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**Short Lived Radionuclide Modeling from Nuclear Weapons Test Sites  
and Nuclear Power Plant Accidents**

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**Short Lived Radionuclide Modeling from Nuclear Weapons Test Sites  
and Nuclear Power Plant Accidents**

**by**

**Jonathan David Helfand, B.S.M.E.**

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## Abstract

### Short Lived Radionuclide Modeling from Nuclear Weapons Test Sites and Nuclear Power Plant Accidents

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The University of Texas at Austin, 2014

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Nuclear accidents and weapons tests are monitored by a worldwide network of air sensors, seismic detectors and several other techniques. At the site of the incident, contaminants are distributed and can provide insight into the time of the incident and type of incident. That information can then be used to affect policy decisions or better understand health risks.

In order to evaluate a post nuclear test scenario, we must better understand the background readings at potential test sites where false positive or false negative allegations are more likely (*e.g.* the Nevada Test Site, the Chernobyl Nuclear Power Plate, *etc.*) Data from these sites have been compiled and compared to high purity germanium detector background readings and activities from a hypothetical nuclear weapon test. The results indicate that the following nuclides would be the best indicator of a recent nuclear test:  $^{89}\text{Sr}$ ,  $^{91}\text{Y}$ ,  $^{95}\text{Zr}$ ,  $^{103}\text{Ru}$ ,  $^{126}\text{Sb}$ ,  $^{129\text{m}}\text{Te}$ ,  $^{147}\text{Nd}$ ,  $^{156}\text{Eu}$ . Nuclides such as  $^{91}\text{Sr}$  or  $^{97}\text{Zr}$  have a steady state concentration due to plutonium spontaneous fission thus would not be a good indication of a recent nuclear test.

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## Chapter 1: Background

Attempts to limit nuclear weapons testing began shortly after the Trinity test (1945). The first step towards limiting tests came in the form of the Partial Nuclear Test Ban Treaty (PTBT) [1, 2] after the U.S. and the U.S.S.R. had conducted atmospheric weapons testing then received heavy criticism for the ensuing fallout. Other attempts to further limit nuclear testing (e.g. The Nuclear Non-Proliferation Treaty) finally culminated in the Comprehensive Nuclear Test Ban Treaty (CTBT), the most current measure attempting to eliminate all nuclear explosions. The CTBT will enter into effect once the 44 states with nuclear capabilities (at the time the treaty was written) sign and ratify the document. [1] The status of the states in the treaty are shown in Figure 1.

