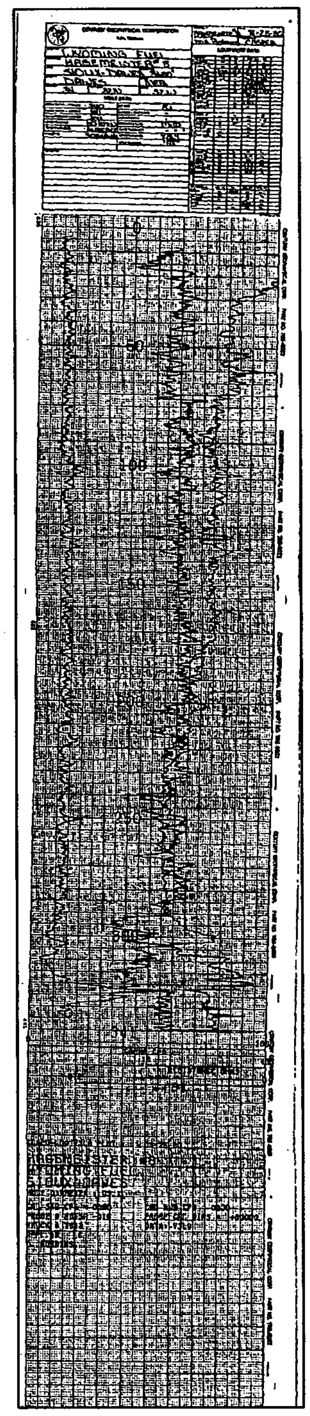

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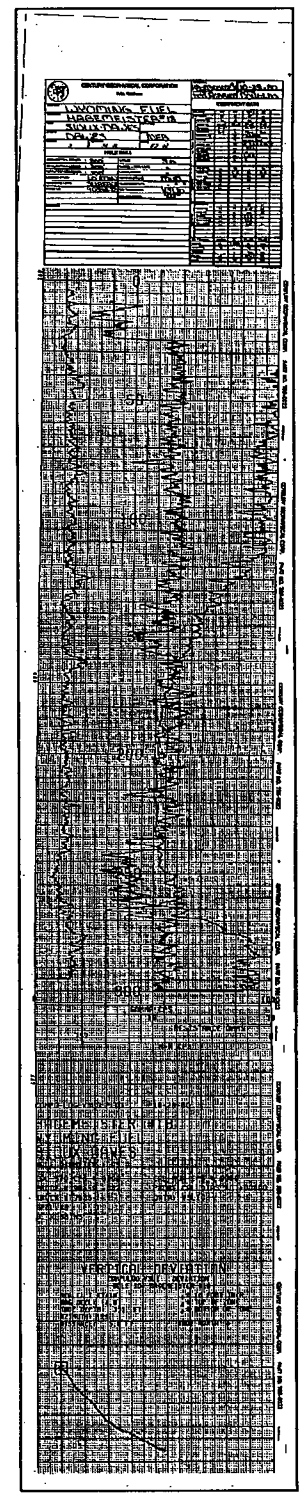

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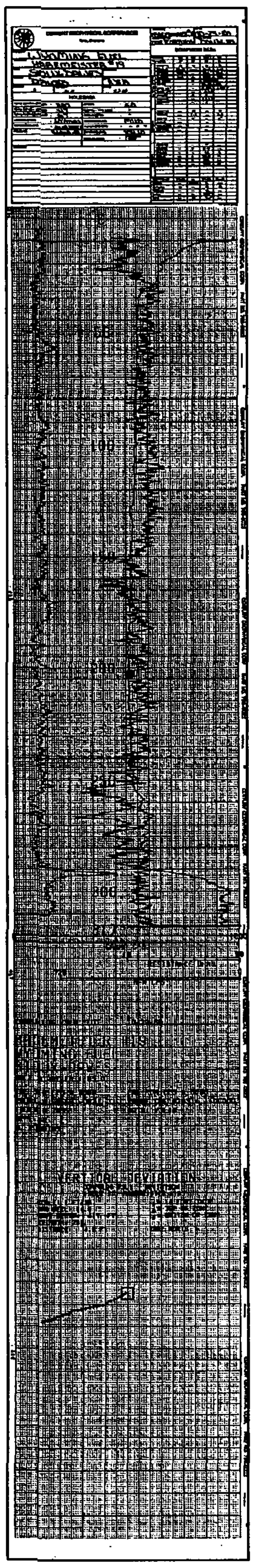
(Ha-18)

APPENDIX A

Boreholes Used in Cross Section Construction



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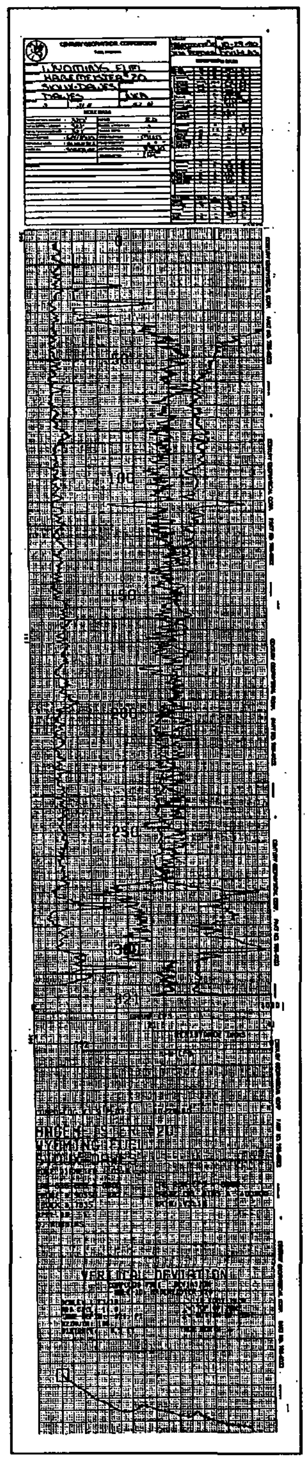

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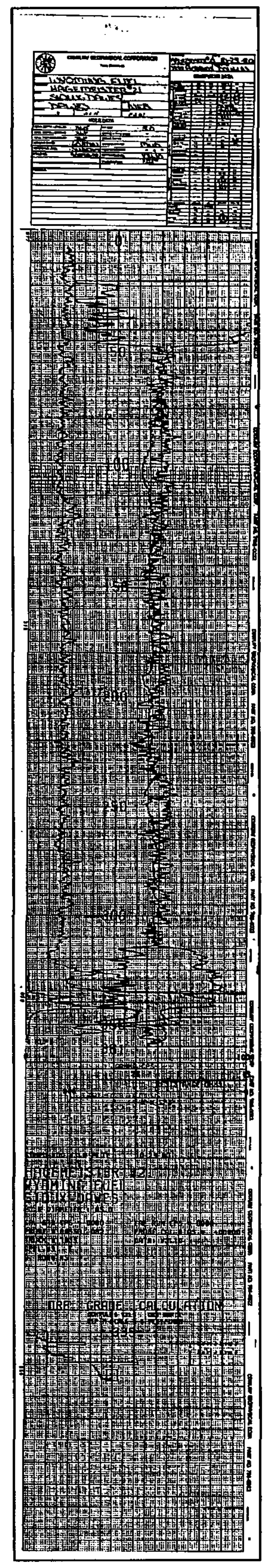

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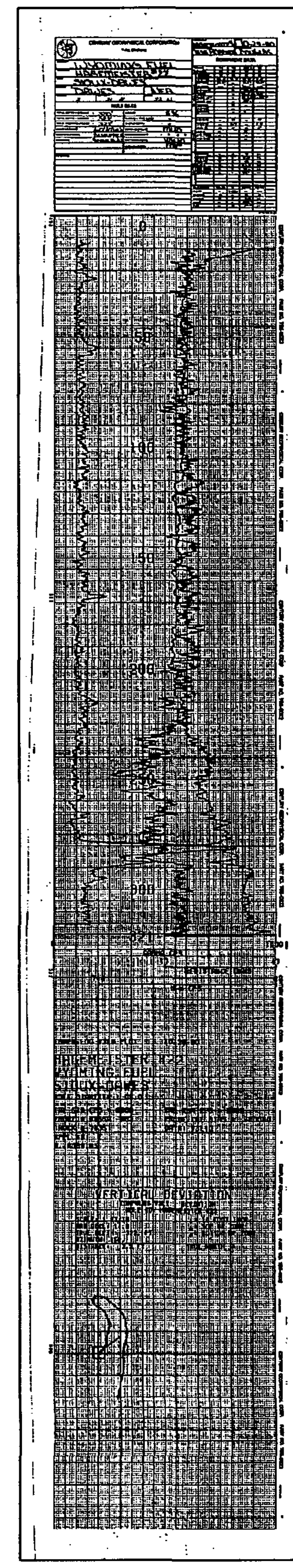
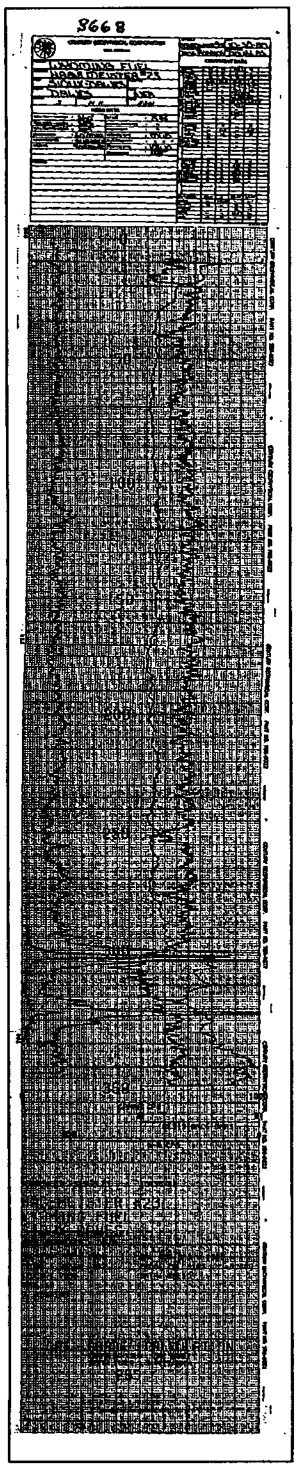


Hagemiester - 22
(Ha-22)

APPENDIX A

Boreholes Used in Cross Section Construction



Hagemiester - 23
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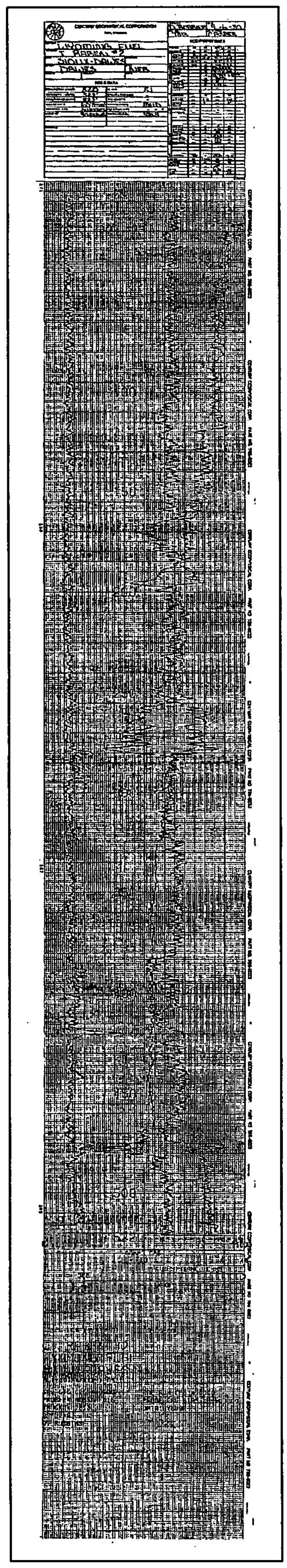

J Raben - 2
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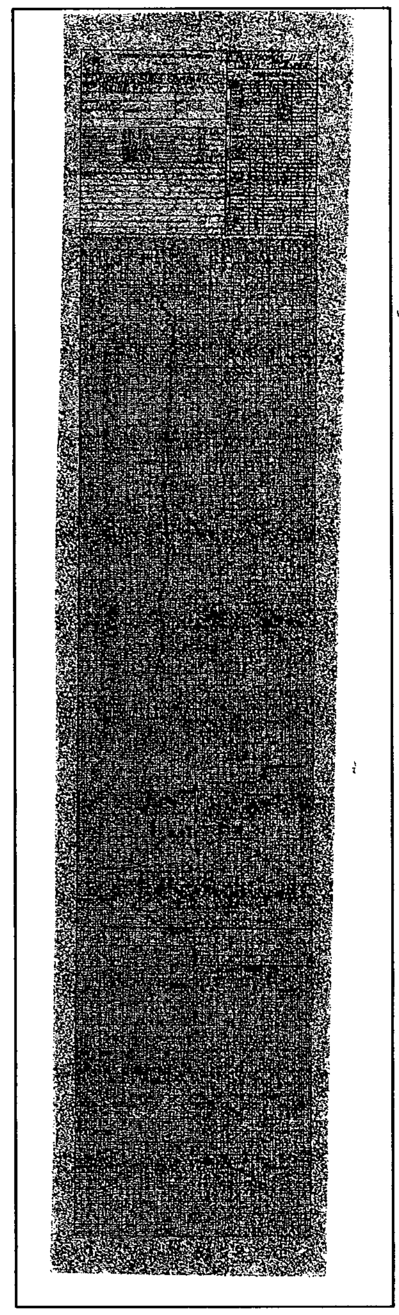
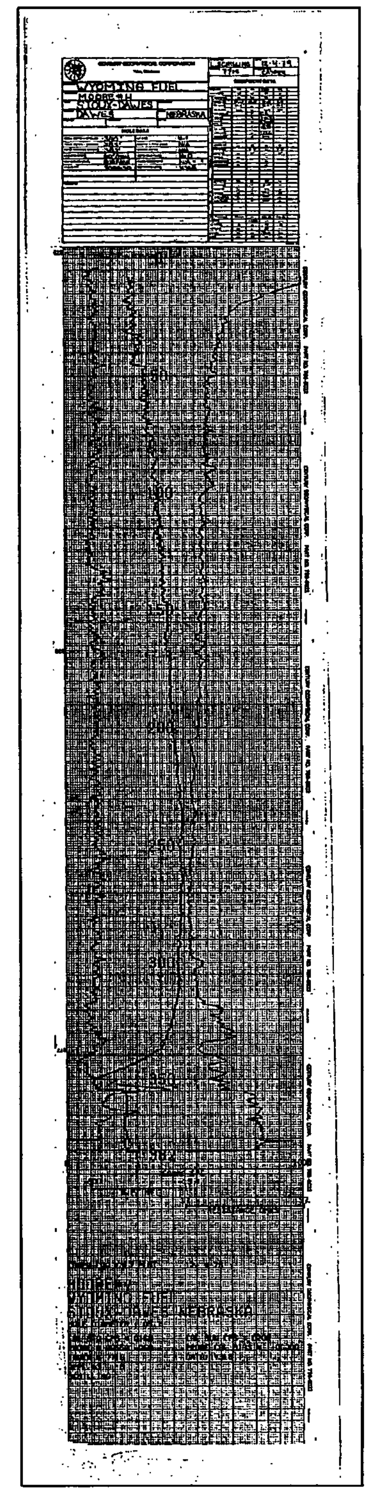


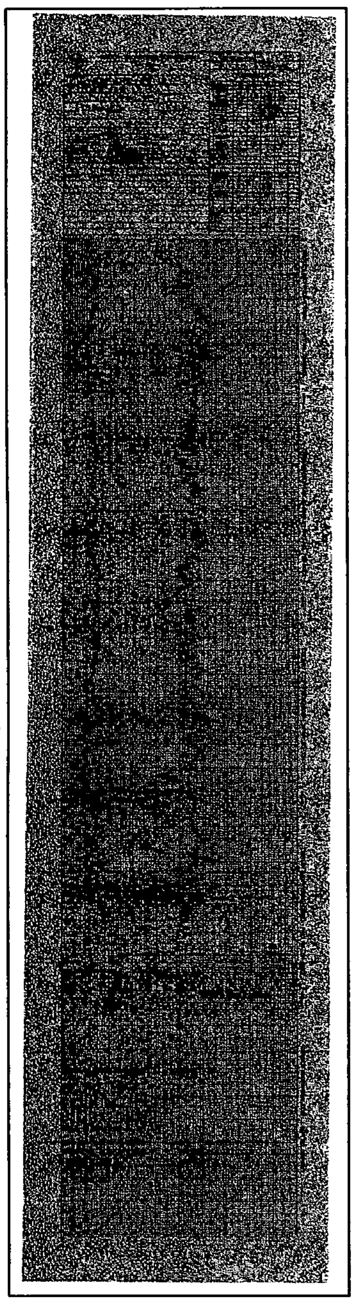
Moore - 1
(Mo-1)



Moore - 4
(Mo-4)

APPENDIX A

Boreholes Used in Cross Section Construction



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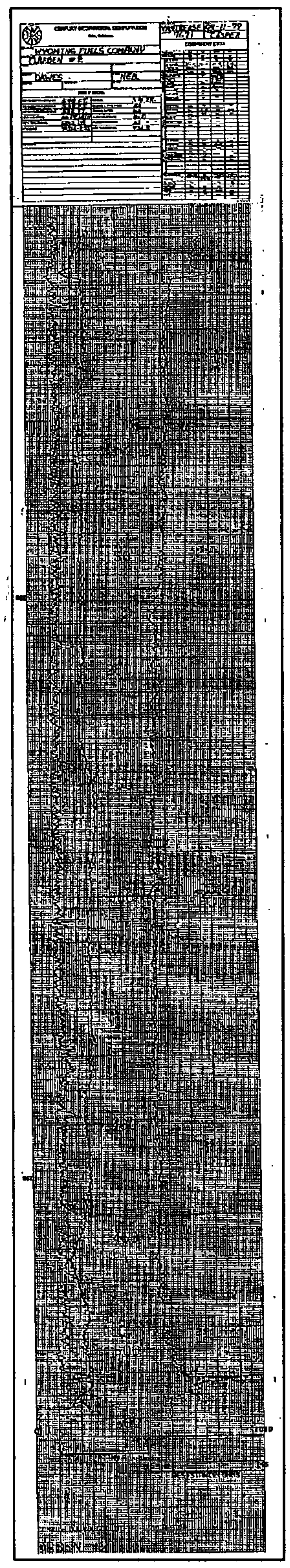
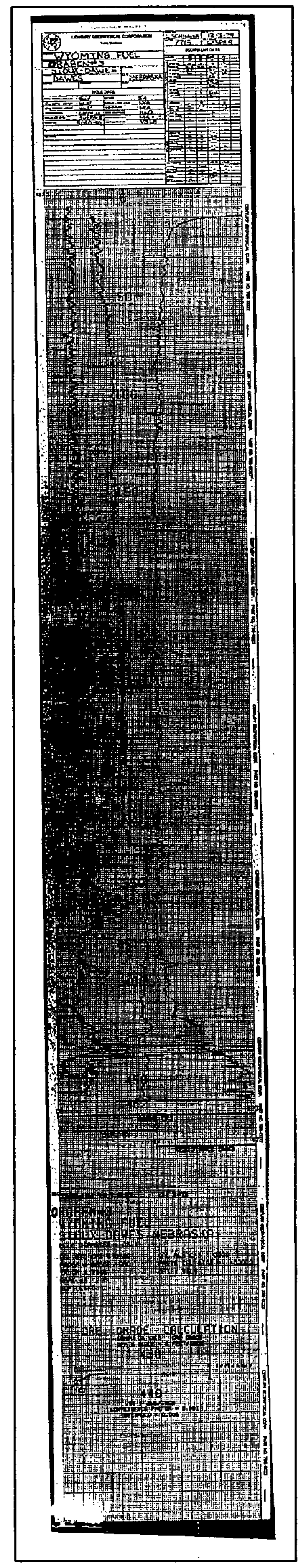
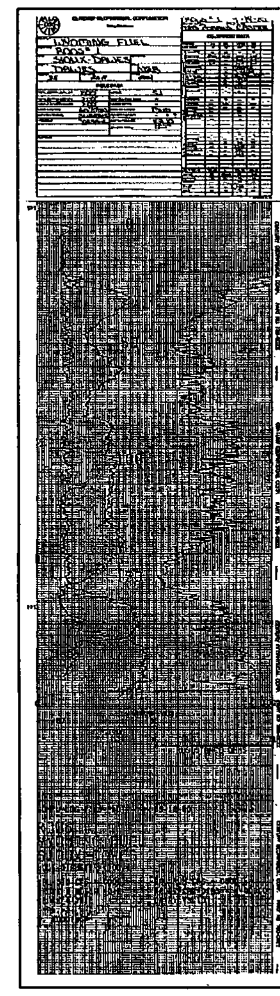


O Raben - 2
(ORa-2)



O Raben - 3
(ORa-3)



Roos - 1
(Rs-1)

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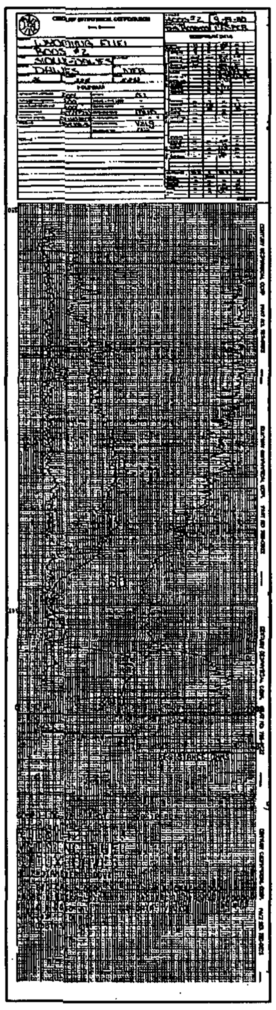

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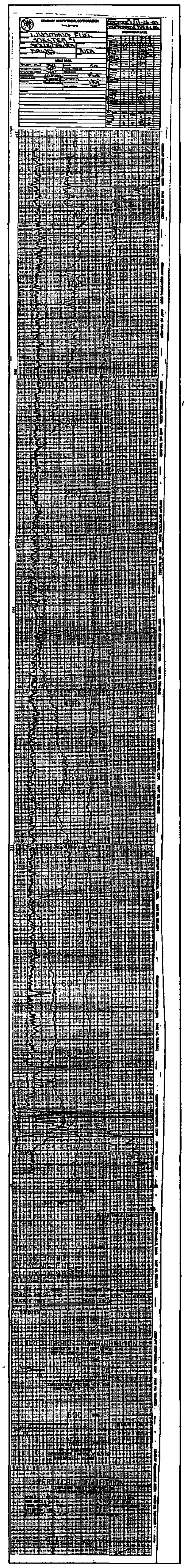
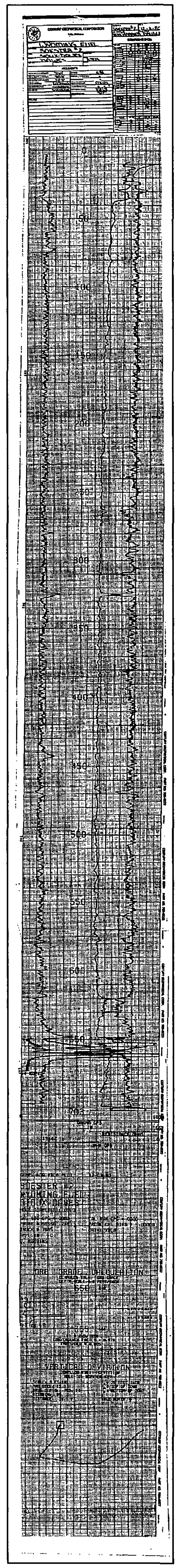


Soester -1
(So-1)



Soester -2
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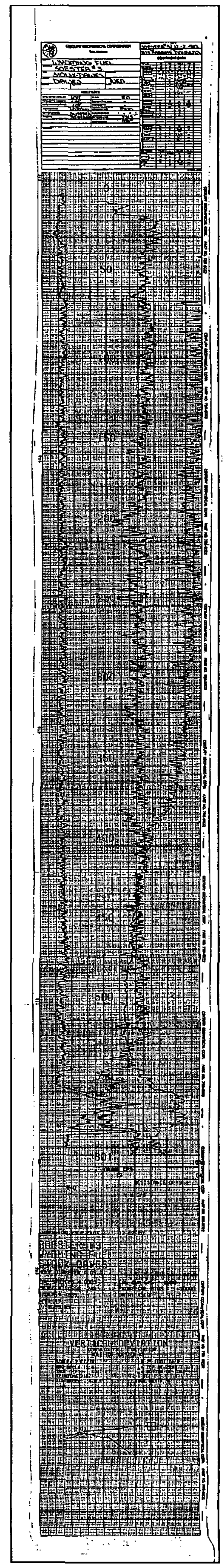
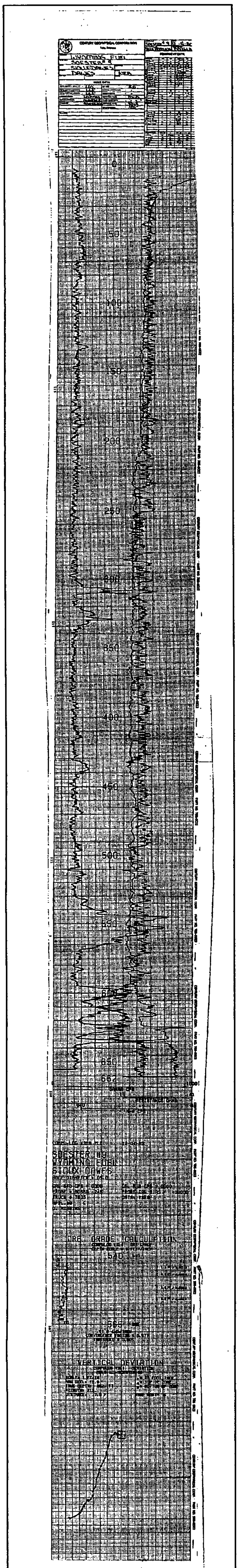


Soester -3
(So-3)

APPENDIX A

Boreholes Used in Cross Section Construction



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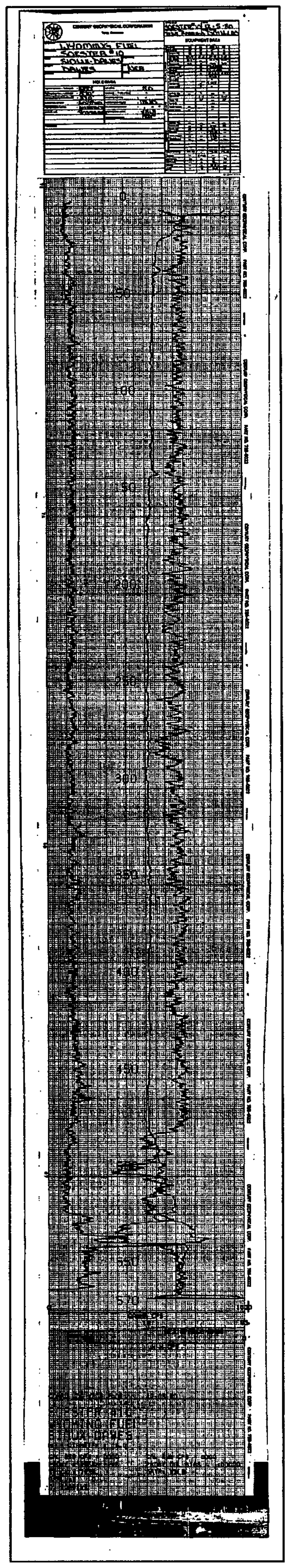

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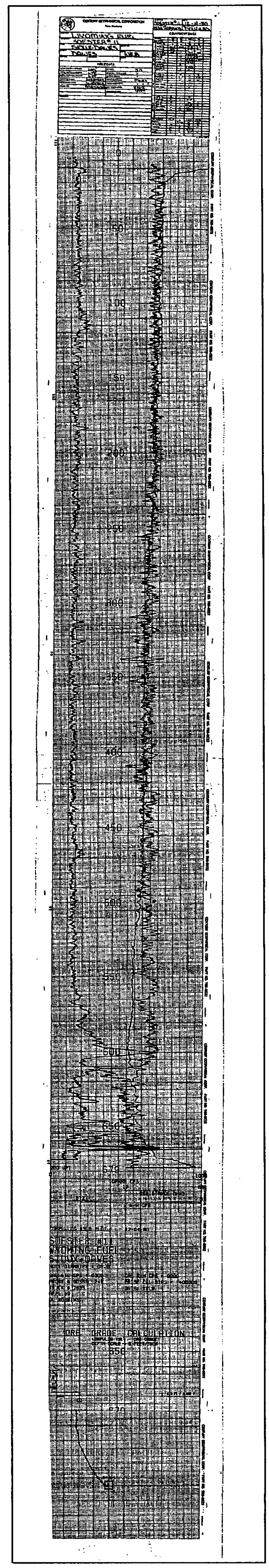

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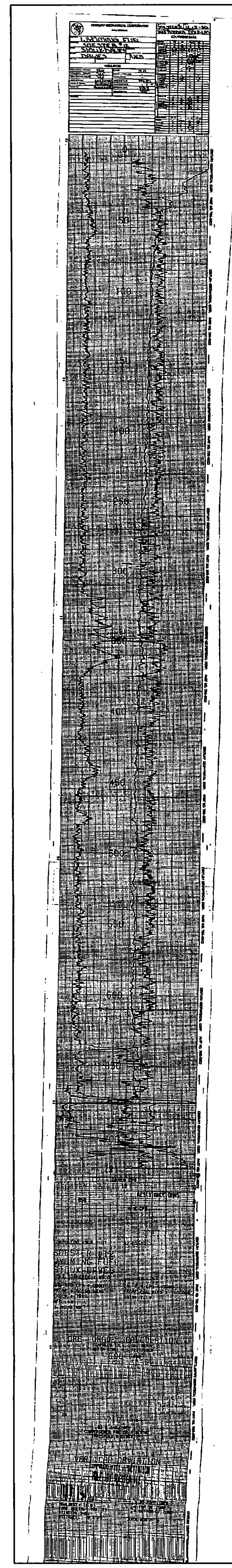
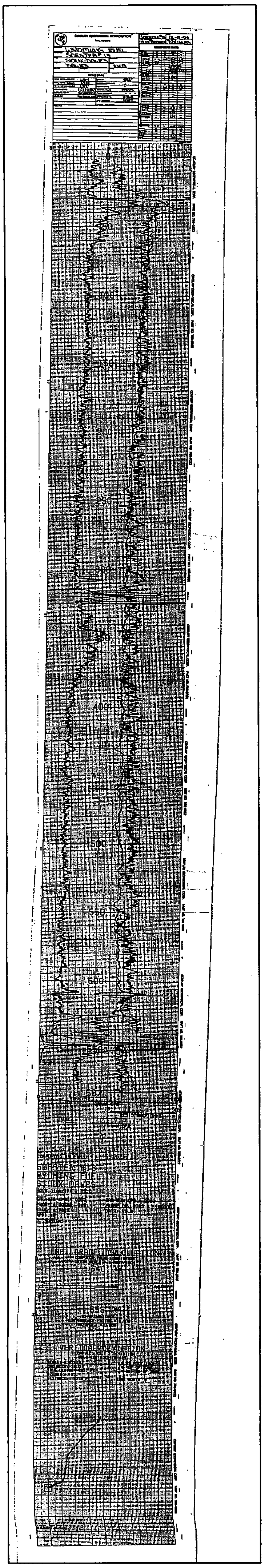


Soester -12
(So-12)

APPENDIX A

Boreholes Used in Cross Section Construction



Soester -13
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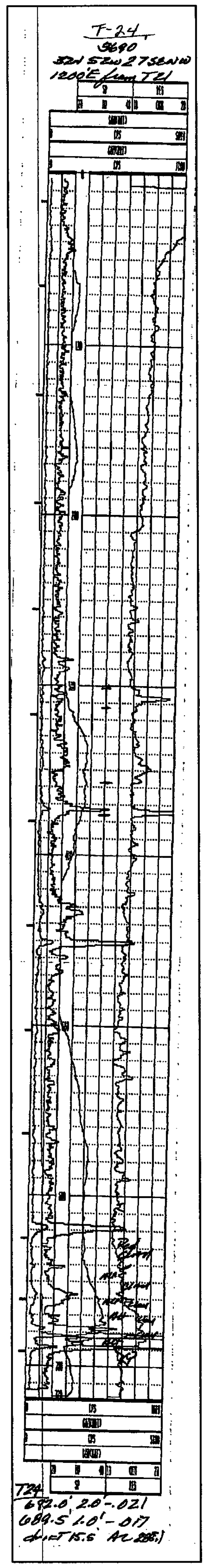

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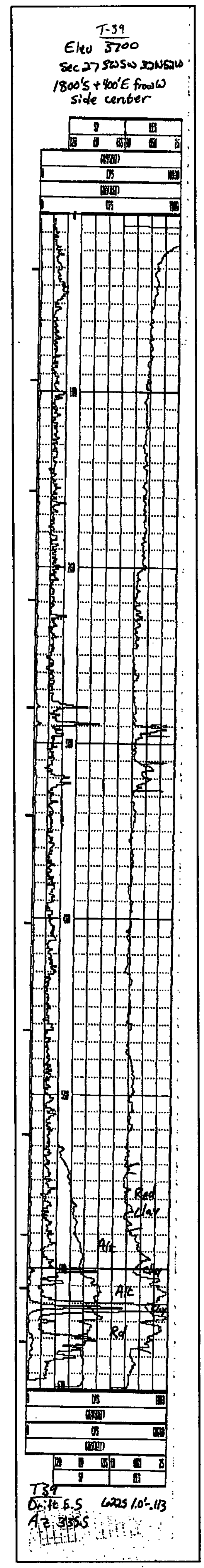

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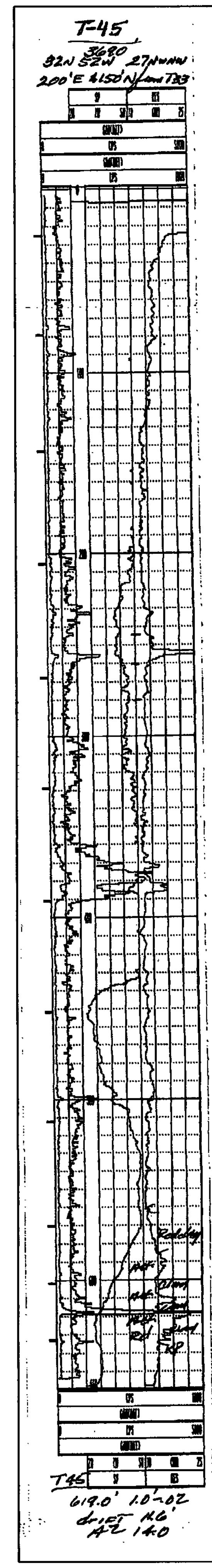
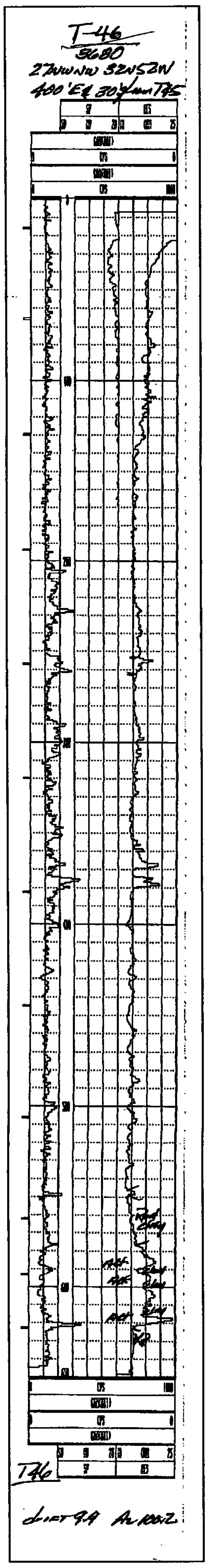


T-45

APPENDIX A

Boreholes Used in Cross Section Construction



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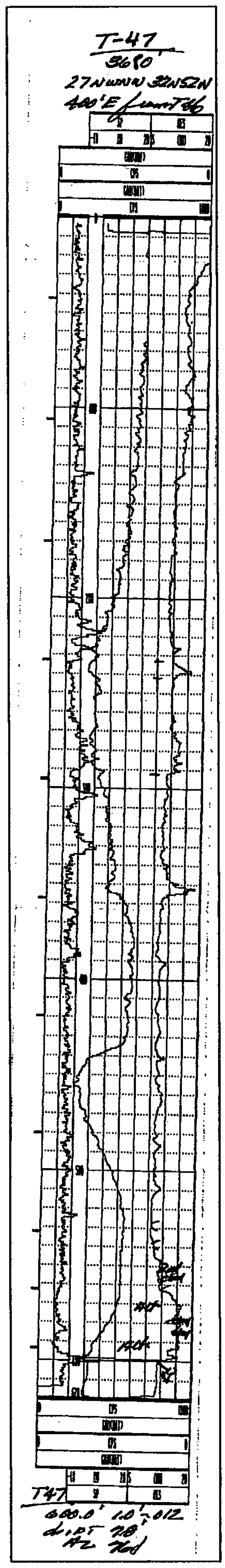

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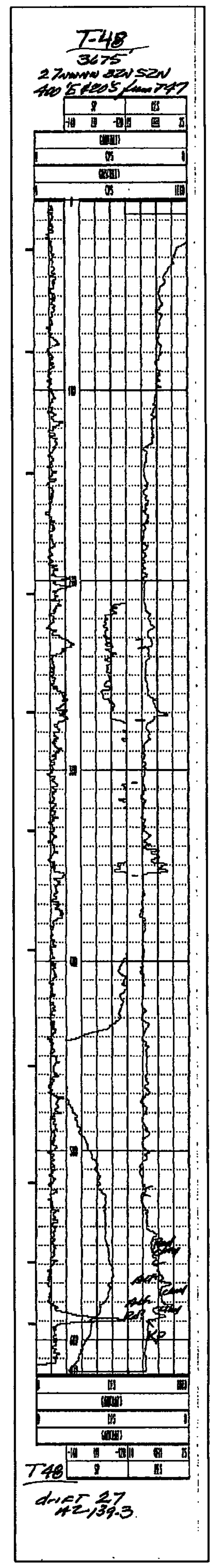

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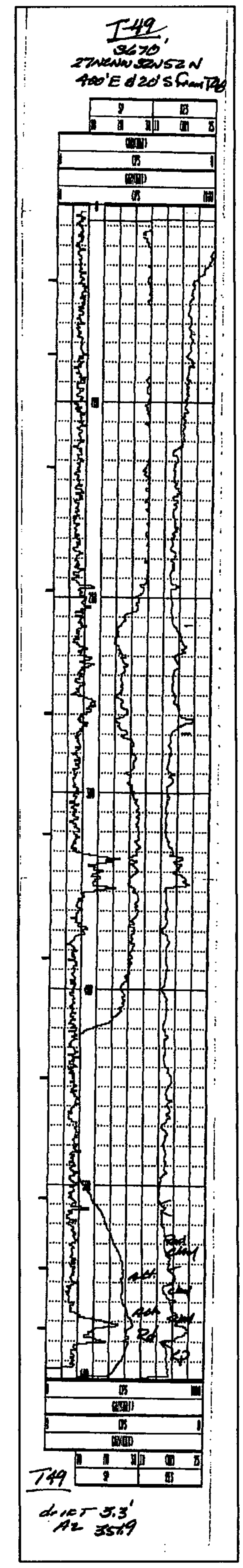
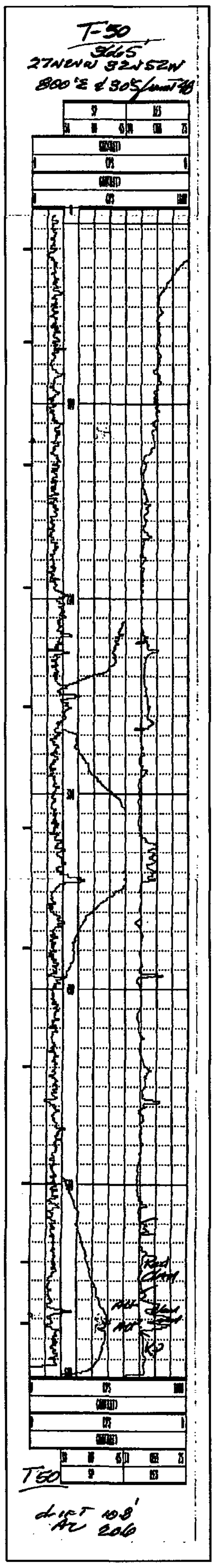


T-49

APPENDIX A

Boreholes Used in Cross Section Construction



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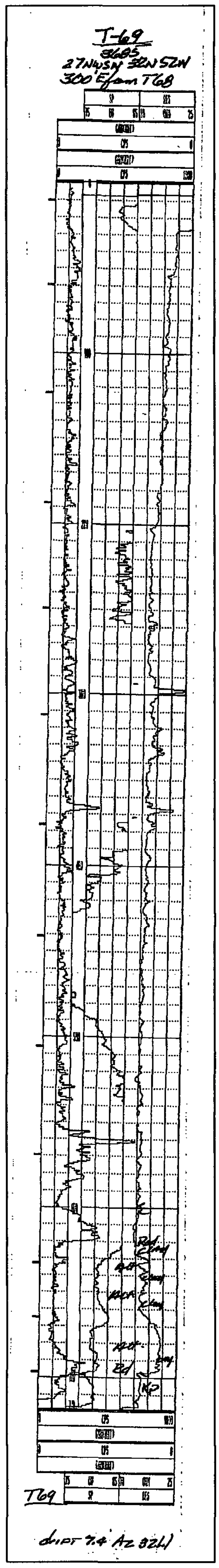

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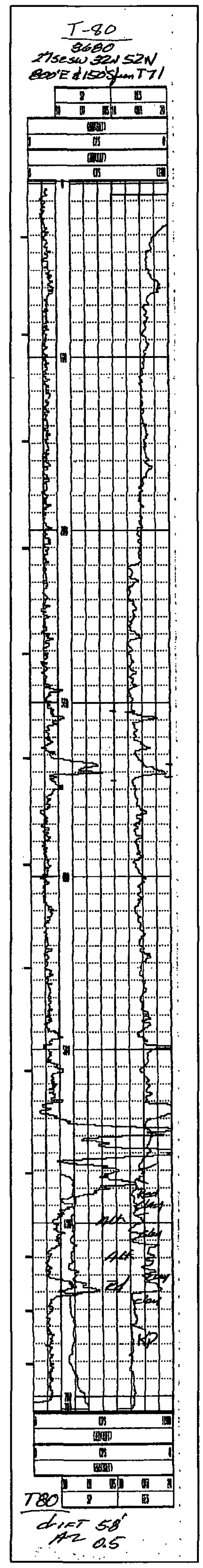

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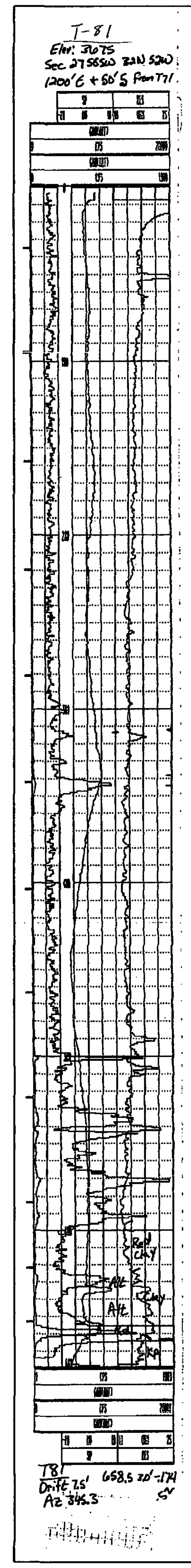
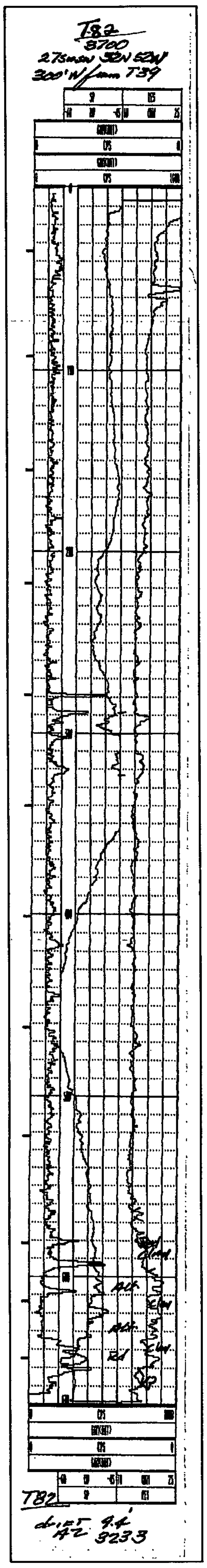


T-81

APPENDIX A

Boreholes Used in Cross Section Construction



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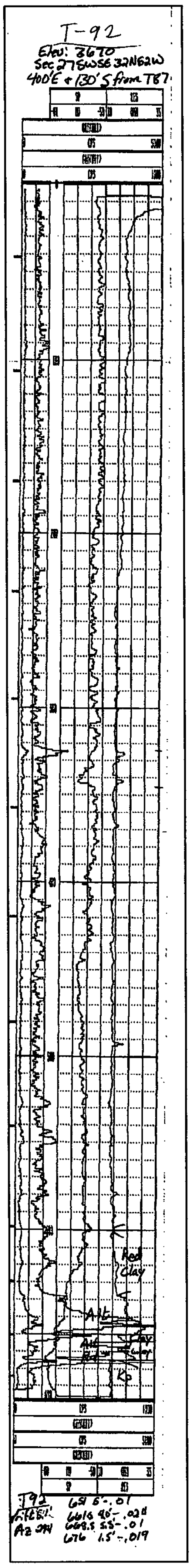

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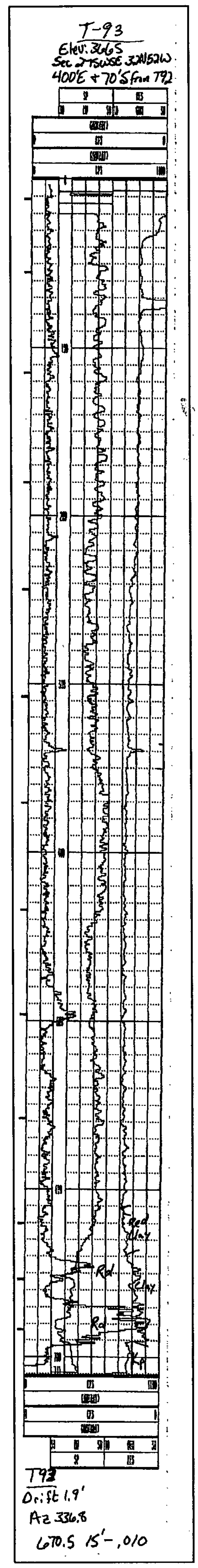

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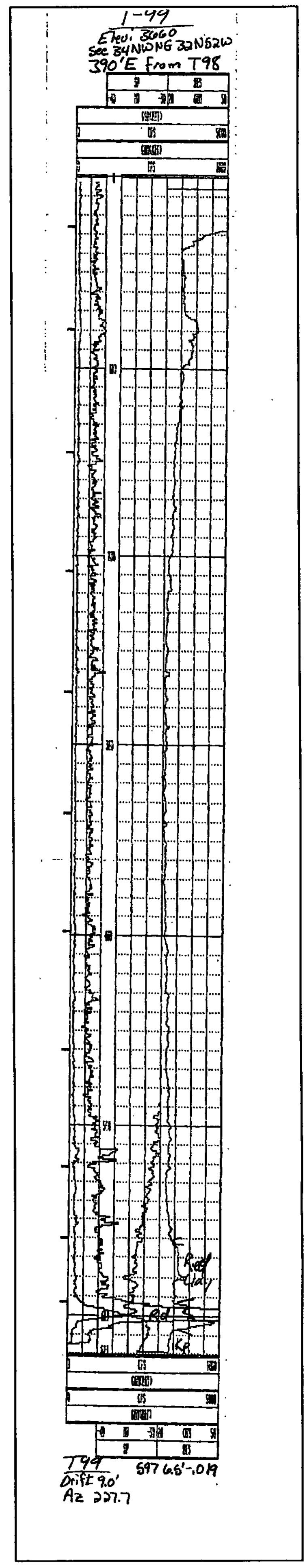
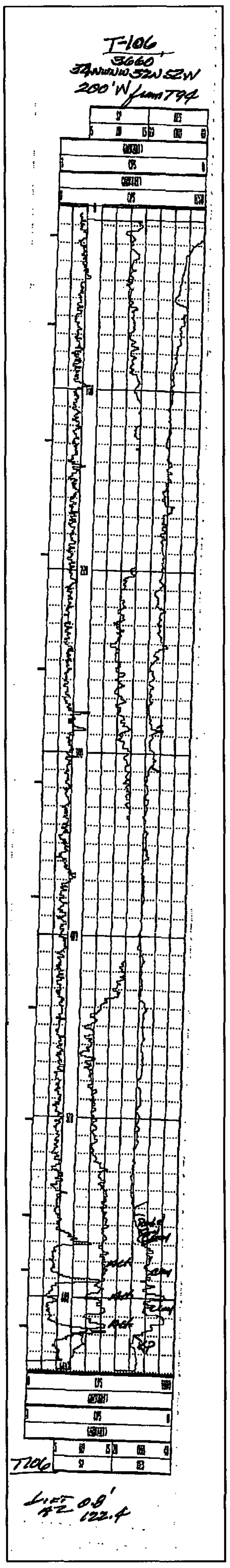


T-99

APPENDIX A

Boreholes Used in Cross Section Construction



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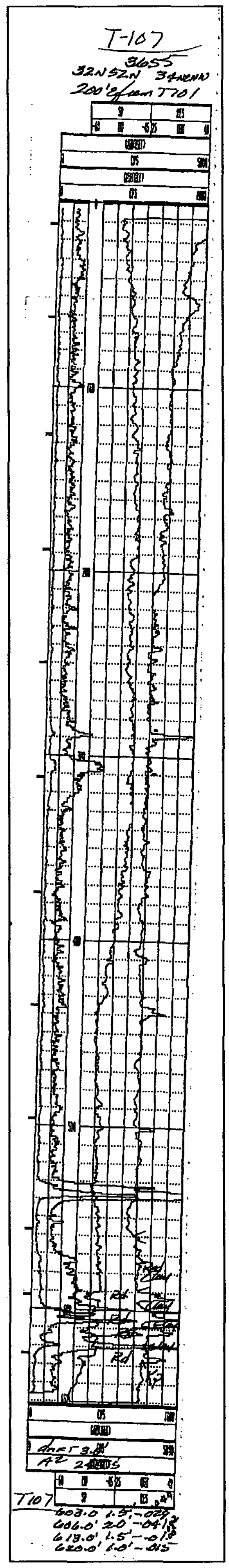

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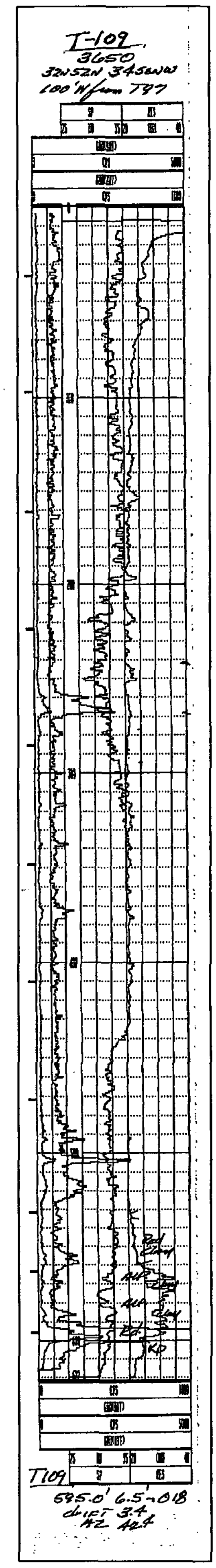

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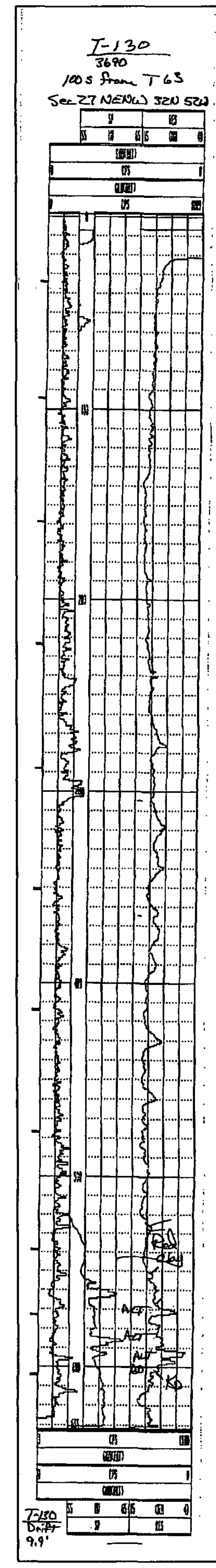
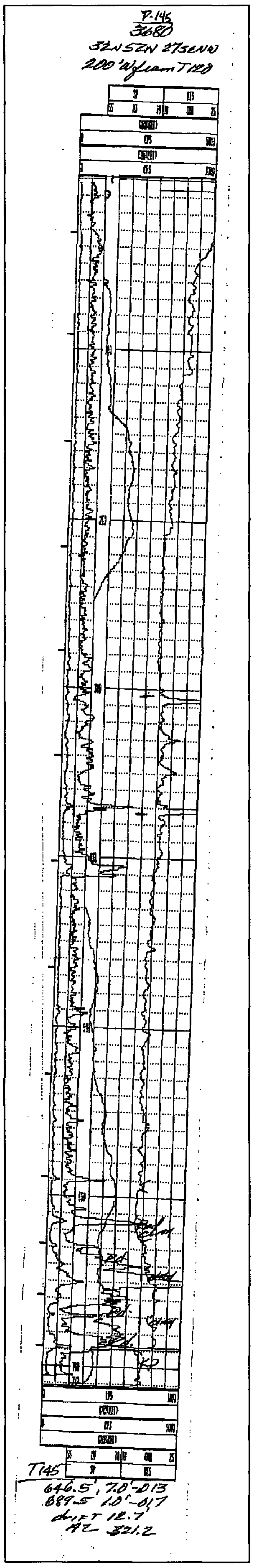


T-130

APPENDIX A

Boreholes Used in Cross Section Construction



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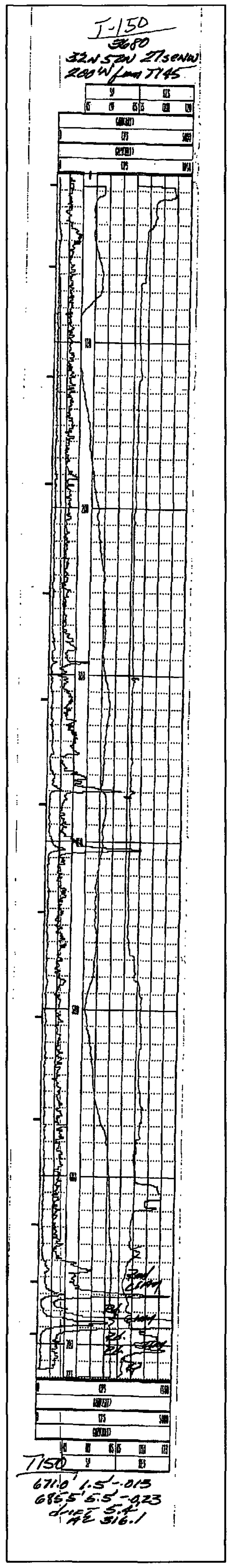

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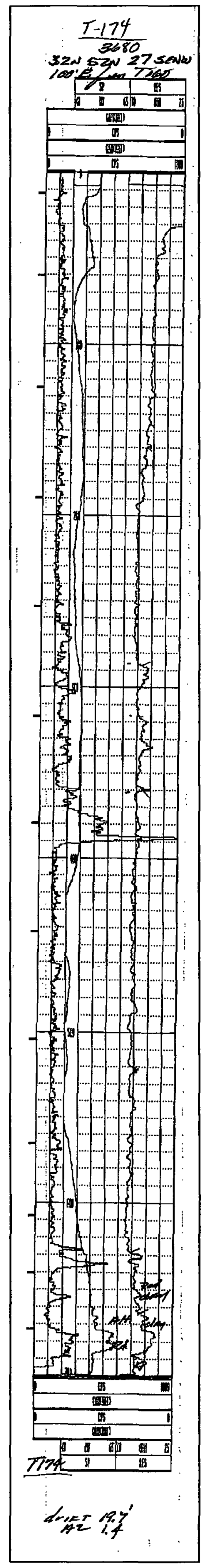

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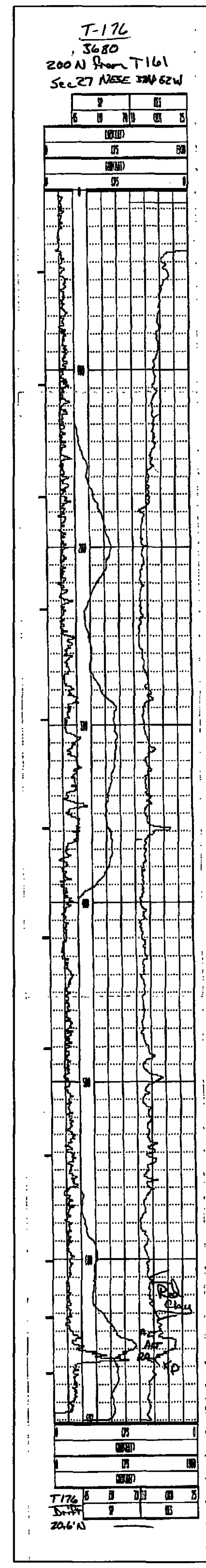
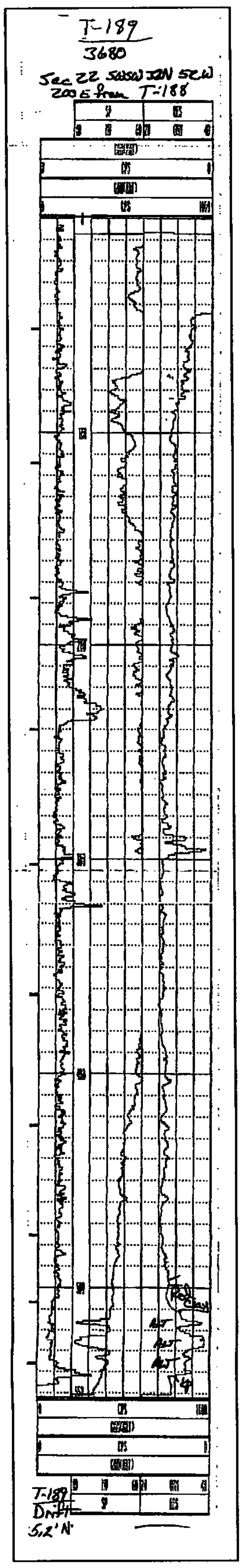


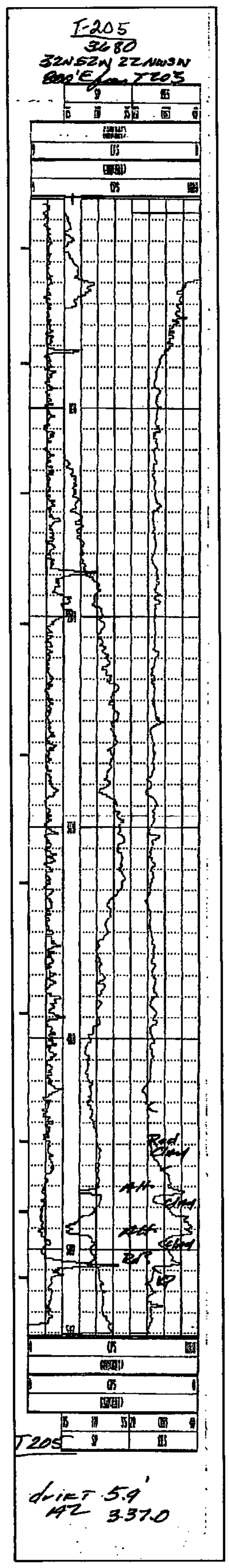
T-176

APPENDIX A

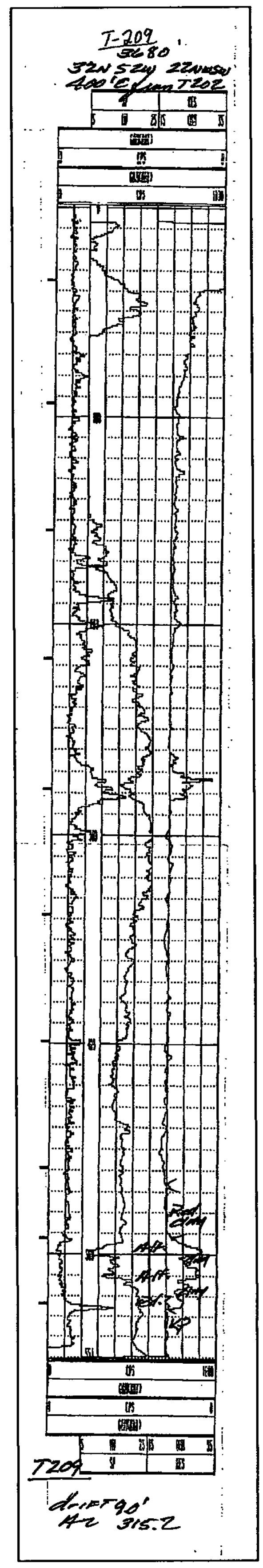
Boreholes Used in Cross Section Construction



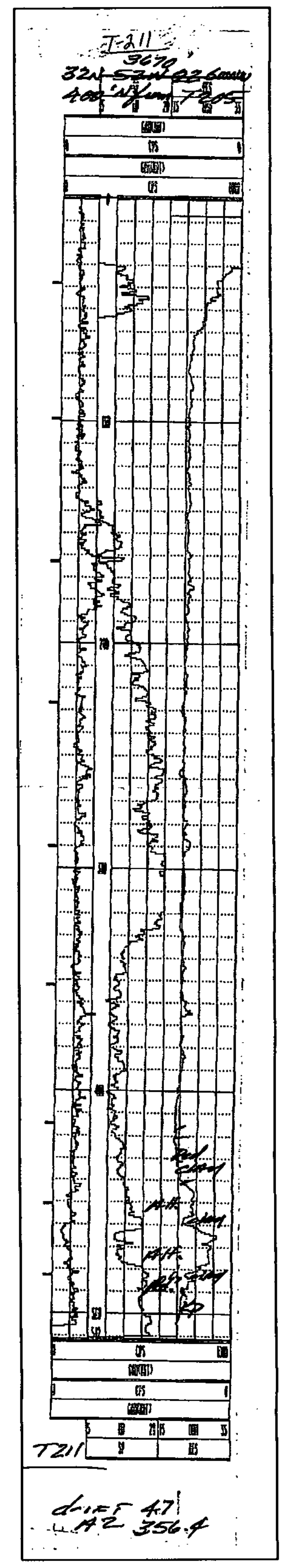
T-189



T-205



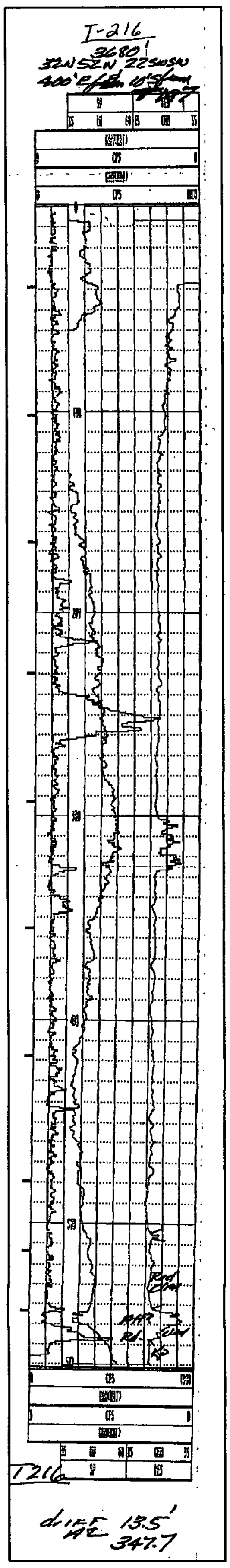
S-209



T-211

APPENDIX A

Boreholes Used in Cross Section Construction



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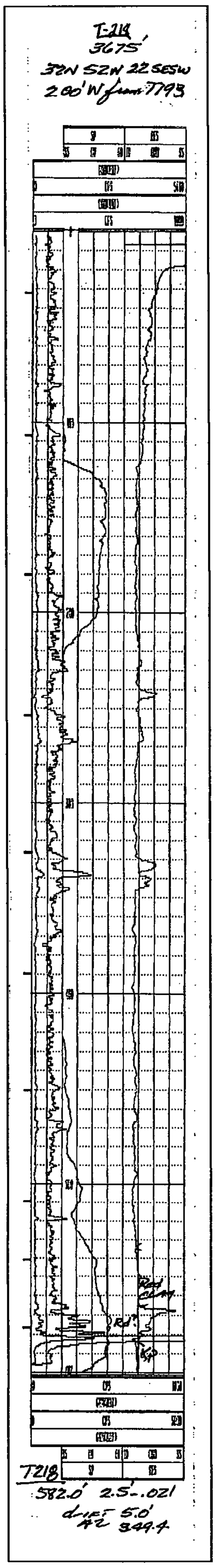

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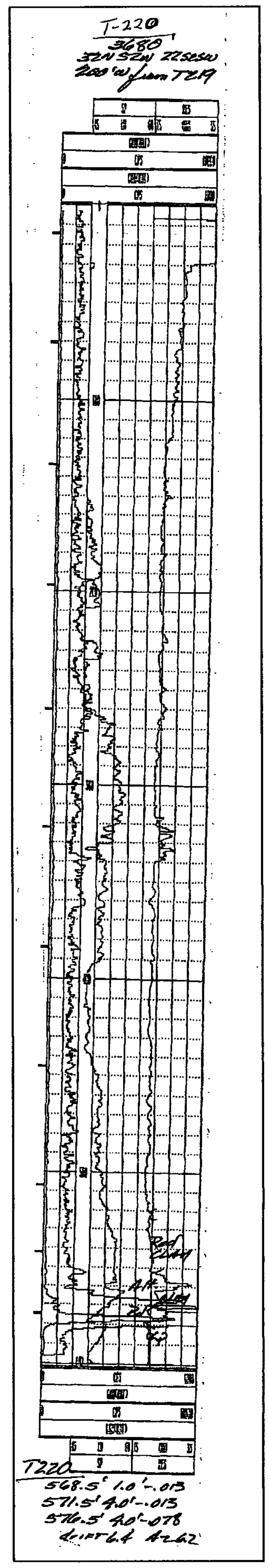

T-220

APPENDIX A

Boreholes Used in Cross Section Construction

Petrotek

NORTH TREND HYDROLOGIC TESTING REPORT – TEST # 6

CROW BUTTE PROJECT, DAWES COUNTY, NE

CROW BUTTE RESOURCES, INC.
141 Union Street, Suite 330
Lakewood, CO 80228

DECEMBER 2006

Prepared By:
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TABLE OF CONTENTS

TABLE OF CONTENTS

Tables

Figures

Appendices

EXECUTIVE SUMMARY

The North Trend Pump Test Plan was submitted by Crow Butte Resources, Inc. (CBR) to the Nebraska Department of Environmental Quality (NDEQ) in June 2006. In accordance with the Plan, CBR installed the necessary wells and performed a pump test to evaluate hydrogeologic conditions in the vicinity of the proposed North Trend expansion area. The pump test was designed to assess:

- The degree of hydrologic communication between the Basal Chadron Production Zone pumping well and the surrounding Production Zone monitor wells;
- The presence or absence of hydrologic boundaries within the Production Zone aquifer over the test area;
- The hydrologic characteristics of the Production Zone aquifer within the test area; and,
- The degree of hydrologic isolation between the Production Zone and the overlying aquifers.

The Production Zone in North Trend is the Basal Chadron Sandstone. The majority of the wells monitored during this test were completed in the Basal Chadron. The exact definition of the "overlying aquifer" at North Trend is somewhat difficult to determine. As such, to assess hydrogeologic isolation between the Production Zone and the overlying sands, overlying monitor wells were installed in both a Mid/Upper Chadron sand and a sandy clay within the base of the shallow Brule Formation. Because the production zone (Basal Chadron sand) is underlain by the Pierre Shale, no underlying monitoring wells were installed.

Initial testing activities at North Trend commenced in 2004. However, the results from those tests were not definitive. For this reason, CBR conducted a longer test with additional monitoring wells in June and July 2006. For the test, 13 wells were monitored using automated equipment. The test was conducted by pumping well COW-5 at 16.4 gpm for 357 hours (14.9 days). More than 110 feet of drawdown was achieved in the pumping well during testing. All of the Basal Chadron wells showed adequate drawdown (e.g., greater than 1.3 feet), which confirms hydrologic communication within the Production Zone sand.

The nearest overlying sand monitor well (MCOW-3) was approximately 43 feet away from the pumping well; the nearest shallow aquifer monitor well (BOW-2) was located 32 feet from the pumping well. No significant water level changes due to the pump test were observed in the overlying or shallow monitor wells.

In summary, the pump test was performed in accordance with the Hydrologic Test Plan submitted by CBR to NDEQ. The testing objectives were met. The test results demonstrate:

- ❑ The Basal Chadron monitor wells are in communication with the Basal Chadron Production Zone throughout the North Trend test area;
- ❑ The Basal Chadron Sandstone has been adequately characterized with respect to hydrogeologic conditions within the

majority of the proposed North Trend permit area;

- Adequate confinement exists between the Basal Chadron sand Production Zone and the overlying Mid/Upper Chadron sand, and the overlying Brule Formation throughout the central portion of Section 27 of the proposed North Trend permit area; and,

- While additional future testing will be necessary prior to mining in part of the proposed permit area, the 2006 testing is sufficient to proceed with Class III permitting and a NRC license application for North Trend.

Because the 2004 and 2005 testing results were inconclusive, additional confirmatory testing may be required to further assess confinement conditions in the extreme southern portion of Section 27 and the northern portion of Section 34. Consistent with NRC requirements regarding demonstration of confinement on a local scale, this testing would be conducted on a wellfield scale with multiple monitoring locations.

The radius of influence for the test is approximately 7,500 feet. However, since no monitoring wells were located in the northern portion of the proposed permit area, additional testing may be required prior to development operations in Sections 15, 21 and the northern portion of Section 22. Such testing would be consistent with the sequential pump tests performed to expand operations in the current Class III permit area.

1.0 INTRODUCTION

1.1 BACKGROUND

The Crow Butte Project is an in-situ uranium mine located southeast of Crawford, Nebraska. The mine was developed to recover uranium from the Basal Chadron Sandstone. During the initial permitting and subsequent development of the mine, CBR performed four pump tests (referred to as Tests #1 through #4) in the current Class III permit area (Permit NE0122611) (Figure 1-1) to: (1) confirm the confinement of the ore-bearing horizon; and (2) assess the hydraulic characteristics of the Basal Chadron Sandstone.

As part of the permitting activities for the proposed North Trend (NT) expansion area, CBR performed a series of groundwater pump tests (referred to collectively as Test #5) during 2004 and 2005. The tests were performed by pumping a well completed in the Basal Chadron Sandstone and monitoring groundwater levels in six wells in the Basal Chadron Sandstone, two wells in an overlying Upper/Middle Chadron sand, and one well in the overlying Brule Formation. The testing operations, field operations, and general results for the 2004 and 2005 testing are summarized on Table 1-1.

The results of the 2004 and 2005 tests were inconclusive (Petrotek, 2005) with regard to confinement between the Basal Chadron and the overlying Upper/Middle Chadron sand. Based on testing results and discussions with Nebraska Department of Environmental Quality (NDEQ) staff, CBR elected to: (1) install additional monitor wells in the Upper/Middle Chadron sand and the Brule Formation; and (2) conduct another pump test, referred to as Test #6 (Figure 1-2).

This report has been prepared to: (1) document the methods used to perform Test #6; and (2) present the results from those tests.

1.2 REGULATORY REQUIREMENTS

Prior to initiation of ISL mining operations, the Nebraska Department of Environmental Quality (NDEQ) Underground Injection Control regulations require the following.

<u>Hydrologic Testing</u>

- Monitor well installation and performance of pump test(s) to assess site conditions.
- Analysis of pump test data.
- Submittal of a Hydrologic Test Report for NDEQ review and approval.

<u>Baseline Water Quality</u>

- Collection and analysis of baseline water quality samples and statistical analysis of ground water quality data.
- Calculation of Upper Control Limits (UCL). Restoration Target Values (RTV) shall also be calculated at this time, although the approved operations plan does not require establishing the RTVs until

restoration.

- Submittal of baseline water quality data, statistical analysis for outliers, and the calculated UCLs for review and approval. The RTVs should also be submitted at this time. These data may be submitted with the Hydrologic Test Report, or as a separate submittal.

Upon review and approval of the Hydrologic Test Report and the proposed UCLs, NDEQ will provide CBR the authority to commence mining operations in the proposed North Trend area. Additional approval must be granted from the Nuclear Regulatory Commission.

This report will address only the hydrologic testing activities and results. Baseline water quality data and subsequent discussion will be submitted under a separate cover.

1.3 PURPOSE AND OBJECTIVES

The purpose of this report is to demonstrate that the majority of the proposed North Trend permit area has been sufficiently evaluated with respect to hydrogeologic conditions and is suitable for ISL mining.

The objective of this report is to present the information required by NDEQ for a Hydrologic Test Report. In accordance with State regulations and CBR's existing permit, the following information is included:

- A description and maps of the proposed permit area;
- Geological cross-sections, including data from new monitor wells;
- Isopach maps of the Production Zone, Overlying confining unit and overlying sands;
- A description of hydrologic testing, including well completion reports;
- Discussion of the hydrologic test results including raw pump test data, type curve matches, potentiometric surface maps, water level graphs, drawdown maps, and other hydrologic data with interpretation and conclusions, as appropriate; and,
- Verification, based on the test data, that: (1) the monitor wells are in communication with the Production Zone; and (2) there is adequate confinement between the Basal Chadron Production Zone and the overlying sands (Upper/Middle Chadron sand and Brule Formation).

1.4 REPORT ORGANIZATION

This report includes eight sections, the first being this introduction. The site-specific hydrogeologic conditions are discussed in Section 2. Information related to the monitor well locations and completions is included in Section 3. Section 4 presents the hydrologic (pump) test design and procedures; the analytical methods and test results for the Basal Chadron Sandstone Production Zone are discussed in Section 5. Results from monitor wells completed in the overlying aquifers are presented in Section 6. Conclusions from the testing and analysis and references are included in Sections 7 and 8, respectively.

Field activities for the North Trend pump test were jointly performed by CBR and Petrotek personnel. The test analysis was performed, and this report written by Petrotek.

2.0 SITE CHARACTERIZATION

Ore-grade uranium deposits underlying the North Trend site are located in the Basal Chadron Sandstone, which ranges from 10 to 50 feet in thickness (typically 20-30 feet of net sand), and occurs at depths from 500 to 700 feet below ground surface (bgs). The Upper/Middle Chadron Formation and the Brule Formation, consisting predominantly of clay, claystone, and siltstone, form a confining layer above the Basal Chadron Sandstone. Based on drilling data to date, the gross thickness of this confining layer averages approximately 580 feet across the proposed North Trend permit area.

2.1 STRATIGRAPHY

Specific to the North Trend area, the stratigraphic sequence of interest, in descending order follows: alluvial sediments with occasional perched water, Brule Formation (including a sandy clay that typically is considered the shallowest overlying aquifer), Upper Chadron (upper confining layer), Upper/Middle Chadron sand (overlying aquifer, where present), Middle Chadron (upper confining layer), Basal Chadron Sandstone (production zone), and Pierre Shale (underlying confining layer). Because no sands occur for over 1,000 feet below the top of the Pierre Shale, no underlying monitoring zone exists. The general stratigraphy underlying the North Trend site, based on data from well CPW-2, is summarized in Table 2-1.

The Basal Chadron production zone lies upon a marked regional unconformity on the top of the Pierre Shale. Regionally, deposition of the Basal Chadron has been assigned to large, high-energy braided streams. In this regard, the Basal Chadron is lenticular with numerous facies changes occurring within short distances. A similar, but lower-energy depositional environment appears to account for the spatial variability of the Upper/Middle Chadron sand.

Isopach maps of the Upper/Middle Chadron sand, the Upper/Middle Chadron confining unit (including the Upper/Middle Chadron sand), and Basal Chadron Sandstone Production Zone are shown in Figures 2-1 through 2-3, respectively. The available data (Figure 2-1) suggest that the Upper/Middle Chadron sand is continuous across the site, yet the regional depositional model suggests that the sand may occur intermittently. Additional drilling data in the future will enhance the understanding of the Upper/Middle Chadron sand distribution. The cross-sections, isopach and structure maps were generated with the PETRA software package using a select drill hole data, geologic picks and logs provided by CBR. A structure map of the top of Pierre Shale is presented in Figure 2-4; the top of Basal Chadron Sandstone structure map is shown on Figure 2-5.

The locations of six geologic cross-sections through the North Trend area are depicted on Figure 2-6. Figures 2-7 through 2-12 (Cross-sections A-A', B-B', C-C', D1-D1', D2-D2' and E-E', respectively) show the geological cross-sections in detail. The cross-sections demonstrate that the Basal Chadron Production Zone is stratigraphically isolated from the overlying Upper/Middle Chadron sand and the water-bearing portion of the Brule Formation by a low permeability-confining unit (and the Upper/Middle Chadron). Figures 2-12 through 2-16 present 3-D views of the Brule, Upper/Middle Chadron sand, Basal Chadron Sandstone, and Pierre Shale and the relation between those units.

2.2 STRUCTURE

Previous drilling at the Crow Butte project identified a structural feature referred to as the White River Fault located between the current permit area and the proposed North Trend permit area. The feature is oriented NE-SW along the drainage of the White River (Figure 1-1). The general location of the feature is shown on Figures 2-11 and 2-12. The vertical movement along the feature appears to be approximately 200 feet, upthrown to the south-southeast. The dip of the fault, and the potential strike-slip displacement, has not been defined. However, based on the data presented in Figures 2-11 through 2-15, it is possible that the referenced structural feature also could be a fold (e.g., a monocline), as discussed below.

The cross-sections show that the Basal Chadron Sandstone is pervasive and correlatable throughout the area. The White River Fault has been mapped to occur in the SE corner of Section 34, T32N R52W. Structure contour maps constructed on the Pierre show there to be a distinct SW-NE trending high in this area, verified through cross-sections. The presence of the White River Fault has been identified in site literature, and the feature does coincide with the location of the White River. Further, the feature also coincides with Pre-Chadron paleotopographic highs on the Pierre shale. All of these data suggests that a structural feature is present in this area that has been expressed as both structural (e.g., Pierre surface) and stratigraphic (Chadron thickness variations) changes.

In the area where the White River Fault is suspected to occur (Figure 1-1), the Chadron (or Chadron/Lower Brule, depending upon interpretation) notably thins across the mapped fault. Also, the Chadron appears to thicken to the west and north of the fault area, and intermittent sandstones of the Middle Chadron are more readily identifiable in these thicker areas, based on available data. Structure contour maps of the Pierre surface show there to be lows in areas of Chadron thickening, and highs where the Chadron thins. This is consistent with historical interpretations in the CBR permitting documents that suggest (1) an erosional paleotopographic surface of the Pierre Shale prior to deposition of the Chadron Formation, and (2) structural folding/faulting which occurred prior to or during deposition of the Chadron.

Previous maps by CBR and others show that the White River Fault to transect the Chadron and upper units suggesting that fault movement affected both the Pierre surface and overlying deposition of the Chadron. However, available cross-section correlations could also be made without showing the fault to explicitly transect these upper units. Cross-section data do not conclusively show an expression of this fault through the Chadron and upper units, although there is certainly a feature present in the area that caused uplift in southeastern Section 34. As a result, the presence or absence of the White River Fault as previously mapped is not explicitly verified in new cross-sections, although there is definite evidence that a structural feature is present that impacted both the paleotopographic Pierre surface and thickness of overlying units.

Additional information related to the characterization of the surface and subsurface geology in the vicinity of the Crow Butte Project has been presented in the report: "*Application and Supporting Environmental Report for State of Nebraska Underground Injection Control Program Commercial Permit*" (Ferret of Nebraska, 1987).

2.3 OVERLYING UNITS: BRULE FORMATION, UPPER CHADRON, UPPER/MID CHADRON SAND, AND MIDDLE CHADRON

The shallowest overlying aquifer is considered to be a sandy clay in the base of the Brule Formation. This zone provides water for domestic and livestock use in the North Trend area. The Brule consists of interbedded silt, clay and sandstone.

The Brule is underlain by the Upper Chadron Formation, which consists of approximately 200 feet of silt and clay. The Upper/Middle Chadron sand occurs, intermittently, below the Upper Chadron, and is underlain by approximately 250 to 300 feet of clay, claystone, and siltstone. The lower portion of the Middle Chadron is characterized by brick red clay.

Because NRC NUREG 1569 specifically states that monitoring above the production zone must be in the nearest overlying sand, during 2004 and 2005 testing, CBR elected to monitor a sandy zone referred to as the Upper/Middle Chadron sand (Figures 2-2 to 2-12). This sand is separated from the Basal Chadron Sandstone (production zone) by approximately 250 to 300 feet of the Middle Chadron. The continuity of this sand, with regard to justification for detailed monitoring, is questionable. However, the sand does occur with sufficient frequency to justify at least some monitoring.

2.4 PRODUCTION ZONE: BASAL CHADRON SANDSTONE

The production zone at North Trend is the Basal Chadron Sandstone. The Basal Chadron is a continuous sandstone unit across the North Trend proposed permit area. However, the sand thickness is variable, ranging from 10 to 50 feet, with an average thickness of 20 to 30 feet (Figure 2-3). The Basal Chadron has been described by CBR as interbedded arkosic sandstone and clay.

2.5 UNDERLYING UNIT: PIERRE SHALE

The Basal Chadron Sandstone is unconformably underlain by approximately 1,000 feet of Cretaceous Pierre Shale of marine deposition. The Pierre and underlying Graneros and Greenhorn shales compose approximately 2,500 feet of lower confining interval below the Basal Chadron. There are no significant sandstone units within the Pierre underlying the North Trend location.

2.6 SUMMARY OF PREVIOUS TESTING RESULTS

As discussed previously, a series of preliminary pump tests were conducted at North Trend during 2004 and 2005 (collectively referred to as Test #5) (Table 1-1). Results from the previous North Trend tests and exploratory drilling conducted to date at North Trend indicate the stratigraphy at North Trend is more complex and anisotropic than that encountered in the current mining area. A summary of results from the previous North Trend aquifer tests, and a comparison to results from the current mining area is presented in Table 2-2.

3.0 MONITOR WELL LOCATIONS, INSTALLATION AND COMPLETION

3.1 WELL LOCATIONS

North Trend monitor wells were located in accordance to planned development of the North Trend proposed permit area. In this regard, CBR anticipates that initial mining activities will be conducted in the central part of Section 27 (Figure 1-2).

3.2 WELL INSTALLATION AND COMPLETION

Prior to the 2004 testing operations, CBR installed five new wells (CPW-1, COW-1, COW-2, COW-3, and COW-4) in the Basal Chadron Sandstone (Figure 1-2). CPW-1 was installed specifically for use as a pumping well and the remainder of the wells were installed as observation wells. One pre-existing Basal Chadron well (RC-2) also was used as a monitoring location. In addition, new wells were installed in the monitoring zone within the Brule Formation (BOW2004, later referred to as BOW-1) and the Upper/Middle Chadron Formation (MCOW2004, later referred to as MCOW-1).

The original pumping well (CPW-1) was plugged and abandoned due to casing problems, and, prior to the initial test in 2004, was replaced with CPW-2. Subsequently, two additional wells (MCOW-2 and COW-5) were installed in the Upper/Middle Chadron and Basal Chadron, respectively.

To specifically address a request from NDEQ for additional monitoring locations, prior to the 2006 testing operations CBR installed two additional wells in the Upper/Middle Chadron sand (MCOW-3 and MCOW-4), and one new well in the Brule Formation (BOW-2) (see Table 1-1 for the sequence of well installation).

All of the wells used for the 2006 pump test are located in Sections 27 and 34, Township 32 North, Range 52 West (Figure 1-2), and were constructed with 4.5-inch nominal diameter casing. The wells were developed using standard water well construction techniques, such as air lifting, pumping, and/or surging. Completion reports for each well are provided in Appendix A. Specific data related to well location, construction, completion interval, and initial water levels are provided in Table 3-1.

In addition to the pumping well, a total of six production zone (Basal Chadron) monitor wells (identified as COW wells) were installed and monitored; overlying wells included four Upper/Middle Chadron wells (MCOW wells) and two Brule Formation wells (BOW wells). A summary of well completion data is included Table 3-1 and in Appendix A. The monitor wells were drilled and completed consistent with CBR's NDEQ permit for the current mining area.

Historically, due to limited productivity of the completion intervals, it is has been difficult to obtain a "static" water level in the Upper/Middle Chadron monitoring wells after drilling, completion and MIT operations. For this reason, and because the MCOW wells will be only used for water-level monitoring purposes at this time, CBR did not perform mechanical integrity tests (MITs) on the following wells: MCOW2 (after surface repairs), MCOW3 and MCOW4. CBR plans to MIT those wells after testing operations at North Trend are completed.

Because water levels in the Upper/Middle Chadron wells recover slowly (e.g., less than 0.004 gpm production rate, based on MCOW-1), the water levels in the MCOW wells were not equilibrated prior the initiation of equipment setup for the pump test. Based on historic information, 3-9 months of recovery would have been necessary for the water levels to stabilize. For this reason, the water levels in the MCOW wells were artificially "equilibrated" by adding Brule Formation water to a level that roughly approximated static conditions. Background monitoring indicated that this effort was largely successful; however, slight background recovery trends were observed in MCOW-3 and MCOW-4.

3.3 ABANDONMENT OF EXISTING WELLS

According to CBR records, historic exploration wells in the North Trend area were properly plugged and abandoned. As such, no historic wells were abandoned prior to the initial North Trend testing in 2004.

Following the initial testing at North Trend in 2004, CBR re-abandoned two historic exploration wells in the immediate vicinity (e.g., within 10 feet) of CPW-2004-2. In early 2006, CBR contracted a water well driller to abandon a former exploration well that had been turned over to a local landowner for use as a water supply well. That well was located in the SE ¼ NE ¼ of Section 27.

4.0 PUMP TEST DESIGN AND PROCEDURES

4.1 TEST DESIGN

CBR conducted the 2006 North Trend pump test in the Basal Chadron with the following objectives:

- Demonstrate hydraulic communication between the Production Zone (Basal Chadron) pumping well and the surrounding monitor wells (COW wells);
- Assess the hydrologic characteristics of the Production Zone aquifer within the test area;
- Evaluate the presence or absence of hydrologic boundaries in the Production Zone within the North Trend test area; and,
- Demonstrate sufficient hydrologic isolation exists between the Production Zone and the Overlying (Upper/Middle Chadron) sand for the purposes of ISL mining.

Figure 1-2 presents the proposed permit area outline and the locations of the pumping and observation (monitor) wells used during the North Trend hydrologic testing operations. The pumping well (COW-5) was screened across the entire thickness of the Basal Chadron Production Zone (Table 3-1).

A step-rate test was performed on COW-5 on June 8, 2006. Based on evaluation of the those data, it was anticipated that a pumping rate on the order of 20 gpm would be needed to: (1) operate the well with approximately 140 feet of drawdown; and (2) achieve 1 to 2 feet of drawdown in the most distant COW wells within a reasonable time (e.g., less than 15 days). Based on these assumptions, the radius of influence for the test was estimated to be approximately 7,500 feet.

The general testing procedures were as follows.

- Install automated monitoring equipment in the wells to be used in the test. Verify setting depths and head readings with manual water level measurements.
- Measure and record background water levels at least every 12 hours for a minimum of 96 hours prior to the test.
- Run the pumping well at a constant rate (or as close as practical). Record water levels and barometric pressure throughout the background, pumping, and recovery periods.

4.2 EQUIPMENT LAYOUT

The test was performed using a 3.0 Hp electrical submersible pump powered by a portable generator; the pump was set at an approximate depth of 230 feet in well COW-5. Flow from the pump was controlled with a manual diaphragm valve. Surface flow monitoring equipment included two Halliburton Model MC-2 flow/totalizer meters. Discharge water was land applied to a pasture located approximately 1,500 feet to the east of the pumping well via a 2-inch diameter plastic line.

Water levels in each well were measured and recorded with In-Situ LevelTROLL transducer/dataloggers. The pressure rating for the transducers ranged from 30 to 100 psi. The equipment was programmed to automatically calibrate prior to the test, take an initial reference (head) reading prior to the start of the test, and measure and record water levels according to a linear schedule (e.g., every 15 minutes for background monitoring, and the pumping and recovery periods). A summary of the monitoring equipment used for each well is presented in Table 4-1.

Because the Basal Chadron Sandstone exhibits artesian head above ground surface at most locations in the NT area, pressure transducers were connected directly to the sample port on the wellhead for each well, or the transducer cable was placed in the well, and the wellhead connection sealed. For this reason, initial water levels for the Basal Chadron wells, reported as feet below top of casing, have negative values (e.g., above the top of casing).

CBR personnel installed the monitoring equipment prior to testing and provided day-to-day data downloads. Prior to the test, Petrotek personnel verified the datalogger programming and equipment layout, subsequently started the test, and supervised testing for the first 36 hours. Thereafter, CBR collected data daily and transferred the data to Petrotek for review.

The monitor wells used for the test, distance from each monitor well to the pumping well, and the drawdown observed are presented in Table 4-2. A summary of the wells used for observation points during the North Trend testing follows.

Well Designation	Number/ Monitored
Overlying Brule Formation (BOW wells)	2/2
Overlying Mid/Upper Chadron Sand (MCOW wells)	4/4
Production Zone Basal Chadron Sand (COW, CPW, RC-2 wells)	6/6
Basal Chadron Sand Pumping Well (COW-5)	1/1
Total	13/13

The distances of the respective monitor wells from the pumping well range from 2,291 to 6,635 feet (COW completions in the Basal Chadron Sandstone), 43 to 2,323 feet (overlying Upper/Middle MCOW completions), and 32 to 2,302 feet (overlying BOW completions) (Tables 3-1 and 4-2).

4.3 POTENTIOMETRIC SURFACE OF THE BASAL CHADRON SANDSTONE

Figure 4-1 is a potentiometric surface map of the Basal Chadron sand Production Zone within the North Trend area based on water level measurements on June 26, 2006. Based on those data, the direction of groundwater flow within the Basal Chadron is predominantly to the east with the ground water gradient at approximately 0.0016 ft/ft (8.5 ft/mile). Water level data used for preparation of this map are presented in Table 3-1.

Since the production rate of the Upper/Middle Chadron sand is very low (e.g., less than 0.004 gpm), and the water levels in several of the MCOW wells had not equilibrated, a potentiometric surface map of the Upper/Middle Chadron sand is not presented.

4.4 BACKGROUND MONITORING, TEST PROCEDURES AND DATA COLLECTION

The majority of the testing equipment (e.g., pump, flow meters, LevelTROLLs) was installed and checked for proper operation in mid-June, 2006. The background monitoring period for the 2006 North Trend pump test began on June 17, 2006. Water levels were recorded every 15 minutes for 10.4 days. In this regard, the background monitoring duration and frequency significantly exceeded the minimum requirements specified in the Hydrologic Test Plan.

The pump test was performed by pumping COW-5 at an average rate of 16.4 gpm from 1030 hours on June 28, 2006 until 0700 hours on July 13, 2006. The total pumping duration was 356.5 hours (14.9 days). The drawdown achieved in the pumping well was 111 feet; drawdown in the Basal Chadron monitor wells ranged from 1.4 to 10.0 feet (Table 4-2). Water levels were automatically measured and recorded every 15 minutes during the pumping and recovery periods. Pumping rate data for the pump test are shown on Table 4-3. Water-level recovery was monitored for 14 days. A CD containing the water level data is included in Appendix C.

5.0 ANALYTICAL METHODS AND TEST RESULTS – PRODUCTION ZONE

5.1 ANALYTICAL METHODS

Drawdown data collected from the monitor wells were graphically analyzed to determine Transmissivity and Storativity. The primary analysis method used was Theis (1935) based on a confined aquifer thickness of 26 feet (Figure 2-3). The use of the Cooper & Jacob time-drawdown (1946) method was considered. However, because of the formation characteristics and large observation well distances, the 'u' assumption limitation (< 0.01) inherent to the Cooper & Jacob method was not satisfied for any of the wells. Because field conditions prevented installation of a check valve above the pump, no Theis Recovery (1935) analysis for the pumping well was performed.

The test data were analyzed using the Theis method because this method is mathematically valid for all distances and times. The significant assumptions inherent in this method include:

- The aquifer is confined and has apparent infinite extent;
- The aquifer is homogeneous and isotropic, and of uniform effective thickness over the area influenced by pumping;
- The piezometric surface is horizontal prior to pumping;
- The well is pumped at a constant rate;
- The pumping well is fully penetrating; and,
- Well diameter is small, so well storage is negligible.

These assumptions are reasonably satisfied, with the exception of the uniform thickness of the aquifer (Figure 2-3). Locally, the Basal Chadron Sandstone at North Trend is not homogeneous and isotropic; however, over the scale of the pump test, it can be treated in this manner.

Leaky aquifer solutions such as presented by Hantush (1955) were not applicable to the data from the Basal Chadron Sandstone or overlying (Upper/Middle Chadron sand and Brule Formation) completions. Likewise, because none of the monitor wells were completed within the confining units, a Neuman-Witherspoon (1972) analysis was not performed. The software used to graphically analyze the data was AquiferTest Pro (Waterloo Hydrogeologic, Inc., 2005).

Water level stability data collected during the pre-test and post-test periods along with barometric pressure were used to assess the background trends. No significant recharge or trend corrections were warranted for any of the BOW, COW or CPW wells. As discussed previously, two of the MCOW wells were recovering following development (air lifting) and subsequent recharge to approximate "static" levels. Regardless, the recovery trend was minimal during the pumping period.

5.2 BACKGROUND TRENDS

Water level stability data were collected prior to the start of the pump test. Plots of the background data for the COW and CPW wells are shown in Figures 5-1 through 5-6. Background levels for the overlying wells are presented in Figures 5-11 through 5-16.

5.3 TEST RESULTS

5.3.1 Drawdown

Drawdown over time during the test for the Basal Chadron Sandstone wells is shown on Figures 5-1 through 5-6. The potentiometric surface over time for the Basal Chadron monitor wells during the pumping period is shown in Figures 5-7 through 5-9.

5.3.2 Analytical Results

Transmissivity (T) results from the Theis analysis range from 42 to 75 ft^2/d, with an average T value of 60 ft^2/d. Based on an average thickness of 26 feet, the average hydraulic conductivity (K) is 2.3 ft/d (8.1×10^{-4} cm/s) (Table 5-1). Assuming a water viscosity of 1.35 cp (50 degrees F) and a density of 1.0, this equates to a permeability of approximately 1,100 millidarcies (md). Storativity (S) values range from 2.3×10^{-5} to 8.4×10^{-5}. The average S value was 5.3×10^{-5}. A comparison of the 2006 testing results to those from 2004 and 2005, as well as the historical results for the current Class III area, is presented in Table 5-2.

Type curve matches for all of the Basal Chadron monitor wells included in the pump test are provided in Appendix B. Water level data for all monitor wells from background through pumping and recovery are included in Appendix C on a CD ROM.

Barometric pressure corrections based on the Barometric Efficiency method (Freeze and Cherry, 1979) did not appear to significantly improve the data analysis; therefore no barometric pressure corrections were applied to the data.

5.4 DIRECTIONAL PERMEABILITY

The transmissivity results correlate reasonably well with the thickness of the Basal Chadron at North Trend. In general, higher T values are reported in the areas of thicker and/or cleaner sand. The test data do not indicate a strong trend in directional permeability (Figure 5-10). On a regional scale, the observed variation in T is not expected to significantly impact ISL mining and has no apparent regulatory implications.

5.5 RADIUS OF INFLUENCE

The test results suggest a radius of influence for the test of approximately 7,500 feet. Hence, the entire portion of Sections 27 and 34 within the proposed permit area have been evaluated, as well as the southern portion of Section 22 (Figure 1-2). As noted previously, additional testing likely would be required prior to initiation of operations in the northern portion of Sections 21 and 22 and the southern portion of Section 15.

It is noted that, based on the test data reviewed, no clear evidence of the White River Fault was observed. Based on Figures 5-7 through 5-9, the drawdown cone around COW-5 is somewhat distended towards the east, which could be a manifestation of the White River Fault/Fold. However, the number of data points are limited and specific interpretation is difficult.

Historically, the exact fault location has not been specifically defined (e.g., within 500 feet). CBR historically has mapped the fault as shown on Figure 1-2. In this regard, the pumping well (COW-5) is located approximately 5,400 feet northwest of the fault location on Figure 1-2; monitor well COW-2 is located approximately 2,100 feet northwest of the fault location. Based on the radius of influence of the test, it is plausible that the fault, if it impacts the regional hydrology, would have been detected. Future testing as part of mine development is expected to provide additional definition of the fault location, whether the feature is a fault or a fold, and hydrologic impacts of the feature, if any.

6.0 TEST RESULTS – CONFINING UNITS

Confining unit vertical hydraulic conductivity has been well established within CBR's current Class III permit area. Few data (e.g., laboratory analyses or detailed pump test data) regarding the vertical hydraulic conductivity of the confining units are available for the North Trend area; however, the data from the current permit area appear to be reasonably analogous to North Trend.

Plots of water levels in the overlying (MCOW and BOW) completions for the background monitoring, pumping, and recovery periods are presented in Figures 5-11 through 5-16. The water levels are compared to barometric pressure for the entire period.

No water-level change of significance was observed in the overlying MCOW completions as a result of pumping the COW-5 well completed in the Basal Chadron Sandstone. Review of these data indicated that, while minor background trends are present, the nature of those trends continues independently of the pump test. The nearest overlying MCOW monitor well (MCOW-3) is approximately 43 feet away from the pumping well.

Similarly, no fluctuations of significance were observed in the overlying Brule Formation wells (Figures 5-15 and 5-16). Water levels in BOW-1 decreased during the pumping period. However, the trend of the decrease began before the pump in COW-5 was started, and continued after the pump was shut off (Figure 5-15).

As noted previously, water levels in MCOW-3 and MCOW-4 were recovering to "static" conditions. The recovery trend in those wells continued independently of pumping in the Basal Chadron. The LevelTROLL in well MCOW-4 was repeatedly interfered with by horses, resulting in both instantaneous increases and decreases in water levels. However, the trends following those events were constant, regardless of pumping in the Basal Chadron.

Potentiometric levels in the overlying Upper/Middle Chadron sand and Brule Formation are approximately 100 feet and 80 feet lower, respectively, than those in the production (Basal Chadron) Sand (Table 3-1), which further indicates the hydraulic isolation between the two overlying sands and the Basal Chadron Sandstone.

As discussed previously, no underlying wells were installed because the production zone (Basal Chadron Sandstone) is underlain by the Pierre Shale.

7.0 SUMMARY AND CONCLUSIONS

In accordance with the North Trend Hydrologic Test Plan, CBR installed the necessary wells and performed a pump test to evaluate hydrogeologic conditions in the vicinity of North Trend.

The pump test was performed in North Trend during June and July 2006. Well COW-5 was used as a pumping well during the test. More than 110 feet of drawdown was achieved in the pumping well during testing, resulting in sufficient stress in the Production Zone and the confining layers for the purposes of the test and CBR's anticipated ISL permit requirements.

All of the Basal Chadron monitor wells showed adequate drawdown (e.g., greater than 1.0 foot).

Analysis of the test data for the Production Zone wells resulted in an average transmissivity of 60 ft^2/day, an average hydraulic conductivity of 2.3 ft/day, and an average permeability (assuming a water viscosity of 1.35 cp and density of 1.0) of 1,110 millidarcies (md). The average Storativity was 5.3×10^{-5}. The data analysis did not indicate the presence of significant geologic boundaries within the Production Zone aquifer over the area evaluated by the testing.

No water level changes of concern were observed in any of the overlying wells during the testing. The nearest overlying monitor wells (MCOW-3 and BOW-2) were approximately 43 and 32 feet away, respectively, from the pumping well.

The testing results indicate that the transmissivity of the Basal Chadron Sandstone in the NT area is relatively consistent, but the thickness and hydraulic conductivity vary with direction and location. Based on the data evaluated to date, this variance may impact mining operations (e.g., well spacing, completion interval, and injection/production rates), but is not anticipated to impact regulatory issues.

In summary, the pump tests were performed in accordance with the Hydrologic Test Plan submitted by CBR to NDEQ. The testing objectives were met. The test results demonstrate:

- The Basal Chadron monitor well ring is in communication with the Basal Chadron Production Zone throughout the North Trend test area;
- The Basal Chadron has been adequately characterized with respect to hydrogeologic conditions within the test area at North Trend;
- Adequate confinement exists between the Basal Chadron Production Zone and the overlying MCOW and BOW sands throughout the majority of the proposed North Trend permit area;
- Based on the 2004 and 2005 testing results, additional (wellfield-scale) testing to further support overlying confinement may be warranted in the extreme southern portion of Section 27;
- Additional (regional-scale) testing would likely be warranted in those portions of the proposed permit area where no

monitoring data were available (e.g., Section 15, 21 and 22). Such testing would be consistent with the sequential pump tests performed to expand operations in the current Class III permit area; and,

- Sufficient testing has been conducted to date at North Trend to proceed with a Class III permit application and a NRC license application.

8.0 REFERENCES

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TABLES

Table 1-1
Crow Butte Resources, Inc.
Summary of North Trend Pump Tests and Field Operations: 2004 and 2005

Start Date	Test/Field Operations	Purpose/Description	Result
8/9/2004	Test 1 (old #5)	Initial NT test to assess hydraulics and provide permitting data	Infiltration to Brule; possible hydraulic communication between Basal Chadron and Upper/Mid Chadron in MCOW1
8/23/2004	Test 2 (old #5a)	Duplicate Test 1	Confirmed responses observed in Test 1
9/28/2004	MITs and sampling	CPW-2, COW-3, MCOW-1, BOW-1	All wells pass MIT; samples could not be obtained from MCOW-1
12/8/04 to 12/22/04	Re-plugging	CPW-1	CWP-1 drilled out and re-plugged
12/8/04 to 12/22/04	Install new monitoring wells	MCOW-2, COW-5	MCOW-2, COW-5 successfully installed
12/8/04 to 12/22/04	Modify discharge line	Extend line 2500' to the east	Line extended along drain and across field
3/9/2005	Test 3	Assess confinement (MCOW-2); assess aquifer (COW-5)	Infiltration to Brule eliminated; drawdown in MCOW-1 during pumping
4/13/2005	Re-abandon exploration holes	Holes T80 & T85 re-abandoned	Holes located, re-drilled and re-plugged
5/2/2005	Test 4a	Evaluate whether meaningful data could be obtained by flowing CPW2	No meaningful data obtained; significant background trend in MCOW-1
5/10/2005	Test 4b	Pump CPW2; evaluate response in MCOW wells	Possible rain directly into wells; significant background trend in MCOW-1; generator ran out of fuel
5/24/2005	Test 4c	As above	No useful data; equipment problems
6/6/2005	Test 5a	As above; 2 cycles pumping and recovery	MCOW1 drawdown during both pumping periods; heavy rain - possible flow directly into wells
6/24/2005	Test 5b	Slug tests to test hypothesis that rain caused increase in water levels during Test 5a	Slug tests confirmed that water levels in BOW and MCOWs had been effected by rain.

Table 2-1
Crow Butte Resources, Inc.
Generalized Stratigraphic Section and Monitoring Well Completions within the
Central Portion of the Proposed North Trend Permit Area

Depth (feet; bgs)	***Description***
0 – 25	Topsoil and alluvial deposits; no wells
25 – 110	Brule Formation (interbedded silt and sandstone); BOW wells
110 - 290	Upper Chadron (silt and clay); no wells
Approx. 290-390	Upper/Mid Chadron Sand; MCOW wells
390 – 615	Middle Chadron (interbedded clay, claystone, and siltstone); no wells
615 – 659	Basal Chadron Sandstone (interbedded sandstone and clay); CPW and COW wells
659 +	Pierre Shale; no wells

Table 2-2
Crow Butte Resources, Inc.
Comparison of North Trend Test Results to Previous Testing Results
from the Existing Class III Permit Area

	Existing Class III Permit Area Tests #1-#4 (mean)	***Test #5 North Trend 2004-2005 (mean)***
Transmissivity (ft^2/day)	363	103
Formation Thickness (feet)	39.0	19.8
Hyd. Cond. (ft/day)	9.3	5.2
Storativity	9.7E-05	7.1E-05

Crow Butte Resources, Inc.
North Trend Well Information
North Trend Regional Aquifer Test

Well	Distance to PW	North	East	Section	Township & Range	TOC Elev. (ft; AMSL)	Surface Elevation (ft; AMSL)	Casing Stickup (ft)	Hole Depth (ft; bgs)	Casing Depth (ft; bgs)	Top Screen (ft; bgs)	Bottom Screen (ft; bgs)	Screen Length (ft)	Screen Interval (feet)	Casing O.D. (in.)	06/28/06 Static Water Elevation (ft; AMSL)
Basal Chadron Pumping Well																
COW-5 (PW)	0.00	523,541.90	1,082,946.00	T32N R52W	27	3,669.05	3,667.65	1.40	740	708	653	708	55	22	4.5	3,704.85
Basal Chadron Observation Wells																
COW-1	3,614.28	525,991.00	1,085,604.00	T32N R52W	27	3,633.77	3,632.57	1.20	580	557	537	557	20	10	4.5	3,699.81
COW-2	4,001.38	519,632.50	1,083,799.00	T32N R52W	34	3,654.52	3,653.22	1.30	620	594	569	594	25	15	4.5	3,704.41
COW-3	3,315.00	521,315.40	1,080,490.00	T32N R52W	27	3,685.33	3,684.63	0.70	670	646	596	646	50	33	4.5	3,710.59
COW-4	3,609.34	526,204.30	1,080,509.00	T32N R52W	27	3,689.04	3,687.94	1.10	670	645	585	645	60	41	4.5	3,705.30
CPW-2	2,291.19	521,626.30	1,081,689.00	T32N R52W	27	3,676.92	3,675.82	1.10	710	685	615	685	70	35	4.5	3,705.99
RC-2	6,634.66	516,911.30	1,082,714.00	T32N R52W	34	3,651.22	3,648.42	2.80	630	630	572	630	58	25	4.5	3,703.93
Brule Observation Wells																
BOW-1	2,301.76	521,642.20	1,081,644.00	T32N R52W	27	3,677.39	3,675.49	1.90	65	65	45	65	20	5	4.5	3,620.68
BOW-2	31.78	523,534.20	1,082,915.00	T32N R52W	27	3,668.73	3,667.93	0.80	59	59	22	59	37	10	4.5	3,608.57
Middle Chadron Observation Wells																
MCOW-1	2,268.07	521,627.10	1,081,729.00	T32N R52W	27	3,676.80	3,675.50	1.30	380	350	305	350	45	5	4.5	3,607.29
MCOW-2	2,323.47	521,681.10	1,081,552.00	T32N R52W	27	3,678.82	3,677.52	1.30	370	360	315	360	45	7	4.5	3,606.83
MCOW-3	43.45	523,582.40	1,082,951.00	T32N R52W	27	3,668.85	3,667.65	1.20	390	391	325	391	66	17	4.5	3,606.14
MCOW-4	1,280.16	523,634.60	1,081,671.00	T32N R52W	27	3,681.66	3,679.86	1.80	371	371	290	371	81	19	4.5	3,608.27

Table 4-1
Crow Butte Resources, Inc.
Equipment Layout: North Trend Regional Aquifer Test

Location ID	Monitoring Equipment	Serial Number	PSI
COW-5 (PW)	LevelTROLL	107167	100
COW-1	LevelTROLL	107145	30
COW-2	LevelTROLL	107156	30
COW-3	LevelTROLL	107139	30
COW-4	LevelTROLL	107140	30
CPW-2	LevelTROLL	107134	30
RC-2	LevelTROLL	107135	30
BOW-1	LevelTROLL	107058	30
BOW-2	LevelTROLL	107155	30
MCOW-1	LevelTROLL	107138	30
MCOW-2	LevelTROLL	107143	30
MCOW-3	LevelTROLL	107144	30
MCOW-4	LevelTROLL	107103	30

Table 4-2
Crow Butte Resources, Inc.
North Trend Regional Aquifer Test
Distances to Pumping Well and Observed Drawdown

Start Date & Time:	6/28/06 10:30
End Date & Time:	7/13/06 7:00
Duration (hours) :	356.5
Ave. Pumping Rate (gpm):	16.4

Completion Type	Well No.	Distance from Pumping Well (ft)	Drawdown At End of Test (ft)
Pumping Well	COW-5 (PW)	0.00	110.79
Basal Chadron Completions	COW-1	3,614.28	10.08
	COW-2	4,001.38	3.56
	COW-3	3,315.00	4.18
	COW-4	3,609.34	7.25
	CPW-2	2,291.19	9.27
	RC-2	6,634.66	1.37
Brule Chadron Completions	BOW-1	2,301.76	0.07
	BOW-2	31.78	-0.02
Middle Chadron Completions	MCOW-1	2,268.07	0.01
	MCOW-2	2,323.47	0.00
	MCOW-3	43.45	-0.12
	MCOW-4	1,280.16	-0.59

Note: MCOW-4 drawdown estimated; equipment was disturbed during testing.

Table 4-3
Crow Butte Resources, Inc.
North Trend Regional Aquifer Test
Flow Rate vs. Time:

Date/Time	Elapsed Time Minutes	Incremental Minutes	Halliburton Meter 1 Total Gallons 1	Incremental Gallons 1	Instant Rate 1 GPM	Calculated Rate 1 GPM	Halliburton Meter 2 Total Gallons 2	Incremental Gallons 2	Instant Rate 2 GPM	Calculated Rate 2 GPM	Average Rate Calculated Rate 1 & Rate 2
6/28/06 10:30	0	0	0	0	0	0.0	0	0	0.0	0.0	0.0
6/28/06 14:48	258	258	4,241	4,241	16.44	16.4	4,153	4,153	16.1	16.1	16.3
6/28/06 18:00	450	192	7,379	3,138	16.40	16.3	7,235	3,082	16.1	16.1	16.2
6/28/06 23:30	780	330	12,844	5,465	16.47	16.6	12,588	5,353	16.2	16.2	16.4
6/29/06 3:15	1005	225	16,552	3,708	16.47	16.5	16,207	3,619	16.1	16.1	16.3
6/29/06 7:57	1287	282	21,207	4,655	16.48	16.5	20,745	4,538	16.1	16.1	16.3
6/29/06 12:34	1564	277	25,777	4,570	16.48	16.5	25,210	4,465	16.1	16.1	16.3
6/29/06 18:00	1890	326	31,100	5,323	16.46	16.3	30,423	5,213	16.0	16.0	16.2
6/29/06 23:15	2205	315	36,300	5,200	16.46	16.5	35,514	5,091	16.2	16.2	16.3
6/30/06 3:10	2440	235	40,172	3,872	16.46	16.5	39,303	3,789	16.1	16.1	16.3
6/30/06 7:40	2710	270	44,685	4,513	16.49	16.7	43,721	4,418	16.4	16.4	16.5
6/30/06 14:15	3105	395	51,234	6,549	16.50	16.6	50,143	6,422	16.3	16.3	16.4
6/30/06 18:00	3330	225	54,923	3,689	16.49	16.4	53,758	3,615	16.1	16.1	16.2
6/30/06 23:23	3653	323	60,357	5,434	16.52	16.8	59,090	5,332	16.5	16.5	16.7
7/1/06 3:10	3880	227	63,995	3,638	16.49	16.0	62,655	3,565	15.7	15.7	15.9
7/1/06 8:10	4180	300	68,899	4,904	16.48	16.3	67,459	4,804	16.0	16.0	16.2
7/1/06 12:05	4415	235	72,823	3,924	16.49	16.7	71,310	3,851	16.4	16.4	16.5
7/1/06 15:20	4610	195	76,076	3,253	16.50	16.7	74,497	3,187	16.3	16.3	16.5
7/1/06 18:21	4791	181	79,068	2,992	16.50	16.5	77,423	2,926	16.2	16.2	16.3
7/1/06 23:15	5085	294	84,027	4,959	16.52	16.9	82,304	4,881	16.6	16.6	16.7
7/2/06 9:15	5685	600	93,967	9,940	16.53	16.6	92,048	9,744	16.2	16.2	16.4
7/2/06 9:40	5710	25	94,414	447	16.53	17.9	92,485	437	17.5	17.5	17.7
7/2/06 12:01	5851	141	96,598	2,184	16.51	15.5	94,628	2,143	15.2	15.2	15.3
7/2/06 14:42	6012	161	99,376	2,778	16.53	17.3	97,351	2,723	16.9	16.9	17.1
7/2/06 16:21	6111	99	101,075	1,699	16.54	17.2	99,017	1,656	16.8	16.8	17.0
7/2/06 23:10	6520	409	107,819	6,744	16.54	16.5	105,631	6,614	16.2	16.2	16.3
7/3/06 3:20	6770	250	112,028	4,209	16.55	16.8	109,759	4,128	16.5	16.5	16.7
7/3/06 8:35	7085	315	117,211	5,183	16.54	16.5	114,839	5,080	16.1	16.1	16.3
7/3/06 11:45	7275	190	120,292	3,081	16.53	16.2	117,861	3,022	15.9	15.9	16.1
7/3/06 15:08	7478	203	123,665	3,373	16.54	16.6	121,167	3,306	16.3	16.3	16.5
7/3/06 23:05	7955	477	131,616	7,951	16.55	16.7	128,960	7,793	16.3	16.3	16.5
7/4/06 3:20	8210	255	135,757	4,141	16.54	16.2	133,018	4,058	15.9	15.9	16.1
7/4/06 12:06	8736	526	144,453	8,696	16.54	16.5	141,537	8,519	16.2	16.2	16.4
7/4/06 15:10	8920	184	147,740	3,287	16.56	17.9	144,758	3,221	17.5	17.5	17.7
7/4/06 23:10	9400	480	155,473	7,733	16.54	16.1	152,338	7,580	15.8	15.8	16.0
7/5/06 3:10	9640	240	159,527	4,054	16.55	16.9	156,309	3,971	16.5	16.5	16.7
7/5/06 7:40	9910	270	164,086	4,559	16.56	16.9	160,771	4,462	16.5	16.5	16.7
7/5/06 14:09	10299	389	170,521	6,435	16.56	16.5	167,078	6,307	16.2	16.2	16.4
7/5/06 17:45	10515	216	174,553	4,032	16.60	18.7	170,547	3,469	16.1	16.1	17.4
7/5/06 23:45	10875	360	180,025	5,472	16.55	15.2	176,395	5,848	16.2	16.2	15.7
7/6/06 4:45	11175	300	184,994	4,969	16.55	16.6	181,262	4,867	16.2	16.2	16.4
7/6/06 8:58	11428	253	189,187	4,193	16.55	16.6	185,371	4,109	16.2	16.2	16.4
7/6/06 13:54	11724	296	194,083	4,896	16.55	16.5	190,173	4,802	16.2	16.2	16.4
7/6/06 15.20	11810	86	195,295	1,212	16.54	14.1	191,364	1,191	13.8	13.8	14.0
7/6/06 22:35	12245	435	202,711	7,416	16.55	17.0	198,632	7,268	16.7	16.7	16.9
7/7/06 5:25	12655	410	209,402	6,691	16.55	16.3	205,190	6,558	16.0	16.0	16.2
7/7/06 7:44	12794	139	211,722	2,320	16.55	16.7	207,460	2,270	16.3	16.3	16.5
7/7/06 19:15	13485	691	223,092	11,370	16.54	16.5	218,599	11,139	16.1	16.1	16.3
7/7/06 22:45	13695	210	226,477	3,385	16.54	16.1	221,913	3,314	15.8	15.8	16.0
7/8/06 5:25	14095	400	233,065	6,588	16.54	16.5	228,369	6,456	16.1	16.1	16.3
7/8/06 8:50	14300	205	236,430	3,365	16.53	16.4	231,670	3,301	16.1	16.1	16.3
7/8/06 14:00	14610	310	241,564	5,134	16.53	16.6	236,703	5,033	16.2	16.2	16.4
7/8/06 17:25	14815	205	245,677	4,113	16.58	20.1	240,735	4,032	19.7	19.7	19.9
7/8/06 22:25	15115	300	249,886	4,209	16.53	14.0	244,854	4,119	13.7	13.7	13.9
7/9/06 5:40	15550	435	256,992	7,106	16.53	16.3	251,805	6,951	16.0	16.0	16.2
7/9/06 9:12	15762	212	260,548	3,556	16.53	16.8	255,284	3,479	16.4	16.4	16.6
7/9/06 12:10	15940	178	263,490	2,942	16.53	16.5	258,115	2,831	15.9	15.9	16.2
7/9/06 15:00	16110	170	266,293	2,803	16.53	16.5	260,908	2,793	16.4	16.4	16.5
7/9/06 23:00	16590	480	274,013	7,720	16.52	16.1	268,465	7,557	15.7	15.7	15.9
7/10/06 3:10	16840	250	278,239	4,226	16.52	16.9	272,605	4,140	16.6	16.6	16.7
7/10/06 7:53	17123	283	282,938	4,699	16.52	16.6	277,203	4,598	16.2	16.2	16.4
7/10/06 13:25	17455	332	288,460	5,522	16.53	16.6	282,613	5,410	16.3	16.3	16.5
7/10/06 23:01	18031	576	297,871	9,411	16.52	16.3	291,825	9,212	16.0	16.0	16.2
7/11/06 3:15	18285	254	302,214	4,343	16.53	17.1	296,076	4,251	16.7	16.7	16.9
7/11/06 13:55	18925	640	312,944	10,730	16.54	16.8	306,580	10,504	16.4	16.4	16.6
7/11/06 23:05	19475	550	322,075	9,131	16.54	16.6	315,530	8,950	16.3	16.3	16.4
7/12/06 3:30	19740	265	326,387	4,312	16.53	16.3	319,747	4,217	15.9	15.9	16.1
7/12/06 8:03	20013	273	330,987	4,600	16.54	16.8	324,247	4,500	16.5	16.5	16.7
7/12/06 22:55	20905	892	345,778	14,791	16.54	16.6	338,733	14,486	16.2	16.2	16.4
7/13/06 3:20	21170	265	350,147	4,369	16.54	16.5	343,012	4,279	16.1	16.1	16.3
7/13/06 6:54	21384	214	353,744	3,597	16.54	16.8	346,532	3,520	16.4	16.4	16.6
7/13/06 7:00	21390	6	353,844	100	16.54	16.7	346,628	96	16.0	16.0	16.3
										Average:	16.4

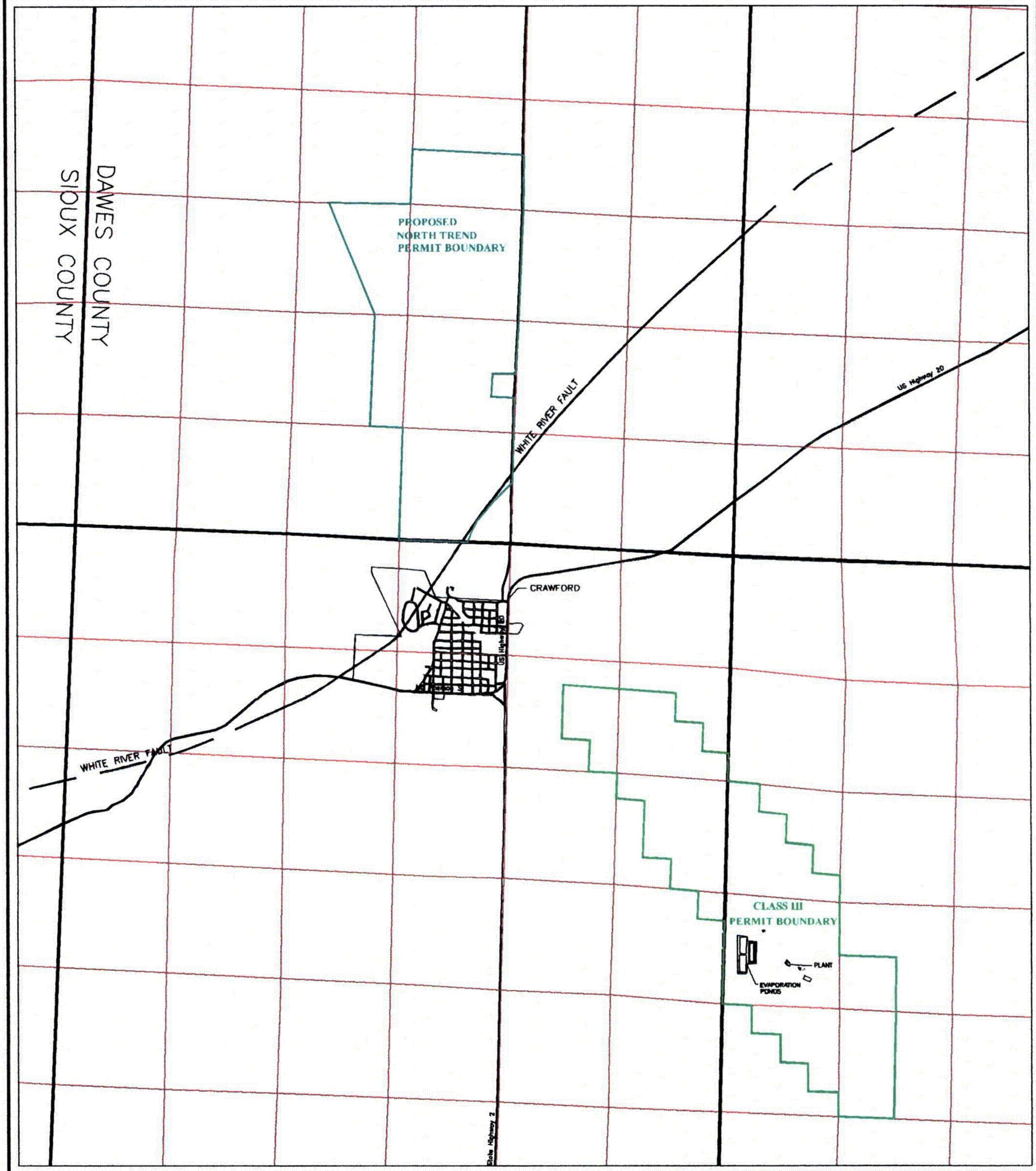
Table 5-1
Crow Butte Resources, Inc.
Summary of 2006 Pump Test Results

Well	Distance from Pumping Well (feet)	Analytical Results	Test #6 Analytical Method: Theis	Test #6 Analytical Method: Theis Recovery
COW-5 (PW)	0.00	Transmissivity (ft^2/day)	NA	*
		Hyd. Cond. (ft/day)	NA	*
		Storativity	NA	*
COW-1	3,614.28	Transmissivity (ft^2/day)	42.0	NA
		Hyd. Cond. (ft/day)	1.6	NA
		Storativity	2.30E-05	NA
COW-2	4,001.38	Transmissivity (ft^2/day)	74.8	NA
		Hyd. Cond. (ft/day)	2.9	NA
		Storativity	7.05E-05	NA
COW-3	3,315.00	Transmissivity (ft^2/day)	71.5	NA
		Hyd. Cond. (ft/day)	2.8	NA
		Storativity	8.40E-05	NA
COW-4	3,609.34	Transmissivity (ft^2/day)	51.7	NA
		Hyd. Cond. (ft/day)	2.0	NA
		Storativity	3.43E-05	NA
CPW-2	2,291.19	Transmissivity (ft^2/day)	60.7	NA
		Hyd. Cond. (ft/day)	2.3	NA
		Storativity	4.55E-05	NA
RC-2	6,634.66	Transmissivity (ft^2/day)	58.2	NA
		Hyd. Cond. (ft/day)	2.2	NA
		Storativity	6.18E-05	NA

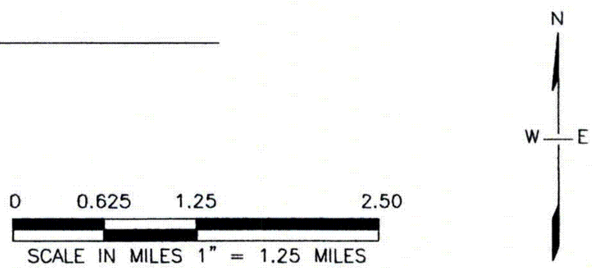
NA - Data not analyzed; pumping data were sufficient for analysis.
* Unable to analyze recovery data due to lack of check valve on top of pump.

Table 5-2
Crow Butte Resources, Inc.
Comparison of Historical Testing Results with 2006 North Trend Results

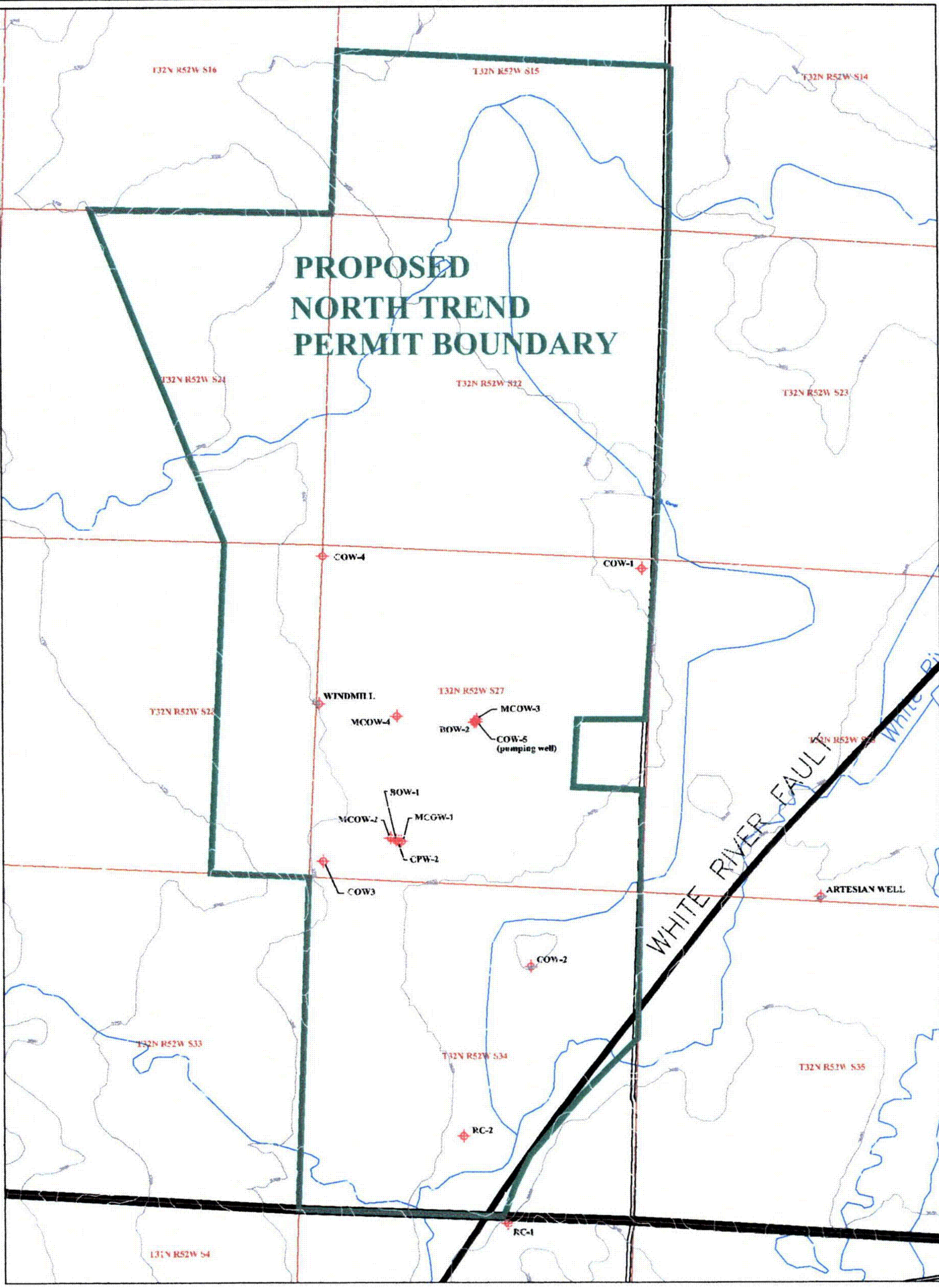
	Existing Class III Permit Area Tests #1-#4 (mean)	***Test #5 North Trend 2004 & 2005 (mean)***	**Test #6 North Trend 2006 (mean)**
Transmissivity (ft^2/day)	363	103	60
Formation Thickness (feet)	39.0	19.8	26
Hyd. Cond. (ft/day)	9.3	5.2	2.3
Storativity	9.7E-05	7.1E-05	5.3E-05



LEGEND



CROW BUTTE RESOURCES, INC.		
FIGURE 1-1 PROJECT LOCATION MAP		
PROJECT: 223-30	DATE: DECEMBER 2006	
DWG: CBRNT3CBase.dwg	BY: KRS	CHECKED: HPD
Petrotek	10288 West Chatfield Avenue, Suite 201 Littleton, Colorado 80127 (303) 290-9414	



LEGEND

✦ MONITORING WELL

N
W — E

0 750 1500 3000
SCALE IN FEET 1" = 1500'

CROW BUTTE RESOURCES, INC.

FIGURE 1-2
NORTH TREND PUMP TEST LAYOUT

PROJECT: 223-30	DATE: DECEMBER 2006
DWG: CBRNT3CBase.dwg	BY: KRS CHECKED: HPD

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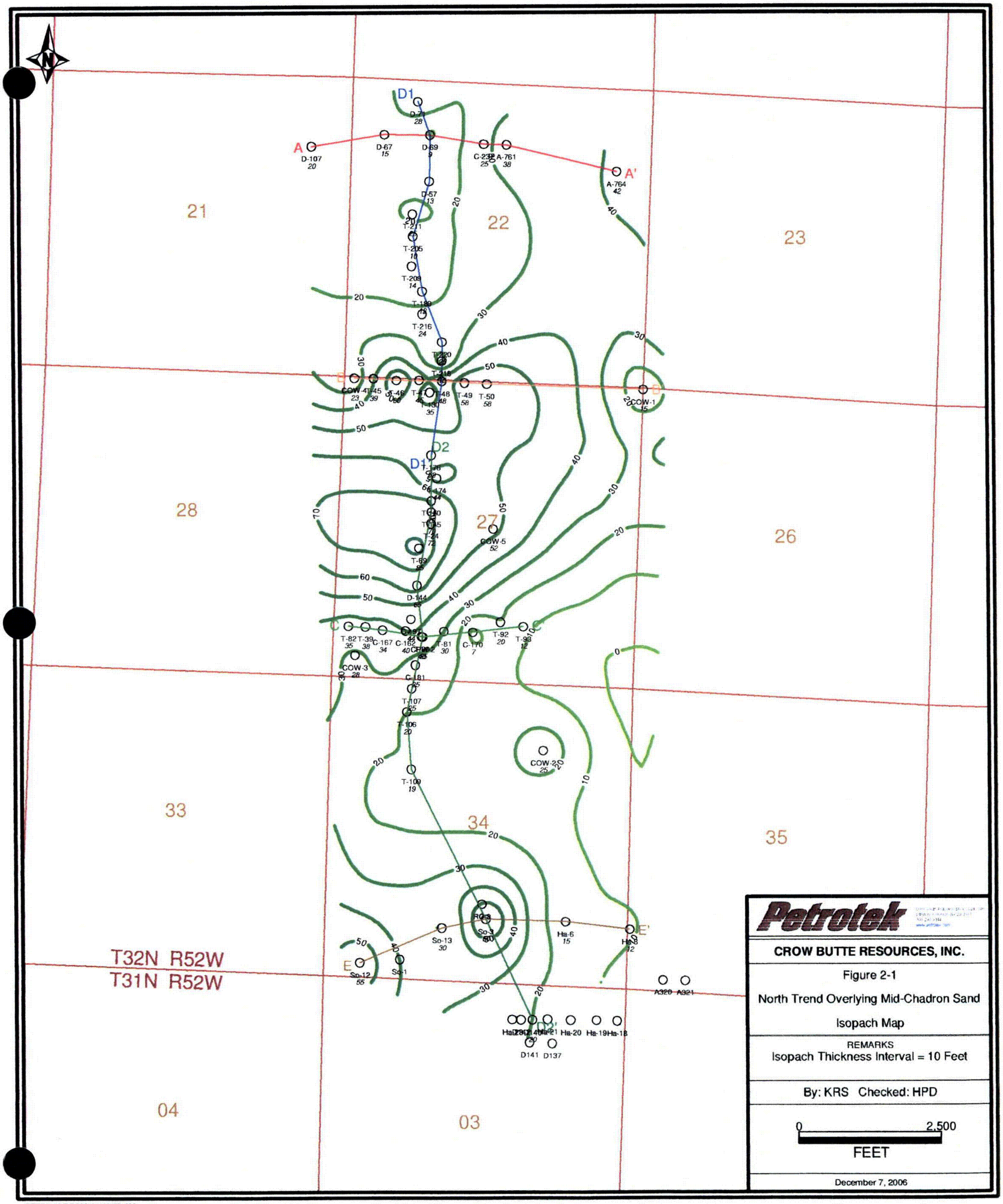

PETRA 12/7/2006 11:10:59 AM

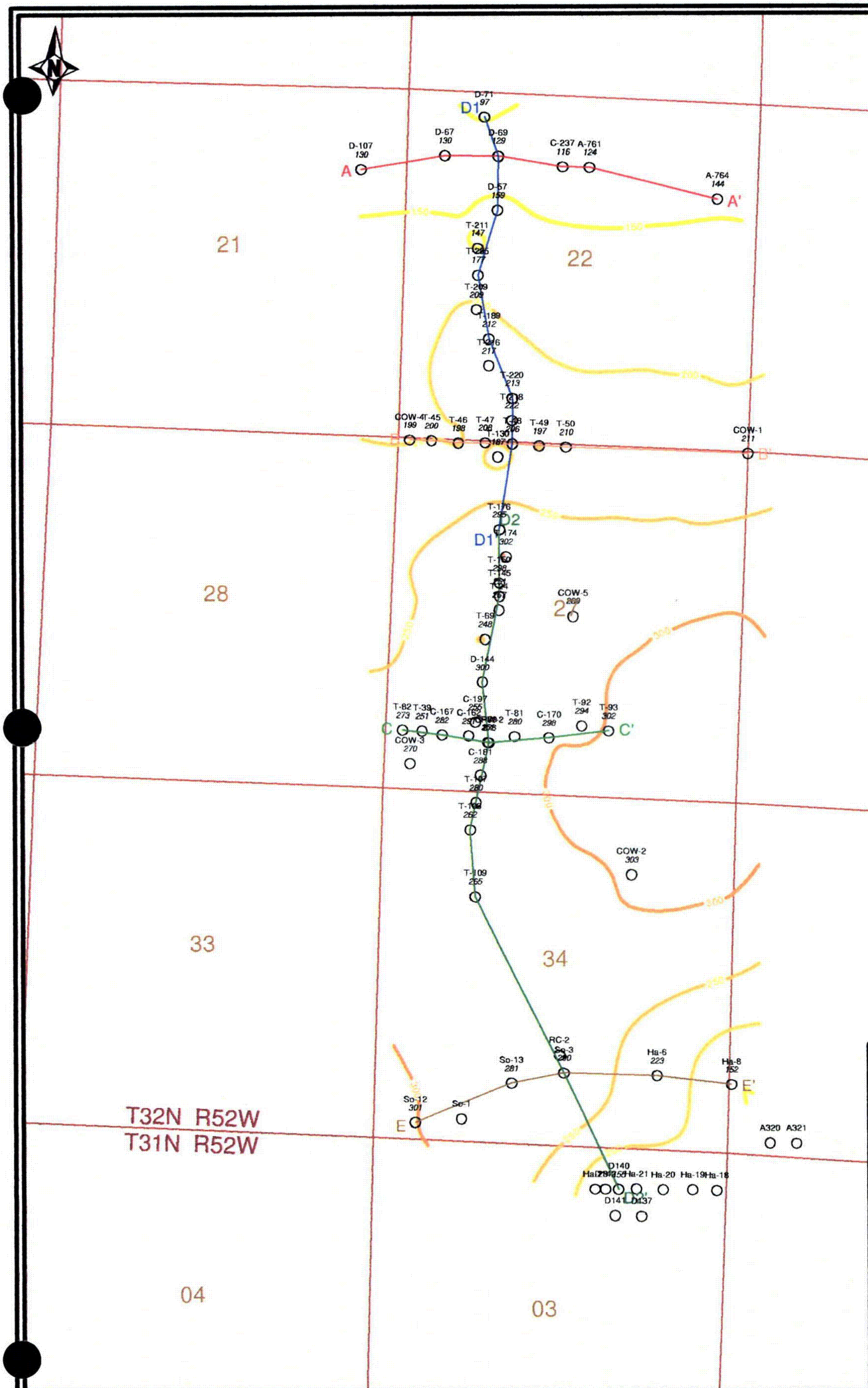

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Figure 2-2

North Trend Mid-Chadron Confining Unit

Isopach Map

REMARKS
Isopach Thickness Interval = 50 Feet

By: KRS Checked: HPD

0 2,500
FEET

December 7, 2006

PETRA 12/7/2006 10:00:40 AM

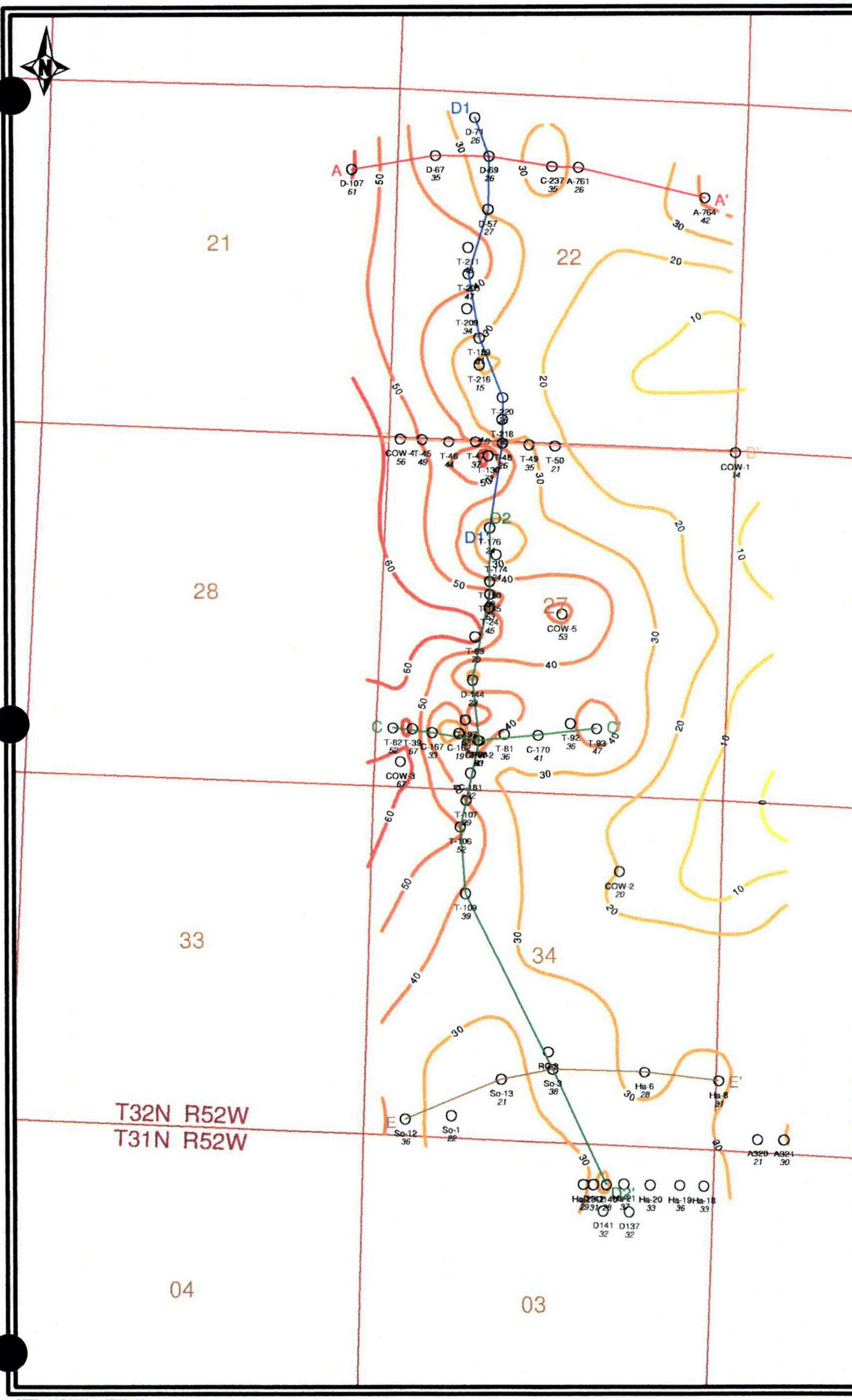

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Figure 2-3

North Trend Basal Chadron Sandstone

Isopach Map

REMARKS

Isopach Thickness Interval = 10 Feet

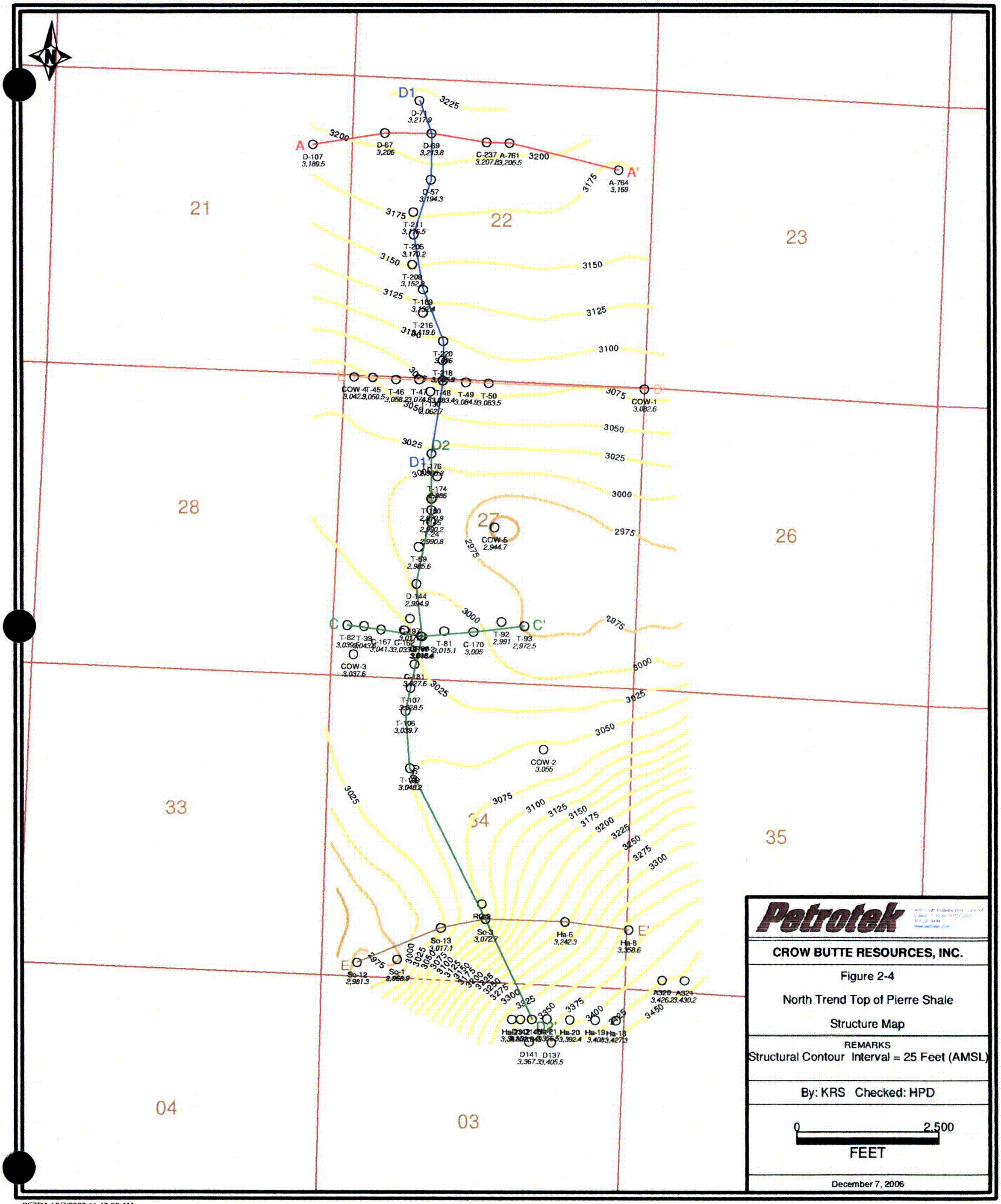
By: KRS Checked: HPD

0 2,500

FEET

December 7, 2006

PETRA 12/7/2006 11:27:39 AM



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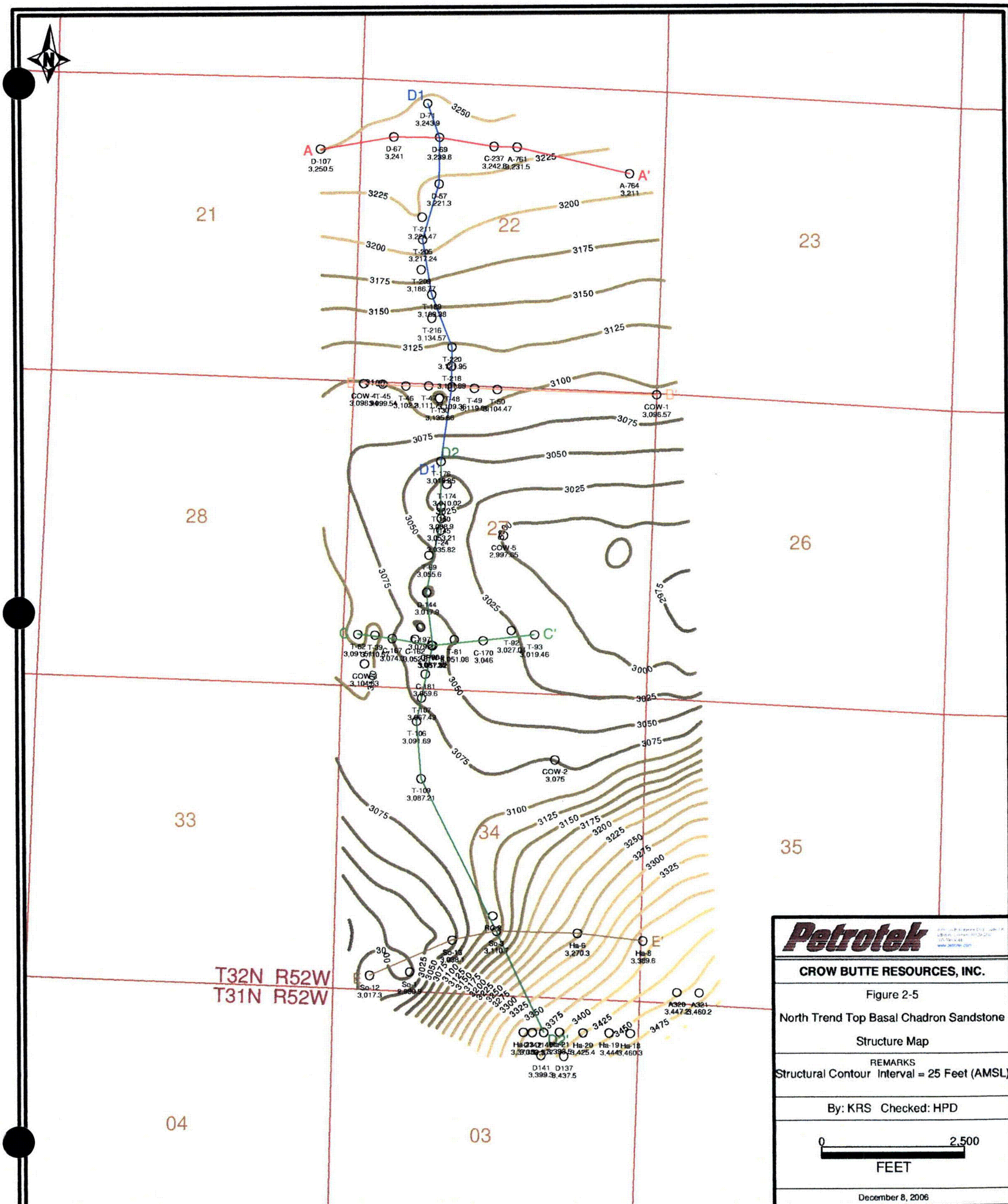
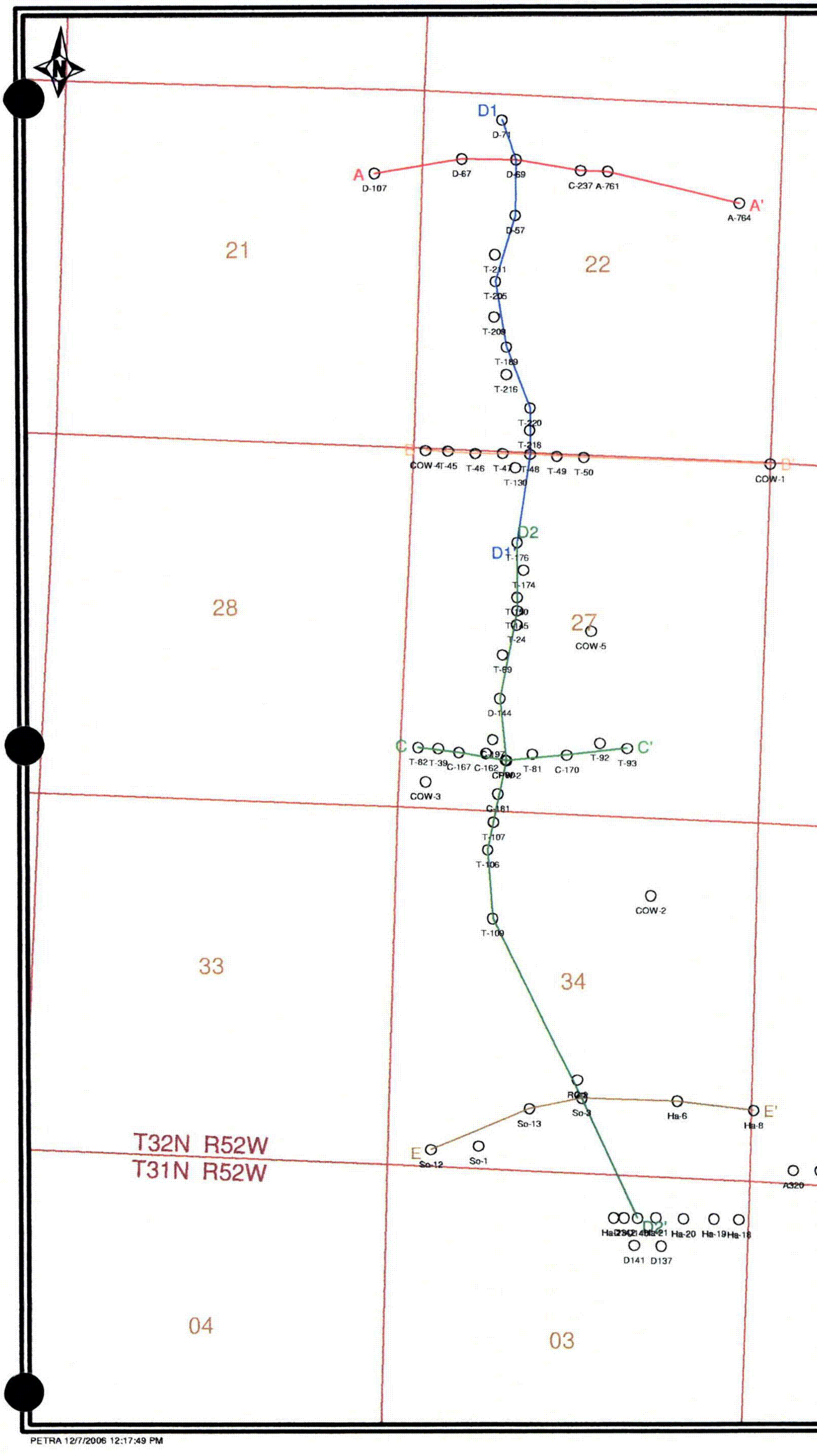


PETRA 12/8/2006 5:14:31 PM



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CROW BUTTE RESOURCES, INC.

Figure 2-6

North Trend Regional Aquifer Test

Cross Section Location Map

By: KRS Checked: HPD

MAP PROJECTION

Datum: North American 1927 (NAD27)

State Plane: Nebraska North (NAD27)

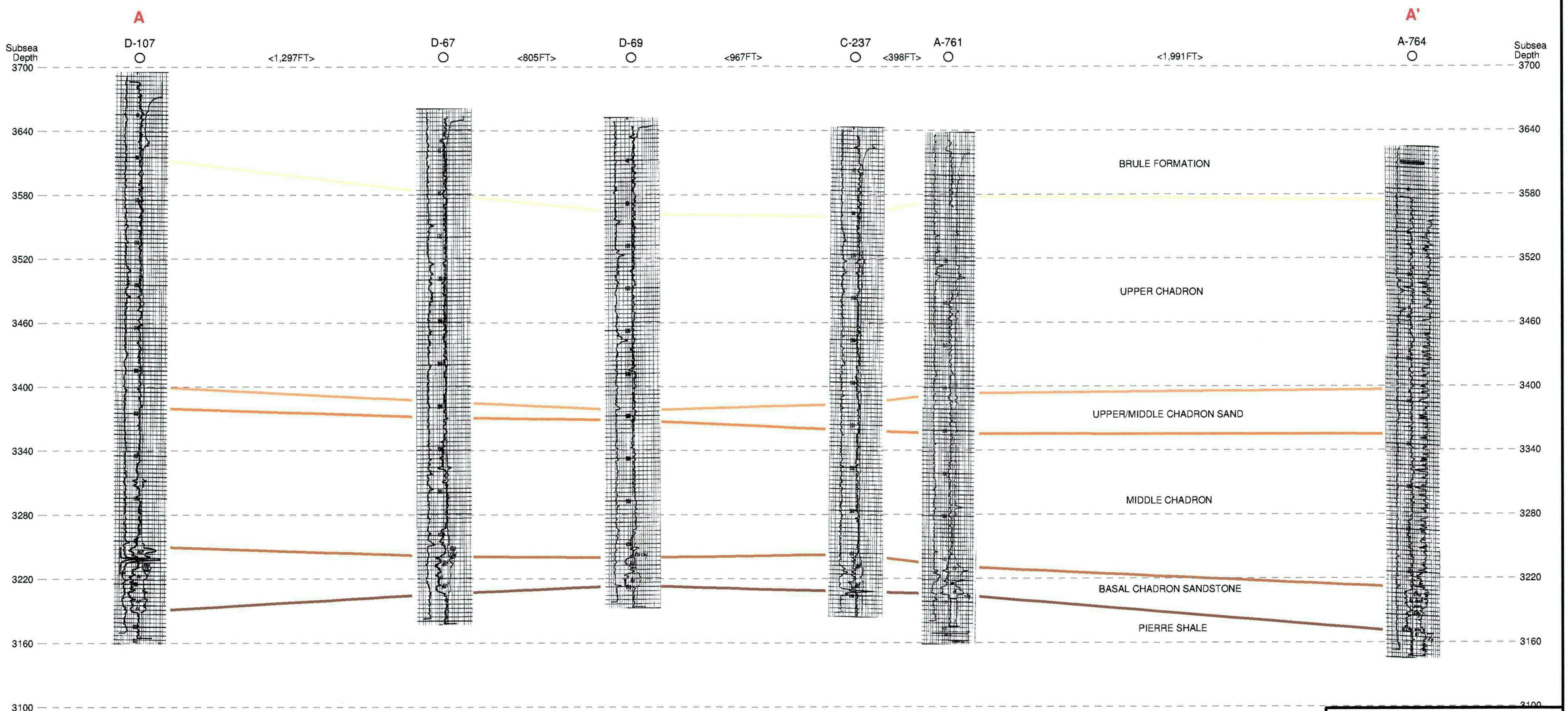
XY Units : FEET

0 2,500

FEET

December 7, 2006

PETRA 12/7/2006 12:17:49 PM



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North Trend Aquifer Test

Regional Structural

Cross Section: A - A'

TOPS AND MARKERS

TOP_UPPER_CHADRON_FORMATION
TOP_UPPER/MIDDLE_CHADRON_SAND
TOP_MIDDLE_CHADRON_FORMATION
TOP_BASAL_CHADRON
TOP_PIERRE

Figure 2-7

By: KRS Checked: HPD/WB

December 6,2006 11:50 AM

PETRA 12/6/2006 11:50:30 AM (A-A'.CSP)

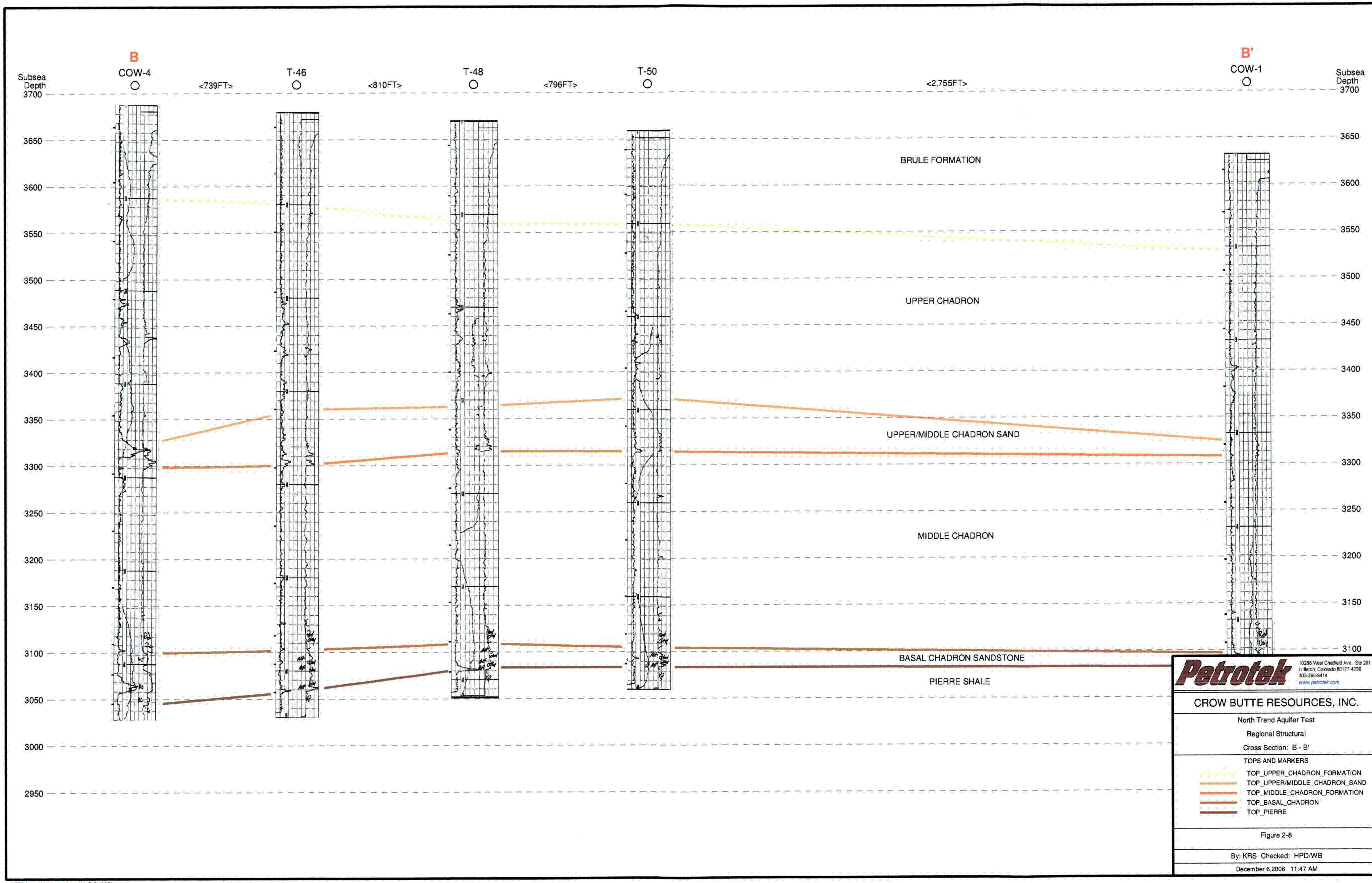
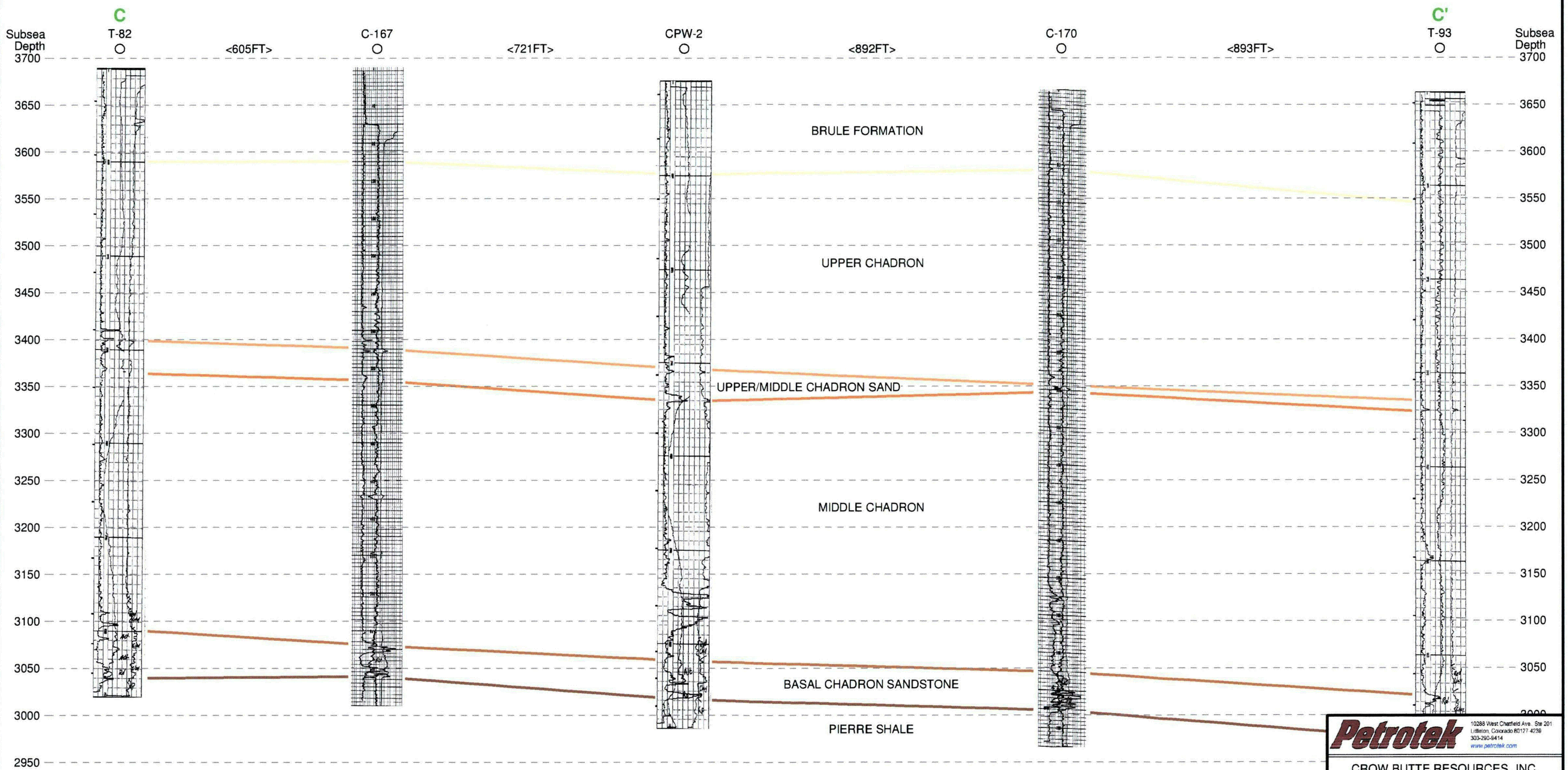


Figure 2-8

PETRA 12/6/2006 11:47:13 AM (B-B'.CSP)



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North Trend Aquifer Test

Regional Structural

Cross Section: C - C'

TOPS AND MARKERS

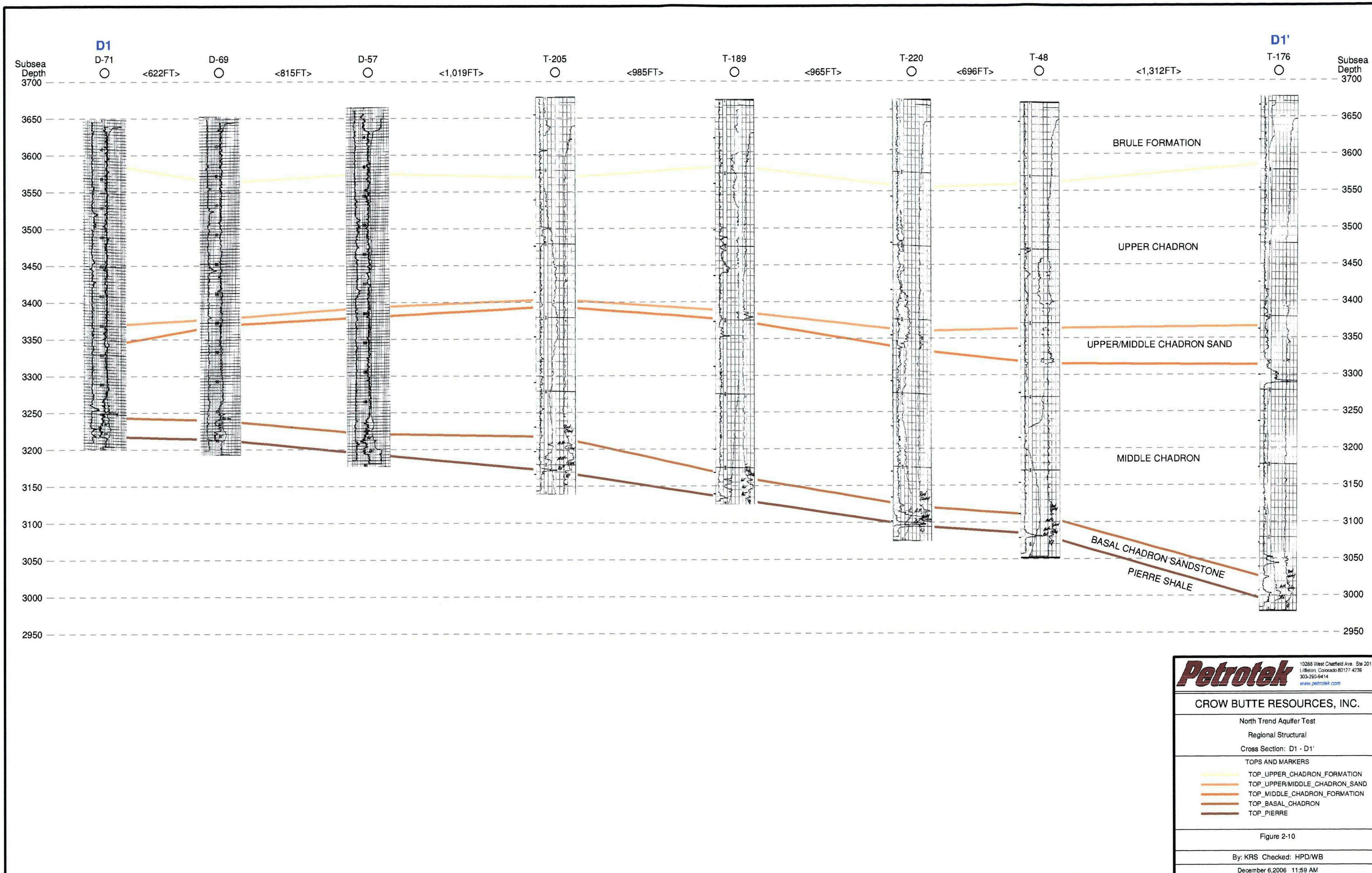
TOP_UPPER_CHADRON_FORMATION
TOP_UPPER/MIDDLE_CHADRON_SAND
TOP_MIDDLE_CHADRON_FORMATION
TOP_BASAL_CHADRON
TOP_PIERRE

Figure 2-9

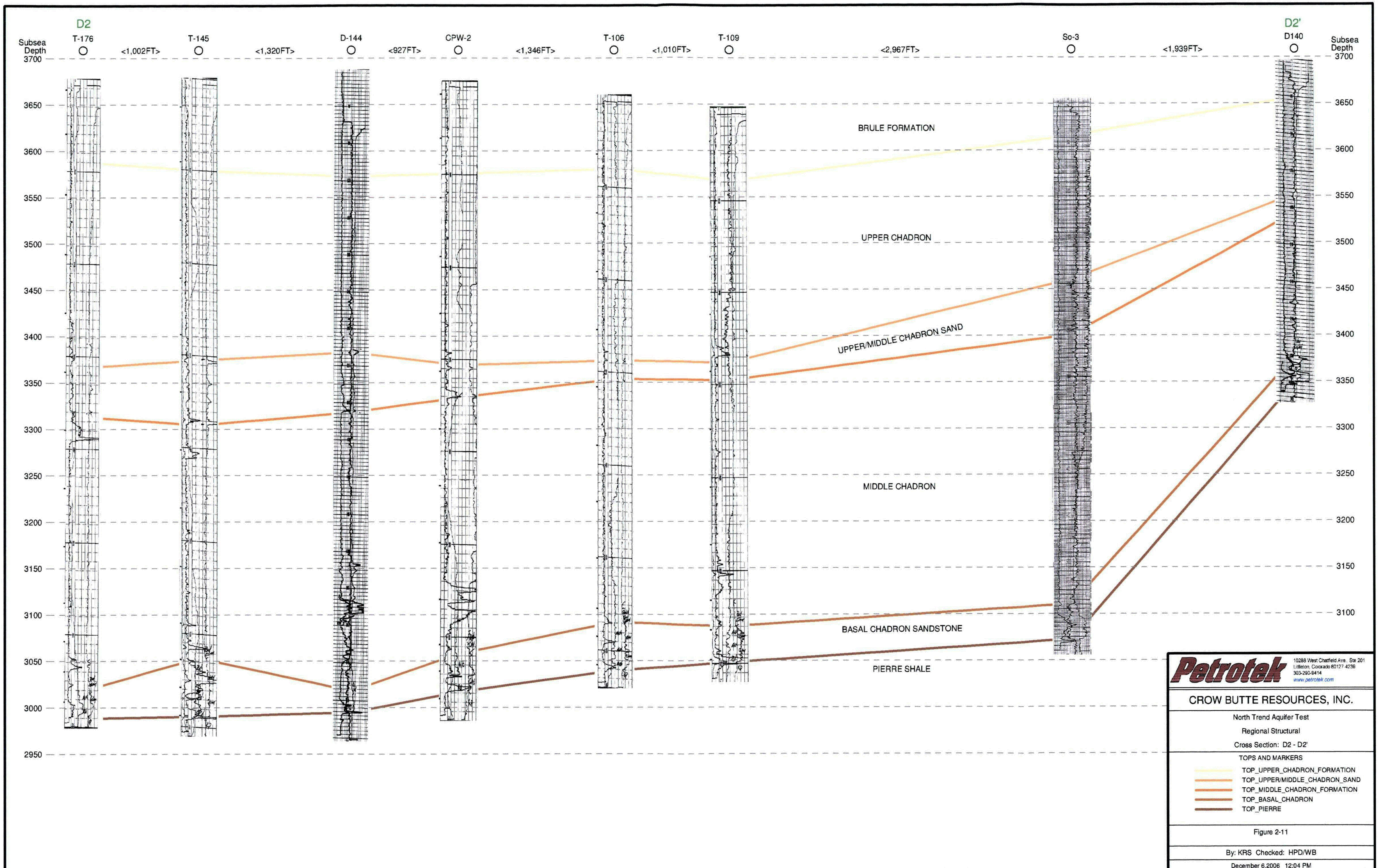
By: KRS Checked: HPD/WB

December 6,2006 11:54 AM

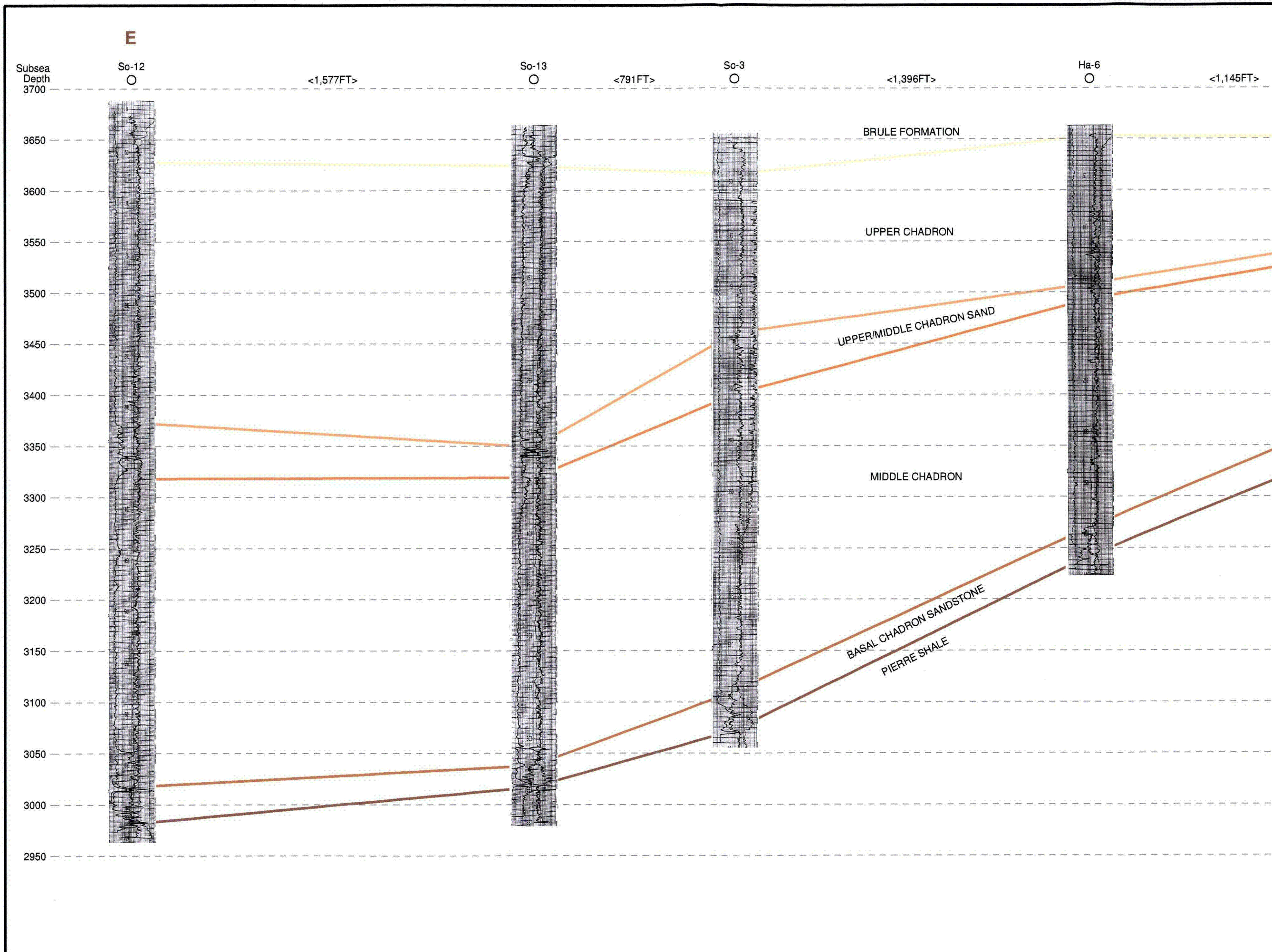
PETRA 12/6/2006 11:54:59 AM (C-C'.CSP)



PETRA 12/6/2006 11:59:43 AM (D1-D1'.CSP)



PETRA 12/6/2006 12:04:44 PM (D2-D2'.CSP)



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North Trend Aquifer Test

Regional Structural

Cross Section: E - E'

TOPS AND MARKERS

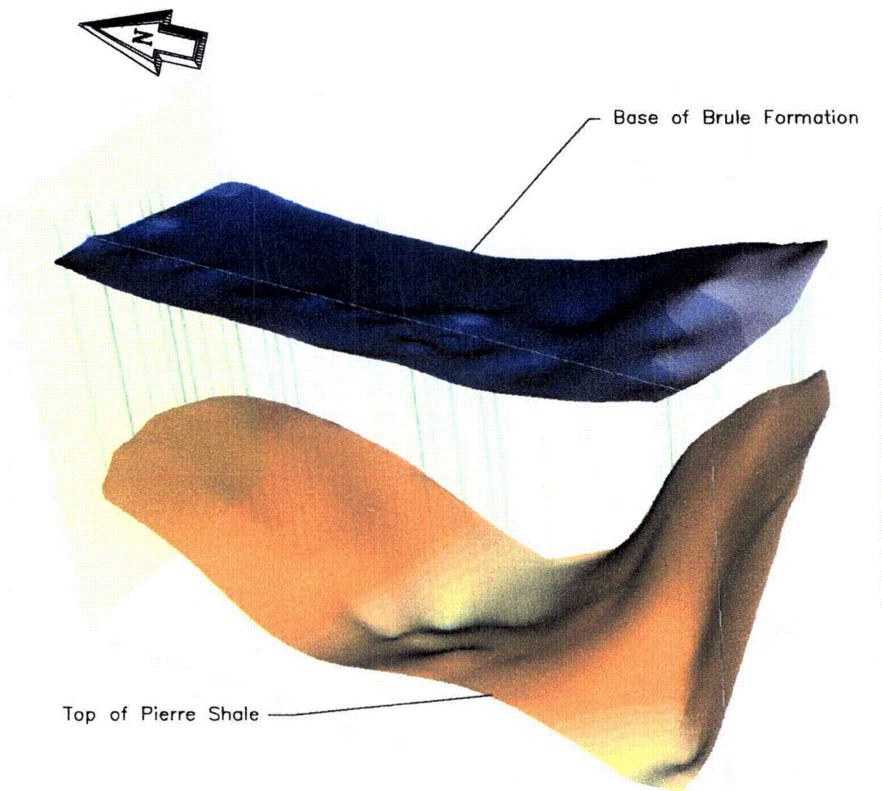
TOP_UPPER_CHADRON_FORMATION
TOP_UPPER/MIDDLE_CHADRON_SAND
TOP_MIDDLE_CHADRON_FORMATION
TOP_BASAL_CHADRON
TOP_PIERRE

Figure 2-12

By: KRS Checked: HPD/WB

December 6,2006 12:09 PM

PETRA 12/6/2006 12:09:21 PM (E-E'.CST)



CROW BUTTE RESOURCES, INC.

FIGURE 2–13

BASE OF BRULE AND TOP OF PIERRE
3–D VIEW LOOKING NORTHEAST

PROJECT: 223–30	DATE: DECEMBER 2006	
DWG: Figure 2–13.dwg	BY: KRS	CHECKED: HPD

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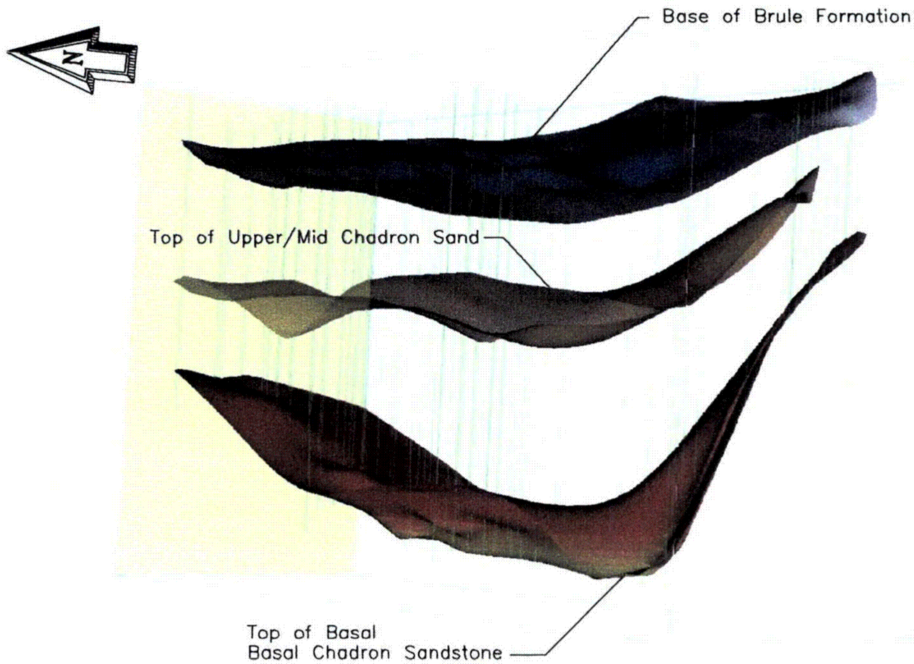

CROW BUTTE RESOURCES, INC.

FIGURE 2-14
BASE OF BRULE, UPPER/MID CHADRON SAND AND TOP OF BASAL CHADRON SANDSTONE 3-D VIEW LOOKING EAST

PROJECT: 223-30	DATE: DECEMBER 2006	
DWG: Figure 2-14.dwg	BY: KRS	CHECKED: HPD

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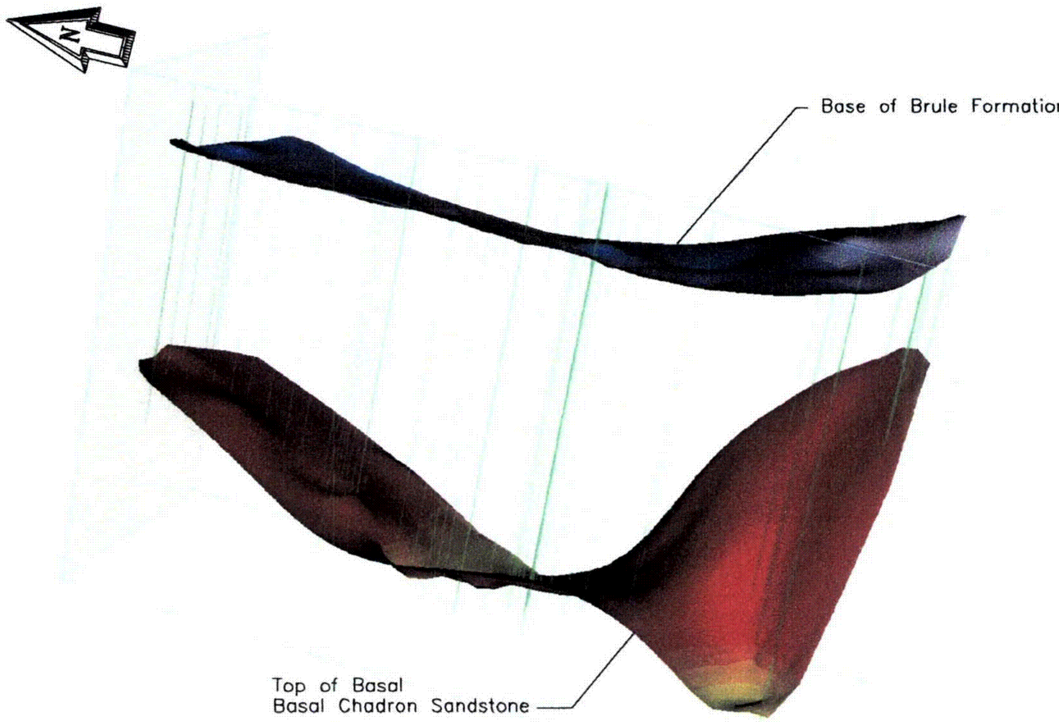

CROW BUTTE
RESOURCES, INC.

FIGURE 2-15
BASE OF BRULE AND TOP OF BASAL
CHADRON SANDSTONE
3-D VIEW LOOKING EAST-NORTHEAST

PROJECT: 223-30	DATE: DECEMBER 2006
DWG: Figure 2-15.dwg	BY: KRS CHECKED: HPD

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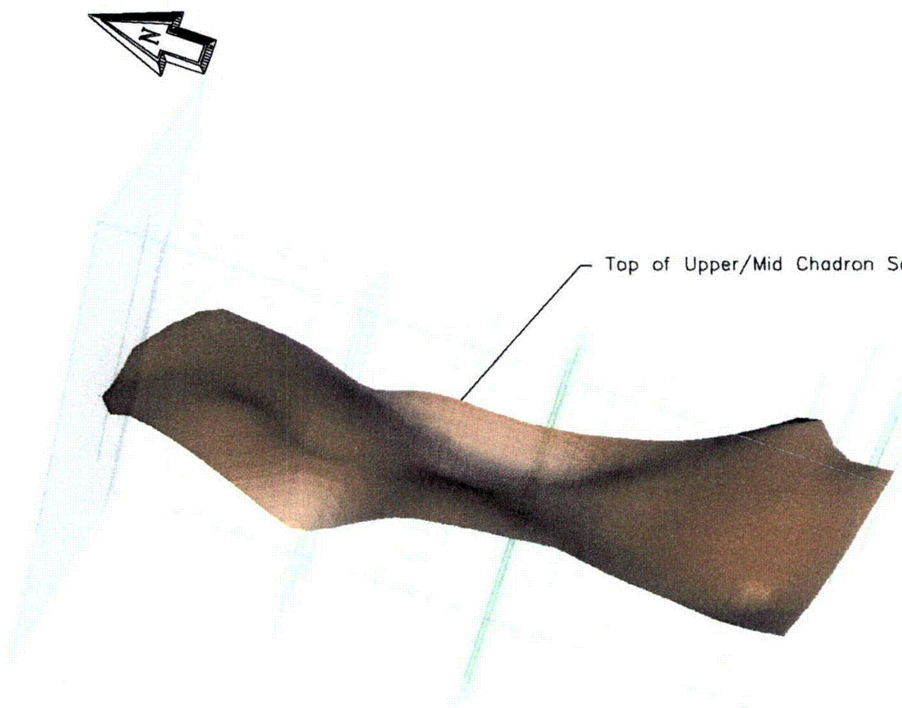

CROW BUTTE RESOURCES, INC.

FIGURE 2–16
TOP OF UPPER/MID CHADRON SAND
3–D VIEW LOOKING EAST

PROJECT: 223–30	DATE: DECEMBER 2006
DWG: Figure 2–16.dwg	BY: KRS CHECKED: HPD

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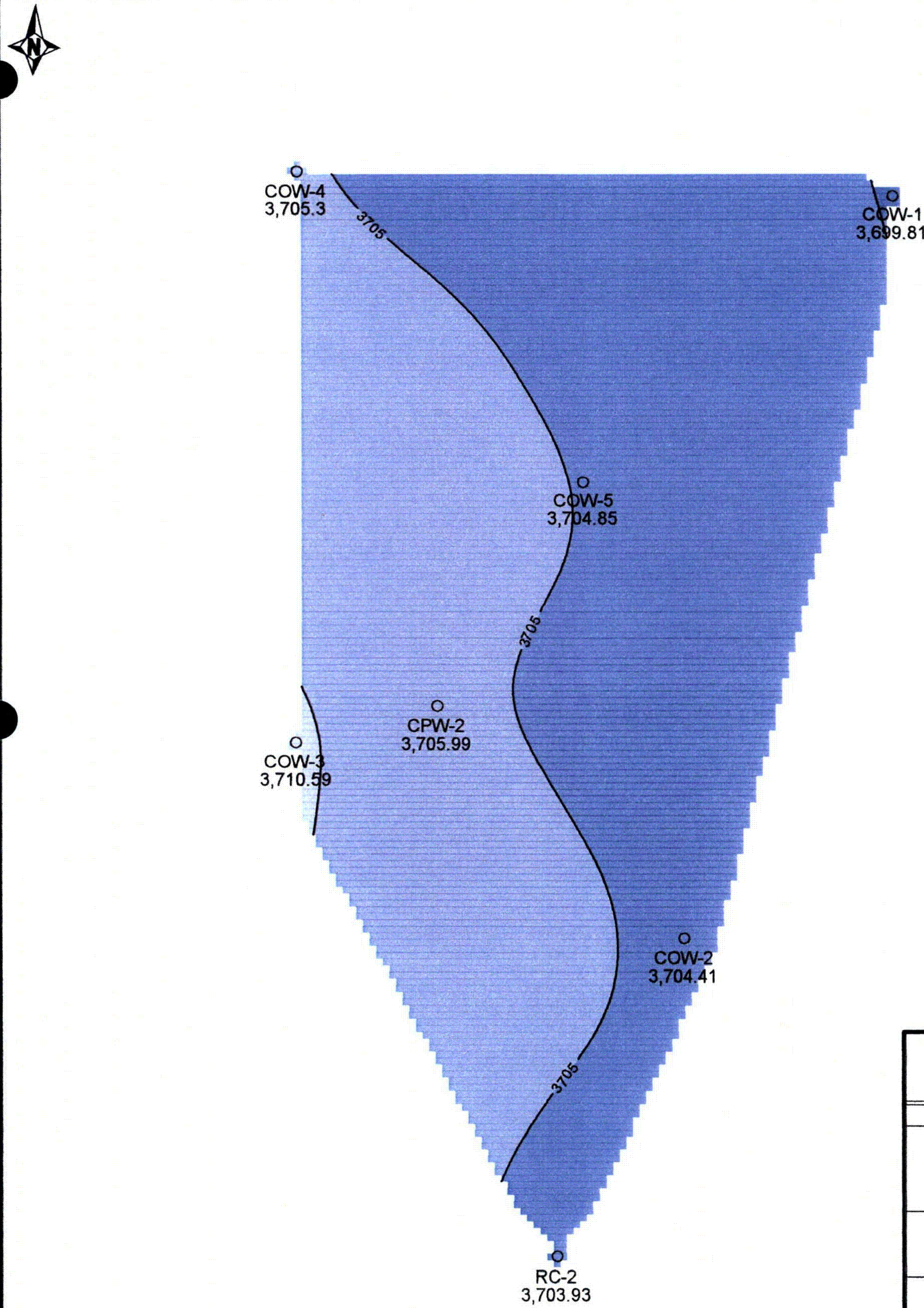

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Crow Butte Resources, Inc.

North Trend Regional Aquifer Test

Background Potentiometric Surface

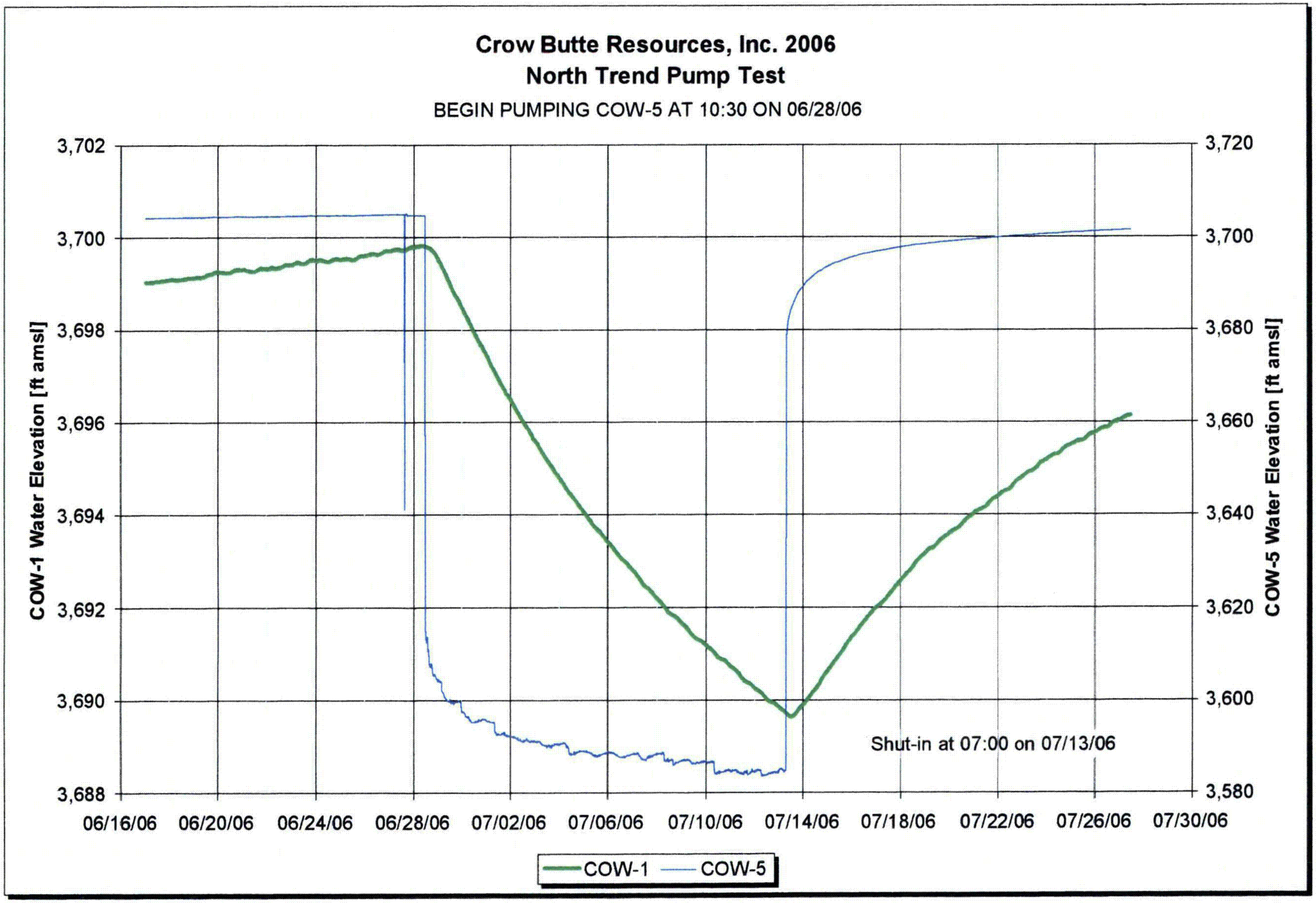
CONTOURS
KS_POTENTIOMETRIC_BCKGRD
KS_POTENTIOMETRIC_BCKGRD.GRD
Contour Interval = 5 Feet

REMARKS
Figure 4-1
Elevation (above mean sea level)

By: KRS Checked: HPD

0 1,226
FEET

PETRA 9/27/2006 1:26:11 PM



Crow Butte Resources, Inc. 2006
North Trend Pump Test
BEGIN PUMPING COW-5 AT 10:30 ON 06/28/06
COW-1 Water Elevation [ft amsl]
COW-5 Water Elevation [ft amsl]
3,702
3,700
3,698
3,696
3,694
3,692
3,690
3,688
3,720
3,700
3,680
3,660
3,640
3,620
3,600
3,580
06/16/06
06/20/06
06/24/06
06/28/06
07/02/06
07/06/06
07/10/06
07/14/06
07/18/06
07/22/06
07/26/06
07/30/06
Shut-in at 07:00 on 07/13/06
COW-1
COW-5

FIGURE 5-1

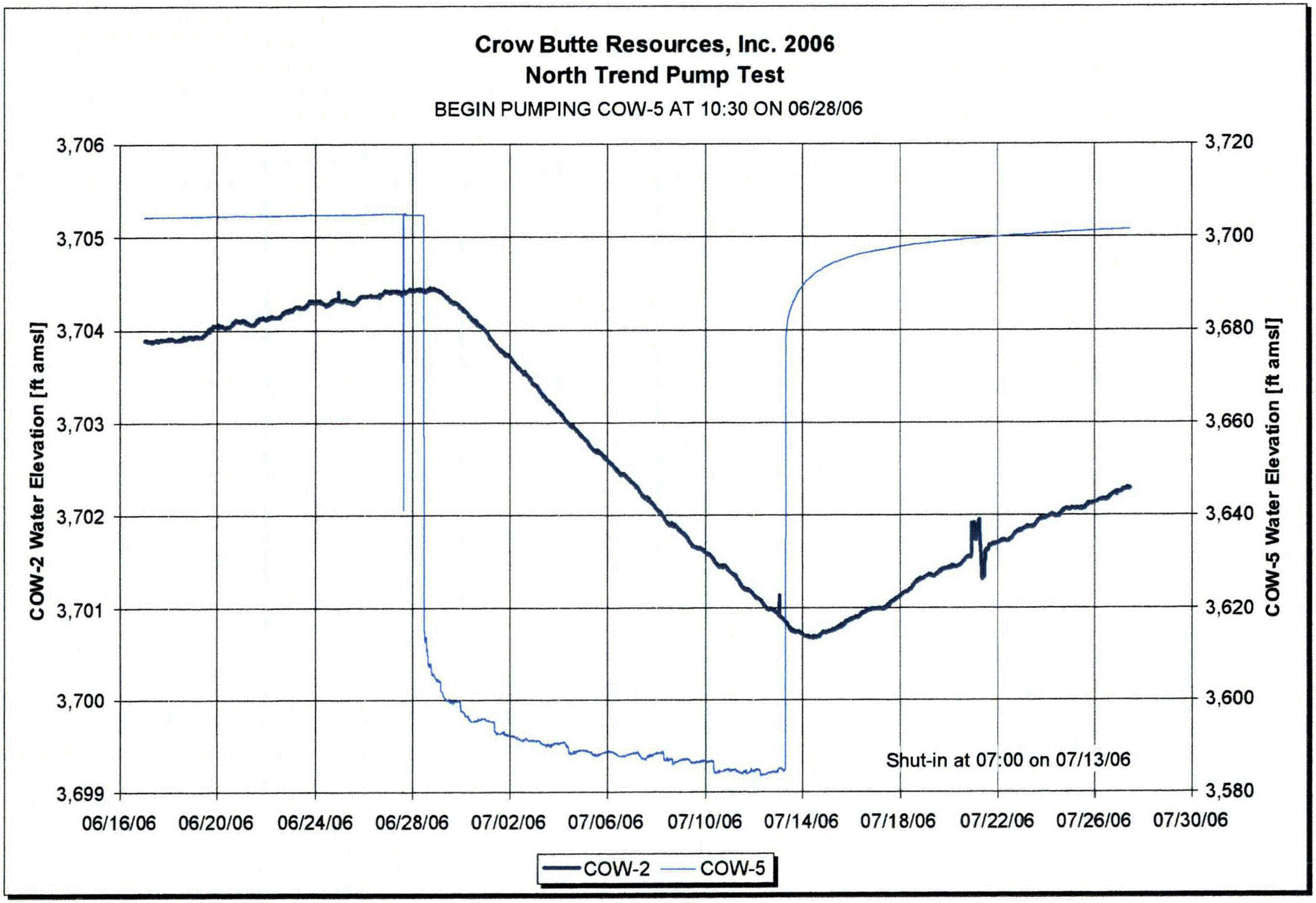
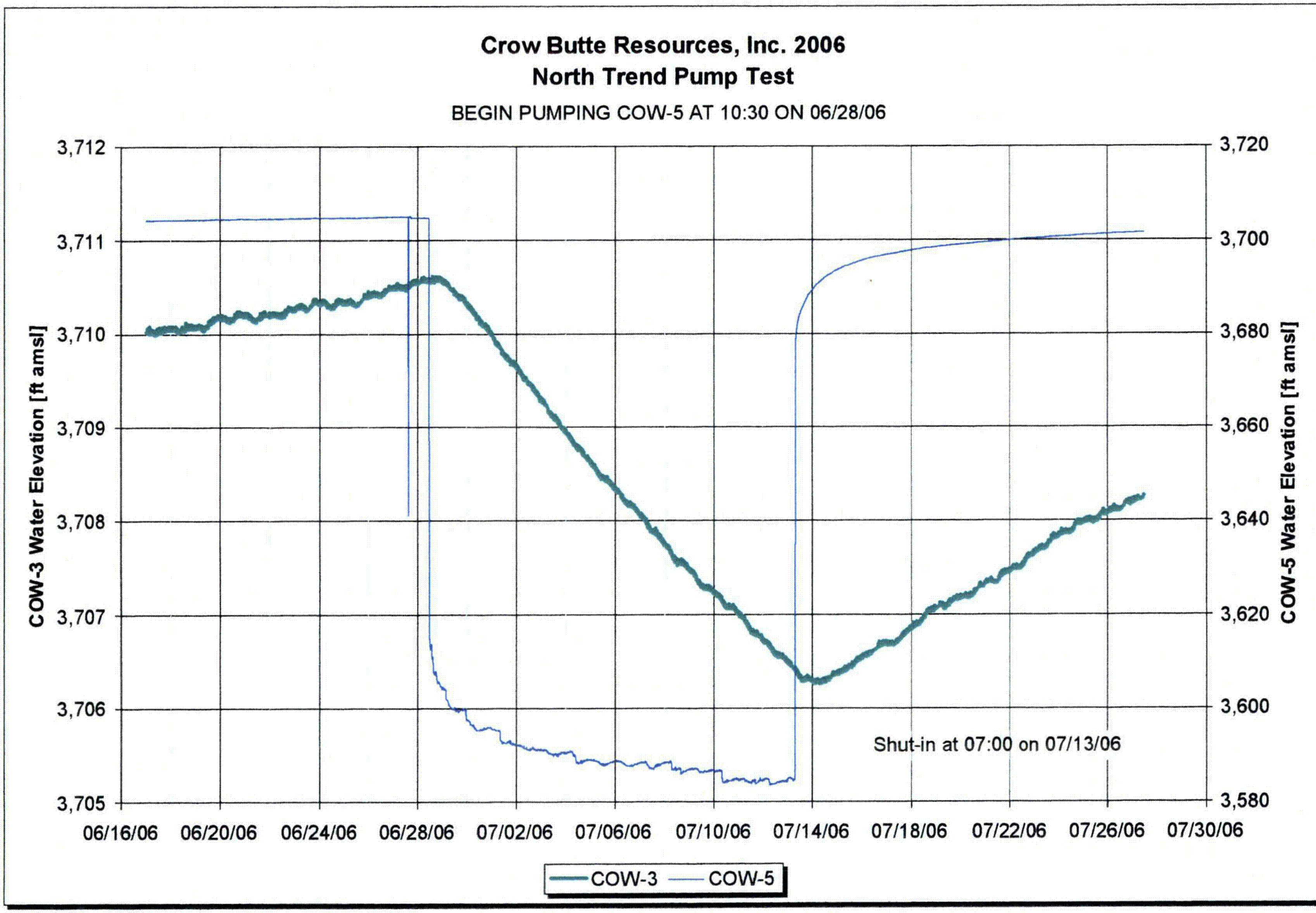
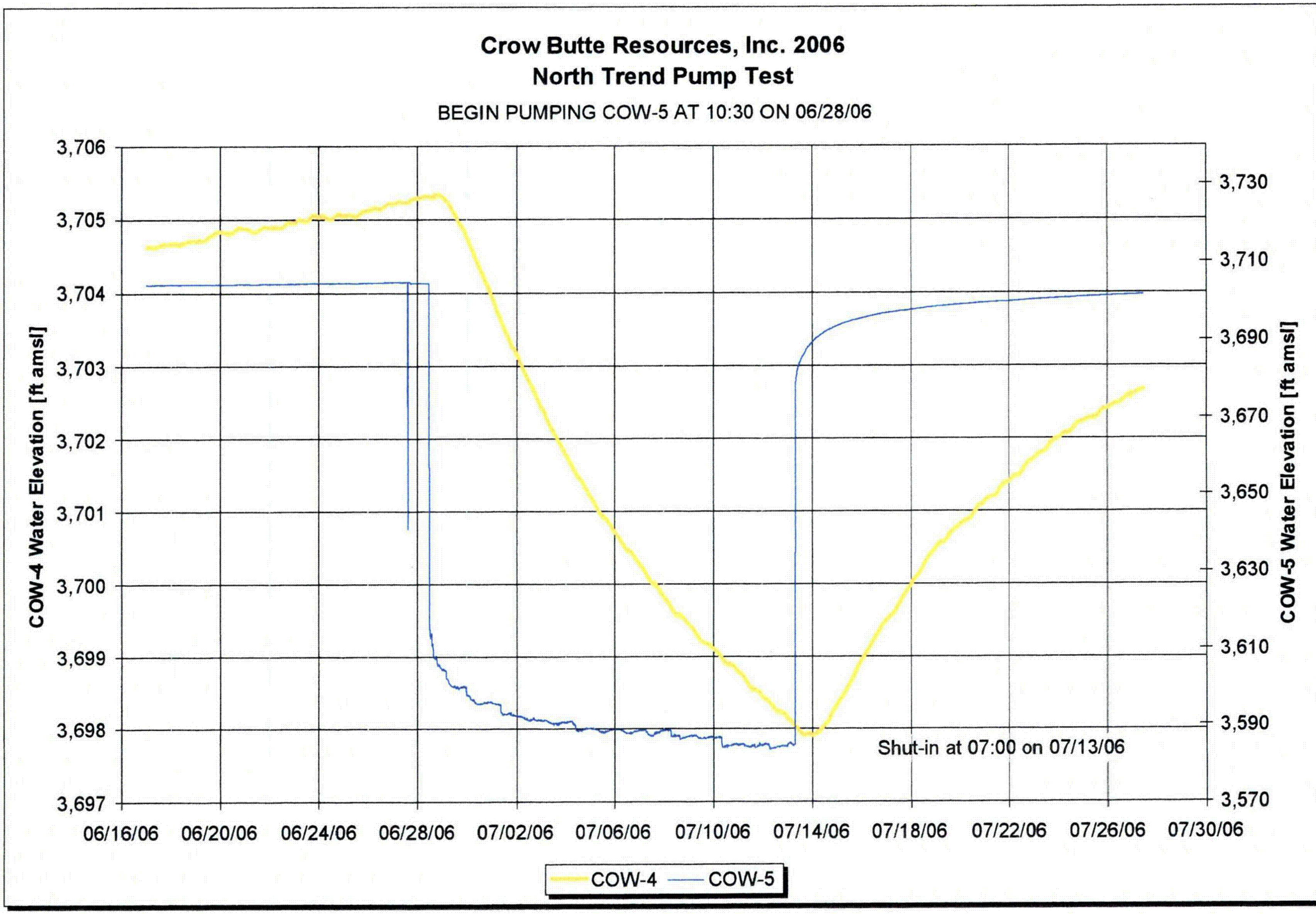

Crow Butte Resources, Inc. 2006
North Trend Pump Test
BEGIN PUMPING COW-5 AT 10:30 ON 06/28/06
COW-2 Water Elevation [ft amsl]
COW-5 Water Elevation [ft amsl]
3,706
3,705
3,704
3,703
3,702
3,701
3,700
3,699
3,720
3,700
3,680
3,660
3,640
3,620
3,600
3,580
06/16/06
06/20/06
06/24/06
06/28/06
07/02/06
07/06/06
07/10/06
07/14/06
07/18/06
07/22/06
07/26/06
07/30/06
Shut-in at 07:00 on 07/13/06
COW-2
COW-5

FIGURE 5-2



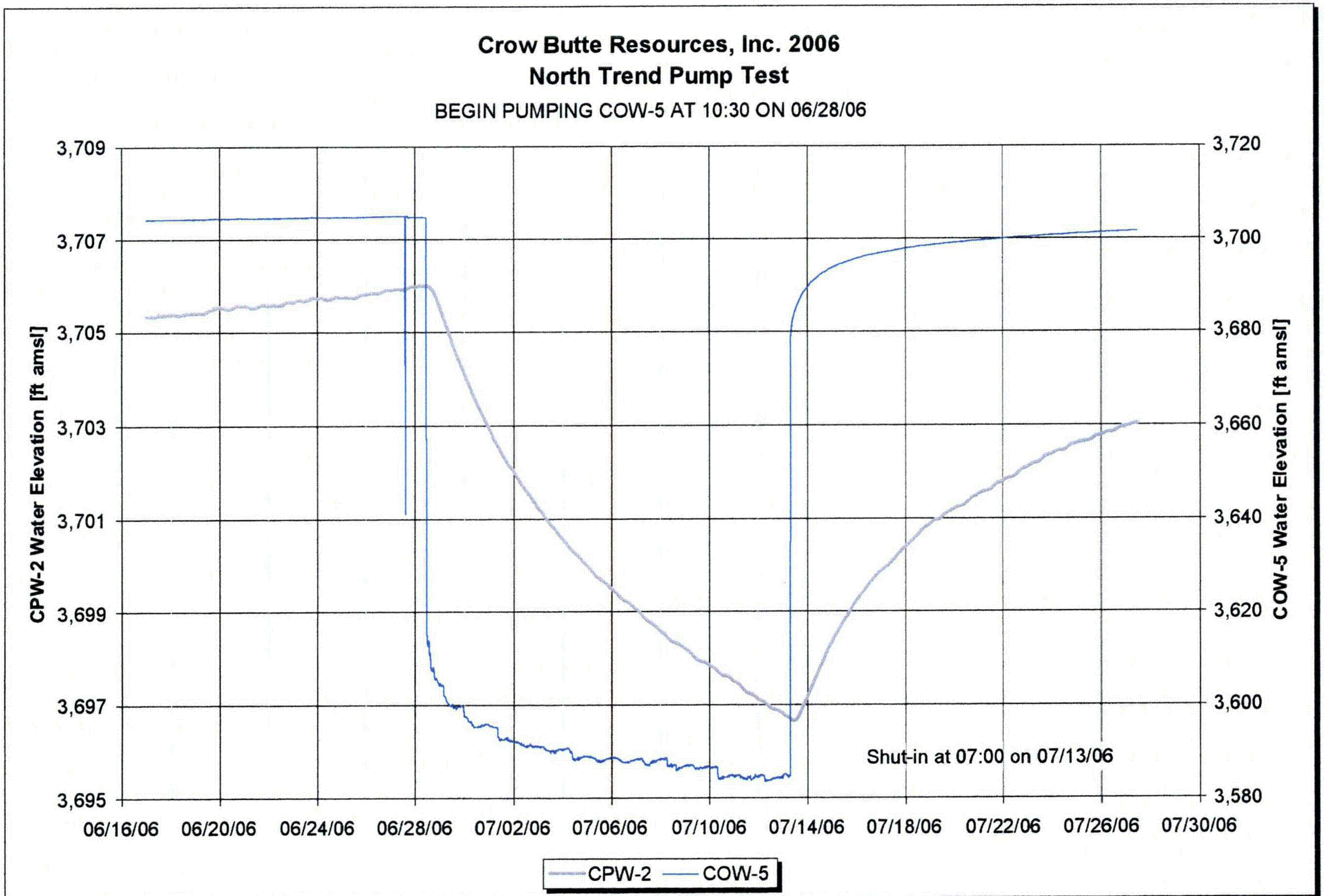
Crow Butte Resources, Inc. 2006
North Trend Pump Test
BEGIN PUMPING COW-5 AT 10:30 ON 06/28/06
COW-3 Water Elevation [ft amsl]
COW-5 Water Elevation [ft amsl]
3,712
3,711
3,710
3,709
3,708
3,707
3,706
3,705
3,720
3,700
3,680
3,660
3,640
3,620
3,600
3,580
06/16/06
06/20/06
06/24/06
06/28/06
07/02/06
07/06/06
07/10/06
07/14/06
07/18/06
07/22/06
07/26/06
07/30/06
Shut-in at 07:00 on 07/13/06
COW-3
COW-5



North Trend Regional Hydrologic Testing Report: September 2006
server\Crow Butte2\PUMPT\2006 North Trend
\Troll Data\CORRECTED NTPT 2006 MASTER CUT & PASTE.xls

FIGURE 5-4

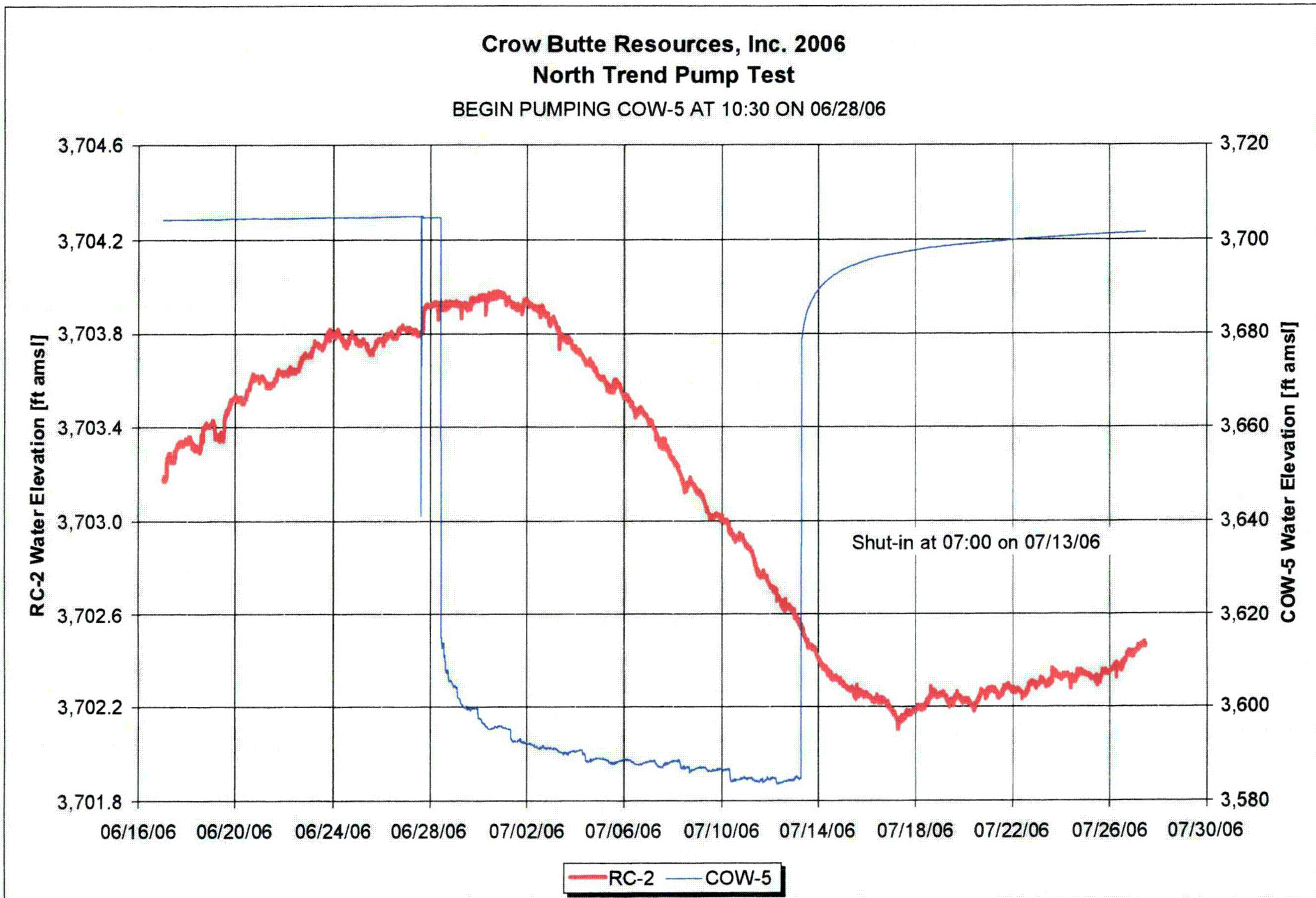
PETROTEK



North Trend Regional Hydrologic Testing Report: September 2006
server\Crow Butte2\PUMPT\2006 North Trend
\Troll Data\CORRECTED NTPT 2006 MASTER CUT & PASTE.xls

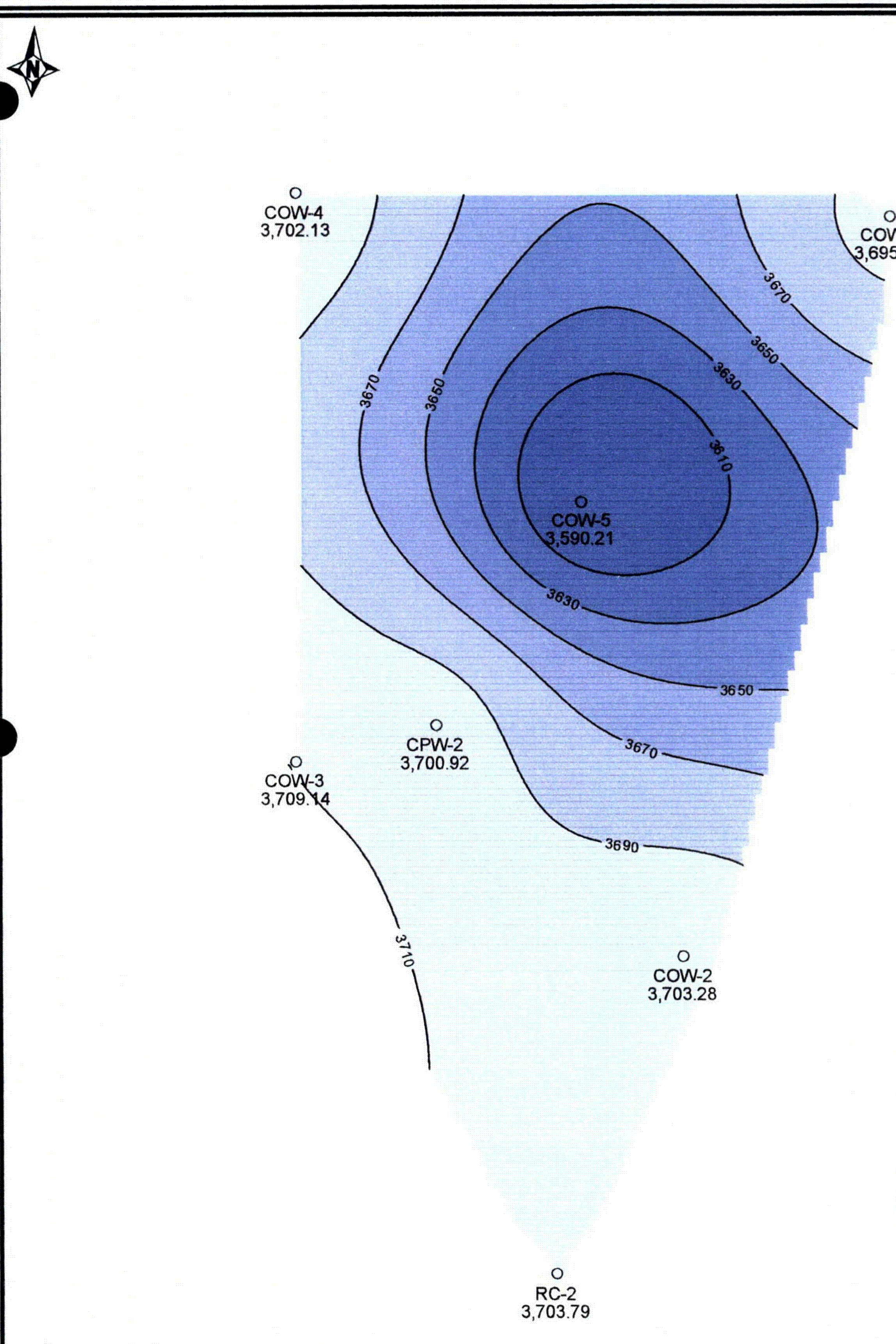
FIGURE 5-5

PETROTEK



Crow Butte Resources, Inc. 2006
North Trend Pump Test
BEGIN PUMPING COW-5 AT 10:30 ON 06/28/06
RC-2 Water Elevation [ft amsl]
COW-5 Water Elevation [ft amsl]
3,704.6
3,704.2
3,703.8
3,703.4
3,703.0
3,702.6
3,702.2
3,701.8
3,720
3,700
3,680
3,660
3,640
3,620
3,600
3,580
Shut-in at 07:00 on 07/13/06
06/16/06
06/20/06
06/24/06
06/28/06
07/02/06
07/06/06
07/10/06
07/14/06
07/18/06
07/22/06
07/26/06
07/30/06
RC-2
COW-5

FIGURE 5-6



Petrotek

9088 South Ridgeline Blvd., Ste 105

Littleton, Colorado 80129 (303)290-9414

Crow Butte Resources, Inc.

North Trend Regional Aquifer Test

Potentiometric Surface At 5 Days

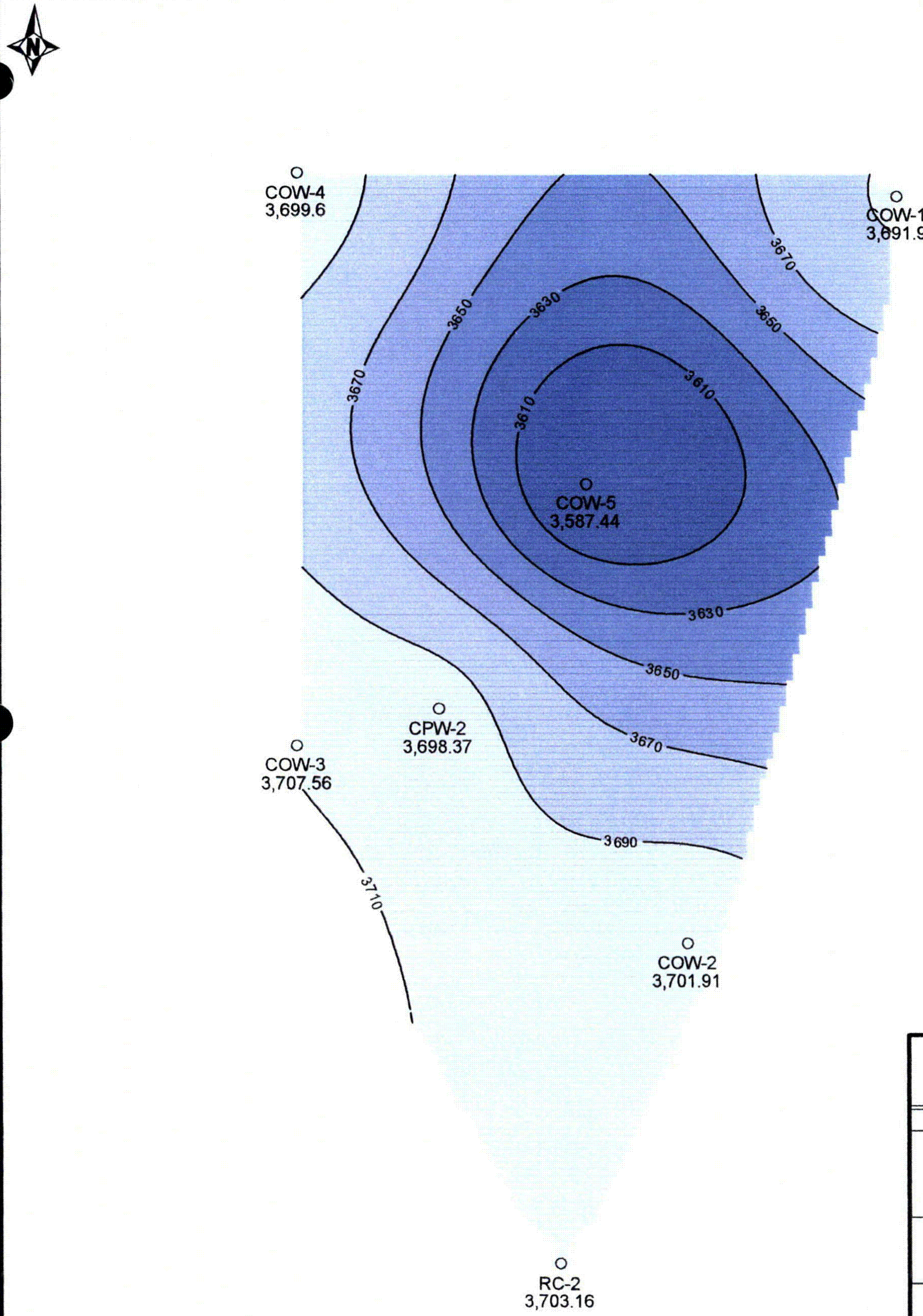
CONTOURS
KS_POTENTIOMETRIC_5_DAYS
KS_POTENTIOMETRIC_5_DAYS.GRD
Contour Interval = 20 Feet

REMARKS
Figure 5-7
Elevation (above mean sea level)

By: By: KRS Checked: HPD

0 1,226
FEET

PETRA 9/27/2006 1:28:40 PM



Petrotek

9088 South Ridgeline Blvd., Ste 105

Littleton, Colorado 80129 (303)290-9414

Crow Butte Resources, Inc.

North Trend Regional Aquifer Test

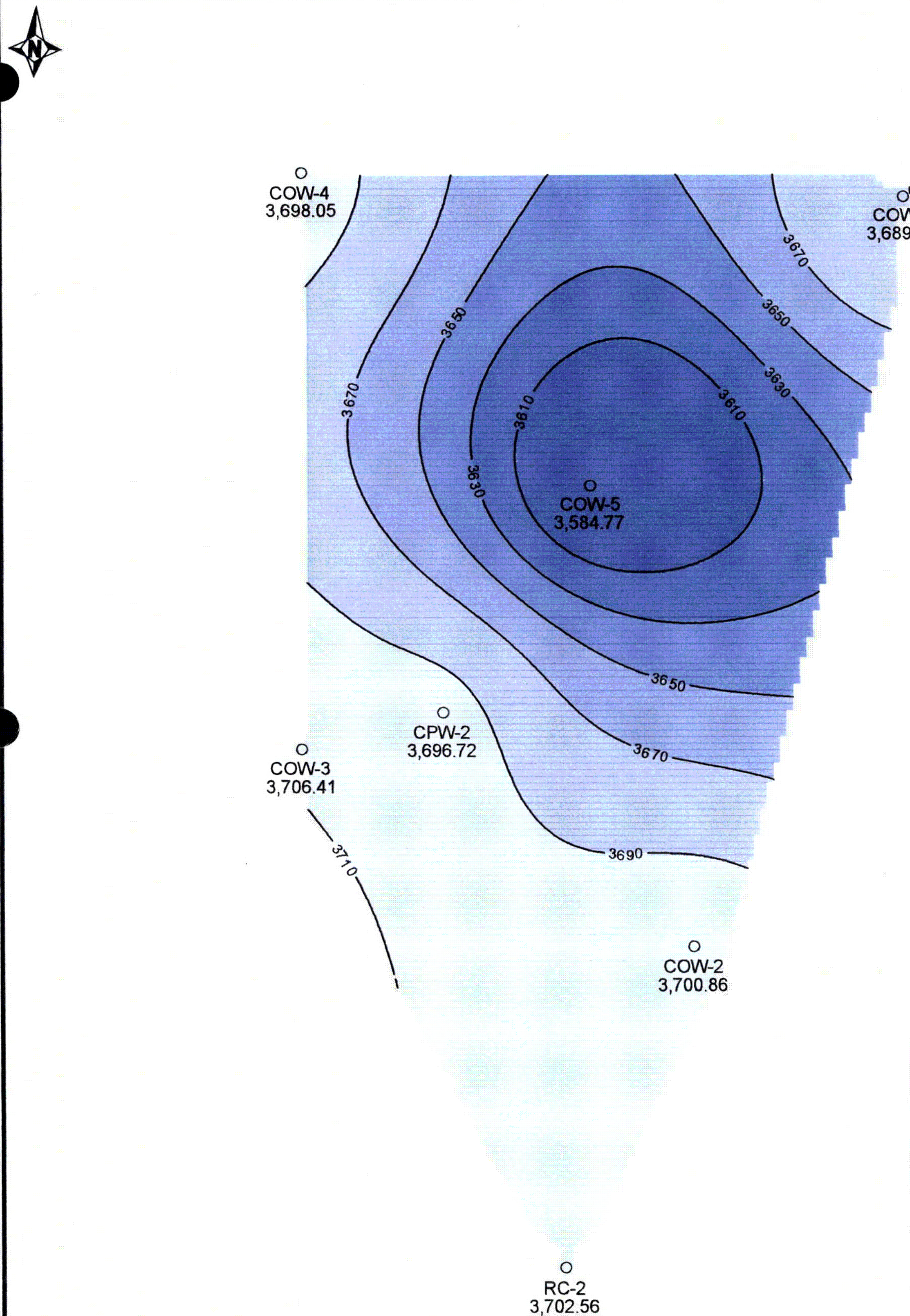
Potentiometric Surface At 10 Days

CONTOURS
KS_POTENTIOMETRIC_10_DAYS
KS_POTENTIOMETRIC_10_DAYS.GRD
Contour Interval = 20 Feet

REMARKS
Figure 5-8
Elevation (above mean sea level)

By: By: KRS Checked: HPD

0 1,226
FEET



Petrotek

9088 South Ridgeline Blvd., Ste 105

Littleton, Colorado 80129 (303)290-9414

Crow Butte Resources, Inc.

North Trend Regional Aquifer Test

Potentiometric Surface At End Of Test

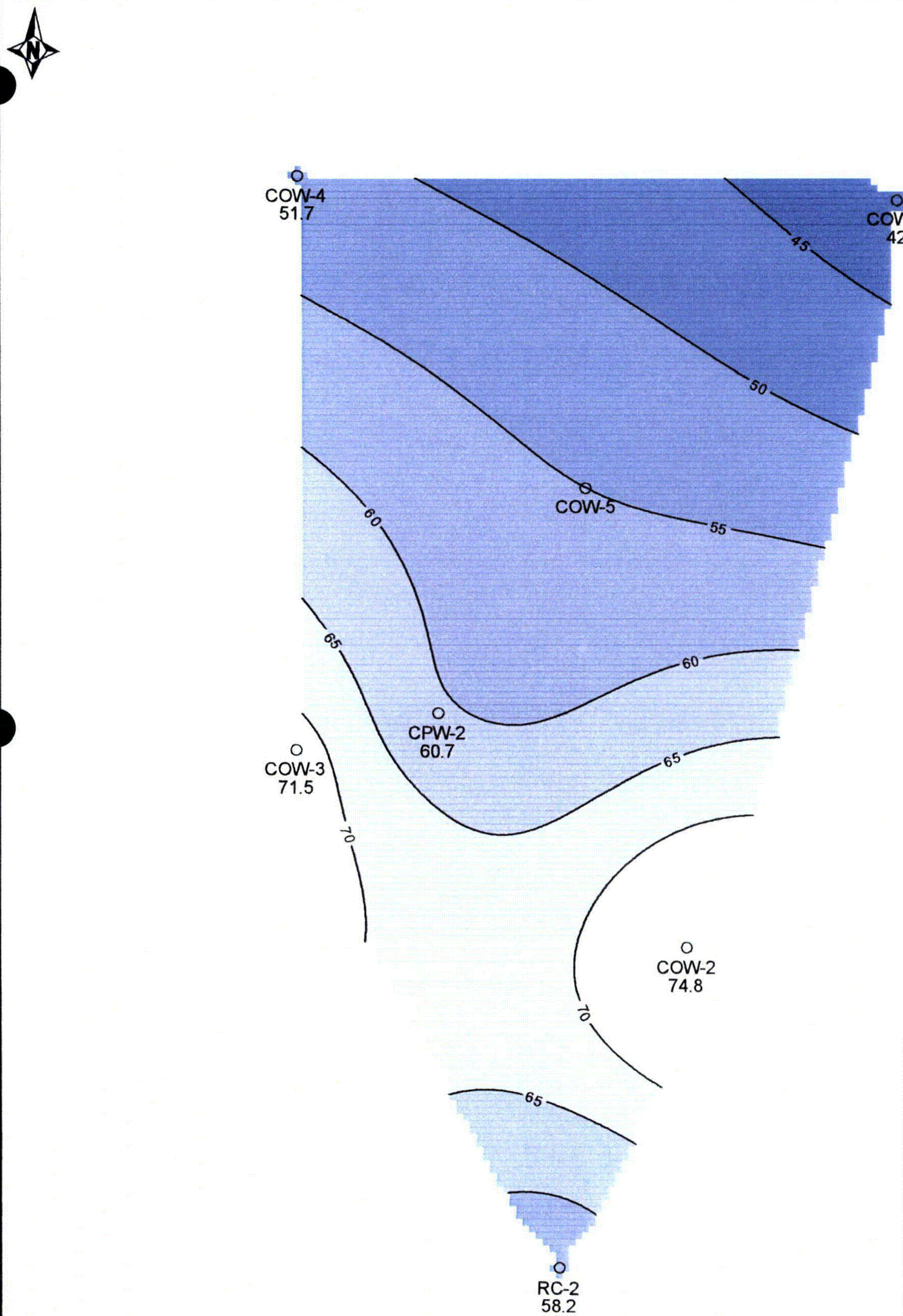
CONTOURS
KS_POTENTIOMETRIC_EOT
KS_POTENTIOMETRIC_EOT.GRD
Contour Interval = 20 Feet

REMARKS
Figure 5-9
Elevation (above mean sea level)

By: By: KRS Checked: HPD

0 1,226
FEET

PETRA 9/27/2006 1:32:50 PM



Petrotek

9088 South Ridgeline Blvd., Ste 105

Littleton, Colorado 80129 (303)290-9414

Crow Butte Resources, Inc.

North Trend Regional Aquifer Test

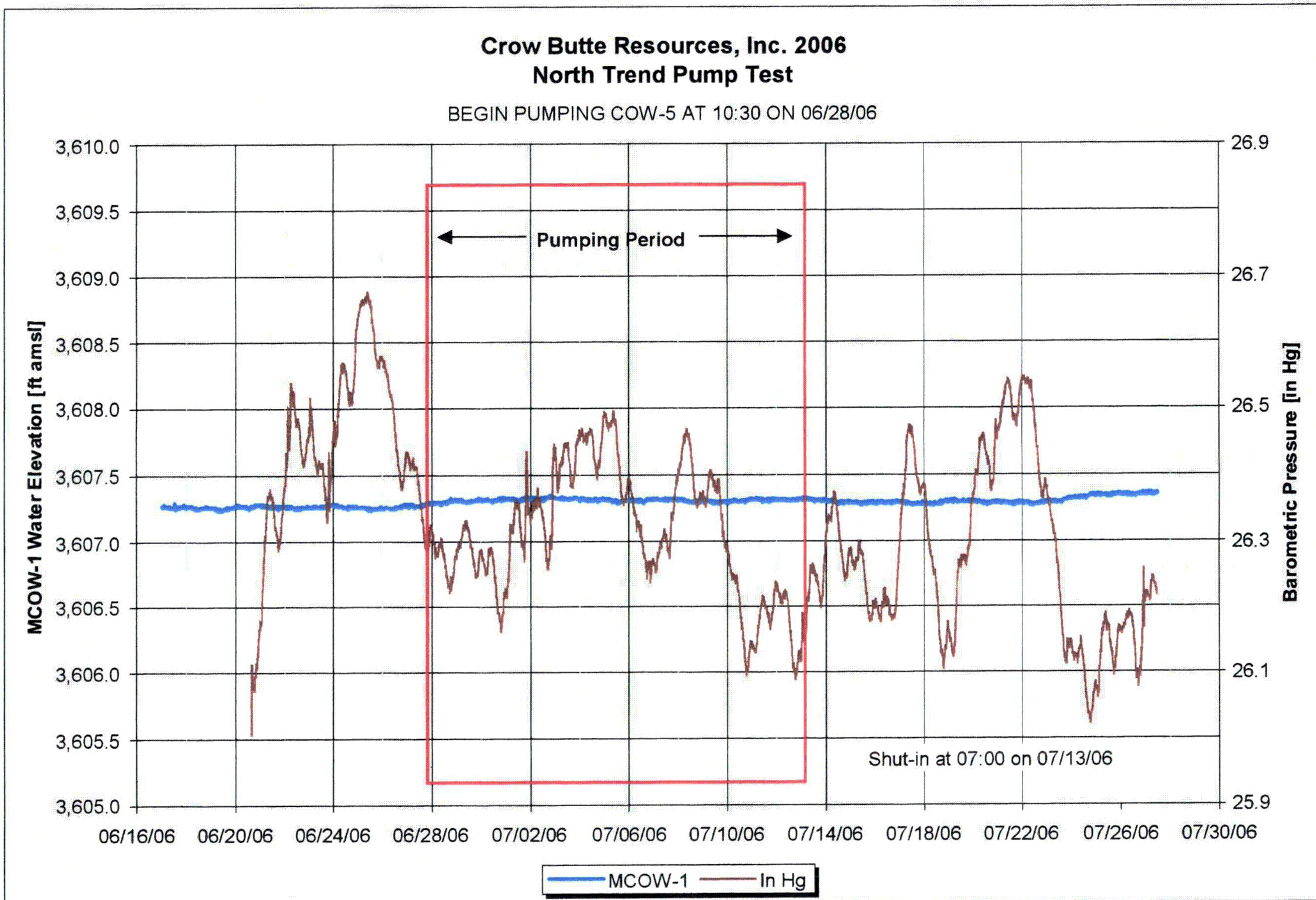
Transmissivity [feet2/day]

CONTOURS
KS_TRANSMISSIVITY_FT2/DAY
KS_TRANSMISSIVITY_FT2DAY.GRD
Contour Interval = 5 Feet

REMARKS
Figure 5-10

By: By: KRS Checked: HPD

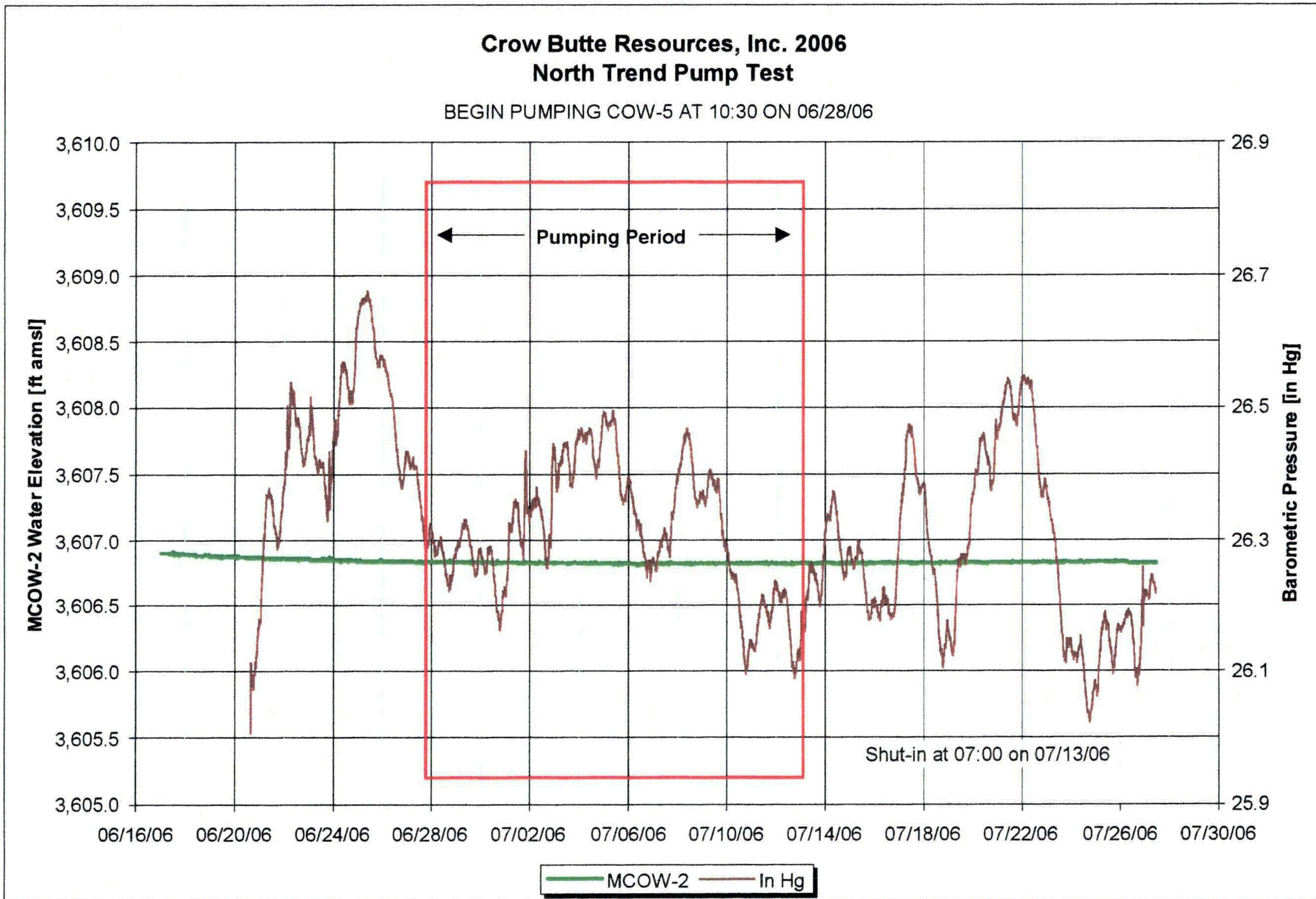
0 1,226
FEET



North Trend Regional Hydrologic Testing Report: September 2006
server\Crow Butte2\PUMPT\2006 North Trend
\Troll Data\NTPT Overlying Wells.xls

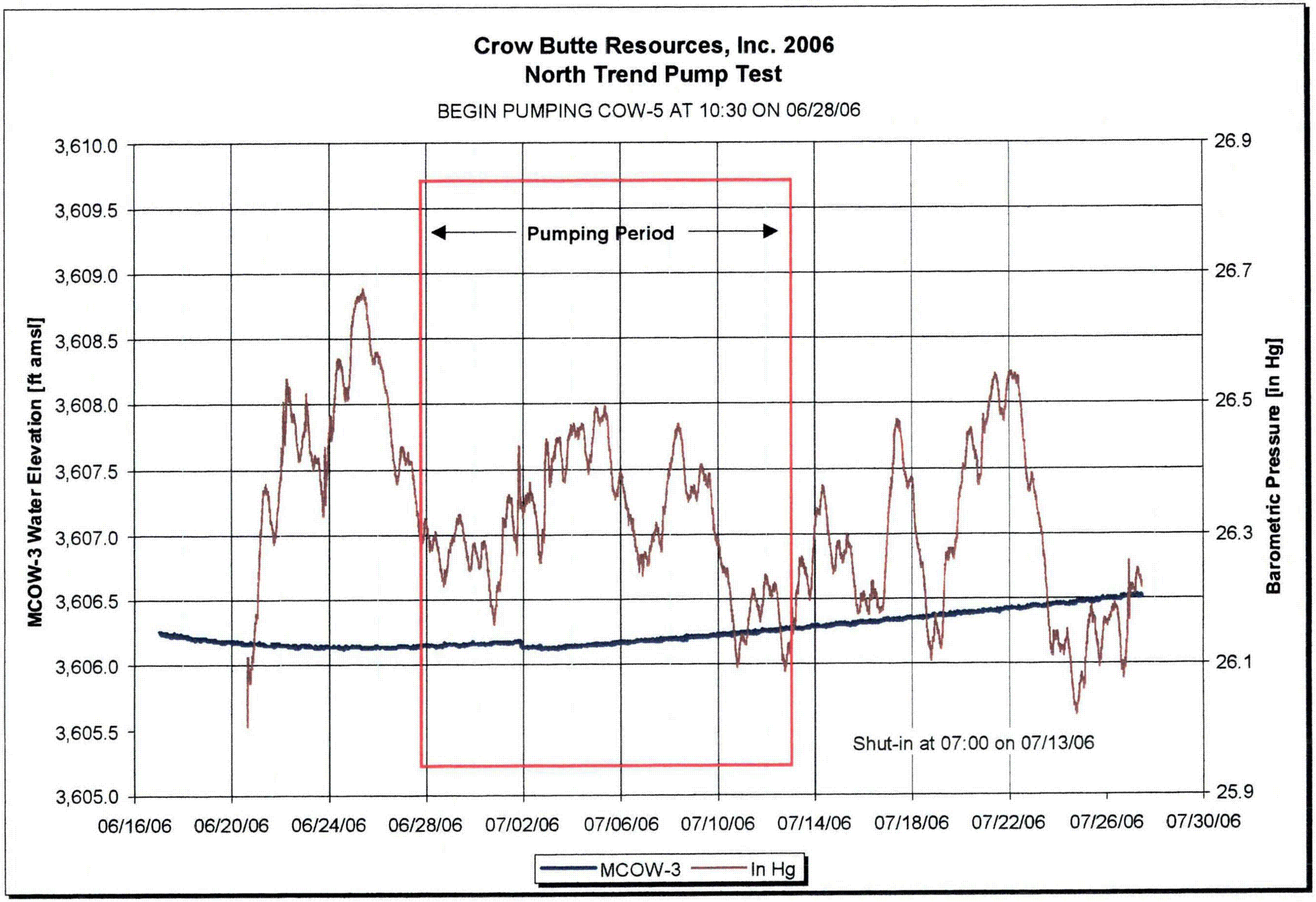
FIGURE 5-11

PETROTEK



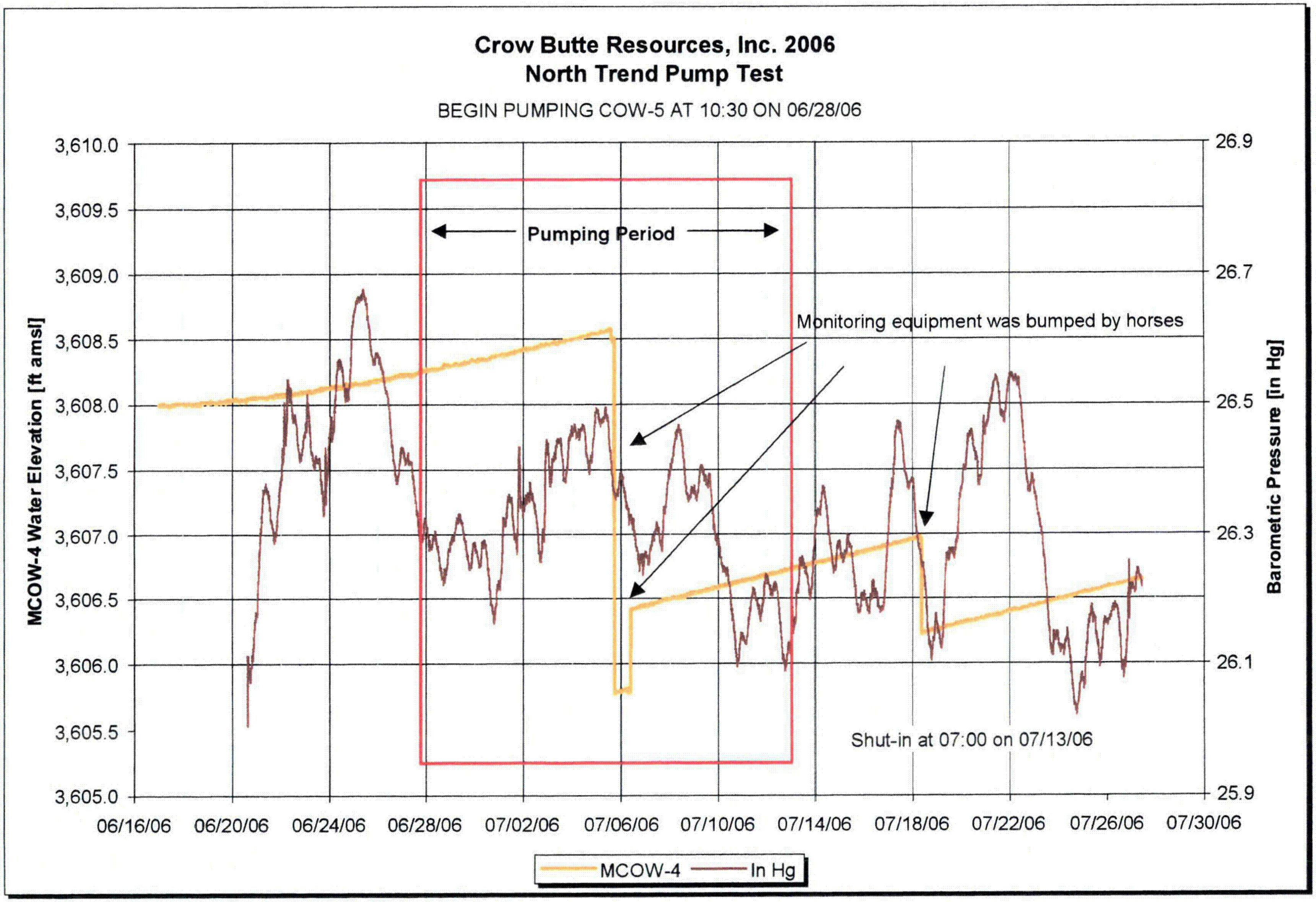
Crow Butte Resources, Inc. 2006
North Trend Pump Test
BEGIN PUMPING COW-5 AT 10:30 ON 06/28/06
Pumping Period
Shut-in at 07:00 on 07/13/06
MCOW-2 Water Elevation [ft amsl]
Barometric Pressure [in Hg]
3,610.0
3,609.5
3,609.0
3,608.5
3,608.0
3,607.5
3,607.0
3,606.5
3,606.0
3,605.5
3,605.0
26.9
26.7
26.5
26.3
26.1
25.9
06/16/06
06/20/06
06/24/06
06/28/06
07/02/06
07/06/06
07/10/06
07/14/06
07/18/06
07/22/06
07/26/06
07/30/06
MCOW-2
In Hg

FIGURE 5-12



Crow Butte Resources, Inc. 2006
North Trend Pump Test
BEGIN PUMPING COW-5 AT 10:30 ON 06/28/06
Pumping Period
Shut-in at 07:00 on 07/13/06
MCOW-3 Water Elevation [ft amsl]
Barometric Pressure [in Hg]
3,610.0
3,609.5
3,609.0
3,608.5
3,608.0
3,607.5
3,607.0
3,606.5
3,606.0
3,605.5
3,605.0
26.9
26.7
26.5
26.3
26.1
25.9
06/16/06
06/20/06
06/24/06
06/28/06
07/02/06
07/06/06
07/10/06
07/14/06
07/18/06
07/22/06
07/26/06
07/30/06
MCOW-3
In Hg

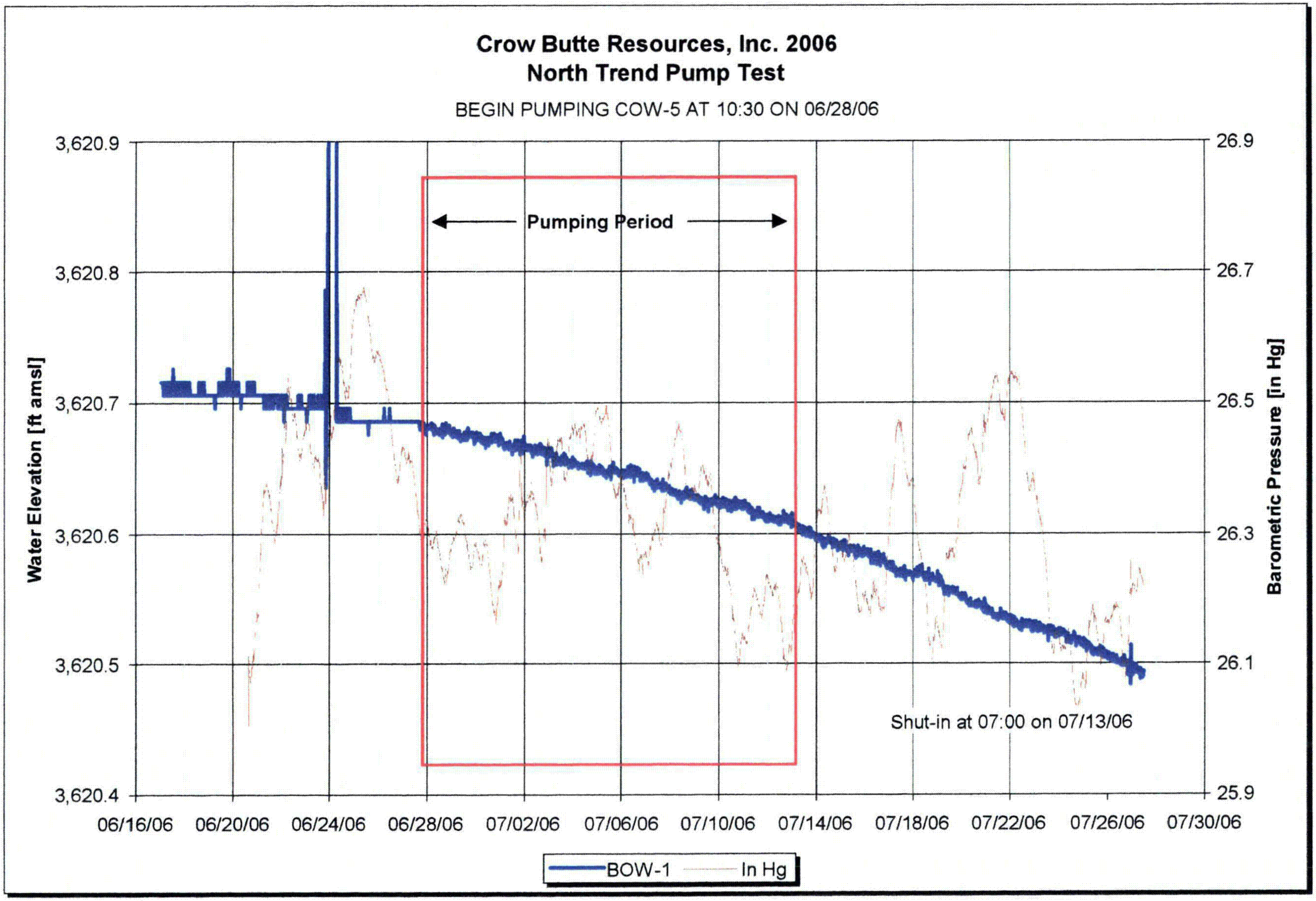
FIGURE 5-13



North Trend Regional Hydrologic Testing Report: September 2006
server\Crow Butte2\PUMPT\2006 North Trend
\Troll Data\NTPT Overlying Wells.xls

FIGURE 5-14

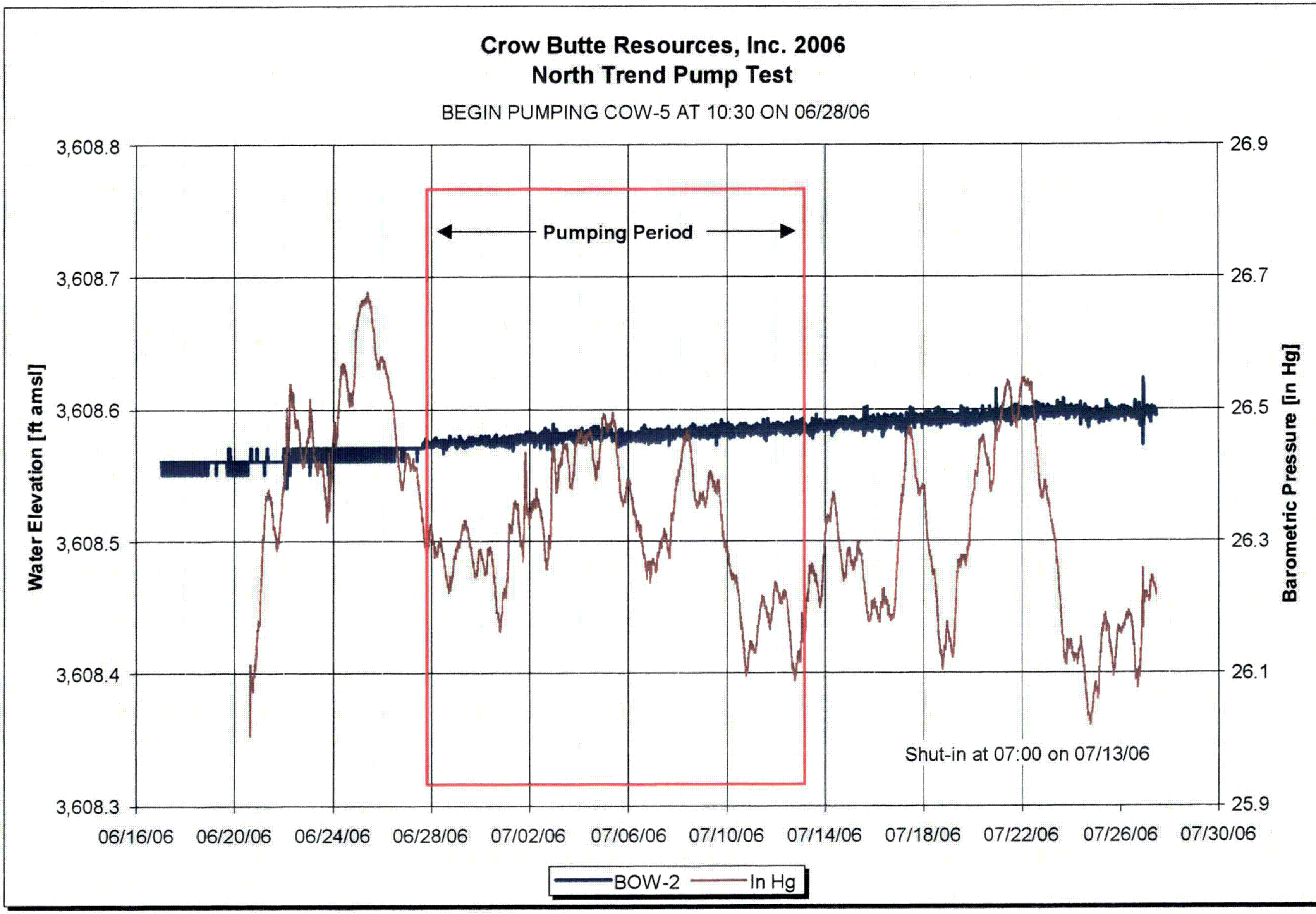
PETROTEK



North Trend Regional Hydrologic Testing Report: September 2006
server\Crow Butte2\PUMPT\2006 North Trend
\Troll Data\NTPT Overlying Wells.xls

FIGURE 5-15

PETROTEK



North Trend Regional Hydrologic Testing Report: September 2006
server\Crow Butte2\PUMPT\2006 North Trend
\Troll Data\NTPT Overlying Wells.xls

FIGURE 5-16

PETROTEK

APPENDICES

Nebraska Department of Environmental Quality **Permit No. NE0122611**

Well Completion Report

Company:	Crow Butte Resources. Inc.	Project:	Crow Butte
Well Type:	Production/Injection ___ Monitor X	Well No.	BOW-2004
Ground Elevation:	3676 ft.	Wellhead Elevation:	3678 ft.
Drilling Contractor:	Landrill Exploration	Driller:	J. Rudloff
Mud Products:	1 Bags Super Gel		
Bit Size:	8 Inch		
Drilling Begun:	7/2/2004	Drilling Completed On:	7/6/2004
Completed Formation:	Brule	Depth Drilled:	110 ft.
Casing Diameter:	4.95 inch O.D.	Casing Type:	White Certalok
Casing Depth:	39 ft.	Basket Depth:	N/A ft.
Packer Type:	Johnson K-packer	Packer Depth:	35 ft.
Centralizer Depths:	20		ft.
			ft.
Screen Size:	3 inch by .020 inch	Gravel Size:	
Screened Interval(s):	45 ft. - 65 ft.	ft. - ft.	
	ft. - ft.	ft. - ft.	
Completed Formation Upper Boundary:	45 ft.	Lower Boundary:	64 ft.
Cement Contractor:	Crow Butte Resources	Operator:	Jordan/Yada
Estimated Cement Volume:	1.6 bbls.	Actual Cement Volume Used:	2.4 bbls.
Cement Density:	14.5 lbs/gal	Water Volume Used:	1.7 bbls.
Cement Type/Class:	I/II API	Additives:	500 lbs. Salt 500 lbs. Bentonite
Cement Circulated to Surface:	1 bbls.	Density At Surface:	13.3 lbs/gal
Logging Contractor:	Century Geophysical Corp.	Operator:	Dunn
Unit No.:	0001	Probe No.:	9055C
Log Type:	Gamma, SP, Resistance, Deviation		
Well Deviation:	3.8 ft. at 129.6 degrees		
Remarks:			

This report was filled out by: Wade Beins

Representing: Crow Butte Resources, Inc.

On:

Certification:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this form and all its attachments and that, based on inquiry of those individuals immediately responsible for obtaining information, I believe the information is true, accurate, and complete. Further, I certify awareness that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

By: Wade Beins Title : Senior Geologist

Date: December 3, 2006

Nebraska Department of Environmental Quality **Permit No. NE0122611**

Well Completion Report

Company:	Crow Butte Resources. Inc.	Project:	Crow Butte
Well Type:	Production/Injection ____ Monitor X	Well No.	**BOW-2004-2**
Ground Elevation:	3667 ft.	Wellhead Elevation:	3668 ft.
Drilling Contractor:	Landrill Exploration	Driller:	S. Osmotherly
Mud Products:			
Bit Size:	8 Inch		
Drilling Begun:	5/8/2006	Drilling Completed On:	5/10/2006
Completed Formation:	Brule	Depth Drilled:	100 ft.
Casing Diameter:	4.95 inch O.D.	Casing Type:	White Certalok
Casing Depth:	19 ft.	Basket Depth:	N/A ft.
Packer Type:	Johnson K-packer	Packer Depth:	12 ft.
Centralizer Depths:	10		ft.
			ft.
Screen Size:	3 inch by .020 inch	Gravel Size:	
Screened Interval(s):	22 ft. - 38 ft.	ft. - 53 ft.	59
	ft. - ft.	ft. - ft.	
Completed Formation Upper Boundary:	20 ft.	Lower Boundary:	60 ft.
Cement Contractor:	Crow Butte Resources	Operator:	Jordan/Yada
Estimated Cement Volume:	0.8 bbls.	Actual Cement Volume Used:	1.2 bbls.
Cement Density:	14.5 lbs/gal	Water Volume Used:	0.9 bbls.
Cement Type/Class:	I/II API	Additives:	500 lbs. Salt 500 lbs. Bentonite
Cement Circulated to Surface:	0.5 bbls.	Density At Surface:	14.5 lbs/gal
Logging Contractor:	Century Geophysical Corp.	Operator:	Dunn
Unit No.:	0001	Probe No.:	9055C
Log Type:	Gamma, SP, Resistance, Deviation		
Well Deviation:	0 ft. at 0 degrees		

Remarks:

This report was filled out by: Wade Beins

Representing: Crow Butte Resources, Inc.

On:

Certification:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this form and all its attachments and that, based on inquiry of those individuals immediately responsible for obtaining information, I believe the information is true, accurate, and complete. Further, I certify awareness that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

By: Wade Beins Title : Senior Geologist

Date: December 3, 2006

Nebraska Department of Environmental Quality **Permit No. NE0122611**

Well Completion Report

Company:	Crow Butte Resources. Inc.	Project:	Crow Butte
Well Type:	Production/Injection ___ Monitor X	Well No.	MCOW-2004-1
Ground Elevation:	3674 ft.	Wellhead Elevation:	3676 ft.
Drilling Contractor:	Landrill Exploration	Driller:	S. Osmotherly
Mud Products:			
Bit Size:	8 Inch		
Drilling Begun:	6/29/2004	Drilling Completed On:	7/1/2004
Completed Formation:	Chadron	Depth Drilled:	380 ft.
Casing Diameter:	4.95 inch O.D.	Casing Type:	White Certalok
Casing Depth:	299 ft.	Basket Depth:	N/A ft.
Packer Type:	Johnson K-packer	Packer Depth:	295 ft.
Centralizer Depths:	20, 40, 100, 160, 220, 280		ft.
			ft.
Screen Size:	3 inch by .020 inch	Gravel Size:	
Screened Interval(s):	305 ft. - 315 ft.	ft. - 325 ft.	350
	ft. - ft.	ft. - ft.	
Completed Formation Upper Boundary:	305 ft.	Lower Boundary:	350 ft.
Cement Contractor:	Crow Butte Resources	Operator:	Jordan/Yada
Estimated Cement Volume:	11.6 bbls.	Actual Cement Volume Used:	17.3 bbls.
Cement Density:	13 lbs/gal	Water Volume Used:	12.4 bbls.
Cement Type/Class:	I/II API	Additives:	500 lbs. Salt 500 lbs. Bentonite
Cement Circulated to Surface:	0.25 bbls.	Density At Surface:	10.6 lbs/gal
Logging Contractor:	Century Geophysical Corp.	Operator:	Dunn
Unit No.:	0001	Probe No.:	9055C
Log Type:	Gamma, SP, Resistance, Deviation		
Well Deviation:	0.001 ft. at 0.001 degrees		
Remarks:			

This report was filled out by: Wade Beins

Representing: Crow Butte Resources, Inc.

On:

Certification:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this form and all its attachments and that, based on inquiry of those individuals immediately responsible for obtaining information, I believe the information is true, accurate, and complete. Further, I certify awareness that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

By: Wade Beins Title: Senior Geologist

Date: December 3, 2006

Nebraska Department of Environmental Quality **Permit No. NE0122611**

Well Completion Report

Company:	Crow Butte Resources. Inc.	Project:	Crow Butte
Well Type:	Production/Injection ___ Monitor X	Well No.	MCOW-2004-2
Ground Elevation:	3681 ft.	Wellhead Elevation:	3683 ft.
Drilling Contractor:	Landrill Exploration	Driller:	S. Osmotherly
Mud Products:	7 Bags Super Gel		1 Bags Lost Circulation Material
Bit Size:	8 Inch		
Drilling Begun:	12/6/2004	Drilling Completed On:	12/8/2004
Completed Formation:	Chadron	Depth Drilled:	370 ft.
Casing Diameter:	4.95 inch O.D.	Casing Type:	White Certalok
Casing Depth:	299 ft.	Basket Depth:	N/A ft.
Packer Type:	Johnson K-packer	Packer Depth:	277 ft.
Centralizer Depths:	20, 40, 100, 160, 220, 280		ft.
			ft.
Screen Size:	3 inch by .020 inch	Gravel Size:	
Screened Interval(s):	297 ft. - 307 ft.	ft. - 312 ft.	322
	332 ft. - 342 ft.	ft. - ft.	
Completed Formation Upper Boundary:	297 ft.	Lower Boundary:	340 ft.
Cement Contractor:	Crow Butte Resources	Operator:	Jordan/Yada
Estimated Cement Volume:	11.6 bbls.	Actual Cement Volume Used:	17.3 bbls.
Cement Density:	12.7 lbs/gal	Water Volume Used:	12.4 bbls.
Cement Type/Class:	I/II API	Additives:	500 lbs. Salt 500 lbs. Bentonite
Cement Circulated to Surface:	0 bbls.	Density At Surface:	9.1 lbs/gal
Logging Contractor:	Century Geophysical Corp.	Operator:	Dunn
Unit No.:	0001	Probe No.:	9055C
Log Type:	Gamma, SP, Resistance, Deviation		
Well Deviation:	0.001 ft. at 0.001 degrees		
Remarks:	Tremmied 3bbls cement to surface		

This report was filled out by: Wade Beins

Representing: Crow Butte Resources, Inc.

On:

Certification:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this form and all its attachments and that, based on inquiry of those individuals immediately responsible for obtaining information, I believe the information is true, accurate, and complete. Further, I certify awareness that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

By: Wade Beins Title: Senior Geologist

Date: December 3, 2006

Nebraska Department of Environmental Quality **Permit No. NE0122611**

Well Completion Report

Company: Crow Butte Resources. Inc. | Project: Crow Butte

Well Type: Production/Injection ____ Monitor X | Well No. MCOW-2004-3

Ground Elevation: 3667 ft. | Wellhead Elevation: 3668 ft.

Drilling Contractor: Landrill Exploration | Driller: S. Osmotherly

Mud Products: 10 Bags Super Gel | 1 Bags Lost Circulation Material

Bit Size: 8 Inch

Drilling Begun: 5/8/2006 | Drilling Completed On: 5/10/2006

Completed Formation: Chadron | Depth Drilled: 410 ft.

Casing Diameter: 4.95 inch O.D. | Casing Type: White Certalok

Casing Depth: 329 ft. | Basket Depth: N/A ft.

Packer Type: Johnson K-packer | Packer Depth: 325 ft.

Centralizer Depths: 20, 40, 100, 160, 220, 280 ft.

ft.

Screen Size: 3 inch by .020 inch | Gravel Size:

Screened Interval(s): 335 ft. - 355 ft. ft. - 365 ft. 371

381 ft. - 391 ft. ft. - ft.

Completed Formation Upper Boundary: 335 ft. | Lower Boundary: 390 ft.

Cement Contractor: Crow Butte Resources | Operator: Jordan/Yada

Estimated Cement Volume: 12.7 bbls. | Actual Cement Volume Used: 19.1 bbls.

Cement Density: 14.5 lbs/gal | Water Volume Used: 13.7 bbls.

Cement Type/Class: I/II API | Additives: 500 lbs. Salt 500 lbs. Bentonite

Cement Circulated to Surface: 0 bbls. | Density At Surface: 9.3 lbs/gal

Logging Contractor: Century Geophysical Corp. | Operator: Dunn

Unit No.: 0001 | Probe No.: 9055C

Log Type: Gamma, SP, Resistance, Deviation

Well Deviation: 3.7 ft. at 272.3 degrees

Remarks: Tremmied 3bbls cement to surface

This report was filled out by: Wade Beins

Representing: Crow Butte Resources, Inc.

On:

Certification:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this form and all its attachments and that, based on inquiry of those individuals immediately responsible for obtaining information, I believe the information is true, accurate, and complete. Further, I certify awareness that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

By: Wade Beins | Title : Senior Geologist

Date: December 3, 2006

Nebraska Department of Environmental Quality **Permit No. NE0122611**

Well Completion Report

Company: Crow Butte Resources. Inc. Project: Crow Butte

Well Type: Production/Injection ____ Monitor X Well No. MCOW-2004-4

Ground Elevation: 3679 ft. Wellhead Elevation: 3681 ft.

Drilling Contractor: Landrill Exploration Driller: S. Osmotherly

Mud Products: 3 Bags Super Gel

Bit Size: 8 Inch

Drilling Begun: 5/9/2006 Drilling Completed On: 5/11/2006

Completed Formation: Chadron Depth Drilled: 390 ft.

Casing Diameter: 4.95 inch O.D. Casing Type: White Certalok

Casing Depth: 289 ft. Basket Depth: N/A ft.

Packer Type: Johnson K-packer Packer Depth: 280 ft.

Centralizer Depths: 20, 40, 100, 160, 220, 280 ft.

ft.

Screen Size: 3 inch by .020 inch Gravel Size:

Screened Interval(s): 290 ft. - 306 ft. ft. - 336 ft. 346

351 ft. - 371 ft. ft. - ft.

Completed Formation Upper Boundary: 290 ft. Lower Boundary: 370 ft.

Cement Contractor: Crow Butte Resources Operator: Jordan/Yada

Estimated Cement Volume: 11.2 bbls. Actual Cement Volume Used: 16.7 bbls.

Cement Density: 13.8 lbs/gal Water Volume Used: 12.0 bbls.

Cement Type/Class: I/II API Additives: 500 lbs. Salt 500 lbs. Bentonite

Cement Circulated to Surface: 1 bbls. Density At Surface: 13.3 lbs/gal

Logging Contractor: Century Geophysical Corp. Operator: Dunn

Unit No.: 0001 Probe No.: 9055C

Log Type: Gamma, SP, Resistance, Deviation

Well Deviation: 3.8 ft. at 227.9 degrees

Remarks:

This report was filled out by: Wade Beins

Representing: Crow Butte Resources, Inc.

On:

Certification:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this form and all its attachments and that, based on inquiry of those individuals immediately responsible for obtaining information, I believe the information is true, accurate, and complete. Further, I certify awareness that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

By: Wade Beins Title: Senior Geologist

Date: December 3, 2006

Nebraska Department of Environmental Quality **Permit No. NE0122611**

Well Completion Report

Company:	Crow Butte Resources. Inc.	Project:	Crow Butte
Well Type:	Production/Injection ___ Monitor X	Well No.	COW-2004-1
Ground Elevation:	3632 ft.	Wellhead Elevation:	3633 ft.
Drilling Contractor:	Landrill Exploration	Driller:	J. Rudloff
Mud Products:	1 Bags Super Gel 3 Quart Polymer		
Bit Size:	8 Inch		
Drilling Begun:	6/28/2004	Drilling Completed On:	6/30/2004
Completed Formation:	Chadron	Depth Drilled:	580 ft.
Casing Diameter:	4.95 inch O.D.	Casing Type:	White Certalok
Casing Depth:	529 ft.	Basket Depth:	N/A ft.
Packer Type:	Johnson K-packer	Packer Depth:	527 ft.
Centralizer Depths:	20, 40, 100, 160, 220, 280, 340, 400, 460		ft.
			ft.
Screen Size:	3 inch by .020 inch	Gravel Size:	
Screened Interval(s):	537 ft. - 557 ft.	ft. - ft.	
	ft. - ft.	ft. - ft.	
Completed Formation Upper Boundary:	536 ft.	Lower Boundary:	550 ft.
Cement Contractor:	Crow Butte Resources	Operator:	Jordan/Yada
Estimated Cement Volume:	20.4 bbls.	Actual Cement Volume Used:	30.6 bbls.
Cement Density:	13.3 lbs/gal	Water Volume Used:	21.9 bbls.
Cement Type/Class:	I/II API	Additives:	500 lbs. Salt 500 lbs. Bentonite
Cement Circulated to Surface:	0 bbls.	Density At Surface:	10.1 lbs/gal
Logging Contractor:	Century Geophysical Corp.	Operator:	Dunn
Unit No.:	0001	Probe No.:	9055C
Log Type:	Gamma, SP, Resistance, Deviation		
Well Deviation:	4.1 ft. at 325.9 degrees		
Remarks:	Tremmied 1 bbl cement to surface		

This report was filled out by: Wade Beins

Representing: Crow Butte Resources, Inc.

On:

Certification:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this form and all its attachments and that, based on inquiry of those individuals immediately responsible for obtaining information, I believe the information is true, accurate, and complete. Further, I certify awareness that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

By: Wade Beins Title : Senior Geologist

Date: December 3, 2006

Nebraska Department of Environmental Quality **Permit No. NE0122611**

Well Completion Report

Company:	Crow Butte Resources. Inc.	Project:	Crow Butte
Well Type:	Production/Injection ___ Monitor X	Well No.	**COW-2004-2**
Ground Elevation:	3652 ft.	Wellhead Elevation:	3654 ft.
Drilling Contractor:	Landrill Exploration	Driller:	J. Rudloff
Mud Products:	1 Bags Super Gel 2 Quart Polymer		
Bit Size:	8 Inch		
Drilling Begun:	7/2/2004	Drilling Completed On:	7/6/2004
Completed Formation:	Chadron	Depth Drilled:	620 ft.
Casing Diameter:	4.95 inch O.D.	Casing Type:	White Certalok
Casing Depth:	569 ft.	Basket Depth:	N/A ft.
Packer Type:	Johnson K-packer	Packer Depth:	559 ft.
Centralizer Depths:	20, 40, 100, 160, 220, 280, 340, 400, 460, 520		ft.
			ft.
Screen Size:	3 inch by .020 inch	Gravel Size:	
Screened Interval(s):	569 ft. - 594 ft.	ft. - ft.	
	ft. - ft.	ft. - ft.	
Completed Formation Upper Boundary:	569 ft.	Lower Boundary:	598 ft.
Cement Contractor:	Crow Butte Resources	Operator:	Jordan/Yada
Estimated Cement Volume:	21.9 bbls.	Actual Cement Volume Used:	32.9 bbls.
Cement Density:	13.1 lbs/gal	Water Volume Used:	23.6 bbls.
Cement Type/Class:	I/II API	Additives:	500 lbs. Salt 500 lbs. Bentonite
Cement Circulated to Surface:	0 bbls.	Density At Surface:	9.4 lbs/gal
Logging Contractor:	Century Geophysical Corp.	Operator:	Dunn
Unit No.:	0001	Probe No.:	9055C
Log Type:	Gamma, SP, Resistance, Deviation		
Well Deviation:	4.1 ft. at 184.4 degrees		
Remarks:	Tremmied 1 bbl cement to surface		

This report was filled out by: Wade Beins

Representing: Crow Butte Resources, Inc.

On:

Certification:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this form and all its attachments and that, based on inquiry of those individuals immediately responsible for obtaining information, I believe the information is true, accurate, and complete. Further, I certify awareness that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

By: Wade Beins Title : Senior Geologist

Date: December 3, 2006

Nebraska Department of Environmental Quality **Permit No. NE0122611**

Well Completion Report

Company:	Crow Butte Resources. Inc.	Project:	Crow Butte
Well Type:	Production/Injection ____ Monitor X	Well No.	COW-2004-3
Ground Elevation:	3683 ft.	Wellhead Elevation:	3685 ft.
Drilling Contractor:	Landrill Exploration	Driller:	J. Rudloff
Mud Products:	1 Bags Super Gel 6 Quart Polymer		
Bit Size:	8 Inch		
Drilling Begun:	6/25/2004	Drilling Completed On:	6/28/2004
Completed Formation:	Chadron	Depth Drilled:	670 ft.
Casing Diameter:	4.95 inch O.D.	Casing Type:	White Certalok
Casing Depth:	589 ft.	Basket Depth:	N/A ft.
Packer Type:	Johnson K-packer	Packer Depth:	586 ft.
Centralizer Depths:	20, 40, 100, 160, 220, 280, 340, 400, 460, 520		ft.
	580,		ft.
Screen Size:	3 inch by .020 inch	Gravel Size:	
Screened Interval(s):	596 ft. - 616 ft.	ft. - 621 ft.	631
	641 ft. - 646 ft.	ft. - ft.	
Completed Formation Upper Boundary:	580 ft.	Lower Boundary:	647 ft.
Cement Contractor:	Crow Butte Resources	Operator:	Jordan/Yada
Estimated Cement Volume:	22.7 bbls.	Actual Cement Volume Used:	34.0 bbls.
Cement Density:	13.2 lbs/gal	Water Volume Used:	24.4 bbls.
Cement Type/Class:	I/II API	Additives:	500 lbs. Salt 500 lbs. Bentonite
Cement Circulated to Surface:	0 bbls.	Density At Surface:	10 lbs/gal
Logging Contractor:	Century Geophysical Corp.	Operator:	Dunn
Unit No.:	0001	Probe No.:	9055C
Log Type:	Gamma, SP, Resistance, Deviation		
Well Deviation:	2.3 ft. at 345.7 degrees		
Remarks:	Tremmied 3 bbls cement to surface		

This report was filled out by: Wade Beins

Representing: Crow Butte Resources, Inc.

On:

Certification:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this form and all its attachments and that, based on inquiry of those individuals immediately responsible for obtaining information, I believe the information is true, accurate, and complete. Further, I certify awareness that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

By: Wade Beins Title: Senior Geologist

Date: December 3, 2006

Nebraska Department of Environmental Quality **Permit No. NE0122611**

Well Completion Report

Company: Crow Butte Resources. Inc.
Project: Crow Butte

Well Type: Production/Injection ____ Monitor X
Well No. COW-2004-4

Ground Elevation: 3686 ft.
Wellhead Elevation: 3687 ft.

Drilling Contractor: Landrill Exploration
Driller: J. Rudloff

Mud Products: 1 Bags Super Gel 3 Quart Polymer

Bit Size: 8 Inch

Drilling Begun: 6/29/2004
Drilling Completed On: 7/1/2004

Completed Formation: Chadron
Depth Drilled: 670 ft.

Casing Diameter: 4.95 inch O.D.
Casing Type: White Certalok

Casing Depth: 579 ft.
Basket Depth: N/A ft.

Packer Type: Johnson K-packer
Packer Depth: 575 ft.

Centralizer Depths: 20, 40, 100, 160, 220, 280, 340, 400, 460, 520 ft.

ft.

Screen Size: 3 inch by .020 inch
Gravel Size:

Screened Interval(s): 585 ft. - 600 ft. ft. - 610 ft. 630

635 ft. - 645 ft. ft. - ft.

Completed Formation Upper Boundary: 585 ft.
Lower Boundary: 645 ft.

Cement Contractor: Crow Butte Resources
Operator: Jordan/Yada

Estimated Cement Volume: 22.3 bbls.
Actual Cement Volume Used: 33.4 bbls.

Cement Density: 13.4 lbs/gal
Water Volume Used: 24.0 bbls.

Cement Type/Class: I/II API
Additives: 500 lbs. Salt 500 lbs. Bentonite

Cement Circulated to Surface: 0 bbls.
Density At Surface: 10.4 lbs/gal

Logging Contractor: Century Geophysical Corp.
Operator: Dunn

Unit No.: 0001
Probe No.: 9055C

Log Type: Gamma, SP, Resistance, Deviation

Well Deviation: 1.6 ft. at 80.7 degrees

Remarks: Tremmied 1 bbl cement to surface

This report was filled out by: Wade Beins

Representing: Crow Butte Resources, Inc.

On:

Certification:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this form and all its attachments and that, based on inquiry of those individuals immediately responsible for obtaining information, I believe the information is true, accurate, and complete. Further, I certify awareness that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

By: Wade Beins
Title : Senior Geologist

Date: December 3, 2006

Nebraska Department of Environmental Quality **Permit No. NE0122611**

Well Completion Report

Company: Crow Butte Resources. Inc. Project: Crow Butte

Well Type: Production/Injection ___ Monitor X Well No. COW-2004-5

Ground Elevation: 3679 ft. Wellhead Elevation: 3680 ft.

Drilling Contractor: Landrill Exploration Driller: K. Osmotherly

Mud Products: 12 Bags Super Gel 3 Bags Lost Circulation Material

Bit Size: 8 Inch

Drilling Begun: 12/13/2004 Drilling Completed On: 12/15/2004

Completed Formation: Chadron Depth Drilled: 740 ft.

Casing Diameter: 4.95 inch O.D. Casing Type: White Certalok

Casing Depth: 659 ft. Basket Depth: N/A ft.

Packer Type: Johnson K-packer Packer Depth: 643 ft.

Centralizer Depths: 20, 40, 100, 160, 220, 280, 340, 400, 460, 520, 580 ft.

580, 640, ft.

Screen Size: 3 inch by .020 inch Gravel Size:

Screened Interval(s): 653 ft. - 683 ft. ft. - 693 ft. 708

ft. - ft. ft. - ft.

Completed Formation Upper Boundary: 653 ft. Lower Boundary: 722 ft.

Cement Contractor: Crow Butte Resources Operator: Jordan/Yada

Estimated Cement Volume: 25.4 bbls. Actual Cement Volume Used: 38.1 bbls.

Cement Density: 12.2 lbs/gal Water Volume Used: 27.3 bbls.

Cement Type/Class: I/II API Additives: 500 lbs. Salt 500 lbs. Bentonite

Cement Circulated to Surface: 0 bbls. Density At Surface: 9.7 lbs/gal

Logging Contractor: Century Geophysical Corp. Operator: Dunn

Unit No.: 0001 Probe No.: 9055C

Log Type: Gamma, SP, Resistance, Deviation

Well Deviation: 4.7 ft. at 160.9 degrees

Remarks: Tremmied 1 bbl cement to surface

This report was filled out by: Wade Beins

Representing: Crow Butte Resources, Inc.

On:

Certification:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this form and all its attachments and that, based on inquiry of those individuals immediately responsible for obtaining information, I believe the information is true, accurate, and complete. Further, I certify awareness that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

By: Wade Beins Title : Senior Geologist

Date: December 3, 2006

Nebraska Department of Environmental Quality **Permit No. NE0122611**

Well Completion Report

Company: Crow Butte Resources. Inc.
Project: Crow Butte

Well Type: Production/Injection ____ Monitor X
Well No. CPW-2004-2

Ground Elevation: 3679 ft.
Wellhead Elevation: 3680 ft.

Drilling Contractor: Landrill Exploration
Driller: S. Osmotherly

Mud Products: 3 Quart Polymer

Bit Size: 8 Inch

Drilling Begun: 7/13/2004
Drilling Completed On: 7/15/2004

Completed Formation: Chadron
Depth Drilled: 710 ft.

Casing Diameter: 4.95 inch O.D.
Casing Type: White Certalok

Casing Depth: 609 ft.
Basket Depth: N/A ft.

Packer Type: Johnson K-packer
Packer Depth: 605 ft.

Centralizer Depths: 20, 40, 100, 160, 220, 280, 340, 400, 460, 520, 580 ft.
580, ft.

Screen Size: 3 inch by .020 inch
Gravel Size:

Screened Interval(s): 615 ft. - 660 ft. ft. - 670 ft. 685
ft. - ft. ft. - ft.

Completed Formation Upper Boundary: 611 ft.
Lower Boundary: 659 ft.

Cement Contractor: Crow Butte Resources
Operator: Jordan/Yada

Estimated Cement Volume: 23.5 bbls.
Actual Cement Volume Used: 35.2 bbls.

Cement Density: 12.8 lbs/gal
Water Volume Used: 25.2 bbls.

Cement Type/Class: I/II API
Additives: 500 lbs. Salt 500 lbs. Bentonite

Cement Circulated to Surface: 0.25 bbls.
Density At Surface: 10.6 lbs/gal

Logging Contractor: Century Geophysical Corp.
Operator: Dunn

Unit No.: 0001
Probe No.: 9055C

Log Type: Gamma, SP, Resistance, Deviation

Well Deviation: 6 ft. at 2.4 degrees

Remarks:

This report was filled out by: Wade Beins

Representing: Crow Butte Resources, Inc.

On:

Certification:

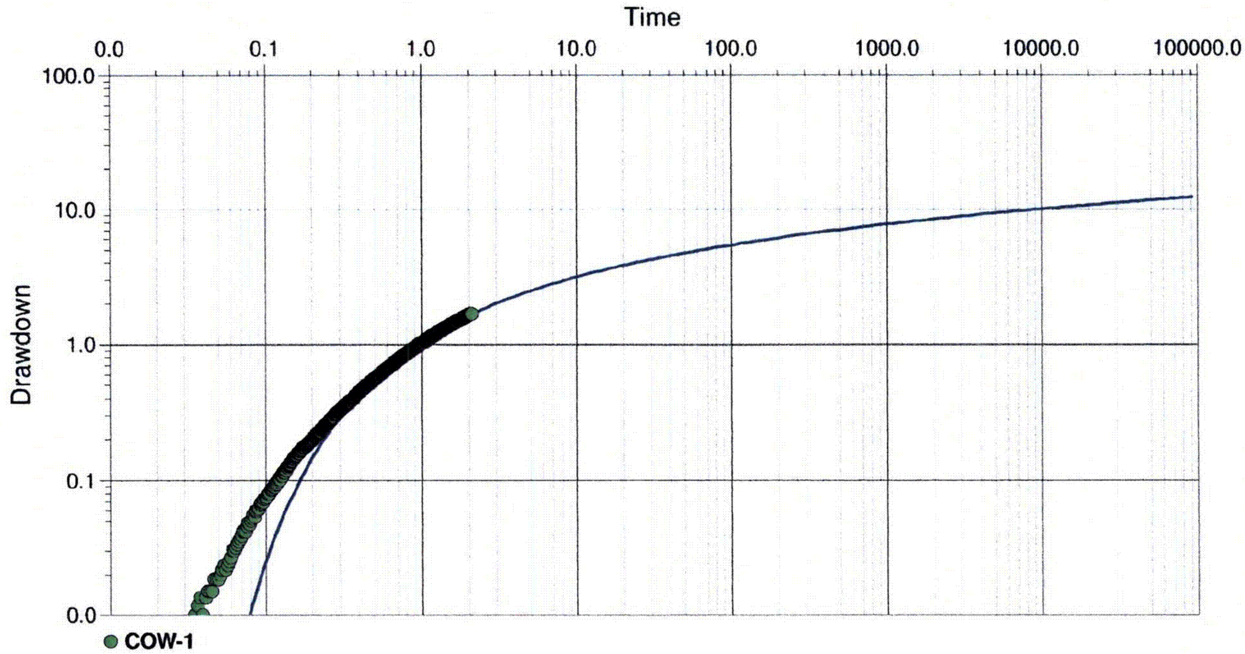
I certify under penalty of law that I have personally examined and am familiar with the information submitted in this form and all its attachments and that, based on inquiry of those individuals immediately responsible for obtaining information, I believe the information is true, accurate, and complete. Further, I certify awareness that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

By: Wade Beins
Title : Senior Geologist

Date: December 3, 2006

Petrotek	Pumping Test Analysis Report
10288 West Chatfield Ave., Ste 201 Littleton, Colorado 80127-4239 303-290-9414 www.petrotek.com	Project: North Trend Regional Aquifer Test
	Number: 223-30
	Client: Crow Butte Resources, Inc.

Location: Crawford, Nebraska	Pumping Test: 2006 North Trend Aquifer Test	Pumping well: COW-5
Test conducted by: Petrotek Engineering Corporation		Test date: 6/28/2006
Analysis performed by: KRS/HPD	COW-1 Theis Type Curve Match	Analysis date: 8/24/2006
Aquifer Thickness: 26.00 ft	Discharge rate: 16.4 [U.S. gal/min]	

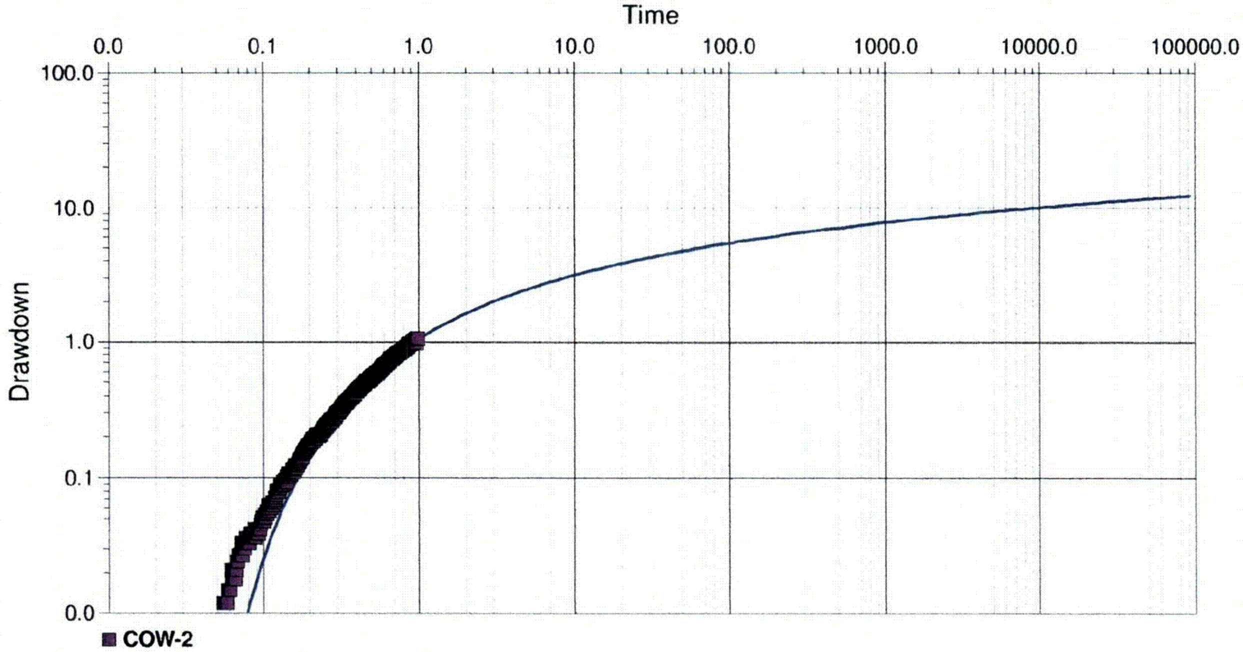


Calculation after Theis

Observation well	Transmissivity [ft²/d]	Hydraulic Conductivity [ft/d]	Storage coefficient	Radial distance to PW [ft]	
COW-1	4.20×10^{1}	1.61×10^{0}	2.30×10^{-5}	3614.28	

Petrotek 10288 West Chatfield Ave., Ste 201 Littleton, Colorado 80127-4239 303-290-9414 www.petrotek.com	**Pumping Test Analysis Report** Project: North Trend Regional Aquifer Test Number: 223-30 Client: Crow Butte Resources, Inc.

Location: Crawford, Nebraska	Pumping Test: 2006 North Trend Aquifer Test	Pumping well: COW-5
Test conducted by: Petrotek Engineering Corporation		Test date: 6/28/2006
Analysis performed by: KRS/HPD	COW-2 Theis Type Curve Match	Analysis date: 8/24/2006
Aquifer Thickness: 26.00 ft	Discharge rate: 16.4 [U.S. gal/min]	

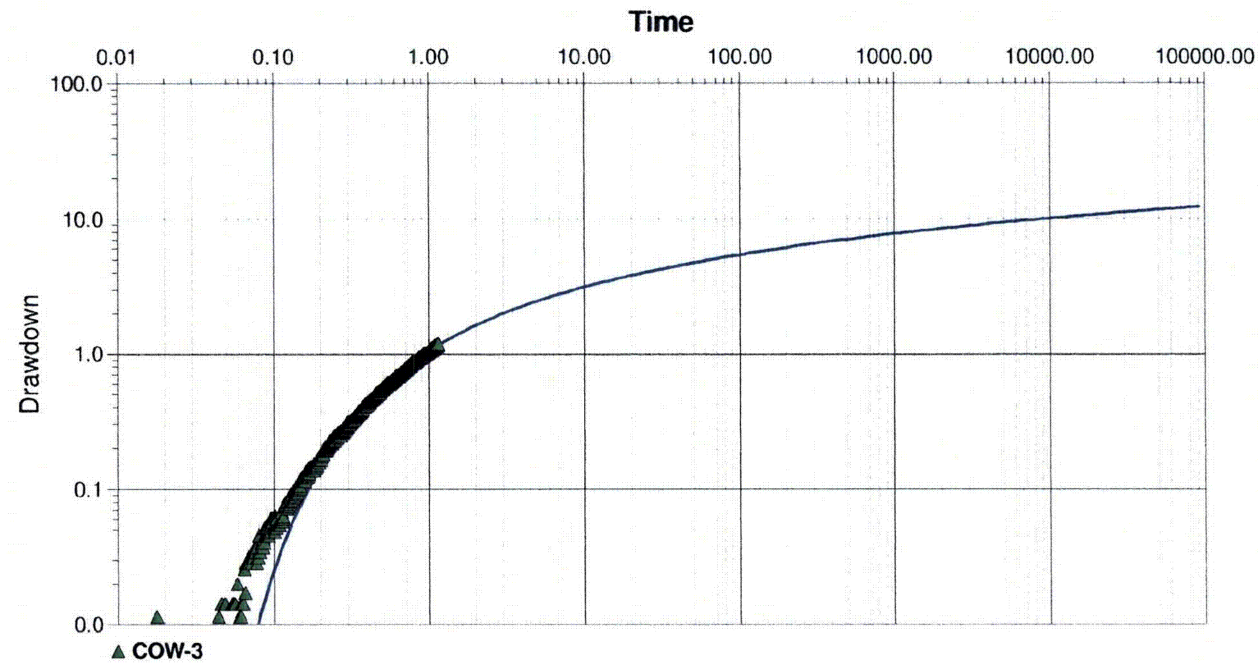


Calculation after Theis

Observation well	Transmissivity [ft²/d]	Hydraulic Conductivity [ft/d]	Storage coefficient	Radial distance to PW [ft]	
COW-2	7.48×10^{1}	2.88×10^{0}	7.05×10^{-5}	4001.38	

Petrotek 10288 West Chatfield Ave., Ste 201 Littleton, Colorado 80127-4239 303-290-9414 www.petrotek.com	**Pumping Test Analysis Report** Project: North Trend Regional Aquifer Test Number: 223-30 Client: Crow Butte Resources, Inc.

Location: Crawford, Nebraska	Pumping Test: 2006 North Trend Aquifer Test	Pumping well: COW-5
Test conducted by: Petrotek Engineering Corporation		Test date: 6/28/2006
Analysis performed by: KRS/HPD	COW-3 Theis Type Curve Match	Analysis date: 8/24/2006
Aquifer Thickness: 26.00 ft	Discharge rate: 16.4 [U.S. gal/min]	

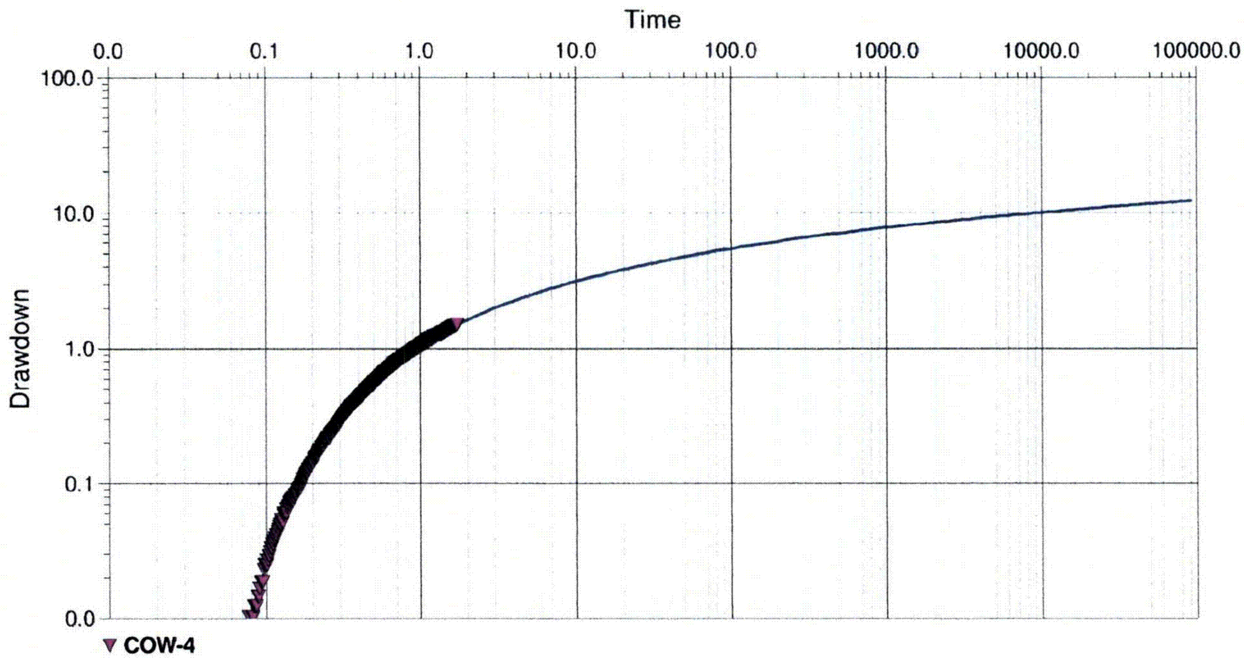


Calculation after Theis

Observation well	Transmissivity [ft²/d]	Hydraulic Conductivity [ft/d]	Storage coefficient	Radial distance to PW [ft]	
COW-3	7.15×10^{1}	2.75×10^{0}	8.40×10^{-5}	3315.0	

Petrotek 10288 West Chatfield Ave., Ste 201 Littleton, Colorado 80127-4239 303-290-9414 www.petrotek.com	**Pumping Test Analysis Report**
	Project: North Trend Regional Aquifer Test
	Number: 223-30
	Client: Crow Butte Resources, Inc.

Location: Crawford, Nebraska	Pumping Test: 2006 North Trend Aquifer Test	Pumping well: COW-5
Test conducted by: Petrotek Engineering Corporation		Test date: 6/28/2006
Analysis performed by: KRS/HPD	COW-4 Theis Type Curve Match	Analysis date: 8/24/2006
Aquifer Thickness: 26.00 ft	Discharge rate: 16.4 [U.S. gal/min]	

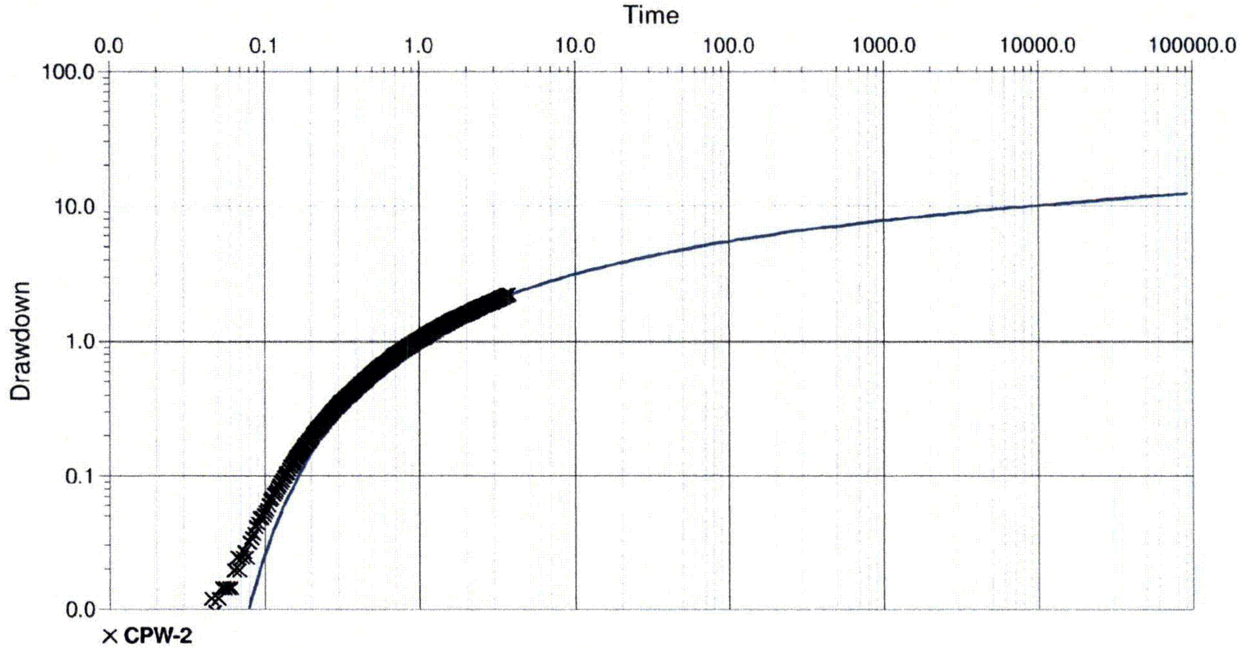


Calculation after Theis

Observation well	Transmissivity [ft²/d]	Hydraulic Conductivity [ft/d]	Storage coefficient	Radial distance to PW [ft]
COW-4	5.17×10^{1}	1.99×10^{0}	3.43×10^{-5}	3609.34

Petrotek	10288 West Chatfield Ave., Ste 201 Littleton, Colorado 80127-4239 303-290-9414 www.petrotek.com	**Pumping Test Analysis Report** Project: North Trend Regional Aquifer Test Number: 223-30 Client: Crow Butte Resources, Inc.

Location: Crawford, Nebraska	Pumping Test: 2006 North Trend Aquifer Test	Pumping well: COW-5
Test conducted by: Petrotek Engineering Corporation		Test date: 6/28/2006
Analysis performed by: KRS/HPD	CPW-2 Theis Type Curve Match	Analysis date: 8/24/2006
Aquifer Thickness: 26.00 ft	Discharge rate: 16.4 [U.S. gal/min]	

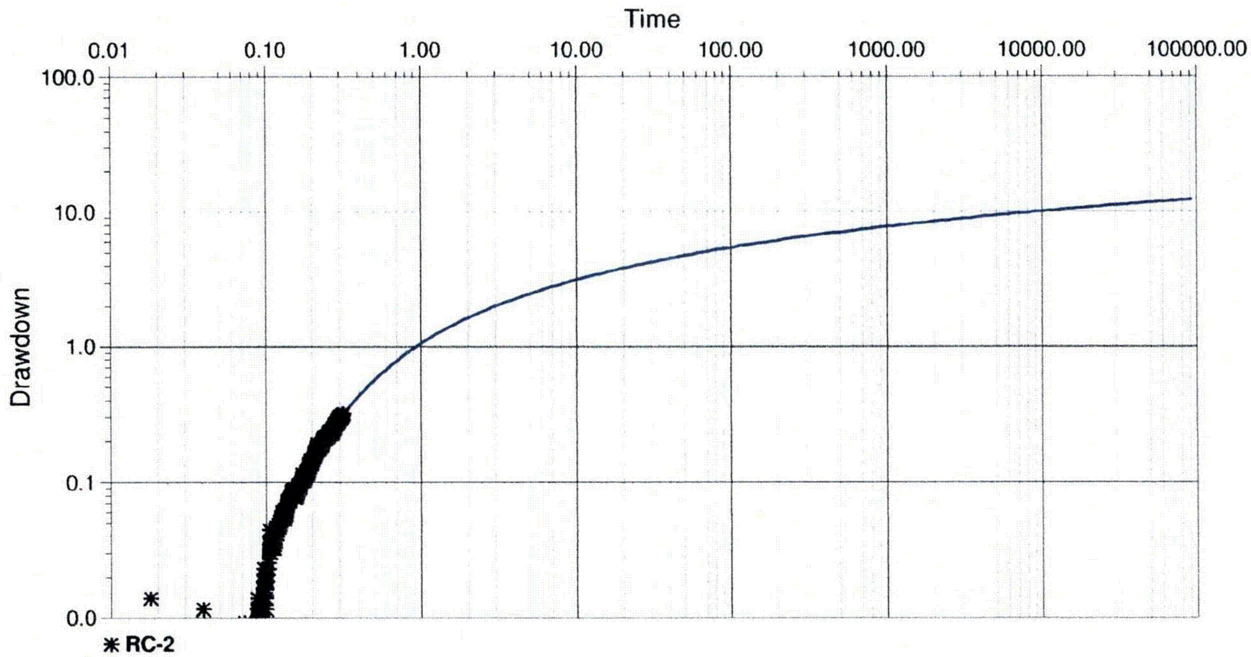


Calculation after Theis

Observation well	Transmissivity [ft²/d]	Hydraulic Conductivity [ft/d]	Storage coefficient	Radial distance to PW [ft]	
CPW-2	6.07×10^{1}	2.33×10^{0}	4.55×10^{-5}	2291.19	

Petrotek 10288 West Chatfield Ave., Ste 201 Littleton, Colorado 80127-4239 303-290-9414 www.petrotek.com	**Pumping Test Analysis Report**
	Project: North Trend Regional Aquifer Test
	Number: 223-30
	Client: Crow Butte Resources, Inc.

Location: Crawford, Nebraska	Pumping Test: 2006 North Trend Aquifer Test	Pumping well: COW-5
Test conducted by: Petrotek Engineering Corporation		Test date: 6/28/2006
Analysis performed by: KRS/HPD	RC-2 Theis Type Curve Match	Analysis date: 8/24/2006
Aquifer Thickness: 26.00 ft	Discharge rate: 16.4 [U.S. gal/min]	



Calculation after Theis

Observation well	Transmissivity [ft²/d]	Hydraulic Conductivity [ft/d]	Storage coefficient	Radial distance to PW [ft]	
RC-2	5.82×10^{1}	2.24×10^{0}	6.18×10^{-5}	6634.66	

REPORT

CROW BUTTE RESOURCES NORTH TREND EXPANSION AREA CLASS III CULTURAL RESOURCE INVENTORY DAWES COUNTY, NEBRASKA

Prepared for:

Crow Butte Resources, Inc
Crawford, Nebraska

Project/Task # CO001223.0001

Prepared by:

ARCADIS U.S., Inc.
Highlands Ranch, Colorado

February 2007

REPORT

CROW BUTTE RESOURCES NORTH TREND EXPANSION AREA CLASS III CULTURAL RESOURCE INVENTORY DAWES COUNTY, NEBRASKA

Prepared for:

Crow Butte Resources, Inc
Crawford, Nebraska

Project/Task # CO001223.0001

Carl Späth, PhD
Principal Investigator
ARCADIS U.S., Inc.
Highlands Ranch, Colorado

February 2007

ABSTRACT

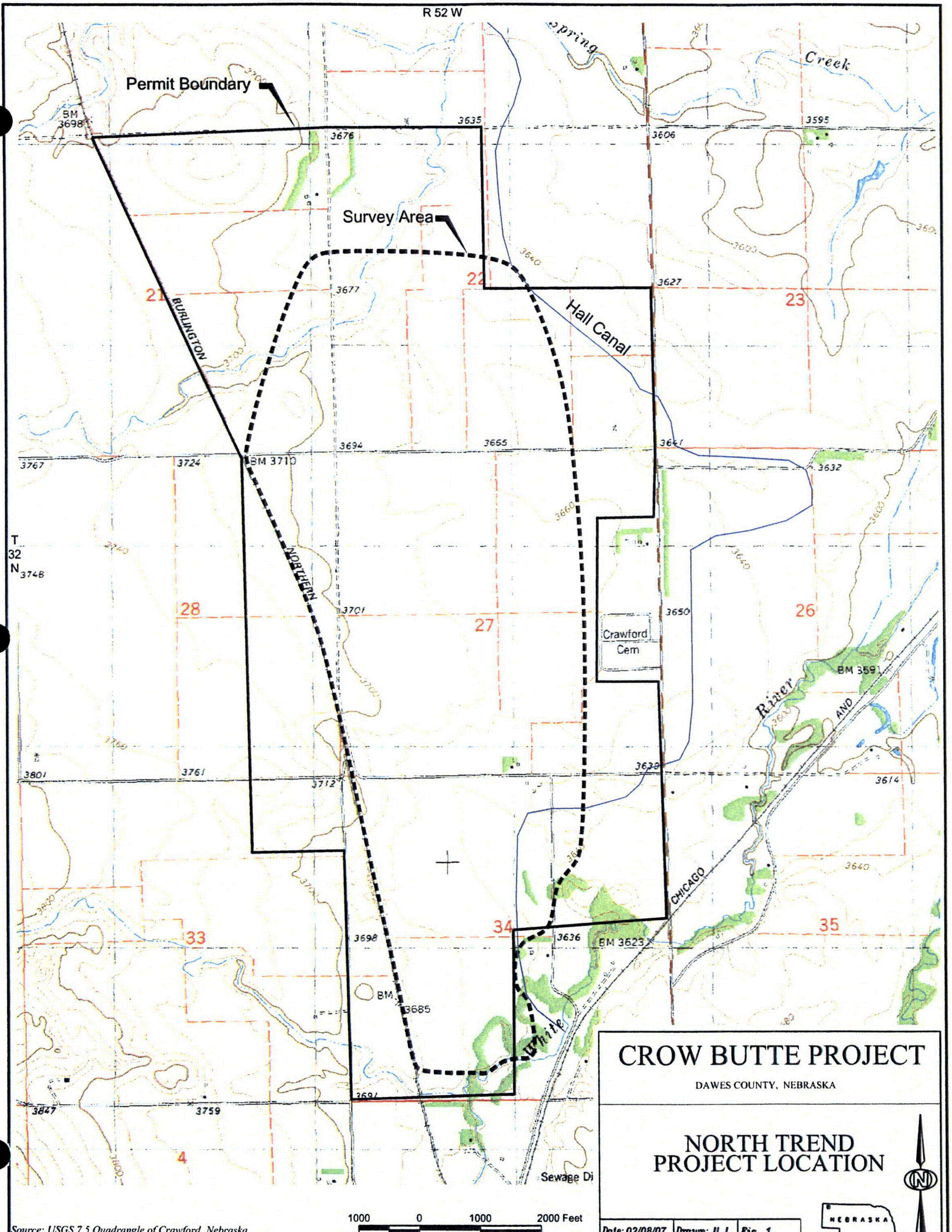
Crow Butte Resources, Inc., is preparing a license amendment application to expand its uranium mining operations to the North Trend Area north of Crawford, Nebraska. A 2,680-acre permit area was defined, and a 1,190-acre archaeological review area was defined within that permit boundary. The archaeological review area was surveyed for the presence of cultural resources that may be impacted by the proposed mine development. Three historic sites and three isolated prehistoric artifacts were located and identified. The historic sites are the ruins of an abandoned farm complex, an occupied farm complex, and a refuse disposal area. The individual artifacts are an early historic (fur trade period) metal trade point, a chert core, and a Plains Archaic chert point fragment. The occupied farm may potentially yield information important in history. The other five resources are not likely to yield information important in prehistory or history, and are considered not eligible for the National Register of Historic Places

TABLE OF CONTENTS

FIGURE

APPENDICES

Figure 1 North Trend Archaeological Review Area



Source: USGS 7.5 Quadrangle of Crawford, Nebraska
2113 Cult 001_r1.dwg

CROW BUTTE NORTH TREND CULTURAL RESOURCE INVENTORY REPORT

PROJECT DESCRIPTION

Greystone conducted an intensive pedestrian cultural resource inventory of approximately 1,190 acres north of Crawford, Nebraska. This inventory was completed for Crow Butte Resources, Inc., in support of a license amendment application. The project area is located in Sections 21, 22, 27, 28, and 34, T32N, R52W, Dawes County, Nebraska (**Figure 1**). This location can be found on the USGS Crawford (1980) 7.5 minute topographic quadrangle.

This project involves federal licensing of uranium mining administered by the Nuclear Regulatory Commission. In accordance with policies and regulations implementing Section 106 of the National Historic Preservation Act (Public Law 89-665), as amended, the cultural resource inventory was completed to locate, identify, and evaluate any cultural resources that might be affected by the proposed undertaking. The inventory was completed by Greystone archaeologists Carl Späth, Gregory Newberry, Michael Landem, Jeff Adams, and Sam Cason from August 16 through August 18, 2004. All field documentation, original records, and copies of this report are on file at the Greystone office in Greenwood Village, Colorado.

The license amendment addresses the North Trend Permit Area, a 2,680 acre area encompassing potential future mine developments north of the Town of Crawford. Within the North Trend Permit Area, a cultural resource survey area of approximately 1,190 acres was identified for potential development over the next 10 years. The latter area was surveyed intensively for the presence of cultural resources that might be impacted by mining development and operations.

The objective of this cultural resource inventory was to locate and record any cultural resources that might be within the area of potential effects (APE) of the proposed project, and to provide recommendations of eligibility to the National Register of Historic Places (Register). Management recommendations for treatment of any discovered resources were to be made in accordance with their recommended Register evaluations and potential impacts.

AFFECTED ENVIRONMENT

The survey area extends from about ½ mile to 3 miles immediately north of the Town of Crawford. It spans from the banks of the White River on the south to Spring Creek on the north, and from about ¼ mile west of Nebraska State Highway 2 on the east to the Burlington Northern-Santa Fe Railroad (BNSF) tracks on the west. This area is within the upper White River valley. Local topography is dominated by open, rolling loess plains. Bedrock capped buttes rise sharply immediately west of Crawford, and there is another group of buttes to the southeast. Survey area elevations range from 3,430 feet above mean sea level west of Hill Road in the southeast portion of the survey area, to 3,710 feet at Moody Road and the BNSF Railroad at the west edge of the survey area. The entire survey area has been cultivated, except for narrow bans along the White River and Spring Creek, and areas immediately around rural buildings or foundations.

Soils in the survey area are fine silty sand. The sediments appear to be a mix of residual material weathered from local substrates and reworked eolian materials. Local exposures of bedrock are dominated by a pale gray mudstone or claystone.

Vegetation in the project area is predominantly wheat and alfalfa stubble with scattered invasive grasses and forbs. Areas along the banks and terraces of Spring Creek support low yucca, sunflower, grasses and forbs. The lower protected areas along the White River support cottonwood, woody underbrush, grasses, and forbs.

The common large mammals found in the area are elk and deer. Bison were also present in the area historically. Small mammals include many small burrowing rodents.

BACKGROUND INFORMATION

Records Search

An architectural and structural properties search was conducted through the Nebraska State Historic Preservation Office (SHPO) and an archaeological site search was completed through the Archeology Division of the Nebraska State Historical Society. These records searches were completed to identify previous investigations and known archaeological and historical sites in the North Trend permit area. The architectural and structural properties search did not identify any documented historic buildings or structures in the permit area. However, the SHPO pointed out that several buildings were shown on the USGS topographic map, and that it was likely that some of them may need to be recorded as historic buildings. The BNSF, Union Pacific Railroad (UP), and Crawford Cemetery are close to but outside the permit area, and were not recorded for this survey. The archaeological site search did not show any formal archaeological investigations within the permit area. It did show one known historic site, the Hall Brothers Mill (25DW501), within the permit area, and a Native American site (25DW73) outside the project area. The historic site is the Hall Brothers Mill, which operated from the 1880s to 1929. The 1980 site form indicates that building foundations and a portion of the dam were still present the previous year. The 1959 site form for the prehistoric site (25DW73) describes it as a small surface scatter with some burned bone in a previously cultivated field. Information on the Native American site is scanty.

Cultural Setting

Today the Crawford area is known for its hunting, and nomadic hunters utilized the area long before the arrival of Europeans. Deer, elk, pronghorn antelope, and game birds are still common. Bison, which were once numerous in the area, were exterminated in the late 1800s. The gravels of the White River and its tributaries yield good quality cherts and quartzites that were used by prehistoric groups to manufacture stone tools. These cherts and quartzites are similar to materials common in the Spanish Diggings and Hartville Uplift areas of southeast Wyoming.

Prehistoric Context

The prehistoric archaeology of the Central Plains is conventionally divided into five traditions that are characterized by common patterns of technology and lifestyle. These traditions are Paleoindian (9,000 to 12,000 years ago), Archaic (2,000 to 9,000 years ago), Plains Woodland (1,000 to 2,000 years ago), Plains Village (600 to 1,000 years ago) and Postcontact (100 to 400 years ago). In many respects, the traditions of northwestern Nebraska are more akin to the Northwestern Plains traditions. Aspects of the stone tool technology of these regions are shared, but the pottery and settled villages that characterize the cultures of eastern Nebraska are absent. The nomadic traditions contemporary with Plains Woodland and Plains Village are often grouped together as Late Prehistoric. Each of these traditions is briefly characterized in the following paragraphs.

Evidence of the Paleoindian tradition begins with the end of the Pleistocene about 12,000 years ago. Several complexes of relatively large, well-made, bifacially chipped stone tools that share common traits over large areas characterize the tradition. Some distinctive stone types, such as Yellowstone obsidian, Knife River flint, Alibates chert, Hartville Uplift chert, and Spanish Diggings quartzite, were preferred raw materials for these tools, and are found in sites far from their source areas. Most known sites are large game kill sites or butchering sites, although a number of small campsites and burials have also been documented. The earlier complexes of this tradition are often associated with mammoths, camels, and extinct species of bison. Later complexes are associated with modern types of game animals, including small animals, and an increasing use of wild plant resources, foreshadowing patterns that would be typical of the subsequent Archaic tradition.

The Archaic tradition began about 9,000 years ago. Although there are widely shared attributes in bifacially chipped stone tools, they tend to be less finely made than their Paleoindian predecessors and exhibit more local variation. In addition, ground stone implements become much more common. Chipped stone tools in this tradition were also typically made of locally available stone types. The sites exhibit evidence of more diverse hunting and foraging, utilizing both large and small game species and a wide range of wild plant resources. The evidence indicates a continued nomadic lifestyle, but the prevalence of local resources and the reduced similarities in certain tool styles over large areas suggest that the movement of people was more localized.

The Woodland tradition began about 2,000 years ago and is marked by innovations in technology, subsistence, and settlement. Elements of this emerging tradition were borrowed or brought from cultural traditions in the woodlands regions east of Nebraska. Among the technological changes was the widespread appearance of small bifacial points for arrows. Earlier points had been larger forms used on hand-held spears, darts thrown with atlatls, and comparatively large arrows used with simple bows. A second technological change was the appearance of fired clay (ceramic) vessels for storage and cooking. An accompanying change in settlement in some areas was the emergence of semi-permanent dwellings in sites that were occupied year-round, or re-occupied seasonally. A Woodland trait shared with traditions farther east is the emergence of elaborate burials in earthen mounds. Nomadic Plains Woodland groups shared aspects of the biface and ceramic technology, but are not associated with semi-permanent dwellings or elaborate mound burials.

The Plains Village tradition emerged in this region about 1,000 years ago. In areas that had been characterized by semi-permanent dwellings and mound burials during the Woodland tradition, there was a marked change in subsistence and material culture. In contrast, there was little evident change in the subsistence patterns of nomadic groups. A major change in the subsistence of sedentary groups was the intense use of garden horticulture based on maize, beans, and squash. Hunting and wild plants continued to be important as well, but garden horticulture became an important source of storable food surplus. Pits for storage of food and tools are often found below the floors of habitations.

The Postcontact period began approximately 400 years ago with the first Spanish colonies in the American Southwest and the establishment of permanent Northern European colonies for the fur trade in eastern North America. The early influences of European presence are virtually invisible in the archaeology of the Central Plains. Even as the fur trade expanded westward and the Spanish expanded northward, physical evidence of European presence is sparse. But by the early eighteenth century, trade goods have spread into areas that no European is known to have visited, virtually all Native American cultures are directly or indirectly affected by the fur trade or Spanish missions, and Old World diseases have crept across the continent. Soon firearms would reach the Plains from fur trading forts, large numbers of horses would be available in the region, and European traders would begin visiting Native villages and establishing trading forts. The early smoothbore trade guns were loud, but of no great advantage to the nomadic plains tribes. They were inaccurate and took a long time to reload. The horse was firmly established in Plains Indian culture before the breach-loading rifle was available in the mid-1800s. The historically documented groups of western Nebraska include Apache, Lakota, Crow, Kiowa, Cheyenne, Arapaho, and Pawnee. These groups were nomadic or semi-nomadic hunters involved in the fur and hide trade. The Lakota, Crow, Cheyenne, and Arapaho were only a few generations removed from more sedentary village traditions, and the Pawnee were still village dwellers or closely associated with sedentary villages. These historical groups embody the classic Plains Equestrian stereotype of the American Indian. Individual free trappers from eastern tribes such as the Iroquois or Delaware are noted occasionally in accounts of the region, but in terms of material remains, these individuals would be indistinguishable from trappers of European or mixed ancestry.

Historic Context

Sustained European presence in northwestern Nebraska began with the fur trade. James Bordeaux established a small trading post along the White River in 1837. In 1841 Louis Chartran managed a competing trading post near modern Chadron. The European traders were preceded in the region by Native American middlemen, including Lakota and Cheyenne bands, who were involved in traditional Native American trade systems and trade with Europeans. The primary products sought for the European markets in this period were furs and hides. The Europeans produced blankets, cloth, metal implements, tobacco pipes, and trinkets such as beads for the Native Americans. Popular metal items included pots, knives, and arrow points. Trade guns were also produced in quantity, but were not a popular item among the Plains tribes. These single-shot, muzzle-loading guns were not very accurate and were not easily reloaded on horseback. Archaeological sites of this period, outside the documented trading posts and other clearly identifiable European sites, are typically identified as Postcontact Native American sites.

After the trade in furs diminished in the 1850s, farmers began to settle the region. In the early 1870s the settlement that would become Chadron was established at the confluence of the White River and Chadron Creek and in 1874 Fort Robinson was established about 25 miles to the west along the White River. Fort Robinson was established to protect the Red Cloud Indian Agency after it was moved from the Platte River in Wyoming, and also to protect the Sidney to Deadwood Trail. The fort was named for a lieutenant who was killed that year by Indians from the Red Cloud Agency. The first Red Cloud Indian Agency had been established in 1868 in Wyoming at the end of Red Cloud's War in the Powder River Basin. Red Cloud was an Ogallala Lakota leader who opposed the Bozeman Trail from Fort Laramie to the Montana gold fields. Other Lakota bands, as well as Cheyenne and Arapaho, also supported Red Cloud in his opposition to the trail.

In 1877 Crazy Horse and a large band of Lakota warriors surrendered at Fort Robinson. Although Sitting Bull's Hunkpapa Lakota and other followers were still free in Canada, the surrender of Crazy Horse marked the end of the US Army's Powder River campaign. Four months later, while being escorted through the fort, Crazy Horse was killed. Later that year the Red Cloud Agency was moved to a new site on the Missouri River. Fort Robinson remained. Troops from Fort Robinson were involved in the capture of Dull Knife and the Cheyenne Outbreak of 1879. Later they were involved in the Pine Ridge Campaign and the battle of Wounded Knee.

A small civilian settlement developed northeast of the fort. In 1886, the Fremont, Elkhorn and Missouri Valley Railroad (FE&MVR), then a subsidiary of the Chicago and Northwestern Railroad, established depots at the fort and at the small settlement that would become Crawford. Three years later, the Chicago, Burlington, and Quincy Railroad (CB&Q) also built through Crawford. With a railroad to haul freight to the Black Hills, the Sidney to Deadwood wagon road was no longer economically viable, and was abandoned. Early Crawford was dominated by saloons and gambling houses, but it soon became an important center for ranchers and farmers. By the late 1880s a water-powered saw mill and flour mill was operated by the Hall brothers northeast of Crawford along the White River. This mill provided lumber, flour, and cattle feed to the local farmers and ranchers. The mill burned in 1929.

Fort Robinson remained a cavalry post until 1919, and with access to the nearby railroads, this fort surpassed Fort Laramie in importance in the region. Even after it was no longer a cavalry post, it remained an important training and breeding center for army horses and mules. From 1935 to 1939 the US Olympic Equestrian team trained at Fort Robinson. In 1943 a German prisoner-of-war camp was built between the post and the town of Crawford. After the war, military activities at Fort Robinson were phased out, and in 1948 it was turned over to the US Department of Agriculture for use as a beef research station.

The old FE&MVR tracks, now operated by the UP, pass along the southeast of the North Trend permit area near the White River, and the CB&Q, now the BNSF, crosses through the western portion of the North Trend permit area. The land has been cultivated for wheat and alfalfa for many years. Few traces of prehistoric settlements, early historic roads, or the military history of the area are likely to be preserved in the upland areas away from the White River and its larger tributaries. Much of what remains will be artifacts scattered through plowed fields and historical features associated with farming and ranching.

STATEMENT OF OBJECTIVES

Following state and federal policies and regulations implementing Section 106 of the National Historic Preservation Act (Public Law 89-665) as amended, this project area was inventoried to identify any cultural resources within the APE of the proposed project. Any discovered cultural resources were to be evaluated for eligibility to the Register under the Criteria for Eligibility (36 CFR 60.4 a-d). Register eligibility is evaluated in terms of the integrity of the resource, and: (a) its association with significant events, or patterns in history or prehistory; (b) its association with the specific contributions of individuals significant in our past; (c) its engineering, artistic, or architectural values; or (d) its information potential for important research questions in history or prehistory.

Prehistoric resources are most often evaluated under Criterion d, for their potential to yield information important in prehistory. Significant information potential in a prehistoric site requires that the site contain intact cultural deposits or discrete activity areas that can be securely associated with a temporal period or discrete cultural group. The potential for intact deposits or cultural/temporal associations may be inferred from surface evidence of cultural features or undisturbed Holocene deposits, and the presence of temporally or culturally diagnostic artifacts. Historic resources may be evaluated under any of the Criteria. However, in the absence of structural features or documented association with significant historic events or the important contributions of persons significant in history, historical resources more than 50 years old are evaluated under essentially the same criteria as prehistoric resources.

Based on information available from files searches and previous research experience in the area, Greystone anticipated that prehistoric and historic cultural resources would be present, but would consist of a small number of prehistoric and historical artifact scatters. A slightly higher proportion of artifacts or features was expected near the drainages (Spring Creek and White River). At least two historic farming complexes with standing buildings or foundations were noted on the aerial photographs and topographic maps.

METHODS

The cultural resource inventory was completed by parallel pedestrian transects at 20- to 30-meter intervals. Surface visibility was excellent (90 to 100 percent) over most of the survey area. There were a few fields with slightly higher or denser stubble or weeds, and the grasses and forbs on uncultivated areas near the drainages were low and open. The only areas of higher and denser vegetation where visibility was fair to good were within historical sites (around historical buildings and foundations). Surface visibility and weather were excellent for the discovery, documentation, and evaluation of cultural resources.

Discovered cultural materials were classified as sites or isolated finds were documented on Nebraska State Historical Society Archeological Site Survey forms, and their locations were plotted on 7.5' US Geological Survey (USGS) topographic maps. The locations were also plotted on 1:12,000 scale orthophoto maps and GPS readings were taken of each location. An isolated find consists of five or fewer surface artifacts with no associated cultural features and minimal potential deposition. A site consists of five or more artifacts within 50 meters of one another, or at least one cultural or structural feature. The same Archeological Site Survey form is used for both sites and isolated finds, but site sketch plans were not drawn for isolated artifacts. The full extent of each site was established, a site sketch plan was drawn, and the site area and any distinctive features were photographed. Any distinctive or diagnostic artifacts were drawn to scale and photographed. Artifacts were not collected unless they were distinctive and unusual, and could not be adequately documented in the field.

RESULTS

A total of 1,190 acres was surveyed for the presence of cultural resources. Field conditions were excellent for the discovery of cultural resources, and the survey area did not contain any extensive areas of Holocene deposition that might contain buried cultural resources. The channel and benches along Spring Creek were well-scoured, exhibiting patches of bedrock mantled by poorly-sorted, high-energy sediments. The current channel of the White River, at the south end of the survey, is deeply incised below the narrow historic floodplain. Abandoned channels and cutbanks did not exhibit any evidence of buried surfaces that might be associated with cultural levels.

Three historical sites (25DW296, 25DW297, and 25DW298) and three isolated prehistoric artifacts (25DW299, 25DW300, and 25DW301) were located and documented. In addition to the recorded cultural resources, two small wooden power poles were noted at the north end of the survey area. No additional poles were seen near the survey area to speculate on the trend or destination of the line. Each was a peeled, untreated pole about 10 to 12 feet high. Near the top of each were bolt holes through the pole and flattened areas about 4 inches wide on each side where three sets of cross members had been bolted. One of the poles also had a single threaded wooden dowel for attachment of a glass or ceramic insulator. No insulator fragments were found. The historic sites included the ruins of an abandoned farm core complex (25DW296), one occupied farm core complex with an adjacent schoolhouse foundation (25DW297), and a small refuse disposal area (25DW298). The prehistoric artifacts consisted of a metal trade point (25DW299), a chert core (25DW300), and a chert point fragment (25DW301). Each of these finds is discussed briefly below.

25DW296 (CB-S-1)

This site is the ruins of a farm core complex in a small area of trees, brush, high grasses, and forbs. Three structural features include a house foundation with collapsed wall remnants and sheet metal wood stove parts (Feature 1), a collapsed stock shelter and pen or corral (Feature 2), and an overgrown concrete sill foundation and building debris (Feature 3). Associated materials include sheet metal parts of a wood-burning stove, coil bed springs and a tubular metal head frame, clear glass jar fragments, brown bottle glass, crimped seam beer cans, rectangular solvent cans, a galvanized metal wash basin, and red modular bricks. The site is on the west side of the old section line road. The road is still in use to the south of the site, but is abandoned and overgrown on the east side of the site and has been plowed under north of the site. The stove parts include parts of at least two wood stoves. A stove part near Feature 1 is embossed "Majestic Mfg – St Louis." One of the stove parts in Features 2 is marked "New Perfection No. 3." All of the buildings have collapsed, and interpretation of their function is based on size and associated debris. Feature 1 was probably a small wood frame house. Feature 2 was probably an animal shelter or shed and a fenced pen. Feature 3 was probably a barn. Most of the trees are around Feature 1. The ground surface in the site area is irregular, with many small swales and berms, and is heavily overgrown with tall weedy grasses and forbs. Overall, there are few visible artifacts. Most of the material on the site is structural debris (wood, bricks, concrete) or large items associated with the structures such as the wood stoves and bed frame. There are relatively few cans and bottle fragments, and many of them are comparatively recent beer containers.

Feature 1 consists mostly of a shallow, irregular depression with scattered and heaped fragments of milled lumber. The lumber is a mix of 2-by-4-inch studs, 1-by-10-inch planks, 1-by-6-inch tongue-in-groove boards, 1-by-¼-inch lath, and a few pieces of decorative trim. Some small portions of walls within large heaps of debris are still articulated and still have patches of plaster on the lath. All of the nails in the lumber are wire nails. A small cluster of bricks and a nearby stove pipe near the east edge of the feature may represent the location of a chimney.

Feature 2 is a roughly rectangular area (16 by 39 feet) bordered by irregularly spaced fence posts (both standing and fallen), at least one fence rail, and fence wire. Near the west end of this area is a small galvanized metal water tank and an irregular pile of lumber and wall elements. This may have been a shelter or shed, or may be lumber piled here from another location. Nearby debris includes fragments of galvanized, corrugated sheet metal and fragments of window screen. Just east of this heap of lumber is a sheet metal wood or kerosene stove.

Feature 3 consists of a fairly complete concrete sill foundation that is about 55 feet square. The sill is about 12 inches tall and 8 inches wide and is made of very coarse concrete containing large cobbles. There is milled lumber scattered about the foundation, including 2-by-4-inch studs, 1-by-12-inch planks, and 1-by-4-inch tongue-in-groove boards. Some articulated studs and planks joined with wire nails appear to be portions of walls as high as 6 feet with no interior facing. Among the debris there are also some un-milled posts, roughly milled timbers, and large strap hinges. The foundation area is slightly raised above the surrounding ground and the area is densely overgrown with brush, sweet clover, and sunflowers. The size and structural debris suggest that this was a barn.

25DW297 (CB-S-2)

This site is a moderate-sized occupied farm complex. Standing buildings include a house, a garage, four barns, and a granary. In addition, there are two foundations, three round galvanized grain bins, and several parked or abandoned pieces of farm machinery. The grain bins are currently northeast of the garage. The owner remembers that they were moved from south of the old granary. All but one of the standing buildings have been remodeled and refaced, and it is difficult to judge their age from their external appearance.

Building 1 is a one-story, wood-frame house with a 3/12 pitch hipped roof. The house is currently faced with horizontal lap siding and a half-height brick veneer. All windows have been replaced with aluminum frame casement windows. The roof has asphalt shingles. Current external appearance is late 1960s or later ranch-style. The owner says that they removed a second story from the house when they remodeled.

Building 2 is a wood-frame, 3-bay garage with a 6/12 pitch side-gable roof. It is northeast of the main house. There are three garage doors and a regular door at the southeast corner. The building is clad with 1-by-6-inch horizontal lap siding and the roof has asphalt shingles.

Building 3 is a wood-frame, 2½ story front-gable barn with a shed addition on the east side. The building is clad with 1-by-4-inch horizontal tongue-in-groove siding and the 6/12 pitch roof has asphalt shingles.

Building 4 is a wood-frame, drive-through, 1½ story, front gable granary. There is a square cupola in the center of the gable. The building is clad in horizontal tongue-in-groove siding. The large double doors on the west elevation are hung on roller tracks. It has a hand-mixed concrete foundation. This style of granary was built in many areas from the 1920s through the 1940s, and no features were noted that would suggest a more exact date of construction.

Building 5 is a 2-story, end gable, drive-through granary. The granary has a cinder block foundation and the lower walls and buttress walls are poured concrete and brick. There are three 8-foot-high buttress walls on the north side of the building resting on a concrete slab that runs the full length of the building. The upper portion of the building is wood-frame with 1-by-6-inch horizontal tongue-in-groove siding. The roof is galvanized, corrugated sheet metal. There are two round poured-concrete pads on the south side for silos or grain bins. Drive-through granaries were built from the early 1900s onward, but became more popular in the 1920s with the increasing use of trucks and tractor-drawn wagons and machinery.

Building 6 is a wood-frame machine shed consisting of a mansard roof on a low foundation wall. There are large tracked doors on the west end. The building has 1-by-6-inch gusseted trusses and 1-by-8-inch horizontal plank sheathing on the end walls. The roof is galvanized corrugated sheet metal and the floor is a poured concrete slab.

Building 7 is a wood-frame, side-gable barn with horizontal tongue-in-groove siding. The roof is galvanized, corrugated sheet metal. The barn opens to a corral on the south side, and the interior appears to be pole-frame with a dirt floor.

Building 8 is a raised stone foundation with a concrete veneer. There are some remnants of brick lower walls, and a wide concrete stairway on the south side. There is a brick and concrete pad near the middle of the foundation and burned remnants of a kerosene or coal oil furnace. There is also a fuel storage tank near the southeast corner. There are numerous indications that the building burned down. The building is set apart from the other buildings in a fenced area. The owner remembers that this was a schoolhouse.

Building 9 is shown on the topographic quad as an abandoned building. It is the location of an old house. There are remnants of wood framing, an earth foundation, and small amounts of brick. On the south side of the foundation pad are a hand pump for a well, a clothes line, a tripod windmill, and a tractor-drawn seed-drill. Well-established trees around the foundation pad indicate that the house had been in this location for many years. Debris (clear and amethyst glass, heavily rusted sanitary cans, and white glazed crockery) suggest occupation at least as early as the 1920s.

This farm complex contains elements typical of a family farm. The old granary and materials around the house pad suggest that this farm has been occupied since at least the 1920s. However, most of the buildings have been remodeled and refaced, and the exterior appearance of the buildings and structures suggests 1960s or 1970s construction. No patent information was found for this location in the General Land Office database.

25DW298 (CB-S-3)

This site is a refuse disposal area on a low hilltop across Hill Road from 25DW297. This site is probably related to the latter site, but is spatially separated. There are berms and depressions on the hilltop indicating earthmoving activity. This location may have been used as a small fill or gravel source, or there may be materials buried here. There is no evidence of former structures in this location. The artifacts are thinly dispersed. Materials observed included a galvanized 5-gallon milk can, a gasoline tank from a truck or tractor, segments of sheep-wire, a green glass bottle with a rubber stopper and attached dauber/brush, a truck running board, a mail box on boards, truck seat springs, a metal handle and lever, a grease can lid, part of a truck tailgate (Ford), an Owens-Illinois clear glass bottle base, blue glass fragments, miscellaneous metal machine parts, and fragments of sheet metal. Most of the identifiable material appeared to be from the 1950s.

25DW299 (CB-I-1)

This is an isolated metal trade point found in a plowed alfalfa field.. The triangular stemmed point was cut from a forged metal sheet, and the blade edges were ground to a bevel. The point measures 70.5 mm maximum length, 20.3 mm maximum width at the shoulder, and 2.4 mm maximum thickness. The stem was cut straight, with an expanded base. The stem measures 8.2 mm maximum length, 9.3 mm maximum width, and 6.3 mm minimum width. The point appears to have been bent and re-straightened about 31 mm from the tip. There are no distinctive markings on the artifact. This general type of metal point was produced by fur trade companies and produced locally by blacksmiths as a trade item. Illustrated points of comparable size and form from eastern Wyoming and western South Dakota typically have serrated stems. The forging and cutting of the point would be consistent with common technologies of the 1840s through 1870s. This specimen is identical to one recovered at the Wagon Box Fight near Sheridan, Wyoming. The Wagon Box Fight was participated in by several Lakota groups, including Red Cloud's Band. Consequently it is likely that this point is associated with the Red Cloud Agency at Fort Robinson from 1873 through 1877, and not with the earlier fur trade posts of James Bordeaux and Louis Chartran along the White River.

25DW300 (CB-I-2)

This is an isolated, maroon chert core found in a plowed wheat field. It is a sub-angular pebble with dark gray and tan cortex that has had about eight flakes removed from around the edges. There is no evidence of use.

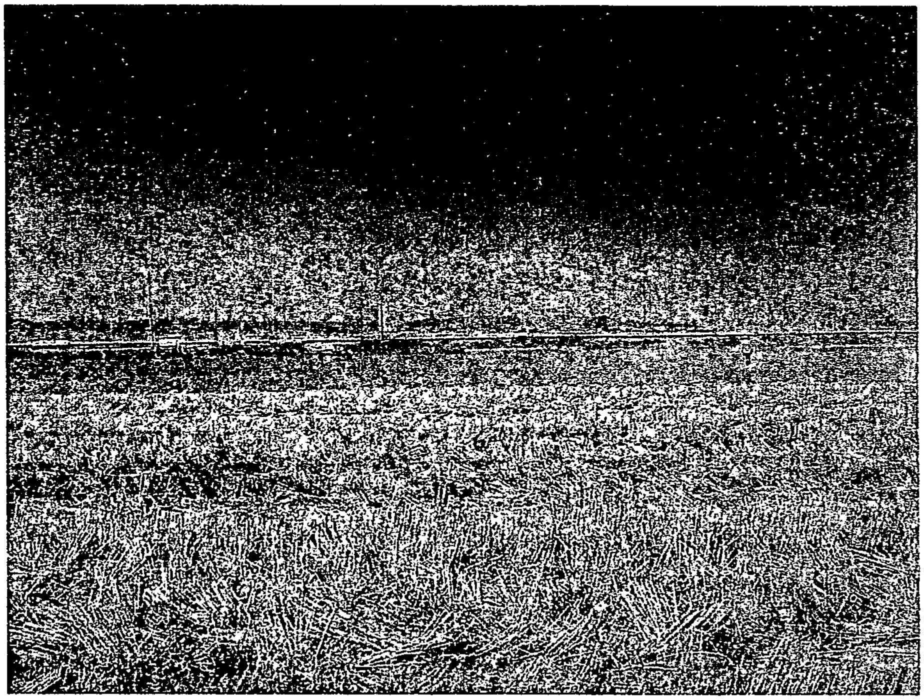
25DW301 (CB-I-3)

This is an isolated triangular, beige chert point found in a plowed wheat field. The base has been broken. The flaking is unpatterned and it has a lenticular cross-section. The size and form is Archaic, but without the base, it cannot be associated with a type or phase. The point measures 32.0 mm maximum length (broken), 16.2 mm maximum width, and 4.0 mm maximum thickness. The base is missing, although there are traces of a notch or shoulder near one edge of the break.

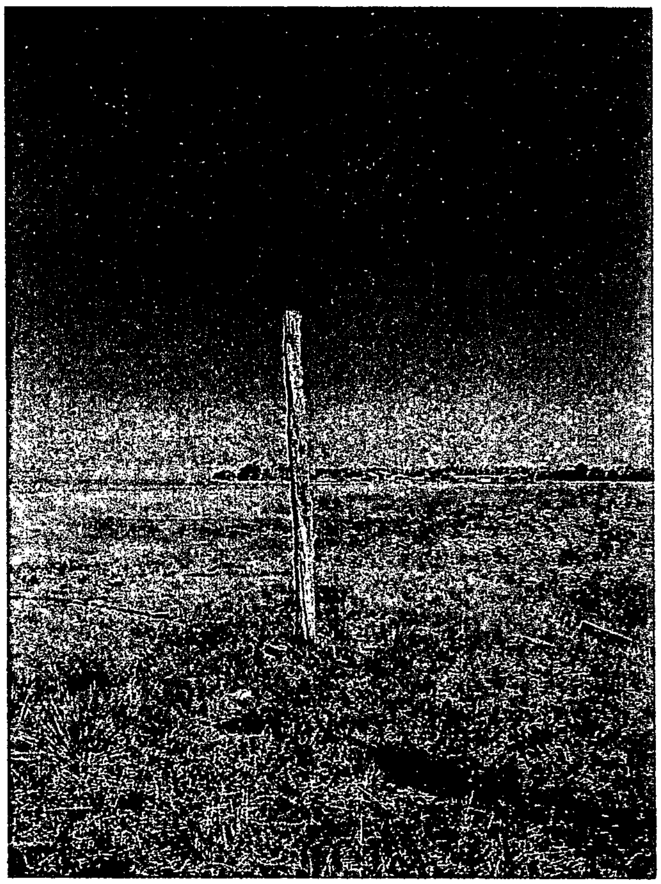
EVALUATION AND RECOMMENDATIONS

The project survey area contained six cultural resources. The resources were the ruins of a small farm complex, a larger occupied farm complex, a refuse disposal area, a metal trade point, a chert core, and a chert point fragment. The occupied farm complex has been remodeled, and no longer has the appearance of its historic period of use. However, this site may potentially yield information regarding rural farming of the 1920s through 1960s. Because the farm is occupied, it is unlikely that there will be direct disturbance in the immediate future. If this site will be disturbed by future mining developments, it is recommended that current documentation be supplemented with a title history and copies of county tax assessor's records concerning the approximate age and former appearance of the buildings and structures. The remaining sites and isolated artifacts have little or no potential to yield additional information important in history or prehistory. It is recommended that these remaining resources are not eligible for the National Register, and that no further cultural resource work is necessary.

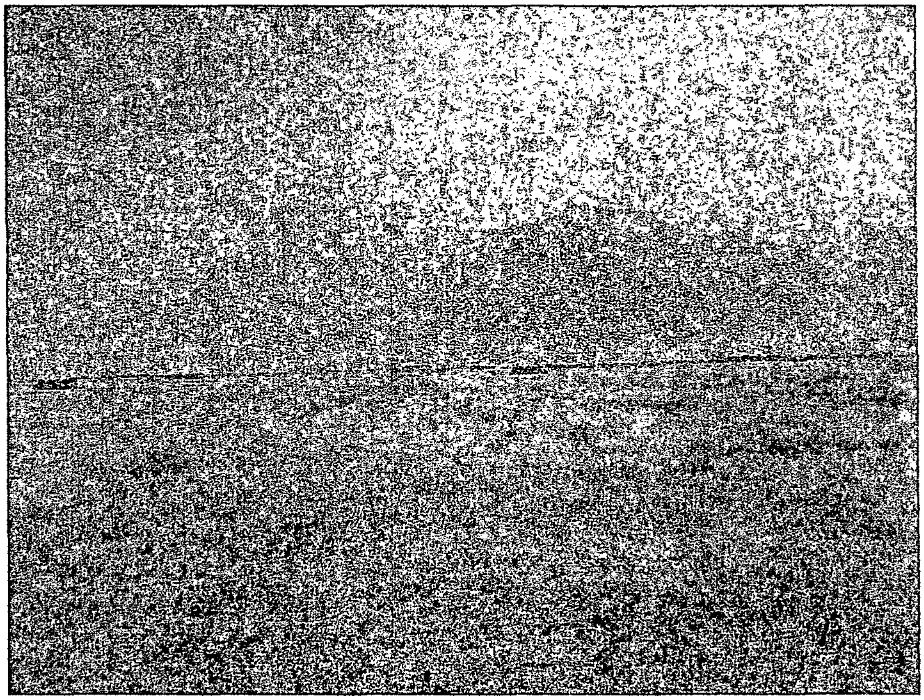
APPENDIX A
PROJECT PHOTOGRAPHS



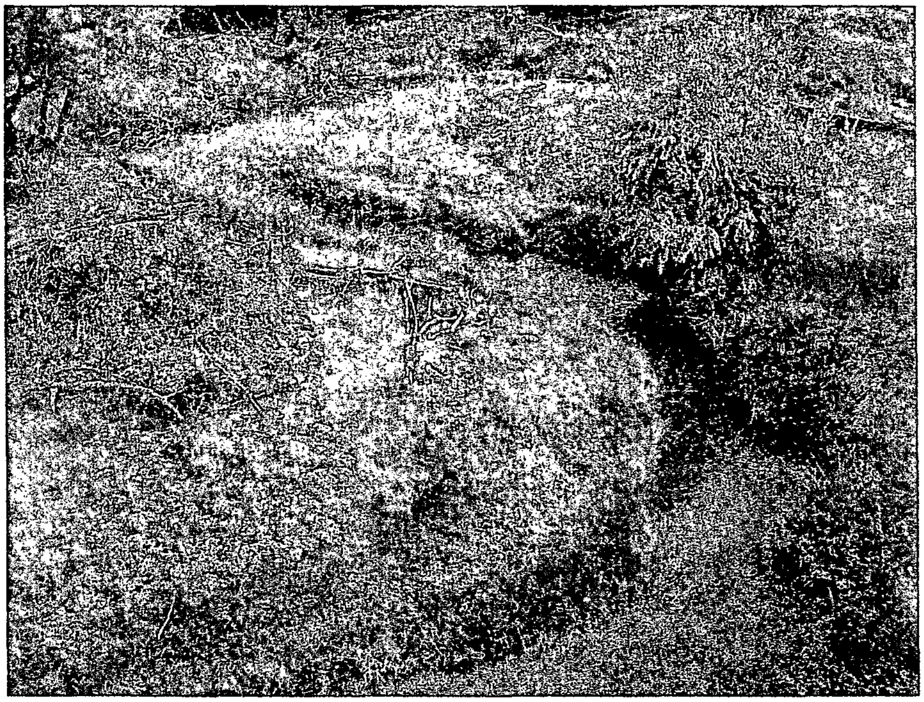
West across portion of survey area to active Burlington Northern Santa Fe Railroad.



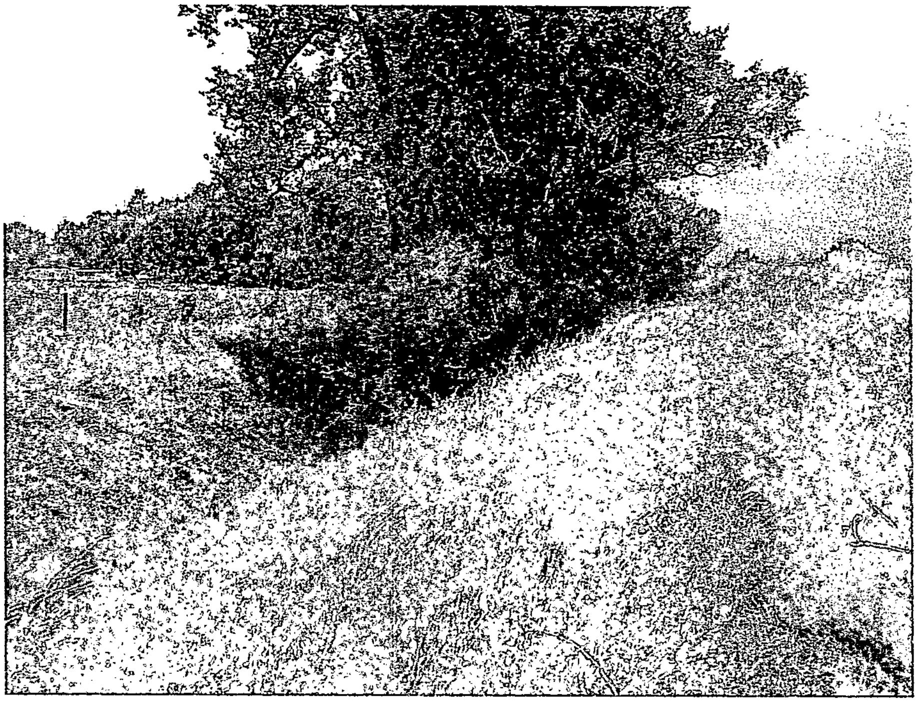
Isolated phone and power pole near Spring Creek.



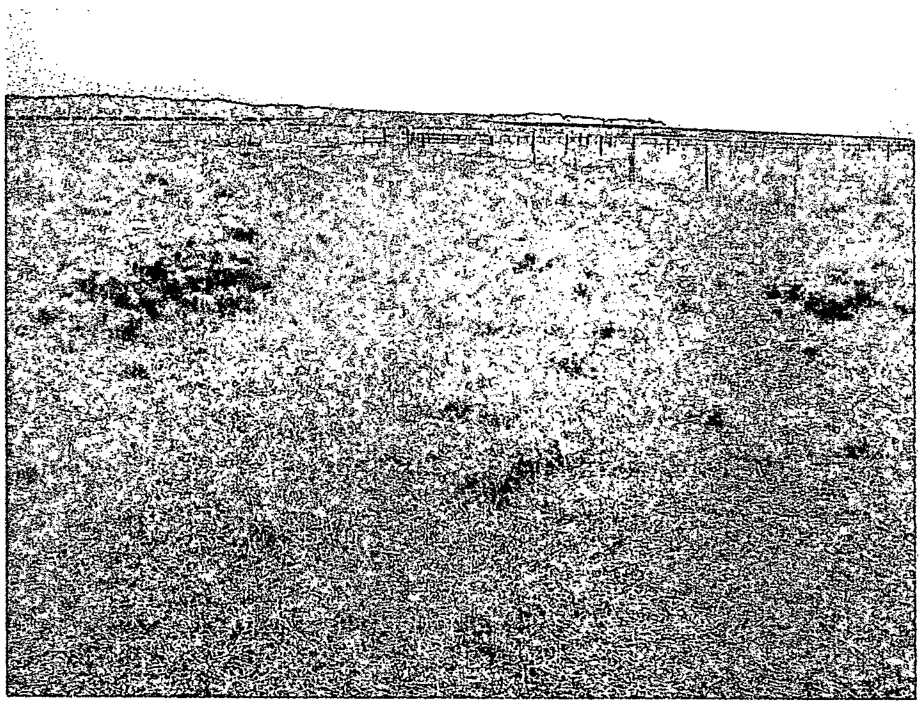
Strip fallow fields in northern part of survey area.



View south to White River from south end of survey area.



Portion of Hall Canal near southeast edge of survey.



Portion of Hall Canal west of Hill Road crossing.

TABLE OF CONTENTS

JOINT FREQUENCY IN PERCENT, DIRECTION INDICATES WHERE WIND IS FROM FREQWS=0.10263,0.28970,0.30245,0.21999,0.07389,0.01933

MPH	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTALS
STABILITY CLASS 1																	
1.5	0.0560	0.1420	0.0930	0.0370	0.0680	0.0190	0.0560	0.0250	0.0560	0.0310	0.0430	0.0370	0.0370	0.0430	0.0370	0.0870	0.8670
5.5	0.4880	0.4950	0.4820	0.2470	0.1110	0.0490	0.0990	0.1420	0.2100	0.1110	0.2100	0.1170	0.0990	0.0800	0.1300	0.2230	3.2930
10.0	0.1480	0.1670	0.0740	0.0310	0.0430	0.0120	0.0930	0.0930	0.0870	0.1170	0.0870	0.0870	0.0990	0.0560	0.0870	0.1050	1.3860
15.5	0.0060	0.0060	0.0000	0.0000	0.0000	0.0000	0.0000	0.0060	0.0000	0.0120	0.0000	0.0000	0.0060	0.0250	0.0060	0.0250	0.0920
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	0.6980	0.8100	0.6490	0.3150	0.2220	0.0800	0.2480	0.2660	0.3530	0.2710	0.3400	0.2410	0.2410	0.2040	0.2600	0.4400	5.6380
STABILITY CLASS 2																	
1.5	0.0740	0.0990	0.0680	0.0620	0.0120	0.0430	0.0060	0.0490	0.0800	0.0740	0.0680	0.0430	0.0310	0.0490	0.0190	0.0310	0.8080
5.5	0.1980	0.2600	0.3890	0.1300	0.0620	0.0430	0.0930	0.0870	0.0740	0.1480	0.2350	0.1480	0.0990	0.0800	0.0800	0.1110	2.2370
10.0	0.4080	0.2780	0.4020	0.2100	0.0560	0.0800	0.1670	0.1790	0.2970	0.1670	0.1850	0.1920	0.1730	0.1550	0.2970	0.3650	3.6110
15.5	0.0490	0.0250	0.0370	0.0190	0.0060	0.0000	0.0190	0.0370	0.0680	0.0560	0.0430	0.0620	0.0310	0.0250	0.0800	0.1240	0.6810
21.5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0060	0.0060	0.0000	0.0060	0.0060	0.0240
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	0.7290	0.6620	0.8960	0.4210	0.1360	0.1660	0.2850	0.3520	0.5190	0.4450	0.5310	0.4510	0.3400	0.3090	0.4820	0.6370	7.3610
STABILITY CLASS 3																	
1.5	0.0800	0.0680	0.0990	0.0490	0.0000	0.0250	0.0190	0.0490	0.1050	0.1240	0.1110	0.1050	0.0120	0.0190	0.0430	0.0430	0.9510
5.5	0.1670	0.2840	0.2470	0.1110	0.0620	0.0370	0.0740	0.0800	0.1790	0.3280	0.3650	0.3280	0.0990	0.0560	0.0800	0.1550	2.6520
10.0	0.2910	0.3150	0.6180	0.3210	0.8000	0.0990	0.1980	0.2410	0.5750	0.4270	0.5070	0.3890	0.2160	0.1110	0.4020	0.3710	5.8810
15.5	0.0800	0.0930	0.1300	0.1050	0.0310	0.0250	0.0800	0.1610	0.0800	0.0930	0.1300	0.1050	0.0310	0.0250	0.0800	0.1610	1.4100
21.5	0.0800	0.0930	0.1300	0.1050	0.0000	0.0250	0.0800	0.1610	0.0000	0.0000	0.0120	0.0060	0.0120	0.0060	0.0060	0.0000	0.7160
28.0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0060	0.0000	0.0000	0.0000	0.0000	0.0060
ALL	0.6980	0.8530	1.2240	0.6910	0.8930	0.2110	0.4510	0.6920	0.9390	0.9720	1.1250	0.9390	0.3700	0.2170	0.6110	0.7300	11.6160
STABILITY CLASS 4																	
1.5	0.0870	0.0800	0.0680	0.0190	0.0120	0.0060	0.0310	0.0680	0.1730	0.1110	0.0870	0.0870	0.0490	0.0250	0.0250	0.0190	0.9470
5.5	0.2660	0.5750	0.7850	0.2410	0.0310	0.1300	0.2160	0.9150	0.8590	0.7050	1.0880	0.3150	0.1050	0.0870	0.1610	0.2530	6.7320
10.0	0.5870	1.2050	1.3110	0.4080	0.1420	0.1790	0.3650	0.7730	1.8400	1.9660	2.9860	1.1750	0.3280	0.4700	0.8220	0.9270	15.4840
15.5	0.4270	1.4900	1.3970	0.2600	0.1110	0.0680	0.2660	1.3400	4.0000	1.8540	1.9530	1.4090	0.5320	0.7170	2.6400	1.2100	19.6740
21.5	0.1050	0.4570	0.2350	0.0310	0.0190	0.0000	0.0930	0.6240	1.8400	0.3890	0.1480	0.2780	0.2410	0.3400	1.3790	0.4640	6.6430
28.0	0.0120	0.0990	0.0430	0.0000	0.0000	0.0000	0.0060	0.1730	0.2970	0.0620	0.0120	0.0800	0.0990	0.1420	0.7970	0.1050	1.9270
ALL	1.4840	3.9060	3.8390	0.9590	0.3150	0.3830	0.9770	3.8930	9.0090	5.0870	6.2740	3.3440	1.3540	1.7810	5.8240	2.9780	51.4070
STABILITY CLASS 5																	
1.5	0.1300	0.1480	0.1480	0.0680	0.0250	0.0430	0.0740	0.2600	0.3400	0.3210	0.2720	0.1610	0.0990	0.0560	0.0680	0.0930	2.3060
5.5	0.4450	0.4270	0.5070	0.1920	0.1110	0.0990	0.2780	1.1600	1.6900	1.6070	1.2490	0.4390	0.1480	0.1480	0.1790	0.2040	8.8830
10.0	0.0990	0.2780	0.2910	0.1110	0.0310	0.0680	0.1300	0.1610	0.6610	0.4270	0.8650	0.3770	0.0560	0.1240	0.1300	0.0740	3.8830
15.5	0.0060	0.0000	0.0120	0.0000	0.0000	0.0000	0.0190	0.0120	0.0250	0.0060	0.0190	0.0060	0.0060	0.0000	0.0310	0.0000	0.1420
21.5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0060	0.0000	0.0000	0.0000	0.0000	0.0000	0.0060
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	0.6800	0.8530	0.9580	0.3710	0.1670	0.2100	0.5010	1.5930	2.7160	2.3610	2.4110	0.9830	0.3090	0.3280	0.4080	0.3710	15.2200
STABILITY CLASS 6																	
1.5	0.3210	0.1610	0.0930	0.1360	0.1240	0.1730	0.1670	0.3650	0.7290	0.7050	0.6310	0.2660	0.1730	0.0800	0.1300	0.1300	4.3840
5.5	0.1610	0.1300	0.1360	0.0740	0.0430	0.0990	0.1730	0.4640	1.1800	1.2800	0.7790	0.2530	0.1420	0.0930	0.1170	0.0490	5.1730
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	0.4820	0.2910	0.2290	0.2100	0.1670	0.2720	0.3400	0.8290	1.9090	1.9850	1.4100	0.5190	0.3150	0.1730	0.2470	0.1790	9.5570
ALL	4.7710	7.3750	7.7950	2.9670	1.9000	1.3220	2.8020	7.6250	15.4450	11.1210	12.0910	6.4770	2.9290	3.0120	7.8320	5.3350	100.7990

INDIVIDUAL RECEPTOR LOCATION DATA, 38 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	R1	-1.21	-0.44	0.00	1.29	10	20	STETSON	-0.46	1.22	0.00	1.30	10
2	R2	-1.95	1.95	0.00	2.76	10	21	KNODE	-1.89	2.68	0.00	3.28	10
3	R3	-1.89	2.71	0.00	3.30	10	22	BROTT	-1.37	1.34	0.00	1.92	10
4	R4	-3.34	2.80	0.00	4.36	10	23	SP1	0.73	0.15	0.00	0.75	10
5	R5	-3.57	3.99	0.00	5.35	10	24	SP2	0.67	0.58	0.00	0.89	10
6	CRAWFORD	-4.39	4.45	0.00	6.25	10	25	SP3	0.67	0.91	0.00	1.13	10
7	R7	-1.99	3.96	0.00	4.43	10	26	McDOWELL	-2.16	4.36	0.00	4.87	10
8	R8	-1.99	3.60	0.00	4.11	10	27	TAGGART	-1.89	4.45	0.00	4.83	10
9	R9	-1.57	3.23	0.00	3.59	10	28	FRANEY	-0.98	4.76	0.00	4.86	10
10	R10	-1.16	2.80	0.00	3.03	10	29	BUNCH	1.01	4.27	0.00	4.39	10
11	R11	-1.78	2.77	0.00	3.29	10	30	DYER	-2.44	0.55	0.00	2.50	10
12	R12	-0.30	2.35	0.00	2.37	10	31	NT-1	-3.97	11.33	0.00	12.01	10
13	R13	0.03	1.49	0.00	1.49	10	32	NT-2	-4.12	8.93	0.00	9.83	10
14	R14	0.51	0.98	0.00	1.10	10	33	NT-3	-4.75	7.87	0.00	9.19	10
15	R15	0.52	0.34	0.00	0.62	10	34	NT-4	-5.82	6.69	0.00	8.87	10
16	R16	1.31	0.30	0.00	1.34	10	35	NT-5	-4.61	6.76	0.00	8.18	10
17	R17	1.31	-0.34	0.00	1.35	10	36	NT-6	-7.20	11.65	0.00	13.70	10
18	EHLERS	0.73	-0.06	0.00	0.73	10	37	NT-7	-8.25	9.86	0.00	12.86	10
19	GIBBONS	0.73	0.73	0.00	1.03	10	38	NT-8	-0.44	2.76	0.00	2.79	10

MISCELLANEOUS INPUTABLE PARAMETER VALUES

DMM	DMA	TSTART	FFORI	FHAYI	FFORP	FHAYP	FPR(1)	FPR(2)	FPR(3)	ACTRAT
100.0	100.0	2006.00	0.90	0.10	0.90	0.10	87000.00	4000.00	0.00	2.50

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

JC EQUALS 1, 0, 1, 1, 0, 0, 1, 0, 0, 0

TIME STEP DATA....	STEP NAMES	LENGTH, YRS	IFTODO
1	10-Year Action Perio	5.00	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	2	0	0	0	1	2	0	0	0	2	2
2.0- 3.0	0	0	0	0	0	3	0	0	0	0	4	0	6	0	0	2
3.0- 4.0	0	0	0	0	0	0	4	0	0	0	0	2	0	0	2	0
4.0- 5.0	0	1	1	0	0	0	4	6	0	0	0	0	0	2	0	5
5.0-10.0	15	2	6	10	0	5	13	1	10	5	4	13	6	84	1308	21
10.0-20.0	39	111	39	39	39	39	39	39	39	39	28	24	39	23	28	21
20.0-30.0	65	65	65	65	65	65	65	94	110	58	35	35	35	35	35	54
30.0-40.0	95	92	91	5982	91	91	124	91	192	64	49	49	49	49	49	61
40.0-50.0	145	142	124	157	140	125	238	1367	243	67	61	61	422	61	63	146
50.0-60.0	178	185	290	232	1047	249	301	301	283	76	76	84	300	79	119	178
60.0-70.0	210	400	488	647	302	302	338	354	299	89	89	242	199	106	191	209
70.0-80.0	242	365	572	3077	1563	348	364	10290	1186	1077	157	354	239	127	187	381
1.0-80.0	989	1363	1676	10209	3247	1229	1490	12543	2362	1476	505	864	1295	566	1984	1080

TOTAL 1-80 KM POPULATION IS 42878 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	15.90	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.60E+03	1001	1	1.16E+01	Main Plant Stac
2	-5.30	9.60	6.00	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.42E+02	1002	1	1.00E+01	Satellite Stack
3	-0.30	0.16	0.00	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.50E+02	1003	1	0.00E+00	MU 2,3,4
4	0.00	0.74	0.00	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.54E+02	1004	1	0.00E+00	MU 5
5	-1.20	1.80	0.00	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.08E+02	1005	1	0.00E+00	MU 6&8
6	0.00	-0.74	0.00	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.08E+02	1006	1	0.00E+00	MU 7&9
7	-5.30	9.60	10.00	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.32E+03	1007	1	0.00E+00	North Trend Wel

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, 1 TIME STEP(S) USED FOR THIS RUN

SOURCE NUMBER	TSTEP 1 5.00YRS	TSTEP 2 5.00YRS	TSTEP 3 5.00YRS	TSTEP 4 5.00YRS	TSTEP 5 5.00YRS	TSTEP 6 5.00YRS	TSTEP 7 5.00YRS	TSTEP 8 5.00YRS	TSTEP 9 5.00YRS	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, 1 TIME STEP(S) USED FOR THIS RUN

SOURCE NUMBER	TSTEP 1 5.00YRS	TSTEP 2 5.00YRS	TSTEP 3 5.00YRS	TSTEP 4 5.00YRS	TSTEP 5 5.00YRS	TSTEP 6 5.00YRS	TSTEP 7 5.00YRS	TSTEP 8 5.00YRS	TSTEP 9 5.00YRS	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

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

CONCENTRATION DATA FOR THE N DIRECTION, THETA EQUALS 0.0 DEGREES

TOTAL AIR CONCENTRATIONS, PCI/M3, AND WL

XRHO, KM	U-238	Th-230	Ra-226	Pb-210	Rn-222	Po-218	Pb-214	Bi-214	Pb-210	WL
1.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.784E+02	3.118E+02	8.581E+01	3.019E+01	3.213E-05	8.689E-
2.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.107E+02	1.947E+02	8.090E+01	3.988E+01	5.942E-05	7.594E-
3.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.447E+02	1.395E+02	7.206E+01	4.256E+01	8.778E-05	6.678E-
4.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.012E+02	9.953E+01	5.976E+01	3.978E+01	1.108E-04	5.539E-
7.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.372E+01	5.351E+01	3.903E+01	2.984E+01	1.517E-04	3.643E-
15.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.186E+01	3.186E+01	2.664E+01	2.223E+01	2.086E-04	2.508E-
25.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.588E+01	1.588E+01	1.483E+01	1.354E+01	2.212E-04	1.421E-
35.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.035E+01	1.036E+01	1.001E+01	9.497E+00	2.201E-04	9.687E-
45.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.515E+00	7.519E+00	7.394E+00	7.163E+00	2.154E-04	7.195E-
55.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.826E+00	5.829E+00	5.785E+00	5.676E+00	2.100E-04	5.650E-
65.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.715E+00	4.718E+00	4.706E+00	4.655E+00	2.048E-04	4.608E-
75.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.936E+00	3.938E+00	3.940E+00	3.918E+00	1.999E-04	3.864E-

GROUND SURFACE CONCENTRATIONS, PCI/M2

XRHO, KM	U-238	Th-230	Ra-226	Pb-210	Rn-222	Po-218	Pb-214	Bi-214	Pb-210
1.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.470E+02	2.470E+02	2.470E+02	1.362E+01
2.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.542E+02	1.542E+02	1.542E+02	2.519E+01
3.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.105E+02	1.105E+02	1.105E+02	3.722E+01
4.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.883E+01	7.883E+01	7.883E+01	4.698E+01
7.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.238E+01	4.238E+01	4.238E+01	6.431E+01
15.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.523E+01	2.523E+01	2.523E+01	8.843E+01
25.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.258E+01	1.258E+01	1.258E+01	9.377E+01
35.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.205E+00	8.205E+00	8.205E+00	9.332E+01
45.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.955E+00	5.955E+00	5.955E+00	9.132E+01
55.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.617E+00	4.617E+00	4.617E+00	8.905E+01
65.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.737E+00	3.737E+00	3.737E+00	8.682E+01
75.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.119E+00	3.119E+00	3.119E+00	8.474E+01

TOTAL DEPOSITION RATES, PCI/M2-SEC

XRHO, KM	U-238	Th-230	Ra-226	Pb-210
1.5	0.000E+00	0.000E+00	0.000E+00	9.639E-08
2.5	0.000E+00	0.000E+00	0.000E+00	1.782E-07
3.5	0.000E+00	0.000E+00	0.000E+00	2.633E-07
4.5	0.000E+00	0.000E+00	0.000E+00	3.325E-07
7.5	0.000E+00	0.000E+00	0.000E+00	4.551E-07
15.0	0.000E+00	0.000E+00	0.000E+00	6.257E-07
25.0	0.000E+00	0.000E+00	0.000E+00	6.635E-07
35.0	0.000E+00	0.000E+00	0.000E+00	6.603E-07
45.0	0.000E+00	0.000E+00	0.000E+00	6.462E-07
55.0	0.000E+00	0.000E+00	0.000E+00	6.301E-07
65.0	0.000E+00	0.000E+00	0.000E+00	6.143E-07
75.0	0.000E+00	0.000E+00	0.000E+00	5.996E-07

TIME STEP NUMBER 1, 10-Year Action Perio   DURATION IN YRS IS... 5.0

CONCENTRATION DATA FOR THE E DIRECTION, THETA EQUALS 90.0 DEGREES

TOTAL AIR CONCENTRATIONS, PCI/M3, AND WL

XRHO, KM	U-238	Th-230	Ra-226	Pb-210	Rn-222	Po-218	Pb-214	Bi-214	Pb-210	WL
1.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.344E+01	6.456E+01	2.411E+01	1.084E+01	1.877E-05	2.292E-
2.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.838E+01	3.649E+01	1.874E+01	1.105E+01	2.488E-05	1.738E-
3.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.578E+01	2.520E+01	1.537E+01	1.046E+01	3.087E-05	1.429E-
4.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.960E+01	1.937E+01	1.305E+01	9.624E+00	3.647E-05	1.220E-
7.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.125E+01	1.123E+01	8.721E+00	7.057E+00	4.580E-05	8.210E-
15.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.053E+00	5.055E+00	4.510E+00	3.968E+00	5.116E-05	4.287E-
25.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.841E+00	2.842E+00	2.708E+00	2.529E+00	5.242E-05	2.609E-
35.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.950E+00	1.951E+00	1.908E+00	1.836E+00	5.230E-05	1.853E-
45.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.466E+00	1.466E+00	1.452E+00	1.420E+00	5.156E-05	1.417E-
55.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.163E+00	1.164E+00	1.160E+00	1.146E+00	5.064E-05	1.135E-
65.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.567E-01	9.572E-01	9.570E-01	9.509E-01	4.963E-05	9.385E-
75.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.071E-01	8.076E-01	8.090E-01	8.067E-01	4.862E-05	7.943E-

GROUND SURFACE CONCENTRATIONS, PCI/M2

XRHO, KM	U-238	Th-230	Ra-226	Pb-210	Rn-222	Po-218	Pb-214	Bi-214	Pb-210
1.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.114E+01	5.114E+01	5.114E+01	7.956E+00
2.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.890E+01	2.890E+01	2.890E+01	1.055E+01
3.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.996E+01	1.996E+01	1.996E+01	1.309E+01
4.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.534E+01	1.534E+01	1.534E+01	1.546E+01
7.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.892E+00	8.892E+00	8.892E+00	1.942E+01
15.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.003E+00	4.003E+00	4.003E+00	2.169E+01
25.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.251E+00	2.251E+00	2.251E+00	2.222E+01
35.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.546E+00	1.546E+00	1.546E+00	2.217E+01
45.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.162E+00	1.162E+00	1.162E+00	2.186E+01
55.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.219E-01	9.219E-01	9.219E-01	2.147E+01
65.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.582E-01	7.582E-01	7.582E-01	2.104E+01
75.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.396E-01	6.396E-01	6.396E-01	2.061E+01

TOTAL DEPOSITION RATES, PCI/M2-SEC

XRHO, KM	U-238	Th-230	Ra-226	Pb-210
1.5	0.000E+00	0.000E+00	0.000E+00	5.630E-08
2.5	0.000E+00	0.000E+00	0.000E+00	7.464E-08
3.5	0.000E+00	0.000E+00	0.000E+00	9.261E-08
4.5	0.000E+00	0.000E+00	0.000E+00	1.094E-07
7.5	0.000E+00	0.000E+00	0.000E+00	1.374E-07
15.0	0.000E+00	0.000E+00	0.000E+00	1.535E-07
25.0	0.000E+00	0.000E+00	0.000E+00	1.573E-07
35.0	0.000E+00	0.000E+00	0.000E+00	1.569E-07
45.0	0.000E+00	0.000E+00	0.000E+00	1.547E-07
55.0	0.000E+00	0.000E+00	0.000E+00	1.519E-07
65.0	0.000E+00	0.000E+00	0.000E+00	1.489E-07
75.0	0.000E+00	0.000E+00	0.000E+00	1.458E-07

TIME STEP NUMBER 1, 10-Year Action Perio   DURATION IN YRS IS... 5.0

CONCENTRATION DATA FOR THE S DIRECTION, THETA EQUALS 180.0 DEGREES

TOTAL AIR CONCENTRATIONS, PCI/M3, AND WL

XRHO, KM	U-238	Th-230	Ra-226	Pb-210	Rn-222	Po-218	Pb-214	Bi-214	Pb-210	WL
1.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.542E+02	1.342E+02	4.137E+01	1.507E+01	2.227E-05	4.042E-
2.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.761E+01	6.492E+01	3.287E+01	1.836E+01	3.633E-05	3.020E-
3.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.464E+01	4.395E+01	2.723E+01	1.825E+01	4.977E-05	2.514E-
4.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.352E+01	3.329E+01	2.305E+01	1.697E+01	6.080E-05	2.144E-
7.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.934E+01	1.933E+01	1.563E+01	1.283E+01	8.252E-05	1.470E-
15.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.184E+00	9.188E+00	8.465E+00	7.625E+00	9.975E-05	8.082E-
25.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.257E+00	5.260E+00	5.112E+00	4.878E+00	1.041E-04	4.953E-
35.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.612E+00	3.614E+00	3.577E+00	3.500E+00	1.041E-04	3.492E-
45.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.714E+00	2.716E+00	2.709E+00	2.682E+00	1.028E-04	2.654E-
55.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.153E+00	2.154E+00	2.156E+00	2.148E+00	1.010E-04	2.116E-
65.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.770E+00	1.771E+00	1.776E+00	1.774E+00	9.914E-05	1.744E-
75.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.494E+00	1.494E+00	1.500E+00	1.502E+00	9.729E-05	1.475E-

GROUND SURFACE CONCENTRATIONS, PCI/M2

XRHO, KM	U-238	Th-230	Ra-226	Pb-210	Rn-222	Po-218	Pb-214	Bi-214	Pb-210
1.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.063E+02	1.063E+02	1.063E+02	9.444E+00
2.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.142E+01	5.142E+01	5.142E+01	1.541E+01
3.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.481E+01	3.481E+01	3.481E+01	2.110E+01
4.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.636E+01	2.636E+01	2.636E+01	2.578E+01
7.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.531E+01	1.531E+01	1.531E+01	3.499E+01
15.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.278E+00	7.278E+00	7.278E+00	4.229E+01
25.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.166E+00	4.166E+00	4.166E+00	4.415E+01
35.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.862E+00	2.862E+00	2.862E+00	4.413E+01
45.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.151E+00	2.151E+00	2.151E+00	4.357E+01
55.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.706E+00	1.706E+00	1.706E+00	4.283E+01
65.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.402E+00	1.402E+00	1.402E+00	4.203E+01
75.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.184E+00	1.184E+00	1.184E+00	4.125E+01

TOTAL DEPOSITION RATES, PCI/M2-SEC

XRHO, KM	U-238	Th-230	Ra-226	Pb-210
1.5	0.000E+00	0.000E+00	0.000E+00	6.682E-08
2.5	0.000E+00	0.000E+00	0.000E+00	1.090E-07
3.5	0.000E+00	0.000E+00	0.000E+00	1.493E-07
4.5	0.000E+00	0.000E+00	0.000E+00	1.824E-07
7.5	0.000E+00	0.000E+00	0.000E+00	2.476E-07
15.0	0.000E+00	0.000E+00	0.000E+00	2.993E-07
25.0	0.000E+00	0.000E+00	0.000E+00	3.124E-07
35.0	0.000E+00	0.000E+00	0.000E+00	3.123E-07
45.0	0.000E+00	0.000E+00	0.000E+00	3.083E-07
55.0	0.000E+00	0.000E+00	0.000E+00	3.030E-07
65.0	0.000E+00	0.000E+00	0.000E+00	2.974E-07
75.0	0.000E+00	0.000E+00	0.000E+00	2.919E-07

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

CONCENTRATION DATA FOR THE W DIRECTION, THETA EQUALS 270.0 DEGREES

TOTAL AIR CONCENTRATIONS, PCI/M3, AND WL

XRHO, KM	U-238	Th-230	Ra-226	Pb-210	Rn-222	Po-218	Pb-214	Bi-214	Pb-210	WL
1.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.886E+01	5.323E+01	2.109E+01	9.545E+00	1.681E-05	1.973E-
2.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.654E+01	3.468E+01	1.677E+01	9.490E+00	2.297E-05	1.561E-
3.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.429E+01	2.374E+01	1.377E+01	9.113E+00	2.957E-05	1.282E-
4.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.745E+01	1.730E+01	1.158E+01	8.512E+00	3.534E-05	1.083E-
7.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.072E+01	1.071E+01	8.339E+00	6.675E+00	4.137E-05	7.821E-
15.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.608E+00	5.611E+00	4.882E+00	4.115E+00	4.193E-05	4.588E-
25.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.475E+00	2.476E+00	2.363E+00	2.191E+00	3.842E-05	2.270E-
35.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.558E+00	1.559E+00	1.534E+00	1.482E+00	3.670E-05	1.491E-
45.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.133E+00	1.134E+00	1.129E+00	1.112E+00	3.538E-05	1.104E-
55.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.794E-01	8.799E-01	8.804E-01	8.754E-01	3.423E-05	8.635E-
65.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.121E-01	7.125E-01	7.145E-01	7.137E-01	3.320E-05	7.018E-
75.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.941E-01	5.945E-01	5.968E-01	5.975E-01	3.227E-05	5.867E-

GROUND SURFACE CONCENTRATIONS, PCI/M2

XRHO, KM	U-238	Th-230	Ra-226	Pb-210	Rn-222	Po-218	Pb-214	Bi-214	Pb-210
1.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.216E+01	4.216E+01	4.216E+01	7.126E+00
2.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.747E+01	2.747E+01	2.747E+01	9.738E+00
3.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.880E+01	1.880E+01	1.880E+01	1.254E+01
4.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.370E+01	1.370E+01	1.370E+01	1.498E+01
7.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.482E+00	8.482E+00	8.482E+00	1.754E+01
15.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.444E+00	4.444E+00	4.444E+00	1.778E+01
25.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.961E+00	1.961E+00	1.961E+00	1.629E+01
35.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.235E+00	1.235E+00	1.235E+00	1.556E+01
45.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.980E-01	8.980E-01	8.980E-01	1.500E+01
55.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.969E-01	6.969E-01	6.969E-01	1.451E+01
65.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.643E-01	5.643E-01	5.643E-01	1.407E+01
75.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.708E-01	4.708E-01	4.708E-01	1.368E+01

TOTAL DEPOSITION RATES, PCI/M2-SEC

XRHO, KM	U-238	Th-230	Ra-226	Pb-210
1.5	0.000E+00	0.000E+00	0.000E+00	5.043E-08
2.5	0.000E+00	0.000E+00	0.000E+00	6.890E-08
3.5	0.000E+00	0.000E+00	0.000E+00	8.870E-08
4.5	0.000E+00	0.000E+00	0.000E+00	1.060E-07
7.5	0.000E+00	0.000E+00	0.000E+00	1.241E-07
15.0	0.000E+00	0.000E+00	0.000E+00	1.258E-07
25.0	0.000E+00	0.000E+00	0.000E+00	1.153E-07
35.0	0.000E+00	0.000E+00	0.000E+00	1.101E-07
45.0	0.000E+00	0.000E+00	0.000E+00	1.061E-07
55.0	0.000E+00	0.000E+00	0.000E+00	1.027E-07
65.0	0.000E+00	0.000E+00	0.000E+00	9.959E-08
75.0	0.000E+00	0.000E+00	0.000E+00	9.681E-08

REGION: Crow Butte North Trend   CODE: MILDOS-AREA (02/97)   PAGE 10
METSET: DATA: CBRMAIN.MIL   03/26/07

TIME STEP NUMBER 1, 10-Year Action Perio   DURATION IN YRS IS... 5.0

EXPOSURE PATHWAY IS INHAL.   EXPOSED ORGAN IS EFFECTIV

DOSES SHOWN BELOW ARE ANNUAL POPULATION DOSE COMMITMENTS, PERSON-REM PER YEAR

DIRECTION	XRHO 1.5	XRHO 2.5	XRHO 3.5	XRHO 4.5	XRHO 7.5	XRHO 15.0	XRHO 25.0	XRHO 35.0	XRHO 45.0	XRHO 55.0	XRHO 65.0	XRH 75.
N	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.661E-04	5.941E-04	1.050E-03	1.528E-03	2.283E-03	2.735E-03	3.146E-03	3.540
NNE	0.000E+00	0.000E+00	0.000E+00	7.553E-06	2.081E-05	1.468E-03	9.590E-04	1.359E-03	2.060E-03	2.620E-03	5.523E-03	4.914
NE	0.000E+00	0.000E+00	0.000E+00	6.482E-06	5.345E-05	4.406E-04	7.947E-04	1.135E-03	1.557E-03	3.614E-03	6.001E-03	6.925
ENE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.273E-05	2.480E-04	4.364E-04	4.080E-02	1.076E-03	1.581E-03	4.363E-03	2.048
E	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.457E-04	2.490E-04	3.479E-04	5.278E-04	3.879E-03	1.097E-03	5.564
ESE	2.501E-06	4.696E-06	0.000E+00	0.000E+00	1.249E-05	1.088E-04	1.846E-04	2.563E-04	3.474E-04	6.813E-04	8.126E-04	9.213
SE	0.000E+00	0.000E+00	8.129E-06	9.400E-06	3.810E-05	1.316E-04	2.277E-04	4.382E-04	8.398E-04	1.055E-03	1.173E-03	1.250
SSE	0.000E+00	0.000E+00	0.000E+00	1.599E-05	3.355E-06	1.521E-04	3.839E-04	3.752E-04	5.617E-03	1.226E-03	1.427E-03	4.101
S	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.026E-05	2.842E-04	8.370E-04	1.461E-03	1.826E-03	2.091E-03	2.170E-03	8.448
SSW	1.680E-06	0.000E+00	0.000E+00	0.000E+00	2.869E-05	2.715E-04	4.239E-04	4.719E-04	4.921E-04	5.530E-04	6.401E-04	7.646
SW	3.267E-06	9.922E-06	0.000E+00	0.000E+00	2.102E-05	1.700E-04	2.240E-04	3.209E-04	4.015E-04	4.987E-04	5.799E-04	1.014
WSW	0.000E+00	0.000E+00	5.319E-06	0.000E+00	5.218E-05	1.051E-04	1.540E-04	2.128E-04	2.585E-04	3.469E-04	9.747E-04	1.392
W	0.000E+00	1.006E-05	0.000E+00	0.000E+00	1.813E-05	1.194E-04	9.825E-05	1.314E-04	1.092E-03	7.511E-04	4.834E-04	5.646
WNW	0.000E+00	0.000E+00	0.000E+00	5.216E-06	2.769E-04	7.491E-05	1.084E-04	1.512E-04	1.851E-04	2.343E-04	3.066E-04	3.584
NW	2.520E-06	0.000E+00	4.089E-06	0.000E+00	4.580E-03	9.428E-05	1.285E-04	1.792E-04	2.263E-04	4.183E-04	6.562E-04	6.281
NNW	3.371E-06	5.510E-06	0.000E+00	2.438E-05	1.324E-04	1.865E-04	4.931E-04	5.422E-04	1.259E-03	1.490E-03	1.700E-03	3.017

TOTAL DOSE COMMITMENT IS 2.492E-01 PERSON-REM/YR

REGION: Crow Butte North Trend
METSET:

CODE: MILDOS-AREA (02/97)
DATA: CBRMAIN.MIL

03/26/07

TIME STEP NUMBER 1, 10-Year Action Perio   DURATION IN YRS IS... 5.0

EXPOSURE PATHWAY IS INHAL.   EXPOSED ORGAN IS BONE

DOSES SHOWN BELOW ARE ANNUAL POPULATION DOSE COMMITMENTS, PERSON-REM PER YEAR

DIRECTION	XRHO 1.5	XRHO 2.5	XRHO 3.5	XRHO 4.5	XRHO 7.5	XRHO 15.0	XRHO 25.0	XRHO 35.0	XRHO 45.0	XRHO 55.0	XRHO 65.0	XRH 75.
N	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.348E-03	4.819E-03	8.518E-03	1.239E-02	1.850E-02	2.215E-02	2.548E-02	2.866
NNE	0.000E+00	0.000E+00	0.000E+00	6.130E-05	1.688E-04	1.191E-02	7.777E-03	1.101E-02	1.669E-02	2.122E-02	4.472E-02	3.977
NE	0.000E+00	0.000E+00	0.000E+00	5.260E-05	4.337E-04	3.574E-03	6.444E-03	9.201E-03	1.261E-02	2.927E-02	4.860E-02	5.605
ENE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.278E-04	2.012E-03	3.538E-03	3.307E-01	8.718E-03	1.281E-02	3.533E-02	1.658
E	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.182E-03	2.019E-03	2.820E-03	4.277E-03	3.141E-02	8.881E-03	4.502
ESE	2.029E-05	3.810E-05	0.000E+00	0.000E+00	1.014E-04	8.828E-04	1.497E-03	2.077E-03	2.815E-03	5.518E-03	6.579E-03	7.456
SE	0.000E+00	0.000E+00	6.596E-05	7.627E-05	3.091E-04	1.067E-03	1.846E-03	3.552E-03	6.805E-03	8.545E-03	9.502E-03	1.012
SSE	0.000E+00	0.000E+00	0.000E+00	1.298E-04	2.722E-05	1.234E-03	3.113E-03	3.041E-03	4.551E-02	9.931E-03	1.156E-02	3.319
S	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.889E-04	2.305E-03	6.787E-03	1.184E-02	1.480E-02	1.694E-02	1.756E-02	6.836
SSW	1.363E-05	0.000E+00	0.000E+00	0.000E+00	2.328E-04	2.203E-03	3.437E-03	3.825E-03	3.987E-03	4.479E-03	5.183E-03	6.189
SW	2.651E-05	8.052E-05	0.000E+00	0.000E+00	1.706E-04	1.379E-03	1.817E-03	2.601E-03	3.253E-03	4.040E-03	4.696E-03	8.206
WSW	0.000E+00	0.000E+00	4.316E-05	0.000E+00	4.234E-04	8.526E-04	1.249E-03	1.725E-03	2.094E-03	2.810E-03	7.893E-03	1.127
W	0.000E+00	8.165E-05	0.000E+00	0.000E+00	1.471E-04	9.688E-04	7.967E-04	1.065E-03	8.845E-03	6.084E-03	3.914E-03	4.569
WNW	0.000E+00	0.000E+00	0.000E+00	4.232E-05	2.247E-03	6.077E-04	8.788E-04	1.226E-03	1.500E-03	1.897E-03	2.482E-03	2.900
NW	2.045E-05	0.000E+00	3.318E-05	0.000E+00	3.717E-02	7.648E-04	1.042E-03	1.453E-03	1.834E-03	3.388E-03	5.313E-03	5.084
NNW	2.736E-05	4.471E-05	0.000E+00	1.978E-04	1.075E-03	1.513E-03	3.999E-03	4.395E-03	1.020E-02	1.207E-02	1.377E-02	2.442

TOTAL DOSE COMMITMENT IS 2.019E+00 PERSON-REM/YR

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

EXPOSURE PATHWAY IS INHAL. EXPOSED ORGAN IS AVG.LUNG

DOSES SHOWN BELOW ARE ANNUAL POPULATION DOSE COMMITMENTS, PERSON-REM PER YEAR

DIRECTION	XRHO 1.5	XRHO 2.5	XRHO 3.5	XRHO 4.5	XRHO 7.5	XRHO 15.0	XRHO 25.0	XRHO 35.0	XRHO 45.0	XRHO 55.0	XRHO 65.0	XRH 75.
N	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.922E-05	6.976E-05	1.261E-04	1.876E-04	2.866E-04	3.507E-04	4.122E-04	4.736
NNE	0.000E+00	0.000E+00	0.000E+00	8.689E-07	2.408E-06	1.727E-04	1.153E-04	1.670E-04	2.588E-04	3.363E-04	7.241E-04	6.579
NE	0.000E+00	0.000E+00	0.000E+00	7.461E-07	6.189E-06	5.189E-05	9.570E-05	1.397E-04	1.955E-04	4.634E-04	7.854E-04	9.244
ENE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.114E-06	2.926E-05	5.271E-05	5.039E-03	1.359E-04	2.040E-04	5.750E-04	2.756
E	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.723E-05	3.015E-05	4.312E-05	6.694E-05	5.031E-04	1.455E-04	7.538
ESE	2.898E-07	5.436E-07	0.000E+00	0.000E+00	1.456E-06	1.289E-05	2.237E-05	3.175E-05	4.399E-05	8.814E-05	1.074E-04	1.243
SE	0.000E+00	0.000E+00	9.414E-07	1.090E-06	4.438E-06	1.558E-05	2.755E-05	5.413E-05	1.058E-04	1.355E-04	1.536E-04	1.666
SSE	0.000E+00	0.000E+00	0.000E+00	1.853E-06	3.908E-07	1.802E-05	4.648E-05	4.640E-05	7.092E-04	1.580E-04	1.876E-04	5.493
S	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.004E-06	3.363E-05	1.015E-04	1.813E-04	2.319E-04	2.716E-04	2.880E-04	1.146
SSW	1.941E-07	0.000E+00	0.000E+00	0.000E+00	3.337E-06	3.213E-05	5.126E-05	5.830E-05	6.208E-05	7.122E-05	8.412E-05	1.025
SW	3.774E-07	1.145E-06	0.000E+00	0.000E+00	2.446E-06	2.006E-05	2.698E-05	3.941E-05	5.026E-05	6.363E-05	7.539E-05	1.342
WSW	0.000E+00	0.000E+00	6.148E-07	0.000E+00	6.064E-06	1.240E-05	1.856E-05	2.620E-05	3.252E-05	4.459E-05	1.279E-04	1.865
W	0.000E+00	1.162E-06	0.000E+00	0.000E+00	2.102E-06	1.405E-05	1.183E-05	1.618E-05	1.374E-04	9.663E-05	6.353E-05	7.577
WNW	0.000E+00	0.000E+00	0.000E+00	6.015E-07	3.203E-05	8.805E-06	1.306E-05	1.866E-05	2.340E-05	3.031E-05	4.060E-05	4.856
NW	2.908E-07	0.000E+00	4.704E-07	0.000E+00	5.288E-04	1.107E-05	1.542E-05	2.200E-05	2.840E-05	5.364E-05	8.597E-05	8.402
NNW	3.881E-07	6.329E-07	0.000E+00	2.803E-06	1.531E-05	2.184E-05	5.905E-05	6.641E-05	1.576E-04	1.905E-04	2.220E-04	4.022

TOTAL DOSE COMMITMENT IS 3.226E-02 PERSON-REM/YR

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

EXPOSURE PATHWAY IS INHAL. EXPOSED ORGAN IS BRONCHI

DOSES SHOWN BELOW ARE ANNUAL POPULATION DOSE COMMITMENTS, PERSON-REM PER YEAR

DIRECTION	XRHO 1.5	XRHO 2.5	XRHO 3.5	XRHO 4.5	XRHO 7.5	XRHO 15.0	XRHO 25.0	XRHO 35.0	XRHO 45.0	XRHO 55.0	XRHO 65.0	XRH 75.
N	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.007E+00	1.553E+00	1.290E+00	1.230E+00	1.362E+00	1.296E+00	1.238E+00	1.191
NNE	0.000E+00	0.000E+00	0.000E+00	1.034E-01	1.142E-01	3.005E+00	1.060E+00	1.001E+00	1.130E+00	1.143E+00	1.998E+00	1.518
NE	0.000E+00	0.000E+00	0.000E+00	8.731E-02	3.010E-01	9.267E-01	8.974E-01	8.725E-01	9.061E-01	1.691E+00	2.347E+00	2.326
ENE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.625E-01	4.774E-01	4.520E-01	2.904E+01	5.826E-01	6.905E-01	1.596E+00	6.444
E	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.463E-01	2.308E-01	2.218E-01	2.565E-01	1.523E+00	3.612E-01	1.577
ESE	1.638E-01	1.223E-01	0.000E+00	0.000E+00	5.937E-02	2.186E-01	2.065E-01	1.973E-01	2.033E-01	3.211E-01	3.204E-01	3.122
SE	0.000E+00	0.000E+00	1.660E-01	1.257E-01	2.444E-01	3.619E-01	3.557E-01	4.777E-01	7.030E-01	7.174E-01	6.726E-01	6.197
SSE	0.000E+00	0.000E+00	0.000E+00	1.799E-01	1.746E-02	3.298E-01	4.664E-01	3.161E-01	3.624E+00	6.412E-01	6.281E-01	1.558
S	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.418E-01	4.477E-01	7.228E-01	8.668E-01	8.245E-01	7.615E-01	6.614E-01	2.214
SSW	2.060E-01	0.000E+00	0.000E+00	0.000E+00	1.387E-01	5.208E-01	4.554E-01	3.511E-01	2.797E-01	2.542E-01	2.469E-01	2.541
SW	3.327E-01	3.753E-01	0.000E+00	0.000E+00	1.149E-01	3.957E-01	2.884E-01	2.832E-01	2.688E-01	2.686E-01	2.611E-01	3.919
WSW	0.000E+00	0.000E+00	7.642E-02	0.000E+00	2.282E-01	2.060E-01	1.704E-01	1.589E-01	1.440E-01	1.538E-01	3.581E-01	4.362
W	0.000E+00	2.741E-01	0.000E+00	0.000E+00	8.036E-02	2.734E-01	1.083E-01	9.542E-02	5.977E-01	3.298E-01	1.771E-01	1.775
WNW	0.000E+00	0.000E+00	0.000E+00	4.366E-02	1.331E+00	1.441E-01	9.704E-02	8.805E-02	7.943E-02	7.936E-02	8.566E-02	8.512
NW	3.458E-01	0.000E+00	9.306E-02	0.000E+00	3.309E+01	2.503E-01	1.486E-01	1.340E-01	1.251E-01	1.834E-01	2.386E-01	1.951
NNW	5.517E-01	1.074E+00	0.000E+00	4.419E-01	9.720E-01	8.819E-01	6.566E-01	4.434E-01	7.503E-01	7.006E-01	6.613E-01	1.001

TOTAL DOSE COMMITMENT IS 1.676E+02 PERSON-REM/YR

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

EXPOSURE PATHWAY IS GROUND EXPOSED ORGAN IS EFFECTIV

DOSES SHOWN BELOW ARE ANNUAL POPULATION DOSE COMMITMENTS, PERSON-REM PER YEAR

DIRECTION	XRHO 1.5	XRHO 2.5	XRHO 3.5	XRHO 4.5	XRHO 7.5	XRHO 15.0	XRHO 25.0	XRHO 35.0	XRHO 45.0	XRHO 55.0	XRHO 65.0	XRH 75.
N	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.154E-04	1.823E-04	1.576E-04	1.559E-04	1.791E-04	1.765E-04	1.744E-04	1.733
NNE	0.000E+00	0.000E+00	0.000E+00	1.168E-05	1.314E-05	3.564E-04	1.305E-04	1.281E-04	1.504E-04	1.579E-04	2.863E-04	2.252
NE	0.000E+00	0.000E+00	0.000E+00	9.866E-06	3.463E-05	1.098E-04	1.103E-04	1.112E-04	1.196E-04	2.308E-04	3.310E-04	3.386
ENE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.024E-05	5.677E-05	5.595E-05	3.734E-03	7.769E-05	9.539E-05	2.282E-04	9.523
E	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.949E-05	2.886E-05	2.891E-05	3.479E-05	2.146E-04	5.282E-05	2.390
ESE	1.578E-05	1.296E-05	0.000E+00	0.000E+00	6.833E-06	2.595E-05	2.541E-05	2.514E-05	2.681E-05	4.377E-05	4.511E-05	4.536
SE	0.000E+00	0.000E+00	1.765E-05	1.380E-05	2.782E-05	4.241E-05	4.278E-05	5.888E-05	8.877E-05	9.273E-05	8.894E-05	8.377
SSE	0.000E+00	0.000E+00	0.000E+00	2.012E-05	2.007E-06	3.901E-05	5.701E-05	3.989E-05	4.716E-04	8.595E-05	8.664E-05	2.210
S	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.802E-05	5.381E-05	9.099E-05	1.141E-04	1.132E-04	1.090E-04	9.847E-05	3.425
SSW	1.905E-05	0.000E+00	0.000E+00	0.000E+00	1.599E-05	6.195E-05	5.620E-05	4.491E-05	3.703E-05	3.481E-05	3.492E-05	3.708
SW	3.229E-05	4.014E-05	0.000E+00	0.000E+00	1.321E-05	4.667E-05	3.511E-05	3.557E-05	3.481E-05	3.584E-05	3.587E-05	5.539
WSW	0.000E+00	0.000E+00	8.546E-06	0.000E+00	2.638E-05	2.448E-05	2.098E-05	2.031E-05	1.913E-05	2.119E-05	5.115E-05	6.452
W	0.000E+00	2.956E-05	0.000E+00	0.000E+00	9.291E-06	3.227E-05	1.333E-05	1.224E-05	7.957E-05	4.552E-05	2.531E-05	2.623
WNW	0.000E+00	0.000E+00	0.000E+00	4.967E-06	1.535E-04	1.714E-05	1.217E-05	1.162E-05	1.101E-05	1.153E-05	1.303E-05	1.353
NW	3.316E-05	0.000E+00	1.025E-05	0.000E+00	3.781E-03	2.935E-05	1.823E-05	1.713E-05	1.663E-05	2.532E-05	3.416E-05	2.892
NNW	5.156E-05	9.442E-05	0.000E+00	4.905E-05	1.097E-04	1.009E-04	7.974E-05	5.613E-05	9.867E-05	9.555E-05	9.337E-05	1.462

TOTAL DOSE COMMITMENT IS 2.161E-02 PERSON-REM/YR

TIME STEP NUMBER 1, 10-Year Action Perio   DURATION IN YRS IS... 5.0

EXPOSURE PATHWAY IS CLOUD   EXPOSED ORGAN IS EFFECTIV

DOSES SHOWN BELOW ARE ANNUAL POPULATION DOSE COMMITMENTS, PERSON-REM PER YEAR

DIRECTION	XRHO 1.5	XRHO 2.5	XRHO 3.5	XRHO 4.5	XRHO 7.5	XRHO 15.0	XRHO 25.0	XRHO 35.0	XRHO 45.0	XRHO 55.0	XRHO 65.0	XRH 75.
N	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.092E-03	9.731E-03	9.754E-03	9.948E-03	1.142E-02	1.109E-02	1.072E-02	1.039
NNE	0.000E+00	0.000E+00	0.000E+00	4.098E-04	6.151E-04	2.098E-02	8.396E-03	8.381E-03	9.706E-03	9.941E-03	1.750E-02	1.334
NE	0.000E+00	0.000E+00	0.000E+00	3.359E-04	1.555E-03	6.357E-03	7.087E-03	7.299E-03	7.785E-03	1.472E-02	2.057E-02	2.046
ENE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.391E-03	3.246E-03	3.526E-03	2.403E-01	4.965E-03	5.977E-03	1.394E-02	5.654
E	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.724E-03	1.816E-03	1.839E-03	2.184E-03	1.316E-02	3.147E-03	1.381
ESE	2.169E-04	2.993E-04	0.000E+00	0.000E+00	2.971E-04	1.402E-03	1.541E-03	1.584E-03	1.698E-03	2.741E-03	2.771E-03	2.721
SE	0.000E+00	0.000E+00	4.133E-04	3.824E-04	9.727E-04	1.963E-03	2.381E-03	3.575E-03	5.607E-03	5.942E-03	5.702E-03	5.330
SSE	0.000E+00	0.000E+00	0.000E+00	6.564E-04	8.337E-05	2.083E-03	3.483E-03	2.552E-03	3.044E-02	5.502E-03	5.454E-03	1.362
S	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.444E-03	3.302E-03	5.911E-03	7.380E-03	7.147E-03	6.659E-03	5.810E-03	1.950
SSW	1.933E-04	0.000E+00	0.000E+00	0.000E+00	7.209E-04	3.550E-03	3.562E-03	2.910E-03	2.385E-03	2.200E-03	2.155E-03	2.228
SW	3.604E-04	7.751E-04	0.000E+00	0.000E+00	5.583E-04	2.616E-03	2.237E-03	2.345E-03	2.294E-03	2.328E-03	2.282E-03	3.441
WSW	0.000E+00	0.000E+00	2.698E-04	0.000E+00	1.266E-03	1.433E-03	1.350E-03	1.331E-03	1.239E-03	1.339E-03	3.139E-03	3.836
W	0.000E+00	6.841E-04	0.000E+00	0.000E+00	4.524E-04	1.799E-03	8.482E-04	7.989E-04	5.147E-03	2.878E-03	1.556E-03	1.564
WNW	0.000E+00	0.000E+00	0.000E+00	2.164E-04	7.796E-03	1.012E-03	7.833E-04	7.495E-04	6.901E-04	6.956E-04	7.539E-04	7.506
NW	3.279E-04	0.000E+00	2.758E-04	0.000E+00	1.694E-01	1.619E-03	1.161E-03	1.116E-03	1.072E-03	1.594E-03	2.088E-03	1.714
NNW	5.026E-04	7.467E-04	0.000E+00	1.503E-03	4.503E-03	4.433E-03	4.921E-03	3.619E-03	6.340E-03	6.027E-03	5.748E-03	8.756

TOTAL DOSE COMMITMENT IS 1.243E+00 PERSON-REM/YR

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

EXPOSURE PATHWAY IS VEG. ING EXPOSED ORGAN IS EFFECTIV

DOSES SHOWN BELOW ARE ANNUAL POPULATION DOSE COMMITMENTS, PERSON-REM PER YEAR

DIRECTION	XRHO 1.5	XRHO 2.5	XRHO 3.5	XRHO 4.5	XRHO 7.5	XRHO 15.0	XRHO 25.0	XRHO 35.0	XRHO 45.0	XRHO 55.0	XRHO 65.0	XRH 75.
N	2.359E-03	7.274E-03	1.504E-02	2.441E-02	2.786E-01	1.532E+00	2.708E+00	3.770E+00	4.745E+00	5.656E+00	6.518E+00	7.338
NNE	2.273E-03	6.840E-03	1.390E-02	2.279E-02	2.617E-01	1.330E+00	2.472E+00	3.462E+00	4.371E+00	5.214E+00	6.006E+00	6.753
NE	2.076E-03	6.090E-03	1.217E-02	1.956E-02	2.241E-01	1.136E+00	2.049E+00	2.923E+00	3.782E+00	4.588E+00	5.350E+00	6.073
ENE	1.757E-03	4.346E-03	7.986E-03	1.226E-02	1.326E-01	6.393E-01	1.125E+00	1.598E+00	2.065E+00	2.509E+00	2.933E+00	3.339
E	1.378E-03	3.046E-03	5.288E-03	8.033E-03	8.412E-02	3.757E-01	6.418E-01	8.959E-01	1.136E+00	1.364E+00	1.580E+00	1.785
ESE	1.257E-03	2.624E-03	4.345E-03	6.275E-03	6.283E-02	2.806E-01	4.758E-01	6.599E-01	8.373E-01	1.007E+00	1.170E+00	1.328
SE	1.248E-03	2.754E-03	4.768E-03	7.090E-03	7.370E-02	3.392E-01	5.869E-01	8.282E-01	1.063E+00	1.290E+00	1.510E+00	1.723
SSE	1.336E-03	3.062E-03	5.370E-03	8.043E-03	8.438E-02	3.921E-01	6.843E-01	9.661E-01	1.238E+00	1.500E+00	1.754E+00	1.999
S	1.636E-03	4.449E-03	8.526E-03	1.339E-02	1.515E-01	7.325E-01	1.275E+00	1.783E+00	2.264E+00	2.720E+00	3.156E+00	3.572
SSW	1.689E-03	4.452E-03	8.414E-03	1.304E-02	1.443E-01	7.000E-01	1.225E+00	1.728E+00	2.213E+00	2.679E+00	3.128E+00	3.561
SW	1.643E-03	4.159E-03	7.600E-03	1.172E-02	1.322E-01	6.103E-01	1.073E+00	1.535E+00	1.983E+00	2.416E+00	2.835E+00	3.239
WSW	1.426E-03	3.405E-03	6.240E-03	9.623E-03	1.010E-01	4.403E-01	7.373E-01	1.018E+00	1.277E+00	1.521E+00	1.752E+00	1.972
W	1.234E-03	2.812E-03	5.065E-03	7.785E-03	7.598E-02	3.079E-01	4.704E-01	6.286E-01	7.793E-01	9.217E-01	1.057E+00	1.185
WNW	1.173E-03	2.619E-03	4.976E-03	7.869E-03	8.292E-02	3.275E-01	5.189E-01	7.232E-01	9.143E-01	1.092E+00	1.258E+00	1.415
NW	1.267E-03	2.693E-03	4.796E-03	7.578E-03	8.807E-02	3.385E-01	6.153E-01	8.573E-01	1.083E+00	1.294E+00	1.494E+00	1.685
NNW	1.695E-03	4.620E-03	9.291E-03	1.471E-02	1.586E-01	8.931E-01	1.530E+00	2.083E+00	2.598E+00	3.081E+00	3.539E+00	3.973

TOTAL DOSE COMMITMENT IS 2.237E+02 PERSON-REM/YR

WARNING--POPULATION FOOD INGESTION DOSES SHOWN ABOVE HAVE NOT BEEN CORRECTED TO REFLECT POTENTIAL FOOD EXPORT AND MAY EXCEED DOSES ACTUALLY RECEIVED BY THE POPULATION OF THIS REGION. SEE SUMMARY TABLE FOR THIS INFORMATION.

REGION: Crow Butte North Trend CODE: MILDOS-AREA (02/97) PAGE 17
METSET: DATA: CBRMAIN.MIL 03/26/07

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

EXPOSURE PATHWAY IS VEG. ING EXPOSED ORGAN IS BONE

DOSES SHOWN BELOW ARE ANNUAL POPULATION DOSE COMMITMENTS, PERSON-REM PER YEAR

DIRECTION	XRHO 1.5	XRHO 2.5	XRHO 3.5	XRHO 4.5	XRHO 7.5	XRHO 15.0	XRHO 25.0	XRHO 35.0	XRHO 45.0	XRHO 55.0	XRHO 65.0	XRH 75.
N	2.726E-02	8.406E-02	1.738E-01	2.821E-01	3.219E+00	1.770E+01	3.129E+01	4.357E+01	5.483E+01	6.536E+01	7.531E+01	8.480
NNE	2.627E-02	7.904E-02	1.606E-01	2.634E-01	3.024E+00	1.536E+01	2.857E+01	4.000E+01	5.051E+01	6.025E+01	6.940E+01	7.803
NE	2.399E-02	7.037E-02	1.407E-01	2.260E-01	2.589E+00	1.312E+01	2.367E+01	3.378E+01	4.370E+01	5.301E+01	6.182E+01	7.017
ENE	2.030E-02	5.022E-02	9.228E-02	1.417E-01	1.532E+00	7.388E+00	1.300E+01	1.847E+01	2.386E+01	2.899E+01	3.390E+01	3.858
E	1.592E-02	3.520E-02	6.111E-02	9.283E-02	9.720E-01	4.341E+00	7.416E+00	1.035E+01	1.312E+01	1.576E+01	1.826E+01	2.063
ESE	1.453E-02	3.033E-02	5.020E-02	7.251E-02	7.260E-01	3.242E+00	5.498E+00	7.626E+00	9.675E+00	1.164E+01	1.352E+01	1.534
SE	1.442E-02	3.183E-02	5.509E-02	8.193E-02	8.516E-01	3.920E+00	6.782E+00	9.571E+00	1.228E+01	1.491E+01	1.745E+01	1.990
SSE	1.543E-02	3.538E-02	6.205E-02	9.293E-02	9.750E-01	4.531E+00	7.908E+00	1.116E+01	1.431E+01	1.733E+01	2.027E+01	2.310
S	1.890E-02	5.140E-02	9.852E-02	1.548E-01	1.751E+00	8.464E+00	1.473E+01	2.060E+01	2.616E+01	3.143E+01	3.647E+01	4.128
SSW	1.952E-02	5.145E-02	9.723E-02	1.506E-01	1.668E+00	8.088E+00	1.415E+01	1.997E+01	2.557E+01	3.096E+01	3.615E+01	4.115
SW	1.899E-02	4.806E-02	8.782E-02	1.354E-01	1.527E+00	7.052E+00	1.239E+01	1.773E+01	2.292E+01	2.792E+01	3.275E+01	3.743
WSW	1.648E-02	3.934E-02	7.210E-02	1.112E-01	1.167E+00	5.088E+00	8.520E+00	1.176E+01	1.475E+01	1.757E+01	2.025E+01	2.279
W	1.426E-02	3.249E-02	5.853E-02	8.996E-02	8.780E-01	3.558E+00	5.435E+00	7.264E+00	9.005E+00	1.065E+01	1.221E+01	1.369
WNW	1.355E-02	3.027E-02	5.750E-02	9.092E-02	9.582E-01	3.784E+00	5.996E+00	8.356E+00	1.056E+01	1.261E+01	1.453E+01	1.635
NW	1.464E-02	3.111E-02	5.542E-02	8.756E-02	1.018E+00	3.912E+00	7.110E+00	9.906E+00	1.251E+01	1.495E+01	1.727E+01	1.947
NNW	1.959E-02	5.338E-02	1.074E-01	1.700E-01	1.833E+00	1.032E+01	1.768E+01	2.407E+01	3.002E+01	3.560E+01	4.089E+01	4.590

TOTAL DOSE COMMITMENT IS 2.585E+03 PERSON-REM/YR

WARNING--POPULATION FOOD INGESTION DOSES SHOWN ABOVE HAVE NOT BEEN CORRECTED TO REFLECT POTENTIAL FOOD EXPORT AND MAY EXCEED DOSES ACTUALLY RECEIVED BY THE POPULATION OF THIS REGION. SEE SUMMARY TABLE FOR THIS INFORMATION.

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

EXPOSURE PATHWAY IS MEAT ING EXPOSED ORGAN IS EFFECTIV

DOSES SHOWN BELOW ARE ANNUAL POPULATION DOSE COMMITMENTS, PERSON-REM PER YEAR

DIRECTION	XRHO 1.5	XRHO 2.5	XRHO 3.5	XRHO 4.5	XRHO 7.5	XRHO 15.0	XRHO 25.0	XRHO 35.0	XRHO 45.0	XRHO 55.0	XRHO 65.0	XRH 75.
N	2.031E-05	6.261E-05	1.294E-04	2.101E-04	2.398E-03	1.318E-02	2.331E-02	3.245E-02	4.084E-02	4.869E-02	5.610E-02	6.317
NNE	1.957E-05	5.887E-05	1.196E-04	1.962E-04	2.252E-03	1.145E-02	2.128E-02	2.979E-02	3.762E-02	4.488E-02	5.170E-02	5.813
NE	1.787E-05	5.242E-05	1.048E-04	1.683E-04	1.929E-03	9.777E-03	1.763E-02	2.516E-02	3.255E-02	3.949E-02	4.605E-02	5.227
ENE	1.512E-05	3.741E-05	6.874E-05	1.055E-04	1.141E-03	5.503E-03	9.683E-03	1.376E-02	1.777E-02	2.160E-02	2.525E-02	2.874
E	1.186E-05	2.622E-05	4.552E-05	6.915E-05	7.240E-04	3.234E-03	5.524E-03	7.711E-03	9.777E-03	1.174E-02	1.360E-02	1.536
ESE	1.082E-05	2.259E-05	3.740E-05	5.401E-05	5.408E-04	2.415E-03	4.096E-03	5.680E-03	7.207E-03	8.670E-03	1.007E-02	1.143
SE	1.074E-05	2.371E-05	4.104E-05	6.103E-05	6.343E-04	2.920E-03	5.052E-03	7.129E-03	9.151E-03	1.111E-02	1.300E-02	1.483
SSE	1.150E-05	2.636E-05	4.622E-05	6.923E-05	7.263E-04	3.375E-03	5.890E-03	8.316E-03	1.066E-02	1.291E-02	1.510E-02	1.720
S	1.408E-05	3.829E-05	7.339E-05	1.153E-04	1.304E-03	6.305E-03	1.097E-02	1.535E-02	1.949E-02	2.341E-02	2.716E-02	3.075
SSW	1.454E-05	3.832E-05	7.243E-05	1.122E-04	1.242E-03	6.025E-03	1.054E-02	1.487E-02	1.905E-02	2.306E-02	2.693E-02	3.065
SW	1.414E-05	3.580E-05	6.542E-05	1.009E-04	1.138E-03	5.253E-03	9.232E-03	1.321E-02	1.707E-02	2.080E-02	2.440E-02	2.788
WSW	1.228E-05	2.931E-05	5.371E-05	8.283E-05	8.689E-04	3.790E-03	6.347E-03	8.761E-03	1.099E-02	1.309E-02	1.508E-02	1.698
W	1.062E-05	2.420E-05	4.360E-05	6.701E-05	6.540E-04	2.650E-03	4.049E-03	5.411E-03	6.708E-03	7.934E-03	9.095E-03	1.020
WNW	1.009E-05	2.255E-05	4.283E-05	6.773E-05	7.137E-04	2.819E-03	4.466E-03	6.225E-03	7.870E-03	9.396E-03	1.083E-02	1.218
NW	1.091E-05	2.318E-05	4.129E-05	6.523E-05	7.581E-04	2.914E-03	5.296E-03	7.379E-03	9.318E-03	1.114E-02	1.286E-02	1.450
NNW	1.459E-05	3.976E-05	7.997E-05	1.266E-04	1.365E-03	7.687E-03	1.317E-02	1.793E-02	2.236E-02	2.652E-02	3.046E-02	3.419

TOTAL DOSE COMMITMENT IS 1.926E+00 PERSON-REM/YR

WARNING--POPULATION FOOD INGESTION DOSES SHOWN ABOVE HAVE NOT BEEN CORRECTED TO REFLECT POTENTIAL FOOD EXPORT AND MAY EXCEED DOSES ACTUALLY RECEIVED BY THE POPULATION OF THIS REGION. SEE SUMMARY TABLE FOR THIS INFORMATION.

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

EXPOSURE PATHWAY IS MEAT ING EXPOSED ORGAN IS BONE

DOSES SHOWN BELOW ARE ANNUAL POPULATION DOSE COMMITMENTS, PERSON-REM PER YEAR

DIRECTION	XRHO 1.5	XRHO 2.5	XRHO 3.5	XRHO 4.5	XRHO 7.5	XRHO 15.0	XRHO 25.0	XRHO 35.0	XRHO 45.0	XRHO 55.0	XRHO 65.0	XRH 75.
N	2.347E-04	7.235E-04	1.496E-03	2.428E-03	2.771E-02	1.523E-01	2.693E-01	3.750E-01	4.719E-01	5.626E-01	6.483E-01	7.299
NNE	2.261E-04	6.803E-04	1.382E-03	2.267E-03	2.603E-02	1.323E-01	2.459E-01	3.443E-01	4.347E-01	5.186E-01	5.974E-01	6.717
NE	2.065E-04	6.057E-04	1.211E-03	1.945E-03	2.229E-02	1.130E-01	2.038E-01	2.908E-01	3.762E-01	4.563E-01	5.321E-01	6.040
ENE	1.747E-04	4.322E-04	7.943E-04	1.220E-03	1.319E-02	6.359E-02	1.119E-01	1.590E-01	2.054E-01	2.496E-01	2.918E-01	3.321
E	1.371E-04	3.030E-04	5.260E-04	7.990E-04	8.366E-03	3.737E-02	6.383E-02	8.911E-02	1.130E-01	1.356E-01	1.571E-01	1.775
ESE	1.251E-04	2.610E-04	4.321E-04	6.241E-04	6.249E-03	2.790E-02	4.733E-02	6.564E-02	8.328E-02	1.002E-01	1.164E-01	1.321
SE	1.241E-04	2.739E-04	4.742E-04	7.052E-04	7.330E-03	3.374E-02	5.837E-02	8.238E-02	1.057E-01	1.283E-01	1.502E-01	1.713
SSE	1.329E-04	3.045E-04	5.341E-04	7.999E-04	8.392E-03	3.900E-02	6.806E-02	9.609E-02	1.231E-01	1.492E-01	1.745E-01	1.988
S	1.627E-04	4.425E-04	8.480E-04	1.332E-03	1.507E-02	7.286E-02	1.268E-01	1.773E-01	2.252E-01	2.706E-01	3.139E-01	3.553
SSW	1.680E-04	4.428E-04	8.369E-04	1.297E-03	1.435E-02	6.962E-02	1.218E-01	1.719E-01	2.201E-01	2.664E-01	3.111E-01	3.542
SW	1.634E-04	4.137E-04	7.559E-04	1.165E-03	1.315E-02	6.070E-02	1.067E-01	1.527E-01	1.972E-01	2.403E-01	2.819E-01	3.221
WSW	1.419E-04	3.386E-04	6.206E-04	9.571E-04	1.004E-02	4.379E-02	7.334E-02	1.012E-01	1.270E-01	1.512E-01	1.743E-01	1.962
W	1.228E-04	2.797E-04	5.038E-04	7.743E-04	7.557E-03	3.062E-02	4.678E-02	6.252E-02	7.751E-02	9.168E-02	1.051E-01	1.178
WNW	1.166E-04	2.605E-04	4.949E-04	7.826E-04	8.247E-03	3.257E-02	5.161E-02	7.193E-02	9.094E-02	1.086E-01	1.251E-01	1.408
NW	1.260E-04	2.678E-04	4.771E-04	7.537E-04	8.760E-03	3.367E-02	6.120E-02	8.527E-02	1.077E-01	1.287E-01	1.486E-01	1.676
NNW	1.686E-04	4.595E-04	9.241E-04	1.463E-03	1.578E-02	8.882E-02	1.522E-01	2.072E-01	2.584E-01	3.065E-01	3.520E-01	3.951

TOTAL DOSE COMMITMENT IS 2.225E+01 PERSON-REM/YR

WARNING--POPULATION FOOD INGESTION DOSES SHOWN ABOVE HAVE NOT BEEN CORRECTED TO REFLECT POTENTIAL FOOD EXPORT AND MAY EXCEED DOSES ACTUALLY RECEIVED BY THE POPULATION OF THIS REGION. SEE SUMMARY TABLE FOR THIS INFORMATION.

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

EXPOSURE PATHWAY IS MILK ING EXPOSED ORGAN IS EFFECTIV

DOSES SHOWN BELOW ARE ANNUAL POPULATION DOSE COMMITMENTS, PERSON-REM PER YEAR

DIRECTION	XRHO 1.5	XRHO 2.5	XRHO 3.5	XRHO 4.5	XRHO 7.5	XRHO 15.0	XRHO 25.0	XRHO 35.0	XRHO 45.0	XRHO 55.0	XRHO 65.0	XRH 75.
N	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000
NNE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000
NE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000
ENE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000
E	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000
ESE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000
SE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000
SSE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000
S	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000
SSW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000
SW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000
WSW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000
W	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000
WNW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000
NW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000
NNW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000

TOTAL DOSE COMMITMENT IS 0.000E+00 PERSON-REM/YR

WARNING--POPULATION FOOD INGESTION DOSES SHOWN
ABOVE HAVE NOT BEEN CORRECTED TO REFLECT POTENTIAL
FOOD EXPORT AND MAY EXCEED DOSES ACTUALLY RECEIVED
BY THE POPULATION OF THIS REGION. SEE SUMMARY
TABLE FOR THIS INFORMATION.

REGION: Crow Butte North Trend CODE: MILDOS-AREA (02/97)
METSET: DATA: CBRMAIN.MIL 03/26/07

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

EXPOSURE PATHWAY IS MILK ING EXPOSED ORGAN IS BONE

DOSES SHOWN BELOW ARE ANNUAL POPULATION DOSE COMMITMENTS, PERSON-REM PER YEAR

DIRECTION	XRHO 1.5	XRHO 2.5	XRHO 3.5	XRHO 4.5	XRHO 7.5	XRHO 15.0	XRHO 25.0	XRHO 35.0	XRHO 45.0	XRHO 55.0	XRHO 65.0	XRH 75.
N	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000
NNE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000
NE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000
ENE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000
E	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000
ESE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000
SE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000
SSE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000
S	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000
SSW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000
SW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000
WSW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000
W	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000
WNW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000
NW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000
NNW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000

TOTAL DOSE COMMITMENT IS 0.000E+00 PERSON-REM/YR

WARNING--POPULATION FOOD INGESTION DOSES SHOWN ABOVE HAVE NOT BEEN CORRECTED TO REFLECT POTENTIAL FOOD EXPORT AND MAY EXCEED DOSES ACTUALLY RECEIVED BY THE POPULATION OF THIS REGION. SEE SUMMARY TABLE FOR THIS INFORMATION.

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

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.	2.492E-01	2.019E+00	3.226E-02	1.514E+00	7.279E-01	1.676E+02
GROUND	2.161E-02	2.161E-02	2.161E-02	2.161E-02	2.161E-02	2.161E-02
CLOUD	1.243E+00	1.243E+00	1.243E+00	1.243E+00	1.243E+00	1.243E+00
VEG. ING	1.518E+00	1.754E+01	1.518E+00	5.213E+00	4.246E+00	1.518E+00
MEAT ING	1.056E-01	1.220E+00	1.056E-01	3.626E-01	2.953E-01	1.056E-01
MILK ING	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RNPLUS50	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TOTALS	3.138E+00	2.204E+01	2.921E+00	8.354E+00	6.534E+00	1.705E+02

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	2.222E+02	2.568E+03	2.222E+02	7.632E+02	6.217E+02	2.222E+02
MEAT ING	1.820E+00	2.103E+01	1.820E+00	6.252E+00	5.092E+00	1.820E+00
MILK ING	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RNPLUS50	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TOTALS	2.240E+02	2.589E+03	2.240E+02	7.695E+02	6.268E+02	2.240E+02

TOTAL DOSES COMPUTED OVER ALL POPULATIONS

PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INHAL.	2.492E-01	2.019E+00	3.226E-02	1.514E+00	7.279E-01	1.676E+02
GROUND	2.161E-02	2.161E-02	2.161E-02	2.161E-02	2.161E-02	2.161E-02
CLOUD	1.243E+00	1.243E+00	1.243E+00	1.243E+00	1.243E+00	1.243E+00
VEG. ING	2.237E+02	2.585E+03	2.237E+02	7.684E+02	6.259E+02	2.237E+02
MEAT ING	1.926E+00	2.225E+01	1.926E+00	6.614E+00	5.388E+00	1.926E+00
MILK ING	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RNPLUS50	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TOTALS	2.272E+02	2.611E+03	2.270E+02	7.778E+02	6.333E+02	3.946E+02

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 1 NAME=R1 X= -1.2KM, Y= -0.4KM, Z= 0.0M, DIST= 1.3KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MILK ING	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

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 1 NAME=R1 X= -1.2KM, Y= -0.4KM, Z= 0.0M, DIST= 1.3KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	6.49E+00	9.98E-03	9.38E-04	5.18E-02	2.01E-02	1.08E+02
INFANT	GROUND	1.06E-02	1.06E-02	1.06E-02	1.06E-02	1.06E-02	1.06E-02
INFANT	CLOUD	1.38E-01	1.38E-01	1.38E-01	1.38E-01	1.38E-01	1.38E-01
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	6.64E+00	1.59E-01	1.50E-01	2.01E-01	1.69E-01	1.08E+02
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	6.49E+00	7.57E-03	4.37E-04	2.30E-02	9.48E-03	1.08E+02
CHILD	GROUND	1.06E-02	1.06E-02	1.06E-02	1.06E-02	1.06E-02	1.06E-02
CHILD	CLOUD	1.38E-01	1.38E-01	1.38E-01	1.38E-01	1.38E-01	1.38E-01
CHILD	VEG. ING	6.78E-04	7.84E-03	2.33E-03	2.33E-03	1.90E-03	0.00E+00
CHILD	MEAT ING	1.37E-04	1.58E-03	4.71E-04	4.71E-04	3.83E-04	0.00E+00
CHILD	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	6.64E+00	1.66E-01	1.52E-01	1.75E-01	1.61E-01	1.08E+02
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	6.49E+00	1.86E-02	1.87E-04	9.87E-03	4.74E-03	1.08E+02
TEENAGE	GROUND	1.06E-02	1.06E-02	1.06E-02	1.06E-02	1.06E-02	1.06E-02
TEENAGE	CLOUD	1.38E-01	1.38E-01	1.38E-01	1.38E-01	1.38E-01	1.38E-01
TEENAGE	VEG. ING	1.12E-03	1.30E-02	3.85E-03	3.85E-03	3.14E-03	0.00E+00
TEENAGE	MEAT ING	2.22E-04	2.57E-03	7.64E-04	7.64E-04	6.22E-04	0.00E+00
TEENAGE	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	6.64E+00	1.83E-01	1.54E-01	1.64E-01	1.58E-01	1.08E+02
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	6.49E+00	1.10E-02	1.56E-04	8.22E-03	3.95E-03	1.08E+02
ADULT	GROUND	1.06E-02	1.06E-02	1.06E-02	1.06E-02	1.06E-02	1.06E-02
ADULT	CLOUD	1.38E-01	1.38E-01	1.38E-01	1.38E-01	1.38E-01	1.38E-01
ADULT	VEG. ING	1.55E-03	1.79E-02	5.32E-03	5.32E-03	4.34E-03	0.00E+00
ADULT	MEAT ING	3.89E-04	4.49E-03	1.34E-03	1.34E-03	1.09E-03	0.00E+00
ADULT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	6.64E+00	1.82E-01	1.56E-01	1.64E-01	1.58E-01	1.08E+02

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 2 NAME=R2 X= -2.0KM, Y= 2.0KM, Z= 0.0M, DIST= 2.8KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MILK ING	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

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 2 NAME=R2 X= -2.0KM, Y= 2.0KM, Z= 0.0M, DIST= 2.8KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	4.67E+00	1.27E-02	1.19E-03	6.59E-02	2.56E-02	7.77E+01
INFANT	GROUND	8.08E-03	8.08E-03	8.08E-03	8.08E-03	8.08E-03	8.08E-03
INFANT	CLOUD	1.42E-01	1.42E-01	1.42E-01	1.42E-01	1.42E-01	1.42E-01
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	4.81E+00	1.63E-01	1.51E-01	2.16E-01	1.75E-01	7.78E+01

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	4.66E+00	9.63E-03	5.54E-04	2.93E-02	1.21E-02	7.77E+01
CHILD	GROUND	8.08E-03	8.08E-03	8.08E-03	8.08E-03	8.08E-03	8.08E-03
CHILD	CLOUD	1.42E-01	1.42E-01	1.42E-01	1.42E-01	1.42E-01	1.42E-01
CHILD	VEG. ING	8.63E-04	9.98E-03	2.97E-03	2.97E-03	2.42E-03	0.00E+00
CHILD	MEAT ING	1.74E-04	2.02E-03	5.99E-04	5.99E-04	4.88E-04	0.00E+00
CHILD	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	4.81E+00	1.71E-01	1.54E-01	1.83E-01	1.65E-01	7.78E+01

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	4.66E+00	2.37E-02	2.38E-04	1.26E-02	6.03E-03	7.77E+01
TEENAGE	GROUND	8.08E-03	8.08E-03	8.08E-03	8.08E-03	8.08E-03	8.08E-03
TEENAGE	CLOUD	1.42E-01	1.42E-01	1.42E-01	1.42E-01	1.42E-01	1.42E-01
TEENAGE	VEG. ING	1.43E-03	1.65E-02	4.91E-03	4.91E-03	4.00E-03	0.00E+00
TEENAGE	MEAT ING	2.83E-04	3.27E-03	9.72E-04	9.72E-04	7.92E-04	0.00E+00
TEENAGE	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	4.81E+00	1.93E-01	1.56E-01	1.68E-01	1.61E-01	7.78E+01

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	4.66E+00	1.40E-02	1.98E-04	1.05E-02	5.03E-03	7.77E+01
ADULT	GROUND	8.08E-03	8.08E-03	8.08E-03	8.08E-03	8.08E-03	8.08E-03
ADULT	CLOUD	1.42E-01	1.42E-01	1.42E-01	1.42E-01	1.42E-01	1.42E-01
ADULT	VEG. ING	1.97E-03	2.28E-02	6.77E-03	6.77E-03	5.52E-03	0.00E+00
ADULT	MEAT ING	4.95E-04	5.72E-03	1.70E-03	1.70E-03	1.38E-03	0.00E+00
ADULT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	4.82E+00	1.92E-01	1.58E-01	1.69E-01	1.62E-01	7.78E+01

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 3 NAME=R3 X= -1.9KM, Y= 2.7KM, Z= 0.0M, DIST= 3.3KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MILK ING	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

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 3 NAME=R3 X= -1.9KM, Y= 2.7KM, Z= 0.0M, DIST= 3.3KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	5.91E+00	1.91E-02	1.78E-03	9.92E-02	3.86E-02	9.85E+01
INFANT	GROUND	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02
INFANT	CLOUD	2.10E-01	2.10E-01	2.10E-01	2.10E-01	2.10E-01	2.10E-01
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	6.14E+00	2.39E-01	2.22E-01	3.20E-01	2.59E-01	9.87E+01

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	5.91E+00	1.45E-02	8.33E-04	4.41E-02	1.81E-02	9.85E+01
CHILD	GROUND	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02
CHILD	CLOUD	2.10E-01	2.10E-01	2.10E-01	2.10E-01	2.10E-01	2.10E-01
CHILD	VEG. ING	1.30E-03	1.50E-02	4.46E-03	4.46E-03	3.63E-03	0.00E+00
CHILD	MEAT ING	2.62E-04	3.03E-03	9.01E-04	9.01E-04	7.34E-04	0.00E+00
CHILD	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	6.13E+00	2.53E-01	2.27E-01	2.70E-01	2.43E-01	9.87E+01

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	5.91E+00	3.57E-02	3.57E-04	1.89E-02	9.07E-03	9.85E+01
TEENAGE	GROUND	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02
TEENAGE	CLOUD	2.10E-01	2.10E-01	2.10E-01	2.10E-01	2.10E-01	2.10E-01
TEENAGE	VEG. ING	2.15E-03	2.48E-02	7.38E-03	7.38E-03	6.01E-03	0.00E+00
TEENAGE	MEAT ING	4.26E-04	4.92E-03	1.46E-03	1.46E-03	1.19E-03	0.00E+00
TEENAGE	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	6.13E+00	2.86E-01	2.30E-01	2.48E-01	2.37E-01	9.87E+01

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	5.91E+00	2.10E-02	2.97E-04	1.57E-02	7.56E-03	9.85E+01
ADULT	GROUND	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02
ADULT	CLOUD	2.10E-01	2.10E-01	2.10E-01	2.10E-01	2.10E-01	2.10E-01
ADULT	VEG. ING	2.97E-03	3.43E-02	1.02E-02	1.02E-02	8.30E-03	0.00E+00
ADULT	MEAT ING	7.44E-04	8.60E-03	2.56E-03	2.56E-03	2.08E-03	0.00E+00
ADULT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	6.14E+00	2.84E-01	2.33E-01	2.49E-01	2.38E-01	9.87E+01

REGION: Crow Butte North Trend CODE: MILDOS-AREA (02/97) PAGE 29
METSET: DATA: CBRMAIN.MIL 03/26/07
TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 4 NAME=R4 X= -3.3KM, Y= 2.8KM, Z= 0.0M, DIST= 4.4KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MILK ING	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

REGION: Crow Butte North Trend CODE: MILDOS-AREA (02/97) PAGE 30
METSET: DATA: CBRMAIN.MIL 03/26/07
TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 4 NAME=R4 X= -3.3KM, Y= 2.8KM, Z= 0.0M, DIST= 4.4KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	1.80E+00	1.76E-02	1.65E-03	9.16E-02	3.56E-02	2.99E+01
INFANT	GROUND	3.37E-03	3.37E-03	3.37E-03	3.37E-03	3.37E-03	3.37E-03
INFANT	CLOUD	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	1.92E+00	1.44E-01	1.28E-01	2.18E-01	1.62E-01	3.00E+01
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	1.80E+00	1.34E-02	7.70E-04	4.07E-02	1.68E-02	2.99E+01
CHILD	GROUND	3.37E-03	3.37E-03	3.37E-03	3.37E-03	3.37E-03	3.37E-03
CHILD	CLOUD	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01
CHILD	VEG. ING	1.20E-03	1.39E-02	4.12E-03	4.12E-03	3.35E-03	0.00E+00
CHILD	MEAT ING	2.42E-04	2.80E-03	8.32E-04	8.32E-04	6.78E-04	0.00E+00
CHILD	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	1.92E+00	1.56E-01	1.32E-01	1.72E-01	1.47E-01	3.00E+01
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	1.80E+00	3.29E-02	3.30E-04	1.74E-02	8.38E-03	2.99E+01
TEENAGE	GROUND	3.37E-03	3.37E-03	3.37E-03	3.37E-03	3.37E-03	3.37E-03
TEENAGE	CLOUD	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01
TEENAGE	VEG. ING	1.98E-03	2.29E-02	6.81E-03	6.81E-03	5.55E-03	0.00E+00
TEENAGE	MEAT ING	3.93E-04	4.54E-03	1.35E-03	1.35E-03	1.10E-03	0.00E+00
TEENAGE	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	1.92E+00	1.87E-01	1.35E-01	1.52E-01	1.41E-01	3.00E+01
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	1.80E+00	1.94E-02	2.75E-04	1.45E-02	6.98E-03	2.99E+01
ADULT	GROUND	3.37E-03	3.37E-03	3.37E-03	3.37E-03	3.37E-03	3.37E-03
ADULT	CLOUD	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01
ADULT	VEG. ING	2.74E-03	3.16E-02	9.41E-03	9.41E-03	7.66E-03	0.00E+00
ADULT	MEAT ING	6.87E-04	7.94E-03	2.36E-03	2.36E-03	1.92E-03	0.00E+00
ADULT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	1.92E+00	1.85E-01	1.38E-01	1.52E-01	1.43E-01	3.00E+01

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 5 NAME=R5 X= -3.6KM, Y= 4.0KM, Z= 0.0M, DIST= 5.4KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MILK ING	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

REGION: Crow Butte North Trend   CODE: MILDOS-AREA (02/97)   PAGE 32
METSET: DATA: CBRMAIN.MIL   03/26/07
TIME STEP NUMBER 1, 10-Year Action Perio   DURATION IN YRS IS... 5.0

NUMBER 5 NAME=R5   X= -3.6KM, Y= 4.0KM, Z= 0.0M, DIST= 5.4KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	1.84E+00	2.20E-02	2.06E-03	1.14E-01	4.44E-02	3.06E+01
INFANT	GROUND	3.47E-03	3.47E-03	3.47E-03	3.47E-03	3.47E-03	3.47E-03
INFANT	CLOUD	1.35E-01	1.35E-01	1.35E-01	1.35E-01	1.35E-01	1.35E-01
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	1.98E+00	1.60E-01	1.40E-01	2.53E-01	1.83E-01	3.07E+01
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	1.84E+00	1.67E-02	9.62E-04	5.08E-02	2.09E-02	3.06E+01
CHILD	GROUND	3.47E-03	3.47E-03	3.47E-03	3.47E-03	3.47E-03	3.47E-03
CHILD	CLOUD	1.35E-01	1.35E-01	1.35E-01	1.35E-01	1.35E-01	1.35E-01
CHILD	VEG. ING	1.50E-03	1.73E-02	5.14E-03	5.14E-03	4.19E-03	0.00E+00
CHILD	MEAT ING	3.02E-04	3.49E-03	1.04E-03	1.04E-03	8.46E-04	0.00E+00
CHILD	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	1.98E+00	1.76E-01	1.45E-01	1.95E-01	1.64E-01	3.07E+01
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	1.84E+00	4.11E-02	4.12E-04	2.18E-02	1.05E-02	3.06E+01
TEENAGE	GROUND	3.47E-03	3.47E-03	3.47E-03	3.47E-03	3.47E-03	3.47E-03
TEENAGE	CLOUD	1.35E-01	1.35E-01	1.35E-01	1.35E-01	1.35E-01	1.35E-01
TEENAGE	VEG. ING	2.48E-03	2.86E-02	8.51E-03	8.51E-03	6.93E-03	0.00E+00
TEENAGE	MEAT ING	4.91E-04	5.67E-03	1.69E-03	1.69E-03	1.37E-03	0.00E+00
TEENAGE	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	1.98E+00	2.14E-01	1.49E-01	1.70E-01	1.57E-01	3.07E+01
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	1.84E+00	2.42E-02	3.43E-04	1.81E-02	8.72E-03	3.06E+01
ADULT	GROUND	3.47E-03	3.47E-03	3.47E-03	3.47E-03	3.47E-03	3.47E-03
ADULT	CLOUD	1.35E-01	1.35E-01	1.35E-01	1.35E-01	1.35E-01	1.35E-01
ADULT	VEG. ING	3.42E-03	3.95E-02	1.17E-02	1.17E-02	9.57E-03	0.00E+00
ADULT	MEAT ING	8.58E-04	9.91E-03	2.95E-03	2.95E-03	2.40E-03	0.00E+00
ADULT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	1.98E+00	2.12E-01	1.53E-01	1.71E-01	1.59E-01	3.07E+01

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 6 NAME=CRAWFORD X= -4.4KM, Y= 4.4KM, Z= 0.0M, DIST= 6.3KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MILK ING	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

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 6 NAME=CRAWFORD X= -4.4KM, Y= 4.4KM, Z= 0.0M, DIST= 6.3KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	1.52E+00	2.31E-02	2.16E-03	1.20E-01	4.66E-02	2.52E+01
INFANT	GROUND	2.88E-03	2.88E-03	2.88E-03	2.88E-03	2.88E-03	2.88E-03
INFANT	CLOUD	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	1.65E+00	1.49E-01	1.28E-01	2.46E-01	1.73E-01	2.54E+01
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	1.52E+00	1.75E-02	1.01E-03	5.33E-02	2.19E-02	2.52E+01
CHILD	GROUND	2.88E-03	2.88E-03	2.88E-03	2.88E-03	2.88E-03	2.88E-03
CHILD	CLOUD	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01
CHILD	VEG. ING	1.57E-03	1.81E-02	5.39E-03	5.39E-03	4.39E-03	0.00E+00
CHILD	MEAT ING	3.17E-04	3.67E-03	1.09E-03	1.09E-03	8.87E-04	0.00E+00
CHILD	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	1.65E+00	1.66E-01	1.34E-01	1.86E-01	1.54E-01	2.54E+01
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	1.52E+00	4.32E-02	4.33E-04	2.28E-02	1.10E-02	2.52E+01
TEENAGE	GROUND	2.88E-03	2.88E-03	2.88E-03	2.88E-03	2.88E-03	2.88E-03
TEENAGE	CLOUD	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01
TEENAGE	VEG. ING	2.60E-03	3.00E-02	8.92E-03	8.92E-03	7.27E-03	0.00E+00
TEENAGE	MEAT ING	5.15E-04	5.95E-03	1.77E-03	1.77E-03	1.44E-03	0.00E+00
TEENAGE	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	1.65E+00	2.05E-01	1.37E-01	1.60E-01	1.46E-01	2.54E+01
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	1.52E+00	2.54E-02	3.61E-04	1.90E-02	9.14E-03	2.52E+01
ADULT	GROUND	2.88E-03	2.88E-03	2.88E-03	2.88E-03	2.88E-03	2.88E-03
ADULT	CLOUD	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01
ADULT	VEG. ING	3.59E-03	4.15E-02	1.23E-02	1.23E-02	1.00E-02	0.00E+00
ADULT	MEAT ING	9.00E-04	1.04E-02	3.09E-03	3.09E-03	2.52E-03	0.00E+00
ADULT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	1.65E+00	2.04E-01	1.42E-01	1.61E-01	1.48E-01	2.54E+01

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 7 NAME=R7 X= -2.0KM, Y= 4.0KM, Z= 0.0M, DIST= 4.4KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MILK ING	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

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 7 NAME=R7 X= -2.0KM, Y= 4.0KM, Z= 0.0M, DIST= 4.4KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	4.60E+00	3.15E-02	2.94E-03	1.64E-01	6.36E-02	7.65E+01
INFANT	GROUND	8.51E-03	8.51E-03	8.51E-03	8.51E-03	8.51E-03	8.51E-03
INFANT	CLOUD	2.61E-01	2.61E-01	2.61E-01	2.61E-01	2.61E-01	2.61E-01
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	4.87E+00	3.01E-01	2.73E-01	4.33E-01	3.33E-01	7.68E+01
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	4.60E+00	2.39E-02	1.37E-03	7.27E-02	2.99E-02	7.65E+01
CHILD	GROUND	8.51E-03	8.51E-03	8.51E-03	8.51E-03	8.51E-03	8.51E-03
CHILD	CLOUD	2.61E-01	2.61E-01	2.61E-01	2.61E-01	2.61E-01	2.61E-01
CHILD	VEG. ING	2.14E-03	2.48E-02	7.36E-03	7.36E-03	6.00E-03	0.00E+00
CHILD	MEAT ING	4.33E-04	5.00E-03	1.49E-03	1.49E-03	1.21E-03	0.00E+00
CHILD	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	4.87E+00	3.23E-01	2.80E-01	3.51E-01	3.07E-01	7.68E+01
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	4.60E+00	5.89E-02	5.89E-04	3.12E-02	1.50E-02	7.65E+01
TEENAGE	GROUND	8.51E-03	8.51E-03	8.51E-03	8.51E-03	8.51E-03	8.51E-03
TEENAGE	CLOUD	2.61E-01	2.61E-01	2.61E-01	2.61E-01	2.61E-01	2.61E-01
TEENAGE	VEG. ING	3.55E-03	4.10E-02	1.22E-02	1.22E-02	9.92E-03	0.00E+00
TEENAGE	MEAT ING	7.03E-04	8.12E-03	2.41E-03	2.41E-03	1.97E-03	0.00E+00
TEENAGE	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	4.87E+00	3.78E-01	2.85E-01	3.15E-01	2.96E-01	7.68E+01
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	4.60E+00	3.46E-02	4.91E-04	2.60E-02	1.25E-02	7.65E+01
ADULT	GROUND	8.51E-03	8.51E-03	8.51E-03	8.51E-03	8.51E-03	8.51E-03
ADULT	CLOUD	2.61E-01	2.61E-01	2.61E-01	2.61E-01	2.61E-01	2.61E-01
ADULT	VEG. ING	4.90E-03	5.66E-02	1.68E-02	1.68E-02	1.37E-02	0.00E+00
ADULT	MEAT ING	1.23E-03	1.42E-02	4.22E-03	4.22E-03	3.44E-03	0.00E+00
ADULT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	4.87E+00	3.75E-01	2.91E-01	3.17E-01	2.99E-01	7.68E+01

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 8 NAME=R8 X= -2.0KM, Y= 3.6KM, Z= 0.0M, DIST= 4.1KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MILK ING	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

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 8 NAME=R8 X= -2.0KM, Y= 3.6KM, Z= 0.0M, DIST= 4.1KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	4.90E+00	2.80E-02	2.61E-03	1.45E-01	5.64E-02	8.15E+01
INFANT	GROUND	8.98E-03	8.98E-03	8.98E-03	8.98E-03	8.98E-03	8.98E-03
INFANT	CLOUD	2.53E-01	2.53E-01	2.53E-01	2.53E-01	2.53E-01	2.53E-01
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	5.16E+00	2.90E-01	2.64E-01	4.07E-01	3.18E-01	8.17E+01

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	4.89E+00	2.12E-02	1.22E-03	6.45E-02	2.66E-02	8.15E+01
CHILD	GROUND	8.98E-03	8.98E-03	8.98E-03	8.98E-03	8.98E-03	8.98E-03
CHILD	CLOUD	2.53E-01	2.53E-01	2.53E-01	2.53E-01	2.53E-01	2.53E-01
CHILD	VEG. ING	1.90E-03	2.20E-02	6.53E-03	6.53E-03	5.32E-03	0.00E+00
CHILD	MEAT ING	3.84E-04	4.44E-03	1.32E-03	1.32E-03	1.07E-03	0.00E+00
CHILD	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	5.16E+00	3.09E-01	2.71E-01	3.34E-01	2.95E-01	8.17E+01

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	4.89E+00	5.22E-02	5.22E-04	2.76E-02	1.33E-02	8.15E+01
TEENAGE	GROUND	8.98E-03	8.98E-03	8.98E-03	8.98E-03	8.98E-03	8.98E-03
TEENAGE	CLOUD	2.53E-01	2.53E-01	2.53E-01	2.53E-01	2.53E-01	2.53E-01
TEENAGE	VEG. ING	3.14E-03	3.63E-02	1.08E-02	1.08E-02	8.79E-03	0.00E+00
TEENAGE	MEAT ING	6.23E-04	7.20E-03	2.14E-03	2.14E-03	1.74E-03	0.00E+00
TEENAGE	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	5.16E+00	3.57E-01	2.75E-01	3.02E-01	2.86E-01	8.17E+01

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	4.89E+00	3.07E-02	4.35E-04	2.30E-02	1.11E-02	8.15E+01
ADULT	GROUND	8.98E-03	8.98E-03	8.98E-03	8.98E-03	8.98E-03	8.98E-03
ADULT	CLOUD	2.53E-01	2.53E-01	2.53E-01	2.53E-01	2.53E-01	2.53E-01
ADULT	VEG. ING	4.34E-03	5.02E-02	1.49E-02	1.49E-02	1.21E-02	0.00E+00
ADULT	MEAT ING	1.09E-03	1.26E-02	3.74E-03	3.74E-03	3.05E-03	0.00E+00
ADULT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	5.16E+00	3.55E-01	2.81E-01	3.03E-01	2.88E-01	8.17E+01

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 9 NAME=R9 X= -1.6KM, Y= 3.2KM, Z= 0.0M, DIST= 3.6KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MILK ING	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

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 9 NAME=R9 X= -1.6KM, Y= 3.2KM, Z= 0.0M, DIST= 3.6KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	7.81E+00	2.69E-02	2.51E-03	1.39E-01	5.42E-02	1.30E+02
INFANT	GROUND	1.38E-02	1.38E-02	1.38E-02	1.38E-02	1.38E-02	1.38E-02
INFANT	CLOUD	3.01E-01	3.01E-01	3.01E-01	3.01E-01	3.01E-01	3.01E-01
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	8.12E+00	3.41E-01	3.17E-01	4.54E-01	3.69E-01	1.30E+02

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	7.80E+00	2.04E-02	1.17E-03	6.20E-02	2.55E-02	1.30E+02
CHILD	GROUND	1.38E-02	1.38E-02	1.38E-02	1.38E-02	1.38E-02	1.38E-02
CHILD	CLOUD	3.01E-01	3.01E-01	3.01E-01	3.01E-01	3.01E-01	3.01E-01
CHILD	VEG. ING	1.83E-03	2.11E-02	6.27E-03	6.27E-03	5.11E-03	0.00E+00
CHILD	MEAT ING	3.69E-04	4.26E-03	1.27E-03	1.27E-03	1.03E-03	0.00E+00
CHILD	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	8.12E+00	3.60E-01	3.23E-01	3.84E-01	3.46E-01	1.30E+02

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	7.80E+00	5.02E-02	5.02E-04	2.66E-02	1.28E-02	1.30E+02
TEENAGE	GROUND	1.38E-02	1.38E-02	1.38E-02	1.38E-02	1.38E-02	1.38E-02
TEENAGE	CLOUD	3.01E-01	3.01E-01	3.01E-01	3.01E-01	3.01E-01	3.01E-01
TEENAGE	VEG. ING	3.02E-03	3.49E-02	1.04E-02	1.04E-02	8.45E-03	0.00E+00
TEENAGE	MEAT ING	5.99E-04	6.92E-03	2.06E-03	2.06E-03	1.68E-03	0.00E+00
TEENAGE	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	8.12E+00	4.06E-01	3.27E-01	3.53E-01	3.37E-01	1.30E+02

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	7.80E+00	2.95E-02	4.18E-04	2.21E-02	1.06E-02	1.30E+02
ADULT	GROUND	1.38E-02	1.38E-02	1.38E-02	1.38E-02	1.38E-02	1.38E-02
ADULT	CLOUD	3.01E-01	3.01E-01	3.01E-01	3.01E-01	3.01E-01	3.01E-01
ADULT	VEG. ING	4.17E-03	4.82E-02	1.43E-02	1.43E-02	1.17E-02	0.00E+00
ADULT	MEAT ING	1.05E-03	1.21E-02	3.59E-03	3.59E-03	2.93E-03	0.00E+00
ADULT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	8.12E+00	4.04E-01	3.33E-01	3.54E-01	3.40E-01	1.30E+02

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 10 NAME=R10 X= -1.2KM, Y= 2.8KM, Z= 0.0M, DIST= 3.0KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MILK ING	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

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 10 NAME=R10 X= -1.2KM, Y= 2.8KM, Z= 0.0M, DIST= 3.0KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	1.56E+01	2.53E-02	2.36E-03	1.31E-01	5.11E-02	2.60E+02
INFANT	GROUND	2.58E-02	2.58E-02	2.58E-02	2.58E-02	2.58E-02	2.58E-02
INFANT	CLOUD	3.73E-01	3.73E-01	3.73E-01	3.73E-01	3.73E-01	3.73E-01
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	1.60E+01	4.25E-01	4.02E-01	5.31E-01	4.50E-01	2.61E+02
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	1.56E+01	1.92E-02	1.10E-03	5.84E-02	2.41E-02	2.60E+02
CHILD	GROUND	2.58E-02	2.58E-02	2.58E-02	2.58E-02	2.58E-02	2.58E-02
CHILD	CLOUD	3.73E-01	3.73E-01	3.73E-01	3.73E-01	3.73E-01	3.73E-01
CHILD	VEG. ING	1.72E-03	1.99E-02	5.91E-03	5.91E-03	4.82E-03	0.00E+00
CHILD	MEAT ING	3.48E-04	4.02E-03	1.19E-03	1.19E-03	9.73E-04	0.00E+00
CHILD	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	1.60E+01	4.42E-01	4.07E-01	4.65E-01	4.29E-01	2.61E+02
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	1.56E+01	4.73E-02	4.73E-04	2.50E-02	1.20E-02	2.60E+02
TEENAGE	GROUND	2.58E-02	2.58E-02	2.58E-02	2.58E-02	2.58E-02	2.58E-02
TEENAGE	CLOUD	3.73E-01	3.73E-01	3.73E-01	3.73E-01	3.73E-01	3.73E-01
TEENAGE	VEG. ING	2.85E-03	3.29E-02	9.78E-03	9.78E-03	7.97E-03	0.00E+00
TEENAGE	MEAT ING	5.65E-04	6.52E-03	1.94E-03	1.94E-03	1.58E-03	0.00E+00
TEENAGE	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	1.60E+01	4.86E-01	4.11E-01	4.36E-01	4.21E-01	2.61E+02
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	1.56E+01	2.78E-02	3.94E-04	2.09E-02	1.00E-02	2.60E+02
ADULT	GROUND	2.58E-02	2.58E-02	2.58E-02	2.58E-02	2.58E-02	2.58E-02
ADULT	CLOUD	3.73E-01	3.73E-01	3.73E-01	3.73E-01	3.73E-01	3.73E-01
ADULT	VEG. ING	3.93E-03	4.54E-02	1.35E-02	1.35E-02	1.10E-02	0.00E+00
ADULT	MEAT ING	9.87E-04	1.14E-02	3.39E-03	3.39E-03	2.76E-03	0.00E+00
ADULT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	1.60E+01	4.84E-01	4.16E-01	4.37E-01	4.23E-01	2.61E+02

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 11 NAME=R11 X= -1.8KM, Y= 2.8KM, Z= 0.0M, DIST= 3.3KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MILK ING	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

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 11 NAME=R11 X= -1.8KM, Y= 2.8KM, Z= 0.0M, DIST= 3.3KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	7.09E+00	2.05E-02	1.91E-03	1.06E-01	4.13E-02	1.18E+02
INFANT	GROUND	1.23E-02	1.23E-02	1.23E-02	1.23E-02	1.23E-02	1.23E-02
INFANT	CLOUD	2.36E-01	2.36E-01	2.36E-01	2.36E-01	2.36E-01	2.36E-01
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	7.34E+00	2.69E-01	2.50E-01	3.55E-01	2.90E-01	1.18E+02

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	7.09E+00	1.55E-02	8.92E-04	4.72E-02	1.94E-02	1.18E+02
CHILD	GROUND	1.23E-02	1.23E-02	1.23E-02	1.23E-02	1.23E-02	1.23E-02
CHILD	CLOUD	2.36E-01	2.36E-01	2.36E-01	2.36E-01	2.36E-01	2.36E-01
CHILD	VEG. ING	1.39E-03	1.61E-02	4.78E-03	4.78E-03	3.89E-03	0.00E+00
CHILD	MEAT ING	2.81E-04	3.25E-03	9.65E-04	9.65E-04	7.86E-04	0.00E+00
CHILD	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	7.34E+00	2.83E-01	2.55E-01	3.01E-01	2.72E-01	1.18E+02

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	7.09E+00	3.82E-02	3.82E-04	2.02E-02	9.72E-03	1.18E+02
TEENAGE	GROUND	1.23E-02	1.23E-02	1.23E-02	1.23E-02	1.23E-02	1.23E-02
TEENAGE	CLOUD	2.36E-01	2.36E-01	2.36E-01	2.36E-01	2.36E-01	2.36E-01
TEENAGE	VEG. ING	2.30E-03	2.66E-02	7.90E-03	7.90E-03	6.44E-03	0.00E+00
TEENAGE	MEAT ING	4.56E-04	5.27E-03	1.57E-03	1.57E-03	1.28E-03	0.00E+00
TEENAGE	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	7.34E+00	3.18E-01	2.58E-01	2.78E-01	2.66E-01	1.18E+02

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	7.09E+00	2.25E-02	3.18E-04	1.69E-02	8.10E-03	1.18E+02
ADULT	GROUND	1.23E-02	1.23E-02	1.23E-02	1.23E-02	1.23E-02	1.23E-02
ADULT	CLOUD	2.36E-01	2.36E-01	2.36E-01	2.36E-01	2.36E-01	2.36E-01
ADULT	VEG. ING	3.18E-03	3.67E-02	1.09E-02	1.09E-02	8.89E-03	0.00E+00
ADULT	MEAT ING	7.97E-04	9.21E-03	2.74E-03	2.74E-03	2.23E-03	0.00E+00
ADULT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	7.34E+00	3.17E-01	2.62E-01	2.79E-01	2.67E-01	1.18E+02

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 12 NAME=R12 X= -0.3KM, Y= 2.3KM, Z= 0.0M, DIST= 2.4KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MILK ING	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

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 12 NAME=R12 X= -0.3KM, Y= 2.3KM, Z= 0.0M, DIST= 2.4KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	1.72E+01	2.64E-02	2.46E-03	1.37E-01	5.32E-02	2.87E+02
INFANT	GROUND	2.92E-02	2.92E-02	2.92E-02	2.92E-02	2.92E-02	2.92E-02
INFANT	CLOUD	4.44E-01	4.44E-01	4.44E-01	4.44E-01	4.44E-01	4.44E-01
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	1.77E+01	4.99E-01	4.75E-01	6.10E-01	5.26E-01	2.87E+02

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	1.72E+01	2.00E-02	1.15E-03	6.09E-02	2.50E-02	2.87E+02
CHILD	GROUND	2.92E-02	2.92E-02	2.92E-02	2.92E-02	2.92E-02	2.92E-02
CHILD	CLOUD	4.44E-01	4.44E-01	4.44E-01	4.44E-01	4.44E-01	4.44E-01
CHILD	VEG. ING	1.79E-03	2.07E-02	6.16E-03	6.16E-03	5.02E-03	0.00E+00
CHILD	MEAT ING	3.62E-04	4.19E-03	1.24E-03	1.24E-03	1.01E-03	0.00E+00
CHILD	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	1.77E+01	5.18E-01	4.82E-01	5.41E-01	5.04E-01	2.87E+02

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	1.72E+01	4.93E-02	4.92E-04	2.61E-02	1.25E-02	2.87E+02
TEENAGE	GROUND	2.92E-02	2.92E-02	2.92E-02	2.92E-02	2.92E-02	2.92E-02
TEENAGE	CLOUD	4.44E-01	4.44E-01	4.44E-01	4.44E-01	4.44E-01	4.44E-01
TEENAGE	VEG. ING	2.97E-03	3.43E-02	1.02E-02	1.02E-02	8.30E-03	0.00E+00
TEENAGE	MEAT ING	5.88E-04	6.79E-03	2.02E-03	2.02E-03	1.64E-03	0.00E+00
TEENAGE	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	1.77E+01	5.63E-01	4.86E-01	5.11E-01	4.95E-01	2.87E+02

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	1.72E+01	2.90E-02	4.10E-04	2.17E-02	1.04E-02	2.87E+02
ADULT	GROUND	2.92E-02	2.92E-02	2.92E-02	2.92E-02	2.92E-02	2.92E-02
ADULT	CLOUD	4.44E-01	4.44E-01	4.44E-01	4.44E-01	4.44E-01	4.44E-01
ADULT	VEG. ING	4.10E-03	4.73E-02	1.41E-02	1.41E-02	1.15E-02	0.00E+00
ADULT	MEAT ING	1.03E-03	1.19E-02	3.53E-03	3.53E-03	2.87E-03	0.00E+00
ADULT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	1.77E+01	5.61E-01	4.91E-01	5.12E-01	4.98E-01	2.87E+02

REGION: Crow Butte North Trend CODE: MILDOS-AREA (02/97) PAGE 47
METSET: DATA: CBRMAIN.MIL 03/26/07
TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 13 NAME=R13 X= 0.0KM, Y= 1.5KM, Z= 0.0M, DIST= 1.5KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MILK ING	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

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 13 NAME=R13 X= 0.0KM, Y= 1.5KM, Z= 0.0M, DIST= 1.5KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	2.76E+01	1.68E-02	1.57E-03	8.72E-02	3.39E-02	4.60E+02
INFANT	GROUND	4.29E-02	4.29E-02	4.29E-02	4.29E-02	4.29E-02	4.29E-02
INFANT	CLOUD	3.94E-01	3.94E-01	3.94E-01	3.94E-01	3.94E-01	3.94E-01
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	2.81E+01	4.53E-01	4.38E-01	5.24E-01	4.70E-01	4.61E+02
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	2.76E+01	1.27E-02	7.32E-04	3.88E-02	1.60E-02	4.60E+02
CHILD	GROUND	4.29E-02	4.29E-02	4.29E-02	4.29E-02	4.29E-02	4.29E-02
CHILD	CLOUD	3.94E-01	3.94E-01	3.94E-01	3.94E-01	3.94E-01	3.94E-01
CHILD	VEG. ING	1.14E-03	1.32E-02	3.92E-03	3.92E-03	3.19E-03	0.00E+00
CHILD	MEAT ING	2.31E-04	2.67E-03	7.92E-04	7.92E-04	6.45E-04	0.00E+00
CHILD	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	2.81E+01	4.65E-01	4.42E-01	4.80E-01	4.56E-01	4.61E+02
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	2.76E+01	3.14E-02	3.14E-04	1.66E-02	7.98E-03	4.60E+02
TEENAGE	GROUND	4.29E-02	4.29E-02	4.29E-02	4.29E-02	4.29E-02	4.29E-02
TEENAGE	CLOUD	3.94E-01	3.94E-01	3.94E-01	3.94E-01	3.94E-01	3.94E-01
TEENAGE	VEG. ING	1.89E-03	2.18E-02	6.49E-03	6.49E-03	5.28E-03	0.00E+00
TEENAGE	MEAT ING	3.74E-04	4.33E-03	1.29E-03	1.29E-03	1.05E-03	0.00E+00
TEENAGE	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	2.81E+01	4.94E-01	4.45E-01	4.61E-01	4.51E-01	4.61E+02
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	2.76E+01	1.85E-02	2.61E-04	1.38E-02	6.65E-03	4.60E+02
ADULT	GROUND	4.29E-02	4.29E-02	4.29E-02	4.29E-02	4.29E-02	4.29E-02
ADULT	CLOUD	3.94E-01	3.94E-01	3.94E-01	3.94E-01	3.94E-01	3.94E-01
ADULT	VEG. ING	2.61E-03	3.01E-02	8.96E-03	8.96E-03	7.30E-03	0.00E+00
ADULT	MEAT ING	6.54E-04	7.56E-03	2.25E-03	2.25E-03	1.83E-03	0.00E+00
ADULT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	2.81E+01	4.93E-01	4.48E-01	4.62E-01	4.52E-01	4.61E+02

NUMBER 14 NAME=R14 X= 0.5KM, Y= 1.0KM, Z= 0.0M, DIST= 1.1KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MILK ING	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

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 14 NAME=R14 X= 0.5KM, Y= 1.0KM, Z= 0.0M, DIST= 1.1KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	2.79E+01	1.23E-02	1.15E-03	6.37E-02	2.48E-02	4.66E+02
INFANT	GROUND	4.11E-02	4.11E-02	4.11E-02	4.11E-02	4.11E-02	4.11E-02
INFANT	CLOUD	2.92E-01	2.92E-01	2.92E-01	2.92E-01	2.92E-01	2.92E-01
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	2.83E+01	3.45E-01	3.34E-01	3.97E-01	3.58E-01	4.66E+02

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	2.79E+01	9.30E-03	5.36E-04	2.83E-02	1.17E-02	4.66E+02
CHILD	GROUND	4.11E-02	4.11E-02	4.11E-02	4.11E-02	4.11E-02	4.11E-02
CHILD	CLOUD	2.92E-01	2.92E-01	2.92E-01	2.92E-01	2.92E-01	2.92E-01
CHILD	VEG. ING	8.34E-04	9.64E-03	2.86E-03	2.86E-03	2.33E-03	0.00E+00
CHILD	MEAT ING	1.68E-04	1.95E-03	5.79E-04	5.79E-04	4.71E-04	0.00E+00
CHILD	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	2.83E+01	3.54E-01	3.37E-01	3.65E-01	3.47E-01	4.66E+02

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	2.79E+01	2.29E-02	2.30E-04	1.21E-02	5.83E-03	4.66E+02
TEENAGE	GROUND	4.11E-02	4.11E-02	4.11E-02	4.11E-02	4.11E-02	4.11E-02
TEENAGE	CLOUD	2.92E-01	2.92E-01	2.92E-01	2.92E-01	2.92E-01	2.92E-01
TEENAGE	VEG. ING	1.38E-03	1.59E-02	4.74E-03	4.74E-03	3.86E-03	0.00E+00
TEENAGE	MEAT ING	2.73E-04	3.16E-03	9.39E-04	9.39E-04	7.65E-04	0.00E+00
TEENAGE	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	2.83E+01	3.75E-01	3.39E-01	3.51E-01	3.43E-01	4.66E+02

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	2.79E+01	1.35E-02	1.91E-04	1.01E-02	4.85E-03	4.66E+02
ADULT	GROUND	4.11E-02	4.11E-02	4.11E-02	4.11E-02	4.11E-02	4.11E-02
ADULT	CLOUD	2.92E-01	2.92E-01	2.92E-01	2.92E-01	2.92E-01	2.92E-01
ADULT	VEG. ING	1.90E-03	2.20E-02	6.54E-03	6.54E-03	5.33E-03	0.00E+00
ADULT	MEAT ING	4.78E-04	5.52E-03	1.64E-03	1.64E-03	1.34E-03	0.00E+00
ADULT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	2.83E+01	3.74E-01	3.41E-01	3.51E-01	3.45E-01	4.66E+02

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 15 NAME=R15 X= 0.5KM, Y= 0.3KM, Z= 0.0M, DIST= 0.6KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MILK ING	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

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 15 NAME=R15 X= 0.5KM, Y= 0.3KM, Z= 0.0M, DIST= 0.6KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	3.15E+01	9.13E-03	8.57E-04	4.74E-02	1.84E-02	5.25E+02
INFANT	GROUND	3.71E-02	3.71E-02	3.71E-02	3.71E-02	3.71E-02	3.71E-02
INFANT	CLOUD	2.02E-01	2.02E-01	2.02E-01	2.02E-01	2.02E-01	2.02E-01
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	3.17E+01	2.48E-01	2.40E-01	2.86E-01	2.57E-01	5.25E+02

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	3.15E+01	6.92E-03	4.00E-04	2.11E-02	8.67E-03	5.25E+02
CHILD	GROUND	3.71E-02	3.71E-02	3.71E-02	3.71E-02	3.71E-02	3.71E-02
CHILD	CLOUD	2.02E-01	2.02E-01	2.02E-01	2.02E-01	2.02E-01	2.02E-01
CHILD	VEG. ING	6.20E-04	7.17E-03	2.13E-03	2.13E-03	1.74E-03	0.00E+00
CHILD	MEAT ING	1.25E-04	1.45E-03	4.30E-04	4.30E-04	3.51E-04	0.00E+00
CHILD	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	3.17E+01	2.55E-01	2.42E-01	2.63E-01	2.50E-01	5.25E+02

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	3.15E+01	1.70E-02	1.71E-04	9.03E-03	4.33E-03	5.25E+02
TEENAGE	GROUND	3.71E-02	3.71E-02	3.71E-02	3.71E-02	3.71E-02	3.71E-02
TEENAGE	CLOUD	2.02E-01	2.02E-01	2.02E-01	2.02E-01	2.02E-01	2.02E-01
TEENAGE	VEG. ING	1.03E-03	1.19E-02	3.53E-03	3.53E-03	2.87E-03	0.00E+00
TEENAGE	MEAT ING	2.03E-04	2.35E-03	6.99E-04	6.99E-04	5.69E-04	0.00E+00
TEENAGE	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	3.17E+01	2.70E-01	2.43E-01	2.52E-01	2.47E-01	5.25E+02

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	3.15E+01	1.00E-02	1.43E-04	7.52E-03	3.61E-03	5.25E+02
ADULT	GROUND	3.71E-02	3.71E-02	3.71E-02	3.71E-02	3.71E-02	3.71E-02
ADULT	CLOUD	2.02E-01	2.02E-01	2.02E-01	2.02E-01	2.02E-01	2.02E-01
ADULT	VEG. ING	1.42E-03	1.64E-02	4.87E-03	4.87E-03	3.97E-03	0.00E+00
ADULT	MEAT ING	3.56E-04	4.11E-03	1.22E-03	1.22E-03	9.95E-04	0.00E+00
ADULT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	3.17E+01	2.70E-01	2.45E-01	2.53E-01	2.48E-01	5.25E+02

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 16 NAME=R16 X= 1.3KM, Y= 0.3KM, Z= 0.0M, DIST= 1.3KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MILK ING	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

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 16 NAME=R16 X= 1.3KM, Y= 0.3KM, Z= 0.0M, DIST= 1.3KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	9.28E+00	1.10E-02	1.03E-03	5.70E-02	2.22E-02	1.55E+02
INFANT	GROUND	1.49E-02	1.49E-02	1.49E-02	1.49E-02	1.49E-02	1.49E-02
INFANT	CLOUD	1.82E-01	1.82E-01	1.82E-01	1.82E-01	1.82E-01	1.82E-01
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	9.48E+00	2.08E-01	1.98E-01	2.54E-01	2.19E-01	1.55E+02

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	9.28E+00	8.33E-03	4.81E-04	2.53E-02	1.04E-02	1.55E+02
CHILD	GROUND	1.49E-02	1.49E-02	1.49E-02	1.49E-02	1.49E-02	1.49E-02
CHILD	CLOUD	1.82E-01	1.82E-01	1.82E-01	1.82E-01	1.82E-01	1.82E-01
CHILD	VEG. ING	7.47E-04	8.63E-03	2.56E-03	2.56E-03	2.09E-03	0.00E+00
CHILD	MEAT ING	1.51E-04	1.74E-03	5.18E-04	5.18E-04	4.22E-04	0.00E+00
CHILD	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	9.48E+00	2.16E-01	2.01E-01	2.26E-01	2.10E-01	1.55E+02

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	9.28E+00	2.05E-02	2.06E-04	1.09E-02	5.22E-03	1.55E+02
TEENAGE	GROUND	1.49E-02	1.49E-02	1.49E-02	1.49E-02	1.49E-02	1.49E-02
TEENAGE	CLOUD	1.82E-01	1.82E-01	1.82E-01	1.82E-01	1.82E-01	1.82E-01
TEENAGE	VEG. ING	1.24E-03	1.43E-02	4.24E-03	4.24E-03	3.46E-03	0.00E+00
TEENAGE	MEAT ING	2.45E-04	2.83E-03	8.41E-04	8.41E-04	6.85E-04	0.00E+00
TEENAGE	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	9.48E+00	2.35E-01	2.02E-01	2.13E-01	2.06E-01	1.55E+02

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	9.28E+00	1.21E-02	1.72E-04	9.05E-03	4.35E-03	1.55E+02
ADULT	GROUND	1.49E-02	1.49E-02	1.49E-02	1.49E-02	1.49E-02	1.49E-02
ADULT	CLOUD	1.82E-01	1.82E-01	1.82E-01	1.82E-01	1.82E-01	1.82E-01
ADULT	VEG. ING	1.71E-03	1.97E-02	5.86E-03	5.86E-03	4.77E-03	0.00E+00
ADULT	MEAT ING	4.28E-04	4.94E-03	1.47E-03	1.47E-03	1.20E-03	0.00E+00
ADULT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	9.48E+00	2.34E-01	2.05E-01	2.13E-01	2.07E-01	1.55E+02

REGION: Crow Butte North Trend CODE: MILDOS-AREA (02/97) PAGE 55
METSET: DATA: CBRMAIN.MIL 03/26/07
TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 17 NAME=R17 X= 1.3KM, Y= -0.3KM, Z= 0.0M, DIST= 1.4KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MILK ING	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

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 17 NAME=R17 X= 1.3KM, Y= -0.3KM, Z= 0.0M, DIST= 1.4KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	5.93E+00	9.11E-03	8.57E-04	4.73E-02	1.84E-02	9.88E+01
INFANT	GROUND	9.37E-03	9.37E-03	9.37E-03	9.37E-03	9.37E-03	9.37E-03
INFANT	CLOUD	1.18E-01	1.18E-01	1.18E-01	1.18E-01	1.18E-01	1.18E-01
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	6.06E+00	1.37E-01	1.28E-01	1.75E-01	1.46E-01	9.90E+01
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	5.93E+00	6.91E-03	4.00E-04	2.10E-02	8.65E-03	9.88E+01
CHILD	GROUND	9.37E-03	9.37E-03	9.37E-03	9.37E-03	9.37E-03	9.37E-03
CHILD	CLOUD	1.18E-01	1.18E-01	1.18E-01	1.18E-01	1.18E-01	1.18E-01
CHILD	VEG. ING	6.19E-04	7.16E-03	2.13E-03	2.13E-03	1.73E-03	0.00E+00
CHILD	MEAT ING	1.25E-04	1.45E-03	4.30E-04	4.30E-04	3.50E-04	0.00E+00
CHILD	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	6.06E+00	1.43E-01	1.31E-01	1.51E-01	1.38E-01	9.90E+01
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	5.93E+00	1.70E-02	1.71E-04	9.01E-03	4.33E-03	9.88E+01
TEENAGE	GROUND	9.37E-03	9.37E-03	9.37E-03	9.37E-03	9.37E-03	9.37E-03
TEENAGE	CLOUD	1.18E-01	1.18E-01	1.18E-01	1.18E-01	1.18E-01	1.18E-01
TEENAGE	VEG. ING	1.02E-03	1.18E-02	3.52E-03	3.52E-03	2.87E-03	0.00E+00
TEENAGE	MEAT ING	2.03E-04	2.35E-03	6.97E-04	6.97E-04	5.68E-04	0.00E+00
TEENAGE	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	6.06E+00	1.59E-01	1.32E-01	1.41E-01	1.35E-01	9.90E+01
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	5.93E+00	1.00E-02	1.43E-04	7.51E-03	3.61E-03	9.88E+01
ADULT	GROUND	9.37E-03	9.37E-03	9.37E-03	9.37E-03	9.37E-03	9.37E-03
ADULT	CLOUD	1.18E-01	1.18E-01	1.18E-01	1.18E-01	1.18E-01	1.18E-01
ADULT	VEG. ING	1.41E-03	1.63E-02	4.86E-03	4.86E-03	3.96E-03	0.00E+00
ADULT	MEAT ING	3.55E-04	4.10E-03	1.22E-03	1.22E-03	9.93E-04	0.00E+00
ADULT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	6.06E+00	1.58E-01	1.34E-01	1.41E-01	1.36E-01	9.90E+01

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 18 NAME=EHLERS X= 0.7KM, Y= -0.1KM, Z= 0.0M, DIST= 0.7KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MILK ING	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

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 18 NAME=EHLERS X= 0.7KM, Y= -0.1KM, Z= 0.0M, DIST= 0.7KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	1.53E+01	8.64E-03	8.13E-04	4.49E-02	1.74E-02	2.55E+02
INFANT	GROUND	2.16E-02	2.16E-02	2.16E-02	2.16E-02	2.16E-02	2.16E-02
INFANT	CLOUD	1.65E-01	1.65E-01	1.65E-01	1.65E-01	1.65E-01	1.65E-01
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	1.55E+01	1.96E-01	1.88E-01	2.32E-01	2.04E-01	2.55E+02
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	1.53E+01	6.55E-03	3.79E-04	1.99E-02	8.21E-03	2.55E+02
CHILD	GROUND	2.16E-02	2.16E-02	2.16E-02	2.16E-02	2.16E-02	2.16E-02
CHILD	CLOUD	1.65E-01	1.65E-01	1.65E-01	1.65E-01	1.65E-01	1.65E-01
CHILD	VEG. ING	5.88E-04	6.79E-03	2.02E-03	2.02E-03	1.64E-03	0.00E+00
CHILD	MEAT ING	1.19E-04	1.37E-03	4.08E-04	4.08E-04	3.32E-04	0.00E+00
CHILD	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	1.55E+01	2.02E-01	1.90E-01	2.09E-01	1.97E-01	2.55E+02
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	1.53E+01	1.61E-02	1.63E-04	8.55E-03	4.10E-03	2.55E+02
TEENAGE	GROUND	2.16E-02	2.16E-02	2.16E-02	2.16E-02	2.16E-02	2.16E-02
TEENAGE	CLOUD	1.65E-01	1.65E-01	1.65E-01	1.65E-01	1.65E-01	1.65E-01
TEENAGE	VEG. ING	9.72E-04	1.12E-02	3.34E-03	3.34E-03	2.72E-03	0.00E+00
TEENAGE	MEAT ING	1.93E-04	2.23E-03	6.62E-04	6.62E-04	5.39E-04	0.00E+00
TEENAGE	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	1.55E+01	2.17E-01	1.91E-01	2.00E-01	1.94E-01	2.55E+02
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	1.53E+01	9.50E-03	1.36E-04	7.12E-03	3.42E-03	2.55E+02
ADULT	GROUND	2.16E-02	2.16E-02	2.16E-02	2.16E-02	2.16E-02	2.16E-02
ADULT	CLOUD	1.65E-01	1.65E-01	1.65E-01	1.65E-01	1.65E-01	1.65E-01
ADULT	VEG. ING	1.34E-03	1.55E-02	4.61E-03	4.61E-03	3.75E-03	0.00E+00
ADULT	MEAT ING	3.37E-04	3.89E-03	1.16E-03	1.16E-03	9.42E-04	0.00E+00
ADULT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	1.55E+01	2.16E-01	1.93E-01	2.00E-01	1.95E-01	2.55E+02

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 19 NAME=GIBBONS X= 0.7KM, Y= 0.7KM, Z= 0.0M, DIST= 1.0KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MILK ING	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

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 19 NAME=GIBBONS X= 0.7KM, Y= 0.7KM, Z= 0.0M, DIST= 1.0KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	2.47E+01	1.13E-02	1.06E-03	5.85E-02	2.28E-02	4.11E+02
INFANT	GROUND	3.58E-02	3.58E-02	3.58E-02	3.58E-02	3.58E-02	3.58E-02
INFANT	CLOUD	2.51E-01	2.51E-01	2.51E-01	2.51E-01	2.51E-01	2.51E-01
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	2.49E+01	2.98E-01	2.88E-01	3.45E-01	3.09E-01	4.11E+02

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	2.46E+01	8.55E-03	4.93E-04	2.60E-02	1.07E-02	4.11E+02
CHILD	GROUND	3.58E-02	3.58E-02	3.58E-02	3.58E-02	3.58E-02	3.58E-02
CHILD	CLOUD	2.51E-01	2.51E-01	2.51E-01	2.51E-01	2.51E-01	2.51E-01
CHILD	VEG. ING	7.66E-04	8.86E-03	2.63E-03	2.63E-03	2.14E-03	0.00E+00
CHILD	MEAT ING	1.55E-04	1.79E-03	5.32E-04	5.32E-04	4.33E-04	0.00E+00
CHILD	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	2.49E+01	3.06E-01	2.90E-01	3.16E-01	3.00E-01	4.11E+02

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	2.46E+01	2.11E-02	2.11E-04	1.11E-02	5.35E-03	4.11E+02
TEENAGE	GROUND	3.58E-02	3.58E-02	3.58E-02	3.58E-02	3.58E-02	3.58E-02
TEENAGE	CLOUD	2.51E-01	2.51E-01	2.51E-01	2.51E-01	2.51E-01	2.51E-01
TEENAGE	VEG. ING	1.27E-03	1.46E-02	4.35E-03	4.35E-03	3.55E-03	0.00E+00
TEENAGE	MEAT ING	2.51E-04	2.90E-03	8.63E-04	8.63E-04	7.03E-04	0.00E+00
TEENAGE	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	2.49E+01	3.25E-01	2.92E-01	3.03E-01	2.96E-01	4.11E+02

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	2.46E+01	1.24E-02	1.76E-04	9.29E-03	4.46E-03	4.11E+02
ADULT	GROUND	3.58E-02	3.58E-02	3.58E-02	3.58E-02	3.58E-02	3.58E-02
ADULT	CLOUD	2.51E-01	2.51E-01	2.51E-01	2.51E-01	2.51E-01	2.51E-01
ADULT	VEG. ING	1.75E-03	2.02E-02	6.01E-03	6.01E-03	4.90E-03	0.00E+00
ADULT	MEAT ING	4.39E-04	5.08E-03	1.51E-03	1.51E-03	1.23E-03	0.00E+00
ADULT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	2.49E+01	3.24E-01	2.94E-01	3.04E-01	2.97E-01	4.11E+02

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 20 NAME=STETSON X= -0.5KM, Y= 1.2KM, Z= 0.0M, DIST= 1.3KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MILK ING	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

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 20 NAME=STETSON X= -0.5KM, Y= 1.2KM, Z= 0.0M, DIST= 1.3KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	1.86E+01	1.15E-02	1.07E-03	5.96E-02	2.32E-02	3.10E+02
INFANT	GROUND	2.86E-02	2.86E-02	2.86E-02	2.86E-02	2.86E-02	2.86E-02
INFANT	CLOUD	2.46E-01	2.46E-01	2.46E-01	2.46E-01	2.46E-01	2.46E-01
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	1.89E+01	2.86E-01	2.76E-01	3.35E-01	2.98E-01	3.11E+02

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	1.86E+01	8.70E-03	5.01E-04	2.65E-02	1.09E-02	3.10E+02
CHILD	GROUND	2.86E-02	2.86E-02	2.86E-02	2.86E-02	2.86E-02	2.86E-02
CHILD	CLOUD	2.46E-01	2.46E-01	2.46E-01	2.46E-01	2.46E-01	2.46E-01
CHILD	VEG. ING	7.80E-04	9.02E-03	2.68E-03	2.68E-03	2.18E-03	0.00E+00
CHILD	MEAT ING	1.58E-04	1.82E-03	5.41E-04	5.41E-04	4.41E-04	0.00E+00
CHILD	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	1.89E+01	2.95E-01	2.79E-01	3.05E-01	2.88E-01	3.11E+02

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	1.86E+01	2.14E-02	2.15E-04	1.13E-02	5.45E-03	3.10E+02
TEENAGE	GROUND	2.86E-02	2.86E-02	2.86E-02	2.86E-02	2.86E-02	2.86E-02
TEENAGE	CLOUD	2.46E-01	2.46E-01	2.46E-01	2.46E-01	2.46E-01	2.46E-01
TEENAGE	VEG. ING	1.29E-03	1.49E-02	4.43E-03	4.43E-03	3.61E-03	0.00E+00
TEENAGE	MEAT ING	2.56E-04	2.96E-03	8.79E-04	8.79E-04	7.16E-04	0.00E+00
TEENAGE	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	1.89E+01	3.14E-01	2.81E-01	2.92E-01	2.85E-01	3.11E+02

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	1.86E+01	1.26E-02	1.79E-04	9.46E-03	4.54E-03	3.10E+02
ADULT	GROUND	2.86E-02	2.86E-02	2.86E-02	2.86E-02	2.86E-02	2.86E-02
ADULT	CLOUD	2.46E-01	2.46E-01	2.46E-01	2.46E-01	2.46E-01	2.46E-01
ADULT	VEG. ING	1.78E-03	2.06E-02	6.12E-03	6.12E-03	4.99E-03	0.00E+00
ADULT	MEAT ING	4.47E-04	5.17E-03	1.54E-03	1.54E-03	1.25E-03	0.00E+00
ADULT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	1.89E+01	3.13E-01	2.83E-01	2.92E-01	2.86E-01	3.11E+02

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 21 NAME=KNODE X= -1.9KM, Y= 2.7KM, Z= 0.0M, DIST= 3.3KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MILK ING	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

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 21 NAME=KNODE X= -1.9KM, Y= 2.7KM, Z= 0.0M, DIST= 3.3KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	5.87E+00	1.88E-02	1.76E-03	9.77E-02	3.80E-02	9.77E+01
INFANT	GROUND	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02
INFANT	CLOUD	2.07E-01	2.07E-01	2.07E-01	2.07E-01	2.07E-01	2.07E-01
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	6.09E+00	2.36E-01	2.19E-01	3.15E-01	2.55E-01	9.79E+01

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	5.87E+00	1.43E-02	8.20E-04	4.34E-02	1.79E-02	9.77E+01
CHILD	GROUND	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02
CHILD	CLOUD	2.07E-01	2.07E-01	2.07E-01	2.07E-01	2.07E-01	2.07E-01
CHILD	VEG. ING	1.28E-03	1.48E-02	4.39E-03	4.39E-03	3.58E-03	0.00E+00
CHILD	MEAT ING	2.58E-04	2.98E-03	8.87E-04	8.87E-04	7.23E-04	0.00E+00
CHILD	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	6.08E+00	2.49E-01	2.23E-01	2.66E-01	2.39E-01	9.79E+01

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	5.87E+00	3.51E-02	3.51E-04	1.86E-02	8.93E-03	9.77E+01
TEENAGE	GROUND	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02
TEENAGE	CLOUD	2.07E-01	2.07E-01	2.07E-01	2.07E-01	2.07E-01	2.07E-01
TEENAGE	VEG. ING	2.12E-03	2.44E-02	7.26E-03	7.26E-03	5.92E-03	0.00E+00
TEENAGE	MEAT ING	4.19E-04	4.84E-03	1.44E-03	1.44E-03	1.17E-03	0.00E+00
TEENAGE	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	6.09E+00	2.82E-01	2.26E-01	2.44E-01	2.33E-01	9.79E+01

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	5.87E+00	2.07E-02	2.93E-04	1.55E-02	7.44E-03	9.77E+01
ADULT	GROUND	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02	1.03E-02
ADULT	CLOUD	2.07E-01	2.07E-01	2.07E-01	2.07E-01	2.07E-01	2.07E-01
ADULT	VEG. ING	2.92E-03	3.38E-02	1.00E-02	1.00E-02	8.17E-03	0.00E+00
ADULT	MEAT ING	7.33E-04	8.47E-03	2.52E-03	2.52E-03	2.05E-03	0.00E+00
ADULT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	6.09E+00	2.80E-01	2.30E-01	2.45E-01	2.35E-01	9.79E+01

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 22 NAME=BROTT X= -1.4KM, Y= 1.3KM, Z= 0.0M, DIST= 1.9KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MILK ING	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

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 22 NAME=BROTT X= -1.4KM, Y= 1.3KM, Z= 0.0M, DIST= 1.9KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	1.60E+01	1.01E-02	9.49E-04	5.26E-02	2.04E-02	2.67E+02
INFANT	GROUND	2.17E-02	2.17E-02	2.17E-02	2.17E-02	2.17E-02	2.17E-02
INFANT	CLOUD	1.61E-01	1.61E-01	1.61E-01	1.61E-01	1.61E-01	1.61E-01
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	1.62E+01	1.93E-01	1.83E-01	2.35E-01	2.03E-01	2.67E+02

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	1.60E+01	7.68E-03	4.43E-04	2.34E-02	9.62E-03	2.67E+02
CHILD	GROUND	2.17E-02	2.17E-02	2.17E-02	2.17E-02	2.17E-02	2.17E-02
CHILD	CLOUD	1.61E-01	1.61E-01	1.61E-01	1.61E-01	1.61E-01	1.61E-01
CHILD	VEG. ING	6.89E-04	7.96E-03	2.36E-03	2.36E-03	1.93E-03	0.00E+00
CHILD	MEAT ING	1.39E-04	1.61E-03	4.78E-04	4.78E-04	3.89E-04	0.00E+00
CHILD	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	1.62E+01	2.00E-01	1.86E-01	2.09E-01	1.94E-01	2.67E+02

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	1.60E+01	1.89E-02	1.90E-04	1.00E-02	4.81E-03	2.67E+02
TEENAGE	GROUND	2.17E-02	2.17E-02	2.17E-02	2.17E-02	2.17E-02	2.17E-02
TEENAGE	CLOUD	1.61E-01	1.61E-01	1.61E-01	1.61E-01	1.61E-01	1.61E-01
TEENAGE	VEG. ING	1.14E-03	1.32E-02	3.91E-03	3.91E-03	3.19E-03	0.00E+00
TEENAGE	MEAT ING	2.26E-04	2.61E-03	7.75E-04	7.75E-04	6.32E-04	0.00E+00
TEENAGE	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	1.62E+01	2.17E-01	1.87E-01	1.97E-01	1.91E-01	2.67E+02

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	1.60E+01	1.11E-02	1.58E-04	8.35E-03	4.01E-03	2.67E+02
ADULT	GROUND	2.17E-02	2.17E-02	2.17E-02	2.17E-02	2.17E-02	2.17E-02
ADULT	CLOUD	1.61E-01	1.61E-01	1.61E-01	1.61E-01	1.61E-01	1.61E-01
ADULT	VEG. ING	1.57E-03	1.82E-02	5.40E-03	5.40E-03	4.40E-03	0.00E+00
ADULT	MEAT ING	3.95E-04	4.56E-03	1.36E-03	1.36E-03	1.10E-03	0.00E+00
ADULT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	1.62E+01	2.16E-01	1.89E-01	1.98E-01	1.92E-01	2.67E+02

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 23 NAME=SP1 X= 0.7KM, Y= 0.2KM, Z= 0.0M, DIST= 0.7KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MILK ING	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

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 23 NAME=SP1 X= 0.7KM, Y= 0.2KM, Z= 0.0M, DIST= 0.7KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	1.79E+01	9.06E-03	8.52E-04	4.70E-02	1.83E-02	2.99E+02
INFANT	GROUND	2.45E-02	2.45E-02	2.45E-02	2.45E-02	2.45E-02	2.45E-02
INFANT	CLOUD	1.82E-01	1.82E-01	1.82E-01	1.82E-01	1.82E-01	1.82E-01
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	1.81E+01	2.16E-01	2.08E-01	2.54E-01	2.25E-01	2.99E+02

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	1.79E+01	6.87E-03	3.97E-04	2.09E-02	8.61E-03	2.99E+02
CHILD	GROUND	2.45E-02	2.45E-02	2.45E-02	2.45E-02	2.45E-02	2.45E-02
CHILD	CLOUD	1.82E-01	1.82E-01	1.82E-01	1.82E-01	1.82E-01	1.82E-01
CHILD	VEG. ING	6.16E-04	7.12E-03	2.12E-03	2.12E-03	1.72E-03	0.00E+00
CHILD	MEAT ING	1.24E-04	1.44E-03	4.27E-04	4.27E-04	3.48E-04	0.00E+00
CHILD	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	1.81E+01	2.22E-01	2.10E-01	2.30E-01	2.18E-01	2.99E+02

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	1.79E+01	1.69E-02	1.70E-04	8.96E-03	4.30E-03	2.99E+02
TEENAGE	GROUND	2.45E-02	2.45E-02	2.45E-02	2.45E-02	2.45E-02	2.45E-02
TEENAGE	CLOUD	1.82E-01	1.82E-01	1.82E-01	1.82E-01	1.82E-01	1.82E-01
TEENAGE	VEG. ING	1.02E-03	1.18E-02	3.50E-03	3.50E-03	2.85E-03	0.00E+00
TEENAGE	MEAT ING	2.02E-04	2.33E-03	6.94E-04	6.94E-04	5.65E-04	0.00E+00
TEENAGE	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	1.81E+01	2.38E-01	2.11E-01	2.20E-01	2.15E-01	2.99E+02

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	1.79E+01	9.96E-03	1.42E-04	7.47E-03	3.59E-03	2.99E+02
ADULT	GROUND	2.45E-02	2.45E-02	2.45E-02	2.45E-02	2.45E-02	2.45E-02
ADULT	CLOUD	1.82E-01	1.82E-01	1.82E-01	1.82E-01	1.82E-01	1.82E-01
ADULT	VEG. ING	1.41E-03	1.63E-02	4.83E-03	4.83E-03	3.94E-03	0.00E+00
ADULT	MEAT ING	3.53E-04	4.08E-03	1.21E-03	1.21E-03	9.88E-04	0.00E+00
ADULT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	1.81E+01	2.37E-01	2.13E-01	2.20E-01	2.15E-01	2.99E+02

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 24 NAME=SP2 X= 0.7KM, Y= 0.6KM, Z= 0.0M, DIST= 0.9KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MILK ING	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

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 24 NAME=SP2 X= 0.7KM, Y= 0.6KM, Z= 0.0M, DIST= 0.9KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	2.60E+01	1.03E-02	9.63E-04	5.33E-02	2.07E-02	4.33E+02
INFANT	GROUND	3.54E-02	3.54E-02	3.54E-02	3.54E-02	3.54E-02	3.54E-02
INFANT	CLOUD	2.25E-01	2.25E-01	2.25E-01	2.25E-01	2.25E-01	2.25E-01
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	2.62E+01	2.70E-01	2.61E-01	3.13E-01	2.81E-01	4.33E+02

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	2.60E+01	7.78E-03	4.49E-04	2.37E-02	9.75E-03	4.33E+02
CHILD	GROUND	3.54E-02	3.54E-02	3.54E-02	3.54E-02	3.54E-02	3.54E-02
CHILD	CLOUD	2.25E-01	2.25E-01	2.25E-01	2.25E-01	2.25E-01	2.25E-01
CHILD	VEG. ING	6.98E-04	8.06E-03	2.40E-03	2.40E-03	1.95E-03	0.00E+00
CHILD	MEAT ING	1.41E-04	1.63E-03	4.84E-04	4.84E-04	3.94E-04	0.00E+00
CHILD	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	2.62E+01	2.78E-01	2.64E-01	2.87E-01	2.72E-01	4.33E+02

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	2.60E+01	1.92E-02	1.93E-04	1.02E-02	4.88E-03	4.33E+02
TEENAGE	GROUND	3.54E-02	3.54E-02	3.54E-02	3.54E-02	3.54E-02	3.54E-02
TEENAGE	CLOUD	2.25E-01	2.25E-01	2.25E-01	2.25E-01	2.25E-01	2.25E-01
TEENAGE	VEG. ING	1.15E-03	1.33E-02	3.97E-03	3.97E-03	3.23E-03	0.00E+00
TEENAGE	MEAT ING	2.29E-04	2.64E-03	7.86E-04	7.86E-04	6.40E-04	0.00E+00
TEENAGE	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	2.62E+01	2.95E-01	2.65E-01	2.75E-01	2.69E-01	4.33E+02

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	2.60E+01	1.13E-02	1.60E-04	8.46E-03	4.06E-03	4.33E+02
ADULT	GROUND	3.54E-02	3.54E-02	3.54E-02	3.54E-02	3.54E-02	3.54E-02
ADULT	CLOUD	2.25E-01	2.25E-01	2.25E-01	2.25E-01	2.25E-01	2.25E-01
ADULT	VEG. ING	1.59E-03	1.84E-02	5.48E-03	5.48E-03	4.46E-03	0.00E+00
ADULT	MEAT ING	4.00E-04	4.62E-03	1.37E-03	1.37E-03	1.12E-03	0.00E+00
ADULT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	2.62E+01	2.95E-01	2.67E-01	2.75E-01	2.70E-01	4.33E+02

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 25 NAME=SP3 X= 0.7KM, Y= 0.9KM, Z= 0.0M, DIST= 1.1KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MILK ING	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

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 25 NAME=SP3 X= 0.7KM, Y= 0.9KM, Z= 0.0M, DIST= 1.1KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	2.44E+01	1.23E-02	1.15E-03	6.36E-02	2.47E-02	4.07E+02
INFANT	GROUND	3.65E-02	3.65E-02	3.65E-02	3.65E-02	3.65E-02	3.65E-02
INFANT	CLOUD	2.77E-01	2.77E-01	2.77E-01	2.77E-01	2.77E-01	2.77E-01
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	2.48E+01	3.26E-01	3.14E-01	3.77E-01	3.38E-01	4.08E+02
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	2.44E+01	9.29E-03	5.35E-04	2.83E-02	1.16E-02	4.07E+02
CHILD	GROUND	3.65E-02	3.65E-02	3.65E-02	3.65E-02	3.65E-02	3.65E-02
CHILD	CLOUD	2.77E-01	2.77E-01	2.77E-01	2.77E-01	2.77E-01	2.77E-01
CHILD	VEG. ING	8.33E-04	9.63E-03	2.86E-03	2.86E-03	2.33E-03	0.00E+00
CHILD	MEAT ING	1.68E-04	1.94E-03	5.78E-04	5.78E-04	4.71E-04	0.00E+00
CHILD	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	2.48E+01	3.34E-01	3.17E-01	3.45E-01	3.28E-01	4.08E+02
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	2.44E+01	2.29E-02	2.29E-04	1.21E-02	5.82E-03	4.07E+02
TEENAGE	GROUND	3.65E-02	3.65E-02	3.65E-02	3.65E-02	3.65E-02	3.65E-02
TEENAGE	CLOUD	2.77E-01	2.77E-01	2.77E-01	2.77E-01	2.77E-01	2.77E-01
TEENAGE	VEG. ING	1.38E-03	1.59E-02	4.73E-03	4.73E-03	3.86E-03	0.00E+00
TEENAGE	MEAT ING	2.73E-04	3.16E-03	9.38E-04	9.38E-04	7.64E-04	0.00E+00
TEENAGE	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	2.48E+01	3.55E-01	3.19E-01	3.31E-01	3.24E-01	4.08E+02
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	2.44E+01	1.35E-02	1.91E-04	1.01E-02	4.85E-03	4.07E+02
ADULT	GROUND	3.65E-02	3.65E-02	3.65E-02	3.65E-02	3.65E-02	3.65E-02
ADULT	CLOUD	2.77E-01	2.77E-01	2.77E-01	2.77E-01	2.77E-01	2.77E-01
ADULT	VEG. ING	1.90E-03	2.20E-02	6.54E-03	6.54E-03	5.32E-03	0.00E+00
ADULT	MEAT ING	4.77E-04	5.52E-03	1.64E-03	1.64E-03	1.34E-03	0.00E+00
ADULT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	2.48E+01	3.54E-01	3.22E-01	3.32E-01	3.25E-01	4.08E+02

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 26 NAME=McDOWELL X= -2.2KM, Y= 4.4KM, Z= 0.0M, DIST= 4.9KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MILK ING	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

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 26 NAME=McDOWELL X= -2.2KM, Y= 4.4KM, Z= 0.0M, DIST= 4.9KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	3.98E+00	3.40E-02	3.18E-03	1.76E-01	6.86E-02	6.61E+01
INFANT	GROUND	7.41E-03	7.41E-03	7.41E-03	7.41E-03	7.41E-03	7.41E-03
INFANT	CLOUD	2.50E-01	2.50E-01	2.50E-01	2.50E-01	2.50E-01	2.50E-01
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	4.24E+00	2.92E-01	2.61E-01	4.34E-01	3.26E-01	6.64E+01

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	3.97E+00	2.58E-02	1.48E-03	7.84E-02	3.23E-02	6.61E+01
CHILD	GROUND	7.41E-03	7.41E-03	7.41E-03	7.41E-03	7.41E-03	7.41E-03
CHILD	CLOUD	2.50E-01	2.50E-01	2.50E-01	2.50E-01	2.50E-01	2.50E-01
CHILD	VEG. ING	2.31E-03	2.67E-02	7.93E-03	7.93E-03	6.46E-03	0.00E+00
CHILD	MEAT ING	4.67E-04	5.39E-03	1.60E-03	1.60E-03	1.31E-03	0.00E+00
CHILD	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	4.23E+00	3.16E-01	2.69E-01	3.46E-01	2.98E-01	6.64E+01

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	3.97E+00	6.35E-02	6.35E-04	3.36E-02	1.61E-02	6.61E+01
TEENAGE	GROUND	7.41E-03	7.41E-03	7.41E-03	7.41E-03	7.41E-03	7.41E-03
TEENAGE	CLOUD	2.50E-01	2.50E-01	2.50E-01	2.50E-01	2.50E-01	2.50E-01
TEENAGE	VEG. ING	3.82E-03	4.41E-02	1.31E-02	1.31E-02	1.07E-02	0.00E+00
TEENAGE	MEAT ING	7.57E-04	8.75E-03	2.60E-03	2.60E-03	2.12E-03	0.00E+00
TEENAGE	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	4.23E+00	3.74E-01	2.74E-01	3.07E-01	2.87E-01	6.64E+01

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	3.97E+00	3.73E-02	5.29E-04	2.80E-02	1.34E-02	6.61E+01
ADULT	GROUND	7.41E-03	7.41E-03	7.41E-03	7.41E-03	7.41E-03	7.41E-03
ADULT	CLOUD	2.50E-01	2.50E-01	2.50E-01	2.50E-01	2.50E-01	2.50E-01
ADULT	VEG. ING	5.28E-03	6.10E-02	1.81E-02	1.81E-02	1.48E-02	0.00E+00
ADULT	MEAT ING	1.32E-03	1.53E-02	4.55E-03	4.55E-03	3.70E-03	0.00E+00
ADULT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	4.24E+00	3.71E-01	2.81E-01	3.08E-01	2.90E-01	6.64E+01

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 27 NAME=TAGGART X= -1.9KM, Y= 4.4KM, Z= 0.0M, DIST= 4.8KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MILK ING	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

TIME STEP NUMBER 1, 10-Year Action Perio　DURATION IN YRS IS... 5.0

NUMBER 27 NAME=TAGGART　X= -1.9KM, Y= 4.4KM, Z= 0.0M, DIST= 4.8KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	4.58E+00	3.71E-02	3.47E-03	1.93E-01	7.49E-02	7.61E+01
INFANT	GROUND	8.51E-03	8.51E-03	8.51E-03	8.51E-03	8.51E-03	8.51E-03
INFANT	CLOUD	2.81E-01	2.81E-01	2.81E-01	2.81E-01	2.81E-01	2.81E-01
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	4.87E+00	3.27E-01	2.93E-01	4.82E-01	3.65E-01	7.64E+01

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	4.57E+00	2.81E-02	1.62E-03	8.56E-02	3.52E-02	7.61E+01
CHILD	GROUND	8.51E-03	8.51E-03	8.51E-03	8.51E-03	8.51E-03	8.51E-03
CHILD	CLOUD	2.81E-01	2.81E-01	2.81E-01	2.81E-01	2.81E-01	2.81E-01
CHILD	VEG. ING	2.52E-03	2.91E-02	8.66E-03	8.66E-03	7.05E-03	0.00E+00
CHILD	MEAT ING	5.09E-04	5.89E-03	1.75E-03	1.75E-03	1.43E-03	0.00E+00
CHILD	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	4.87E+00	3.53E-01	3.02E-01	3.86E-01	3.33E-01	7.64E+01

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	4.57E+00	6.93E-02	6.93E-04	3.67E-02	1.76E-02	7.61E+01
TEENAGE	GROUND	8.51E-03	8.51E-03	8.51E-03	8.51E-03	8.51E-03	8.51E-03
TEENAGE	CLOUD	2.81E-01	2.81E-01	2.81E-01	2.81E-01	2.81E-01	2.81E-01
TEENAGE	VEG. ING	4.17E-03	4.82E-02	1.43E-02	1.43E-02	1.17E-02	0.00E+00
TEENAGE	MEAT ING	8.27E-04	9.55E-03	2.84E-03	2.84E-03	2.31E-03	0.00E+00
TEENAGE	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	4.87E+00	4.17E-01	3.08E-01	3.44E-01	3.21E-01	7.64E+01

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	4.57E+00	4.08E-02	5.78E-04	3.06E-02	1.47E-02	7.61E+01
ADULT	GROUND	8.51E-03	8.51E-03	8.51E-03	8.51E-03	8.51E-03	8.51E-03
ADULT	CLOUD	2.81E-01	2.81E-01	2.81E-01	2.81E-01	2.81E-01	2.81E-01
ADULT	VEG. ING	5.76E-03	6.66E-02	1.98E-02	1.98E-02	1.61E-02	0.00E+00
ADULT	MEAT ING	1.45E-03	1.67E-02	4.96E-03	4.96E-03	4.04E-03	0.00E+00
ADULT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	4.87E+00	4.14E-01	3.15E-01	3.45E-01	3.25E-01	7.64E+01

REGION: Crow Butte North Trend   CODE: MILDOS-AREA (02/97)   PAGE 77
METSET: DATA: CBRMAIN.MIL   03/26/07
TIME STEP NUMBER 1, 10-Year Action Perio   DURATION IN YRS IS... 5.0

NUMBER 28 NAME=FRANEY   X= -1.0KM, Y= 4.8KM, Z= 0.0M, DIST= 4.9KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MILK ING	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

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 28 NAME=FRANEY X= -1.0KM, Y= 4.8KM, Z= 0.0M, DIST= 4.9KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	6.16E+00	5.06E-02	4.73E-03	2.63E-01	1.02E-01	1.02E+02
INFANT	GROUND	1.15E-02	1.15E-02	1.15E-02	1.15E-02	1.15E-02	1.15E-02
INFANT	CLOUD	3.81E-01	3.81E-01	3.81E-01	3.81E-01	3.81E-01	3.81E-01
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	6.55E+00	4.43E-01	3.97E-01	6.55E-01	4.94E-01	1.03E+02

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	6.15E+00	3.84E-02	2.21E-03	1.17E-01	4.81E-02	1.02E+02
CHILD	GROUND	1.15E-02	1.15E-02	1.15E-02	1.15E-02	1.15E-02	1.15E-02
CHILD	CLOUD	3.81E-01	3.81E-01	3.81E-01	3.81E-01	3.81E-01	3.81E-01
CHILD	VEG. ING	3.44E-03	3.98E-02	1.18E-02	1.18E-02	9.62E-03	0.00E+00
CHILD	MEAT ING	6.95E-04	8.03E-03	2.39E-03	2.39E-03	1.94E-03	0.00E+00
CHILD	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	6.55E+00	4.78E-01	4.08E-01	5.23E-01	4.52E-01	1.03E+02

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	6.15E+00	9.45E-02	9.46E-04	5.00E-02	2.40E-02	1.02E+02
TEENAGE	GROUND	1.15E-02	1.15E-02	1.15E-02	1.15E-02	1.15E-02	1.15E-02
TEENAGE	CLOUD	3.81E-01	3.81E-01	3.81E-01	3.81E-01	3.81E-01	3.81E-01
TEENAGE	VEG. ING	5.69E-03	6.58E-02	1.95E-02	1.95E-02	1.59E-02	0.00E+00
TEENAGE	MEAT ING	1.13E-03	1.30E-02	3.87E-03	3.87E-03	3.16E-03	0.00E+00
TEENAGE	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	6.55E+00	5.65E-01	4.16E-01	4.66E-01	4.35E-01	1.03E+02

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	6.15E+00	5.56E-02	7.88E-04	4.17E-02	2.00E-02	1.02E+02
ADULT	GROUND	1.15E-02	1.15E-02	1.15E-02	1.15E-02	1.15E-02	1.15E-02
ADULT	CLOUD	3.81E-01	3.81E-01	3.81E-01	3.81E-01	3.81E-01	3.81E-01
ADULT	VEG. ING	7.86E-03	9.08E-02	2.70E-02	2.70E-02	2.20E-02	0.00E+00
ADULT	MEAT ING	1.97E-03	2.28E-02	6.77E-03	6.77E-03	5.52E-03	0.00E+00
ADULT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	6.55E+00	5.61E-01	4.27E-01	4.68E-01	4.40E-01	1.03E+02

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 29 NAME=BUNCH X= 1.0KM, Y= 4.3KM, Z= 0.0M, DIST= 4.4KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MILK ING	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

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 29 NAME=BUNCH X= 1.0KM, Y= 4.3KM, Z= 0.0M, DIST= 4.4KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	7.08E+00	5.56E-02	5.19E-03	2.89E-01	1.12E-01	1.18E+02
INFANT	GROUND	1.32E-02	1.32E-02	1.32E-02	1.32E-02	1.32E-02	1.32E-02
INFANT	CLOUD	4.38E-01	4.38E-01	4.38E-01	4.38E-01	4.38E-01	4.38E-01
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	7.53E+00	5.07E-01	4.57E-01	7.40E-01	5.64E-01	1.18E+02

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	7.07E+00	4.21E-02	2.42E-03	1.28E-01	5.28E-02	1.18E+02
CHILD	GROUND	1.32E-02	1.32E-02	1.32E-02	1.32E-02	1.32E-02	1.32E-02
CHILD	CLOUD	4.38E-01	4.38E-01	4.38E-01	4.38E-01	4.38E-01	4.38E-01
CHILD	VEG. ING	3.78E-03	4.37E-02	1.30E-02	1.30E-02	1.06E-02	0.00E+00
CHILD	MEAT ING	7.63E-04	8.82E-03	2.62E-03	2.62E-03	2.14E-03	0.00E+00
CHILD	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	7.53E+00	5.46E-01	4.70E-01	5.95E-01	5.17E-01	1.18E+02

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	7.07E+00	1.04E-01	1.04E-03	5.50E-02	2.64E-02	1.18E+02
TEENAGE	GROUND	1.32E-02	1.32E-02	1.32E-02	1.32E-02	1.32E-02	1.32E-02
TEENAGE	CLOUD	4.38E-01	4.38E-01	4.38E-01	4.38E-01	4.38E-01	4.38E-01
TEENAGE	VEG. ING	6.25E-03	7.22E-02	2.15E-02	2.15E-02	1.75E-02	0.00E+00
TEENAGE	MEAT ING	1.24E-03	1.43E-02	4.26E-03	4.26E-03	3.47E-03	0.00E+00
TEENAGE	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	7.53E+00	6.42E-01	4.78E-01	5.32E-01	4.99E-01	1.18E+02

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	7.07E+00	6.11E-02	8.65E-04	4.58E-02	2.20E-02	1.18E+02
ADULT	GROUND	1.32E-02	1.32E-02	1.32E-02	1.32E-02	1.32E-02	1.32E-02
ADULT	CLOUD	4.38E-01	4.38E-01	4.38E-01	4.38E-01	4.38E-01	4.38E-01
ADULT	VEG. ING	8.63E-03	9.97E-02	2.96E-02	2.96E-02	2.41E-02	0.00E+00
ADULT	MEAT ING	2.17E-03	2.50E-02	7.44E-03	7.44E-03	6.06E-03	0.00E+00
ADULT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	7.54E+00	6.37E-01	4.89E-01	5.34E-01	5.04E-01	1.18E+02

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 30 NAME=DYER X= -2.4KM, Y= 0.6KM, Z= 0.0M, DIST= 2.5KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MILK ING	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

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 30 NAME=DYER X= -2.4KM, Y= 0.6KM, Z= 0.0M, DIST= 2.5KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	3.14E+00	1.18E-02	1.11E-03	6.15E-02	2.39E-02	5.23E+01
INFANT	GROUND	5.55E-03	5.55E-03	5.55E-03	5.55E-03	5.55E-03	5.55E-03
INFANT	CLOUD	1.18E-01	1.18E-01	1.18E-01	1.18E-01	1.18E-01	1.18E-01
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	3.27E+00	1.36E-01	1.25E-01	1.85E-01	1.48E-01	5.24E+01

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	3.14E+00	8.98E-03	5.18E-04	2.73E-02	1.12E-02	5.23E+01
CHILD	GROUND	5.55E-03	5.55E-03	5.55E-03	5.55E-03	5.55E-03	5.55E-03
CHILD	CLOUD	1.18E-01	1.18E-01	1.18E-01	1.18E-01	1.18E-01	1.18E-01
CHILD	VEG. ING	8.05E-04	9.30E-03	2.77E-03	2.77E-03	2.25E-03	0.00E+00
CHILD	MEAT ING	1.63E-04	1.88E-03	5.59E-04	5.59E-04	4.55E-04	0.00E+00
CHILD	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	3.26E+00	1.44E-01	1.28E-01	1.54E-01	1.38E-01	5.24E+01

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	3.14E+00	2.21E-02	2.22E-04	1.17E-02	5.62E-03	5.23E+01
TEENAGE	GROUND	5.55E-03	5.55E-03	5.55E-03	5.55E-03	5.55E-03	5.55E-03
TEENAGE	CLOUD	1.18E-01	1.18E-01	1.18E-01	1.18E-01	1.18E-01	1.18E-01
TEENAGE	VEG. ING	1.33E-03	1.54E-02	4.57E-03	4.57E-03	3.73E-03	0.00E+00
TEENAGE	MEAT ING	2.64E-04	3.05E-03	9.07E-04	9.07E-04	7.39E-04	0.00E+00
TEENAGE	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	3.26E+00	1.64E-01	1.29E-01	1.41E-01	1.34E-01	5.24E+01

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	3.14E+00	1.30E-02	1.85E-04	9.76E-03	4.69E-03	5.23E+01
ADULT	GROUND	5.55E-03	5.55E-03	5.55E-03	5.55E-03	5.55E-03	5.55E-03
ADULT	CLOUD	1.18E-01	1.18E-01	1.18E-01	1.18E-01	1.18E-01	1.18E-01
ADULT	VEG. ING	1.84E-03	2.13E-02	6.32E-03	6.32E-03	5.15E-03	0.00E+00
ADULT	MEAT ING	4.61E-04	5.33E-03	1.58E-03	1.58E-03	1.29E-03	0.00E+00
ADULT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	3.27E+00	1.63E-01	1.32E-01	1.41E-01	1.35E-01	5.24E+01

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 31 NAME=NT-1 X= -4.0KM, Y= 11.3KM, Z= 0.0M, DIST= 12.0KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MILK ING	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

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 31 NAME=NT-1 X= -4.0KM, Y= 11.3KM, Z= 0.0M, DIST= 12.0KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	5.55E+00	6.18E-02	5.85E-03	3.21E-01	1.25E-01	9.22E+01
INFANT	GROUND	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02
INFANT	CLOUD	2.82E-01	2.82E-01	2.82E-01	2.82E-01	2.82E-01	2.82E-01
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	5.84E+00	3.54E-01	2.98E-01	6.13E-01	4.17E-01	9.25E+01
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	5.54E+00	4.69E-02	2.73E-03	1.43E-01	5.87E-02	9.22E+01
CHILD	GROUND	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02
CHILD	CLOUD	2.82E-01	2.82E-01	2.82E-01	2.82E-01	2.82E-01	2.82E-01
CHILD	VEG. ING	4.20E-03	4.85E-02	1.44E-02	1.44E-02	1.18E-02	0.00E+00
CHILD	MEAT ING	8.49E-04	9.81E-03	2.91E-03	2.91E-03	2.37E-03	0.00E+00
CHILD	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	5.84E+00	3.97E-01	3.12E-01	4.52E-01	3.65E-01	9.25E+01
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	5.54E+00	1.15E-01	1.17E-03	6.11E-02	2.93E-02	9.22E+01
TEENAGE	GROUND	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02
TEENAGE	CLOUD	2.82E-01	2.82E-01	2.82E-01	2.82E-01	2.82E-01	2.82E-01
TEENAGE	VEG. ING	6.95E-03	8.03E-02	2.39E-02	2.39E-02	1.94E-02	0.00E+00
TEENAGE	MEAT ING	1.38E-03	1.59E-02	4.73E-03	4.73E-03	3.85E-03	0.00E+00
TEENAGE	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	5.84E+00	5.03E-01	3.22E-01	3.81E-01	3.44E-01	9.25E+01
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	5.54E+00	6.79E-02	9.75E-04	5.09E-02	2.45E-02	9.22E+01
ADULT	GROUND	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02	1.01E-02
ADULT	CLOUD	2.82E-01	2.82E-01	2.82E-01	2.82E-01	2.82E-01	2.82E-01
ADULT	VEG. ING	9.60E-03	1.11E-01	3.30E-02	3.30E-02	2.68E-02	0.00E+00
ADULT	MEAT ING	2.41E-03	2.78E-02	8.27E-03	8.27E-03	6.73E-03	0.00E+00
ADULT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	5.84E+00	4.98E-01	3.34E-01	3.84E-01	3.50E-01	9.25E+01

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 32 NAME=NT-2 X= -4.1KM, Y= 8.9KM, Z= 0.0M, DIST= 9.8KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MILK ING	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

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 32 NAME=NT-2 X= -4.1KM, Y= 8.9KM, Z= 0.0M, DIST= 9.8KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	3.24E+00	4.59E-02	4.33E-03	2.38E-01	9.26E-02	5.38E+01
INFANT	GROUND	5.42E-03	5.42E-03	5.42E-03	5.42E-03	5.42E-03	5.42E-03
INFANT	CLOUD	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	3.41E+00	2.17E-01	1.76E-01	4.10E-01	2.64E-01	5.39E+01
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	3.23E+00	3.48E-02	2.02E-03	1.06E-01	4.36E-02	5.38E+01
CHILD	GROUND	5.42E-03	5.42E-03	5.42E-03	5.42E-03	5.42E-03	5.42E-03
CHILD	CLOUD	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01
CHILD	VEG. ING	3.12E-03	3.60E-02	1.07E-02	1.07E-02	8.73E-03	0.00E+00
CHILD	MEAT ING	6.30E-04	7.28E-03	2.16E-03	2.16E-03	1.76E-03	0.00E+00
CHILD	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	3.41E+00	2.50E-01	1.86E-01	2.90E-01	2.26E-01	5.39E+01
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	3.23E+00	8.57E-02	8.67E-04	4.54E-02	2.18E-02	5.38E+01
TEENAGE	GROUND	5.42E-03	5.42E-03	5.42E-03	5.42E-03	5.42E-03	5.42E-03
TEENAGE	CLOUD	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01
TEENAGE	VEG. ING	5.16E-03	5.96E-02	1.77E-02	1.77E-02	1.44E-02	0.00E+00
TEENAGE	MEAT ING	1.02E-03	1.18E-02	3.51E-03	3.51E-03	2.86E-03	0.00E+00
TEENAGE	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	3.41E+00	3.29E-01	1.94E-01	2.38E-01	2.11E-01	5.39E+01
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	3.23E+00	5.04E-02	7.22E-04	3.78E-02	1.82E-02	5.38E+01
ADULT	GROUND	5.42E-03	5.42E-03	5.42E-03	5.42E-03	5.42E-03	5.42E-03
ADULT	CLOUD	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01
ADULT	VEG. ING	7.13E-03	8.23E-02	2.45E-02	2.45E-02	1.99E-02	0.00E+00
ADULT	MEAT ING	1.79E-03	2.07E-02	6.14E-03	6.14E-03	5.00E-03	0.00E+00
ADULT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	3.41E+00	3.25E-01	2.03E-01	2.40E-01	2.15E-01	5.39E+01

REGION: Crow Butte North Trend   CODE: MILDOS-AREA (02/97)   PAGE 87
METSET: DATA: CBRMAIN.MIL   03/26/07
TIME STEP NUMBER 1, 10-Year Action Perio   DURATION IN YRS IS... 5.0

NUMBER 33 NAME=NT-3   X= -4.8KM, Y= 7.9KM, Z= 0.0M, DIST= 9.2KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MILK ING	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

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 33 NAME=NT-3 X= -4.8KM, Y= 7.9KM, Z= 0.0M, DIST= 9.2KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	2.92E+00	3.82E-02	3.60E-03	1.98E-01	7.71E-02	4.85E+01
INFANT	GROUND	5.22E-03	5.22E-03	5.22E-03	5.22E-03	5.22E-03	5.22E-03
INFANT	CLOUD	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	3.09E+00	2.10E-01	1.75E-01	3.70E-01	2.49E-01	4.86E+01
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	2.91E+00	2.90E-02	1.68E-03	8.81E-02	3.63E-02	4.85E+01
CHILD	GROUND	5.22E-03	5.22E-03	5.22E-03	5.22E-03	5.22E-03	5.22E-03
CHILD	CLOUD	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01
CHILD	VEG. ING	2.60E-03	3.00E-02	8.92E-03	8.92E-03	7.26E-03	0.00E+00
CHILD	MEAT ING	5.24E-04	6.06E-03	1.80E-03	1.80E-03	1.47E-03	0.00E+00
CHILD	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	3.09E+00	2.37E-01	1.84E-01	2.71E-01	2.17E-01	4.86E+01
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	2.91E+00	7.13E-02	7.20E-04	3.78E-02	1.81E-02	4.85E+01
TEENAGE	GROUND	5.22E-03	5.22E-03	5.22E-03	5.22E-03	5.22E-03	5.22E-03
TEENAGE	CLOUD	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01
TEENAGE	VEG. ING	4.29E-03	4.96E-02	1.47E-02	1.47E-02	1.20E-02	0.00E+00
TEENAGE	MEAT ING	8.51E-04	9.84E-03	2.92E-03	2.92E-03	2.38E-03	0.00E+00
TEENAGE	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	3.09E+00	3.02E-01	1.90E-01	2.27E-01	2.04E-01	4.86E+01
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	2.91E+00	4.20E-02	6.00E-04	3.15E-02	1.51E-02	4.85E+01
ADULT	GROUND	5.22E-03	5.22E-03	5.22E-03	5.22E-03	5.22E-03	5.22E-03
ADULT	CLOUD	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01
ADULT	VEG. ING	5.93E-03	6.85E-02	2.04E-02	2.04E-02	1.66E-02	0.00E+00
ADULT	MEAT ING	1.49E-03	1.72E-02	5.11E-03	5.11E-03	4.16E-03	0.00E+00
ADULT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	3.09E+00	2.99E-01	1.98E-01	2.29E-01	2.08E-01	4.86E+01

TIME STEP NUMBER 1, 10-Year Action Perio　　DURATION IN YRS IS... 5.0

NUMBER 34 NAME=NT-4　　X= -5.8KM, Y= 6.7KM, Z= 0.0M, DIST= 8.9KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MILK ING	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

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 34 NAME=NT-4 X= -5.8KM, Y= 6.7KM, Z= 0.0M, DIST= 8.9KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	2.00E+00	2.74E-02	2.58E-03	1.42E-01	5.54E-02	3.31E+01
INFANT	GROUND	3.72E-03	3.72E-03	3.72E-03	3.72E-03	3.72E-03	3.72E-03
INFANT	CLOUD	1.39E-01	1.39E-01	1.39E-01	1.39E-01	1.39E-01	1.39E-01
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	2.14E+00	1.70E-01	1.45E-01	2.85E-01	1.98E-01	3.33E+01

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	1.99E+00	2.08E-02	1.20E-03	6.33E-02	2.61E-02	3.31E+01
CHILD	GROUND	3.72E-03	3.72E-03	3.72E-03	3.72E-03	3.72E-03	3.72E-03
CHILD	CLOUD	1.39E-01	1.39E-01	1.39E-01	1.39E-01	1.39E-01	1.39E-01
CHILD	VEG. ING	1.86E-03	2.16E-02	6.41E-03	6.41E-03	5.22E-03	0.00E+00
CHILD	MEAT ING	3.77E-04	4.35E-03	1.29E-03	1.29E-03	1.05E-03	0.00E+00
CHILD	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	2.14E+00	1.89E-01	1.51E-01	2.13E-01	1.75E-01	3.33E+01

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	1.99E+00	5.12E-02	5.16E-04	2.71E-02	1.30E-02	3.31E+01
TEENAGE	GROUND	3.72E-03	3.72E-03	3.72E-03	3.72E-03	3.72E-03	3.72E-03
TEENAGE	CLOUD	1.39E-01	1.39E-01	1.39E-01	1.39E-01	1.39E-01	1.39E-01
TEENAGE	VEG. ING	3.09E-03	3.56E-02	1.06E-02	1.06E-02	8.63E-03	0.00E+00
TEENAGE	MEAT ING	6.12E-04	7.07E-03	2.10E-03	2.10E-03	1.71E-03	0.00E+00
TEENAGE	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	2.14E+00	2.36E-01	1.55E-01	1.82E-01	1.66E-01	3.33E+01

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	1.99E+00	3.01E-02	4.30E-04	2.26E-02	1.09E-02	3.31E+01
ADULT	GROUND	3.72E-03	3.72E-03	3.72E-03	3.72E-03	3.72E-03	3.72E-03
ADULT	CLOUD	1.39E-01	1.39E-01	1.39E-01	1.39E-01	1.39E-01	1.39E-01
ADULT	VEG. ING	4.26E-03	4.92E-02	1.46E-02	1.46E-02	1.19E-02	0.00E+00
ADULT	MEAT ING	1.07E-03	1.23E-02	3.67E-03	3.67E-03	2.99E-03	0.00E+00
ADULT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	2.14E+00	2.34E-01	1.61E-01	1.83E-01	1.68E-01	3.33E+01

TIME STEP NUMBER 1, 10-Year Action Perio   DURATION IN YRS IS... 5.0

NUMBER 35 NAME=NT-5   X= -4.6KM, Y= 6.8KM, Z= 0.0M, DIST= 8.2KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MILK ING	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

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 35 NAME=NT-5 X= -4.6KM, Y= 6.8KM, Z= 0.0M, DIST= 8.2KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	2.25E+00	3.45E-02	3.25E-03	1.79E-01	6.97E-02	3.73E+01
INFANT	GROUND	4.21E-03	4.21E-03	4.21E-03	4.21E-03	4.21E-03	4.21E-03
INFANT	CLOUD	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	2.42E+00	2.05E-01	1.73E-01	3.49E-01	2.40E-01	3.75E+01
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	2.25E+00	2.62E-02	1.52E-03	7.97E-02	3.28E-02	3.73E+01
CHILD	GROUND	4.21E-03	4.21E-03	4.21E-03	4.21E-03	4.21E-03	4.21E-03
CHILD	CLOUD	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01
CHILD	VEG. ING	2.35E-03	2.71E-02	8.07E-03	8.07E-03	6.57E-03	0.00E+00
CHILD	MEAT ING	4.74E-04	5.48E-03	1.63E-03	1.63E-03	1.33E-03	0.00E+00
CHILD	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	2.42E+00	2.29E-01	1.81E-01	2.59E-01	2.11E-01	3.75E+01
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	2.25E+00	6.45E-02	6.49E-04	3.42E-02	1.64E-02	3.73E+01
TEENAGE	GROUND	4.21E-03	4.21E-03	4.21E-03	4.21E-03	4.21E-03	4.21E-03
TEENAGE	CLOUD	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01
TEENAGE	VEG. ING	3.88E-03	4.49E-02	1.33E-02	1.33E-02	1.09E-02	0.00E+00
TEENAGE	MEAT ING	7.70E-04	8.90E-03	2.64E-03	2.64E-03	2.15E-03	0.00E+00
TEENAGE	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	2.42E+00	2.88E-01	1.87E-01	2.20E-01	2.00E-01	3.75E+01
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	2.25E+00	3.80E-02	5.41E-04	2.85E-02	1.37E-02	3.73E+01
ADULT	GROUND	4.21E-03	4.21E-03	4.21E-03	4.21E-03	4.21E-03	4.21E-03
ADULT	CLOUD	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.66E-01
ADULT	VEG. ING	5.36E-03	6.20E-02	1.84E-02	1.84E-02	1.50E-02	0.00E+00
ADULT	MEAT ING	1.35E-03	1.56E-02	4.62E-03	4.62E-03	3.76E-03	0.00E+00
ADULT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	2.42E+00	2.86E-01	1.94E-01	2.22E-01	2.03E-01	3.75E+01

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 36 NAME=NT-6 X= -7.2KM, Y= 11.6KM, Z= 0.0M, DIST= 13.7KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MILK ING	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

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 36 NAME=NT-6 X= -7.2KM, Y= 11.6KM, Z= 0.0M, DIST= 13.7KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	1.51E+00	4.17E-02	3.97E-03	2.16E-01	8.41E-02	2.49E+01
INFANT	GROUND	2.85E-03	2.85E-03	2.85E-03	2.85E-03	2.85E-03	2.85E-03
INFANT	CLOUD	1.21E-01	1.21E-01	1.21E-01	1.21E-01	1.21E-01	1.21E-01
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	1.63E+00	1.66E-01	1.28E-01	3.40E-01	2.08E-01	2.51E+01
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	1.50E+00	3.16E-02	1.85E-03	9.62E-02	3.96E-02	2.49E+01
CHILD	GROUND	2.85E-03	2.85E-03	2.85E-03	2.85E-03	2.85E-03	2.85E-03
CHILD	CLOUD	1.21E-01	1.21E-01	1.21E-01	1.21E-01	1.21E-01	1.21E-01
CHILD	VEG. ING	2.83E-03	3.27E-02	9.73E-03	9.73E-03	7.93E-03	0.00E+00
CHILD	MEAT ING	5.72E-04	6.61E-03	1.97E-03	1.97E-03	1.60E-03	0.00E+00
CHILD	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	1.63E+00	1.95E-01	1.38E-01	2.32E-01	1.73E-01	2.51E+01
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	1.50E+00	7.79E-02	7.93E-04	4.12E-02	1.98E-02	2.49E+01
TEENAGE	GROUND	2.85E-03	2.85E-03	2.85E-03	2.85E-03	2.85E-03	2.85E-03
TEENAGE	CLOUD	1.21E-01	1.21E-01	1.21E-01	1.21E-01	1.21E-01	1.21E-01
TEENAGE	VEG. ING	4.69E-03	5.42E-02	1.61E-02	1.61E-02	1.31E-02	0.00E+00
TEENAGE	MEAT ING	9.29E-04	1.07E-02	3.19E-03	3.19E-03	2.60E-03	0.00E+00
TEENAGE	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	1.63E+00	2.67E-01	1.44E-01	1.85E-01	1.60E-01	2.51E+01
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	1.50E+00	4.58E-02	6.61E-04	3.44E-02	1.65E-02	2.49E+01
ADULT	GROUND	2.85E-03	2.85E-03	2.85E-03	2.85E-03	2.85E-03	2.85E-03
ADULT	CLOUD	1.21E-01	1.21E-01	1.21E-01	1.21E-01	1.21E-01	1.21E-01
ADULT	VEG. ING	6.47E-03	7.48E-02	2.22E-02	2.22E-02	1.81E-02	0.00E+00
ADULT	MEAT ING	1.62E-03	1.88E-02	5.58E-03	5.58E-03	4.54E-03	0.00E+00
ADULT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	1.63E+00	2.63E-01	1.53E-01	1.86E-01	1.63E-01	2.51E+01

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 37 NAME=NT-7 X= -8.3KM, Y= 9.9KM, Z= 0.0M, DIST= 12.9KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MILK ING	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

TIME STEP NUMBER 1, 10-Year Action Perio DURATION IN YRS IS... 5.0

NUMBER 37 NAME=NT-7 X= -8.3KM, Y= 9.9KM, Z= 0.0M, DIST= 12.9KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	9.52E-01	2.85E-02	2.71E-03	1.48E-01	5.75E-02	1.57E+01
INFANT	GROUND	1.81E-03	1.81E-03	1.81E-03	1.81E-03	1.81E-03	1.81E-03
INFANT	CLOUD	8.34E-02	8.34E-02	8.34E-02	8.34E-02	8.34E-02	8.34E-02
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	1.04E+00	1.14E-01	8.79E-02	2.33E-01	1.43E-01	1.58E+01
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	9.48E-01	2.16E-02	1.26E-03	6.57E-02	2.71E-02	1.57E+01
CHILD	GROUND	1.81E-03	1.81E-03	1.81E-03	1.81E-03	1.81E-03	1.81E-03
CHILD	CLOUD	8.34E-02	8.34E-02	8.34E-02	8.34E-02	8.34E-02	8.34E-02
CHILD	VEG. ING	1.94E-03	2.24E-02	6.65E-03	6.65E-03	5.42E-03	0.00E+00
CHILD	MEAT ING	3.91E-04	4.52E-03	1.34E-03	1.34E-03	1.09E-03	0.00E+00
CHILD	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	1.04E+00	1.34E-01	9.45E-02	1.59E-01	1.19E-01	1.58E+01
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	9.48E-01	5.32E-02	5.41E-04	2.82E-02	1.35E-02	1.57E+01
TEENAGE	GROUND	1.81E-03	1.81E-03	1.81E-03	1.81E-03	1.81E-03	1.81E-03
TEENAGE	CLOUD	8.34E-02	8.34E-02	8.34E-02	8.34E-02	8.34E-02	8.34E-02
TEENAGE	VEG. ING	3.20E-03	3.70E-02	1.10E-02	1.10E-02	8.96E-03	0.00E+00
TEENAGE	MEAT ING	6.35E-04	7.34E-03	2.18E-03	2.18E-03	1.78E-03	0.00E+00
TEENAGE	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	1.04E+00	1.83E-01	9.89E-02	1.27E-01	1.09E-01	1.58E+01
AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	9.47E-01	3.13E-02	4.51E-04	2.35E-02	1.13E-02	1.57E+01
ADULT	GROUND	1.81E-03	1.81E-03	1.81E-03	1.81E-03	1.81E-03	1.81E-03
ADULT	CLOUD	8.34E-02	8.34E-02	8.34E-02	8.34E-02	8.34E-02	8.34E-02
ADULT	VEG. ING	4.42E-03	5.11E-02	1.52E-02	1.52E-02	1.24E-02	0.00E+00
ADULT	MEAT ING	1.11E-03	1.28E-02	3.81E-03	3.81E-03	3.10E-03	0.00E+00
ADULT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	1.04E+00	1.80E-01	1.05E-01	1.28E-01	1.12E-01	1.58E+01

TIME STEP NUMBER 1, 10-Year Action Perio   DURATION IN YRS IS... 5.0

NUMBER 38 NAME=NT-8   X= -0.4KM, Y= 2.8KM, Z= 0.0M, DIST= 2.8KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	MILK ING	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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	GROUND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	CLOUD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	MILK ING	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

NUMBER 38 NAME=NT-8 X= -0.4KM, Y= 2.8KM, Z= 0.0M, DIST= 2.8KM, IRTYPE=10

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

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	INHAL.	1.54E+01	3.11E-02	2.90E-03	1.61E-01	6.27E-02	2.57E+02
INFANT	GROUND	2.67E-02	2.67E-02	2.67E-02	2.67E-02	2.67E-02	2.67E-02
INFANT	CLOUD	4.62E-01	4.62E-01	4.62E-01	4.62E-01	4.62E-01	4.62E-01
INFANT	VEG. ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MEAT ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
INFANT	TOTALS	1.59E+01	5.19E-01	4.91E-01	6.50E-01	5.51E-01	2.57E+02

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
CHILD	INHAL.	1.54E+01	2.36E-02	1.35E-03	7.17E-02	2.95E-02	2.57E+02
CHILD	GROUND	2.67E-02	2.67E-02	2.67E-02	2.67E-02	2.67E-02	2.67E-02
CHILD	CLOUD	4.62E-01	4.62E-01	4.62E-01	4.62E-01	4.62E-01	4.62E-01
CHILD	VEG. ING	2.11E-03	2.44E-02	7.26E-03	7.26E-03	5.91E-03	0.00E+00
CHILD	MEAT ING	4.27E-04	4.93E-03	1.47E-03	1.47E-03	1.19E-03	0.00E+00
CHILD	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	1.59E+01	5.41E-01	4.98E-01	5.69E-01	5.25E-01	2.57E+02

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
TEENAGE	INHAL.	1.54E+01	5.81E-02	5.80E-04	3.07E-02	1.48E-02	2.57E+02
TEENAGE	GROUND	2.67E-02	2.67E-02	2.67E-02	2.67E-02	2.67E-02	2.67E-02
TEENAGE	CLOUD	4.62E-01	4.62E-01	4.62E-01	4.62E-01	4.62E-01	4.62E-01
TEENAGE	VEG. ING	3.49E-03	4.04E-02	1.20E-02	1.20E-02	9.78E-03	0.00E+00
TEENAGE	MEAT ING	6.93E-04	8.01E-03	2.38E-03	2.38E-03	1.94E-03	0.00E+00
TEENAGE	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	1.59E+01	5.95E-01	5.03E-01	5.33E-01	5.15E-01	2.57E+02

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
ADULT	INHAL.	1.54E+01	3.42E-02	4.83E-04	2.56E-02	1.23E-02	2.57E+02
ADULT	GROUND	2.67E-02	2.67E-02	2.67E-02	2.67E-02	2.67E-02	2.67E-02
ADULT	CLOUD	4.62E-01	4.62E-01	4.62E-01	4.62E-01	4.62E-01	4.62E-01
ADULT	VEG. ING	4.83E-03	5.58E-02	1.66E-02	1.66E-02	1.35E-02	0.00E+00
ADULT	MEAT ING	1.21E-03	1.40E-02	4.16E-03	4.16E-03	3.39E-03	0.00E+00
ADULT	MILK ING	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	1.59E+01	5.92E-01	5.10E-01	5.35E-01	5.17E-01	2.57E+02

Program execution time = 2.52 seconds

Wellfield Decommissioning Plan
for
Crow Butte Uranium Project

NRC Source Material License SUA-1534
Docket No. 40-8943

June 2004

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Table of Contents

Table of Tables

Table of Figures

1.0 Introduction

Crow Butte Resources, Inc. (CBR) is required by the Nuclear Regulatory Commission (NRC) and the Nebraska Department of Environmental Quality (NDEQ) to decommission areas within the site boundary following completion of active mining. Part of this decommissioning involves the reclamation of a mine unit following successful completion of groundwater restoration activities. Reclamation involves proper plugging and abandonment of all wells within the mine unit boundary, removal of surface and subsurface structures, utilities, and pipelines, and removal of surface and subsurface radiological contamination.

The NDEQ has authority for groundwater protection including the proper plugging and abandonment of wells. Proper plugging and abandonment of the mining and monitor wells at Crow Butte is regulated under NDEQ Rules and Regulations, Title 122, *Rules and Regulations for Underground Injection and Mineral Production Wells* and CBR's Class III Underground Injection Control (UIC) Permit.

The NRC regulates the decommissioning of facilities and surface and subsurface soils for the cleanup of radiological contamination. Consideration of other hazardous materials is also required. The requirements for surface and subsurface reclamation are contained in 10 CFR Part 40 Appendix A. CBR's Source Materials License SUA-1534 further specifies actions that must be taken for release of facilities and decommissioning planning.

The purpose of this report is to provide instructions for wellfield reclamation that will ensure that CBR complies with the regulatory requirements of NRC.

On April 12, 1999, the U.S. Nuclear Regulatory Commission (NRC) issued a Final Rule (64 FR 17506) that requires the use of the existing soil Ra-226 standard to derive a dose criterion for the cleanup of byproduct material. The amendment to Criterion 6(6) of 10 CFR Part 40, Appendix A was effective on June 11, 1999. This "benchmark approach" requires that NRC licensees model the site-specific dose from the existing Ra-226 standard and then use that dose to determine the allowable quantity of other radionuclides that would result in a similar dose to the average member of the critical group. These determinations must then be submitted to NRC with the site reclamation plan or included in license applications. This report documents this approach for the Crow Butte Resources Project as well as incorporates other guidance included in NUREG-1569, Standard Review Plan for In Situ Leach Uranium Extraction License Applications (for citation, see NRC, 2003a in Section 9 of this document).

2.0 Crow Butte Project

The Crow Butte Project is permitted for portions of Sections 11, 12, 13, and 24 of Township 31 North, Range 52 West and Sections 18, 19, 20, 29, and 30 of Township 31 North, Range 51 West, Dawes County, Nebraska. The plant site is situated approximately 4.0 miles southeast of the City of Crawford. Figure 2-1 shows the general location of the facility and Figure 2-2 shows the Project Site.

The original development of what is now the Crow Butte Project was done by Wyoming Fuel Corporation, who constructed a Research and Development Facility in 1986. The project was subsequently acquired and operated by Ferret Exploration Company of Nebraska until May 1994, when the name was changed to Crow Butte Resources. This change was only a name change and not an ownership change.

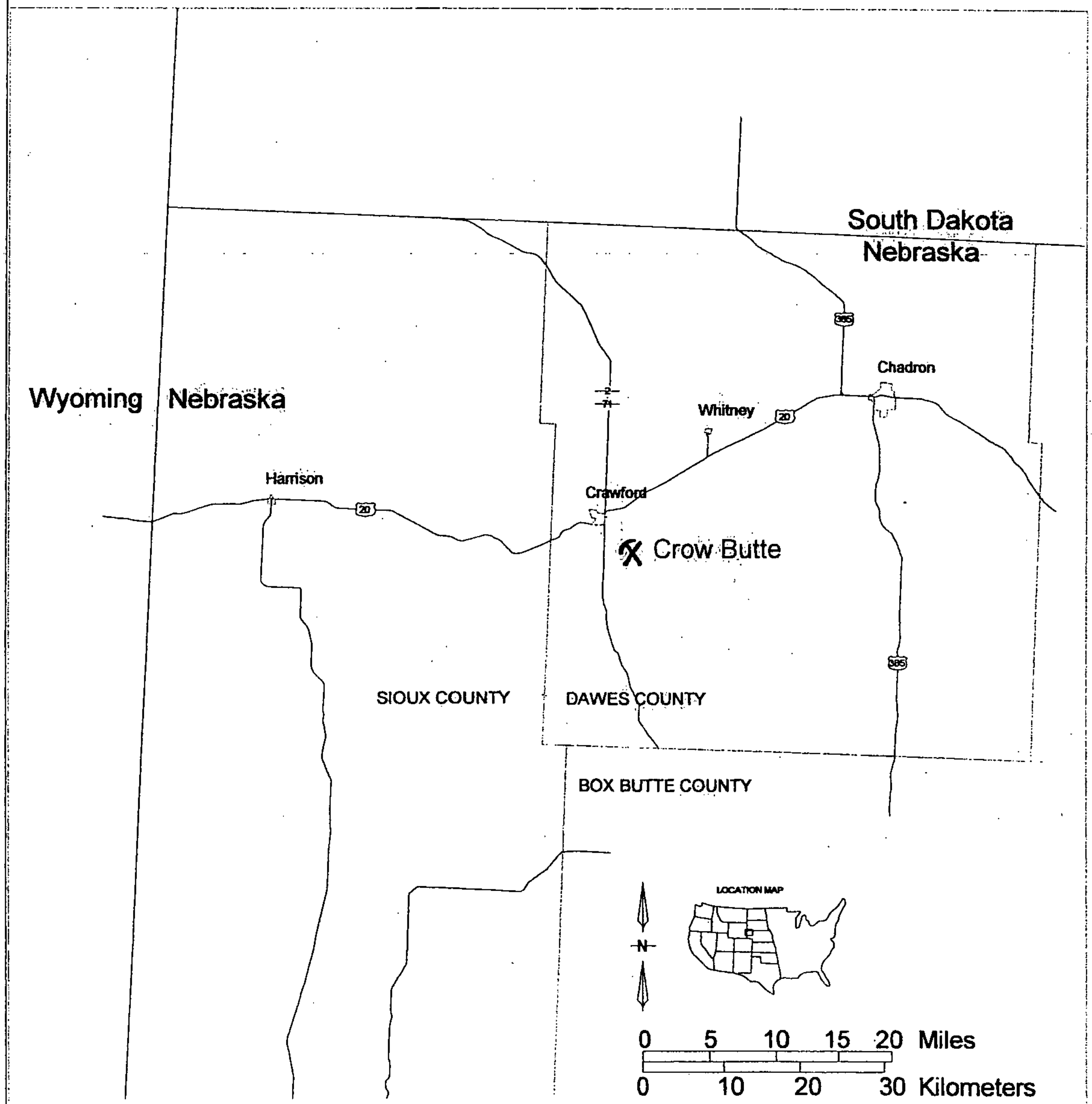
The Research and Development Facility was located in N/2 SE/4 of Section 19, T 31 N, R 51 W. Operations at this facility were initiated in July 1986, and mining took place in two wellfields (WF-1 and WF-2). Mining in WF-2 was completed in 1987 and restoration of that wellfield has been completed. WF-1 was incorporated into Mine Unit One of Commercial Operations.

The production wellfield is located within the permit area as shown in Figure 2-2. The process plant is located in Section 19, Township 31 North, Range 51 West, Dawes County, Nebraska. The permit area is approximately 2,800 acres and the surface area affected over the estimated life of the project is approximately 500 acres.

2.1 Solution Mining Method and Recovery Process

Uranium is recovered by in-situ leaching from the Basal Chadron Sandstone at a depth that varies from 400 feet to 800 feet over the permit area. The overall width of the mineralized area varies from 1000 feet to 5000 feet. The ore body ranges in grade from less than 0.05 to greater than 0.5% U_3O_8, with an average grade estimated at 0.26% equivalent U_3O_8 and 0.31% chemical U_3O_8.

Figure 2-1 CBR General Location



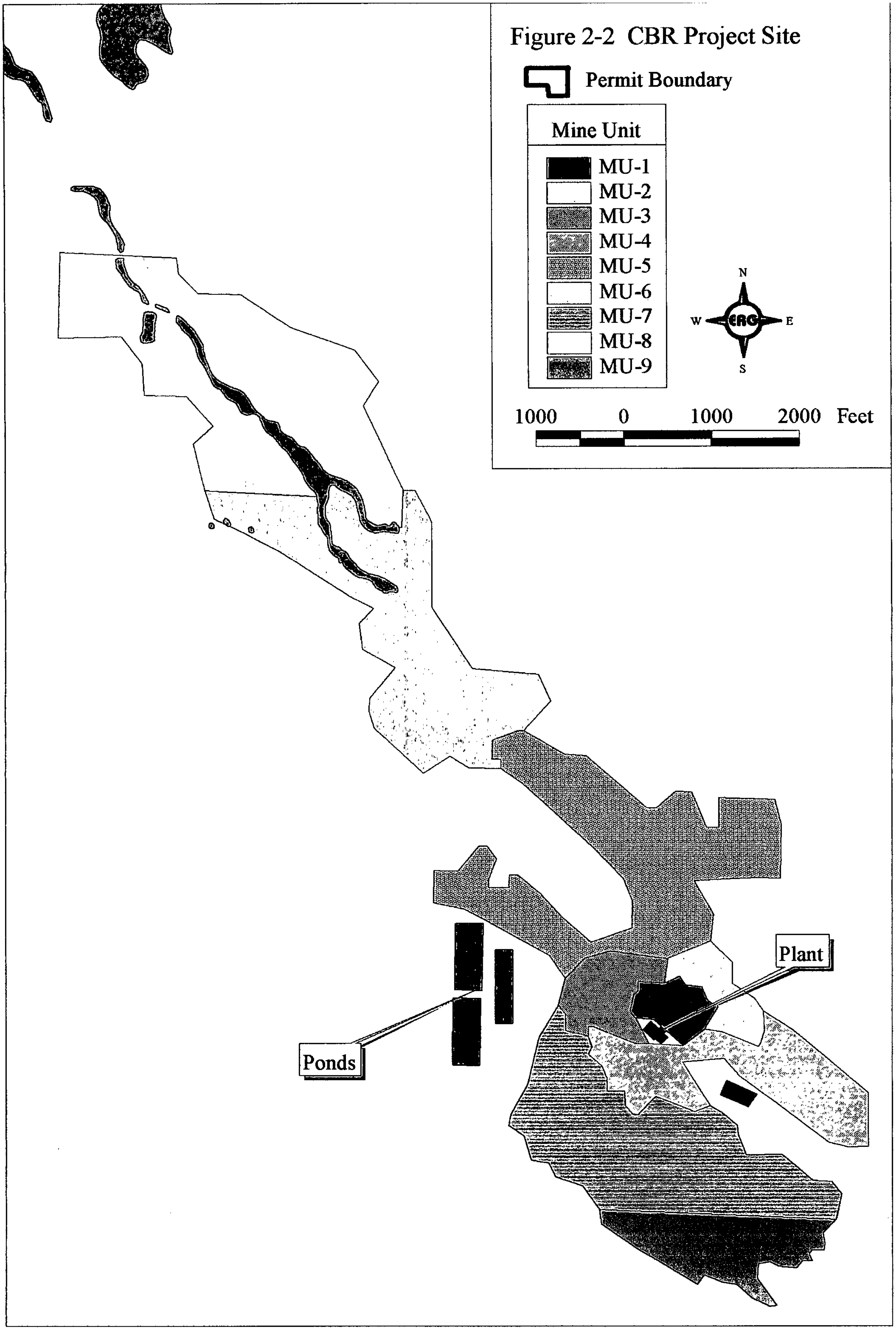


Figure 2-2 CBR Project Site
Permit Boundary
Mine Unit
MU-1
MU-2
MU-3
MU-4
MU-5
MU-6
MU-7
MU-8
MU-9
N
W
E
S
ERG
1000 0 1000 2000 Feet
Plant
Ponds

The in-situ leaching process consists of an oxidation step and a dissolution step. Gaseous oxygen or hydrogen peroxide is used to oxidize the uranium, and bicarbonate is used for dissolution. The uranium bearing solution that results from the leaching of uranium underground is recovered from the wellfield and the uranium extracted in the process plant. The plant process uses the following steps:

- Loading of uranium complexes onto ion exchange resin;
- Reconstitution of the solution by the addition of bicarbonate and oxygen;
- Elution of the uranium complexes from the resin;
- Drying and packaging of the uranium.

Sufficient reserves have been estimated to allow mining operations to continue for 10 to 25 years. Status of the current mine unit operations is shown in Table 2-1.

Table 2-1 Mine Unit Status

Mine Unit	Production Initiated	Current Status
Mine Unit 1	April 1991	GroundwaterRestoration Complete
Mine Unit 2	March 1992	Under Restoration
Mine Unit 3	January 1993	Under Restoration
Mine Unit 4	March 1994	Under Restoration
Mine Unit 5	January 1996	Production
Mine Unit 6	March 1998	Production
Mine Unit 7	July 1999	Production
Mine Unit 8	July 2002	Production
Mine Unit 9	October 2003	Production

2.2 Groundwater Restoration

Restoration activities are performed concurrently with mining activities. The restoration process used to successfully restore the R & D Wellfield and Mine Unit No. 1 will be continued. The method consists of four basic activities:

- **Groundwater transfer**- groundwater is transferred between the mining unit commencing restoration and a mine unit commencing production or another water source.

- **Groundwater sweep**- water is pumped from the wellfield which results in an influx of baseline quality water from the wellfield perimeter.

- **Groundwater treatment**- water from injection wells is pumped to the restoration plant where ion exchange, reverse osmosis, filtration or other treatment methods take place.

- **Wellfield recirculation**- water is recirculated by pumping from the production wells and reinjecting the recovered solution. This will act to homogenize the quality of the aquifer.

Following these restoration phases, a groundwater stabilization monitoring program is initiated. Once the restoration values are reached and maintained, restoration is deemed complete. Groundwater restoration activities are conducted under plans submitted to and approved by the NRC and the NDEQ.

2.3 Radioactive Effluents

The only radioactive airborne effluent at the Crow Butte Project is Rn-222 gas. As yellowcake drying and packaging is carried out using a vacuum dryer, there are no airborne effluents from that system.

The Rn-222 is contained in the pregnant lixiviant that comes from the wellfield to the process plant. The majority of this radon is released in the ion exchange columns and process tanks. These vessels are covered and vented to a manifold, which are in turn exhausted to atmosphere outside the building through stacks. The manifolds are equipped with an exhausting fan.

2.4 Liquid and Solid Waste Generation

There are three sources of wastewater and three wastewater disposal options for the Crow Butte Project. The specific method utilized depends upon the volume and characterization of the waste stream.

The operation of the process facility results in three sources of water that are collected on the site. They include the following:

- **Water generated during well development** - This water is recovered groundwater that has not been exposed to any mining process or chemicals. The water is discharged directly to one of the solar evaporation ponds where silt, fines and other suspended matter collected during well development settles out. This water may be land applied.

- **Liquid process waste** - The operation of the process plant results in two primary sources of liquid waste, an eluant bleed and a production bleed. This water is also routed to the evaporation ponds or injected into the deep well.

- **Aquifer restoration** - Following mining operations, restoration of the affected aquifer commences which results in the production of wastewater. The restoration waste is primarily brine from the reverse osmosis unit, which is sent to the waste disposal system. The permeate is either reinjected into the wellfield or sent to the waste disposal system.

Domestic liquid waste is disposed of in an approved septic system.

Solid wastes generated at the site consist of spent resin, resin fines, empty reagent containers, miscellaneous pipe and fittings, and domestic waste. These wastes are classified as contaminated or non-contaminated waste according to their survey results. Contaminated wastes that cannot be decontaminated are stored until they can be shipped to a licensed waste disposal site or licensed mill tailings facility. Non-contaminated solid waste is collected on the site on a regular basis and disposed of in a sanitary landfill.

2.5 Spills

CBR's NRC License requires that all spills of source or 11e.(2) byproduct material and all spills of process chemicals be documented. Radioactive material releases that meet the reporting criteria in 10 CFR 20, Subpart M and 10 CFR §40.60 must be reported to the NRC Operations Center. The license also requires that CBR notify the NRC Project Manager by telephone or electronic mail within 48 hours of any significant spill that may have a radiological impact on the environment and that is reportable to other State or Federal agencies.

The major source of radioactive material releases in the wellfields are broken pipelines that contain injection or production fluid. The potential impact of a radioactive materials release is influenced by several factors such as magnitude of the release, the concentration of radionuclides in the release, and the location of the release. The majority of spills originate in the injection circuit which is under high pressure. A sample of injection water was taken on April 15, 2004 and submitted to a vendor laboratory for analysis. The results are shown in Table 2-2 below.

Table 2-2 Radionuclide Concentrations in Injection Water Sample

Radionuclide	Concentration (pCi/L)	Reporting Limit (pCi/L)
Uranium	4.7	0.2
Ra-226	1140	0.2
Th-230	ND *	0.2
Pb-210	49	2.7

ND – nondetectable at the reporting limit of 0.2 pCi/L

The levels in the production fluid are expected to be similar to the injection water other than the uranium concentrations are much higher, averaging approximately 30,000 pCi/L.

The spill response procedure requires immediate response once a spill has been discovered. A sample of any water that has pooled is taken to verify that it is a process solution. Any water that has pooled is retrieved with a vacuum trailer and placed in the evaporation ponds. The volume of recovered water is recorded.

After all standing water is removed, a measurement of the extent of the release is made and a detailed diagram drawn. Saturation depth measurements are made at several locations to allow determination of an average depth of saturation. A worksheet is prepared showing the exact location of the release, the affected area, the quantity of material released, a description of how the release occurred and how it was discovered.

A data base is maintained that includes the following:

- Release date
- Release location
- Name of individual entering data
- Release area (in square feet)
- Release depth (in inches)
- Injection or Production solution

The following additional information is not required, but is recorded if known:

- Release volume (if estimated from operating data)
- Release volume recovered (if any)
- Solution uranium activity (if known from samples of release)
- Solution Ra-226 activity (if known from samples of release)

A gamma survey is performed and documented. If the results of the gamma survey indicate levels in excess of 20 μR/hr above background, soil sampling may be performed to determine the soil Ra-226 and U-nat concentrations (at the discretion of the RSO).

In release areas adjacent to active wellheads, high background gamma levels from contaminated piping may prevent accurate gamma survey results. Normally these areas are not cleaned up after each release due to the on-going potential for contamination from subsequent releases and the presence of buried utility lines. For these release areas, no soil samples are taken but the release reports are maintained in the Decommissioning File as required by 10 CFR 40.36.

If soil sampling indicates that the Ra-226 concentration exceeds the criteria for final site cleanup standards, the RSO will determine the appropriate corrective actions. Any soil that requires cleanup is treated as byproduct material and handled and disposed of properly.

Following completion of radiological surveys and release reports, the RSO ensures that the following information has been gathered and recorded in the decommissioning file:

- Date
- Release volume
- Total activity of each radionuclide released
- Corrective actions

- Results of remediation surveys
- Map showing release location and impacted area

Records of releases are maintained until NRC license termination. The RSO is responsible for maintaining the release records.

For the four calendar years beginning in the year 2000, 104 spills were reported, releasing an estimated 90,657 gallons of water.

2.6 Natural Background Radionuclides in Soil

USNRC Regulatory Guide 4.14, Section 1.1.4 specifies that one set of pre-operational surface soil samples should be collected to a depth of five centimeters at 300-meter intervals in each of the eight compass directions out to a distance of 1500 meters from the center of the milling area, and at each of the air particulate sampling locations. This requirement results in the collection of a minimum of 41 surface soil samples. All pre-operational soil samples are to be analyzed for Ra-226. In addition, all soil samples collected from the air particulate sampling locations, plus ten percent of all other soil samples, are to be analyzed for U-nat, Th-230, and Pb-210. The pre-operational data are intended to be compared with data collected during plant operations. The pre-operations data requirements for the Crow Butte Facility were adjusted somewhat to be appropriate for the potential releases from this ISL facility.

MARSSIM (NRC, 2000) recommends that background soil samples be collected to a depth of 15 centimeters (6 inches). The greater depth recommended by MARSSIM is based on the pathway models which consider plow mixing and crop growth to be over a 0 to 15 cm depth. Additionally, NUREG-1569 specifies in Section 2.9.3 that background soil samples must be collected from both 5-cm depth in conformance with Regulatory Guide 4.14 for operations purposes, and 15 cm for decommissioning purposes. Therefore, additional background samples were collected using MARSSIM guidance.

2.6.1 Pre-Operational Data

In July, 1982, 50 surface (to a depth of 5 centimeters) soil samples were collected in and around the permit area and from the air particulate sampling stations. All 50 samples were analyzed for U-nat and Ra-226. The uranium concentrations ranged from 0.36 to 6.7 pCi/g, and averaged 1.6 ± 1.1 pCi/g (1 standard deviation). It was noted at the time that the sample with the highest uranium concentration, 6.7 pCi/g, was collected from a compacted dirt driveway of a local motel. This datum should probably be considered unrepresentative and discarded. The Ra-226 concentrations ranged from 0.1 to 2.0 pCi/g, and averaged 1.1 ± 0.3 pCi/g. These data were considered typical of background concentrations expected for the area.

2.6.2 Gamma Surveys and Soil Sample Results in Reference Areas

Background studies were conducted by ERG personnel from May 10-14, 2004. Four reference areas were selected which were considered to be non-impacted from site operations and representative of the site physically, chemically, geologically, radiologically, and biologically. The four reference areas include areas near the northern and southern boundaries of the current permitted area as shown in Figure 2-3.

A gamma scanning survey was first conducted over each reference area using transect lines spaced at two-meter intervals and a walking speed of about one meter per second. A Ludlum Model 44-10 2-inch by 2-inch NaI detector was coupled to a Ludlum Model 2221 ratemeter/scaler. Gamma-ray count rates were recorded at one-second intervals. The gamma survey data maps for Areas 1 and 4 are shown in Figures 2-4 and 2-5. A histogram of the gamma-ray survey data for the four reference areas is presented in Figure 2-6. These figures demonstrate that the gamma-ray levels are fairly uniform across the surface of the four reference areas. Table 2-3 summarizes the gamma scanning survey data in tabular form. The number of gamma-ray survey points for the four reference areas ranged from 265 to 423. The average count rate ranged from 13,977 cpm to 14,503 cpm. The standard deviation of the count rate data ranged from 774 to 832.

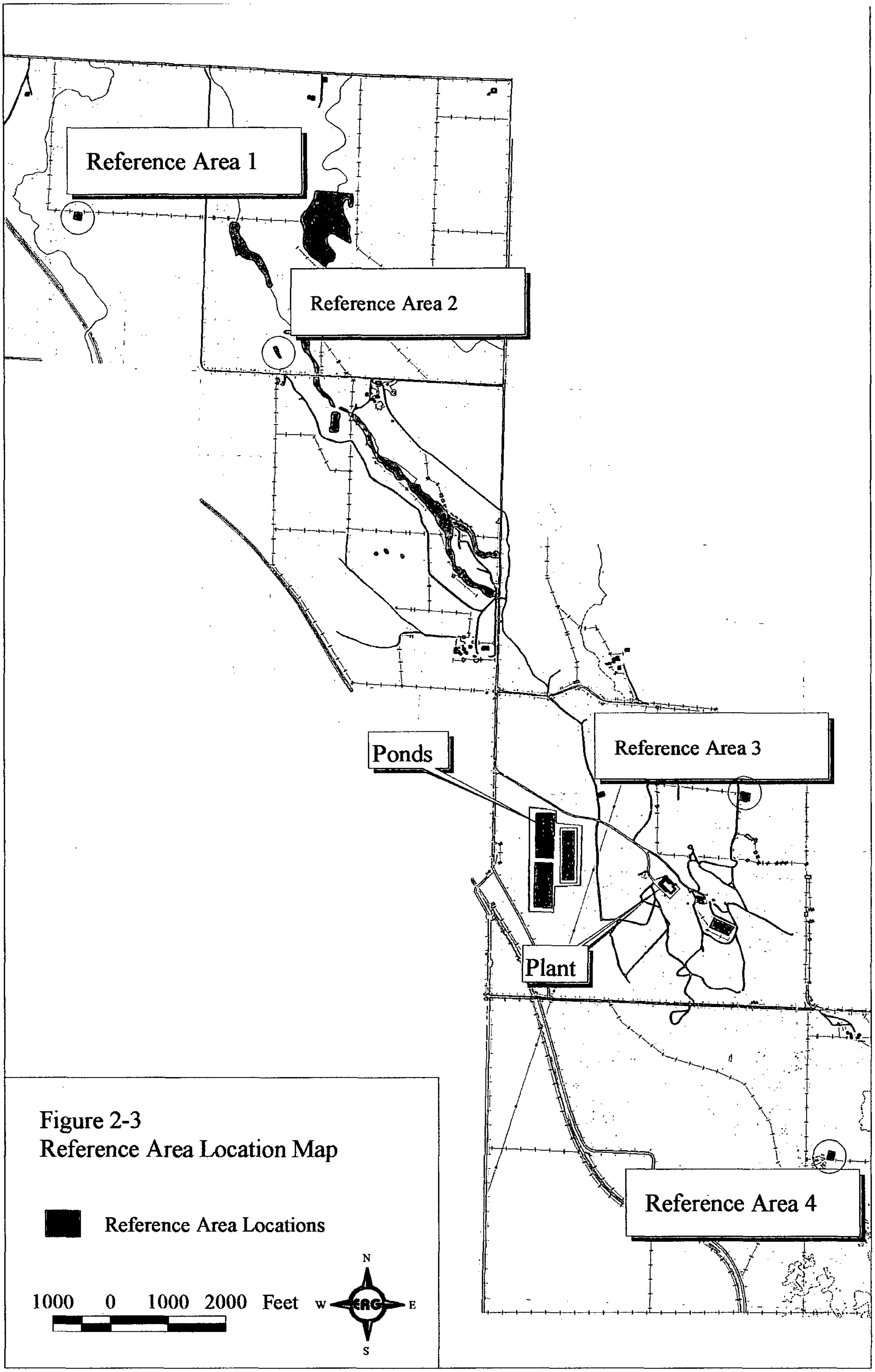


Figure 2-3
Reference Area Location Map

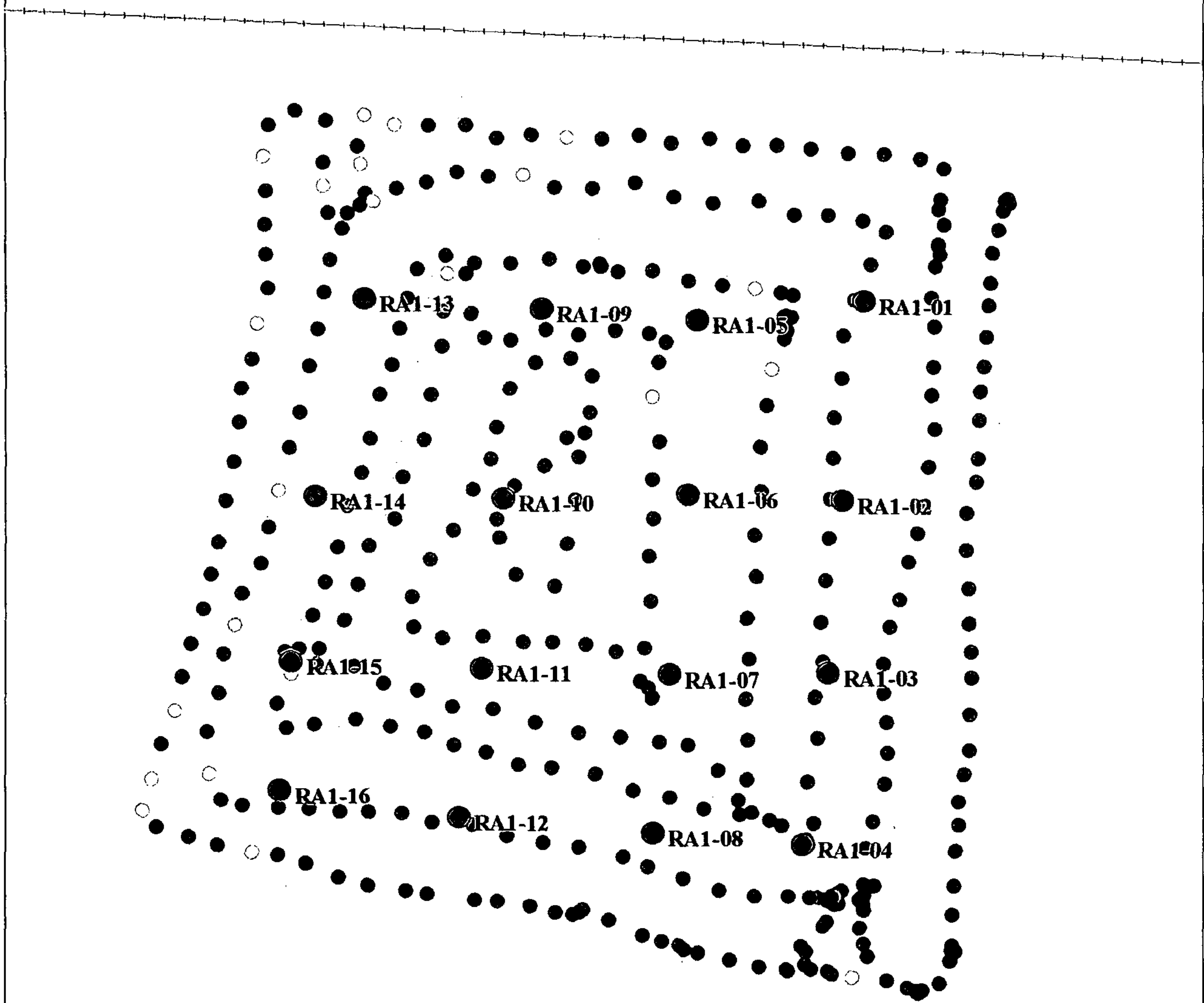
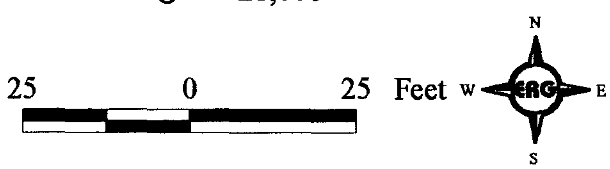


Figure 2-4
Reference Area 1
Survey & Sample Locations

Reference Area Sample Locations

Gamma Survey (CPM)

- < 13,000
- 13,000 - 16,000
- 16,000 - 19,000
- 19,000 - 22,000
- 22,000 - 25,000
- 25,000 - 28,000
- > 28,000



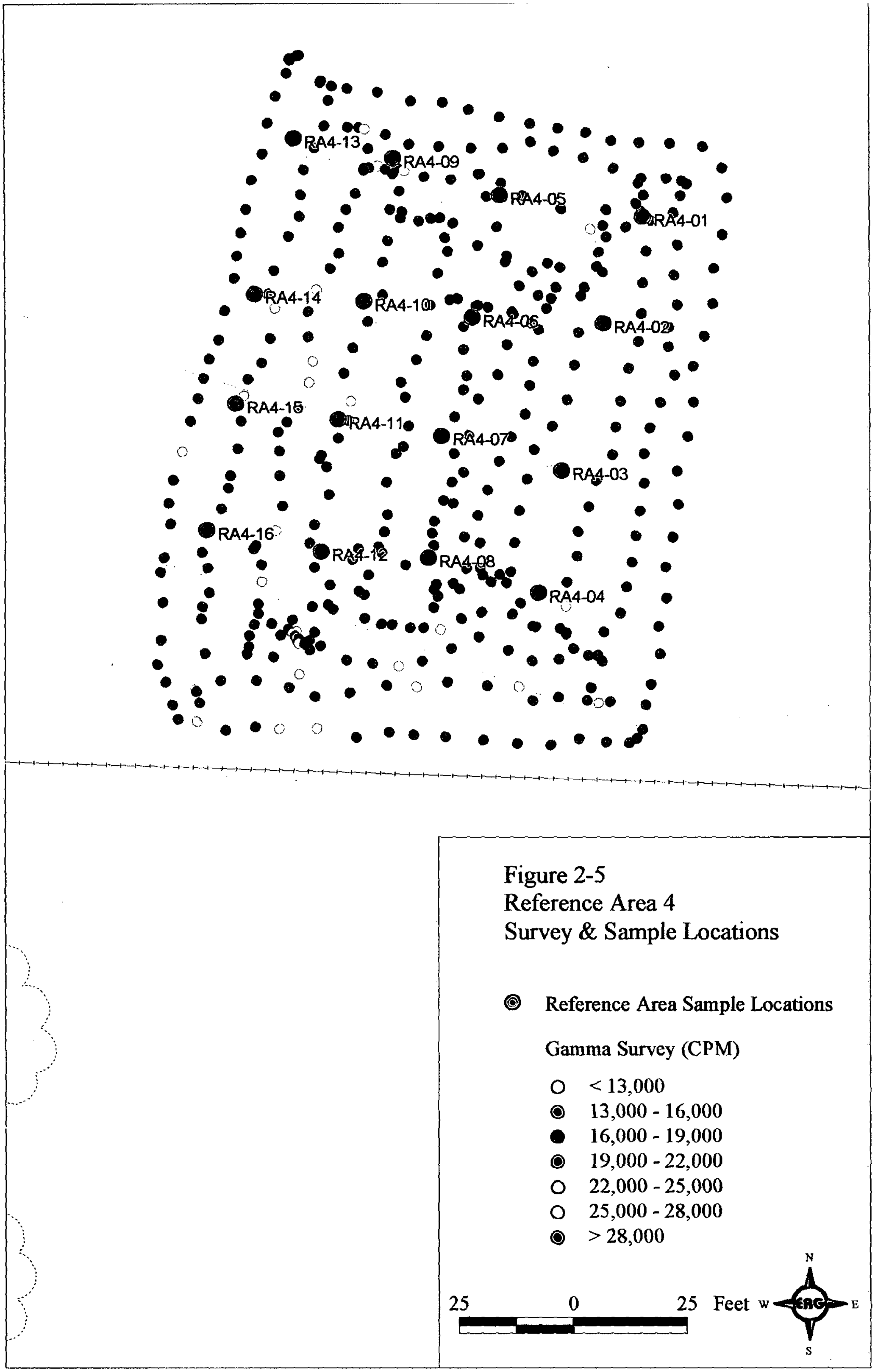


Figure 2-5
Reference Area 4
Survey & Sample Locations

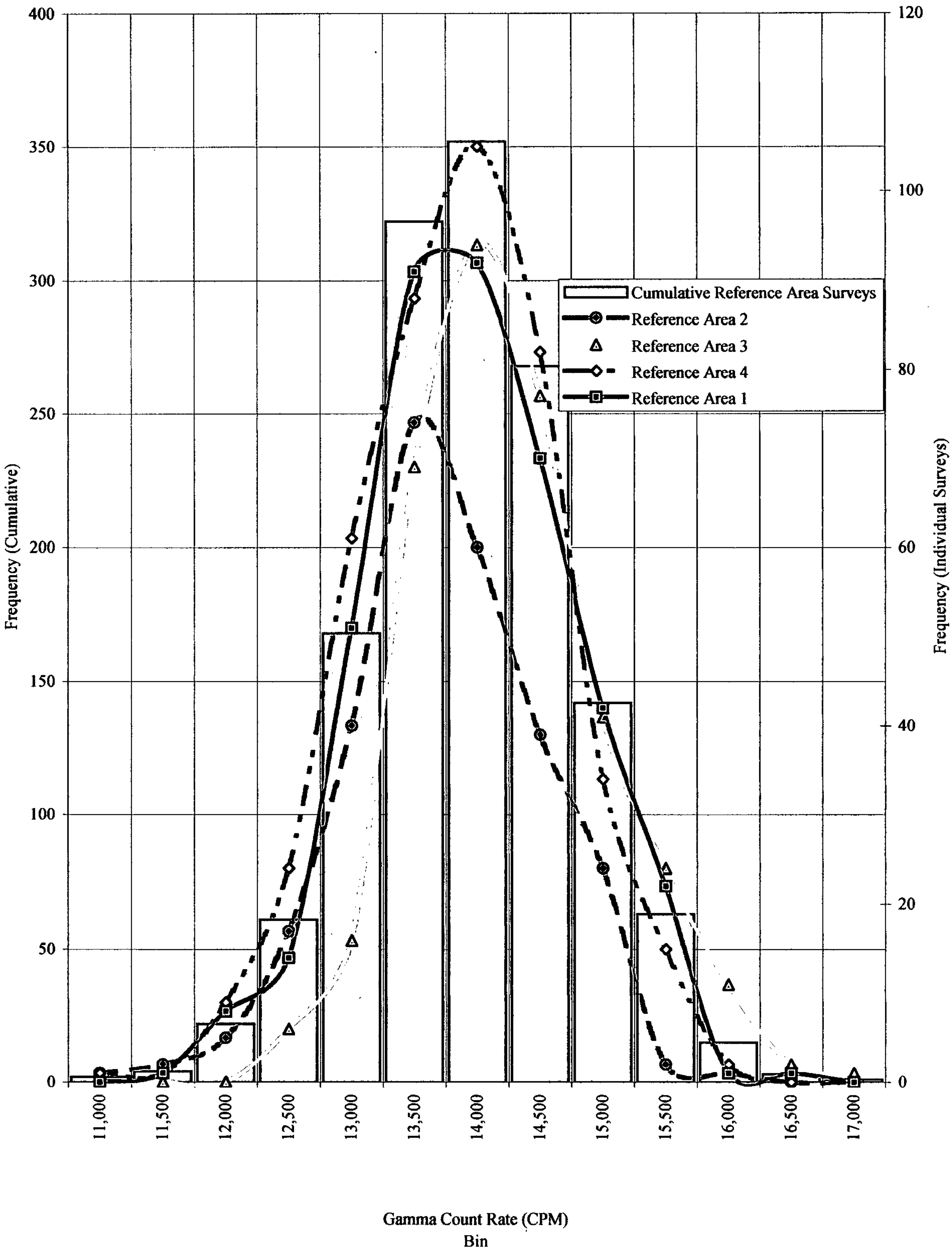


Figure 2-6 Reference Area Survey Data Histogram

Table 2-3 Reference Area Gamma Survey Data Summary

Location	Population Size (n)	Avg. Ratemeter Count Rate (cpm)	Standard Deviation
RA-1	393	14199	803
RA-2	265	13977	775
RA-3	341	14503	744
RA-4	423	14098	832

A casual review of the gamma count rate data leads to the conclusion that the four reference areas appear to have uniform background gamma-ray radiation levels, and therefore uniform concentrations of naturally occurring radionuclides. To assess the accuracy of this conclusion, a more detailed characterization of Reference Area 1 and Reference Area 4 was performed. Sixteen survey points were uniformly spaced across the areas for additional study. These survey points are identified as RA1-1 through RA1-16, and RA4-1 through RA4-16 on Figures 2-4 and 2-5, respectively. At these survey points, a static one-minute gamma-ray count was collected using the same portable instruments as the scanning survey. The difference between the measurements is that the scanning survey data is the estimated cpm from a one second count time, whereas the static measurement is a true one-minute data collection. The exposure rate was also measured at a height of 18 inches above each survey point using a Ludlum Model 19. After gamma-ray and exposure rate data were recorded, a soil sample was collected to a depth of six inches (15 cm) using a 5-point composite sampling method. These soil samples were analyzed by a vendor laboratory for total uranium, Ra-226, and Pb-210. The static gamma-ray count, exposure rate, and laboratory analyses for each survey point is presented in Table 2-4.

Any difference in the mean radionuclide concentration between the survey unit and the reference area will be interpreted as caused by residual radioactivity from site activities. If there is a significant variability in background concentration, or when there is a significant difference in backgrounds between reference areas, then the NRC recommends that a Kruskal-Wallis (K-W) test be conducted to determine whether there are, in fact, significant differences in the mean background between the reference areas. The K-W test is described in NUREG-1505 (NRC, 1997). The test assumes that if the distribution of the measurements in each reference areas are the same, then the average rank for each reference area should also be about the same. A Kruskal-Wallis statistic (K) for each survey unit is calculated, which is a measure of how different the reference areas are from each other. While NUREG-1505 does not recommend a specific value of K_c, the critical value, the NRC staff recommends in DG-4006 (NRC, 1998a) a Type I error rate of an a_{kw}=0.2. From Table 13.3 of NUREG-1505, given that two reference areas are being compared at CBR and an a_{kw} of 0.2, the acceptable K_c is 1.6.

A K-W statistical test was performed on the static one minute gamma-ray data, the Ra-226 soil sample results, and the total uranium soil sample results presented in Table 2-4. In the case of the Ra-226 and total uranium data, several of the analytical results were identical. Abelquist, 2001 (page 134) states "when ranking, if several measurements are tied, they are all assigned the average rank of that group of tied measurements". Also, in the case of total uranium data, several of the analytical results were reported as not detectable at the reporting limit of 0.3 pCi/g. For ranking purposes, the data were ranked as if the concentration reported was 0.3 pCi/g. The K for each measurement type was calculated with the results as follows:

- One minute gamma-ray count rate K = 9.5
- Ra-226 soil data K = 13.1
- Total uranium soil data K = 21.4

In all three statistical tests, the calculated K significantly exceeds the critical value of 1.6. This suggests that the reference areas do have significantly different distributions of gamma-ray count rates and soil concentrations.

While these tests demonstrate that the distribution of all three measurements in Reference Areas 1 and 4 are statistically different, another question to consider is are these differences in backgrounds significant? Guidance presented in Section 2.3.1 of NUREG-

Table 2-4 Reference Area Sample Data

Reference Area 1

Sample ID	1-Minute Integrated Count (cpm)	Exposure Reading (µR/hr)	Pb-210 (pCi/g) *	Ra-226 (pCi/g)	Uranium (pCi/g)	Ra-226 : Uranium Ratio
RA1-01	14317	17	ND	0.8	0.5	1.5
RA1-02	14434	18	ND	0.7	0.5	1.5
RA1-03	14381	17	ND	0.7	0.4	1.7
RA1-04	14373	18	ND	0.6	0.5	1.3
RA1-05	14518	18	ND	0.6	0.5	1.3
RA1-06	14113	17	ND	0.6	0.4	1.5
RA1-07	14543	18	ND	0.6	0.4	1.5
RA1-08	14177	18	ND	0.7	0.5	1.5
RA1-09	14339	18	ND	0.8	0.5	1.7
RA1-10	13967	17	ND	0.6	0.4	1.5
RA1-11	14191	17	ND	0.4	0.4	1.0
RA1-12	14208	16	ND	0.5	0.4	1.2
RA1-13	13842	16	ND	0.6	0.5	1.3
RA1-14	13767	16	ND	0.5	0.4	1.2
RA1-15	13820	17	ND	0.7	0.4	1.7
RA1-16	13496	16	ND	0.8	0.5	1.7
Average	*14155*	*17*		*0.6*	*0.4*	*1.4*
Std. Dev.	*291*	*0.8*		*0.1*	*0.0*	*0.2*

Reference Area 4

Sample ID	1-Minute Integrated Count (cpm)	Exposure Reading (µR/hr)	Pb-210 (pCi/g) *	Ra-226 (pCi/g)	Uranium (pCi/g) **	Ra-226 : Uranium Ratio
RA4-01	13784	17	ND	0.5	0.4	1.2
RA4-02	13778	16	ND	0.6	** ***0.3***	1.8
RA4-03	13810	16	ND	0.5	** ***0.3***	1.5
RA4-04	13873	16	ND	0.4	0.4	1.0
RA4-05	13808	18	ND	0.7	0.4	1.7
RA4-06	14096	17	ND	0.6	0.3	1.8
RA4-07	13936	17	ND	0.5	** ***0.3***	1.5
RA4-08	13732	16	ND	0.4	** ***0.3***	1.2
RA4-09	14086	17	ND	0.5	0.3	1.5
RA4-10	13730	16	ND	0.5	0.4	1.2
RA4-11	13843	16	ND	0.4	** ***0.3***	1.2
RA4-12	13550	17	ND	0.4	0.3	1.2
RA4-13	14094	16	ND	0.7	0.4	1.7
RA4-14	13781	17	ND	0.5	0.3	1.5
RA4-15	13782	17	ND	0.4	** ***0.3***	1.2
RA4-16	13870	16	ND	0.4	0.4	1.0
Average	*13847*	*17*		*0.5*	*0.4*	*1.4*
Std. Dev.	*142*	*0.6*		*0.1*	*0.0*	*0.3*

** ND - nondetectable at the reporting limit of 0.2 pCi/g*
*** **0.3** - nondetectable at the reporting limit of 0.3 pCi/g*

CR/5849 (NRC, 1998b) indicates that if the sum of the mean background and 2 standard deviations of the measurements is less than 10% of the DCGL, variations in background can be considered insignificant. This is the case for the total uranium analyses where the average concentrations and standard deviations for Reference Areas 1 and 4 are 0.5 ± 0.1 pCi/g, and 0.3 ± 0.1 pCi/g respectively and the DCGL is 240 pCi/g. These differences are clearly insignificant. For Ra-226, the average concentrations for Reference Areas 1 and 4 are 0.6 ± 0.1 pCi/g and 0.5 ± 0.1 pCi/g, respectively, and the DCGL is 5 pCi/g. While this comparison is not quite as conclusive, the same argument can be made that the variability in radium background can be neglected for cleanup comparison purposes. A radium background concentration of 0.55 pCi/g is proposed.

3.0 Current Site Conditions

A characterization survey was conducted in May 2004 to provide information needed to develop a final verification plan for contaminated soils. Spill areas within the wellfields and near evaporation ponds were surveyed in an effort to collect data used to develop a gamma count rate to radionuclide soil concentration correlation. This correlation will assist in interpreting the radiological survey data and to develop a gamma-ray action level. Four areas were chosen for survey and soil sampling. Figure 3-1 shows the four areas relative to the overall site. Spill areas involving large quantities of injection well solution were selected. Spills in the proximity of contaminated piping, such as next to the wellheads or trunklines, were not considered since the gamma shine from such features would influence the correlation.

3.1 Gamma Surveys and Soil Sampling

Each area was surveyed using a 2-inch by 2-inch NaI detector (Ludlum Model 44-10), coupled to a Ludlum Model 2221 ratemeter/scaler and a Trimble ProXRS GPS unit. The survey system automatically logged individual gamma count rates with a corresponding coordinate every one second. The GPS system was placed into a backpack and was worn by field personnel while walking at a rate of approximately 2.5 feet per second over the area to be surveyed. The data were managed using ArcView GIS, a geographic information system computer application for managing, displaying, and analyzing data geographically. After review of the survey data maps, the area was further scanned with only the Ludlum Model 2221 and 44-10 to identify locations within a specific range of gamma readings from which to sample. The coordinates of each sample location were recorded using the GPS. A one-minute integrated gamma count was taken using the 2221 and 44-10 at eighteen inches above the sample location. An exposure-rate reading was taken with a Ludlum Model 19 at eighteen inches above the sample location. Lastly, a five point composite surface to 15-cm deep sample was taken. One sample was taken directly beneath the detector and the four other samples were taken at points extending in the compass directions eighteen inches from the center.

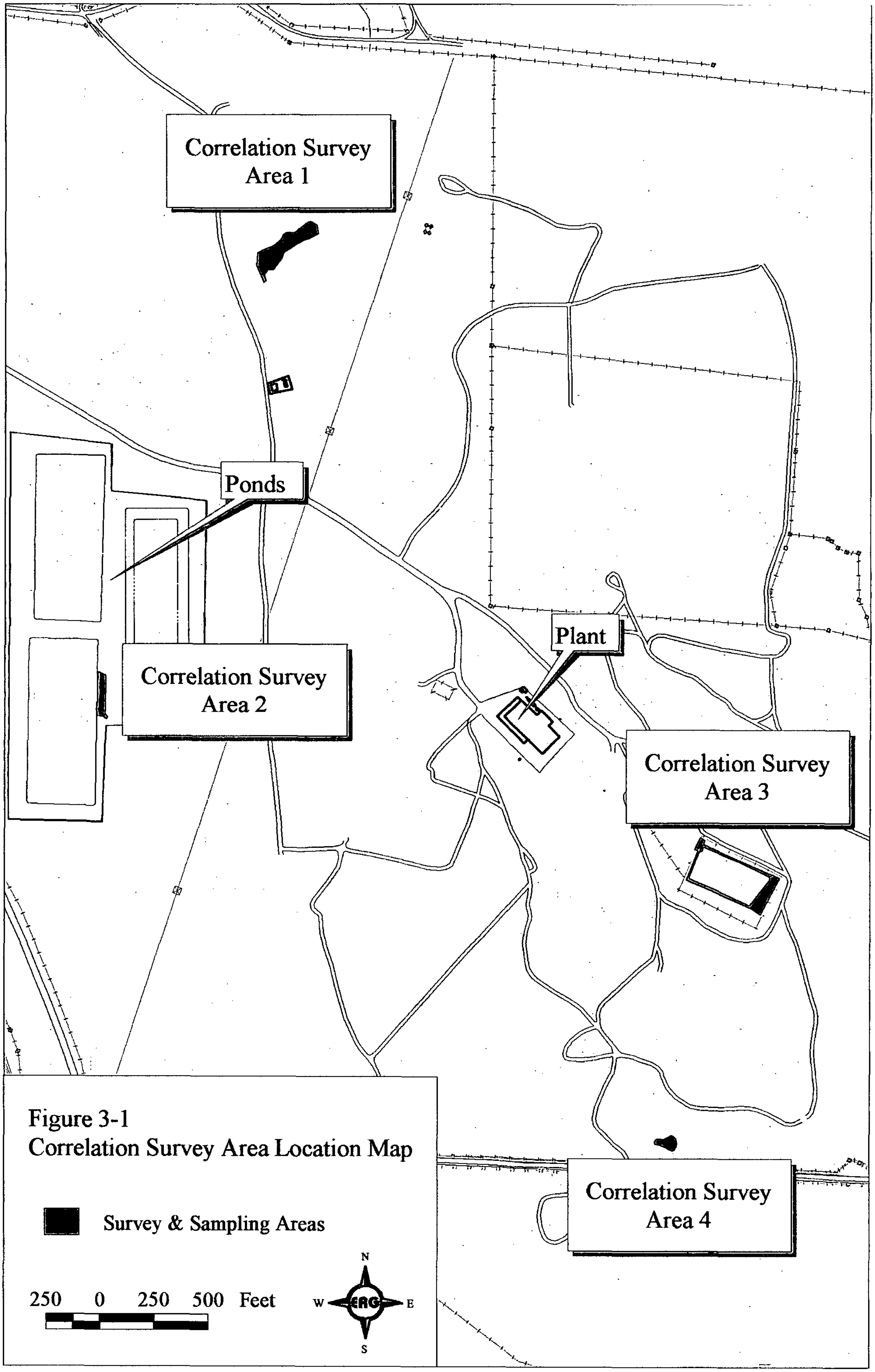


Figure 3-1
Correlation Survey Area Location Map

3.2 Soil Sample Data and Gamma Survey Results

A total of fifteen soil samples were taken from the four correlation survey areas. The results of the one-minute integrated counts, exposure rates, and soil concentrations are shown in Table 3-1. Figures 3-2 through 3-5 show the GPS-radiological survey and correlation sample locations for each of the four areas. Each color dot in the figures represents a recorded count rate within one of the count-rate ranges given in the legends of the figure. Of the few locations that indicate elevated gamma levels, some are near pipes or other gamma-emitting sources. The correlation survey resulted in over 2100 individual gamma records with associated coordinates. The maximum reading observed was 28,272 cpm in Area 4 while the minimum reading was 10,411 cpm in Area 1.

Four samples were taken from Area 1 where a trunkline had leaked and solution had run down the hillside. At Area 2 three samples were taken from a location between two evaporation ponds currently in use. There were three samples taken at Area 3, next to the pilot plant evaporation pond. At Area 4, five samples were taken in an area where a large trunkline spill had occurred. Several elevated areas were not suitable for correlation studies since the source of gamma rays were from nearby process components or from a spill of a very concentrated material in a small localized area.

The high Ra-226 to U-nat concentration ratios for the data in Table 3-1 suggest that all spills were from injection water with the exception of Area 2, which was not wellfield water line spill related. The contamination in Area 2 is believed to have arisen from spillage while transferring water from one evaporation pond to another.

Table 3-1 Correlation Area Sample Data

Correlation Area	Sample ID	1-Minute Integrated Count (cpm)	Exposure Rate (μR/hr)	Pb-210 (pCi/g)	Ra-226 (pCi/g)	Uranium (pCi/g)	Ra-226:U-nat Ratio	Average Ratio
1	CBR-CS-01	16330	20	ND	3.4	0.9	3.6	3.3
	CBR-CS-02	15911	19	ND	4.6	1.4	3.2	
	CBR-CS-03	13868	17	ND	0.7	0.5	1.3	
	CBR-CS-04	17359	21	ND	4.1	0.8	5.0	
4	CBR-CS-05	35132	40	1.5	53.0	1.6	32.6	26.2
	CBR-CS-06	29930	34	ND	45.0	1.8	25.6	
	CBR-CS-07	21756	27	ND	29.0	1.4	20.4	
	CBR-CS-08	19504	24	ND	10.0	1.2	8.2	
	CBR-CS-09	15712	19	ND	0.8	1.0	0.8	
2	CBR-CS-10	16233	19	ND	0.9	3.1	0.3	0.2
	CBR-CS-11	17070	19	ND	1.2	7.6	0.2	
	CBR-CS-12	17981	20	1.2	1.0	11.3	0.1	
3	CBR-CS-13	21606	25	3.9	10.0	1.5	6.7	5.7
	CBR-CS-14	18462	21	2.7	5.0	1.0	4.9	
	CBR-CS-15	23223	27	4.5	11.0	2.0	5.4	

** ND - nondetectable at the reporting limit of 0.2 pCi/g*

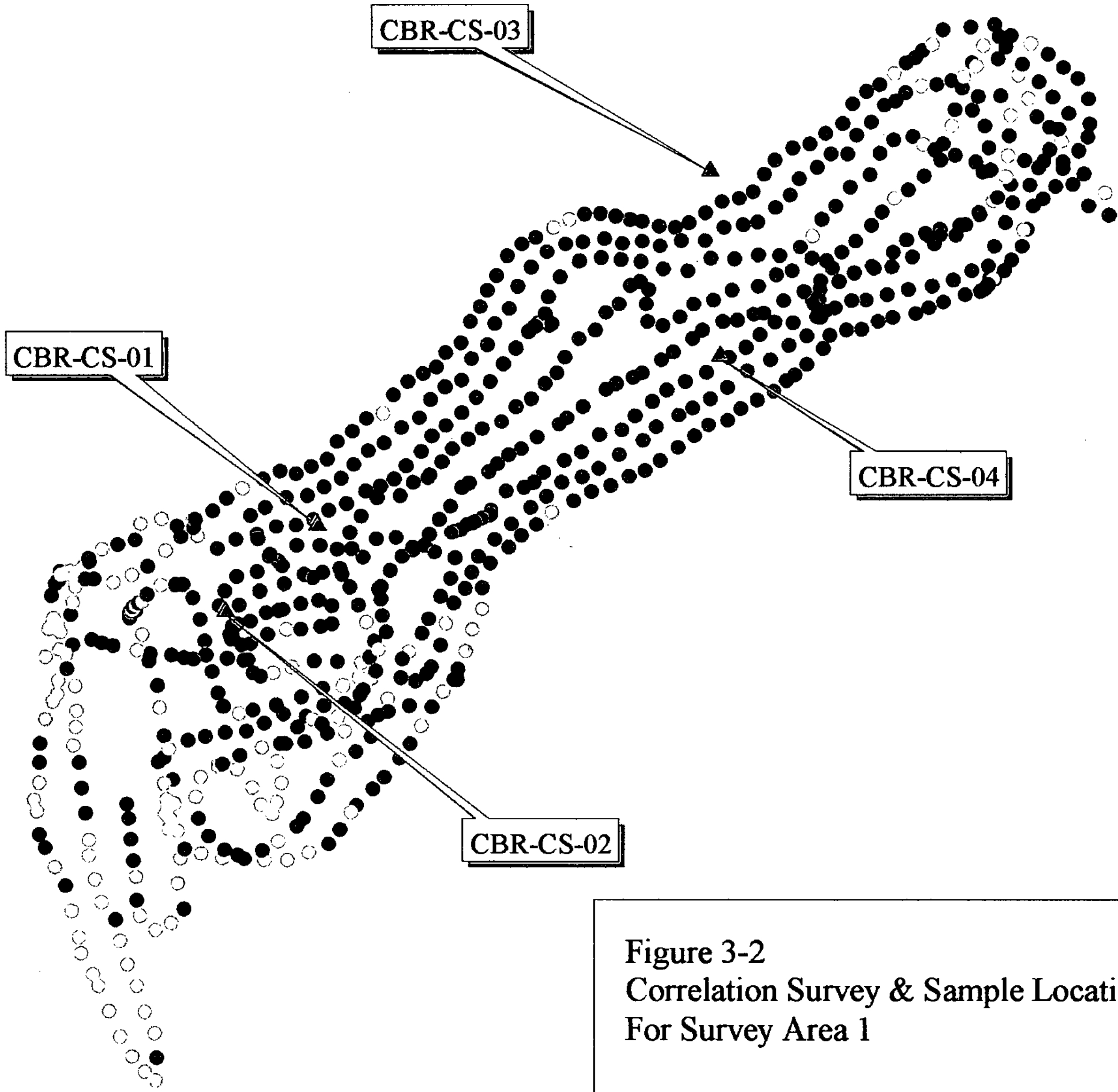


Figure 3-2
Correlation Survey & Sample Locations
For Survey Area 1

▲ Correlation Sample Locations

Gamma Survey (CPM)

- < 13,000
- 13,000 - 16,000
- 16,000 - 19,000
- 19,000 - 22,000
- 22,000 - 25,000
- 25,000 - 28,000
- > 28,000

25 0 25 Feet

N
W E
S

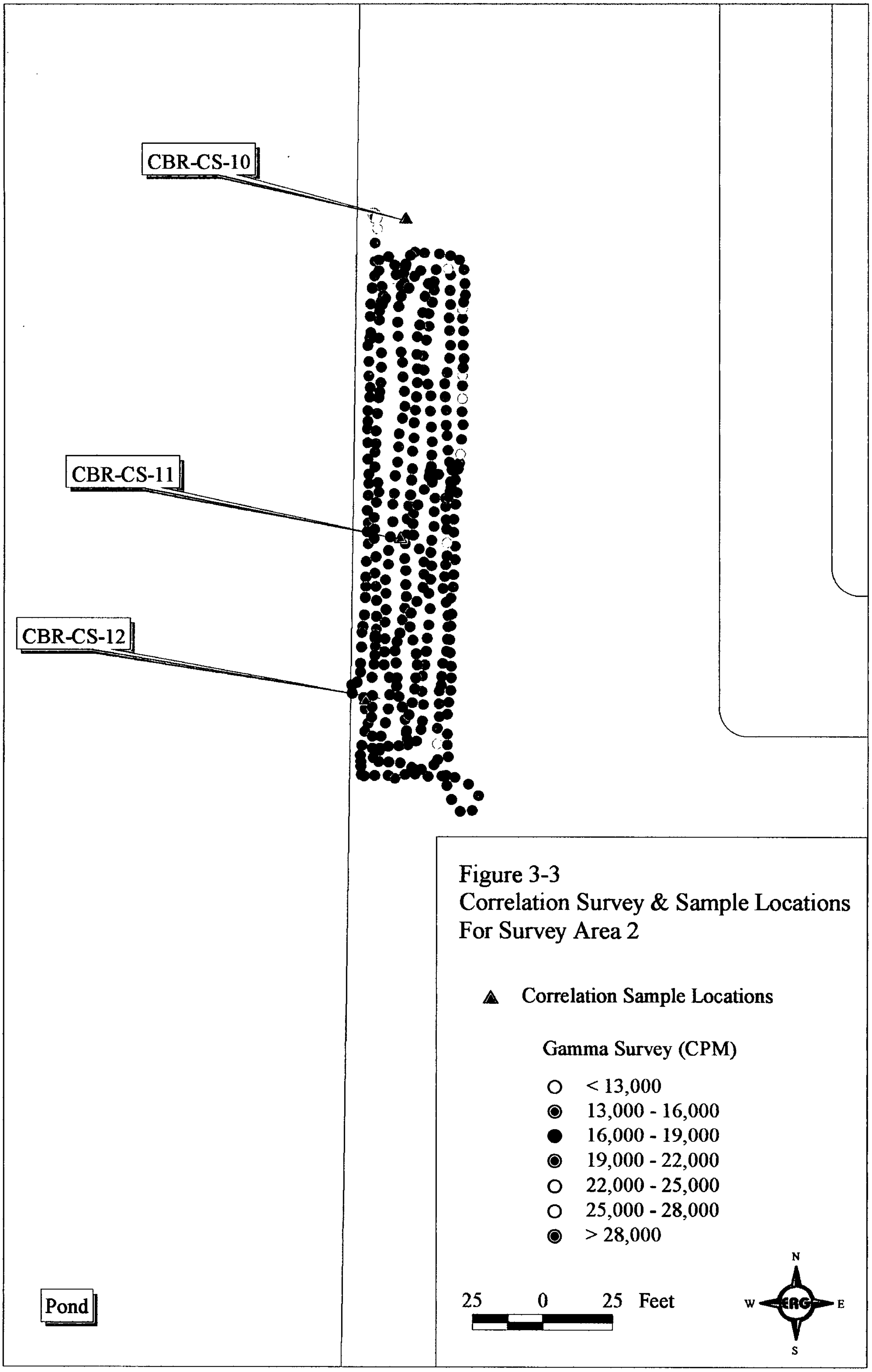


Figure 3-3
Correlation Survey & Sample Locations
For Survey Area 2

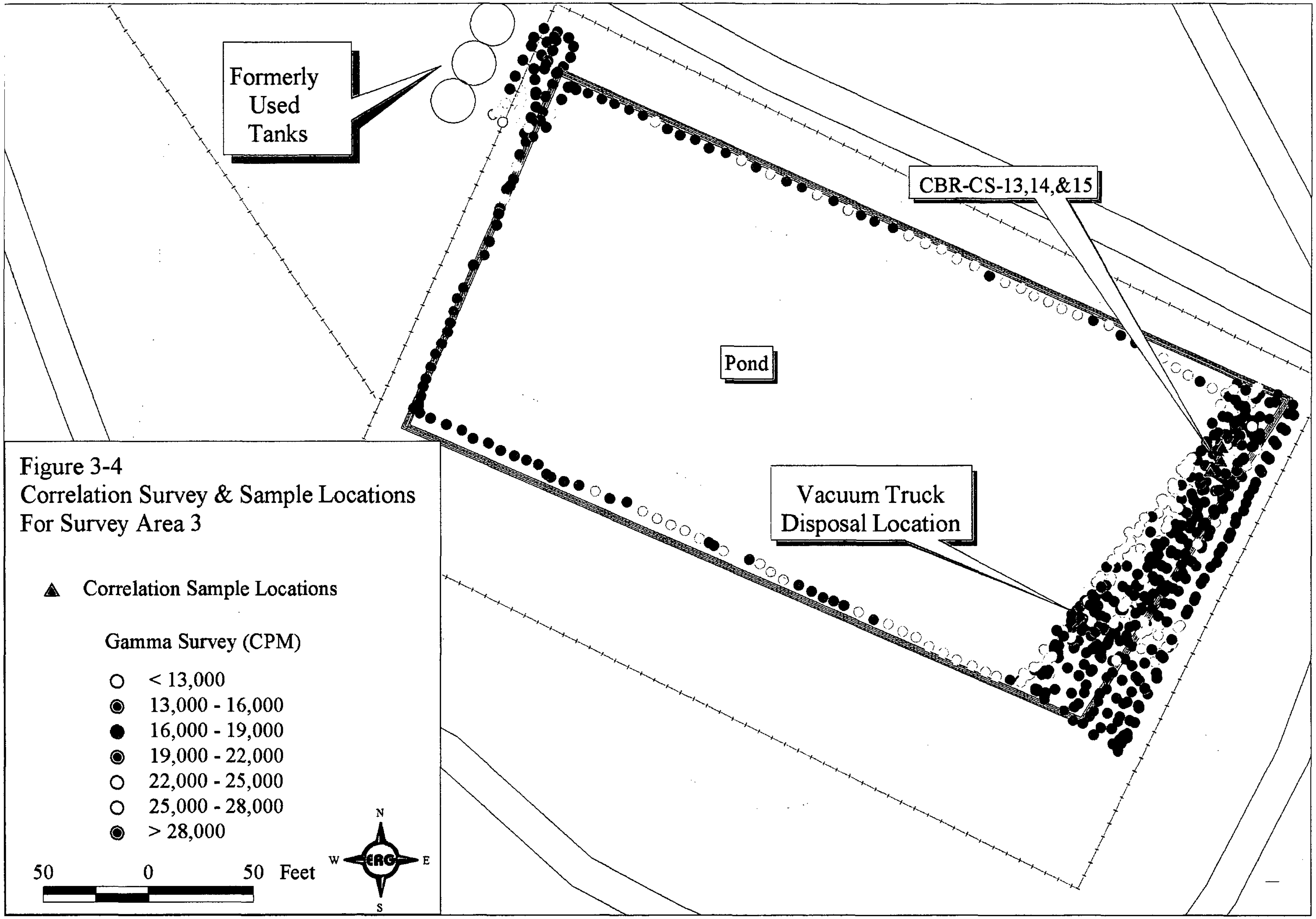


Figure 3-4
Correlation Survey & Sample Locations
For Survey Area 3

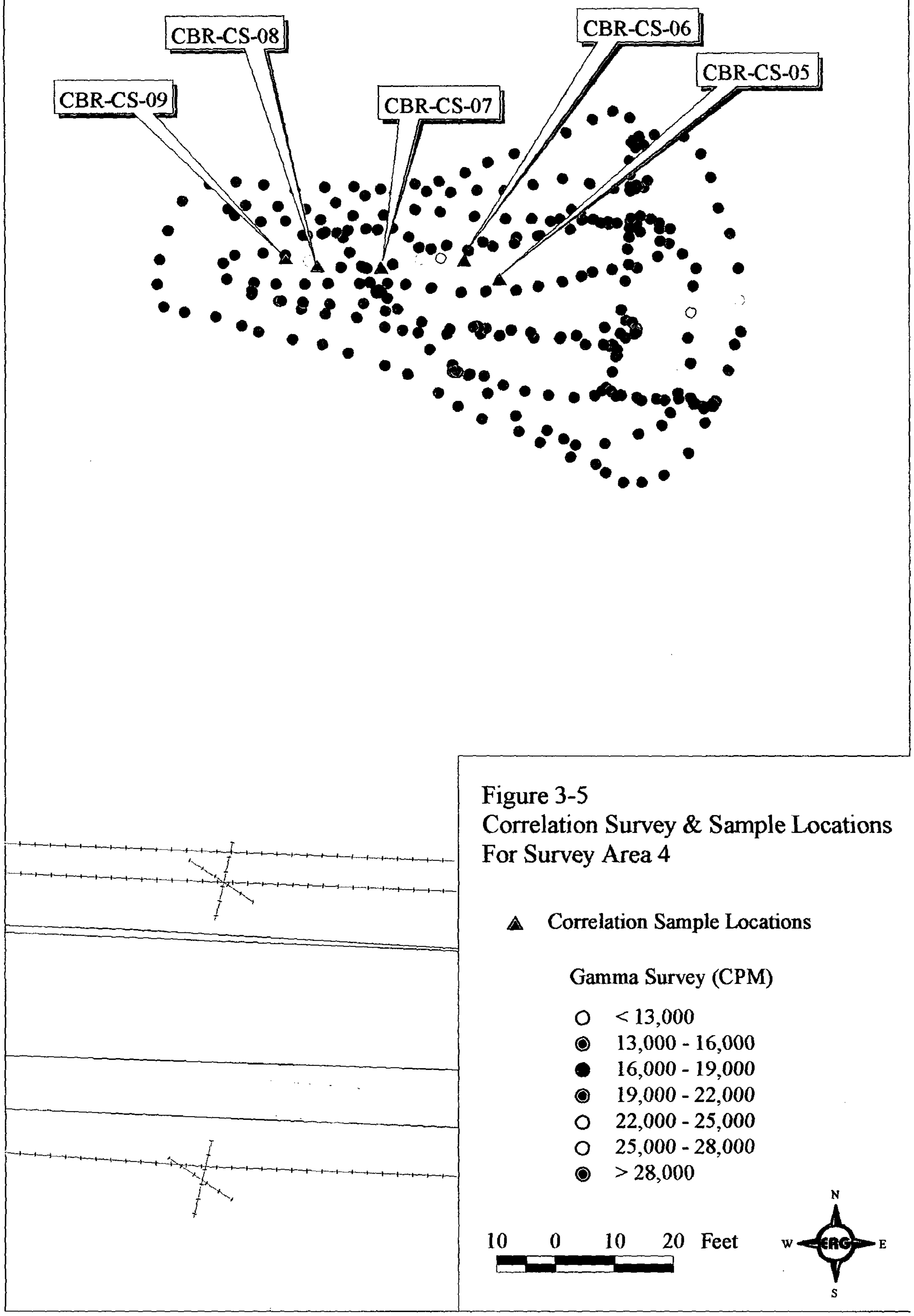


Figure 3-5
Correlation Survey & Sample Locations
For Survey Area 4

▲ Correlation Sample Locations

Gamma Survey (CPM)

- < 13,000
- 13,000 - 16,000
- 16,000 - 19,000
- 19,000 - 22,000
- 22,000 - 25,000
- 25,000 - 28,000
- > 28,000

10 0 10 20 Feet

4.0 Wellfield Decommissioning

Decommissioning and demolition work will be performed by CBR personnel and outside contractor(s). All workers will receive industrial and radiation safety training according to the Section 7.2 of this plan. As stated in that section, the ESH department will monitor decommissioning activities related to safe work practices and assure compliance with procedures. All personnel have the authority to terminate work when unsafe practices are observed. Section 5.0 lists the disposal options and survey requirements for decommissioned equipment, materials and structures. Contaminated soil and those items that cannot be economically decontaminated below the releasable limits will be disposed of as byproduct material according to Section 5.4.

Wellfield decommissioning includes the removal of surface equipment consisting of feed lines, electrical conduit, well boxes, and wellhead equipment. Wellhead equipment such as valves, meters, or control fixtures will be salvaged when possible. Buried wellfield piping will be removed. Wells will be plugged and abandoned according to the procedure below. Following removal of all equipment and piping, a gamma survey will be performed in potentially contaminated areas to identify and remove contaminated soil above the cleanup criteria. The wellfield area may then be recontoured, if necessary. Additional information regarding each step of the decommissioning is discussed below.

4.1 Well Plugging and Abandonment

Wells no longer useful for continued mining or restoration will be abandoned. This includes injection and recovery wells, monitoring wells, and any other wells used for the collection of hydrologic or water quality data. One known exception may be a well could be transferred to the landowner for personal use.

The objective of the CBR well abandonment program is to seal all wells such that the groundwater supply is protected, and to remove potential physical hazards. All abandoned wells will be plugged and abandoned in accordance with The Plugging and Abandonment Plan approved by the NDEQ and summarized in Section 6.2.3.1 of the CBR license renewal application. This procedure is summarized below.

A hose is lowered to the bottom of the well casing, and an approved abandonment mud is pumped down the hose. After filling the casing, the hose is removed and a cement plug is placed on the top. A hole is dug around the well, and the top three feet of casing are removed. The hole is then backfilled and vegetated.

A well abandonment report will be filed with the appropriate agencies upon completion of the wellfield decommissioning.

4.2 Trunk Lines, Pipes, and Wellfield Equipment

Surface piping used for wellfield activities, such as injection and recovery well lines or trunk lines, will be removed from the wellfields along with the valves, meters, and other related equipment. The underground piping (well lines and trunk lines) will be excavated and removed. Salvageable lines will be held for future use in ongoing mining operations. Non-salvageable lines will either be surveyed for unrestricted release, or disposed of at a licensed disposal facility as radioactive waste.

In some situations, CBR may desire to leave buried pipes in place. If so, studies will be conducted to determine the effectiveness of acid washes or other decontamination methods. The results will be documented and, if successful, used to develop a procedure for submission to the NRC for approval.

Contaminated equipment will be evaluated on a cost-benefit basis to determine if an attempt to decontaminate the item is warranted. Possible decontamination methods include acid wash, sandblasting, and pressurized water spray. During decontamination attempts, the work area will be controlled in accordance with radiological control requirements using procedures from the CBR Health Physics Manual (HPM). If decontamination is not successful, items will be disposed of at a licensed facility. Areas where wash water has been released to the ground will be considered potentially contaminated and monitored in accordance with Section 6 of this plan.

After all surface equipment and piping are removed, and all wells are properly plugged and abandoned, soil monitoring and removal procedures specified in Section 6 of this D&D plan will be applied.

4.3 Wellfield Buildings

Wellfield buildings are small enough to be transported intact and may be reused at another wellfield, transferred to another licensee, or released for unrestricted use if they can be decontaminated to release criteria. These small, industrial structures are not suitable for long-term occupancy by workers or as a residence. Therefore, the release criteria for materials and equipment as specified in Section 5.1 will be applied.

5.0 Disposition Options and Release Surveys

The disposition of potentially contaminated items and materials fall within four broad categories. These categories are the unrestricted release of equipment and pipe, the unrestricted release of wellfield buildings, the transfer of contaminated equipment and buildings to another licensee, and the disposal of contaminated equipment as waste byproduct material.

5.1 Equipment, Pipe and Materials to be Released for Unrestricted Use

Salvageable equipment, pipe and other materials to be released for unrestricted use will be surveyed for alpha radiation contamination in accordance with the NRC guidance document, "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material," dated May 1987.

The monitoring for beta-gamma dose rate is a current license requirement, based on the referenced 1987 NRC guidance document. This requirement has been eliminated in subsequent ANSI standards, including the latest ANSI/HPS N13.12-1999 standard, "Surface and Volume Radioactivity Standards for Clearance." CBR has routinely made these measurements but has never found them limiting. The characterization data indicate that the long-lived radionuclides, uranium, Ra-226, and Pb-210 are the principal radionuclides in the process water and thus are the principal constituents in contaminated areas. Anticipated mixtures of these radionuclides anywhere on the CBR site, including within process equipment, result in alpha and beta emission rates that are approximately the same. When Ra-226 is the predominant constituent, then the alpha emission rate should be approximately twice the beta emission rate. Considering that the background count rate is approximately 10 times higher (per unit area surveyed) for a beta-gamma detector compared to an alpha detector, it is reasonable to expect that the alpha measurement will always be more sensitive and limiting. Therefore, CBR proposes to make only alpha surface contamination measurements during release surveys for unrestricted use.

The CBR release limits for alpha radiation are as follows:

- Removable total of 1,000 dpm/100 cm^2.
- Average total of 5,000 dpm/100 cm^2 over an area no greater than 1 square meter.
- Maximum total of 15,000 dpm/100 cm^2 over an area no greater than 100 cm^2.

Decontamination of surfaces will be done to comply with CBR's ALARA policy to reduce the contamination as far below the limits as practical. Decontamination methods include pressurized spray washing, acid treatment, and sandblasting. Decontamination residues will be properly handled and disposed of as byproduct material. Equipment and materials released for unrestricted use will either be placed in an approved landfill, or salvaged.

5.2 Buildings to be Released for Unrestricted Use

The only buildings to be released or disposed of under this plan are the small wellfield buildings which provide environmental protection to valves, meters, and other equipment. These small industrial structures are not suitable for long-term occupancy by workers or others. Therefore, the applicable release criteria for their unrestricted use are the same criteria specified for equipment above. These structures will be surveyed for alpha contamination and released for unrestricted use or disposed of in a licensed facility.

5.3 Contaminated Equipment, Materials, and Buildings Transferred to Another Licensee

Salvageable contaminated equipment such as valves, meters, and other valuable components, along with small movable structures such as wellfield buildings, may be transferred to another licensed facility. If surface contamination exceeds the limits for unrestricted release, the equipment or structures may be shipped to another licensed facility in accordance with Title 49 of the Code of Federal Regulations (CFR). In most cases the equipment or structures will be shipped as Surface Contaminated Object (SCO-I), DOT regulations 49CFR173.427, UN2913, or as Empty Packages as Excepted Packages, DOT regulations 49CFR173.428, UN 2910.

Equipment and structures will be free of any loose exterior contamination and drained of any process liquids prior to shipment. If necessary, the equipment or structures will be washed to ensure that the exterior contamination is not easily removable. External exposure and contamination surveys will be conducted and documented to ensure that the DOT limits in 49 CFR 173.427 (a) (1), 173.441 and 173.443 are met. Surface contaminated objects (SCO-1) may be transported as an exclusive use shipment in a strong tight container that prevents leakage of the radioactive contents under normal conditions of transport, as specified in 173.427(b) (3).

5.4 Contaminated Equipment, Materials, and Buildings Disposed of as Byproduct Material

Non-salvageable contaminated equipment, materials, dismantled structural sections, and soils will be sent to an NRC licensed facility for disposal. Shipments will be conducted per procedures in the HPM. In most cases the byproduct material will be shipped as Low Specific Activity (LSA-I) material, pursuant to DOT regulations in 49 CFR 173.427, UN2912.

External exposure and contamination surveys will be conducted and documented to ensure that the DOT limits in 49 CFR 173.427 (a) (1), 173.441 and 173.443 are met. Byproduct material will normally be transported as an exclusive use shipment in a strong tight container that prevents leakage of the radioactive contents under normal conditions of transport, as specified in 173.427(b) (3).

6.0 Cleanup of Surface and Subsurface Soils

The cleanup of surface and subsurface soils will be done according to the requirements in 10 CFR Part 40, Appendix A. Appendix A indicates that the Ra-226 concentration in soil should be limited to 5 pCi/g above background for 15-cm thick surface layers, averaged over 100-m^2. Similar layers of subsurface contamination are limited to15 pCi/g.

The NRC amended 10 CFR Part 40 on April 12, 1999 (FR/Vol. 64, No. 69, pp17506-17509) to require uranium recovery licensees to consider radionuclides other than Ra-226 in soil cleanup criteria. The existing soil Ra-226 criterion in 10 CFR Part 40, Appendix A, is used to derive a dose criterion (Benchmark Approach) for the cleanup of byproduct material radionuclides, including Ra-226. The radionuclide-specific criteria are adjusted so that the total dose resulting from the mixture of residual radionuclides will not exceed the Benchmark Dose. The dose from radon is excluded from the benchmark calculation. Other recommended guidance documents that were reviewed include NUREG-1620 (NRC, 2003b) and NUREG-1549.

The only radionuclides other than Ra-226 of concern at the CBR Project are from U-nat, a mixture of U-238, U-234, and U-235. The natural abundance activity percentages for these radionuclides are approximately 0.489, 0.489, and 0.022, respectively.

6.1 Cleanup Limits for Soils

The Benchmark Dose was modeled (see Appendix A) using the RESRAD code. The results show that a concentration of 537 pCi/g for uranium (U-nat) in the top 15-cm layer of soil for the resident farmer scenario is equivalent to the Benchmark Dose derived from a concentration of 5 pCi/g of Ra-226. It can conservatively be assumed, from a radiological exposure perspective, that since the subsurface concentration limit for Ra-226 is 15 pCi/g, the subsurface concentration limit for uranium would be 1600 pCi/g. It will be shown below that the uranium concentration should be limited to 230 pCi/g for all soil depths because of chemical toxicity concerns. A maximum soil contamination limit for uranium of 230 pCi/g in the surface and subsurface 15-cm layers is therefore proposed for CBR.

6.1.1 Radiological Dose Assessment

The NRC requires that when more than one radionuclide is present, the unity rule is applied to the radiological concentrations and corresponding radiological limits. The sum of the fractions of concentrations compared to their corresponding limits should be less than one. CBR interprets this to mean that the concentration of uranium in the surface soil layer will be divided by 537 pCi/g (as opposed to the limit based on chemical toxicity). Similarly, the concentration in a subsurface layer will be divided by 1600 pCi/g to obtain the fraction for the uranium concentration.

ALARA considerations require that an effort be made to reduce contaminants to as low as reasonably achievable levels. The ALARA goals are normally based on a cost-benefit analysis. For the cleanup of gamma-emitting radionuclides, the cost of cleanup becomes excessively high as the soil concentrations become either indistinguishable from background or the gamma emission rate corresponding to a soil concentration becomes indistinguishable from the gamma background count-rate. For uranium, the concentrations corresponding to these two situations are quite different.

Cleanup of uranium mill sites has demonstrated that conservatively derived gamma action levels, along with procedures similar to those in this plan, result in near background Ra-226 concentrations for the site. It is therefore believed that no specific ALARA goal is required for surface Ra-226. The proposed gamma action level (See Section 6.3) has been established at near background levels and is considered adequate to limit the concentration of Ra-226 to 5 pCi/g above background levels. The presence of a mixture of Ra-226 and uranium will tend to drive the cleanup to even lower Ra-226 concentrations.

Establishing an ALARA goal for uranium is more difficult. The calculated dose rates from the direct exposure to uranium and Ra-226 in soils are available from the RESRAD runs in Appendix A. The ratio of the Ra-226 dose rate per pCi/g to the uranium dose rate per pCi/g is 120. In this analysis, it is assumed that the dose rate for direct exposure is proportional to the average photon energy times the emission rate, or:

$$D = k \times E \times R$$

Where:

- k = proportionality constant,
- D = direct dose rate,
- E = average photon energy
- R = emission rate.

Writing an equation for pure uranium and one for Ra-226 plus progeny, and dividing results in the following equation:

$$\frac{R_{Ra}}{R_U} = \frac{D_{Ra} \times E_U}{D_U \times E_{Ra}}$$

The average gamma energy from uranium is approximately 100 keV and the average energy from Ra-226 plus progeny is on the order of 400 keV. Substituting $D_{Ra} / D_U = 120$ and $E_U / E_{Ra} = 100 / 400$, then $R_{Ra} / R_U \approx 30$.

For a gross-gamma count rate meter in the field, the count rates are proportional to the emission rate ratios, adjusted for the detection efficiency differences for the two different spectra. Assuming that the difference is small, the ratio of the count rates should be about 30. Therefore if the action level for pure Ra-226 results in cleanup of the site to less than 5 pCi/g, the action level should result in the cleanup of pure uranium to 30 × 5, or 150 pCi/g. When both radionuclides are present, the levels should be somewhat lower. Based on the above argument, CBR proposes an ALARA goal of limiting the U-nat concentration in the top 15-cm layer to 150 pCi/g, averaged over an area of 100 m^2.

Subsurface contamination is expected around some of the well heads, wellfield pipe trenches, and wellfield houses. The difficulty in monitoring for removal is seldom as favorable under these conditions as for contamination on the surface. It is CBR's desire to reduce the subsurface concentrations to a maximum of two-thirds of the proposed limits of 15 pCi/g above background for Ra-226 and 230 pCi/g for U-nat. Therefore ALARA goals for Ra-226 of 10 pCi/g above background and for U-nat of 230 pCi/g are proposed. The subsurface uranium goal has not been reduced below the limit since it has not been demonstrated that these levels can be detected with readily available field instruments. The limits are summarized in Table 6-1.

Table 6-1 Proposed Limits and ALARA Goals for Cleanup of Soils *

Layer Depth	Ra-226 Limit (pCi/g)	Ra-226 Goal (pCi/g)	U-nat Limit ** (pCi/g)	U-nat Goal (pCi/g)
Surface 0-15 cm	5	5	230	150
Subsurface 15 cm layers	15	10	230	230

* *Averaged over a 100-m^2 area and 15-cm thickness*

** *Based on chemical toxicity*

It should be recognized that there may be circumstances, especially for subsurface contamination, that could result in the cost overriding the benefit of attempting to reach an ALARA goal. Should this happen, CBR will document why the ALARA goal was knowingly abandoned. It should also be recognized that backfilling may be required (for safety reasons) prior to receiving the confirmation sample laboratory results. In some situations, sample results may surprisingly be higher than the ALARA goals. In this situation, the cost-to-benefit ratio for remediating the backfilled area to meet ALARA goals will normally be prohibitively high.

6.1.2 Chemical Toxicity Assessment

The chemical toxicity effects from uranium exposure are evaluated by assuming the same exposure scenario as that used for the radiation dose assessment. In the Benchmark Dose assessment for the resident farmer scenario, it was assumed that the diet consisted of 25 percent of the meat, fruits, and vegetables grown at the site. No intake of contaminated food through the aquatic or milk pathways was considered probable. Also, the model showed that the contamination would not affect the groundwater quality. Therefore, the same model will be used in assessing the chemical toxicity. The intake from eating meat was shown to be negligible compared to the plant pathway and therefore is not shown here. This is confirmed by the results of the RESRAD calculations shown in Appendix A.

The method and parameters for estimating the human intake of uranium from ingestion are taken from NUREG/CR-5512 Vol. 1 (NRC, 1992). The uptake of uranium in food is a product of the uranium concentration in soil and the soil-to-plant conversion factor. The annual intake in humans is then calculated by multiplying the annual consumption by the uranium concentration in the food. Since the soil-plant conversion factor is based on a dry weight, the annual consumption must be adjusted to a dry-weight basis by multiplying by the dry-weight to wet-weight ratio. Parameters for these calculations are given in Section 6.5.9 of the NUREG/CR-5512. Table 6-2 provides the parameters used in these calculation and results for leafy vegetables, other vegetables, and fruit. Annual intakes of 14 kg/year and 97 kg/year were assumed for leafy vegetables and other vegetables and fruit, respectively. Consistent with Appendix A dose calculations, it was assumed that 25 percent of the food was grown on the site. It was also assumed that the uranium concentration in the garden or orchard was 537 pCi/g. This corresponds to the uranium Benchmark Concentration for surface soils. Using a conversion factor for U-nat of 1 mg = 677 pCi, then 537 pCi/g is equivalent to 793 mg/kg. The human intake shown in the first column of Table 6-2 is equal to the product of the parameters given in the subsequent columns. Table 6-2 shows that the total annual uranium intake from all sources of food from the site is 92 mg/yr.

The two-compartment model of uranium toxicity in the kidney from oral ingestion was used (ICRP, 1995) to predict the burden of uranium in the kidney following chronic uranium ingestion. This model allows for the distribution of the two forms of uranium in the blood, and consists of a kidney with two compartments, as well as several other compartments for uranium distribution, storage and elimination including the skeleton, liver, red blood cells (macrophages) and other soft tissues.

Table 6-2 Annual Intake of Uranium from Ingestion

Human Intake (mg/yr)	Soil Concentration (mg/kg)	Soil to Plant Ratio (mg/kg plant to mg/kg soil)	Annual Consumption (kg)	Dry Weight Wet Weight Ratio	Food Source
9.4	793	1.7E-2	3.5	0.2	Leafy Vegetables
36	793	1.4E-2	13	0.25	Other Vegetables
6.9	793	4.0E-3	12	0.18	Fruit
52					Total

The total burden to the kidney is the sum of the two compartments. The mathematical representation for the kidney burden of uranium at steady state can be derived as follows:

$$Q_P = \frac{IR \times f_1}{\lambda_P \left(1 - f_{ps} - f_{pr} - f_{pl} - f_{pk} - f_{pk1}\right)}$$

Where:

Q_P = uranium burden in the plasma, μg

IR = dietary consumption rate, mg U/d

f_1 = fractional transfer of uranium from GI tract to blood, unitless

f_{ps} = fractional transfer of uranium from plasma to skeleton, unitless

f_{pr} = fractional transfer of uranium from plasma to red blood cells, unitless

f_{pl} = fractional transfer of uranium from plasma to liver, unitless

f_{pt} = fractional transfer of uranium from plasma to soft tissue, unitless

f_{pk1} = fractional transfer of uranium from plasma to kidney, compartment 1, unitless;

λ_p = biological retention constant in the plasma, d^{-1}.

The burden in kidney compartment 1 is:

$$Q_{k1} = \lambda_P \times Q_P \times \frac{f_{pk1}}{\lambda_{k1}}$$

Where:

Q_{k1} = uranium burden in kidney compartment 1, mg;

λ_{k1} = biological retention constant of uranium in kidney compartment 1, d^{-1}.

Similarly, for compartment 2 in the kidney, the burden is:

$$Q_{k2} = \lambda_P \times Q_P \times \frac{f_{pk2}}{\lambda_{k2}}$$

Where:

Q_{k2} = uranium burden in kidney compartment 2, µg;

λ_{k2} = biological retention constant of uranium in kidney compartment 2, d^{-1};

f_{pk2} = fractional transfer of uranium from plasma to kidney compartment 2, unitless.

The total burden to the kidney is then the sum of the two compartments is:

$$Q_{k1} + Q_{k2} = \frac{IR \times f_1}{\left(1 - f_{ps} - f_{pr} - f_{pl} - f_{pt} - f_{pk1}\right)} \times \left(\frac{f_{pk1}}{\lambda_{k1}} + \frac{f_{pk2}}{\lambda_{k2}}\right)$$

The parameter input values for the two-compartment kidney model include the daily intake of uranium estimated for residents at this site, and the ICRP69 values recommended by the ICRP as listed below (ICRP, 1995). The daily uranium intake rate was estimated to be 0.14 mg/day (52mg/year) from ingestion while residing at this site.

$IR = 0.14$ mg/day
$f_1 = 0.02$
$f_{ps} = 0.105$
$f_{pr} = 0.007$
$f_{pl} = 0.0105$
$f_{pt} = 0.347$
$f_{pk1} = 0.00035$
$f_{pk2} = 0.084$
$\lambda_{k1} = \ln(2)/5$ yrs
$\lambda_{k2} = \ln(2)/7$ days
where $\ln(2) = 0.693\ldots$

Given a daily uranium intake of 0.14 mg/day at this site and the above equation, the calculated uranium in the kidneys is 0.0093 μg U, or a concentration of 0.03 μgU/g kidney. This is three percent of the 1.0 μg U/g value that has generally been assumed to protect the kidney from the toxic effects of uranium. Some researchers have suggested that mild effects may be observable at levels as low as 0.1 μg U/g of kidney tissue. Using 0.1 μg U/g as a criterion, then the intake is thirty percent of the considered unsafe level.

The EPA recently evaluated the chemical toxicity data and found that mild proteinuria has been observed at drinking water levels between 20 and 100 μg/liter. Assuming water intake of 2 liters/day, this corresponds to an intake of 0.04 to 0.2 mg/day. Using animal data and a conservative factor of 100, the EPA arrived at a 30 μg/liter limit for use as a National Primary Drinking Water Standard (Federal Register/Vol.65, No.236/ December 7, 2000). This is equivalent to 0.06 mg/day for the average individual. Naturally, since large diverse populations are potentially exposed to drinking water sources regulated using these standards, the EPA is very conservative in developing limits.

This analysis indicates that a soil limit of 537 pCi/g of U-nat would result in an intake of 0.14 mg/day. Using the most conservative daily limit corresponding to the National Primary Drinking Water standard, a soil limit of 230 pCi/g corresponds to the EPA intake limit from drinking water with a uranium concentration of 0.06 mg/day. Therefore exposure to soils containing 230 pCi/g of U-nat should not result in chemical toxicity effects. Since the roots of a fruit tree would penetrate to a considerable depth, limiting subsurface uranium concentrations to 230 pCi/g will be considered appropriate as well.

6.2 Soil Cleanup and Verification

Gamma surveys will be used to guide the soil remediation efforts. The surveys will identify soil contamination that potentially exceeds the cleanup criteria and will be used to guide the cleanup efforts. After cleanup, the surveys will be used, in conjunction with surface soil sample analyses, to verify that the soil meets the site cleanup criteria. A gamma action level, defined as a gamma count rate level corresponding to the soil cleanup criterion, is used in the interpretation of the data. Normally the action level is conservatively developed to allow only a five percent error rate of exceeding the cleanup criteria at the 95% confidence level.

6.3 Gamma Action Level

The gamma action level is determined from data taken from known contaminated areas of the site, using equipment and methods similar to those that will be used during the soil cleanup verification phase of decommissioning. Verification plans call for sampling all 100-m^2 grid blocks that exceed the gamma action level using a five-point composite sampling procedure. A percentage of the grid blocks with gamma count rates below the action level will also be sampled.

The results of the preliminary site characterization described in Section 3 were used to develop the action level. The gamma survey was conducted in four areas considered to have the potential for being contaminated above cleanup criteria. The survey revealed that the contaminated areas were restricted to areas only a few feet across. The gamma-ray count rate measured above small contaminated areas is significantly lower than those above large areas contaminated at the same level. Therefore, the action level may be overly-conservative when used for assessing large contaminated areas.

An extensive effort at locating additional sampling points was made but, at this time, additional potentially contaminated areas are not evident. Since the contaminated areas were small and the distribution non-uniform, no attempt was made to determine the average count rate and average radionuclide concentration in a 100-m^2 grid block. Instead, the gamma count rate was measured above the soil-sampling location at an 18-inch height above the soil surface. This detector height will be used in the final verification survey.

Table 3-1 in Section 3 provides a summary of the data taken for the purposes of developing an action level along with additional information. The exact sampling locations have been provided in Figures 3-2 through 3-5. Section 2.6 presents the background data and proposes natural background value of 0.55 pCi/g for Ra-226. Figure 6-1 shows the Ra-226 concentration plotted against the gamma count rate using the data in Table 3-1. The linear regression indicates that, on average, a gamma count rate of 17,900 cpm corresponds to 5.55 pCi/g (5 pCi/g above background). This is easily distinguishable from the background count rate of approximately 14,500 cpm. The lower 95% confidence line for the linear regression, based on the available data, shows that 5.5 pCi/g corresponds to slightly less than 14,000 cpm, or approximately equal to the mean background count rate. This lower 95% confidence line therefore does not lead to a practical gamma action level. Until more data are available on which to refine this linear regression, CBR will use 17,900 cpm as the gamma action level for cleanup of areas that are small compared to the 100-m^2 grid block size. This will assure that when averaged over a grid block, the Ra-226 concentration will be less than the 5 pCi/g limit. As indicated above, when the contaminated area is large, the action level will be expected to increase by a few thousand counts per minute. There are no site data, however, on which to obtain an estimate. If large areas are decontaminated, the action level will be used with caution, or a new action level will be developed.

A correlation between the Ludlum Model 19 Micro-R meter and the Ludlum Model 2221/Ludlum Model 44-10 NaI count rate instruments, as shown in Figure 6-2, shows that 17,900 cpm corresponds to about 21 μR/h on the Model 19. While the Model 19

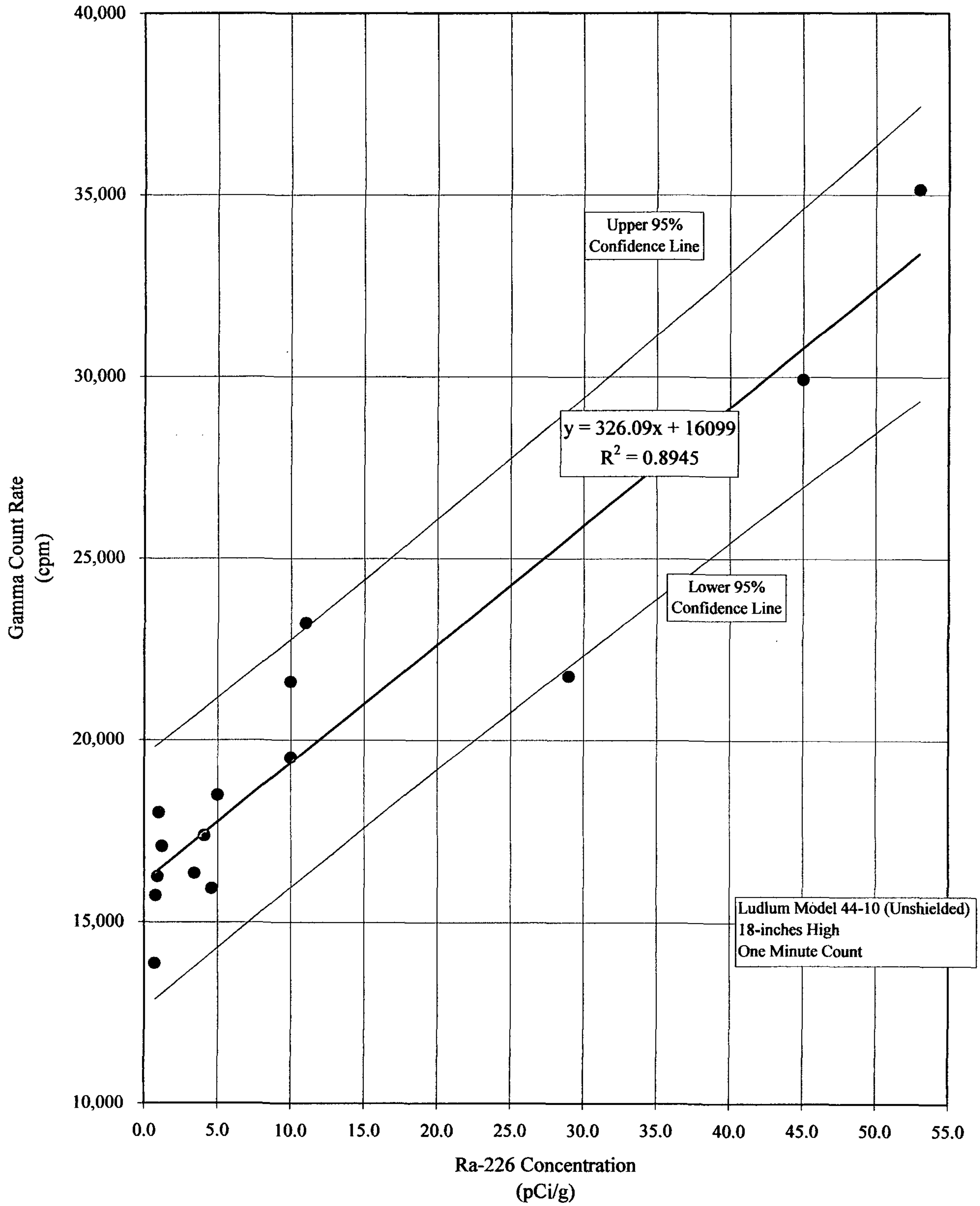


Figure 6-1 Gamma Count Rate vs. Ra-226 Concentration Correlation with Upper and Lower 95% Confidence Lines

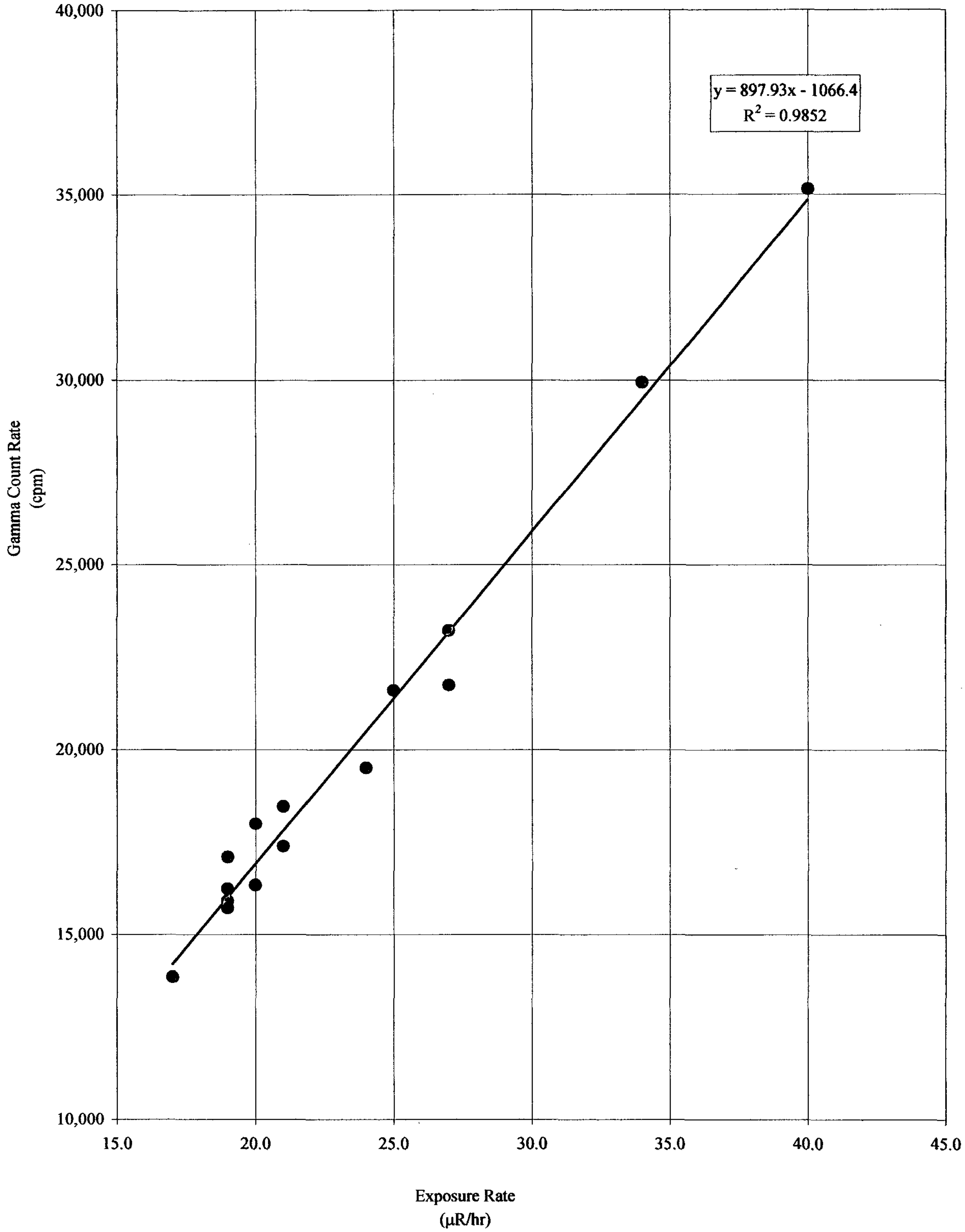


Figure 6-2 Exposure Rate vs. Gamma Count Rate Correlation

may be a useful instrument in some very high exposure rate situations, the factor of approximately five better sensitivity of the Model 44-10 along with the integrating-over-time feature of the Ludlum Model 2221 make it the preferred instrument for use at these low levels. The Model 19 will be used for a rough estimate as to whether an area meets the action level criterion.

At this time, no additional contaminated areas are known to exist where correlation data may be obtained. Therefore, unless areas are identified during remediation, all areas above 17,900 cpm will be remediated or the grid blocks sampled to assure that the cleanup criteria are met. If adequate data are obtained during remediation on which to base a more precise soil cleanup action level corresponding to the cleanup criterion, CBR may choose to petition the NRC for a change in the Decommissioning Plan.

6.4 Gamma Surveys for Characterization and Verification

Two methods are proposed for conducting site gamma surveys, one the GPS-radiological survey system and the second being the equivalent conventional method using a Ludlum 2221 ratemeter/scaler and Model 44-10 detector. Since the methods differ only in data recording and management, there are no apparent differences in the accuracy of the results. The surveys are described and CBR will decide which method to employ.

6.4.1 Gamma Surveys and Mapping Using Global Positioning System

The GPS-radiological surveys will be done using the same or equivalent equipment to that used in the correlation studies. The gamma-mapping system consists of a Ludlum Model 2221 ratemeter/scaler coupled to a Ludlum Model 44-10, a 2-inch by 2-inch NaI(Tl) detector. The digitized radiological count rate data are recorded once every second. The data are transmitted to a Trimble ProXRS GPS receiver which automatically tags the data with the coordinates at the time the data count rate is received. The ProXRS, manufactured by Trimble Navigation, is state-of-the-art mapping grade surveying equipment, employing the use of satellite GPS technology. The accuracy of the coordinates is better than one meter while collecting data.

The data are collected in the GPS data logger and later downloaded into a computer equipped with data management software. The data are then exported into the ArcView GIS file format, or other software for mapping, averaging, and developing isocontours.

A gamma survey will be done over the extent of the affected areas. Gamma count rate contour lines at the action level will be used to define where remediation is required. After the remediation, the area will be resurveyed with the new data added to the database, replacing the obsolete pre-remediation data. This iterative procedure will be applied until all areas are determined to meet the action levels.

In the verification phase, the average count rate over each 100-m^2 grid block is calculated by downloading the data into a data base management computer application. The data records within each grid block are counted, averaged, and assessed as to whether the grid block meets verification criteria.

Function checks for the equipment will be performed at the beginning and end of each work shift using standard operating procedures. In addition, standard operating procedures will be used for operating the GPS-radiological survey equipment.

6.4.2 Radiological Surveys and Mapping Using Conventional Methods

Gamma surveys may be conducted using the same type of radiological survey equipment described above other than the data will be recorded manually and presented on maps with isocontours using computer assisted means. Grid blocks of 33.3-ft by 33.3-ft (approximately 100-m^2 area) will be established over the affected area. In order to determine the average gamma count rate within a grid block, the Ludlum Model 2221/Model 44-10 combination will be used to integrate the count rate while a technician walks the area for one minute. Correlation studies at mill sites have demonstrated that this results in a good correlation with the Ra-226 in the soil.

6.5 Excavation Control Monitoring

Remediation of contaminated soils will be performed by excavation. The purpose of excavation control monitoring is to guide the removal of contaminated material to the point where it is highly probable that an area meets the cleanup criteria. Monitoring equipment and action levels developed in the calibration studies will be used for excavation control monitoring. A technician will monitor the soil after the removal of layers of soil until the instrumentation shows that the levels are below the action level. No documentation of the results is necessary since the verification data will serve to demonstrate compliance with the cleanup standards. For large areas, a GPS based survey may be performed periodically to more accurately assess the progress of the excavation.

For areas exhibiting contamination below the top 15-cm, excavation control monitoring will be performed using the same detector (or equivalent) as used in the calibration study, considering the appropriate action level and adjusting for geometry factors. The cleanup limit for deep excavations where backfill is applied is 15 pCi/g for Ra-226, or the equivalent uranium/radium level developed in the Benchmark Dose Assessment, considering the 230 pCi/g limit for uranium in the surface and subsurface layers based on chemical toxicity.

6.6 Soil Cleanup Verification and Sampling Plan

Existing characterization data indicate that the cleanup of surface soils in the wellfields will be restricted to the cleanup of a few areas where there were known spills and potentially small spills near well heads. Other areas considered potentially contaminated include roads within the well fields. Most of the minor spills are not anticipated to result in measurable levels of contamination. These spill areas have a physical size of a few meters across. The contamination in areas near wells and in pipe trenches may require backfill and thus subsurface soil procedures will apply. All work related to demonstrating compliance with the cleanup criteria will be done using standard operating procedures.

6.6.1 Surface Soil Gamma Survey and Sampling Plan

A final gamma survey will be performed in potentially contaminated areas and areas where cleanup occurred from known spills using the GPS-radiological survey equipment or conventional equipment as described above. A 10-m wide buffer zone will be established around each area . It is anticipated that the boundary of the wellfield containing areas that have been remediated may extend as far as the outermost production well. The 10-m wide buffer zone would in that case lie between the outermost production wells and the monitoring wells that surround the well fields. A gamma-ray survey will be conducted over the entire area, including the buffer zone. The area will be divided in a non-biased manner into grid blocks of approximately 100 m^2 area. For the GPS-radiological survey, a minimum of seven data records in each 100-m^2 grid block will be used to obtain the average gamma count rate for the grid blocks. For conventional surveys, a one-minute integrated count while walking the area will be used as the average count rate.

All grid blocks containing elevated gamma-ray count rates above the gamma action level (including buffer area) will be sampled for compliance with the cleanup criteria. A five-point composite sample of surface soils will be taken in each 100-m^2 grid block. The sample will be analyzed to assure that the Ra-226 and uranium concentration complies with the cleanup criteria.

All of the remaining grid blocks with average gamma count rate ranking in the top ten percent will be sampled. Grid blocks failing the cleanup criteria will be decontaminated and sampled until the grid block passes. If any grid blocks within the top ten percent fail the cleanup criteria, the second ten percent of the grid blocks will be sampled. This will continue until all grid blocks pass within a 10 percent grouping.

In order to meet the cleanup criterion, each grid block must satisfy the inequality,

$$\sum C_i / C_c < 1$$

where C_i is the concentration of constituent and C_c is the concentration of the constituent that is equivalent to the Benchmark Dose.

After all sampled grids have met the cleanup criterion, an EPA-recommended statistical test will be done to determine whether the mean of the equality defined above for all grid blocks is 1 or less at the 95 per cent confidence level, using Equation 8-13 of draft NUREG/CR-5849. The EPA recommends that μ_α be compared to the guideline value, where

$$\mu_\alpha = \bar{u} + t_{1-\alpha,df} (s_x/\sqrt{n})$$

and $\bar{u}$ is the mean of the $\sum C_i / C_c$ for each grid block, $t_{1-\alpha,df}$ is the 95% confidence level obtained from Student t Distribution tables where α is the false positive probability, i.e. the probability that μ_α is less than the guideline value if the true mean activity is equal to the guideline value. In this case the guideline value is equal to unity (1). The symbol, df, represents the degrees of freedom (equal to n-1).

Since this represents the mean of a set of biased samples (selected from the grids that have the highest gamma count rate), the passing of this test provides assurance that the cleanup error rate is very low for the entire sample set made up of all the possible grids that could have been sampled.

If the mean of the sample concentrations is less than the criterion but the data fails the statistical test, CBR will follow procedures similar to those recommended in Section 8.6 of draft NUREG/CR-5849. The number of samples will be increased to include the grids with next highest average gamma levels, and the statistical test will be performed again. This will be done until the statistical test is met. In any case, all grid blocks that were sampled and measured to exceed the cleanup criterion will be further decontaminated and resurveyed.

6.6.2 Subsurface Soil Verification Gamma Survey and Sampling Plan

Gamma count rates from the subsurface excavations will be taken at a sufficient frequency to ensure a minimum of seven readings per 100-m^2 of excavated surface. For excavations of less than 100-m^2 area, a minimum of one record per 10-m^2 area will be taken. Data will be recorded and referenced to a drawing of the excavation and/or State Plane Coordinates. The average of the count rate records for each 100-m^2 (or less) will be calculated for comparison against the instrument action level. If the average exceeds the action level, additional excavation may be considered, followed by another gamma survey of the area. For deep trenches where it is unsafe for entry, a scan of the sidewalls and floor will be done by dropping a detector into the excavation to assure that the count rate is uniform.

For linear excavations (trenches), a single 15-cm deep soil sample at approximately one-half the excavation width at 150-ft. intervals will be taken. The sample may be taken with a backhoe where necessary. Each sampling location will be documented.

For excavations other than long trenches, a minimum of one five-point composite sample from the excavation surface will be taken. If the excavation surface exceeds 100 m^2, a five-point composite for each 100 m^2 of excavation surface will be taken. The sample points for the composite will be more or less evenly spaced to provide adequate representative coverage of the area. The sample locations will be documented. Specific dimensions cannot be predetermined due to the likely variability in excavation shape.

All samples will be submitted to a commercial laboratory for analysis for Ra-226 and U-nat. An alternative that may be used is to establish an on-site laboratory. If an on-site laboratory is used, ten percent of the samples will be selected at random and submitted to a commercial laboratory for analysis. Procedures for selecting the commercial laboratory and comparing test results are described in Section 6.7.

6.7 Laboratory Quality Assurance

Verification soil samples will be sent to a commercial laboratory for analysis of Ra-226 and U-nat. The commercial laboratory will be selected using a performance based approach which allows the laboratory the freedom to propose methods for the specific constituents and matrix that meet the measurement quality objectives required by CBR.

Only laboratories that adhere to a well-defined quality assurance (QA) program will be considered as the commercial laboratory to receive the verification samples. The QA program must address the laboratory's organization and management, personnel qualifications, physical facilities, equipment and instrumentation, reference materials, measurement traceability and calibration, analytical method validation, standard operating procedures (SOP), sample receipt, handling, and storage, records, and appropriate licenses.

CBR will select the radiochemistry laboratory that best meets the data quality objectives for verification soil samples. USNRC Regulatory Guides 4.14 and 4.15, provide some information, but this guidance is over 25 years old. ANSI N42.23, Measurement and Associated Instrument Quality Assurance for Radioassay Laboratories describes a system in which quality and traceability of performing laboratory measurements to the national standards can be demonstrated through reference laboratories. The most recent guidance on this subject (NRC, 2001a) has not yet been released for publication, but is expected to be released for use during the third quarter of 2004. This guidance is the Multi-Agency Radiological Laboratory Analytical Protocols Manual (MARLAP) which was developed by a working group with representatives from USNRC, DOD, DOE, EPA, NIST, USGS, FDA and several states. This guidance document is expected to be a primary reference document and thus will be applied to this project plan.

The analytical work performed by the commercial laboratory will be done under a written contract, and includes a scope of work prepared by CBR that defines the data quality objectives. Part of the data quality objectives are the specific analytical sensitivities required by CBR. The anticipated maximum activity levels in each sample is 5 pCi/g Ra-226 and 300 pCi/g U-nat, and their associated daughter products. The minimum sensitivity required for each sample is 0.5 pCi/g dry weight for each analyte, with an estimated overall error of ± 0.5 pCi/g. The contract will also define what is to be required in the data package. At a minimum the data package will include a case narrative, the analytical results, documentation of any deviation from the SOPs, copies of lab personnel notebooks, a chain of custody, a copy of the raw data, initial and continuing instrument and equipment calibration data, and standard and tracer information. This data package contains information equivalent to that required for an EPA Contract Laboratory Program

(CLP)-like level 3 data package, which is the minimum level data package acceptable for verification samples.

A Laboratory QA file shall be maintained to support the selection of the laboratory. The content of the file will include laboratory provided data and audit reports from the following QA activities:

1. The commercial laboratory will provide information needed to assess the quality of the data generated by the laboratory. This may include a copy of the laboratory's quality assurance manual (QAM) and standard operating procedures for the constituents of concern in a soil matrix.

2. CBR will perform an audit of the commercial laboratory before samples are delivered to verify adherence to the requirements of the QAM and SOP's. The laboratory's own QC results such as in-house blanks, duplicates, and spikes will be reviewed. The results from interlaboratory testing programs will be reviewed to obtain a measure of analytical quality and accuracy. Performance evaluation samples should have been prepared from an NIST traceable source. These samples preferably will be of a similar matrix, containing the constituents of concern, with the constituents at anticipated activity levels. Reference material may be obtained from the DOE's Radiological Environmental Sciences Laboratory (RESL) at INEEL (or equivalent). This DOE laboratory is also the NRC's reference laboratory.

U. S. Nuclear Regulatory Commission, Inspection Procedure 84525 will be applied to the results from the interlaboratory comparison program for comparing two data sets. In that procedure, each reference laboratory result is divided by the reported standard deviation to obtain the "resolution". The other lab (CBR's vendor laboratory) result is then divided by the reference laboratory result to obtain the "ratio". The data are considered in agreement if the ratio is within the range given in the following table.

Table 6-3 Criteria for Comparison of Laboratory Results

Resolution	Ratio
< 4	0.40 – 2.5
4 – 7	0.50 – 2.0
8 – 15	0.60 – 1.66
16 – 50	0.75 – 1.33
51 – 200	0.80 – 1.25
> 200	0.85 – 1.18

If significant differences exist, a review will be conducted in order to resolve discrepancies.

7.0 Radiation Safety Program

CBR maintains a performance-based approach to the management of environmental affairs, and employee health and safety. The Environmental Management System (EMS) encompasses licensing, compliance, environmental monitoring, industrial hygiene, and radiation safety. The EMS organization begins with the Company's Board of Directors, and flows down through the President, Senior VP of Operations, Mine Manager, Manager of Health, Safety, and Environmental Affairs, Radiation Safety Officer, and ends with the site workers. The EMS formalizes the company's approach to ES&H management, which operates under the direction of operating procedures, radiation work permits, and a performance-based license condition that allows CBR to make changes to processes or procedures without prior NRC approval. Oversight is provided by the Safety and Environmental Review Panel (SERP), which consists of at least three members of CBR's management team. The SERP is responsible for monitoring any changes to the processes or procedures.

The CBR Environmental, Health and Safety (EHS) staff will monitor decommissioning activities to ensure that occupational radiation exposure levels are kept as low as reasonably achievable. The Radiation Safety Officer (RSO), Radiation Safety Technician, or designee by way of specialized training will be on site during decommissioning activities where potential radiation exposure hazards exist. EHS staff will evaluate radiological hazards to employees and the environment, implementing the necessary controls to maintain exposures ALARA during decommissioning. The EHS staff routinely report to management any departure from safe work practices, any item of noncompliance with accepted practices or procedures, and any need for improvement in the radiation safety programs. They have sufficient authority to terminate work when unsound radiological or work safety practices exist.

7.1 D&D Task Analysis

Most of the decommissioning activities are not significantly different from those conducted during mining operations and, as such, the standard operating procedures (SOP) in the CBR Health Physics Manual (HPM) will be followed. The first task includes cutting and/or removal of contaminated piping and surface equipment, including injection and production feed lines, electrical conduit, well boxes, and well head equipment. Some of the equipment, such as valves, meters, and control fixtures will be surveyed for contamination and salvaged, if possible. Following removal of the surface equipment, buried well field piping will be removed, and the wells will be plugged and abandoned. Finally, any contaminated soils will be removed for disposal. The RSO will evaluate each task and prepare a Radiation Work Permit (RWP) if an SOP is not already in existence. This RWP will be reviewed with employees prior to conducting each task. Slip, trip, and fall hazards will be a concern during dismantling of the piping and any buildings and equipment. All workers will be required to wear hard hats and take other safety measures in accordance with the Mine Safety and Health Administration (MSHA) requirements.

7.2 Personnel Training

All workers employed during decommissioning, whether contractor employees or CBR employees, will be given specialized training for minimizing radiological exposures in addition to industrial safety training.

Initial radiation and industrial safety training for CBR and contractor employees will be conducted as outlined in the HPM and in the EMS Training Manual. This training is in accordance with NRC Reg. Guide 8.31 and the approved MSHA training plan. In addition, new assignment training and indoctrination is required whenever a worker is assigned to an unfamiliar task. The project will also conduct periodic safety meetings.

The extent of contractor's training will be based on the type and degree of hazards applicable to their specific work. At a minimum, they will receive hazard training as outlined in the HPM and in the EMS Training Manual, which covers both radiation and industrial hazards. Additional specialized safety training will be given to all affected employees whenever new or unusual hazards become evident during decommissioning.

7.3 Standard Operating Procedures

The radiation safety program utilized during decommissioning will be based upon the existing ALARA program and the HPM, which have provided a sound radiation safety program during production operations. The HPM, supplemented by any specific RWPs or standing radiation work permits (SRWP) and Decommissioning Procedures will govern the radiation safety program during decommissioning. The CBR health physics standard operating procedures are embedded in the HPM.

7.4 Air Monitoring and Respiratory Protection Programs

The existing airborne radioactivity monitoring program and respiratory protection program will be maintained during decommissioning. The HPM provides guidance for determining and controlling the quantity of airborne material in the work area and the environment. This guidance includes the method to evaluate the need for air sampling, and the selection and location of sampling equipment. It provides sampling procedures for uranium dust and radon daughters. Air sampling is required if the estimated annual intake is greater than 0.1 ALI. D&D tasks will be evaluated by the RSO to determine if air monitoring is required.

The HPM gives guidance on respirator selection, use, care, and maintenance, in the event air monitoring indicates the need for respiratory protection. This program is considered appropriate for the decommissioning work.

7.5 Radiation Work Permit (RWP) Program

All routine tasks will be performed in accordance with the procedures embedded within the HPM. Any non-routine task where the potential for significant exposure to radioactive materials exists, and for which no standing RWP or SOP exists, will require the preparation of a Radiation Work Permit (RWP). Examples of D&D tasks that may require an RWP include cutting, sandblasting, or grinding on any potentially contaminated surface such as pipelines, tanks, vessels, and process equipment.

The RSO may also issue Standing Radiation Work Permits (SRWPs) for periodic or repetitive tasks that require similar radiological protection measures (e.g., piping removal). The SRWP will describe the scope of the work, precautions necessary to maintain radiation exposures to ALARA, and any supplemental radiological monitoring and sampling requirements. The SRWP shall be reviewed and approved in writing by the RSO (or qualified designee in the absence of the RSO) prior to initiation of the work.

ESH staff will review the planned decommissioning activities in order to determine what RWPs are needed, if any. The industrial safety hazards and associated protective measures will also be identified in accordance with MSHA requirements.

7.6 Health Physics Surveys and Dose Calculations

Health physics surveys conducted during decommissioning will be guided by applicable sections of 10 CFR 20 and USNRC Regulatory Guide No. 8.30 entitled "Health Physics Surveys in Uranium Recovery Facilities" and the many applicable Health Physics Manual SOPs.

Health physics surveys can be broadly classified into two categories, those required for contamination control, and those required for employee exposure monitoring. The intent of contamination control is to control the release of radioactive material to the work area, to control personnel exposures in the work place, to prevent the intake of contaminants by the work force, and to identify contaminated areas requiring remediation. The HPM provides guidance on survey methods and procedures, and allowable limits for the unrestricted release of equipment from CBR.

Surveys required for employee exposure monitoring include programs for external monitoring and internal, or bioassay, monitoring. CBR will evaluate the decommissioning tasks and determine appropriate monitoring requirements, consistent with the policy and requirements in the HPM.

7.7 Protective Clothing

There are two types of protective clothing (PPE) available to workers at CBR, disposable and non-disposable. The selection of PPE required will depend on the type of work to be accomplished. If an RWP is written, it will list the necessary PPE which may include coveralls, head covers, gloves, rain suits, and shoe covers. When the potential for contamination is high, the RWP may require rubber boots, plastic gloves, and taping of cuffs and sleeves. The HPM provides guidance regarding the selection of appropriate PPE. It is anticipated that for D&D tasks involving the potential exposure to loose radioactive material, the workers will normally be issued coveralls, gloves, and shoe covers, at a minimum.

7.8 Shipments of Radioactive Materials

Shipments of radioactive equipment and materials will be conducted to meet Department of Transportation (DOT) requirements, as specified under 49 CFR Subchapter C, "Hazardous Materials Regulations". NRC also has regulations governing the shipment of radioactive materials under 10 CFR Parts 20 and 71. Shipment of radioactive materials from CBR is discussed in the HPM. Specific guidance regarding the shipment of byproduct material is also presented.

7.9 Records and Reports

Personnel monitoring and other records required under 10 CFR Part 20, Subpart L will be maintained as a part of the normal mining operations radiation protection program. Specific records on transfer and disposal of byproduct or source material addressed in 10 CFR Part 40, §40.51 will be maintained as required by the current license. Specific records associated with wellfield decommissioning will be retained until the NRC has terminated the license. These records include radiation verification surveys and soil sample results for areas released for unconditional use.

8.0 Environmental Impacts

Normal site production operations will continue during decommissioning of the well fields. Therefore, the operational environmental monitoring program will continue unabated as defined by license conditions and CBR's standard operating procedures. Only those impacts that are incremental to normal operations will be discussed here.

8.1 Land Use

The primary impact on the land use through the life of the project, including decommissioning of the well field, is the loss of grazing capacity. The impact is temporary and will be reversed during decommissioning.

8.2 Air Quality

Air quality impacts from decommissioning activities will be minimal but likely increase from operational status but decrease as the decommissioning progresses. After decommissioning, fugitive dust will decrease due to less road traffic from employees and vendors. The decommissioned well field will eventually be returned to grazing status. Road traffic will increase at various times during decommissioning, particularly with the transport of byproduct and decommissioned materials. Byproduct material shipments will be transported in tarped or enclosed containers, pursuant to DOT regulations and procedures in the HPM. Engine exhaust and dust from local soil disturbances will increase during decommissioning. Measurable levels of radioactive particulate are not anticipated due to the low concentrations of radionuclides in the soil.

8.3 Wildlife

No significant adverse impact to wildlife was noted during operations or is expected during decommissioning. There are no threatened or endangered mammals, birds, reptiles, amphibians, or fish in the well field remediation area. Section 2.8 of the license renewal application (CBR, 1998) discusses the ecology of the area and concludes there has been minimal impact due to mining operations. This is expected to also be the case during remediation of the well field.

8.4 Surface Water

Sediment yields and total runoff may increase for a very short period of time during and immediately following decommissioning and reclamation activities. The impacts to surface waters within and adjacent to the licensed area will not be significant because of the limited size and duration of the disturbance. Efforts to minimize soil erosion will follow CBR's storm water best practices program.

The current surface water sampling (for operations) program will continue as listed in the operational environmental monitoring plan. No additional surface water impoundments are expected to be generated from D&D activities.

8.5 Archaeological Sites

Field investigations in 1982 and 1987 (CBR, 1998) identified 21 possible archeological sites within the permit area. During plant operations these sites have been avoided and not directly impacted. These sites will also be avoided during decommissioning. However, if a new archeological site is discovered, all work in the immediate area will cease until authorization to proceed is received from the NRC.

8.6 Groundwater

Well plugging and abandonment will not adversely affect groundwater during the well field decommissioning phase. As stated in Section 6.2.3.1 of CBR's license renewal application, the objective is to "seal and abandon all wells in such a manner as to assure the groundwater supply is protected and to eliminate any potential physical hazard."

8.7 Environmental Radiological Monitoring

The current environmental radiological effluent monitoring program (for production) will continue per CBR's license requirements. During remediation of the well field, some components and equipment such as pipe, buildings, and valves may be decontaminated by high pressure water and acids, or by sandblasting. Wash water or sandblasting material will be collected and disposed of as byproduct material. Contaminated soils in the decontamination area will be monitored and removed for disposal, if required. No release of contaminated surface water is anticipated.

Excavation of trunklines may generate a small amount of potentially contaminated dust. However, this will be minimized by application of a water spray or misting. Pipe cutting, sand blasting and building demolition may also generate a small amount of dust. The air in the vicinity of these activities will be sampled for particulates as part of the occupational monitoring program. While specific decommissioning activities will result in short-term task-specific employee safety and environmental monitoring, the operational environmental and effluent monitoring program is considered adequate to detect any incremental environmental impacts from wellfield reclamation.

8.8 Non-Radiological Impacts

The potential impacts from non-radiological components of byproduct material from wellfield decommissioning are small. Solutions from decontaminating pipe or other items may be acidic and may harm vegetation if spilled. Normally, these solutions will be collected and placed in the byproduct waste disposal system. Should small quantities spill on the ground, the acids will quickly be neutralized by the soil with little or no long-term effects.

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Wellfield Decommissioning Plan

for

Crow Butte Uranium Project

Appendix A

Radium Benchmark Dose Assessment

Radium Benchmark Dose Assessment

A.1 Introduction

On April 12, 1999, the U.S. Nuclear Regulatory Commission (NRC) issued a Final Rule (64 FR 17506) that requires the use of the existing soil radium standard to derive a dose criterion for the cleanup of byproduct material. The amendment to Criterion 6(6) of 10 CFR Part 40, Appendix A was effective on June 11, 1999. This "benchmark approach" requires that NRC licensees model the site-specific dose from the existing radium standard and then use that dose to determine the allowable quantity of other radionuclides that would result in a similar dose to the average member of the critical group. These determinations must then be submitted to NRC with the site reclamation plan or included in license applications. This Appendix documents the modeling and assumptions made by Crow Butte Resources, Inc. (CBR) to derive a standard for U-nat in soil for the Crow Butte Uranium Project.

Concurrent with publication of the Final Rule, NRC published draft guidance (64 FR 17690) for performing the benchmark dose modeling required to implement the final rule. Final guidance (NRC, 2003) was published as Appendix E to the Standard Review Plan for In Situ Leach License Applications (NUREG-1569). This guidance discusses acceptable models and input parameters. This guidance, guidance from the RESRAD Users Manual (ANL, 2001), and site-specific parameters were used in the modeling as discussed in the following sections.

A.2 Determination of Radium Benchmark Dose

RESRAD Version 6.22 computer code was used to model the Crow Butte site and calculate the annual dose from the current radium cleanup standard. A sensitivity analysis was run for each input parameter that was not based upon local data.

The following supporting documentation for determination of the radium benchmark dose is attached:

- The RESRAD Data Input Basis (Attachment 1) provides a summary of the modeling performed with RESRAD and the values that were used for the input parameters. A discussion of the sensitivity analysis for each parameter is also included. The sensitivity analysis indicated that many of the parameters had little, if any, effect on the maximum dose. The parameters that had a noticeable affect on the maximum dose included the distribution coefficient (K_d) for each radionuclide; the soil density in the contaminated zone; the external gamma shielding factor; the fruit, vegetable and grain consumption rate; the leafy vegetable consumption rate; and the depth of roots. Each of these parameters, the sensitivity analysis and the chosen input value are discussed.
- Selected graphs produced with RESRAD that present the results of the sensitivity analysis performed on the input parameters are attached (Attachment 2).
- A full printout of the final RESRAD modeling results for the resident farmer scenario with the chosen input values is attached (Attachment 3). The printout provides the modeled maximum annual dose for calculated times for the 1,000-year time span and provides a breakdown of the fraction of dose due to each pathway.
- Graphs produced by RESRAD in Attachment 4 provide the modeling results for the maximum dose during the 1,000 year time span. A series of graphs depicts the summed dose for all pathways and the component pathways that contribute to the total dose. Additional graphs show the soil concentration and the dose to source ratio over time for each radionuclide.

The maximum dose from Ra-226 contaminated soil at the 5 pCi/g cleanup standard level, as determined by RESRAD, for the residential farmer scenario was 42.4 mrem/yr. This dose was based upon the 5 pCi/g above background surface (0 to 6-inch) Ra-226 standard and was noted at time, t = 0 years. This dose was used to determine the U-nat soil standard for use at Crow Butte as described in the following section.

A.3 Determination of Natural Uranium Soil Standard

RESRAD was used to determine the concentration of U-nat in soil distinguishable from background that would result in a maximum dose of 42.4 mrem/yr. The method involved modeling the dose from a set concentration of U-nat in soil. This dose was then compared to the radium benchmark dose and scaled to arrive at the maximum allowable U-nat concentration in soil.

For ease of calculations, a preset concentration of 100 pCi/g U-nat was used for modeling the dose. The fractions used were 48.9 percent (or pCi/g) U-234, 48.9 percent (or pCi/g) U-238 and 2.2 percent (or pCi/g) U-235. The distribution coefficients that were selected for each radionuclide were based upon the local soil types. All other input parameters were the same as those used in the Ra-226 benchmark modeling. A sensitivity analysis was conducted of the hydraulic conductivity and other parameters of the unsaturated zone and compared to the baseline case. The results showed no affect on the dose. The RESRAD output showing the input parameters is provided in Attachment 5.

Using a U-nat concentration in soil of 100 pCi/g, RESRAD determined a maximum dose of 7.9 mrem/yr. at time, t = 0 years. The printout of the RESRAD data summary is provided in Attachment 5.

To determine the uranium soil standard, the following formula was used:

$$\text{Uranium Limit} = \left(\frac{100 \text{ pCi/g natural uranium}}{7.9 \text{ mrem/yr. natural uranium dose}} \right) \text{x } 42.4 \text{ mrem/yr radium benchmark dose}$$

$$\text{Uranium Limit} = 537 \text{ pCi/g natural uranium}$$

The U-nat limit is applied to soil cleanup with the Ra-226 limit using the unity rule. To determine whether an area exceeds the cleanup standards, the standards are applied according to the following formula:

$$\left(\frac{\text{Soil Uranium Concentration}}{\text{Soil Uranium Limit}}\right)+\left(\frac{\text{Soil Radium Concentration}}{\text{Soil Radium Limit}}\right)<1$$

This approach will be used at the Crow Butte site to determine the radiological impact on the environment from releases of source and byproduct materials.

A.4 References

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Radium Benchmark Dose Assessment

Attachment 1

RESRAD Data Input Basis

Parameters

RESRAD Data Input Basis

Parameters

This document summarizes the data input and modeling scenario that was used to determine the radium benchmark dose for the Crow Butte Project well fields near Crawford, Nebraska. The modeling was performed using RESRAD for Windows Version 6.22 developed by the Environmental Assessment Division at Argonne National Laboratory.

Two possible scenarios for future land having the highest maximum dose to the most critically affected individual were evaluated:

1. The resident farmer scenario where an indoor occupancy time factor of 50% and an outdoor occupancy time factor of 25% is recommended (NRC, 2003).

2. The work at home scenario where a 70% factor for indoor occupancy and a 15% factor for outdoors occupancy is recommended (NRC, 2003).

The scenarios were run using RESRAD after all other parameters in the model were set and a sensitivity analysis had been run. The scenarios were then run with all other factors held constant.

The working at home scenario resulted in a slightly higher maximum dose of 43.0 mrem/year at time = 0 years compared with the resident farmer scenario which resulted in a dose of 42.4 mrem/year at time = 0 years. The resident farmer scenario is, however, the most likely future use of the land within the Crow Butte permit area. Therefore, this scenario was used to determine the radium benchmark dose. The use of the lower maximum dose value will result in a slightly lower uranium soil concentration and thus be conservative.

The following sections describe the data parameters that were used to model site-specific conditions. Where a sensitivity analysis was run on a particular factor, the results are noted.

The data input was based upon four principal sources:

1. The RESRAD Data Collection Handbook (ANL, 1993)

2. The RESRAD Users' Manual (ANL, 2003)

3. The NUREG-1569

4. Crow Butte Resources, Inc. License Renewal Application (LRA) CBR, "Application for Renewal of USNRC Radioactive Source Materials License SUA-1534,"December 1995.

Soil Concentration

1. Lead 210: Used 5.0 pCi/g per the NUREG-1569.

2. Radium 226: Used 5.0 pCi/g regulatory limit as basis for determining benchmark.

Distribution Coefficient (K_d) (values based upon data in RESRAD Handbook)

1. Lead 210: Used a distribution coefficient of 270 cm^3/g for sandy soil based upon soil type at the mine. The RESRAD User's Manual specifies the following values:

   - Sand = 270
   - Loam = 16,000

Sensitivity analysis indicates with a multiple of 100, no appreciable impact on maximum dose using higher K_d. Used values of 2.7, 270 (mid range), and 27,000 which covers the range of potential values at the site based upon sandy and loamy soil types. Graph attached.

2. Radium 226: Used a distribution coefficient of 500 cm^3/g for sandy soil based upon soil type at the mine. The RESRAD User's Manual specifies the following values:

   - Sand = 500
   - Loam = 36,000

Sensitivity analysis indicates with a multiple of 100, no appreciable impact on maximum dose using higher K_d. Used values of 5, 500 (mid range), and 50,000 which covers the range of potential values at the site based upon sandy and loamy soil types. Graph attached.

Contaminated Zone

1. Area: Used default value of 10,000 square meters.

Sensitivity analysis was performed with a 2 multiple (5,000, 10,000 and 20,000 square meters). There was no impact on maximum dose. Graph attached.

2. Thickness: 15 cm (6 inches) based upon regulatory requirement (minimum in RESRAD Handbook)

3. Length parallel to aquifer flow: Default of 100 meters was used and is based upon the square root of a 10,000 square meter contaminated zone.

Sensitivity analysis was performed with a multiple of 5 (20, 100 and 500 square meters). There was no impact on maximum dose. Graph attached.

Cover and Contaminated Zone

1. Cover depth: 0 inches (in accordance with NUREG-1569).

2. Density of contaminated zone: Used the default value of 1.5 g/cc, which corresponds to sandy soil in the RESRAD Handbook. This compares with the soil types at Crow Butte and the engineering data in the Dawes County Soil Survey.

Sensitivity analysis was run using a factor of 1.5 (i.e., 1, 1.5, 2.25) and resulted in changes in the maximum dose with a higher dose projected with a higher density. See graph. However, the standard range given in the Handbook is 1.1 to 1.6 g/cc. 1.5 is the most representative density of the soil types at Crow Butte based upon the Soil Survey as discussed in CBR, 1995.

3. Contaminated zone erosion rate: Used the default value of 0.001 meters/year. NUREG-1569 states that the erosion rate should be lower at uranium recovery sites due to the semi-arid environment. The RESRAD Handbook states that this value should be adequate for screening purposes. It also states that, while water erosion is the primary factor, wind erosion can also be significant.

Sensitivity analysis was run using a multiple of 5 (i.e., 0.0002, 0.001 and 0.005). The lower erosion rate resulted in the total dose remaining at a higher level over a longer period of time. However, there was minimal impact on the maximum dose.

4. Contaminated zone total porosity: Default value of 0.4 is the same as used for the spill impact analysis and is based upon the soil types at Crow Butte and the Soil Survey engineering data.

Sensitivity analysis was run with a multiple of 2 (i.e., 0.2, 0.4 and 0.8). The range given in the RESRAD handbook for sandy and silty soils is 0.25 to 0.53 and is covered in this sensitivity analysis. There was no impact on maximum dose.

5. Contaminated zone field capacity: Default value of 0.2 was used. This value was used because it is at the midpoint of the range for the soil types at Crow Butte.

Sensitivity analysis was run with a multiple of 2 (i.e., 0.4, 0.2 and 0.1). The range given in the RESRAD handbook for sandy and silty soils is 0.01 to 0.46. The maximum value is covered in this range. There was no impact on the maximum dose.

6. Contaminated zone hydraulic conductivity: The range given in RESRAD handbook for silty sand is 1×10^1 to 1×10^4. The soil types in the licensed area are principally Busher loamy very fine sand. The hydraulic conductivity (K_{sat}) in m/yr. given in the RESRAD Manual for loamy sand is 4.93×10^3. Very fine sand is given a K_{sat} of 3.0×10^3 in the RESRAD Handbook. A midrange value of 4.0×10^3 was chosen since site specific data is unavailable.

Sensitivity analysis was run with a multiple of 2 (i.e., 2000, 4000 and 8000 m/yr). There was no impact on maximum dose.

7. Contaminated zone b parameter: Default parameter is 5.3 for silty loam. The RESRAD Handbook and RESRAD Manual specify a value of 4.38 for loamy sand, which corresponds to the soil classification used for the hydraulic conductivity. The range from sand to loam is 4.05 to 5.39.

Sensitivity analysis was run with a multiple of 2 (i.e., 2.19, 4.38, 8.76). There was no impact on maximum dose.

8. Evapotranspiration Coefficient: The RESRAD default value is 0.5. NUREG-1569 suggests that a value of 0.6 to 0.99 for uranium recovery sites is appropriate because

they are located in a semiarid environment. For screening purposes, a mid-value (0.75) was used.

Sensitivity analysis was run with a multiple of 1.33 (i.e., 0.564, 0.75 and 0.998) which is the maximum sensitivity set by RESRAD. There was no impact on the maximum dose.

9. Wind Speed: The RESRAD default is 2 m/s. The average for the Crow Butte site is 4.3 m/s (8.4 knots). Site data was used. No sensitivity analysis was performed since this is actual site data as recommended in NUREG-1569.

10. Precipitation: The RESRAD default is 1 m/yr. The average for the Crow Butte site is 0.39 m/yr. Site data was used. No sensitivity analysis was performed since this is actual site data as recommended in NUREG-1569.

11. Irrigation Rate: The RESRAD default is 0.2 m/yr. The actual site data should be 0 m/yr. since use of irrigation is limited in Dawes County and there is no irrigated land near the mine. Sources of irrigation are expected to be limited in the future. No sensitivity analysis was performed since this is actual site data as recommended in NUREG-1569.

12. Runoff Coefficient: The RESRAD default value is 0.2. This is the value for open rolling land in the RESRAD Handbook and was used for Crow Butte. The potential range in the RESRAD handbook for the site would be 0.1 to 0.4.

Sensitivity analysis was run with a multiple of 2 (i.e., 0.1, 0.2 and 0.4) which covers the potential range for the site. There was no impact on maximum dose.

13. Watershed Area for nearby stream or pond: The RESRAD default value is 1×10^6 m^2. Used the estimated area of the Squaw Creek watershed, which is approximately 14 sections, or 3.63×10^7 m^2.

Although this is actual data for the site, a sensitivity analysis with a multiple of 2 was run (i.e., 1.82, 3.63 and 7.26 x 10^7 m^2). There was no impact on maximum dose.

14. Accuracy: Used the default value of 0.001.

Saturated Zone

1. Density of saturated zone: Used the default value of 1.5 g/cc, which corresponds to sandy soil in the RESRAD Handbook. This compares with the soil types at Crow Butte and the engineering data in the Dawes County Soil Survey.

Sensitivity analysis was run using a factor of 1.5 (i.e., 1, 1.5, 2.25). There were no changes in the maximum dose. See graph. The standard range given in the Handbook is 1.1 to 1.6 g/cc. 1.5 is the most representative density of the soil types at Crow Butte based upon the Soil Survey as discussed in the CBR, 1995.

2. Saturated zone total porosity: Default value of 0.4 is the same as used for the spill impact analysis and is based upon the soil types at Crow Butte and the Soil Survey engineering data.

Sensitivity analysis was run with a multiple of 2 (i.e., 0.2, 0.4 and 0.8). The range given in the RESRAD handbook for sandy and silty soils is 0.25 to 0.53 and is covered in this sensitivity analysis. There was no impact on maximum dose.

3. Saturated zone effective porosity: Default value of 0.2 was used. This value was used because it is at the midpoint of the range for the soil types at Crow Butte.

Sensitivity analysis was run with a multiple of 5 (i.e., 0.04, 0.2 and 1). The range given in the RESRAD handbook for sandy and silty soils is 0.01 to 0.46. The maximum value is covered in this range. There was no impact on the maximum dose.

4. Contaminated zone field capacity: Default value of 0.2 was used. This value was used because it is at the midpoint of the range for the soil types at Crow Butte.

Sensitivity analysis was run with a multiple of 2 (i.e., 0.04, 0.2 and 1). The range given in the RESRAD handbook for sandy and silty soils is 0.01 to 0.46. The maximum value is covered in this range. There was no impact on the maximum dose.

5. Saturated zone hydraulic conductivity: The range given in RESRAD handbook for silty sand is 1×10^1 to 1×10^4. The soil types on Section 19 are principally Busher loamy very fine sand. The hydraulic conductivity (K_{sat}) in m/yr. given in the RESRAD Manual for loamy sand is 4.93×10^3. Very fine sand is given a K_{sat} of 3.0×10^3 in the RESRAD Handbook. A midrange value of 4.0×10^3 was chosen since site specific data is unavailable.

Sensitivity analysis was run with a multiple of 2 (i.e., 2000, 4000 and 8000 m/yr.). There was no impact on maximum dose.

6. Saturated zone hydraulic gradient: The default value of 0.02 was used for screening purposes.

Sensitivity analysis was run with a multiple of 2 (i.e., 0.01, 0.02 and 0.04.). There was no impact on maximum dose.

7. Saturated zone b parameter: Default parameter is 5.3 for silty loam. The RESRAD Handbook and RESRAD Manual specify a value of 4.38 for loamy sand, which corresponds to the soil classification used for the hydraulic conductivity. The range from sand to loam is 4.05 to 5.39.

Sensitivity analysis was run with a multiple of 2 (i.e., 2.19, 4.38, and 8.76). There was no impact on maximum dose.

8. Water Table Drop Rate: The default value of 0.001 m/yr. was used for screening purposes. The site specific drop rate should be similar because there is little consumptive use of groundwater in the immediate area other than ranches that use local wells for domestic and livestock.

Sensitivity analysis was run with a multiple of 10 (i.e., 0.0001, 0.001 and 0.01). There was no impact on maximum dose.

9. Well Pump Intake Depth: The RESRAD default is 10 m. Since the depth to saturated zone is 15 meters and most local wells are completed from 60 to 80 feet, a value of 20 meters was chosen.

Sensitivity analysis was run with a multiple of 2 (i.e., 10m, 20m and 40m). There was no impact on maximum dose

10. Model for Water Transport Parameters: Used non-dispersion per NUREG-1569.

11. Well Pumping Rate: Used default of 250 m^3/yr. (66,000 gal/yr.).

Sensitivity analysis was run with a multiple of 2 (i.e., 125, 250m and 500 m^3/yr.). There was no impact on maximum dose

Unsaturated Zone

1. Unsaturated zone thickness: Used 15 meters (50 ft) per Reg.Guide-1569.

2. Density of unsaturated zone: Used 1.5 g/cc, which is similar to the saturated zone as discussed in NUREG-1569.

Sensitivity analysis was run with a multiple of 2 (i.e., 0.75, 1.5 and 3.0 g/cc) There was no impact on maximum dose.

3. Unsaturated zone total Porosity: The default value of 0.4 is the same as used for the saturated zone as discussed in NUREG-1569.

Sensitivity analysis was run with a multiple of 2 (i.e., 0.2, 0.4 and 0.8). The range given in the RESRAD handbook for sandy and silty soils is 0.25 to 0.53 and is covered in this sensitivity analysis. There was no impact on maximum dose.

4. Unsaturated zone effective porosity: The default value of 0.2 is the same as used for the saturated zone as discussed in NUREG-1569.

Sensitivity analysis was run with a multiple of 1.5 (i.e., 0.3, 0.2 and 0.13). The range given in the RESRAD handbook for sandy and silty soils is 0.01 to 0.46. The maximum value is covered in this range. There was no impact on the maximum dose.

5. Unsaturated zone field capacity: Default value of 0.2 was used. This value was used because it is at the midpoint of the range for the soil types at Crow Butte.

Sensitivity analysis was run with a multiple of 2 (i.e., 0.4, 0.2 and 0.1). The range given in the RESRAD handbook for sandy and silty soils is 0.01 to 0.46. The maximum value is covered in this range. There was no impact on the maximum dose.

6. Unsaturated zone hydraulic conductivity: The range given in the RESRAD handbook for silty sand is 1 x 10^1 to 1 x 10^4. The soil types in the licensed area are principally Busher loamy very fine sand. The hydraulic conductivity (K_{sat}) in m/yr. given in the RESRAD Manual for loamy sand is 4.93 x 10^3. Very fine sand is given a K_{sat} of 3.0 x 10^3 in the RESRAD Handbook. A midrange value of 4.0 x 10^3 and is the same as used for the saturated zone as discussed in NUREG 1569.

Sensitivity analysis was run with a multiple of 2 (i.e., 2000, 4000 and 8000 m/yr.). There was no impact on maximum dose.

7. Saturated zone b parameter: Used 4.28 rather than the default parameter of 5.3. The RESRAD Handbook and RESRAD Manual specify a value of 4.38 for loamy sand, which corresponds to the soil classification used for the hydraulic conductivity. The range from sand to loam is 4.05 to 5.39.

Occupancy

1. Inhalation Rate: Used default value of 8,400 m^3/yr.

2. Mass Loading for Inhalation: Default is 0.0001 g/m^3. Handbook gives a value of 0.0003 g/ m^3 for agricultural generated dust loading.

Sensitivity analysis run with a multiple of 3 (i.e., 0.0001, 0.0003 and 0.0009 g/m^3) which will cover the range from the default value. There was no impact on maximum dose.

3. Exposure Duration: Used default value of 30 years.

4. Indoor dust filtration factor: Used default value of 0.4.

5. External gamma shielding factor: The RESRAD default is 0.7, which assumes that the indoor gamma radiation level is 30% lower than the outdoor gamma radiation

level. NUREG-1569 requires that a value between 0.33 and 0.55 be used. The screening level was set at 0.55. This is a value suitable for a 7-inch thick concrete slab on grade house (NUREG/CR-5512 Vol.3, p 6-25). This is representative of the thickness of the local slab or basement floor thicknesses.

Sensitivity analysis using a 1.5 multiple (i.e., 0.367, 0.55 and 0.825 resulted in a change in the maximum dose. See graph. The low range (0.367) resulted in a maximum dose of approximately 38 mrem/yr compared to a dose of 42 mrem/yr for a shielding factor of 0.55. Based upon the fact that most construction of rural homes in the local area includes a thick concrete basement floor or slab, a shielding factor of 0.55 for the Crow Butte area is justified.

6. Indoor/Outdoor Fractions: Used defaults of 0.5 indoors and 0.25 outdoors for farmer scenario and 0.7 indoors and 0.15 outdoors for the work at home scenario. As discussed above, the resident farmer scenario was chosen as the most likely land use for the foreseeable future (i.e., 200 years).

7. Shape of contaminated zone: NUREG-1569 suggests use of actual shape. However, the shape is unknown at this time. Various shapes were assumed including a rectangle having a length of up to four times the width. The results were independent of these shapes as long as the receptor was centered. When the receptor was at the edge of the area, the dose was reduced significantly as expected. A circular shape was adopted for the modeling.

Ingestion: Dietary

1. Consumption Rates:

A. Fruit, vegetable and grain: RESRAD default is 160 kg/yr. This value was used based upon EPA estimated consumption. NRC Reg. Guide 1.109 has an estimated consumption for an adult of 190 kg/yr. Screening level set at default of 160 kg/yr.

This amount is the total consumption. RESRAD adjusts for contaminated and uncontaminated fractions based upon the size of the contaminated area.

Sensitivity analysis with 1.25 factor (i.e., 152, mid of 190 and high of 237.5 kg/yr) had an impact on maximum dose. This factor covers the range for the consumption discussed in Reg. Guide 1.109. See Graph. Based upon NRC Reg. Guide 1.109, adjusted the consumption to 190 kg/yr.

B. Leafy Vegetable: Used default value of 14 kg/yr. NRC Reg. Guide 1.109 has an estimated consumption for an adult of 64 kg/yr, while NRC estimates for dose from nuclear power plants uses a consumption rate of 30 kg/yr. Screening level for total set at default of 190 kg/yr (see above entry). This amount is the total consumption. RESRAD adjusts for contaminated and uncontaminated fractions based upon the size of the contaminated area.

Sensitivity analysis was run with a multiple of 5 (i.e., 2.8, 14 and 70 kg/yr.) to cover the range of NRC estimated consumption. There was an impact on maximum dose. Based upon these results, the consumption rate was left at the default value of 14 kg/yr. for ALARA purposes.

C. Milk: No consumption of locally produced and consumed milk per NUREG-1569. Dairy operations are not prevalent in the area.

D. Meat and Poultry: Used RESRAD default value of 63 kg/yr. According to NRC Regulatory Guide 1.109 (NRC, 1977), the recommended average value for consumption of meat and poultry is 37 kg/yr for children, 59 kg/yr for teenagers, and 95 kg/yr. for adults.

Sensitivity analysis was run with a multiple of 2 (i.e., 31.5, 63 and 126 kg/yr.) which covers the range between the RESRAD default and the rates in Reg. Guide 1.109. There *was minimal impact on the maximum dose. The default consumption rate from RESRAD was used.*

E. Fish/Seafood: No consumption of locally produced and consumed fish or seafood products was considered as recommended by NUREG-1569.

F. Soil ingestion: Used the RESRAD default value of 36.5 g/yr.

Sensitivity analysis was run with a multiple of 2 (i.e., 18.25, 36.5 and 73 kg/yr). There was minimal impact on the maximum dose. The RESRAD default value was chosen.

G. Drinking water intake: Used the RESRAD default of 510 l/yr. (1.4 L/d) as a screening level. This value is based upon EPA estimates of drinking water intake. The EPA (1990) has suggested that the average adult drinking water consumption rate is 1.4 L/d; the reasonable worst-case value is 2.0 L/d.

Sensitivity analysis was run with a multiple of 2 (i.e., 255, 510 and 1020 L/yr.). There was no impact on the maximum dose. The RESRAD default value was chosen.

2. Contaminated Fractions:

NUREG-1569 states that for sites with over 25 acres (10,117 square meters) of contamination, the fraction of diet from contaminated area should be assumed to be 25% (0.25). A sensitivity analysis on these parameters was not performed based upon the guidance.

A. Water: Used the default value of 1 (i.e., 100% of consumption is from contaminated well water). All current water use in rural areas around the site is from private wells and will likely continue to be in the foreseeable future.

B. Livestock Water: Used default of 1 (i.e., 100% is from contaminated water). All current water use in rural areas around the site is from private wells and will likely continue to be in the foreseeable future.

C. Irrigation Water: Used the RESRAD default of 1 (i.e., 100% is from contaminated water). All current water use in rural areas around the site is from private wells and will likely continue to be in the foreseeable future.

D. Plant food: Used 0.25 as percentage of plant food that is contaminated.

E. Meat: Used 0.25 as percentage of meat that is contaminated.

Ingestion: Nondietary

1. Consumption Rates:

A. Livestock fodder intake for meat: Used the RESRAD default of 68 kg/day.

Sensitivity analysis was run with a multiple of 2 (i.e., 34, 68, and 136 kg/d). There was no significant impact on maximum dose.

B. Livestock water intake for meat: Used the RESRAD default of 50 L/day. According to NRC Regulatory Guide 1.109 (NRC 1977), the water ingestion rate for beef cattle is 50 L/d.

Sensitivity analysis was run with a multiple of 2 (i.e., 25, 50, and 100 L/d). There was no impact on maximum dose.

C. Livestock intake of soil for meat: Used the RESRAD default of 0.5 g/day.

Sensitivity analysis was run with a multiple of 2 (i.e., 0.25, 0.5, and 1 g/d). There was no significant impact on maximum dose.

D. Mass loading for foliar deposition: Used the same value of 0.0003 g/m^3 for agricultural generated dust loading as the inhalation parameter discussed above.

E. Depth of soil mixing layer: Used the RESRAD default of 0.15 meters.

Sensitivity analysis was run with a multiple of 3 (i.e., 0.9, 03, and 0.1 meters). There was a minimal (i.e., less than 1 mrem/yr) impact on maximum dose

F. Depth of roots: Used 0.3 meters as a screening level based upon NUREG-1569 instead of the RESRAD default of 0.9. The root depth varies for different plants. For some plants, such as beets, carrots, lettuce, and so forth, it does not extend below about 0.3 m, which is the basis of the NRC guidance. For others, such as fruit trees, the roots may extend 2 or 3 m below the surface. Tap roots for some crops (e.g., alfalfa) can extend to 5 m. Most of the plant roots from which nutrients are obtained, however, usually extend to less than 1 m below the surface. Due to the common use of grazing crops such as alfalfa in the immediate area surrounding the Crow Butte site, a sensitivity analysis was chosen that would determine the dose using the 0.3 m NRC guidance as the screening level as well as the 0.9 m RESRAD default.

Sensitivity analysis was run with a multiple of 3 (i.e., 0.1, 0.3, and 0.9 meters). There was a significant impact on the maximum dose. Assumption of a shallow root system increased the dose significantly. In a review of the exposure pathways, the plant pathway resulted in approximately 38% of the total maximum dose. The meat pathway, which would be the primary pathway affected by deeper roots such as alfalfa, accounted for approximately 1.4% of the total maximum dose. Therefore, the root depth recommended in the NRC NUREG-1569 was chosen for this parameter.

G. Groundwater fractional usage:

- Drinking water: Used the RESRAD default of 1 (i.e., 100% from well).
- Livestock water: Used the RESRAD default of 1 (i.e., 100% from well).
- Irrigation water: Used the RESRAD default of 1 (i.e., 100% from well).

Storage Times

Used the RESRAD default values for all storage times (for vegetables, meats, fodder, etc.).

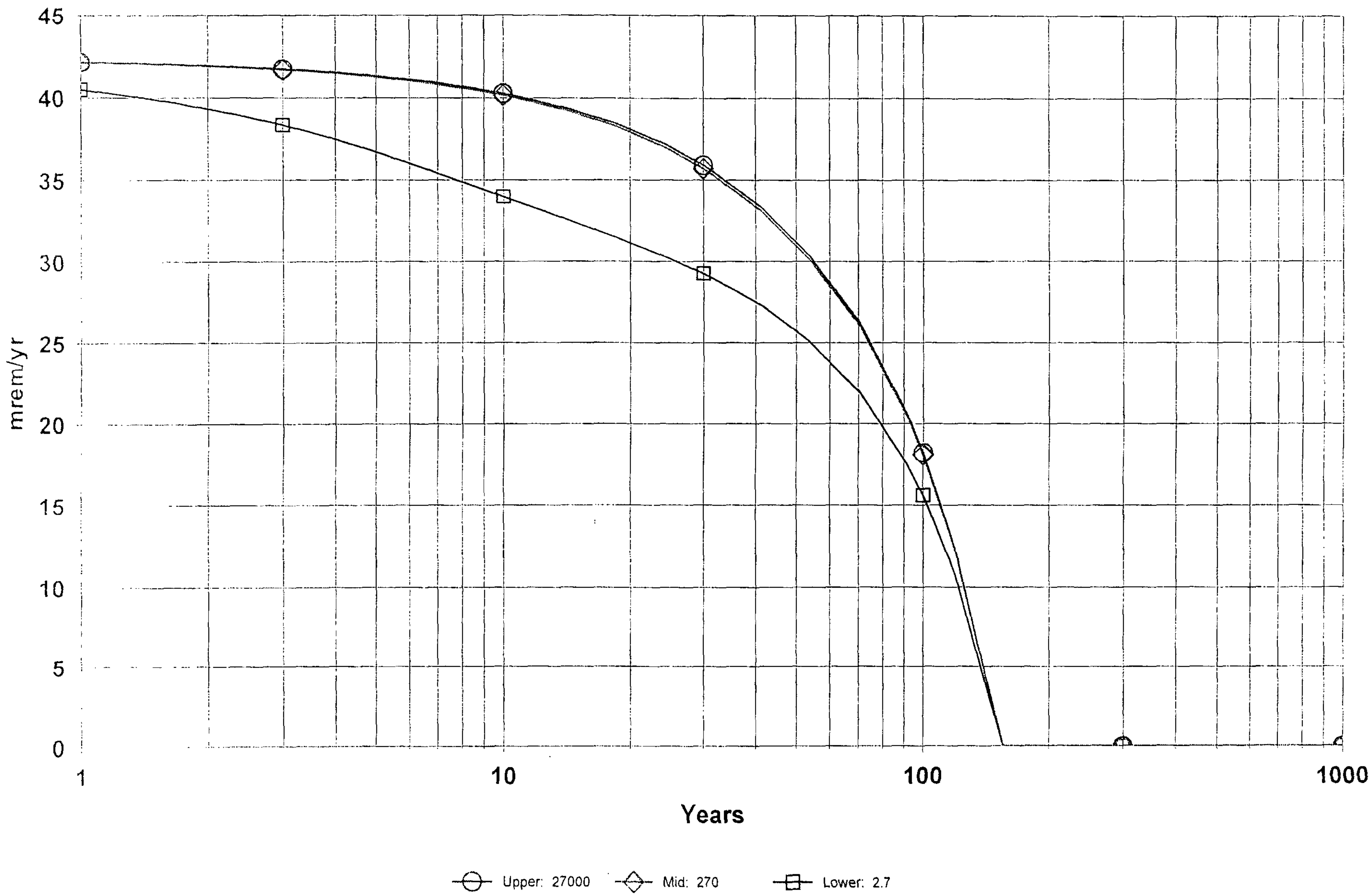
Radium Benchmark Dose Assessment

Attachment 2

RESRAD Input Parameter

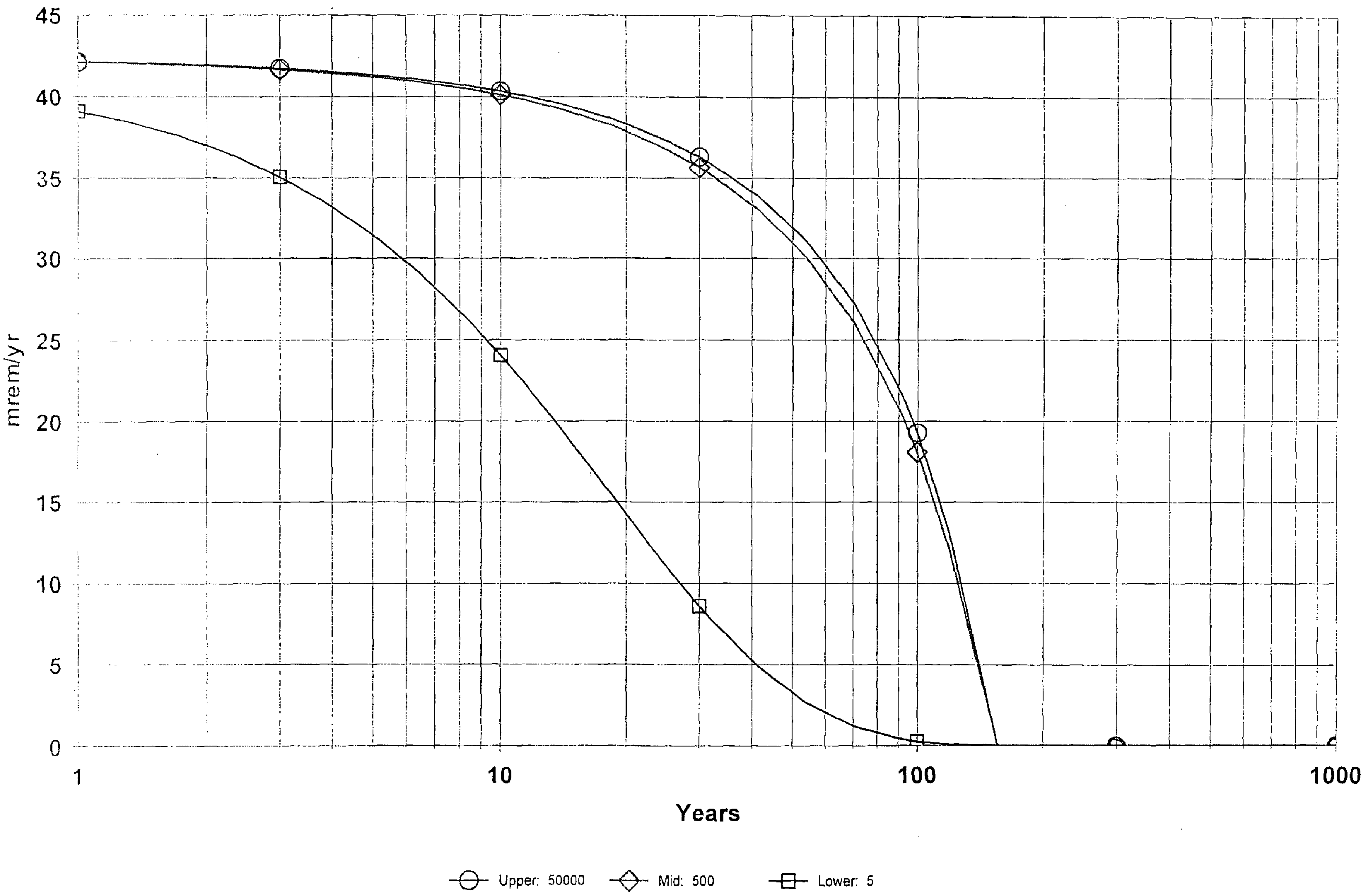
Sensitivity Analysis

DOSE: All Nuclides Summed, All Pathways Summed With SA on Pb-210 Contaminated Zone Distribution Coef.



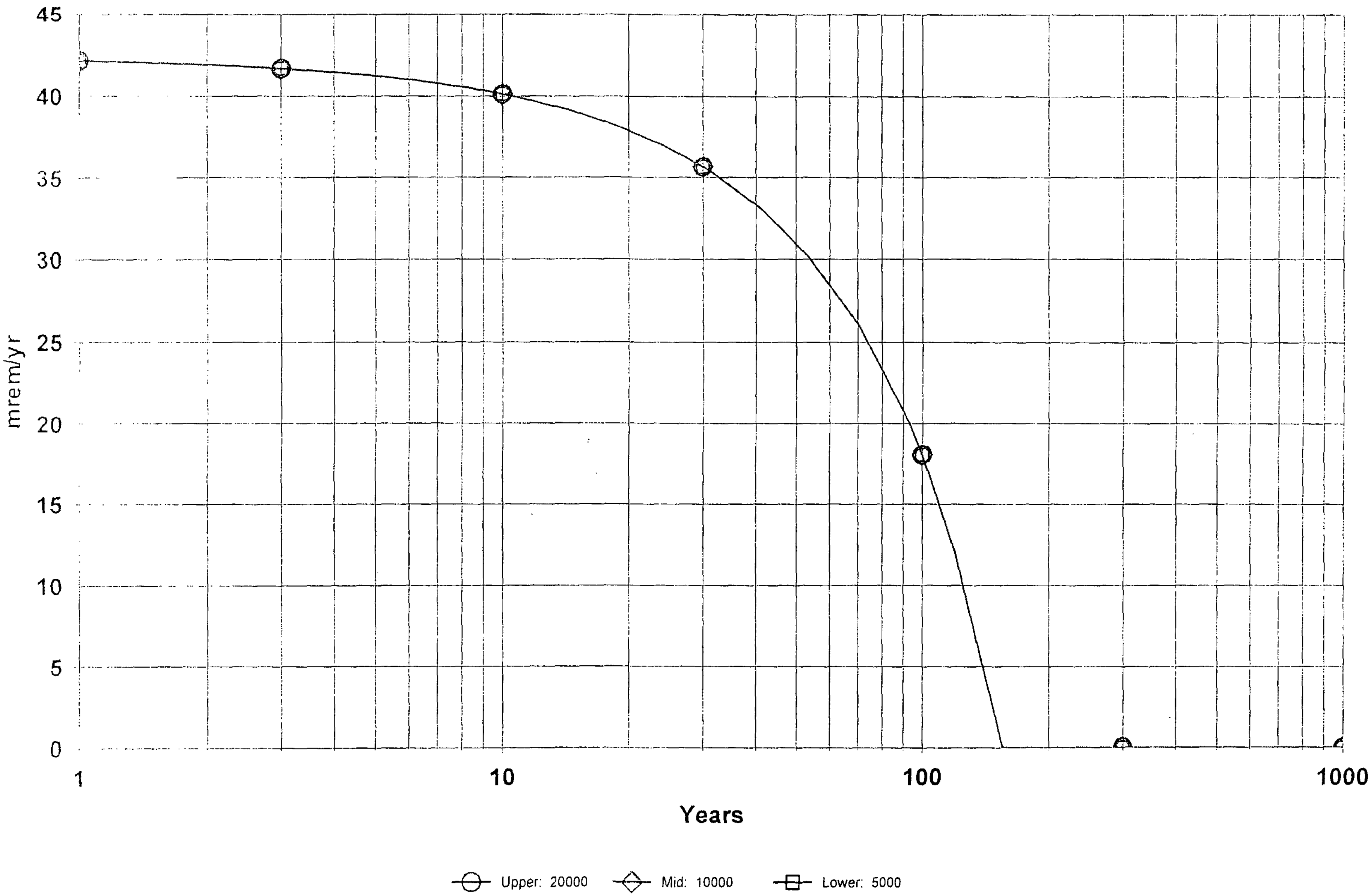
CBR1.rad 02/26/2004 11:07 Includes All Pathways

DOSE: All Nuclides Summed, All Pathways Summed With SA on Ra-226 Contaminated Zone Distribution Coef.

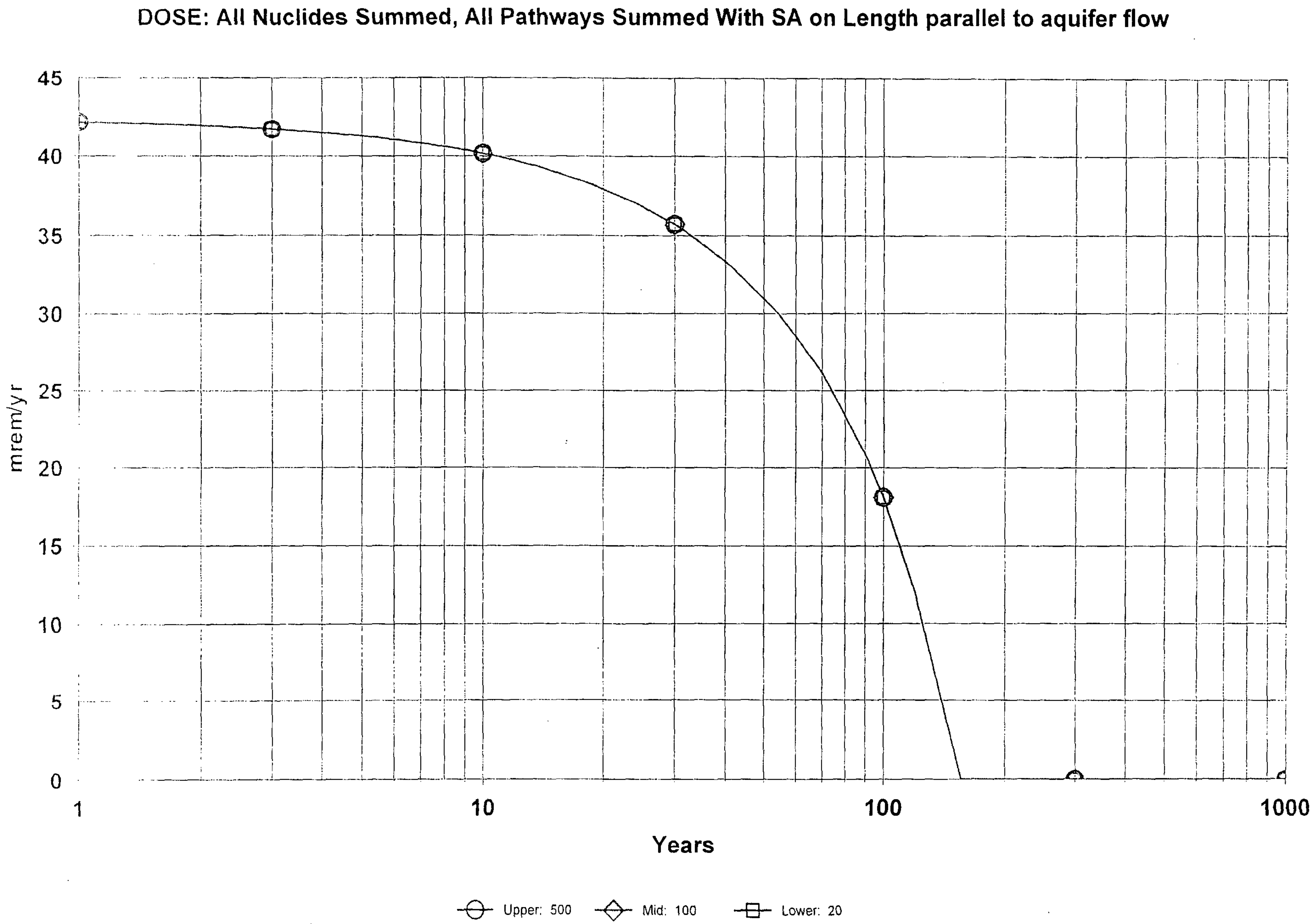


Ra022704.RAD 02/27/2004 09:40 Includes All Pathways

DOSE: All Nuclides Summed, All Pathways Summed With SA on Area of contaminated zone

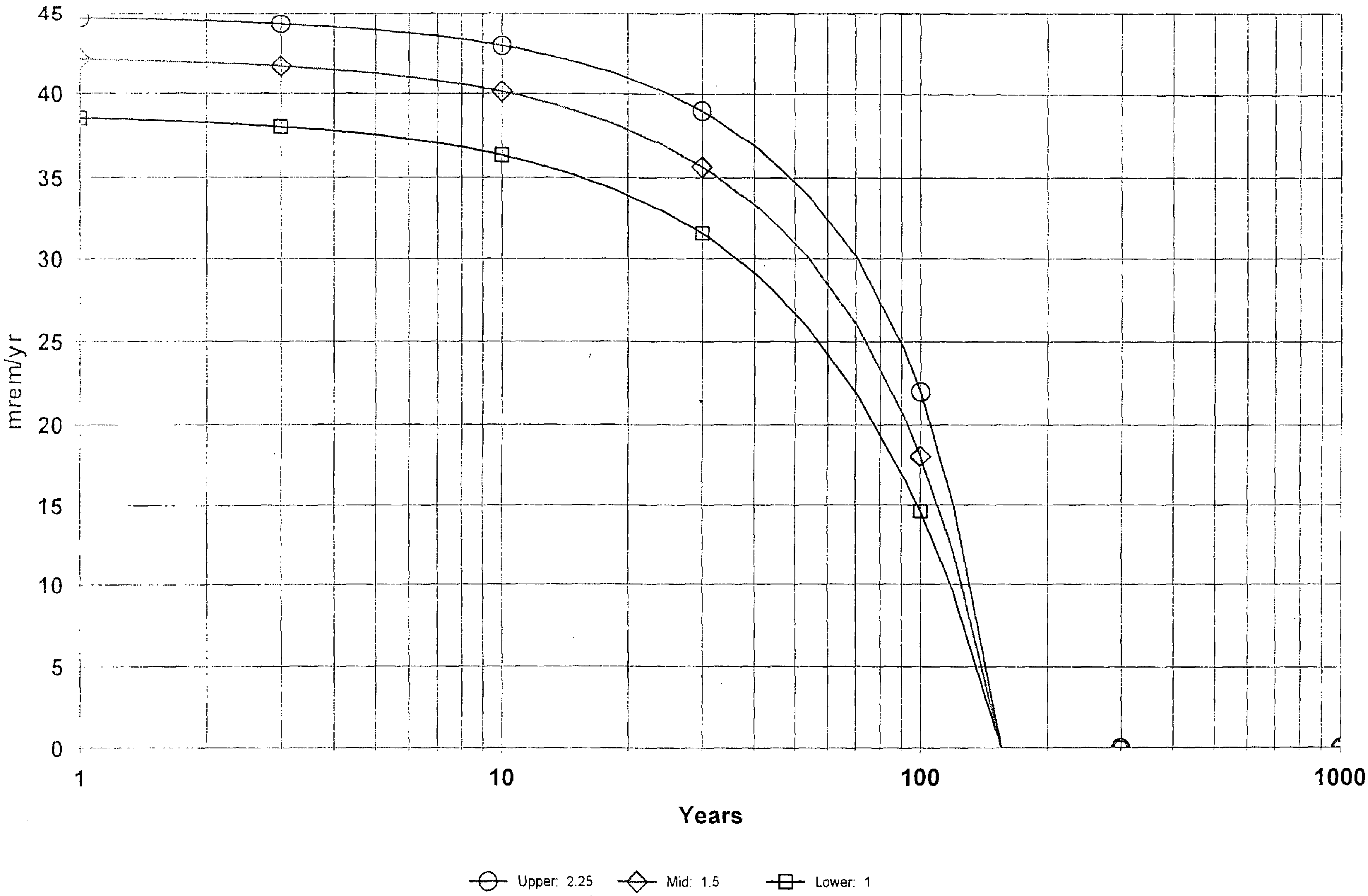


Ra022704.RAD 02/27/2004 09:56 Includes All Pathways



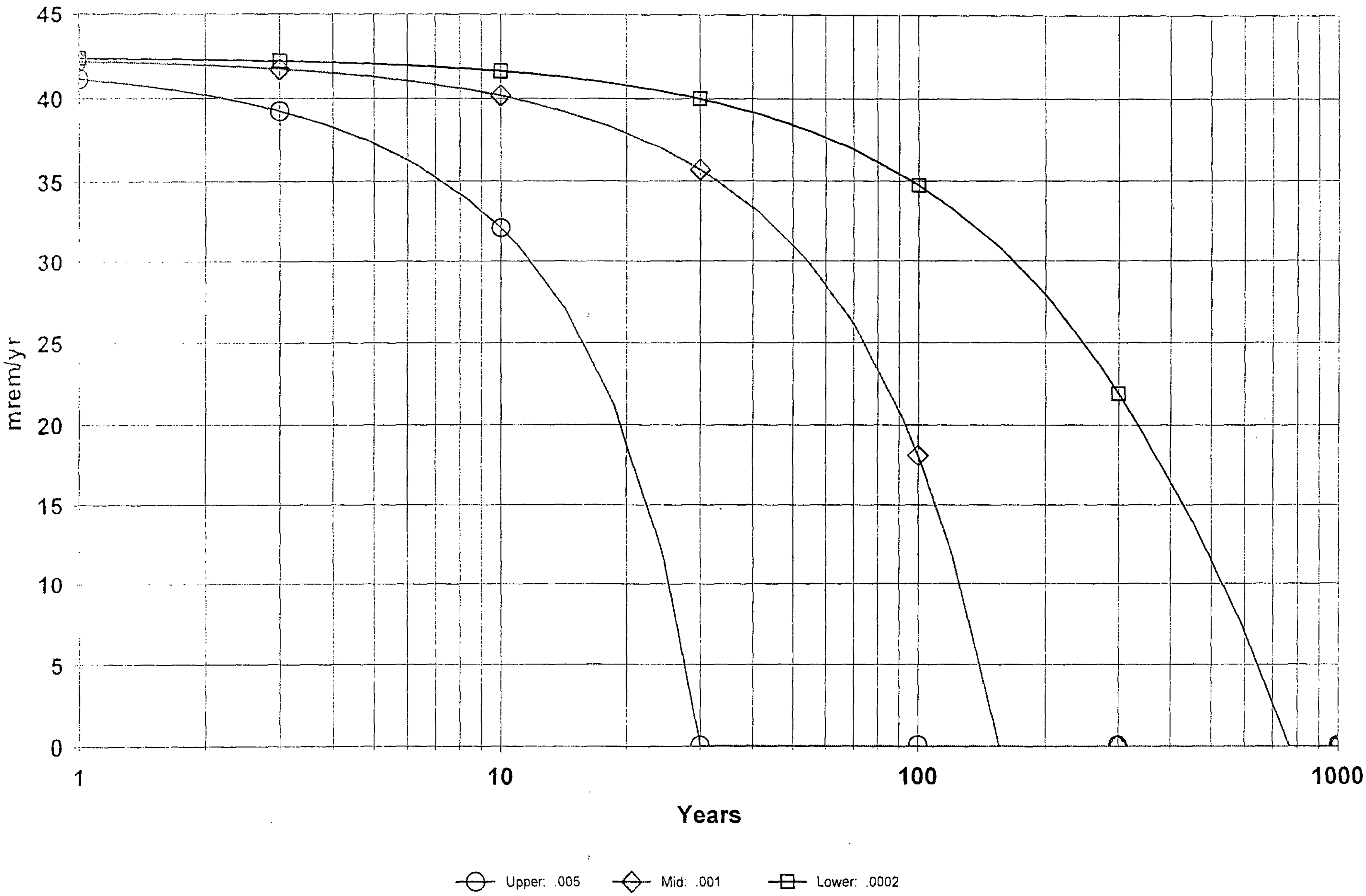
Ra022704.RAD 02/27/2004 15:40 Includes All Pathways

DOSE: All Nuclides Summed, All Pathways Summed With SA on Density of contaminated zone

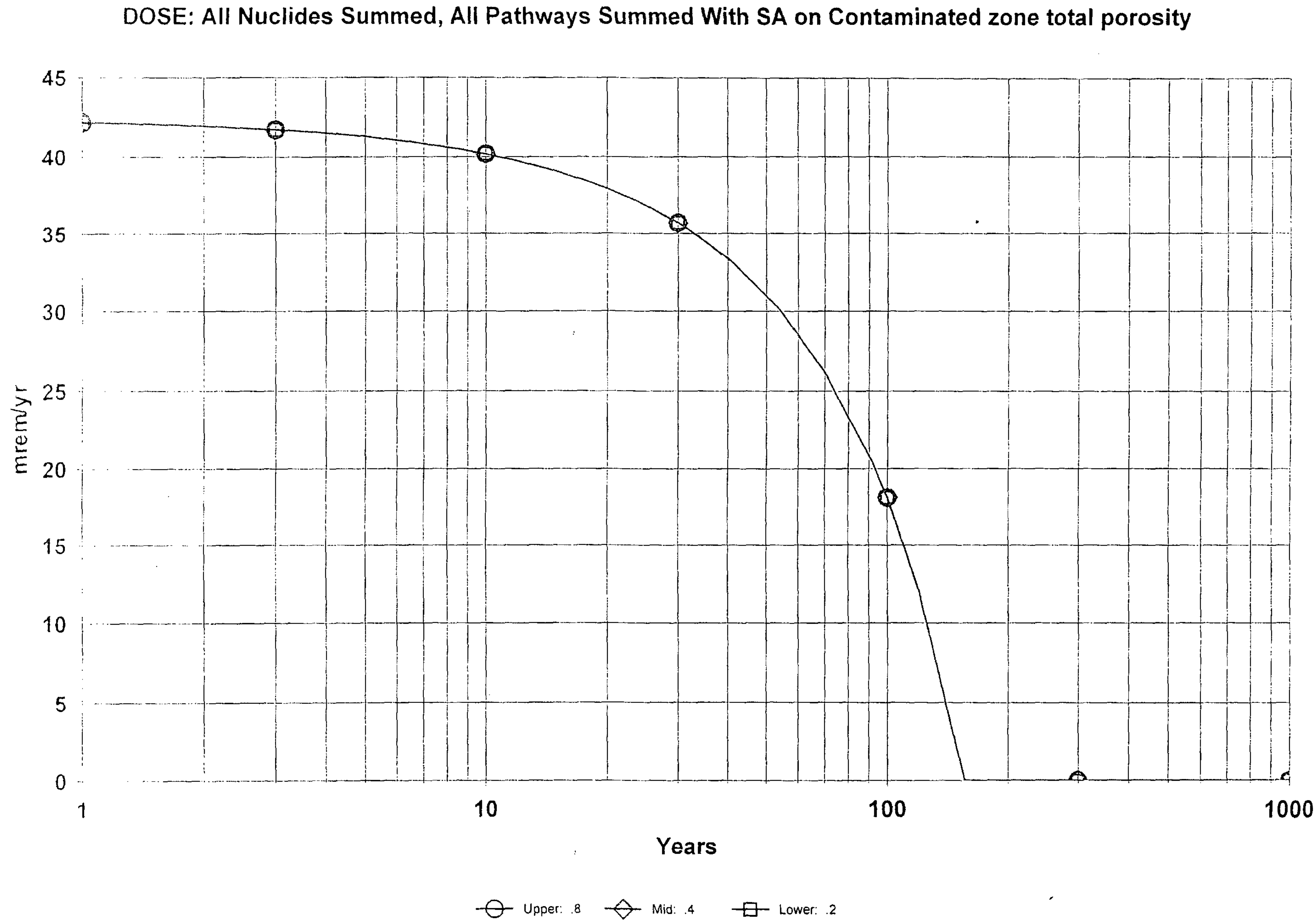


Ra022704.RAD 02/27/2004 09:56 Includes All Pathways

DOSE: All Nuclides Summed, All Pathways Summed With SA on Contaminated zone erosion rate

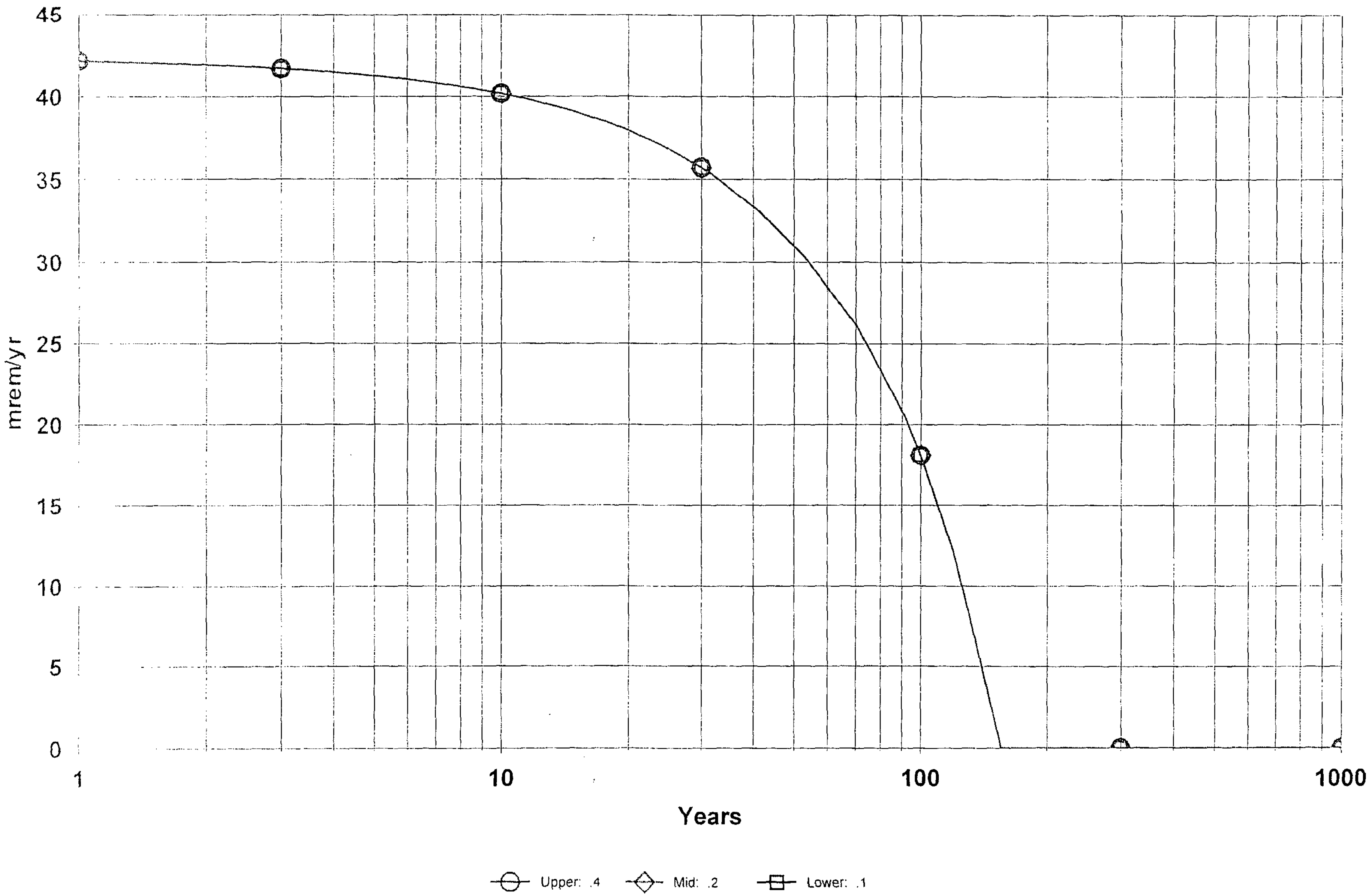


Ra022704.RAD 02/27/2004 10:14 Includes All Pathways



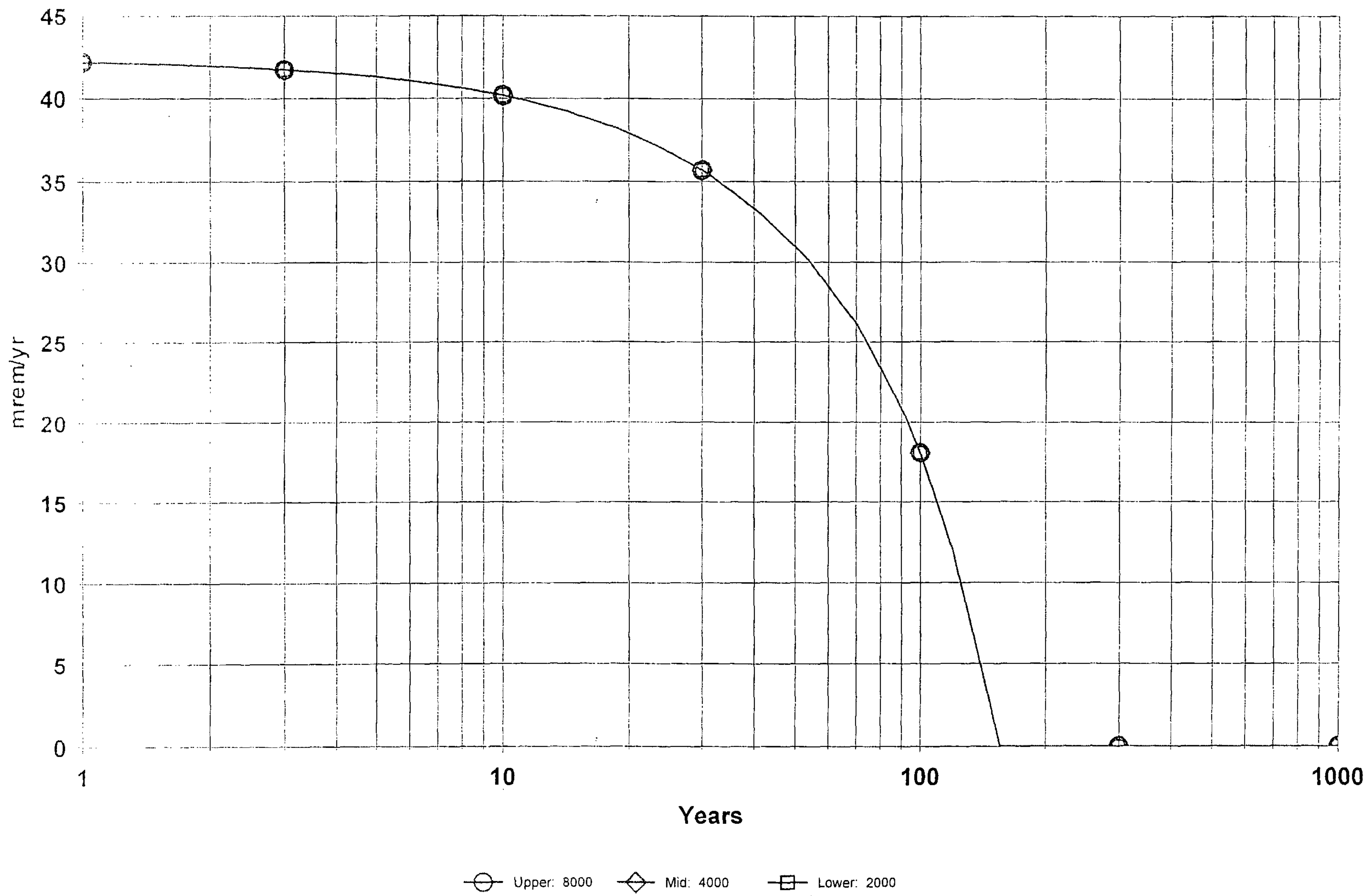
Ra022704.RAD 02/27/2004 10:14 Includes All Pathways

DOSE: All Nuclides Summed, All Pathways Summed With SA on Contaminated zone field capacity



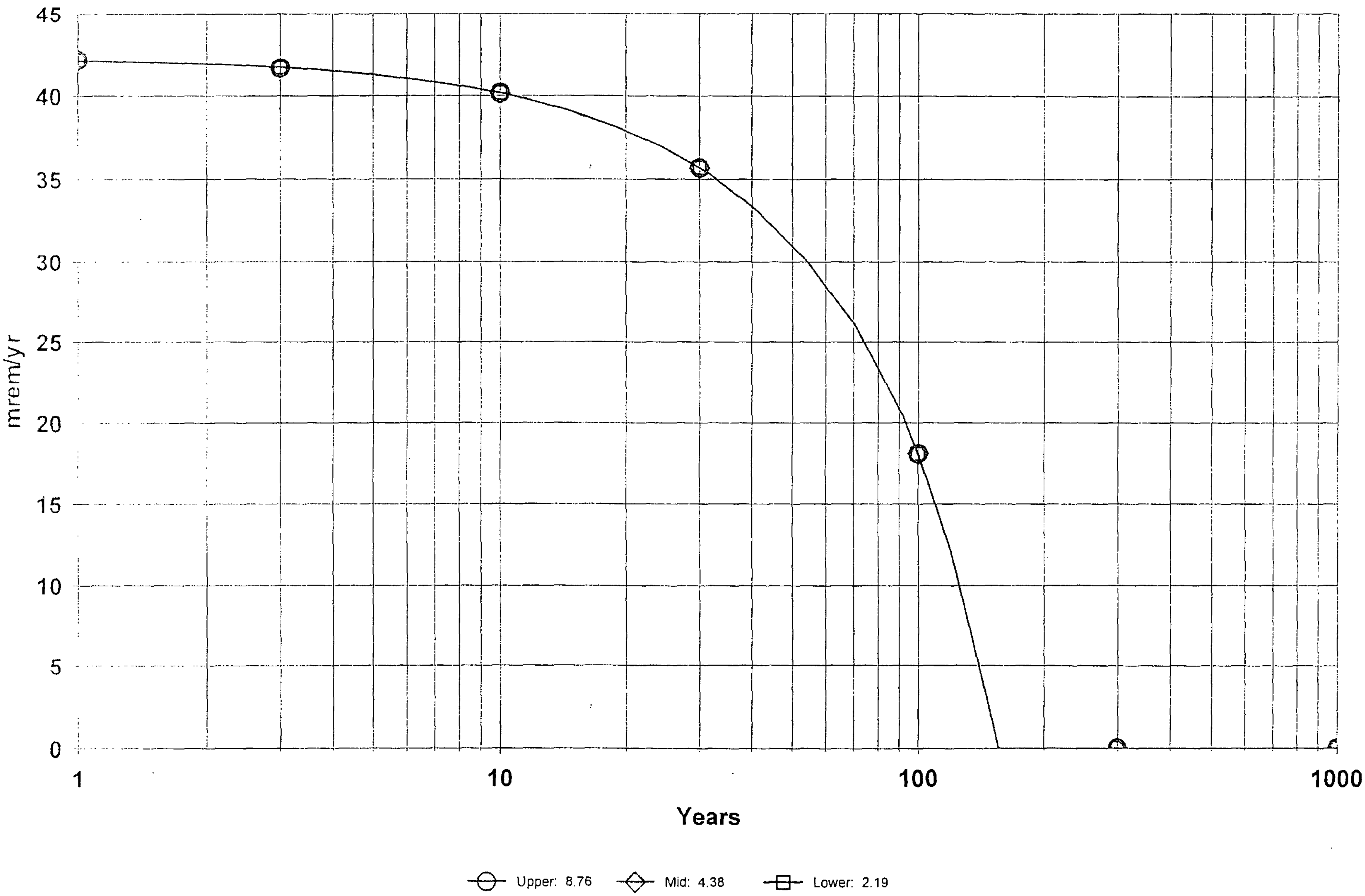
Ra022704.RAD 02/27/2004 10:14 Includes All Pathways

DOSE: All Nuclides Summed, All Pathways Summed With SA on Contaminated zone hydraulic conductivity



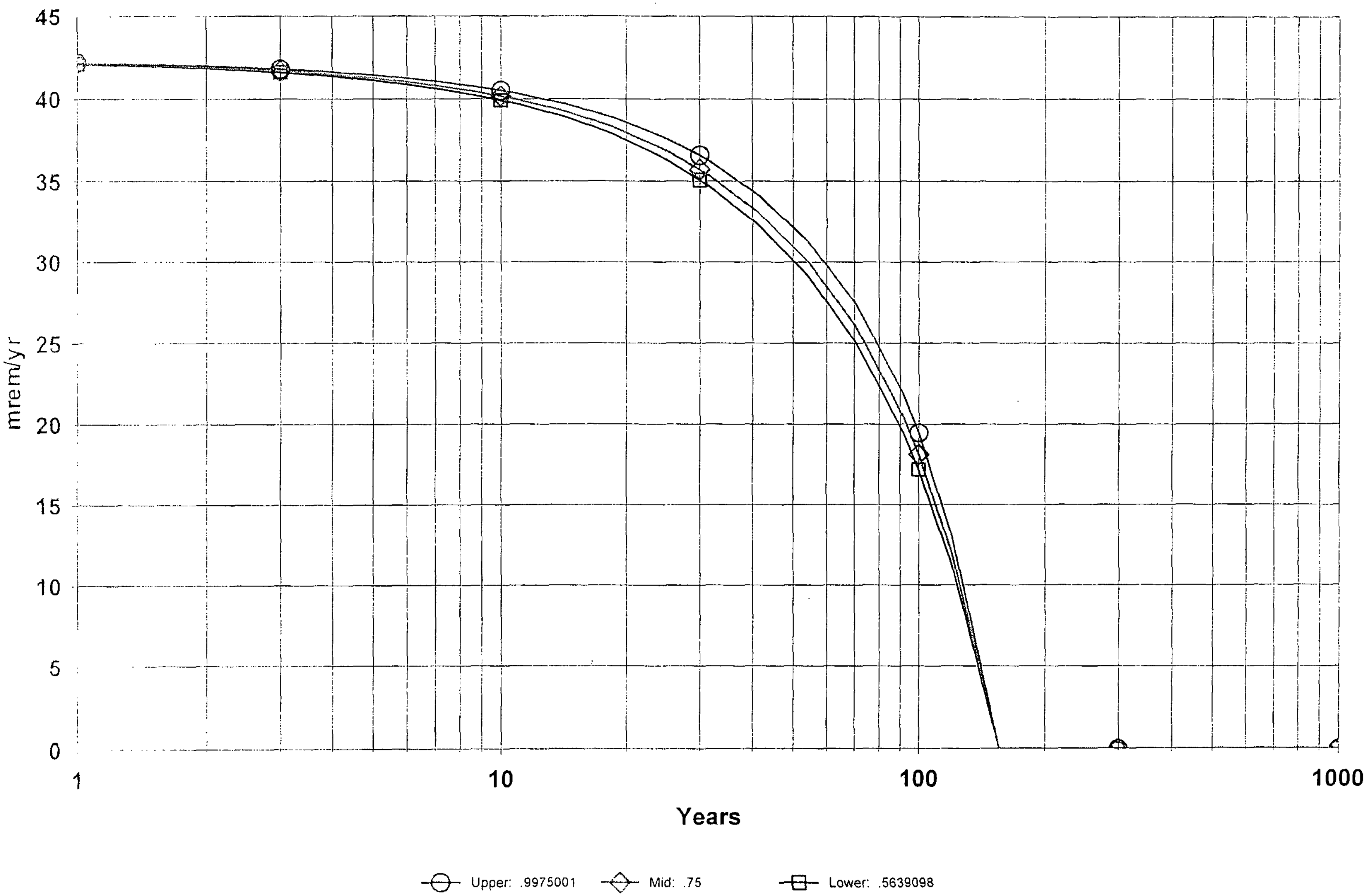
Ra022704.RAD 02/27/2004 10:14 Includes All Pathways

DOSE: All Nuclides Summed, All Pathways Summed With SA on Contaminated zone b parameter



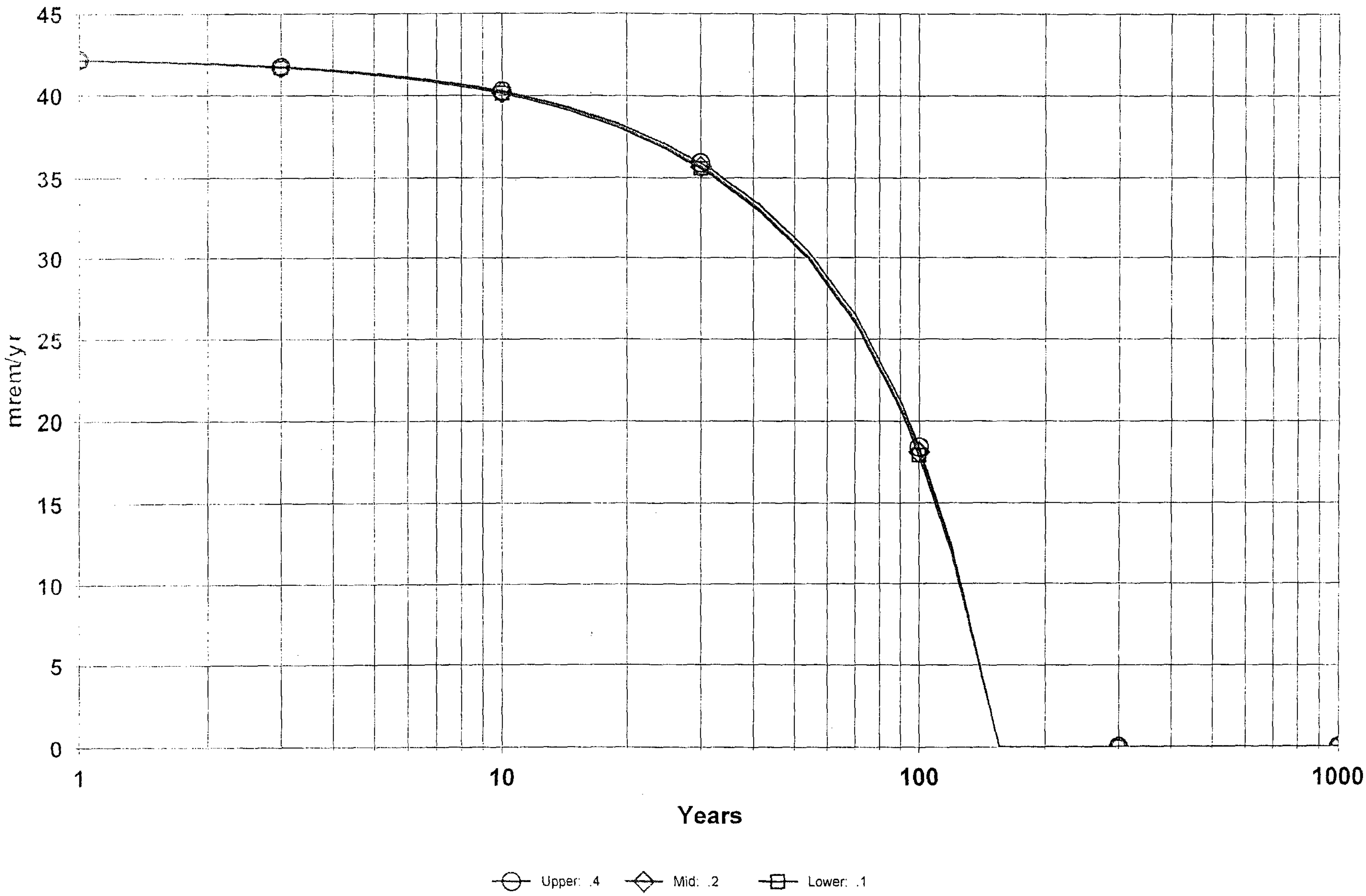
Ra022704.RAD 02/27/2004 10:14 Includes All Pathways

DOSE: All Nuclides Summed, All Pathways Summed With SA on Evapotranspiration coefficient



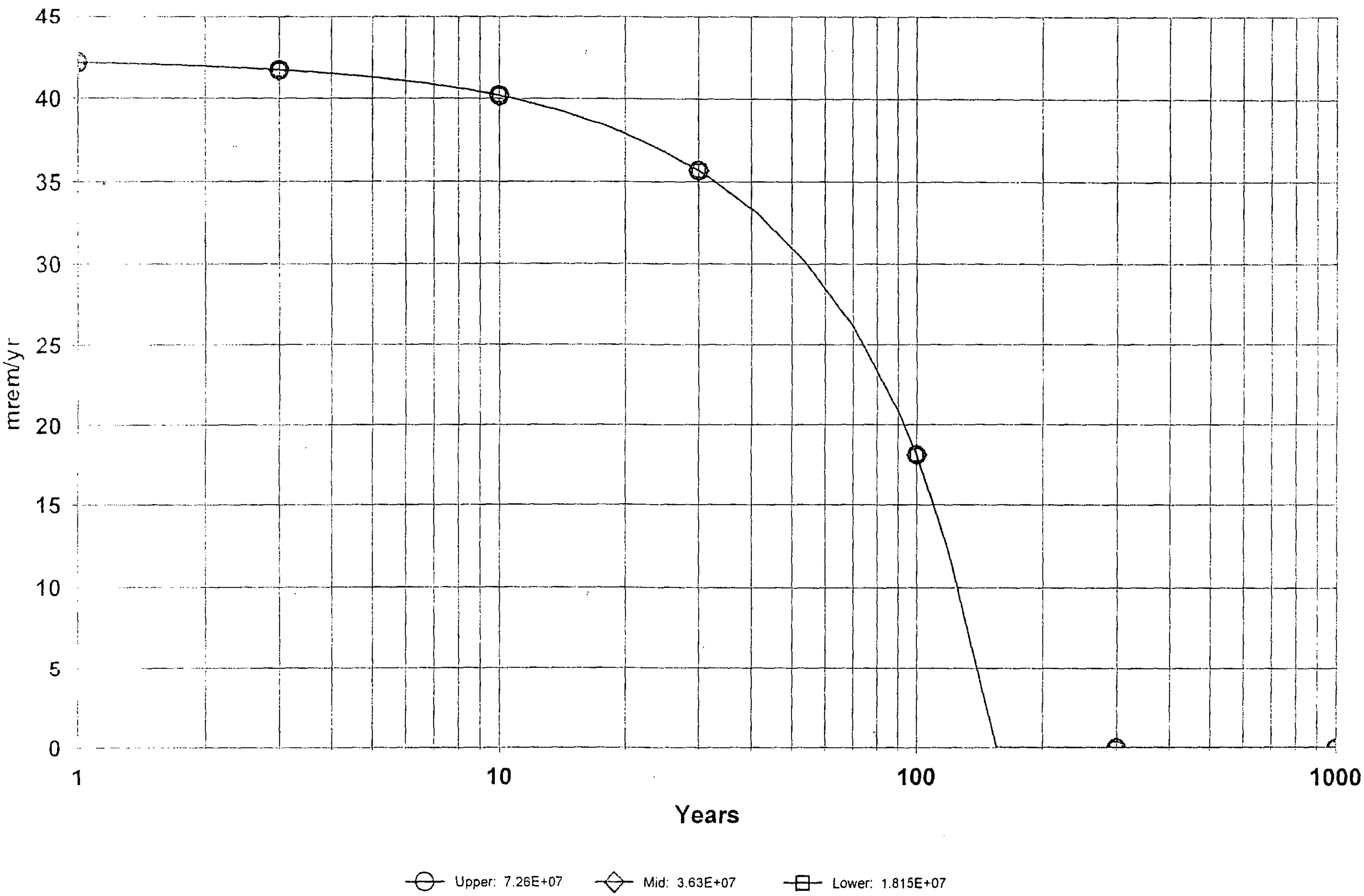
Ra022704.RAD 02/27/2004 10:22 Includes All Pathways

DOSE: All Nuclides Summed, All Pathways Summed With SA on Runoff coefficient

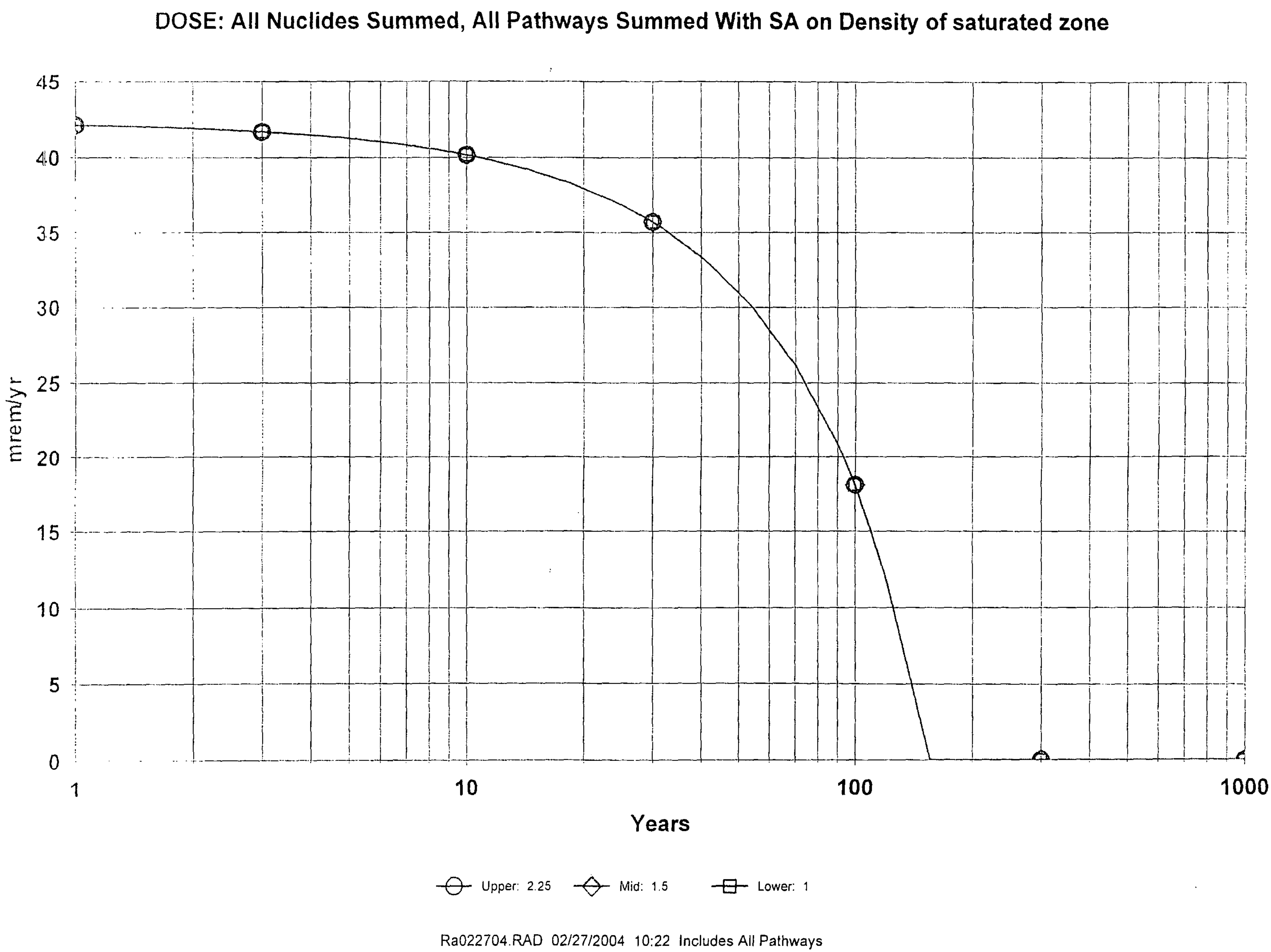


Ra022704.RAD 02/27/2004 10:22 Includes All Pathways

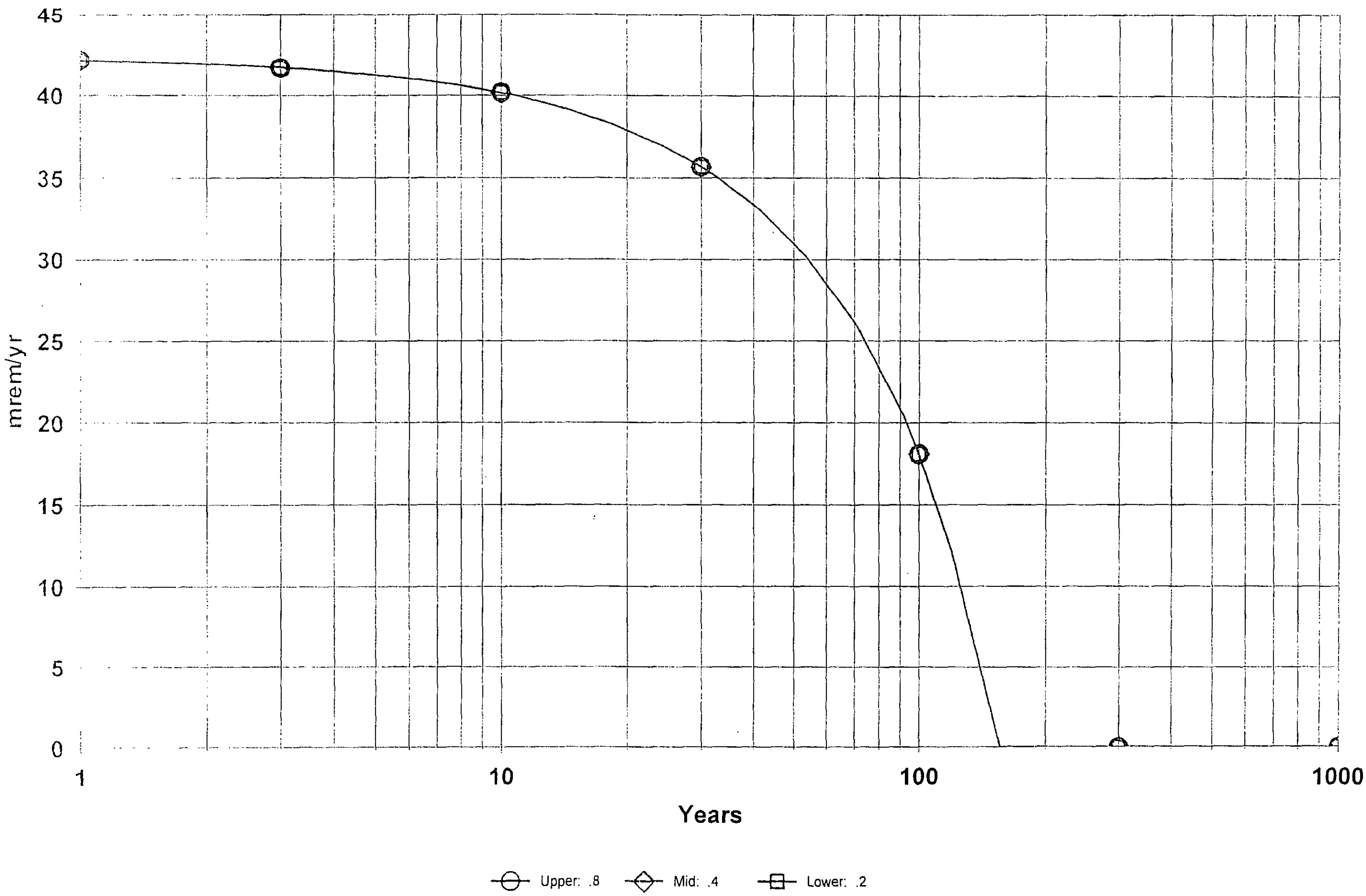
DOSE: All Nuclides Summed, All Pathways Summed With SA on Watershed area for nearby stream or pond



Ra022704.RAD 02/27/2004 10:22 Includes All Pathways

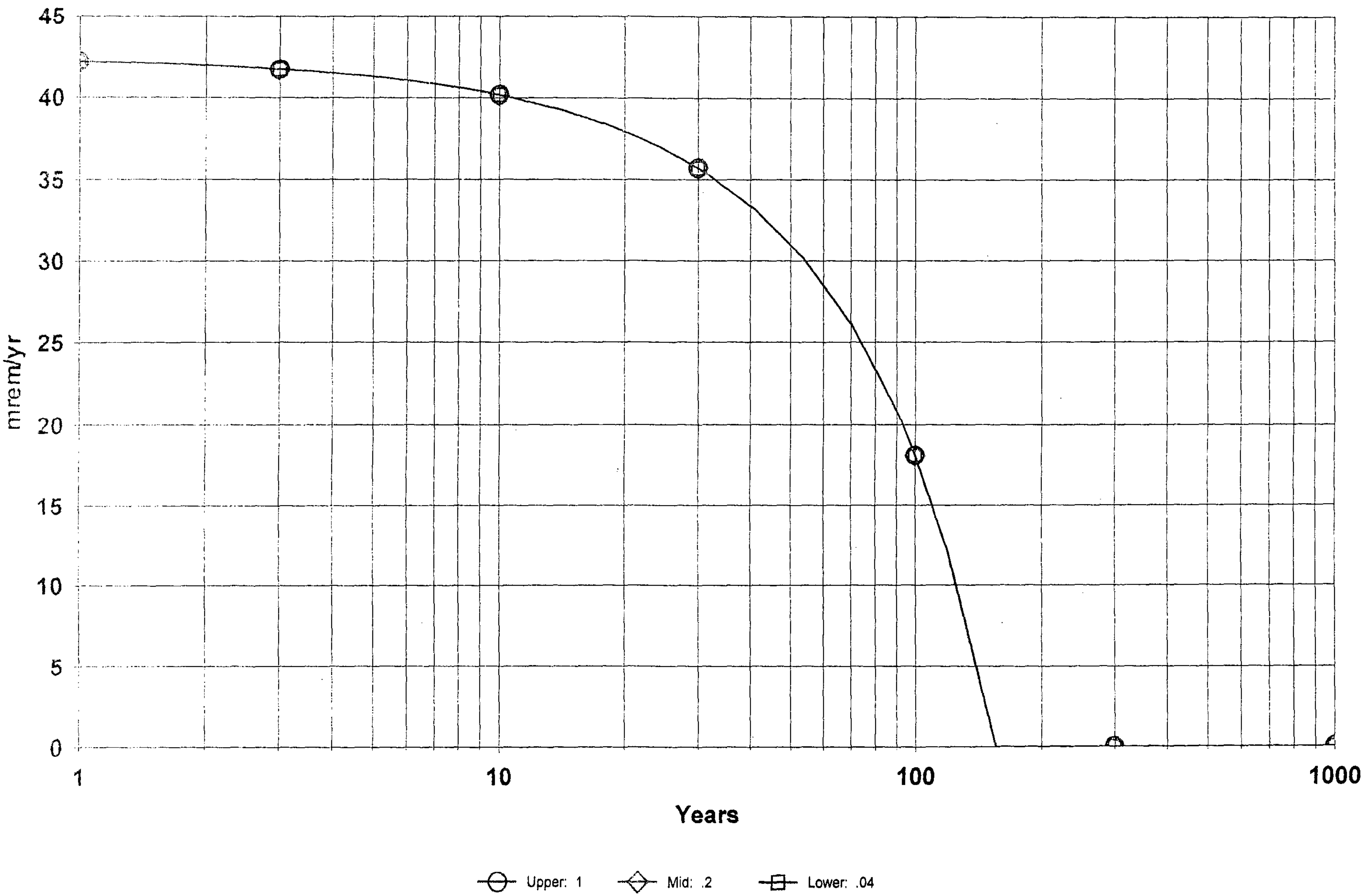

DOSE: All Nuclides Summed, All Pathways Summed With SA on Density of saturated zone
45
40
35
30
25
20
15
10
5
0
mrem/yr
1
10
100
1000
Years
Upper: 2.25
Mid: 1.5
Lower: 1
Ra022704.RAD 02/27/2004 10:22 Includes All Pathways

DOSE: All Nuclides Summed, All Pathways Summed With SA on Saturated zone total porosity



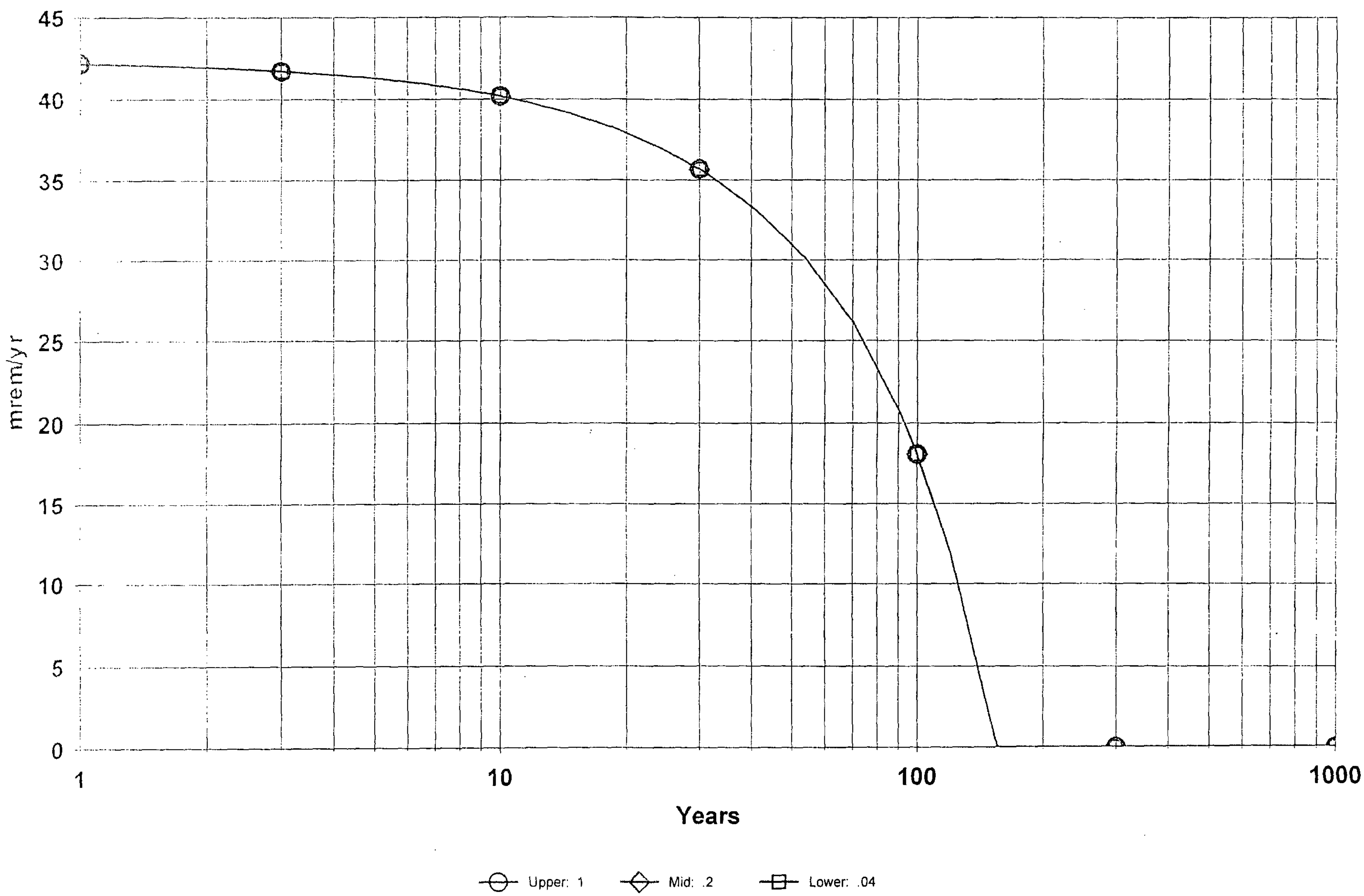
Ra022704.RAD 02/27/2004 10:22 Includes All Pathways

DOSE: All Nuclides Summed, All Pathways Summed With SA on Saturated zone effective porosity

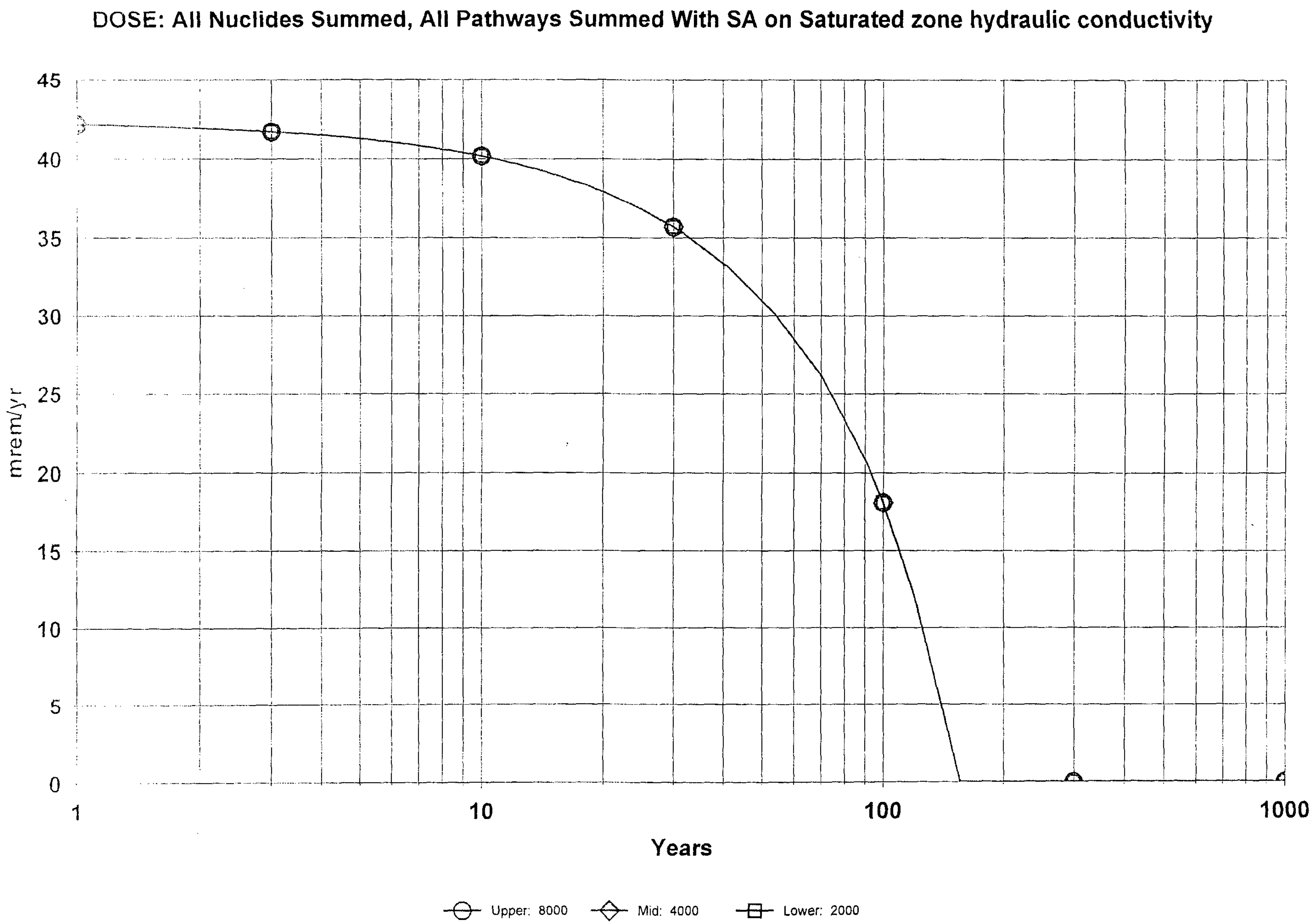


Ra022704.RAD 05/24/2004 16:52 Includes All Pathways

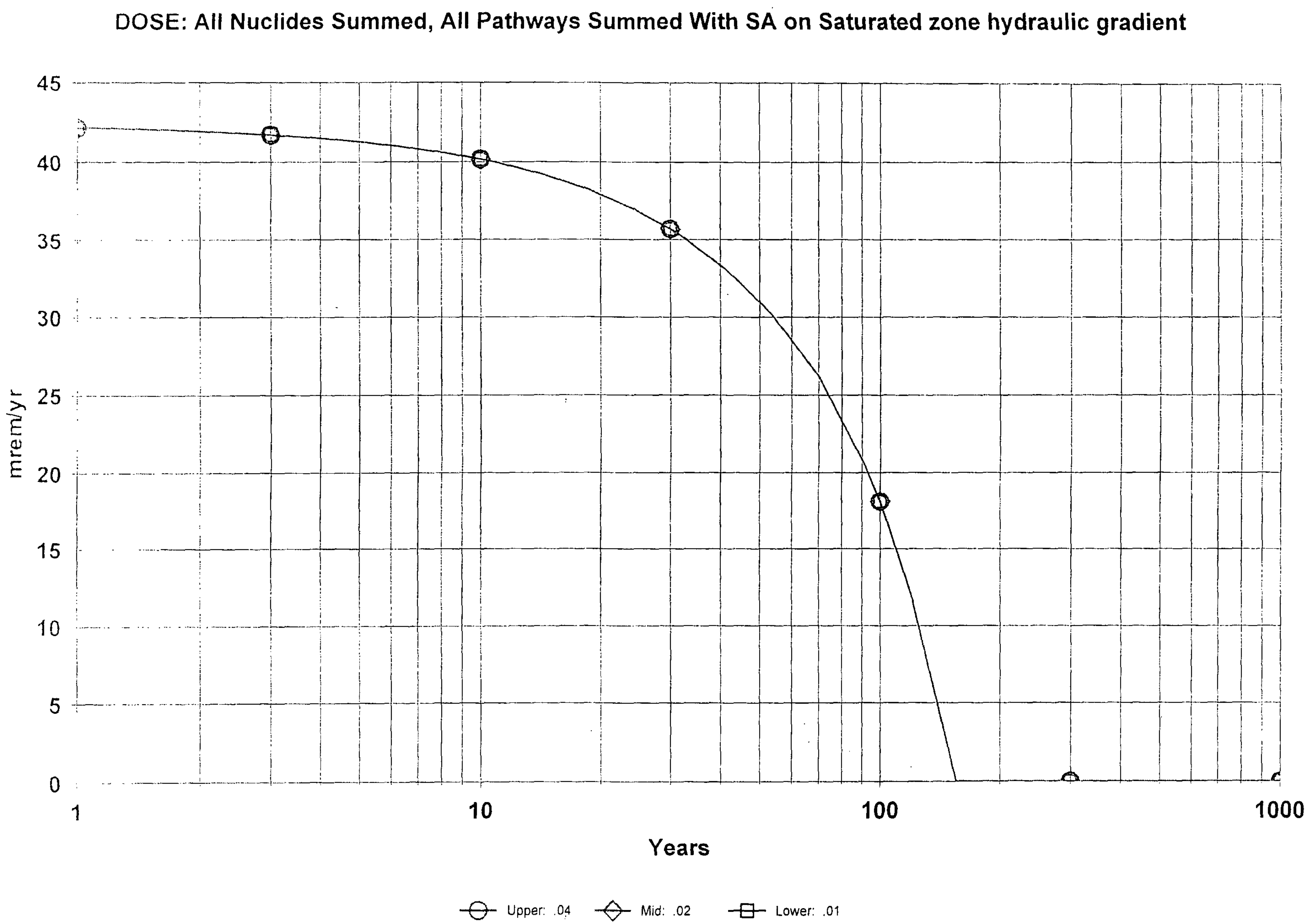
DOSE: All Nuclides Summed, All Pathways Summed With SA on Saturated zone field capacity



Ra022704.RAD 02/27/2004 16:11 Includes All Pathways

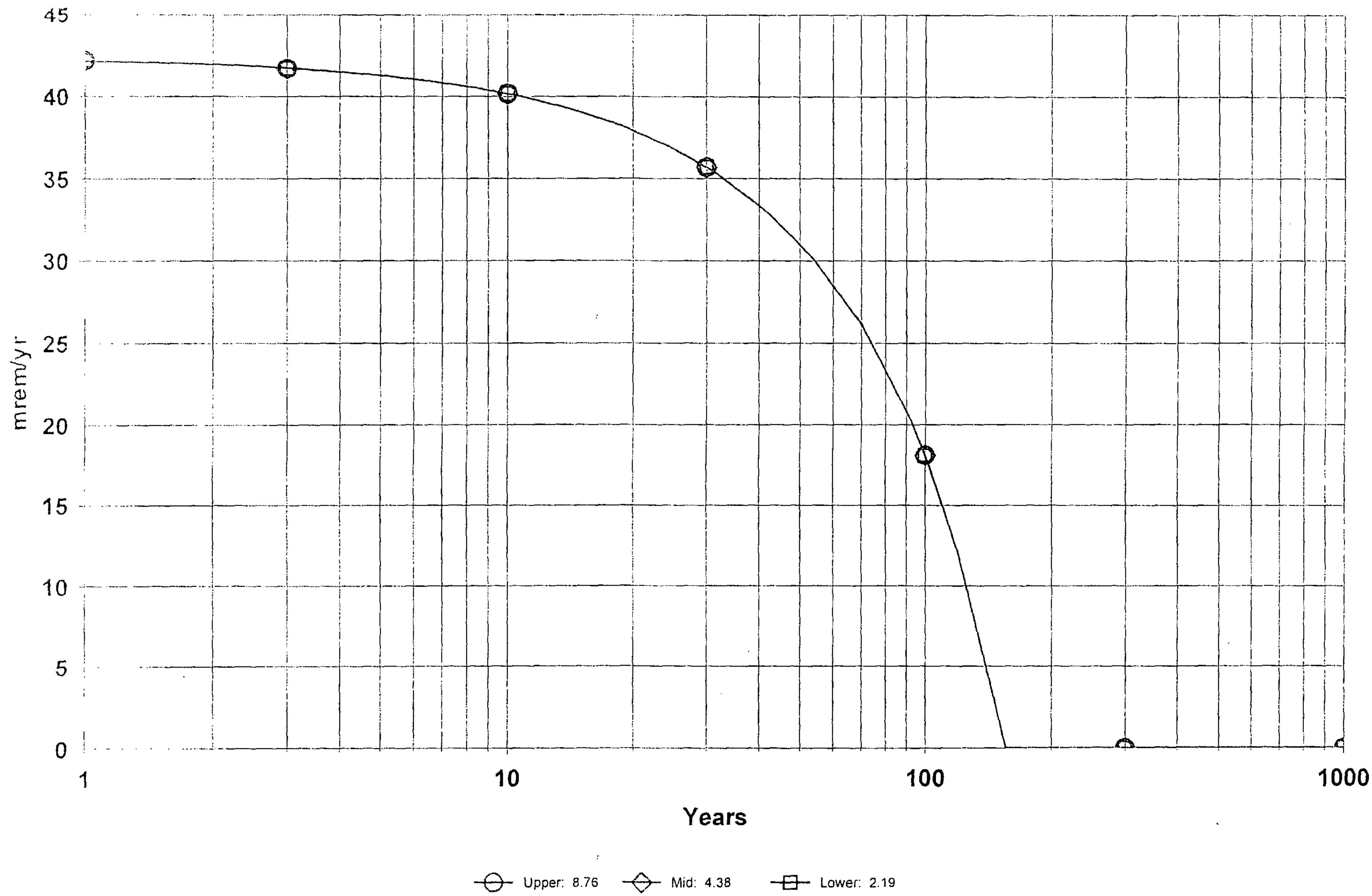


Ra022704.RAD 02/27/2004 15:34 Includes All Pathways



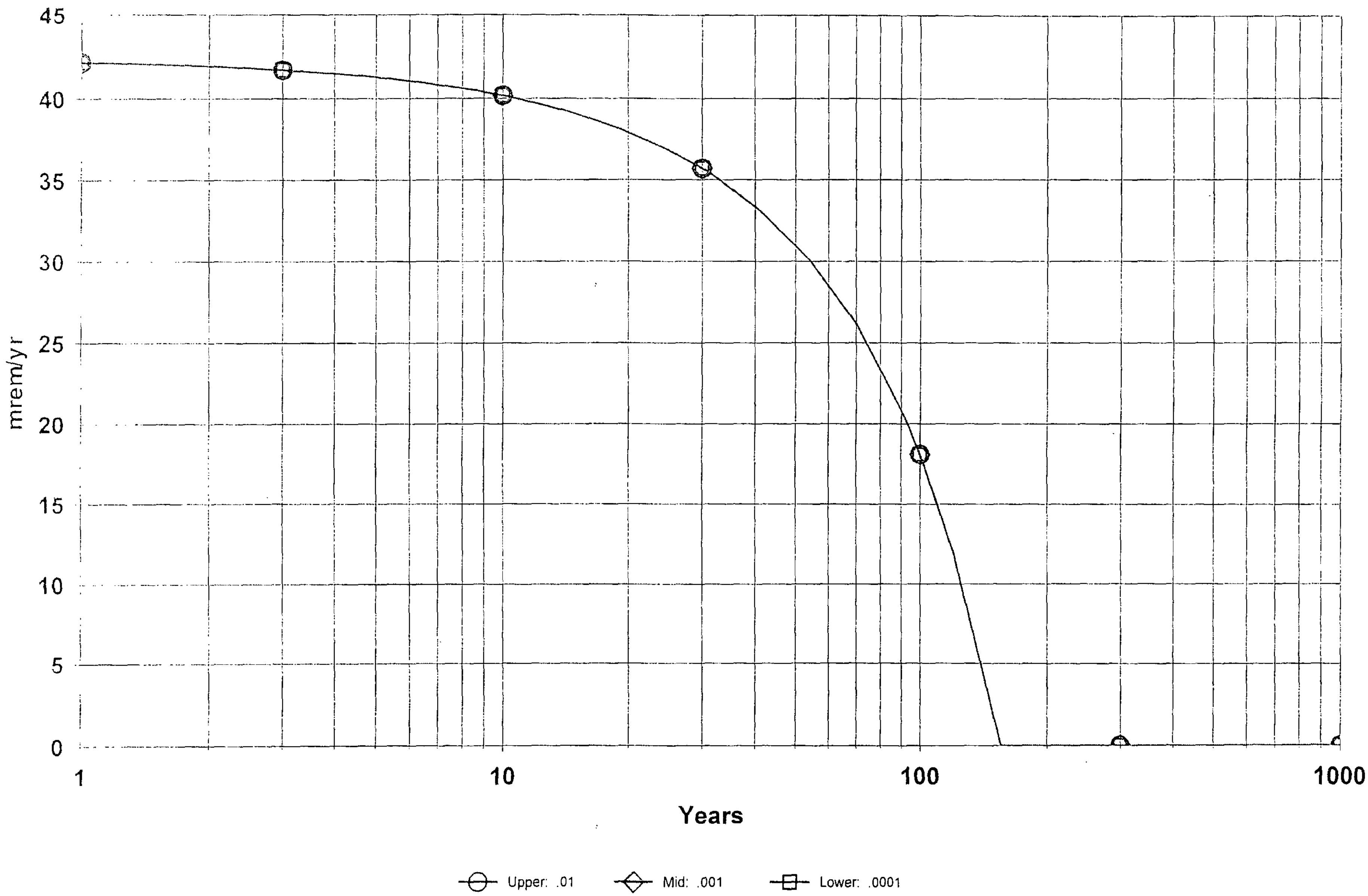
Ra022704.RAD 02/27/2004 10:35 Includes All Pathways

DOSE: All Nuclides Summed, All Pathways Summed With SA on Saturated zone b parameter

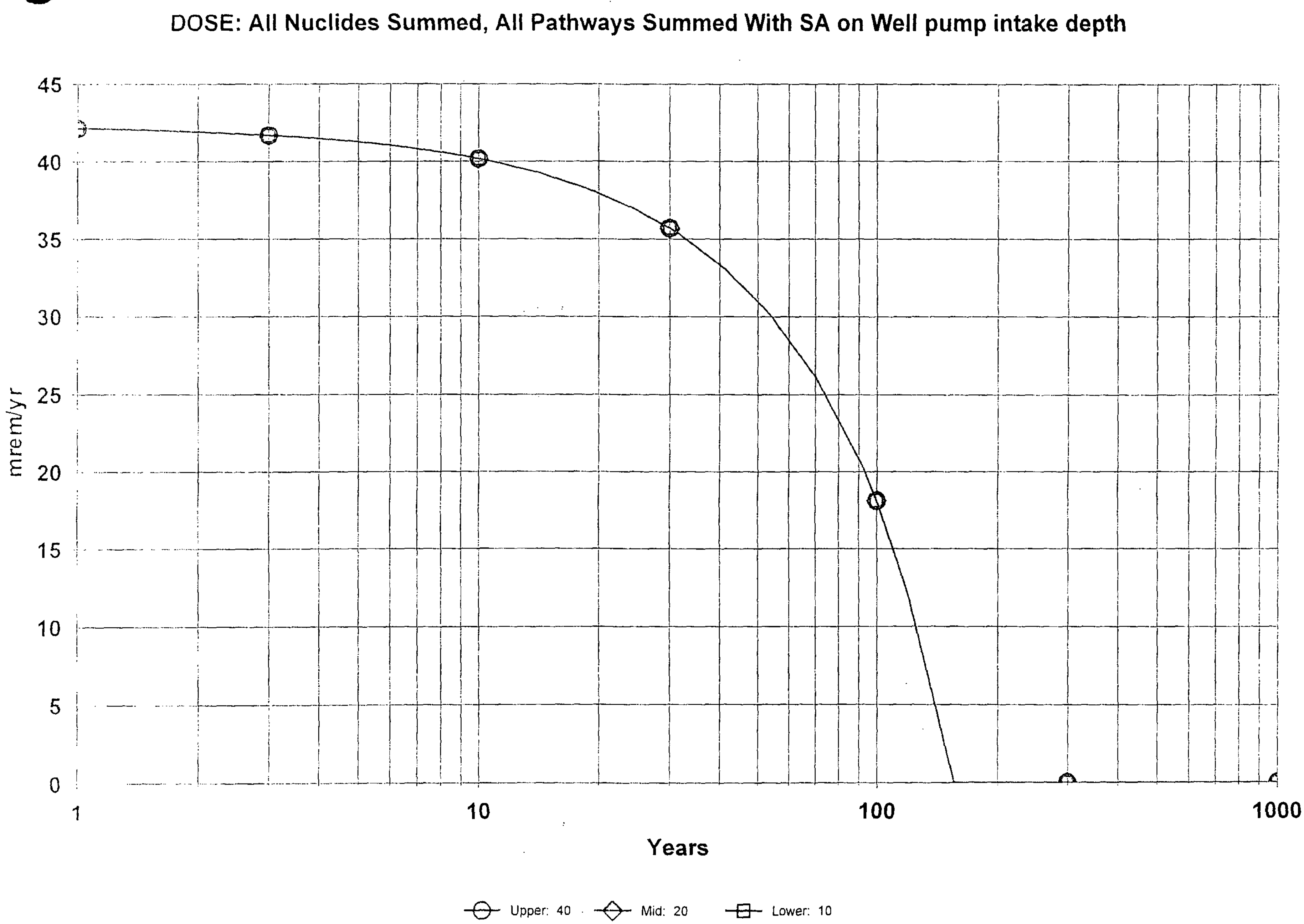


Ra022704.RAD 02/27/2004 10:35 Includes All Pathways

DOSE: All Nuclides Summed, All Pathways Summed With SA on Water table drop rate

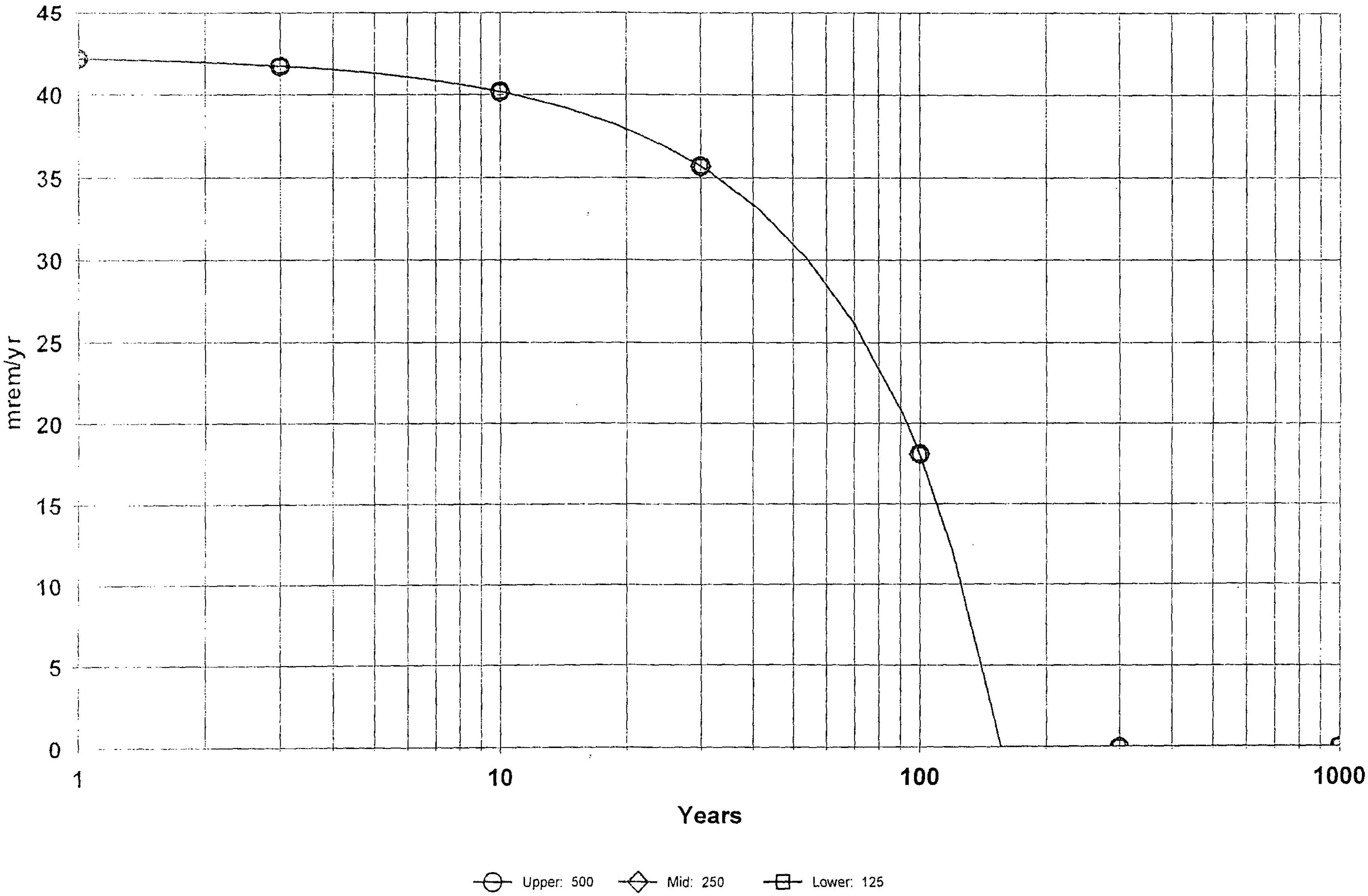


Ra022704.RAD 02/27/2004 10:35 Includes All Pathways



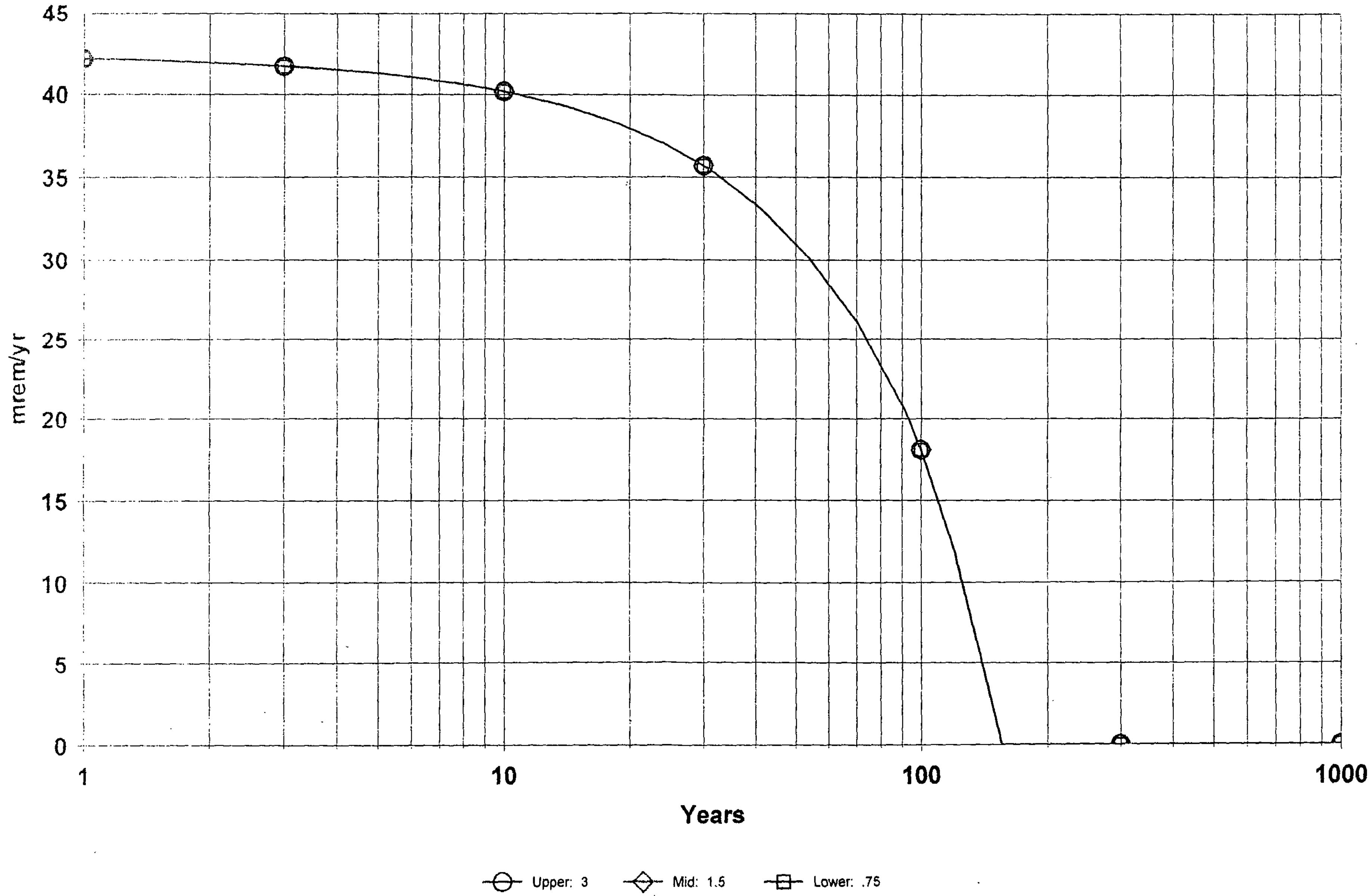
Ra022704.RAD 02/27/2004 10:35 Includes All Pathways

DOSE: All Nuclides Summed, All Pathways Summed With SA on Well pumping rate

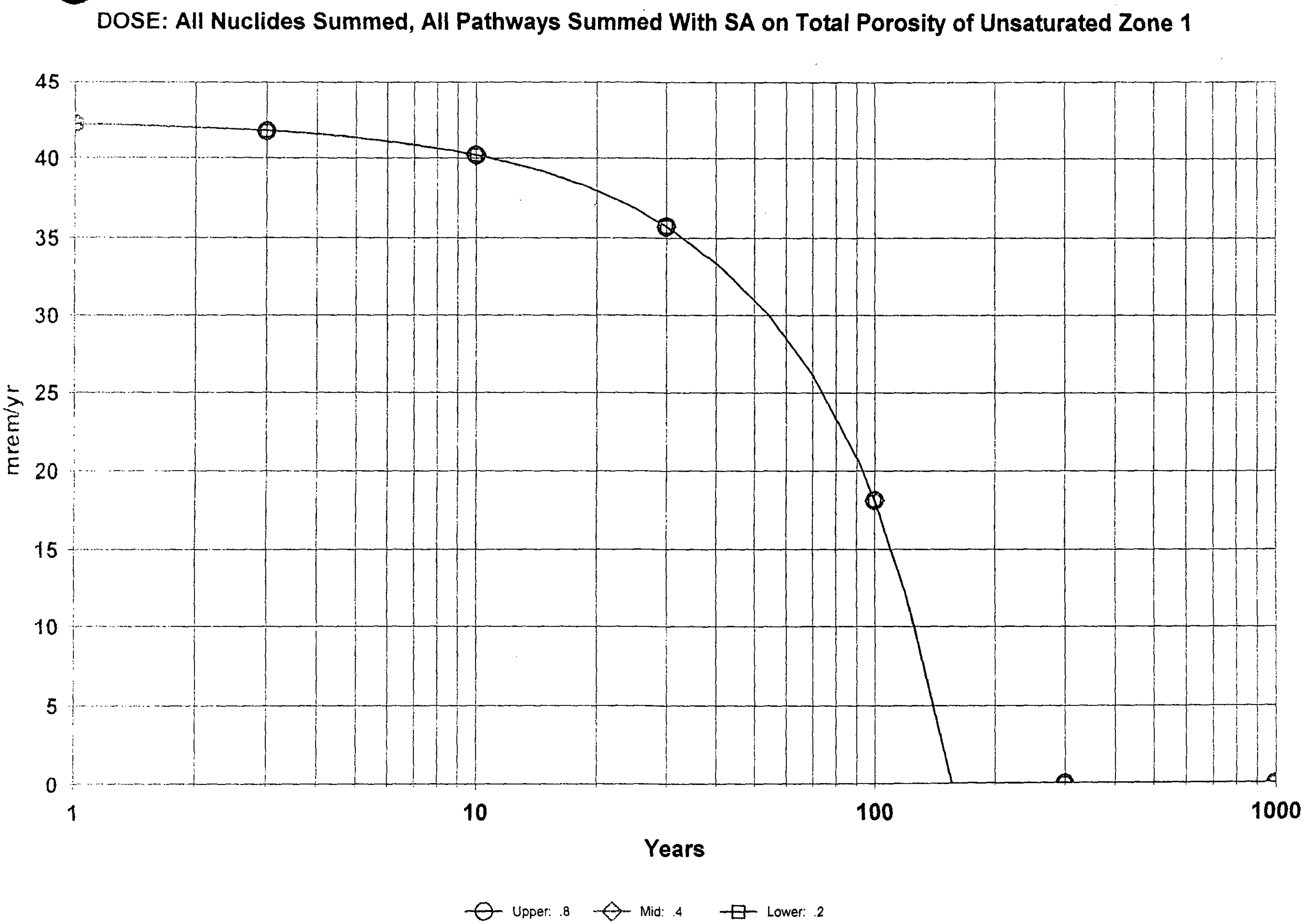


Ra022704.RAD 02/27/2004 10:35 Includes All Pathways

DOSE: All Nuclides Summed, All Pathways Summed With SA on Density of Unsaturated Zone 1

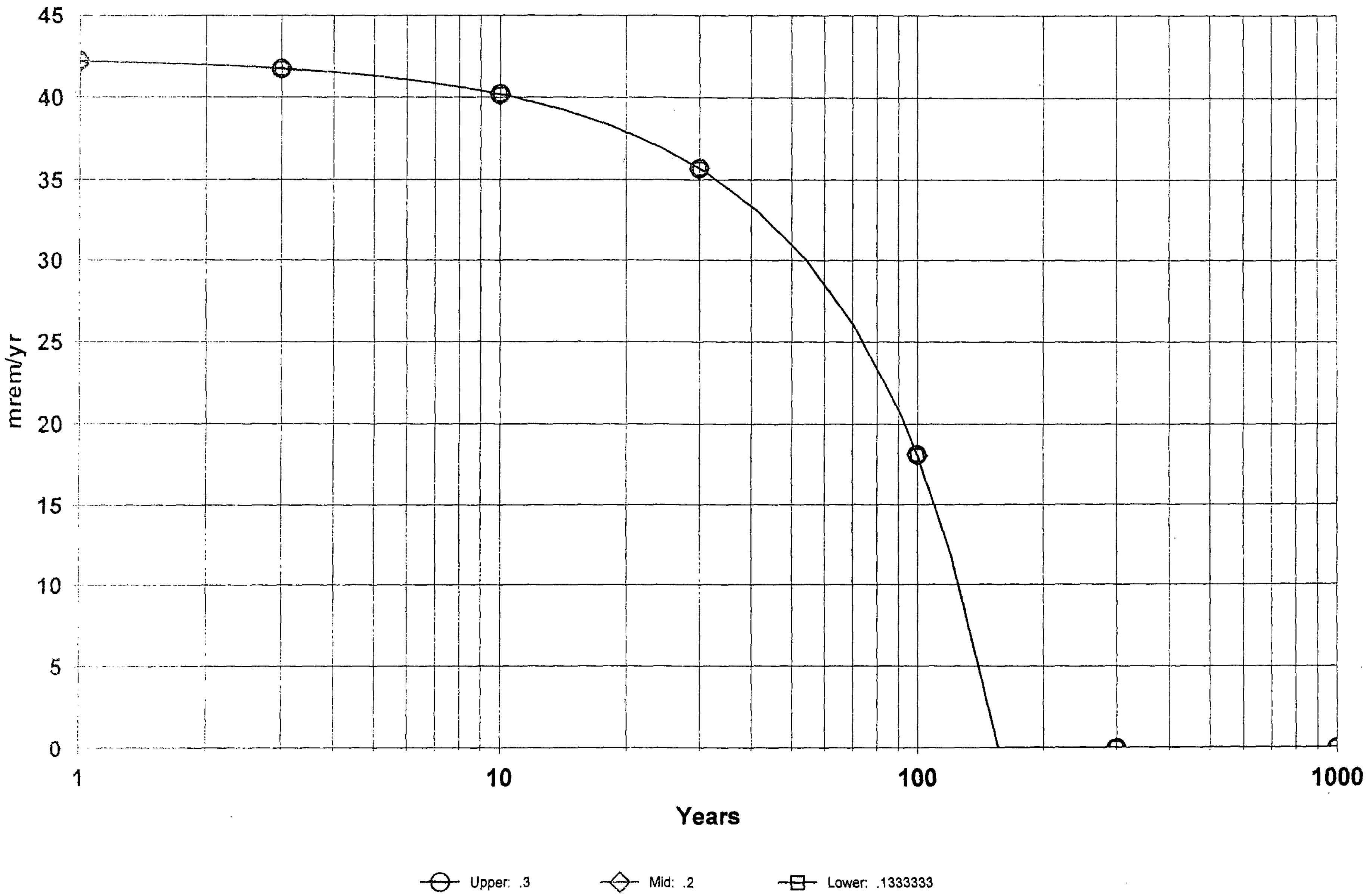


Ra022704.RAD 05/24/2004 17:32 Includes All Pathways

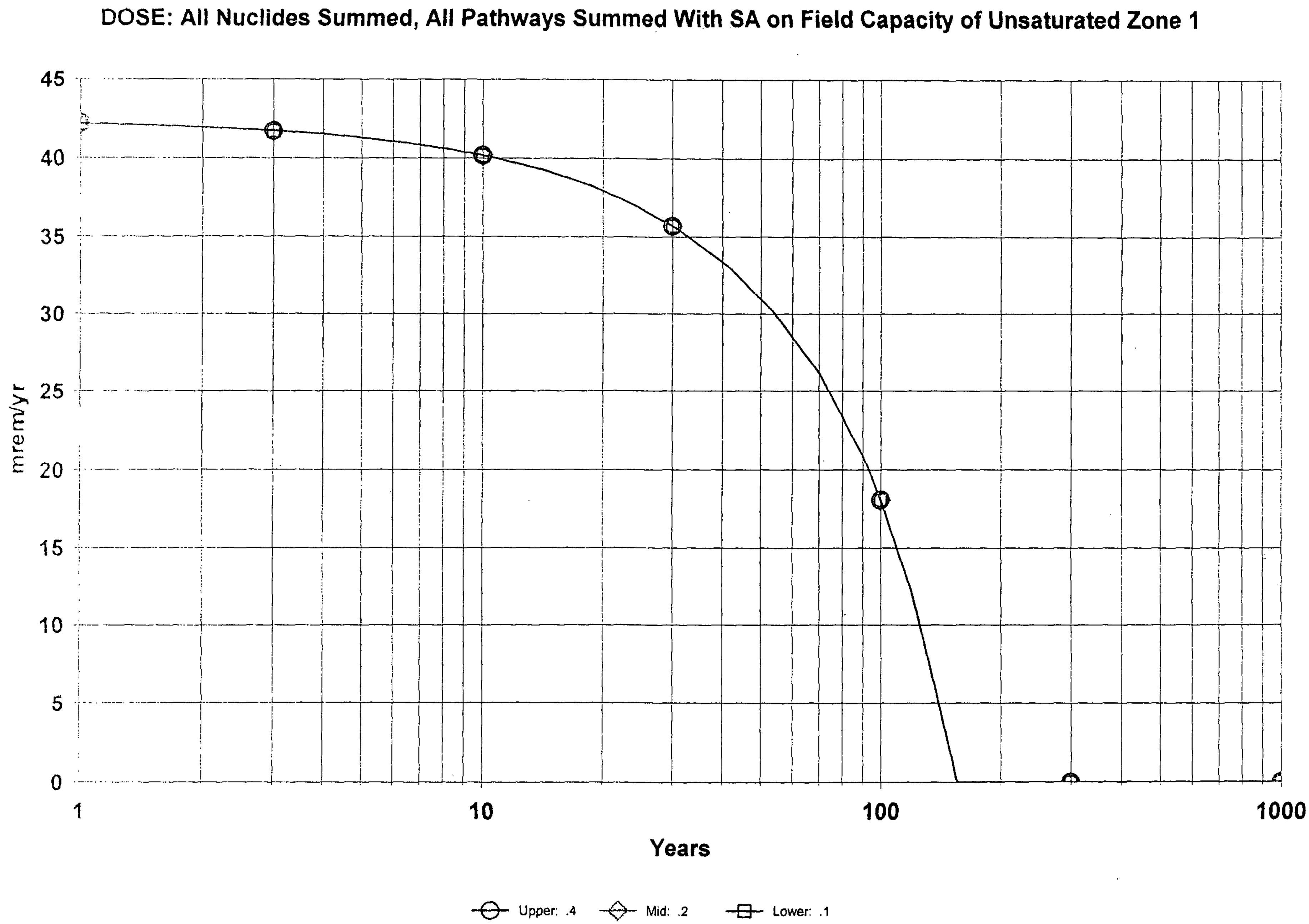


Ra022704.RAD 05/24/2004 17:32 Includes All Pathways

DOSE: All Nuclides Summed, All Pathways Summed With SA on Effective Porosity of Unsaturated Zone 1

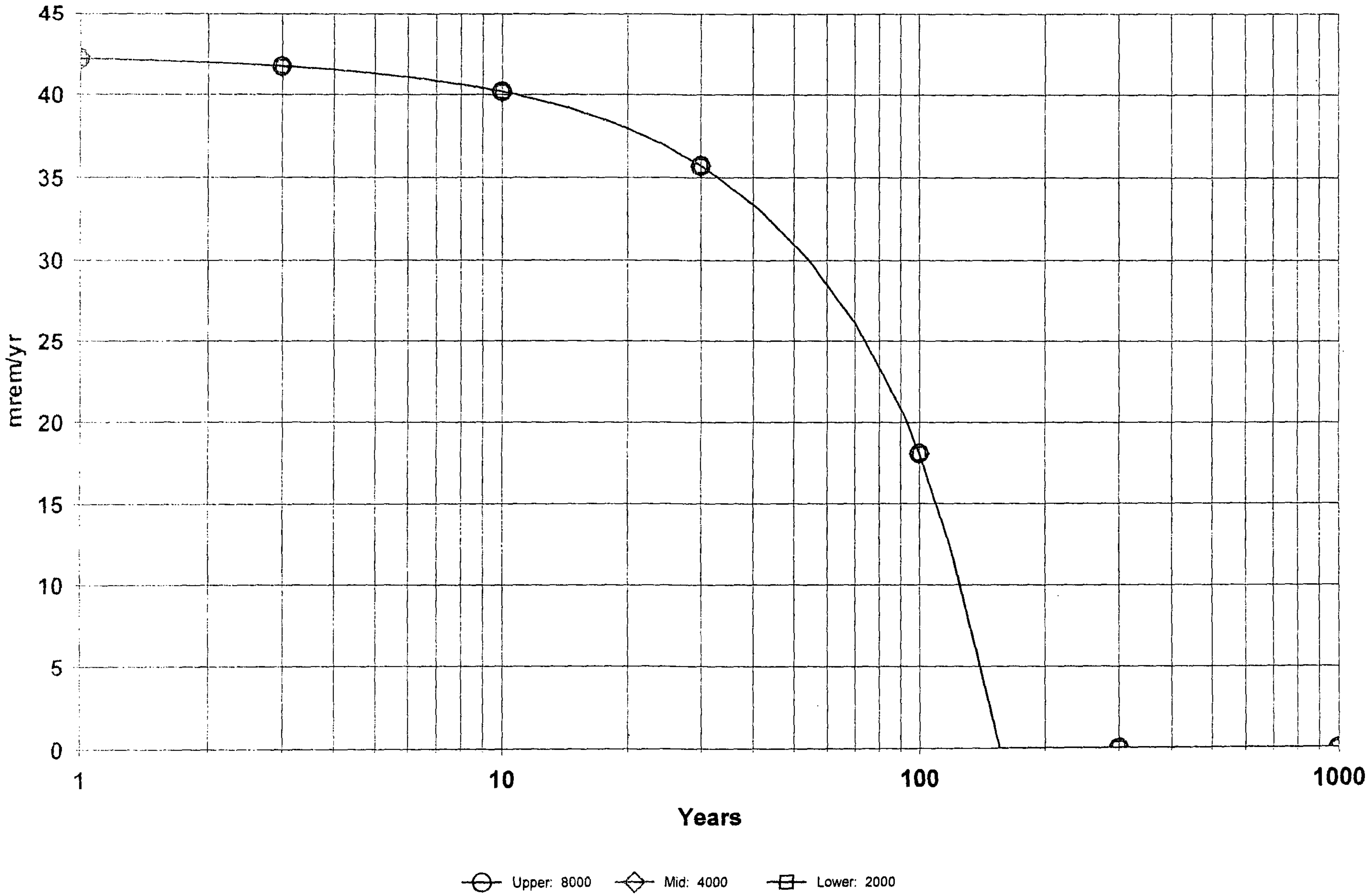


Ra022704.RAD 05/24/2004 17:32 Includes All Pathways

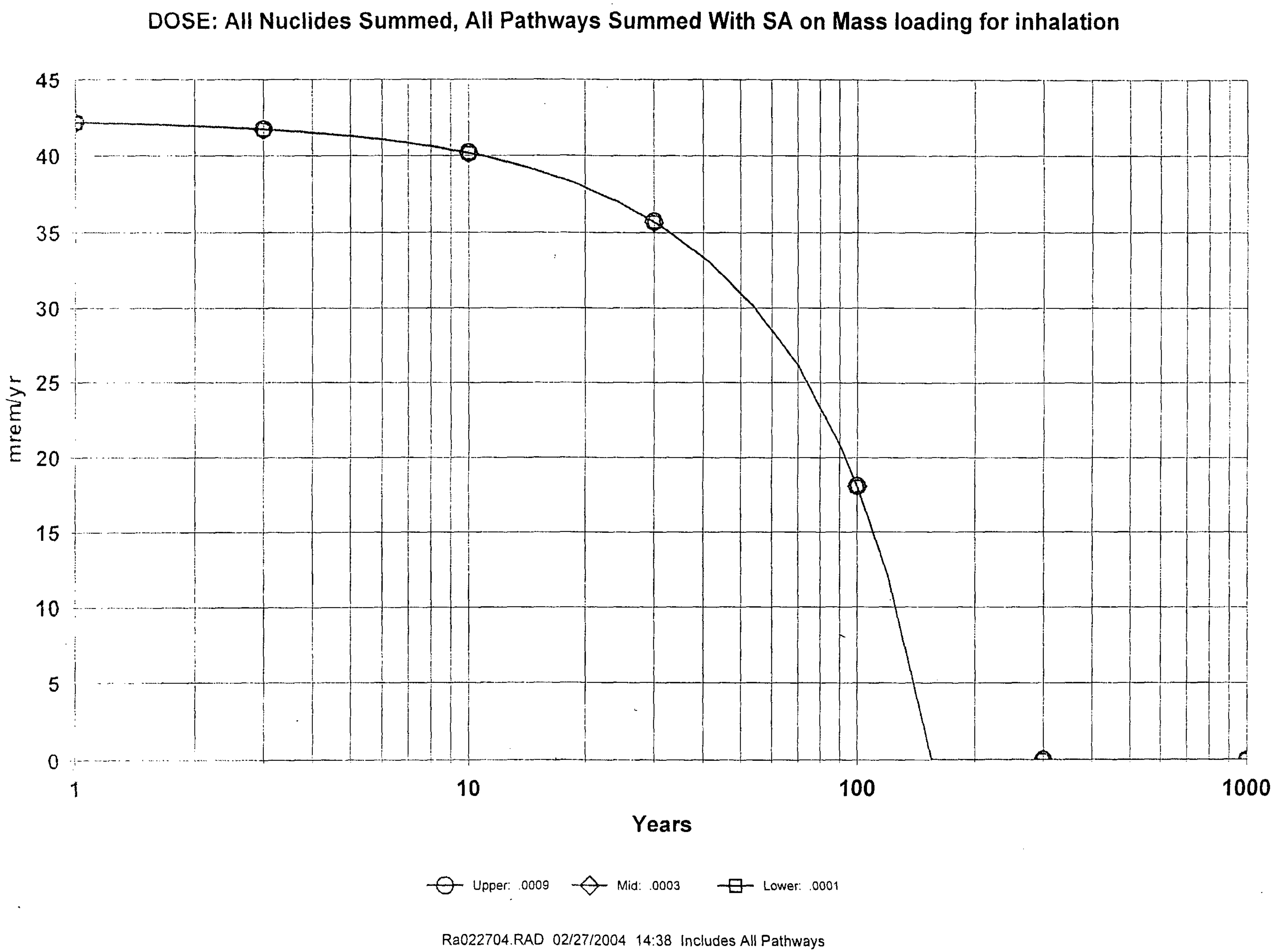


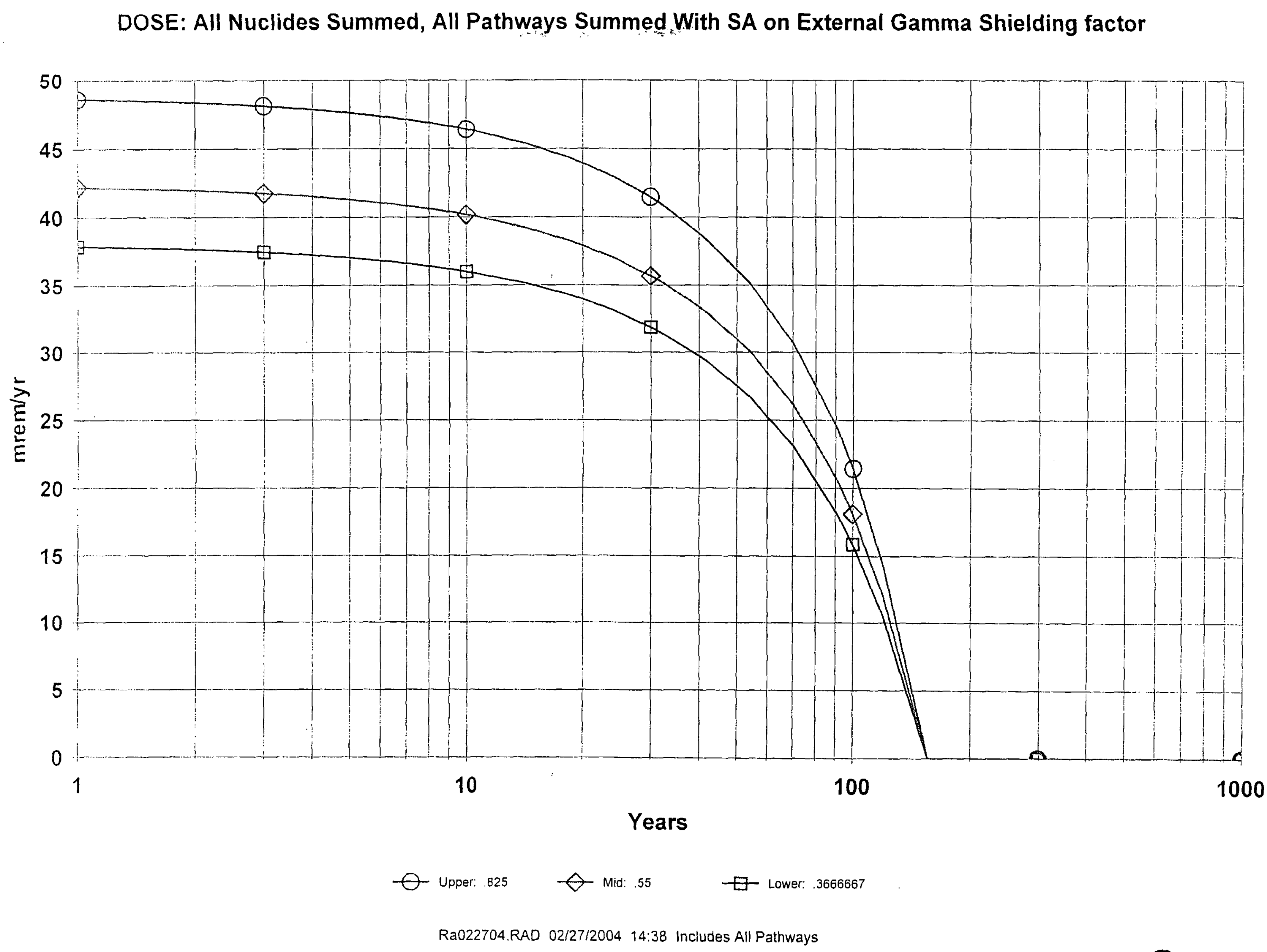
Ra022704.RAD 05/24/2004 17:32 Includes All Pathways

DOSE: All Nuclides Summed, All Pathways Summed With SA on Hydraulic Conductivity of Unsaturated Zone 1

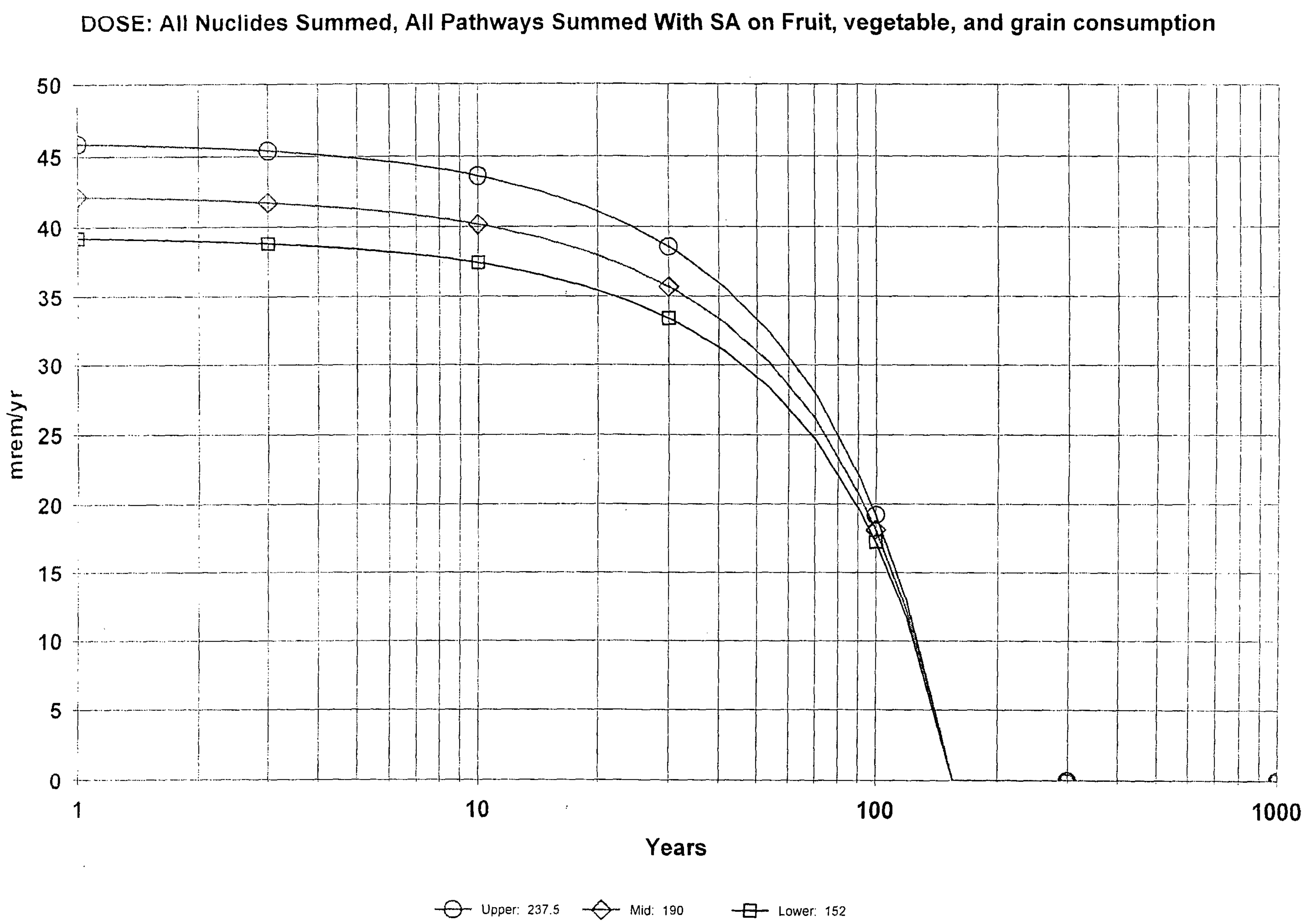


Ra022704.RAD 05/24/2004 17:32 Includes All Pathways

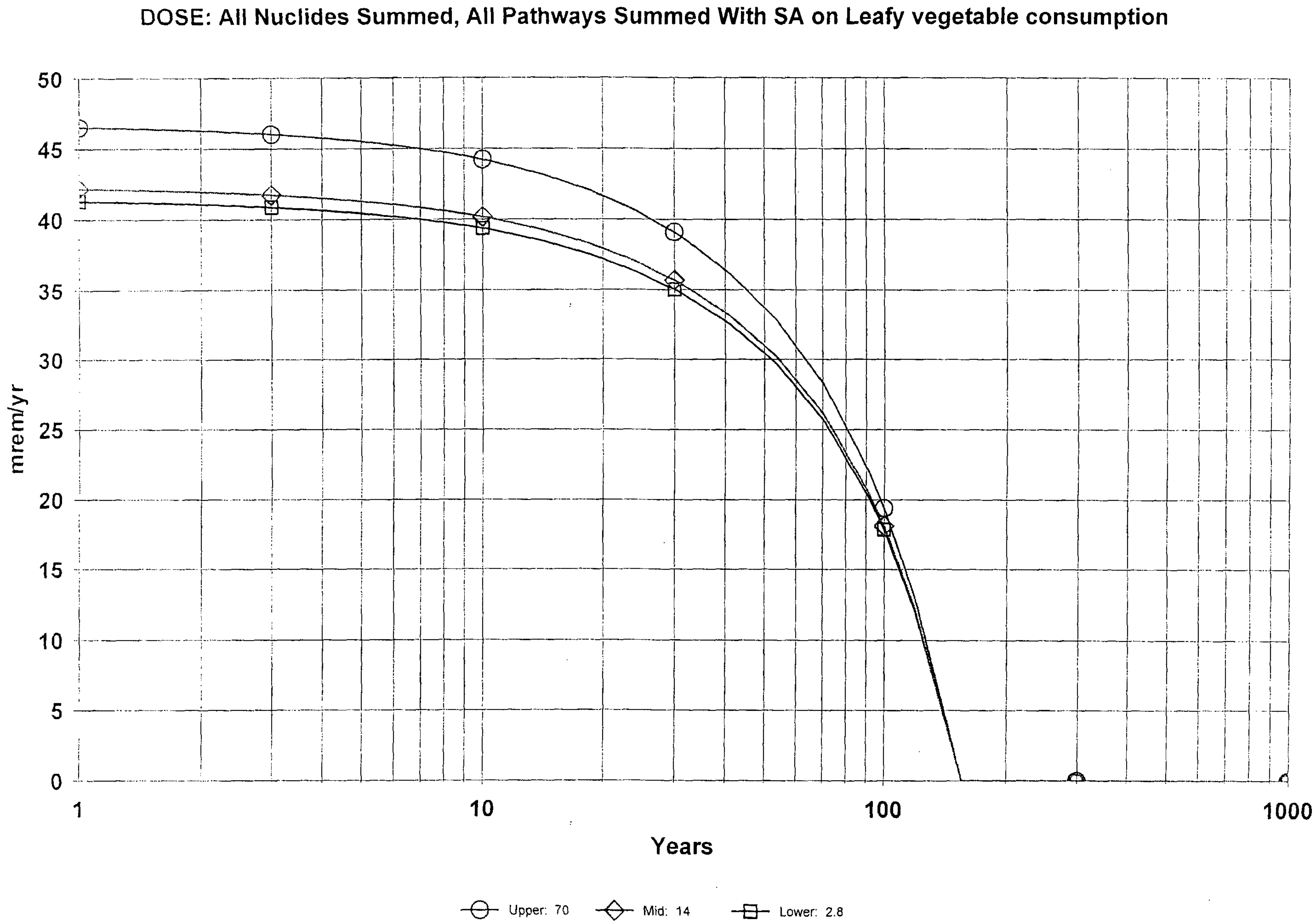

DOSE: All Nuclides Summed, All Pathways Summed With SA on Mass loading for inhalation
45
40
35
30
25
20
15
10
5
0
mrem/yr
1
10
100
1000
Years
Upper: .0009
Mid: .0003
Lower: .0001
Ra022704.RAD 02/27/2004 14:38 Includes All Pathways



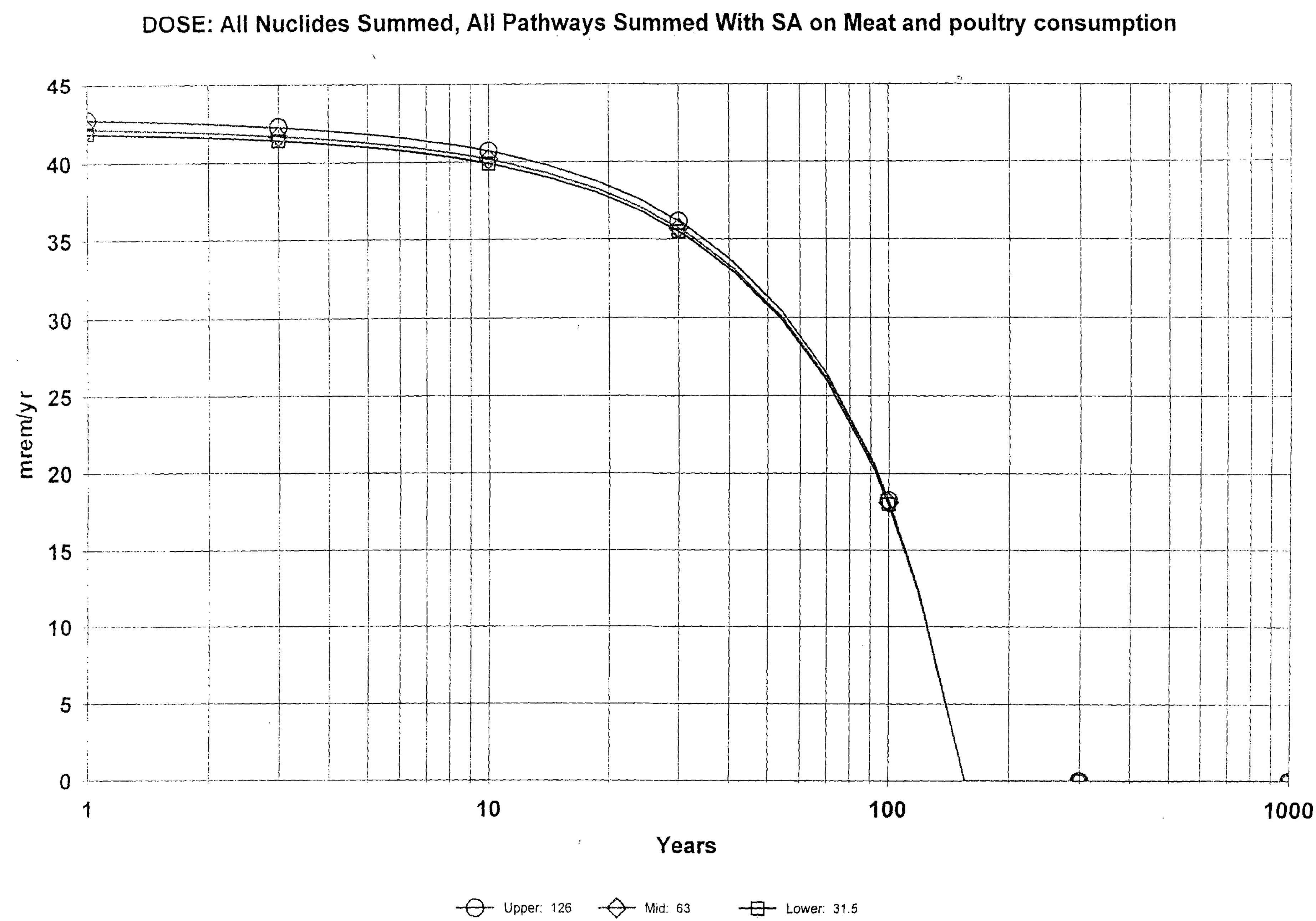
DOSE: All Nuclides Summed, All Pathways Summed With SA on External Gamma Shielding factor
mrem/yr
50
45
40
35
30
25
20
15
10
5
0
1
10
100
1000
Years
Upper: .825
Mid: .55
Lower: .3666667
Ra022704.RAD 02/27/2004 14:38 Includes All Pathways



Ra022704.RAD 02/27/2004 14:38 Includes All Pathways

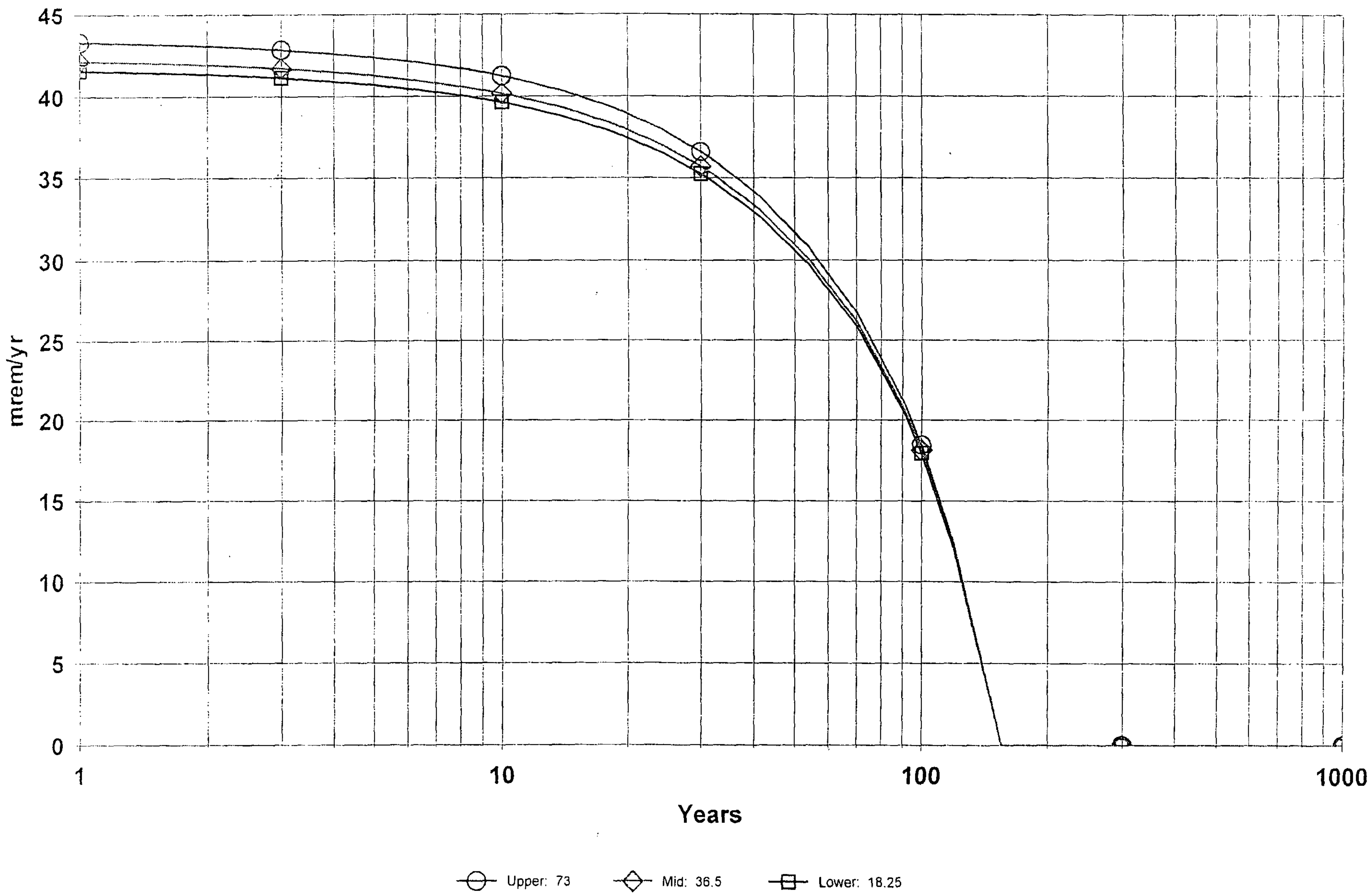


Ra022704.RAD 02/27/2004 14:38 Includes All Pathways



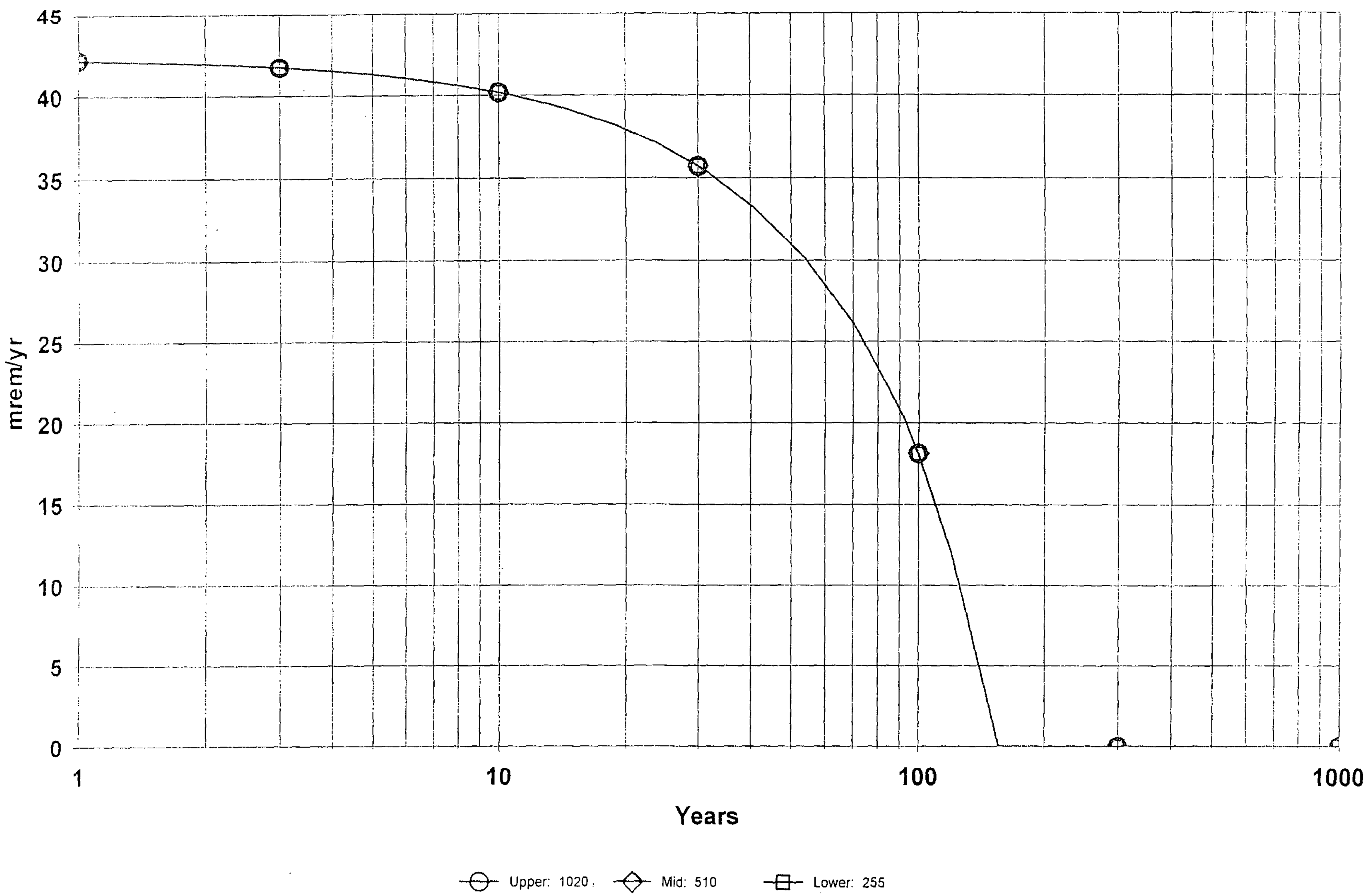
Ra022704.RAD 02/27/2004 14:38 Includes All Pathways

DOSE: All Nuclides Summed, All Pathways Summed With SA on Soil ingestion



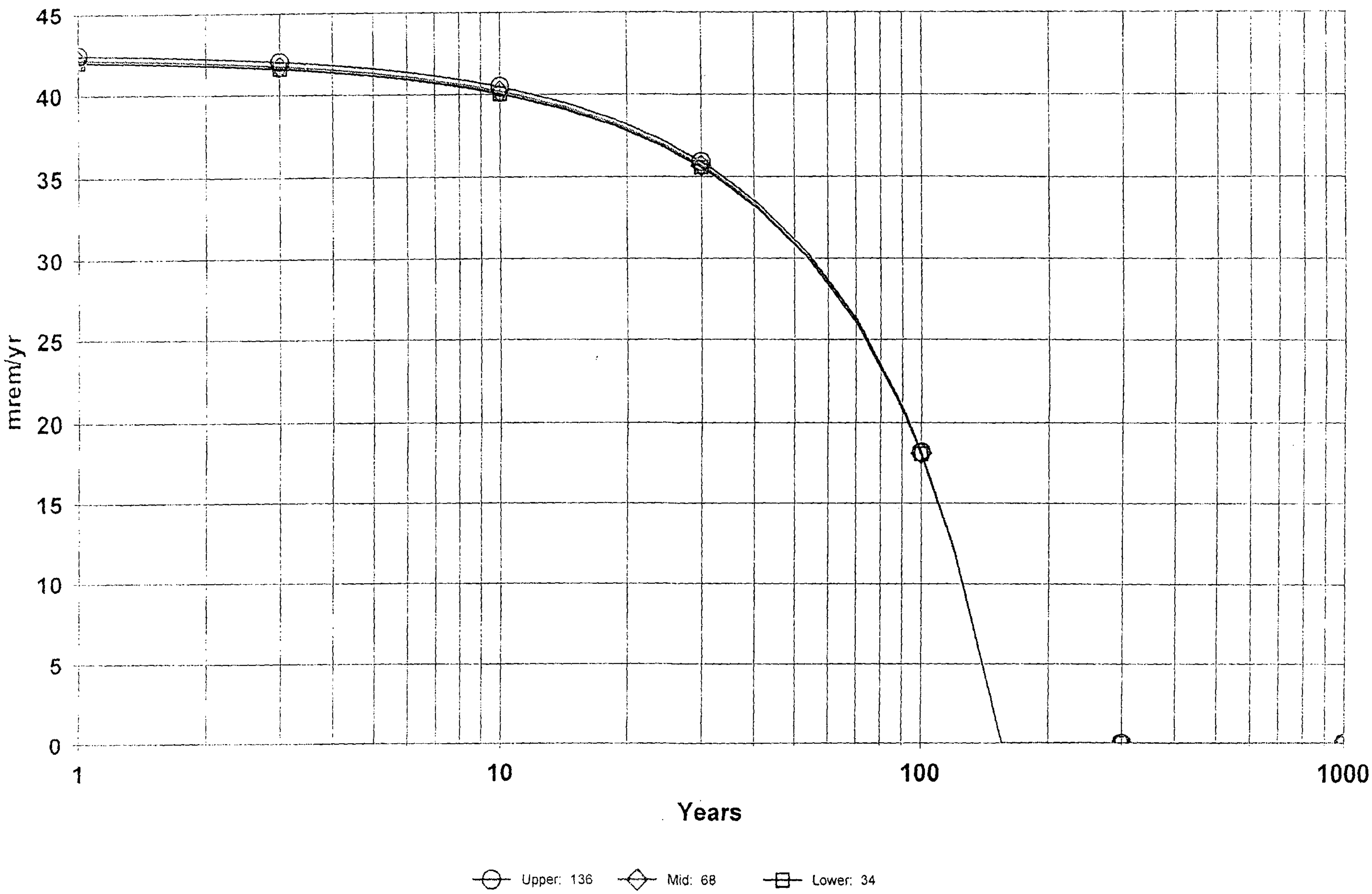
Ra022704.RAD 02/27/2004 11:01 Includes All Pathways

DOSE: All Nuclides Summed, All Pathways Summed With SA on Drinking water intake

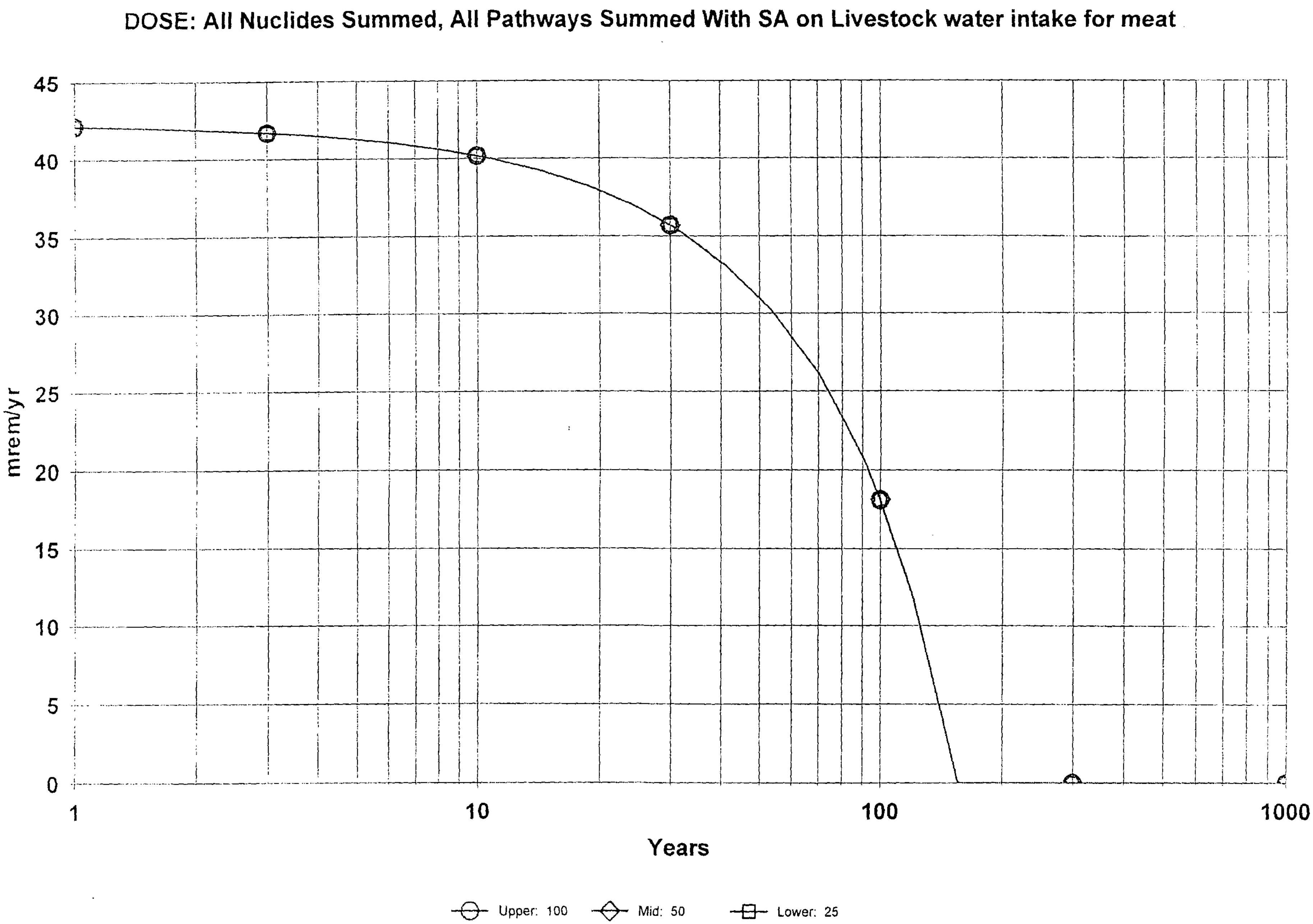


Ra022704.RAD 02/27/2004 11:01 Includes All Pathways

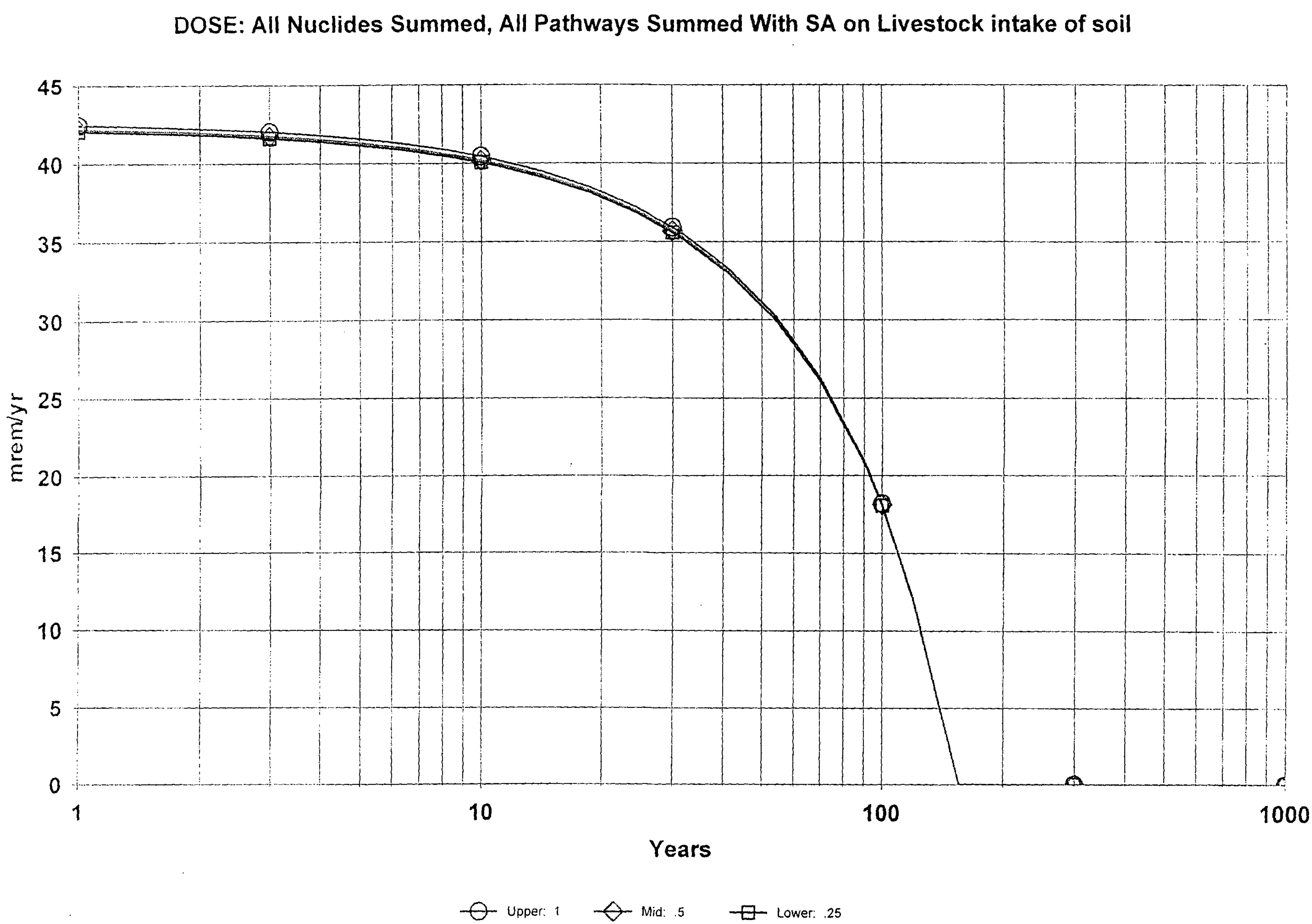
DOSE: All Nuclides Summed, All Pathways Summed With SA on Livestock fodder intake for meat



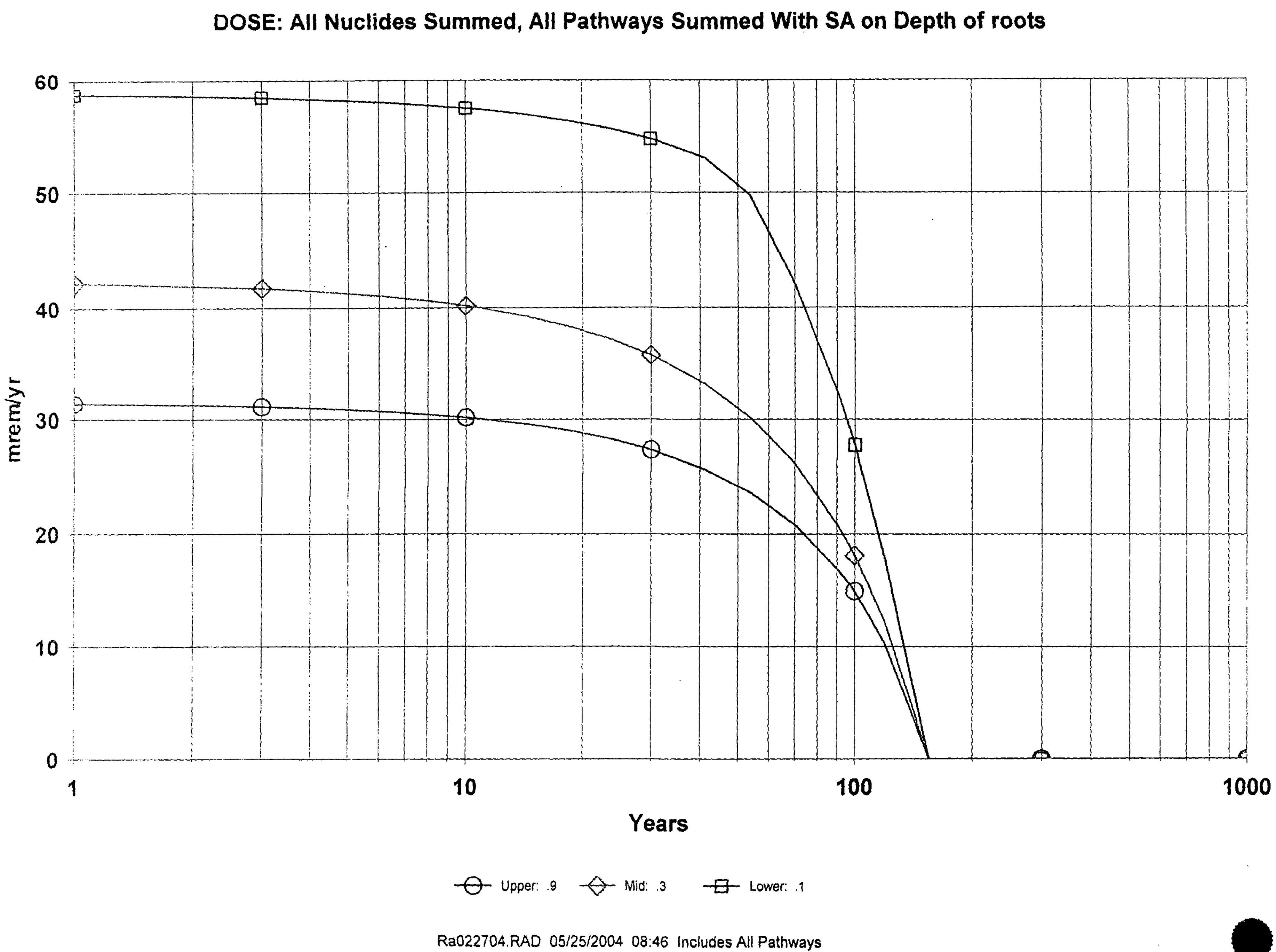
Ra022704.RAD 02/27/2004 11:01 Includes All Pathways

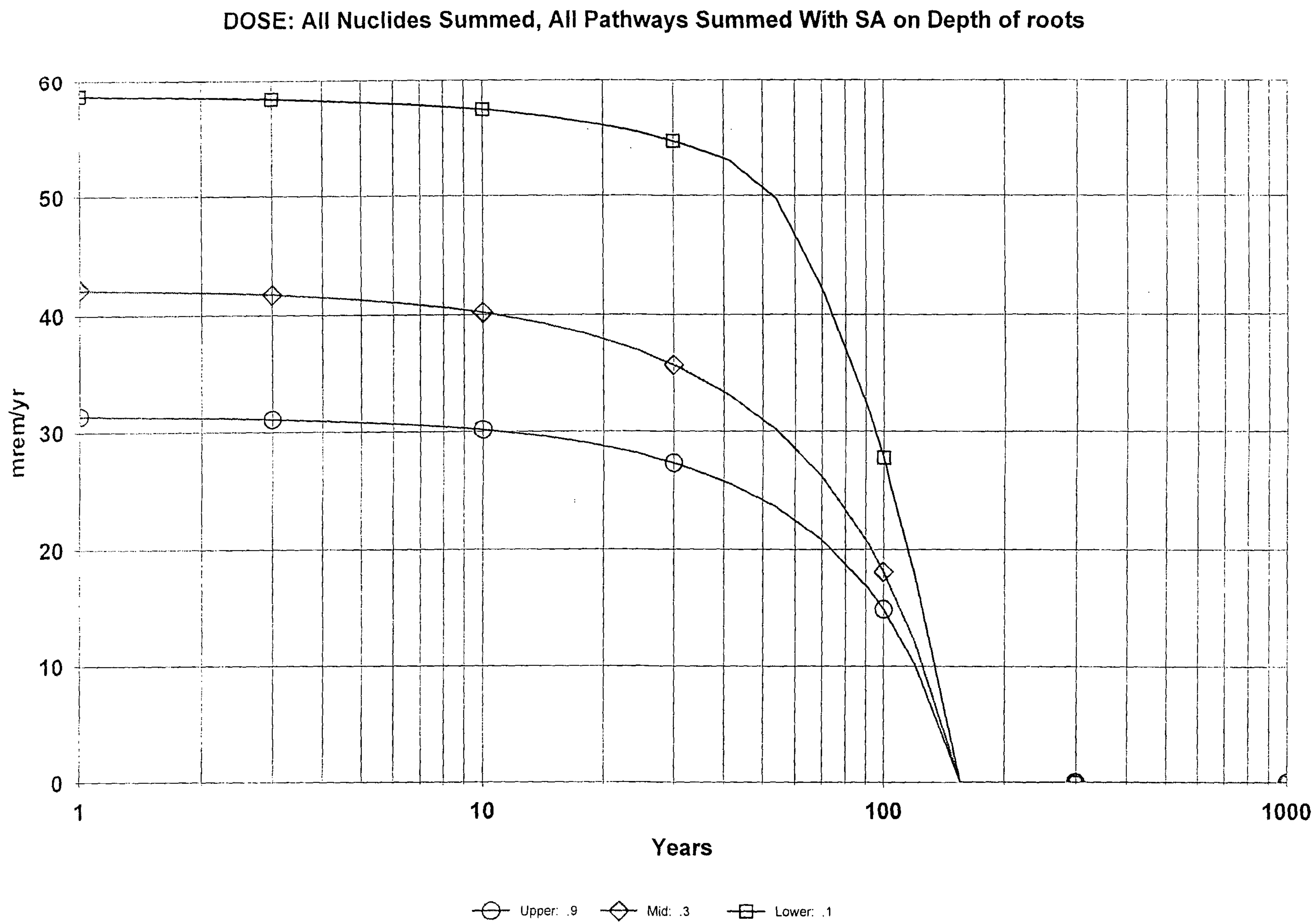


Ra022704.RAD 02/27/2004 11:01 Includes All Pathways



Ra022704.RAD 02/27/2004 11:01 Includes All Pathways


DOSE: All Nuclides Summed, All Pathways Summed With SA on Depth of roots
mrem/yr
60
50
40
30
20
10
0
1
10
100
1000
Years
Upper: .9
Mid: .3
Lower: .1
Ra022704.RAD 05/25/2004 08:46 Includes All Pathways



Ra022704.RAD 02/27/2004 11:09 Includes All Pathways

Attachment 3

RESRAD Model Output

Radium

Table of Contents

Part I: Mixture Sums and Single Radionuclide Guidelines

Dose Conversion Factor (and Related) Parameter Summary
File: HEAST 1995 Morbidity

	Parameter	Current Value	Default	Parameter Name
·1	Dose conversion factors for inhalation, mrem/pCi:			
·1	Pb-210+D	2.320E-02	2.320E-02	DCF2(1)
·1	Ra-226+D	8.600E-03	8.600E-03	DCF2(2)
1	Dose conversion factors for ingestion, mrem/pCi:			
1	Pb-210+D	7.270E-03	7.270E-03	DCF3(1)
1	Ra-226+D	1.330E-03	1.330E-03	DCF3(2)
34	Food transfer factors:			
34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(1,1)
34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(1,2)
34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(1,3)
34				
34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(2,1)
34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(2,2)
34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(2,3)
5	Bioaccumulation factors, fresh water, L/kg:			
5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(1,1)
5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(1,2)
5				
5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(2,1)
5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(2,2)

Site-Specific Parameter Summary

enu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
	Area of contaminated zone (m**2)	1.000E+04	1.000E+04	---	AREA
11	Thickness of contaminated zone (m)	1.500E-01	2.000E+00	---	THICK0
11	Length parallel to aquifer flow (m)	1.000E+02	1.000E+02	---	LCZPAQ
11	Basic radiation dose limit (mrem/yr)	1.000E+02	2.500E+01	---	BRDL
11	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
11	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
11	Times for calculations (yr)	3.000E+00	3.000E+00	---	T(3)
11	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
11	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
11	Times for calculations (yr)	1.000E+02	1.000E+02	---	T(6)
11	Times for calculations (yr)	3.000E+02	3.000E+02	---	T(7)
11	Times for calculations (yr)	1.000E+03	1.000E+03	---	T(8)
11	Times for calculations (yr)	not used	0.000E+00	---	T(9)
11	Times for calculations (yr)	not used	0.000E+00	---	T(10)
12	Initial principal radionuclide (pCi/g): Pb-210	5.000E+00	0.000E+00	---	S1(1)
12	Initial principal radionuclide (pCi/g): Ra-226	5.000E+00	0.000E+00	---	S1(2)
12	Concentration in groundwater (pCi/L): Pb-210	not used	0.000E+00	---	W1(1)
12	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	W1(2)
13	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
13	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
13	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
13	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
13	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
3	Contaminated zone hydraulic conductivity (m/yr)	4.000E+03	1.000E+01	---	HCCZ
3	Contaminated zone b parameter	4.380E+00	5.300E+00	---	BCZ
3	Average annual wind speed (m/sec)	4.300E+00	2.000E+00	---	WIND
3	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
3	Evapotranspiration coefficient	7.500E-01	5.000E-01	---	EVAPTR
3	Precipitation (m/yr)	3.900E-01	1.000E+00	---	PRECIP
3	Irrigation (m/yr)	0.000E+00	2.000E-01	---	RI
3	Irrigation mode	overhead	overhead	---	IDITCH
3	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
3	Watershed area for nearby stream or pond (m**2)	3.630E+07	1.000E+06	---	WAREA
3	Accuracy for water/soil computations	1.000E-03	1.000E-03	---	EPS
4	Density of saturated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSAQ
4	Saturated zone total porosity	4.000E-01	4.000E-01	---	TPSZ
4	Saturated zone effective porosity	2.000E-01	2.000E-01	---	EPSZ
4	Saturated zone field capacity	2.000E-01	2.000E-01	---	FCSZ
4	Saturated zone hydraulic conductivity (m/yr)	4.000E+03	1.000E+02	---	HCSZ
4	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	---	HGWT
4	Saturated zone b parameter	4.380E+00	5.300E+00	---	BSZ
4	Water table drop rate (m/yr)	1.000E-03	1.000E-03	---	VWT
4	Well pump intake depth (m below water table)	2.000E+01	1.000E+01	---	DWIBWT
4	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	---	MODEL
	ll pumping rate (m**3/yr)	2.500E+02	2.500E+02	---	UW

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
15	Number of unsaturated zone strata	1	1	---	NS
15	Unsat. zone 1, thickness (m)	1.500E+01	4.000E+00	---	H(1)
15	Unsat. zone 1, soil density (g/cm**3)	1.500E+00	1.500E+00	---	DENSUZ(1)
15	Unsat. zone 1, total porosity	4.000E-01	4.000E-01	---	TPUZ(1)
15	Unsat. zone 1, effective porosity	2.000E-01	2.000E-01	---	EPUZ(1)
15	Unsat. zone 1, field capacity	2.000E-01	2.000E-01	---	FCUZ(1)
15	Unsat. zone 1, soil-specific b parameter	4.380E+00	5.300E+00	---	BUZ(1)
15	Unsat. zone 1, hydraulic conductivity (m/yr)	4.000E+03	1.000E+01	---	HCUZ(1)
16	Distribution coefficients for Pb-210				
16	Contaminated zone (cm**3/g)	2.700E+02	1.000E+02	---	DCNUCC(1)
16	Unsaturated zone 1 (cm**3/g)	2.700E+02	1.000E+02	---	DCNUCU(1,1)
16	Saturated zone (cm**3/g)	2.700E+02	1.000E+02	---	DCNUCS(1)
16	Leach rate (/yr)	0.000E+00	0.000E+00	1.283E-03	ALEACH(1)
16	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
16	Distribution coefficients for Ra-226				
16	Contaminated zone (cm**3/g)	5.000E+02	7.000E+01	---	DCNUCC(2)
16	Unsaturated zone 1 (cm**3/g)	5.000E+02	7.000E+01	---	DCNUCU(2,1)
16	Saturated zone (cm**3/g)	5.000E+02	7.000E+01	---	DCNUCS(2)
16	Leach rate (/yr)	0.000E+00	0.000E+00	6.931E-04	ALEACH(2)
16	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
17	Inhalation rate (m**3/yr)	8.400E+03	8.400E+03	---	INHALR
17	Mass loading for inhalation (g/m**3)	3.000E-04	1.000E-04	---	MLINH
17	Exposure duration	3.000E+01	3.000E+01	---	ED
17	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
17	Shielding factor, external gamma	5.500E-01	7.000E-01	---	SHF1
17	Fraction of time spent indoors	5.000E-01	5.000E-01	---	FIND
17	Fraction of time spent outdoors (on site)	2.500E-01	2.500E-01	---	FOTD
17	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS
17	Radii of shape factor array (used if FS = -1):				
17	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
17	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
17	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
17	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
17	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
17	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
17	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
17	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
17	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE(9)
17	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
17	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
17	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)

Site-Specific Parameter Summary (continued)

·nu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
	Fractions of annular areas within AREA:				
17	Ring 1	not used	1.000E+00	---	FRACA(1)
17	Ring 2	not used	2.732E-01	---	FRACA(2)
17	Ring 3	not used	0.000E+00	---	FRACA(3)
17	Ring 4	not used	0.000E+00	---	FRACA(4)
17	Ring 5	not used	0.000E+00	---	FRACA(5)
17	Ring 6	not used	0.000E+00	---	FRACA(6)
17	Ring 7	not used	0.000E+00	---	FRACA(7)
17	Ring 8	not used	0.000E+00	---	FRACA(8)
17	Ring 9	not used	0.000E+00	---	FRACA(9)
17	Ring 10	not used	0.000E+00	---	FRACA(10)
17	Ring 11	not used	0.000E+00	---	FRACA(11)
17	Ring 12	not used	0.000E+00	---	FRACA(12)
18	Fruits, vegetables and grain consumption (kg/yr)	1.900E+02	1.600E+02	---	DIET(1)
.8	Leafy vegetable consumption (kg/yr)	1.400E+01	1.400E+01	---	DIET(2)
.8	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)
.8	Meat and poultry consumption (kg/yr)	6.300E+01	6.300E+01	---	DIET(4)
.8	Fish consumption (kg/yr)	not used	5.400E+00	---	DIET(5)
.8	Other seafood consumption (kg/yr)	not used	9.000E-01	---	DIET(6)
.8	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	---	SOIL
8	Drinking water intake (L/yr)	5.100E+02	5.100E+02	---	DWI
8	Contamination fraction of drinking water	1.000E+00	1.000E+00	---	FDW
8	Contamination fraction of household water	not used	1.000E+00	---	FHHW
	Contamination fraction of livestock water	1.000E+00	1.000E+00	---	FLW
	Contamination fraction of irrigation water	1.000E+00	1.000E+00	---	FIRW
8	Contamination fraction of aquatic food	not used	5.000E-01	---	FR9
8	Contamination fraction of plant food	2.500E-01	-1	---	FPLANT
8	Contamination fraction of meat	2.500E-01	-1	---	FMEAT
8	Contamination fraction of milk	not used	-1	---	FMILK
9	Livestock fodder intake for meat (kg/day)	6.800E+01	6.800E+01	---	LFI5
9	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	---	LFI6
9	Livestock water intake for meat (L/day)	5.000E+01	5.000E+01	---	LWI5
9	Livestock water intake for milk (L/day)	not used	1.600E+02	---	LWI6
9	Livestock soil intake (kg/day)	5.000E-01	5.000E-01	---	LSI
9	Mass loading for foliar deposition (g/m**3)	3.000E-04	1.000E-04	---	MLFD
9	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
9	Depth of roots (m)	3.000E-01	9.000E-01	---	DROOT
9	Drinking water fraction from ground water	1.000E+00	1.000E+00	---	FGWDW
9	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
9	Livestock water fraction from ground water	1.000E+00	1.000E+00	---	FGWLW
9	Irrigation fraction from ground water	1.000E+00	1.000E+00	---	FGWIR
9	Wet weight crop yield for Non-Leafy (kg/m**2)	7.000E-01	7.000E-01	---	YV(1)
9	Wet weight crop yield for Leafy (kg/m**2)	1.500E+00	1.500E+00	---	YV(2)
9	Wet weight crop yield for Fodder (kg/m**2)	1.100E+00	1.100E+00	---	YV(3)
9	Growing Season for Non-Leafy (years)	1.700E-01	1.700E-01	---	TE(1)
9	Growing Season for Leafy (years)	2.500E-01	2.500E-01	---	TE(2)
	Growing Season for Fodder (years)	8.000E-02	8.000E-02	---	TE(3)
	Translocation Factor for Non-Leafy	1.000E-01	1.000E-01	---	TIV(1)

Site-Specific Parameter Summary (continued)

enu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
	Translocation Factor for Leafy	1.000E+00	1.000E+00	---	TIV(2)
.9B	Translocation Factor for Fodder	1.000E+00	1.000E+00	---	TIV(3)
.9B	Dry Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RDRY(1)
9B	Dry Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RDRY(2)
9B	Dry Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RDRY(3)
9B	Wet Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RWET(1)
9B	Wet Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RWET(2)
9B	Wet Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RWET(3)
9B	Weathering Removal Constant for Vegetation	2.000E+01	2.000E+01	---	WLAM
4	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
4	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
4	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
4	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
4	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
4	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
4	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
4	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
4	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
4	DCF correction factor for gaseous forms of C14	not used	8.894E+01	---	CO2F
)R	Storage times of contaminated foodstuffs (days):				
)R	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
)R	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
)R	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
)R	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
)R	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
)R	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
)R	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
1	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR1
1	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
1	Total porosity of the cover material	not used	4.000E-01	---	TPCV
1	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
1	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV
1	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
1	Diffusion coefficient for radon gas (m/sec):				
1	in cover material	not used	2.000E-06	---	DIFCV
1	in foundation material	not used	3.000E-07	---	DIFFL
1	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
1	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
1	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
1	Height of the building (room) (m)	not used	2.500E+00	---	HRM
1	Building interior area factor	not used	0.000E+00	---	FAI
1	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
1	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA(1)
1	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2
	Number of graphical time points	32	---	---	NPTS
	Maximum number of integration points for dose	17	---	---	LYMAX

Site-Specific Parameter Summary (continued)

enu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
	Maximum number of integration points for risk	257	---	---	KYMAX

Summary of Pathway Selections

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

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	10000.00 square meters	Pb-210	5.000E+00
Thickness:	0.15 meters	Ra-226	5.000E+00
Depth:	0.00 meters		

Total Dose TDOSE(t), mrem/yr
Basic Radiation Dose Limit = 1.000E+02 mrem/yr
Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	4.237E+01	4.216E+01	4.172E+01	4.018E+01	3.570E+01	1.810E+01	0.000E+00	0.000E+00
M(t):	4.237E-01	4.216E-01	4.172E-01	4.018E-01	3.570E-01	1.810E-01	0.000E+00	0.000E+00

ximum TDOSE(t): 4.237E+01 mrem/yr at t = 0.000E+00 years

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

Water Independent Pathways (Inhalation excludes radon)

dio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
clide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
-210	1.528E-02	0.0004	1.027E-02	0.0002	0.000E+00	0.0000	9.096E+00	0.2147	3.778E-01	0.0089	0.000E+00	0.0000	9.759E-01	0.0230
-226	2.457E+01	0.5798	4.028E-03	0.0001	0.000E+00	0.0000	6.927E+00	0.1635	2.027E-01	0.0048	0.000E+00	0.0000	1.966E-01	0.0046
tal	2.458E+01	0.5802	1.430E-02	0.0003	0.000E+00	0.0000	1.602E+01	0.3781	5.805E-01	0.0137	0.000E+00	0.0000	1.172E+00	0.0277

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

Water Dependent Pathways

jio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
clide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.048E+01	0.2472
-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.190E+01	0.7528
al	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.237E+01	1.0000

all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

dio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
clide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
-210	1.479E-02	0.0004	9.879E-03	0.0002	0.000E+00	0.0000	8.748E+00	0.2075	3.634E-01	0.0086	0.000E+00	0.0000	9.385E-01	0.0223
-226	2.449E+01	0.5809	4.309E-03	0.0001	0.000E+00	0.0000	7.154E+00	0.1697	2.130E-01	0.0051	0.000E+00	0.0000	2.247E-01	0.0053
tal	2.451E+01	0.5812	1.419E-02	0.0003	0.000E+00	0.0000	1.590E+01	0.3772	5.764E-01	0.0137	0.000E+00	0.0000	1.163E+00	0.0276

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

Water Dependent Pathways

lio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
:lide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
·210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.007E+01	0.2389
·226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.209E+01	0.7611
al	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.216E+01	1.0000

all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

ıdio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
ıclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
›-210	1.385E-02	0.0003	9.135E-03	0.0002	0.000E+00	0.0000	8.089E+00	0.1939	3.360E-01	0.0081	0.000E+00	0.0000	8.678E-01	0.0208
ı-226	2.433E+01	0.5832	4.827E-03	0.0001	0.000E+00	0.0000	7.561E+00	0.1812	2.312E-01	0.0055	0.000E+00	0.0000	2.768E-01	0.0066
›tal	2.435E+01	0.5835	1.396E-02	0.0003	0.000E+00	0.0000	1.565E+01	0.3751	5.672E-01	0.0136	0.000E+00	0.0000	1.145E+00	0.0274

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Dependent Pathways

dio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
clide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.316E+00	0.2233
-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.241E+01	0.7767
tal	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.172E+01	1.0000

all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

dio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
clide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
-210	1.101E-02	0.0003	6.935E-03	0.0002	0.000E+00	0.0000	6.141E+00	0.1528	2.551E-01	0.0063	0.000E+00	0.0000	6.588E-01	0.0164
-226	2.376E+01	0.5914	6.247E-03	0.0002	0.000E+00	0.0000	8.636E+00	0.2150	2.805E-01	0.0070	0.000E+00	0.0000	4.217E-01	0.0105
tal	2.377E+01	0.5917	1.318E-02	0.0003	0.000E+00	0.0000	1.478E+01	0.3678	5.356E-01	0.0133	0.000E+00	0.0000	1.081E+00	0.0269

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

Water Dependent Pathways

dio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
clide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.073E+00	0.1760
-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.311E+01	0.8240
tal	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.018E+01	1.0000

all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

dio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
clide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
-210	5.691E-03	0.0002	3.110E-03	0.0001	0.000E+00	0.0000	2.754E+00	0.0771	1.144E-01	0.0032	0.000E+00	0.0000	2.954E-01	0.0083
-226	2.196E+01	0.6153	7.917E-03	0.0002	0.000E+00	0.0000	9.611E+00	0.2693	3.338E-01	0.0093	0.000E+00	0.0000	6.083E-01	0.0170
tal	2.197E+01	0.6154	1.103E-02	0.0003	0.000E+00	0.0000	1.237E+01	0.3464	4.482E-01	0.0126	0.000E+00	0.0000	9.037E-01	0.0253

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Dependent Pathways

dio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
clide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.172E+00	0.0889
-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.252E+01	0.9111
tal	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.570E+01	1.0000

all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

adio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
uclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
)-210	4.873E-04	0.0000	1.337E-04	0.0000	0.000E+00	0.0000	1.184E-01	0.0065	4.923E-03	0.0003	0.000E+00	0.0000	1.270E-02	0.0007
ı-226	1.284E+01	0.7097	4.082E-03	0.0002	0.000E+00	0.0000	4.613E+00	0.2549	1.667E-01	0.0092	0.000E+00	0.0000	3.328E-01	0.0184
otal	1.284E+01	0.7097	4.216E-03	0.0002	0.000E+00	0.0000	4.731E+00	0.2614	1.716E-01	0.0095	0.000E+00	0.0000	3.455E-01	0.0191

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

Water Dependent Pathways

dio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
clide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.367E-01	0.0076
-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.796E+01	0.9924
tal	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.810E+01	1.0000

all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

*[illegible] all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

* all water independent and dependent pathways.

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

Parent	Product (j)	Branch Fraction*	DSR(j,t) (mrem/yr)/(pCi/g) t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210	Pb-210	1.000E+00	2.095E+00	2.015E+00	1.863E+00	1.415E+00	6.345E-01	2.733E-02	0.000E+00	0.000E+00
Ra-226	Ra-226	1.000E+00	6.341E+00	6.315E+00	6.260E+00	6.069E+00	5.494E+00	2.989E+00	0.000E+00	0.000E+00
Ra-226	Pb-210	1.000E+00	3.846E-02	1.028E-01	2.207E-01	5.525E-01	1.011E+00	6.028E-01	0.000E+00	0.000E+00
Ra-226	∑DSR(j)		6.380E+00	6.417E+00	6.481E+00	6.621E+00	6.505E+00	3.592E+00	0.000E+00	0.000E+00

*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

Single Radionuclide Soil Guidelines G(i,t) in pCi/g
Basic Radiation Dose Limit = 1.000E+02 mrem/yr

Nuclide (i)	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210	4.773E+01	4.963E+01	5.367E+01	7.069E+01	1.576E+02	3.659E+03	*7.631E+13	*7.631E+13
Ra-226	1.567E+01	1.558E+01	1.543E+01	1.510E+01	1.537E+01	2.784E+01	*9.882E+11	*9.882E+11

*At specific activity limit

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

Nuclide (i)	Initial (pCi/g)	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Pb-210	5.000E+00	0.000E+00	2.095E+00	4.773E+01	2.095E+00	4.773E+01
Ra-226	5.000E+00	15.93 ± 0.03	6.654E+00	1.503E+01	6.380E+00	1.567E+01

Individual Nuclide Dose Summed Over All Pathways
Parent Nuclide and Branch Fraction Indicated

Nuclide	Parent	BRF(i)	DOSE(j,t), mrem/yr							
[illegible]	(i)	t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210	Pb-210	1.000E+00	1.048E+01	1.007E+01	9.316E+00	7.073E+00	3.172E+00	1.367E-01	0.000E+00	0.000E+00
Pb-210	Ra-226	1.000E+00	1.923E-01	5.138E-01	1.103E+00	2.763E+00	5.054E+00	3.014E+00	0.000E+00	0.000E+00
Pb-210	∑DOSE(j)		1.067E+01	1.059E+01	1.042E+01	9.835E+00	8.226E+00	3.151E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.000E+00	3.171E+01	3.157E+01	3.130E+01	3.034E+01	2.747E+01	1.494E+01	0.000E+00	0.000E+00

BRF(i) is the branch fraction of the parent nuclide.

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide	Parent	BRF(i)	S(j,t), pCi/g							
(j)	(i)	t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210	Pb-210	1.000E+00	5.000E+00	4.841E+00	4.537E+00	3.617E+00	1.894E+00	1.965E-01	3.034E-04	4.391E-14
Pb-210	Ra-226	1.000E+00	0.000E+00	1.528E-01	4.436E-01	1.320E+00	2.926E+00	4.249E+00	3.548E+00	1.613E+00
Pb-210	∑S(j):		5.000E+00	4.994E+00	4.981E+00	4.937E+00	4.819E+00	4.446E+00	3.548E+00	1.613E+00
Ra-226	Ra-226	1.000E+00	5.000E+00	4.994E+00	4.983E+00	4.944E+00	4.834E+00	4.467E+00	3.566E+00	1.621E+00

BRF(i) is the branch fraction of the parent nuclide.

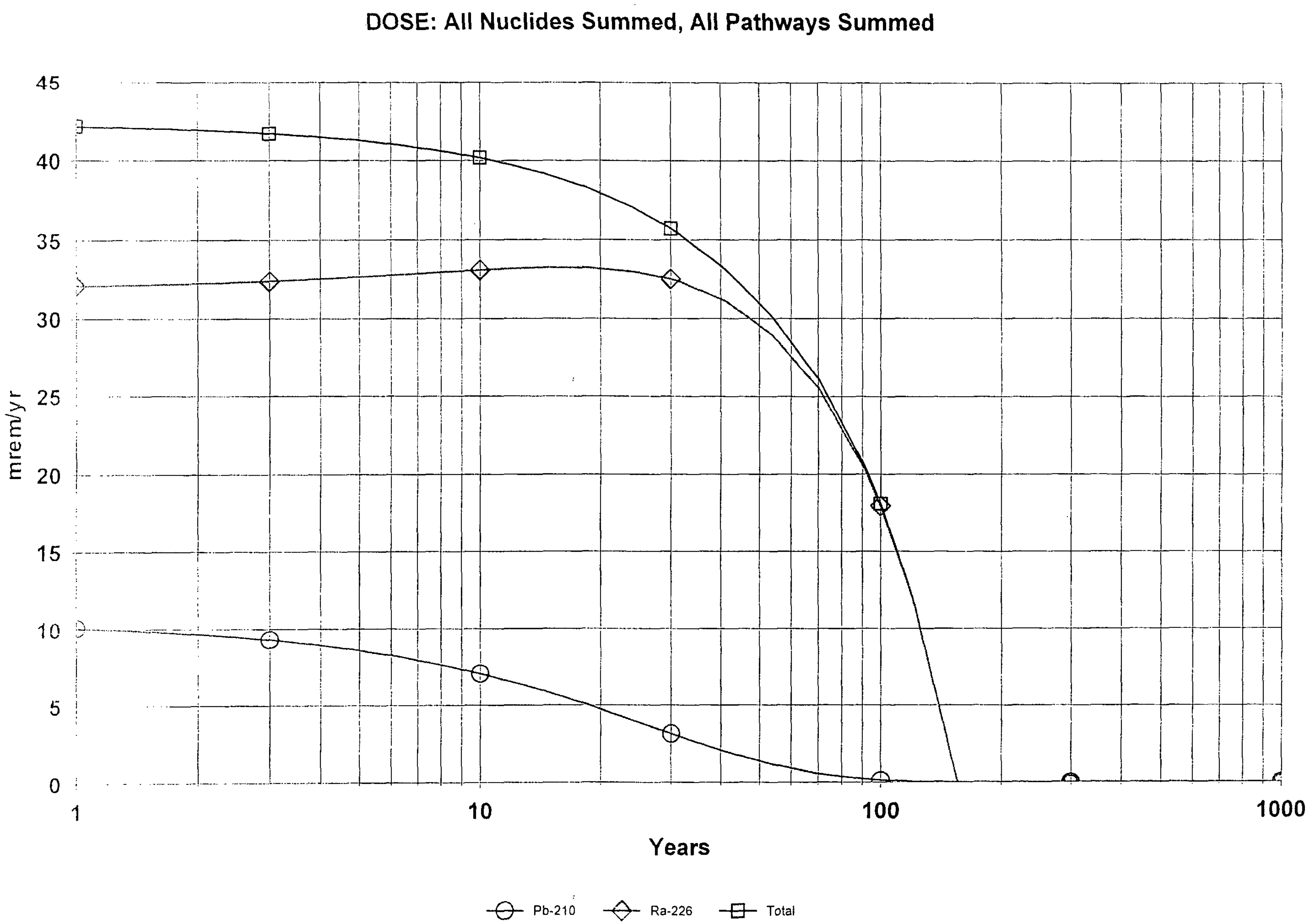
R[illegible].EXE execution time = 0.71 seconds

Radium Benchmark Dose Assessment

Attachment 4

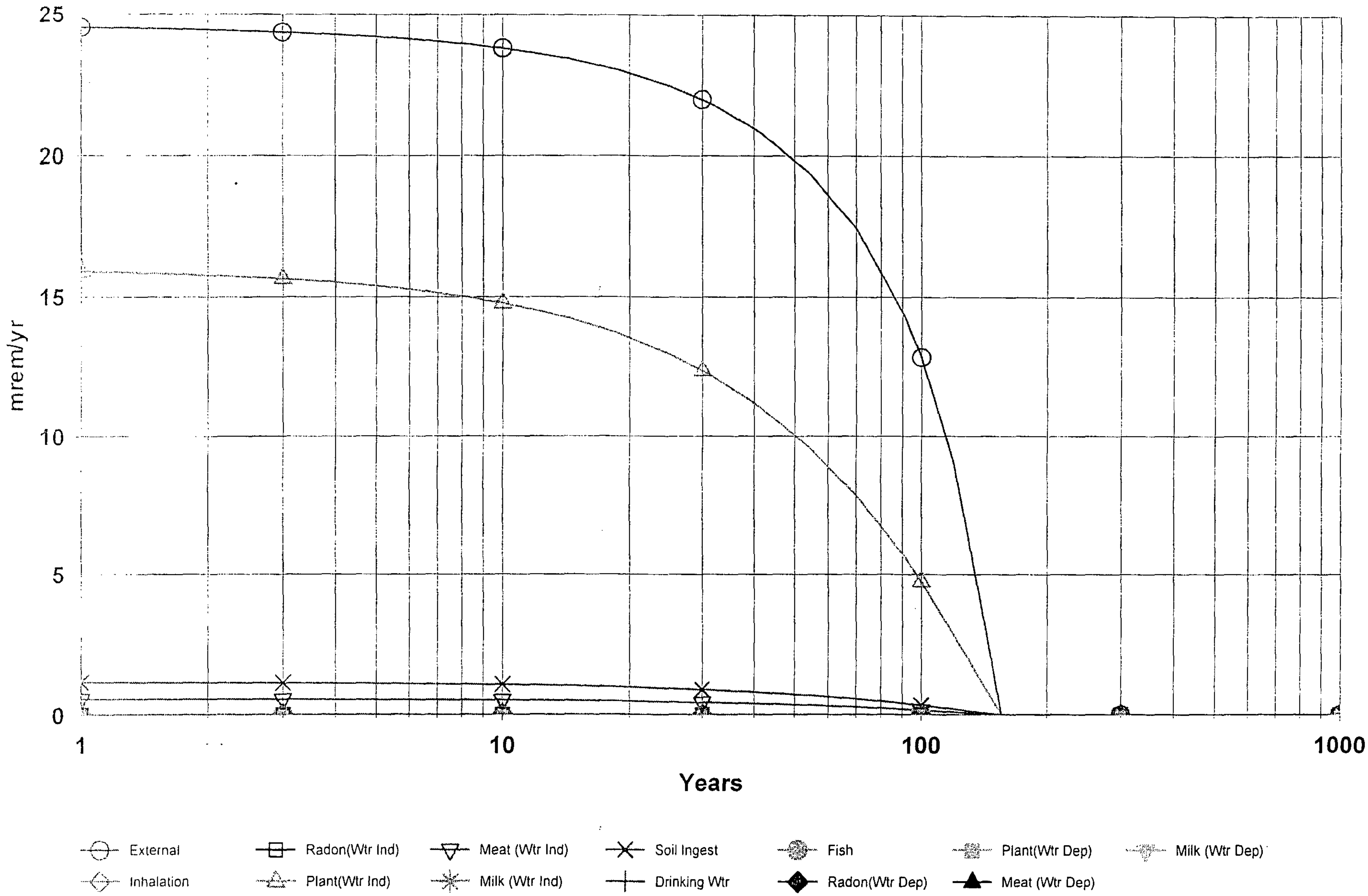
RESRAD Model Output

Standard Graphics

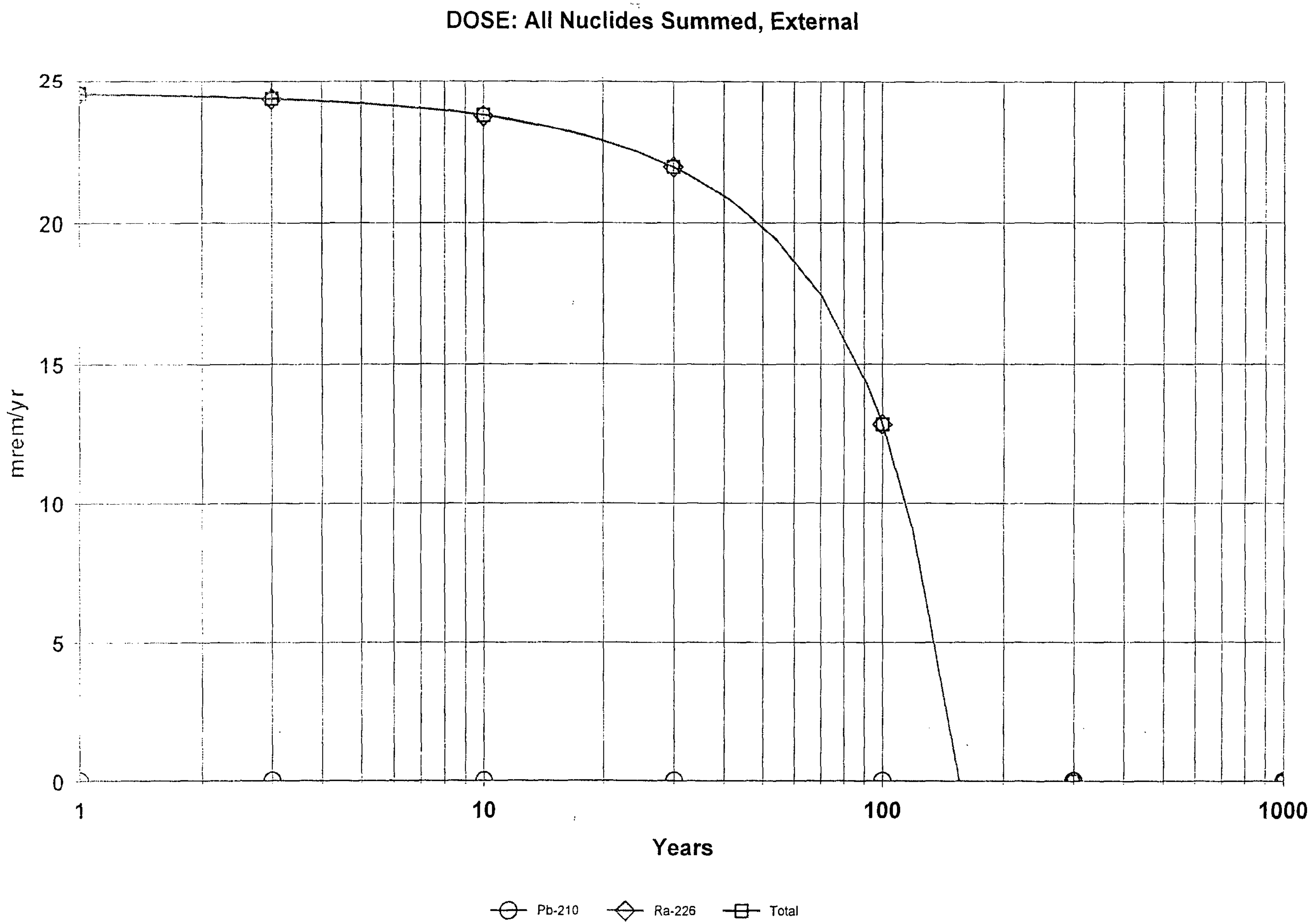


Ra022704.RAD 03/05/2004 10:01 Includes All Pathways

DOSE: All Nuclides Summed, Component Pathways

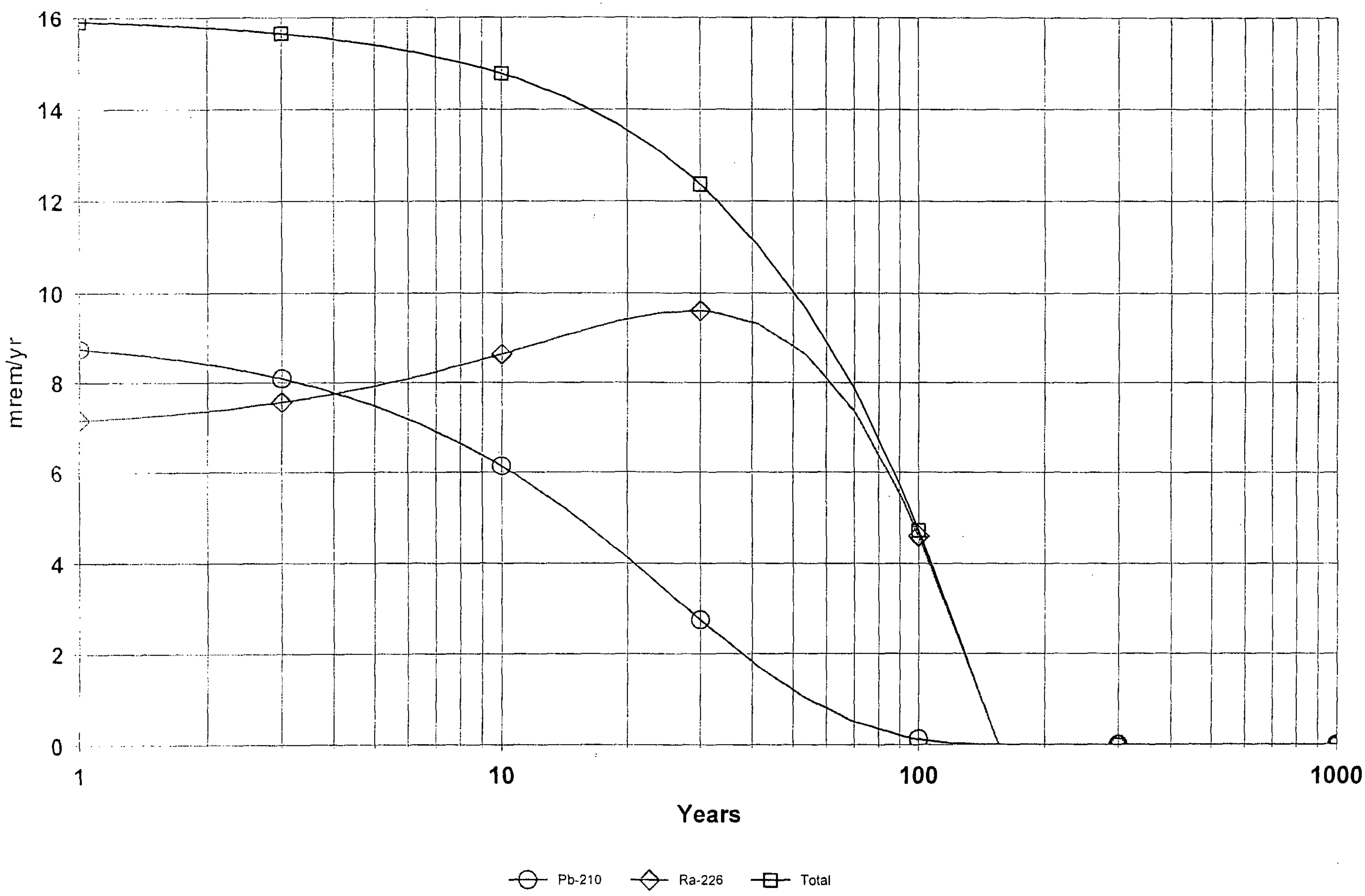


Ra022704.RAD 03/05/2004 10:01



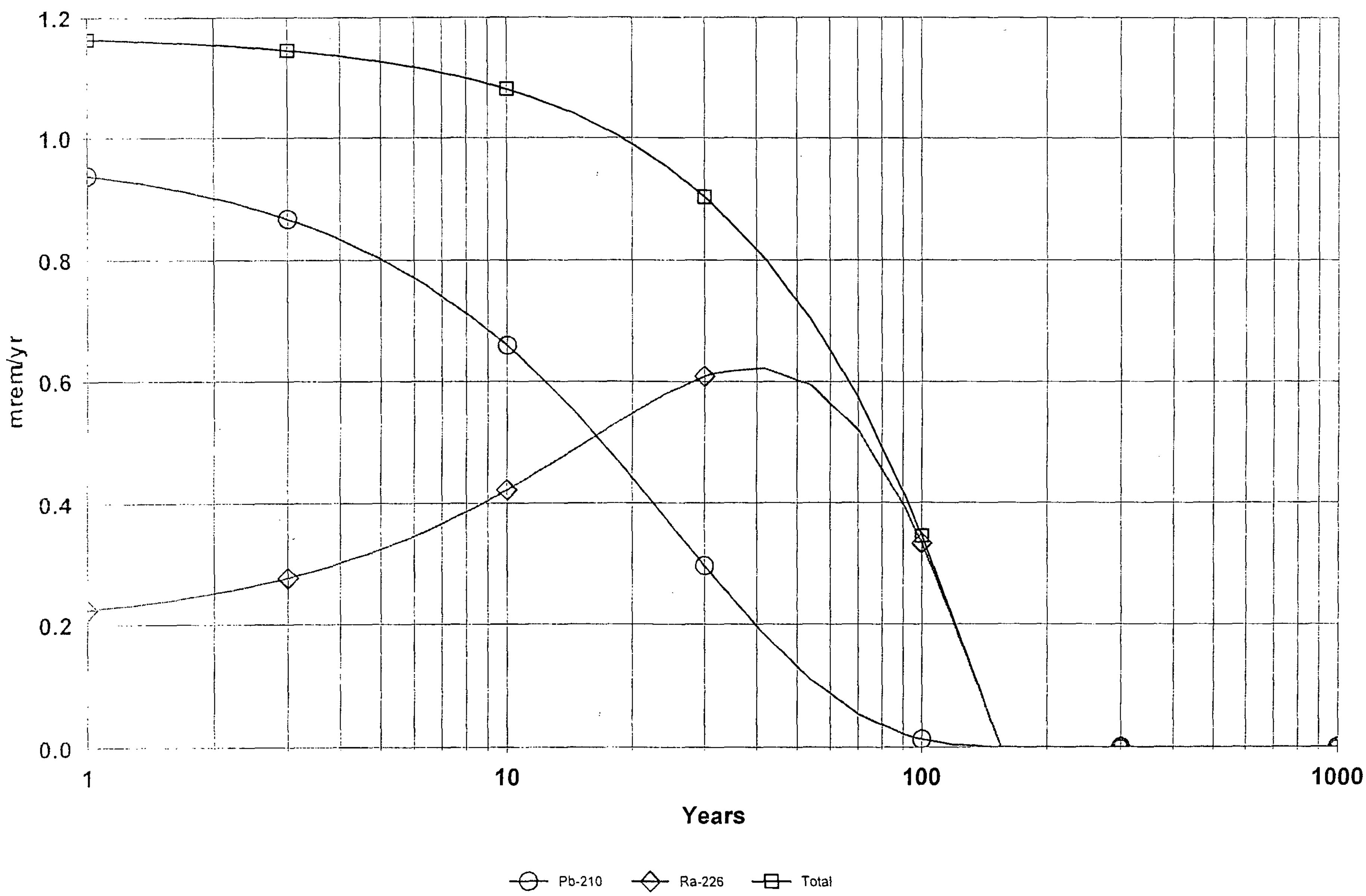
Ra022704.RAD 03/05/2004 10:01 Pathways: External

DOSE: All Nuclides Summed, Plant(Wtr Ind)

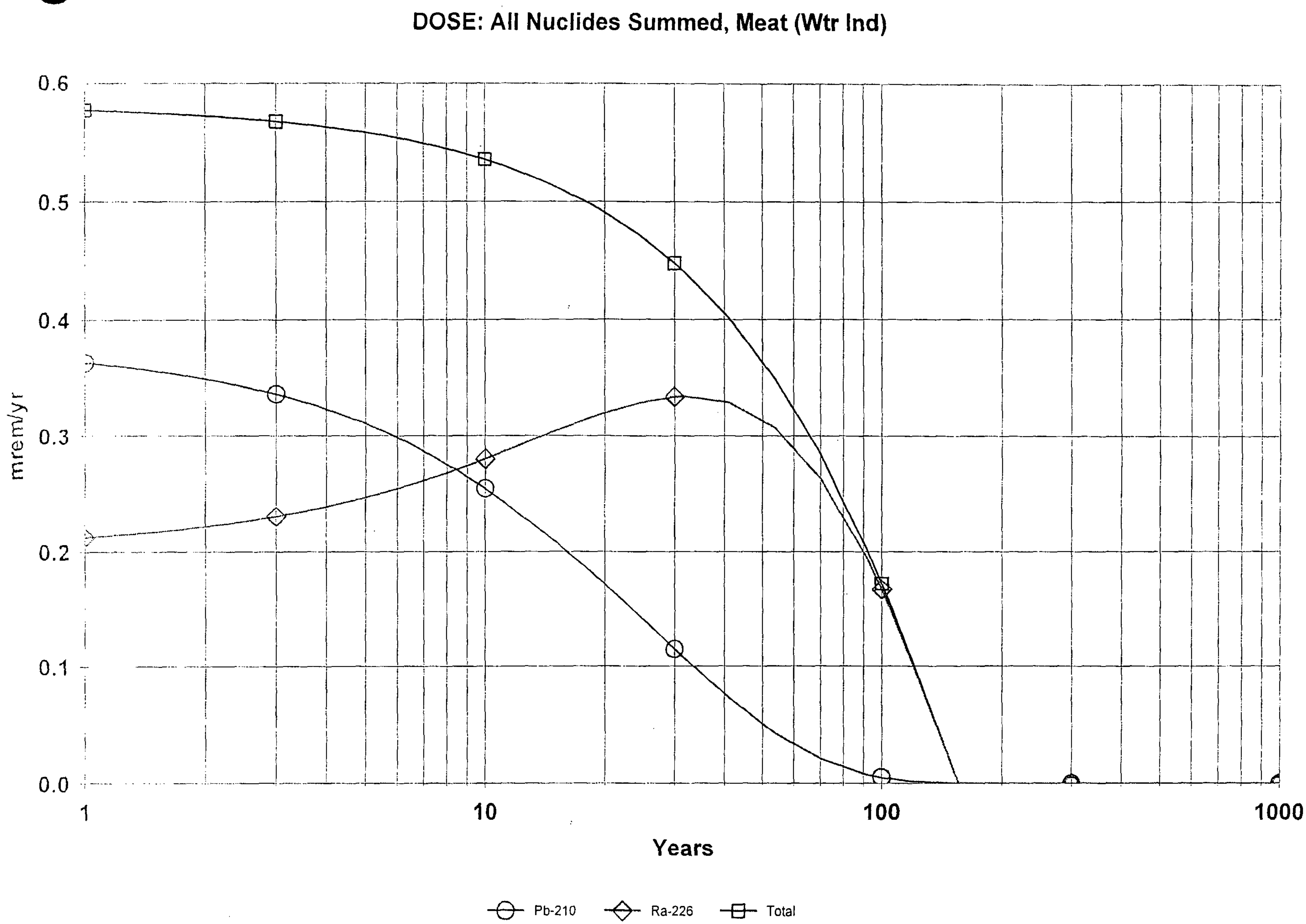


Ra022704.RAD 03/05/2004 10:01 Pathways: Plant(Wtr Ind)

DOSE: All Nuclides Summed, Soil Ingest

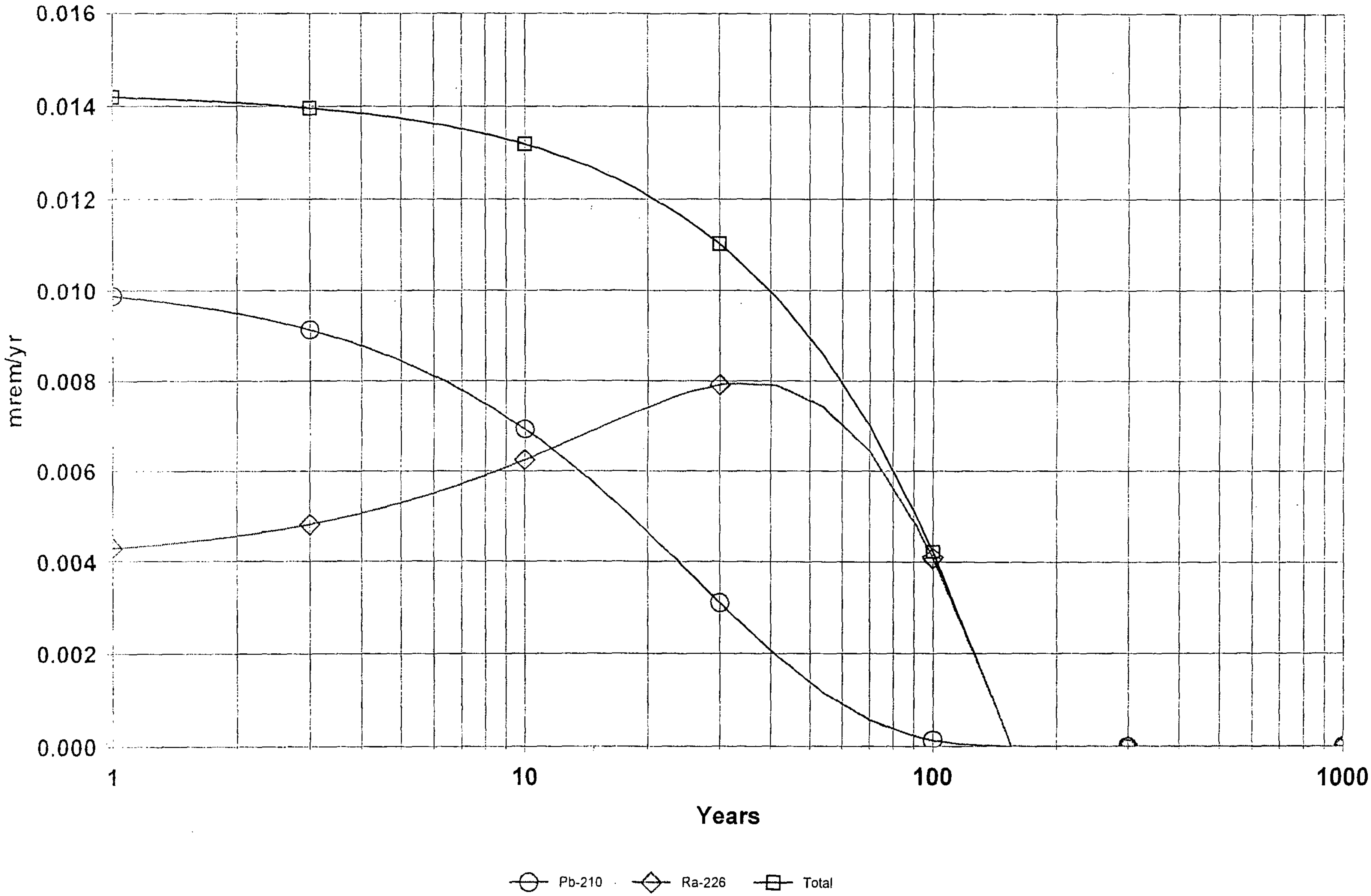


Ra022704.RAD 03/05/2004 10:01 Pathways: Soil Ingest

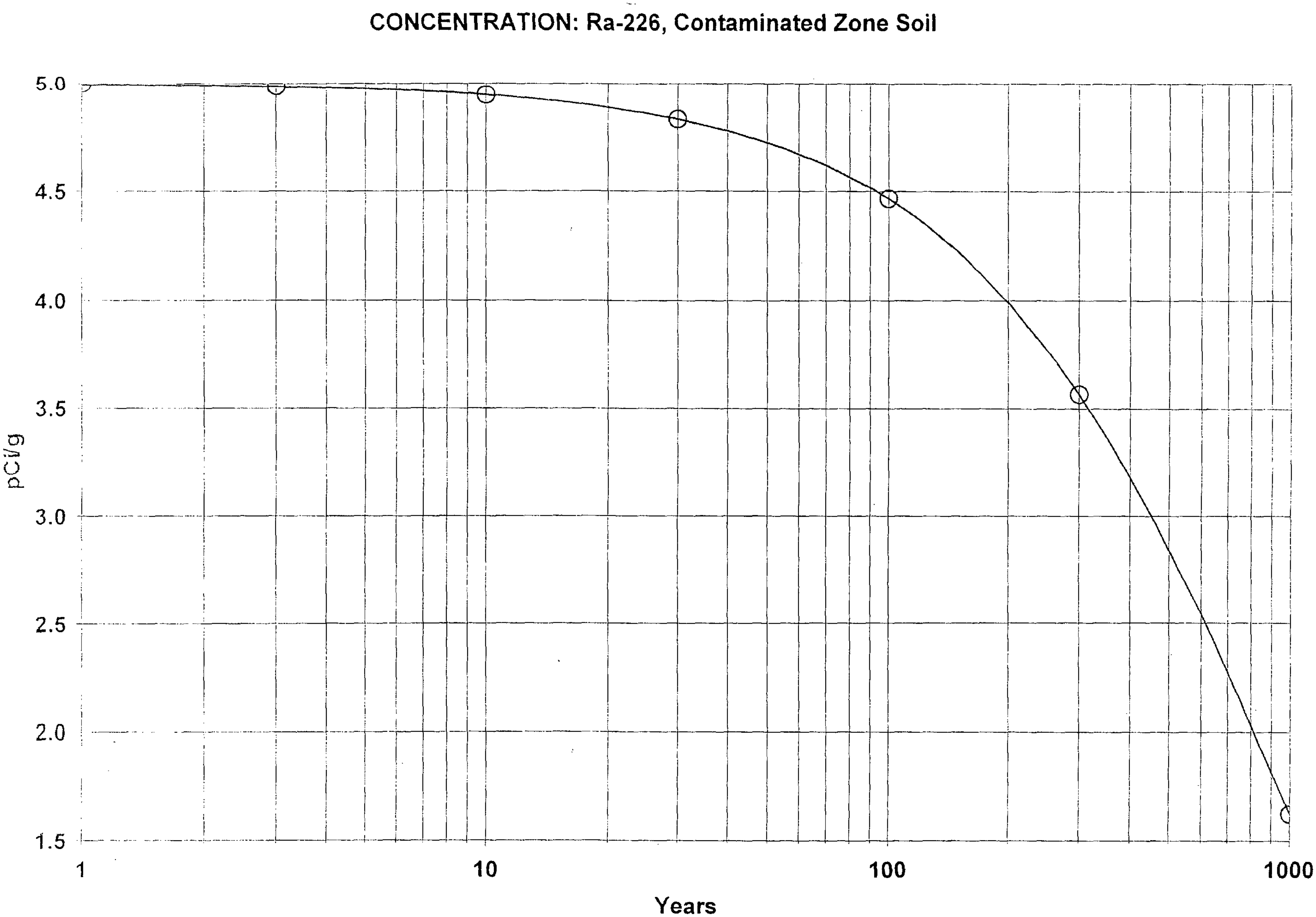


Ra022704.RAD 03/05/2004 10:01 Pathways: Meat (Wtr Ind)

DOSE: All Nuclides Summed, Inhalation

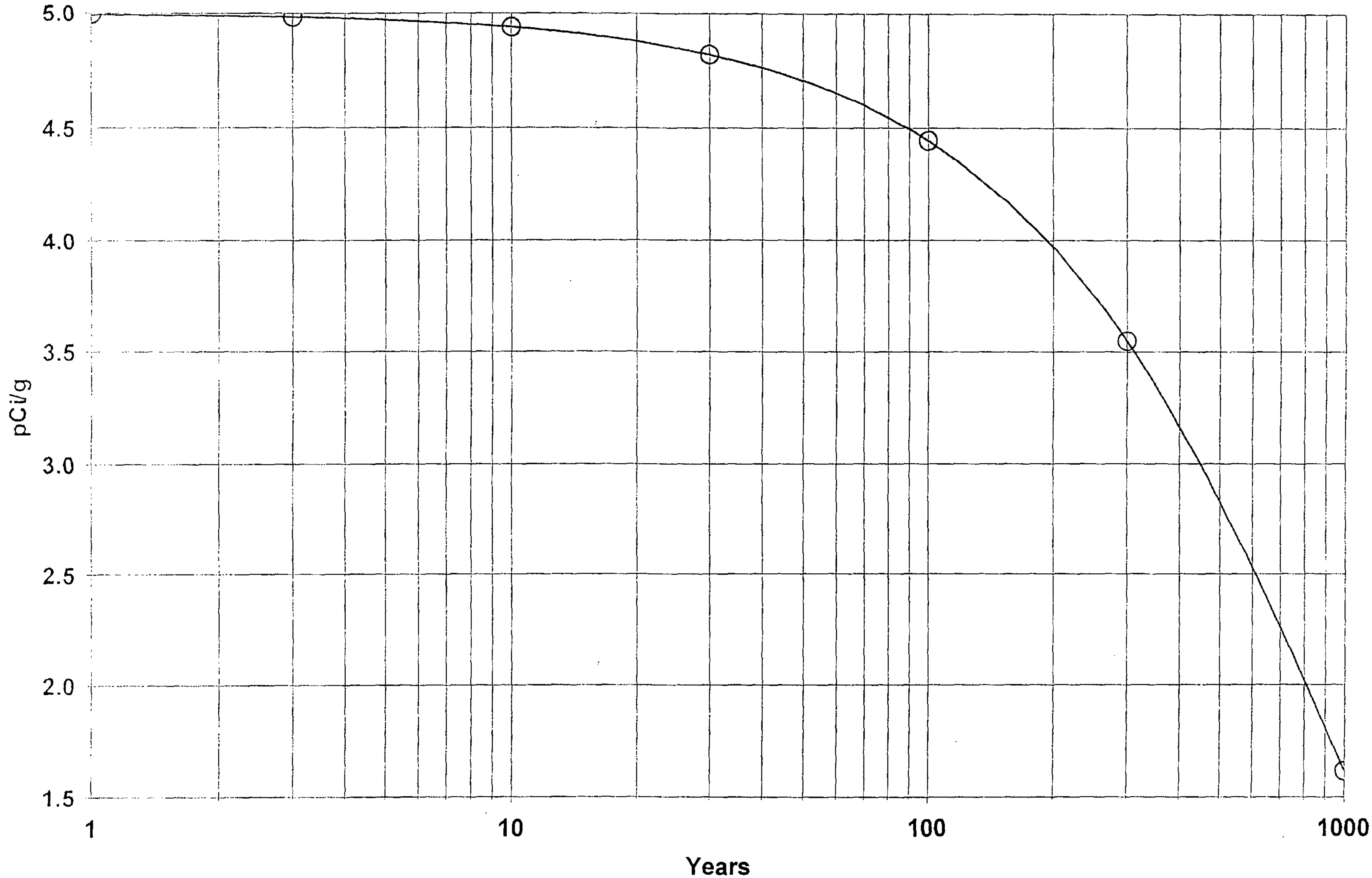


Ra022704.RAD 03/05/2004 10:01 Pathways: Inhalation



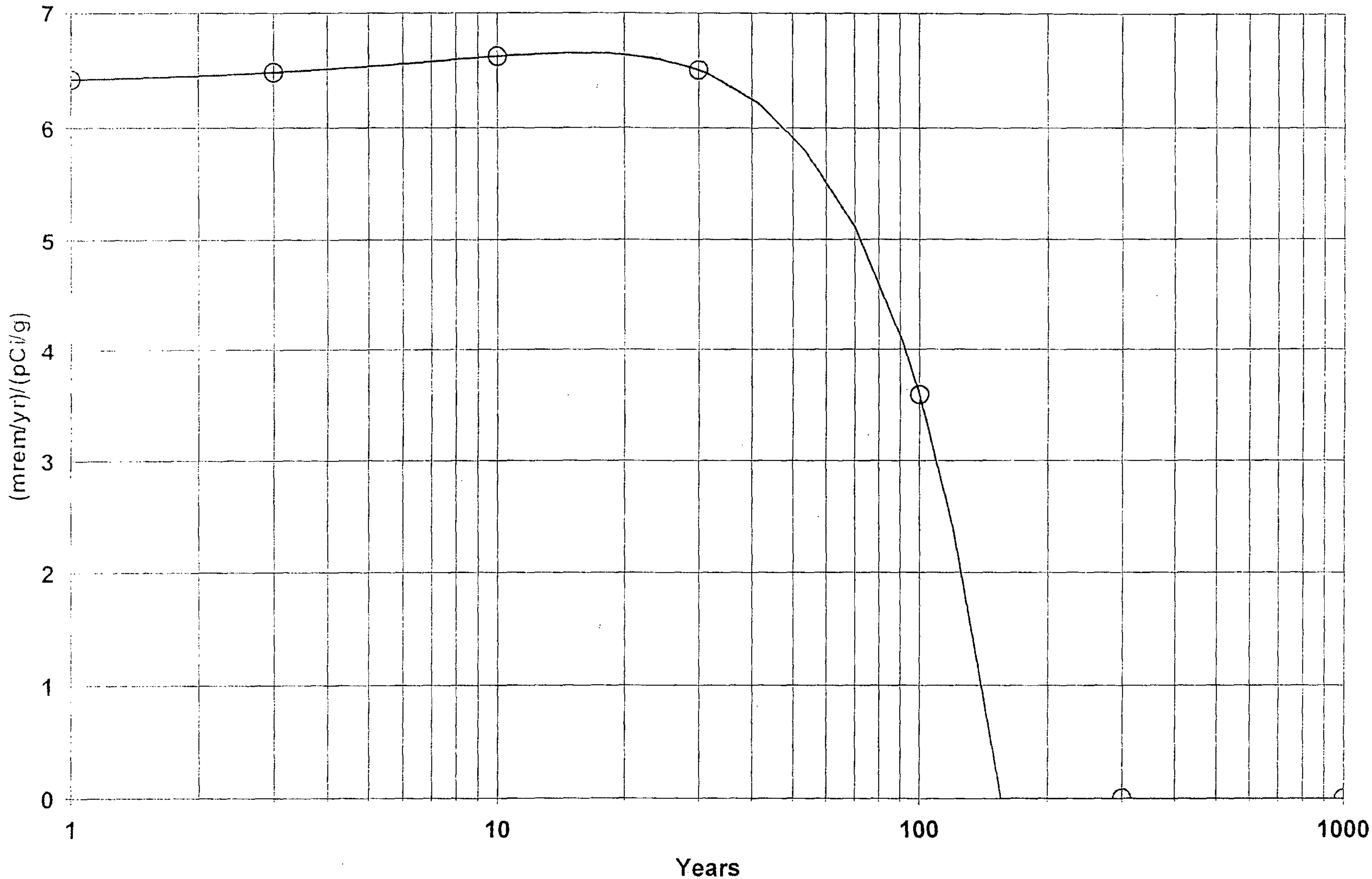
Ra022704.RAD 03/05/2004 10:01

CONCENTRATION: Pb-210, Contaminated Zone Soil



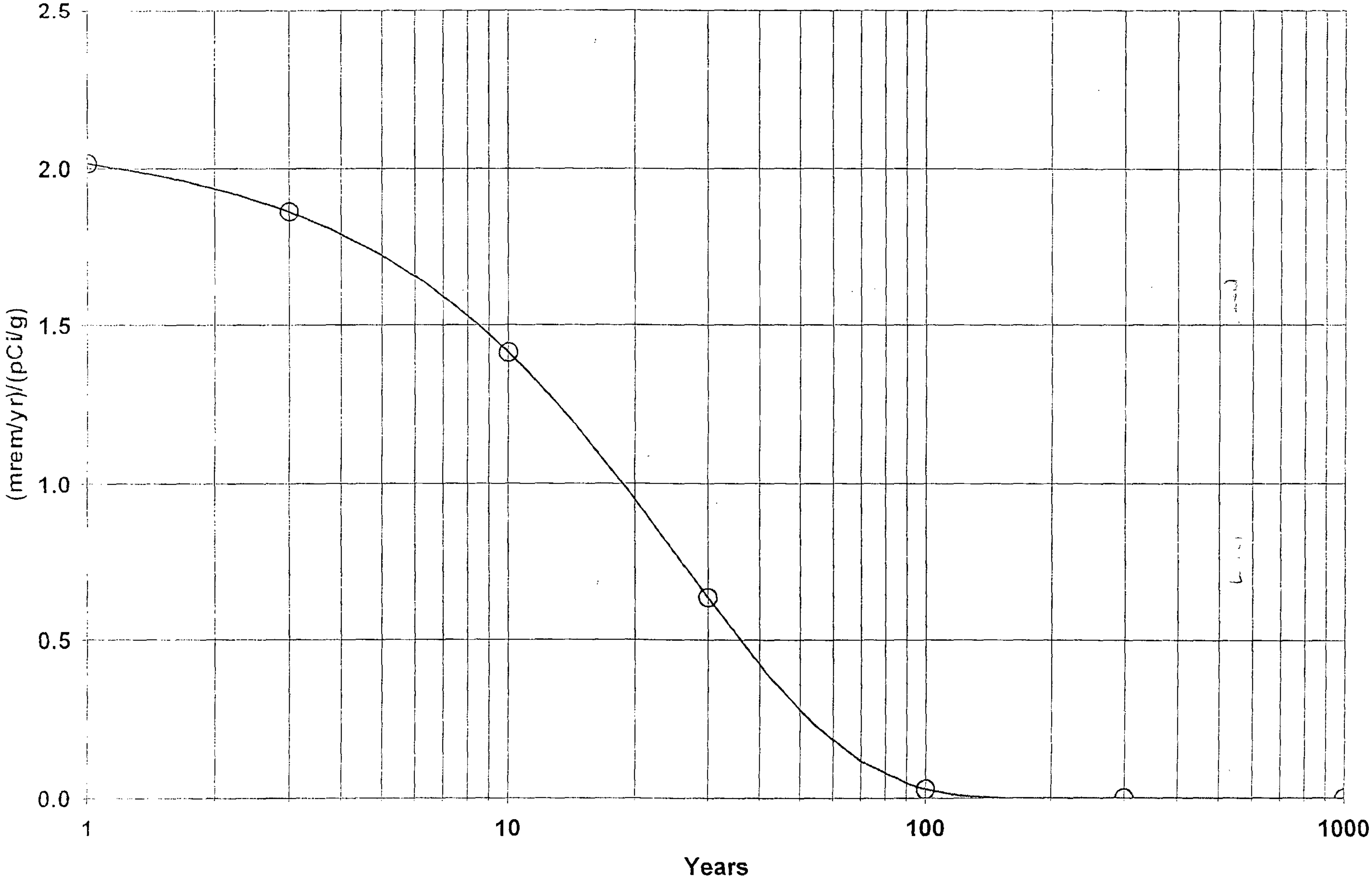
Ra022704.RAD 03/05/2004 10:01

DOSE/SOURCE RATIO: Ra-226, All Pathways Summed



Ra022704.RAD 03/05/2004 10:01 Includes All Pathways

DOSE/SOURCE RATIO: Pb-210, All Pathways Summed



Ra022704.RAD 03/05/2004 10:01 Includes All Pathways

Radium Benchmark Dose Assessment

Attachment 5

RESRAD Model Output

Uranium Analysis

Table of Contents

Part I: Mixture Sums and Single Radionuclide Guidelines

Dose Conversion Factor (and Related) Parameter Summary
File: HEAST 1995 Morbidity

	Parameter	Current Value	Default	Pa
3-1	Dose conversion factors for inhalation, mrem/pCi:			
3-1	Ac-227+D	6.720E+00	6.720E+00	DCF
3-1	Pa-231	1.280E+00	1.280E+00	DCF
3-1	Pb-210+D	2.320E-02	2.320E-02	DCF
3-1	Ra-226+D	8.600E-03	8.600E-03	DCF
-1	Th-230	3.260E-01	3.260E-01	DCF
-1	U-234	1.320E-01	1.320E-01	DCF
-1	U-235+D	1.230E-01	1.230E-01	DCF
-1	U-238+D	1.180E-01	1.180E-01	DCF
-1	Dose conversion factors for ingestion, mrem/pCi:			
-1	Ac-227+D	1.480E-02	1.480E-02	DCF
-1	Pa-231	1.060E-02	1.060E-02	DCF
-1	Pb-210+D	7.270E-03	7.270E-03	DCF
-1	Ra-226+D	1.330E-03	1.330E-03	DCF
-1	Th-230	5.480E-04	5.480E-04	DCF
-1	U-234	2.830E-04	2.830E-04	DCF
-1	U-235+D	2.670E-04	2.670E-04	DCF
-1	U-238+D	2.690E-04	2.690E-04	DCF
-34	Food transfer factors:			
-34	Ac-227+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF
-34	Ac-227+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF
	Ac-227+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF
-34				
-34	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF
-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF
-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF
-34				
-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF
-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF
-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF
-34				
-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF
-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF
-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF
-34				
-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF
-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF
-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF
34				
34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF
34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF
34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF
34				
34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF
34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF
34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF

Dose Conversion Factor (and Related) Parameter Summary (continued)
File: HEAST 1995 Morbidity

	Parameter	Current Value	Default	Pa
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Ac-227+D , fish	1.500E+01	1.500E+01	BIO
D-5	Ac-227+D , crustacea and mollusks	1.000E+03	1.000E+03	BIO
D-5				
D-5	Pa-231 , fish	1.000E+01	1.000E+01	BIO
D-5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIO
D-5				
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIO
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIO
D-5				
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIO
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIO
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIO
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIO
D-5				
D-5	U-234 , fish	1.000E+01	1.000E+01	BIO
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIO
D-5				
	U-235+D , fish	1.000E+01	1.000E+01	BIO
D-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIO
D-5				
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIO
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIO

Site-Specific Parameter Summary

	Parameter	User Input	Default	Used b (If different
011	Area of contaminated zone (m**2)	1.000E+04	1.000E+04	-
011	Thickness of contaminated zone (m)	1.500E-01	2.000E+00	-
011	Length parallel to aquifer flow (m)	1.000E+02	1.000E+02	-
011	Basic radiation dose limit (mrem/yr)	1.000E+02	2.500E+01	-
011	Time since placement of material (yr)	0.000E+00	0.000E+00	-
011	Times for calculations (yr)	1.000E+00	1.000E+00	-
011	Times for calculations (yr)	3.000E+00	3.000E+00	-
011	Times for calculations (yr)	1.000E+01	1.000E+01	-
011	Times for calculations (yr)	3.000E+01	3.000E+01	-
011	Times for calculations (yr)	1.000E+02	1.000E+02	-
011	Times for calculations (yr)	3.000E+02	3.000E+02	-
011	Times for calculations (yr)	1.000E+03	1.000E+03	-
011	Times for calculations (yr)	not used	0.000E+00	-
011	Times for calculations (yr)	not used	0.000E+00	-
012	Initial principal radionuclide (pCi/g): U-234	4.890E+01	0.000E+00	-
012	Initial principal radionuclide (pCi/g): U-235	2.200E+00	0.000E+00	-
012	Initial principal radionuclide (pCi/g): U-238	4.890E+01	0.000E+00	-
012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	-
012	Concentration in groundwater (pCi/L): U-235	not used	0.000E+00	-
012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	-
013	Cover depth (m)	0.000E+00	0.000E+00	-
	Density of cover material (g/cm**3)	not used	1.500E+00	-
	Cover depth erosion rate (m/yr)	not used	1.000E-03	-
13	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	-
13	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	-
13	Contaminated zone total porosity	4.000E-01	4.000E-01	-
13	Contaminated zone field capacity	2.000E-01	2.000E-01	-
13	Contaminated zone hydraulic conductivity (m/yr)	4.000E+03	1.000E+01	-
13	Contaminated zone b parameter	4.380E+00	5.300E+00	-
13	Average annual wind speed (m/sec)	4.300E+00	2.000E+00	-
13	Humidity in air (g/m**3)	not used	8.000E+00	-
13	Evapotranspiration coefficient	7.500E-01	5.000E-01	-
13	Precipitation (m/yr)	3.900E-01	1.000E+00	-
13	Irrigation (m/yr)	0.000E+00	2.000E-01	-
13	Irrigation mode	overhead	overhead	-
13	Runoff coefficient	2.000E-01	2.000E-01	-
13	Watershed area for nearby stream or pond (m**2)	3.630E+07	1.000E+06	-
13	Accuracy for water/soil computations	1.000E-03	1.000E-03	-
14	Density of saturated zone (g/cm**3)	1.500E+00	1.500E+00	-
14	Saturated zone total porosity	4.000E-01	4.000E-01	-
14	Saturated zone effective porosity	2.000E-01	2.000E-01	-
14	Saturated zone field capacity	2.000E-01	2.000E-01	-
14	Saturated zone hydraulic conductivity (m/yr)	4.000E+03	1.000E+02	-
14	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	-
14	Saturated zone b parameter	4.380E+00	5.300E+00	-
	Water table drop rate (m/yr)	1.000E-03	1.000E-03	-
	Well pump intake depth (m below water table)	2.000E+01	1.000E+01	-
14	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	-

Site-Specific Parameter Summary (continued)

	Parameter	User Input	Default	Used b (If different
014	Well pumping rate (m**3/yr)	2.500E+02	2.500E+02	-
015	Number of unsaturated zone strata	1	1	-
015	Unsat. zone 1, thickness (m)	1.500E+01	4.000E+00	-
015	Unsat. zone 1, soil density (g/cm**3)	1.500E+00	1.500E+00	-
015	Unsat. zone 1, total porosity	4.000E-01	4.000E-01	-
015	Unsat. zone 1, effective porosity	2.000E-01	2.000E-01	-
015	Unsat. zone 1, field capacity	2.000E-01	2.000E-01	-
015	Unsat. zone 1, soil-specific b parameter	4.380E+00	5.300E+00	-
015	Unsat. zone 1, hydraulic conductivity (m/yr)	4.000E+03	1.000E+01	-
016	Distribution coefficients for U-234			
016	Contaminated zone (cm**3/g)	3.500E+01	5.000E+01	-
016	Unsaturated zone 1 (cm**3/g)	3.500E+01	5.000E+01	-
016	Saturated zone (cm**3/g)	3.500E+01	5.000E+01	-
016	Leach rate (/yr)	0.000E+00	0.000E+00	9.86
016	Solubility constant	0.000E+00	0.000E+00	not
016	Distribution coefficients for U-235			
016	Contaminated zone (cm**3/g)	3.500E+01	5.000E+01	-
16	Unsaturated zone 1 (cm**3/g)	3.500E+01	5.000E+01	-
16	Saturated zone (cm**3/g)	3.500E+01	5.000E+01	-
16	Leach rate (/yr)	0.000E+00	0.000E+00	9.86
16	Solubility constant	0.000E+00	0.000E+00	not
16	Distribution coefficients for U-238			
16	Contaminated zone (cm**3/g)	3.500E+01	5.000E+01	-
16	Unsaturated zone 1 (cm**3/g)	3.500E+01	5.000E+01	-
16	Saturated zone (cm**3/g)	3.500E+01	5.000E+01	-
16	Leach rate (/yr)	0.000E+00	0.000E+00	9.86
16	Solubility constant	0.000E+00	0.000E+00	not
16	Distribution coefficients for daughter Ac-227			
16	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	-
16	Unsaturated zone 1 (cm**3/g)	2.000E+01	2.000E+01	-
16	Saturated zone (cm**3/g)	2.000E+01	2.000E+01	-
16	Leach rate (/yr)	0.000E+00	0.000E+00	1.72
16	Solubility constant	0.000E+00	0.000E+00	not
16	Distribution coefficients for daughter Pa-231			
16	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	-
16	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	-
16	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	-
16	Leach rate (/yr)	0.000E+00	0.000E+00	6.91
16	Solubility constant	0.000E+00	0.000E+00	not
16	Distribution coefficients for daughter Pb-210			
16	Contaminated zone (cm**3/g)	2.700E+02	1.000E+02	-
	Unsaturated zone 1 (cm**3/g)	2.700E+02	1.000E+02	-
	Saturated zone (cm**3/g)	2.700E+02	1.000E+02	-
16	Leach rate (/yr)	0.000E+00	0.000E+00	1.29
16	Solubility constant	0.000E+00	0.000E+00	not

Site-Specific Parameter Summary (continued)

	Parameter	User Input	Default	Used b (If different
016	Distribution coefficients for daughter Ra-226			
.016	Contaminated zone (cm**3/g)	5.000E+02	7.000E+01	–
.016	Unsaturated zone 1 (cm**3/g)	5.000E+02	7.000E+01	–
.016	Saturated zone (cm**3/g)	5.000E+02	7.000E+01	–
.016	Leach rate (/yr)	0.000E+00	0.000E+00	6.93
016	Solubility constant	0.000E+00	0.000E+00	not
016	Distribution coefficients for daughter Th-230			
016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	–
016	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	–
016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	–
016	Leach rate (/yr)	0.000E+00	0.000E+00	5.77
016	Solubility constant	0.000E+00	0.000E+00	not
017	Inhalation rate (m**3/yr)	8.400E+03	8.400E+03	–
017	Mass loading for inhalation (g/m**3)	3.000E-04	1.000E-04	–
017	Exposure duration	3.000E+01	3.000E+01	–
017	Shielding factor, inhalation	4.000E-01	4.000E-01	–
017	Shielding factor, external gamma	5.500E-01	7.000E-01	–
017	Fraction of time spent indoors	5.000E-01	5.000E-01	–
017	Fraction of time spent outdoors (on site)	2.500E-01	2.500E-01	–
017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows ci
017	Radii of shape factor array (used if FS = -1):			
017	Outer annular radius (m), ring 1:	not used	5.000E+01	–
	Outer annular radius (m), ring 2:	not used	7.071E+01	–
017	Outer annular radius (m), ring 3:	not used	0.000E+00	–
017	Outer annular radius (m), ring 4:	not used	0.000E+00	–
017	Outer annular radius (m), ring 5:	not used	0.000E+00	–
017	Outer annular radius (m), ring 6:	not used	0.000E+00	–
017	Outer annular radius (m), ring 7:	not used	0.000E+00	–
17	Outer annular radius (m), ring 8:	not used	0.000E+00	–
17	Outer annular radius (m), ring 9:	not used	0.000E+00	–
17	Outer annular radius (m), ring 10:	not used	0.000E+00	–
17	Outer annular radius (m), ring 11:	not used	0.000E+00	–
17	Outer annular radius (m), ring 12:	not used	0.000E+00	–
17	Fractions of annular areas within AREA:			
17	Ring 1	not used	1.000E+00	–
17	Ring 2	not used	2.732E-01	–
17	Ring 3	not used	0.000E+00	–
17	Ring 4	not used	0.000E+00	–
17	Ring 5	not used	0.000E+00	–
17	Ring 6	not used	0.000E+00	–
17	Ring 7	not used	0.000E+00	–
17	Ring 8	not used	0.000E+00	–
17	Ring 9	not used	0.000E+00	–
17	Ring 10	not used	0.000E+00	–
17	Ring 11	not used	0.000E+00	–
	Ring 12	not used	0.000E+00	–
18	Fruits, vegetables and grain consumption (kg/yr)	1.900E+02	1.600E+02	–

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)
018	Leafy vegetable consumption (kg/yr)	1.400E+01	1.400E+01	-
018	Milk consumption (L/yr)	not used	9.200E+01	-
018	Meat and poultry consumption (kg/yr)	6.300E+01	6.300E+01	-
018	Fish consumption (kg/yr)	not used	5.400E+00	-
018	Other seafood consumption (kg/yr)	not used	9.000E-01	-
018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	-
018	Drinking water intake (L/yr)	5.100E+02	5.100E+02	-
018	Contamination fraction of drinking water	1.000E+00	1.000E+00	-
018	Contamination fraction of household water	not used	1.000E+00	-
018	Contamination fraction of livestock water	1.000E+00	1.000E+00	-
018	Contamination fraction of irrigation water	1.000E+00	1.000E+00	-
018	Contamination fraction of aquatic food	not used	5.000E-01	-
018	Contamination fraction of plant food	2.500E-01	-1	-
018	Contamination fraction of meat	2.500E-01	-1	-
018	Contamination fraction of milk	not used	-1	-
019	Livestock fodder intake for meat (kg/day)	6.800E+01	6.800E+01	-
019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	-
019	Livestock water intake for meat (L/day)	5.000E+01	5.000E+01	-
019	Livestock water intake for milk (L/day)	not used	1.600E+02	-
019	Livestock soil intake (kg/day)	5.000E-01	5.000E-01	-
019	Mass loading for foliar deposition (g/m**3)	3.000E-04	1.000E-04	-
019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	-
019	Depth of roots (m)	3.000E-01	9.000E-01	-
	Drinking water fraction from ground water	1.000E+00	1.000E+00	-
019	Household water fraction from ground water	not used	1.000E+00	-
019	Livestock water fraction from ground water	1.000E+00	1.000E+00	-
019	Irrigation fraction from ground water	1.000E+00	1.000E+00	-
9B	Wet weight crop yield for Non-Leafy (kg/m**2)	7.000E-01	7.000E-01	-
9B	Wet weight crop yield for Leafy (kg/m**2)	1.500E+00	1.500E+00	-
9B	Wet weight crop yield for Fodder (kg/m**2)	1.100E+00	1.100E+00	-
9B	Growing Season for Non-Leafy (years)	1.700E-01	1.700E-01	-
9B	Growing Season for Leafy (years)	2.500E-01	2.500E-01	-
9B	Growing Season for Fodder (years)	8.000E-02	8.000E-02	-
9B	Translocation Factor for Non-Leafy	1.000E-01	1.000E-01	-
9B	Translocation Factor for Leafy	1.000E+00	1.000E+00	-
9B	Translocation Factor for Fodder	1.000E+00	1.000E+00	-
9B	Dry Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	-
9B	Dry Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	-
9B	Dry Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	-
9B	Wet Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	-
9B	Wet Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	-
9B	Wet Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	-
9B	Weathering Removal Constant for Vegetation	2.000E+01	2.000E+01	-
4	C-12 concentration in water (g/cm**3)	not used	2.000E-05	-
4	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	-
4	Fraction of vegetation carbon from soil	not used	2.000E-02	-
	Fraction of vegetation carbon from air	not used	9.800E-01	-
4	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	-

Site-Specific Parameter Summary (continued)

	Parameter	User Input	Default	Used b (If different
:14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	-
:14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	-
:14	Fraction of grain in beef cattle feed	not used	8.000E-01	-
:14	Fraction of grain in milk cow feed	not used	2.000E-01	-
:14	DCF correction factor for gaseous forms of C14	not used	8.894E+01	-
TOR	Storage times of contaminated foodstuffs (days):			
TOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	-
TOR	Leafy vegetables	1.000E+00	1.000E+00	-
TOR	Milk	1.000E+00	1.000E+00	-
TOR	Meat and poultry	2.000E+01	2.000E+01	-
TOR	Fish	7.000E+00	7.000E+00	-
TOR	Crustacea and mollusks	7.000E+00	7.000E+00	-
TOR	Well water	1.000E+00	1.000E+00	-
TOR	Surface water	1.000E+00	1.000E+00	-
TOR	Livestock fodder	4.500E+01	4.500E+01	-
)21	Thickness of building foundation (m)	not used	1.500E-01	-
)21	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	-
)21	Total porosity of the cover material	not used	4.000E-01	-
)21	Total porosity of the building foundation	not used	1.000E-01	-
)21	Volumetric water content of the cover material	not used	5.000E-02	-
)21	Volumetric water content of the foundation	not used	3.000E-02	-
)21	Diffusion coefficient for radon gas (m/sec):			
	in cover material	not used	2.000E-06	-
)21	in foundation material	not used	3.000E-07	-
)21	in contaminated zone soil	not used	2.000E-06	-
)21	Radon vertical dimension of mixing (m)	not used	2.000E+00	-
)21	Average building air exchange rate (1/hr)	not used	5.000E-01	-
)21	Height of the building (room) (m)	not used	2.500E+00	-
)21	Building interior area factor	not used	0.000E+00	-
)21	Building depth below ground surface (m)	not used	-1.000E+00	-
)21	Emanating power of Rn-222 gas	not used	2.500E-01	-
)21	Emanating power of Rn-220 gas	not used	1.500E-01	-
TL	Number of graphical time points	32	---	-
TL	Maximum number of integration points for dose	17	---	-
TL	Maximum number of integration points for risk	513	---	-

Summary of Pathway Selections

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

Contaminated Zone Dimensions			Initial Soil Concentrations, pCi/g	
Area:	10000.00	square meters	U-234	4.890E+01
ckness:	0.15	meters	U-235	2.200E+00
er Depth:	0.00	meters	U-238	4.890E+01

Total Dose TDOSE(t), mrem/yr
Basic Radiation Dose Limit = 1.000E+02 mrem/yr
Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.00
TDOSE(t):	7.898E+00	7.791E+00	7.578E+00	6.874E+00	5.153E+00	1.485E+00	0.000E+00	0.00
M(t):	7.898E-02	7.791E-02	7.578E-02	6.874E-02	5.153E-02	1.485E-02	0.000E+00	0.00

aximum TDOSE(t): 7.898E+00 mrem/yr   at t = 0.000E+00 years

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
-234	9.872E-03	0.0012	5.781E-01	0.0732	0.000E+00	0.0000	8.766E-01	0.1110	4.307E-02	0.0055
-235	8.127E-01	0.1029	2.424E-02	0.0031	0.000E+00	0.0000	3.727E-02	0.0047	1.842E-03	0.0002
-238	3.375E+00	0.4273	5.168E-01	0.0654	0.000E+00	0.0000	8.332E-01	0.1055	4.094E-02	0.0052
otal	4.198E+00	0.5315	1.119E+00	0.1417	0.000E+00	0.0000	1.747E+00	0.2212	8.586E-02	0.0109

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

Water Dependent Pathways

adio-	Water		Fish		Radon		Plant		Meat	
uclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
-234	9.775E-03	0.0013	5.686E-01	0.0730	0.000E+00	0.0000	8.622E-01	0.1107	4.237E-02	0.0054
-235	8.040E-01	0.1032	2.384E-02	0.0031	0.000E+00	0.0000	3.678E-02	0.0047	1.844E-03	0.0002
-238	3.337E+00	0.4283	5.083E-01	0.0652	0.000E+00	0.0000	8.196E-01	0.1052	4.028E-02	0.0052
otal	4.150E+00	0.5327	1.101E+00	0.1413	0.000E+00	0.0000	1.719E+00	0.2206	8.449E-02	0.0108

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

Water Dependent Pathways

adio-	Water		Fish		Radon		Plant		Meat	
uclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) an
As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground		Inhalation		Radon		Plant		Meat	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	9.587E-03	0.0013	5.500E-01	0.0726	0.000E+00	0.0000	8.340E-01	0.1100	4.099E-02	0.0054
U-235	7.870E-01	0.1039	2.308E-02	0.0030	0.000E+00	0.0000	3.582E-02	0.0047	1.846E-03	0.0002
U-238	3.260E+00	0.4302	4.916E-01	0.0649	0.000E+00	0.0000	7.927E-01	0.1046	3.896E-02	0.0051
Total	4.057E+00	0.5353	1.065E+00	0.1405	0.000E+00	0.0000	1.663E+00	0.2194	8.179E-02	0.0108

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) an
As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Dependent Pathways

Radio-Nuclide	Water		Fish		Radon		Plant		Meat	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground		Inhalation		Radon		Plant		Meat	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	8.984E-03	0.0013	4.888E-01	0.0711	0.000E+00	0.0000	7.412E-01	0.1078	3.643E-02	0.0053
U-235	7.298E-01	0.1062	2.057E-02	0.0030	0.000E+00	0.0000	3.264E-02	0.0047	1.837E-03	0.0003
U-238	3.004E+00	0.4371	4.369E-01	0.0636	0.000E+00	0.0000	7.045E-01	0.1025	3.462E-02	0.0050
Total	3.743E+00	0.5445	9.463E-01	0.1377	0.000E+00	0.0000	1.478E+00	0.2151	7.289E-02	0.0106

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

Water Dependent Pathways

Radio-Nuclide	Water		Fish		Radon		Plant		Meat	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
[illegible]	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) an
As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.
J-234	7.655E-03	0.0015	3.439E-01	0.0667	0.000E+00	0.0000	5.214E-01	0.1012	2.562E-02	0.0050
J-235	5.840E-01	0.1133	1.469E-02	0.0029	0.000E+00	0.0000	2.477E-02	0.0048	1.703E-03	0.0003
J-238	2.356E+00	0.4573	3.073E-01	0.0596	0.000E+00	0.0000	4.955E-01	0.0962	2.435E-02	0.0047
'otal	2.948E+00	0.5721	6.659E-01	0.1292	0.000E+00	0.0000	1.042E+00	0.2021	5.168E-02	0.0100

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) an
As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Dependent Pathways

adio-uclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.
-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
.	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground		Inhalation		Radon		Plant		Meat	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	5.111E-03	0.0034	7.161E-02	0.0482	0.000E+00	0.0000	1.089E-01	0.0734	5.345E-03	0.0036
U-235	2.140E-01	0.1442	3.308E-03	0.0022	0.000E+00	0.0000	6.774E-03	0.0046	6.964E-04	0.0005
U-238	8.041E-01	0.5416	6.381E-02	0.0430	0.000E+00	0.0000	1.029E-01	0.0693	5.061E-03	0.0034
Total	1.023E+00	0.6892	1.387E-01	0.0934	0.000E+00	0.0000	2.186E-01	0.1473	1.110E-02	0.0075

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

Water Dependent Pathways

Radio-Nuclide	Water		Fish		Radon		Plant		Meat	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
[illegible]	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) an
As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) an
As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
[illegible]	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

*Sum of all water independent and dependent pathways.

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
[illegible]	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

*Sum of all water independent and dependent pathways.

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

it	Product (j)	Branch Fraction*	DSR(j,t) (mrem/yr)/(pCi/g) t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+
J-234	U-234	1.000E+00	3.851E-02	3.788E-02	3.664E-02	3.257E-02	2.293E-02	4.793E-03	0.000E+
J-234	Th-230	1.000E+00	2.722E-07	7.968E-07	1.808E-06	4.980E-06	1.127E-05	1.143E-05	0.000E+
J-234	Ra-226	1.000E+00	4.014E-09	2.830E-08	1.485E-07	1.269E-06	9.239E-06	4.666E-05	0.000E+
J-234	Pb-210	1.000E+00	1.434E-11	1.855E-10	1.926E-09	4.292E-08	7.206E-07	5.689E-06	0.000E+
J-234	∑DSR(j)		3.851E-02	3.788E-02	3.665E-02	3.258E-02	2.295E-02	4.857E-03	0.000E+
J-235	U-235	1.000E+00	4.054E-01	4.009E-01	3.920E-01	3.621E-01	2.867E-01	1.013E-01	0.000E+
J-235	Pa-231	1.000E+00	3.847E-05	1.183E-04	2.716E-04	7.372E-04	1.560E-03	1.210E-03	0.000E+
J-235	Ac-227	1.000E+00	3.673E-07	2.347E-06	1.138E-05	8.310E-05	4.157E-04	7.009E-04	0.000E+
J-235	∑DSR(j)		4.054E-01	4.010E-01	3.923E-01	3.629E-01	2.886E-01	1.032E-01	0.000E+
J-238	U-238	1.000E+00	1.048E-01	1.034E-01	1.007E-01	9.166E-02	6.944E-02	2.086E-02	0.000E+
J-238	U-234	1.000E+00	5.444E-08	1.609E-07	3.635E-07	9.695E-07	1.982E-06	1.366E-06	0.000E+
J-238	Th-230	1.000E+00	2.606E-13	1.766E-12	9.008E-12	7.299E-11	4.633E-10	1.364E-09	0.000E+
J-238	Ra-226	1.000E+00	2.820E-15	4.267E-14	4.938E-13	1.240E-11	2.539E-10	3.787E-09	0.000E+
J-238	Pb-210	1.000E+00	8.516E-18	2.256E-16	4.989E-15	3.234E-13	1.565E-11	3.944E-10	0.000E+
J-238	∑DSR(j)		1.048E-01	1.034E-01	1.007E-01	9.166E-02	6.945E-02	2.086E-02	0.000E+

Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j
he DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

Single Radionuclide Soil Guidelines G(i,t) in pCi/g
Basic Radiation Dose Limit = 1.000E+02 mrem/yr

uclide (i)	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02
-234	2.597E+03	2.640E+03	2.729E+03	3.069E+03	4.358E+03	2.059E+04	*6.245E+09 *
-235	2.466E+02	2.494E+02	2.549E+02	2.755E+02	3.465E+02	9.687E+02	*2.160E+06 *
-238	9.545E+02	9.672E+02	9.932E+02	1.091E+03	1.440E+03	4.794E+03	*3.360E+05 *

At specific activity limit

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

uclide (i)	Initial (pCi/g)	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
-234	4.890E+01	0.000E+00	3.851E-02	2.597E+03	3.851E-02	2.597E+03
-235	2.200E+00	0.000E+00	4.054E-01	2.466E+02	4.054E-01	2.466E+02
-238	4.890E+01	0.000E+00	1.048E-01	9.545E+02	1.048E-01	9.545E+02

Individual Nuclide Dose Summed Over All Pathways
Parent Nuclide and Branch Fraction Indicated

de (j)	Parent (i)	BRF(i)		DOSE(j,t), mrem/yr						
			t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+
J-234	U-234	1.000E+00		1.883E+00	1.852E+00	1.792E+00	1.593E+00	1.121E+00	2.344E-01	0.000E+
J-234	U-238	1.000E+00		2.662E-06	7.870E-06	1.777E-05	4.741E-05	9.693E-05	6.679E-05	0.000E+
J-234	∑DOSE(j)			1.883E+00	1.852E+00	1.792E+00	1.593E+00	1.121E+00	2.345E-01	0.000E+
h-230	U-234	1.000E+00		1.331E-05	3.896E-05	8.839E-05	2.435E-04	5.513E-04	5.590E-04	0.000E+
h-230	U-238	1.000E+00		1.274E-11	8.635E-11	4.405E-10	3.569E-09	2.265E-08	6.672E-08	0.000E+
h-230	∑DOSE(j)			1.331E-05	3.896E-05	8.839E-05	2.435E-04	5.513E-04	5.591E-04	0.000E+
a-226	U-234	1.000E+00		1.963E-07	1.384E-06	7.261E-06	6.208E-05	4.518E-04	2.282E-03	0.000E+
a-226	U-238	1.000E+00		1.379E-13	2.086E-12	2.415E-11	6.064E-10	1.242E-08	1.852E-07	0.000E+
a-226	∑DOSE(j)			1.963E-07	1.384E-06	7.261E-06	6.208E-05	4.518E-04	2.282E-03	0.000E+
b-210	U-234	1.000E+00		7.011E-10	9.070E-09	9.419E-08	2.099E-06	3.524E-05	2.782E-04	0.000E+
b-210	U-238	1.000E+00		4.164E-16	1.103E-14	2.440E-13	1.582E-11	7.651E-10	1.929E-08	0.000E+
b-210	∑DOSE(j)			7.011E-10	9.070E-09	9.419E-08	2.099E-06	3.524E-05	2.782E-04	0.000E+
-235	U-235	1.000E+00		8.919E-01	8.819E-01	8.624E-01	7.967E-01	6.306E-01	2.229E-01	0.000E+
a-231	U-235	1.000E+00		8.463E-05	2.602E-04	5.974E-04	1.622E-03	3.431E-03	2.662E-03	0.000E+
c-227	U-235	1.000E+00		8.080E-07	5.164E-06	2.504E-05	1.828E-04	9.145E-04	1.542E-03	0.000E+
	U-238	1.000E+00		5.123E+00	5.056E+00	4.923E+00	4.482E+00	3.396E+00	1.020E+00	0.000E+

RF(i) is the branch fraction of the parent nuclide.

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	BRF(i)	S(j,t), pCi/g t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+
U-234	U-234	1.000E+00	4.890E+01	4.842E+01	4.747E+01	4.430E+01	3.637E+01	1.822E+01	2.531E+
U-234	U-238	1.000E+00	0.000E+00	1.373E-04	4.038E-04	1.256E-03	3.093E-03	5.167E-03	2.154E-
U-234	∑S(j):		4.890E+01	4.842E+01	4.747E+01	4.431E+01	3.637E+01	1.823E+01	2.534E+
Th-230	U-234	1.000E+00	0.000E+00	4.380E-04	1.301E-03	4.191E-03	1.143E-02	2.795E-02	4.216E-
Th-230	U-238	1.000E+00	0.000E+00	6.199E-10	5.506E-09	5.844E-08	4.620E-07	3.322E-06	1.016E-
Th-230	∑S(j):		0.000E+00	4.380E-04	1.301E-03	4.191E-03	1.143E-02	2.796E-02	4.217E-
Ra-226	U-234	1.000E+00	0.000E+00	9.500E-08	8.488E-07	9.194E-06	7.703E-05	6.761E-04	3.451E-
Ra-226	U-238	1.000E+00	0.000E+00	8.964E-14	2.395E-12	8.554E-11	2.084E-09	5.464E-08	6.155E-
Ra-226	∑S(j):		0.000E+00	9.500E-08	8.488E-07	9.194E-06	7.704E-05	6.762E-04	3.451E-
Pb-210	U-234	1.000E+00	0.000E+00	9.773E-10	2.582E-08	8.879E-07	1.955E-05	3.872E-04	2.885E-
Pb-210	U-238	1.000E+00	0.000E+00	6.928E-16	5.494E-14	6.301E-12	4.161E-10	2.670E-08	4.868E-
Pb-210	∑S(j):		0.000E+00	9.773E-10	2.582E-08	8.879E-07	1.955E-05	3.872E-04	2.885E-
U-235	U-235	1.000E+00	2.200E+00	2.178E+00	2.136E+00	1.993E+00	1.636E+00	8.202E-01	1.140E-
Pa-231	U-235	1.000E+00	0.000E+00	4.616E-05	1.362E-04	4.280E-04	1.086E-03	2.016E-03	1.160E-
Ac-227	U-235	1.000E+00	0.000E+00	7.249E-07	6.246E-06	5.976E-05	3.589E-04	1.196E-03	8.300E-
[illegible]	U-238	1.000E+00	4.890E+01	4.842E+01	4.747E+01	4.431E+01	3.637E+01	1.823E+01	2.534E+

BRF(i) is the branch fraction of the parent nuclide.

RESCALC.EXE execution time =   0.55 seconds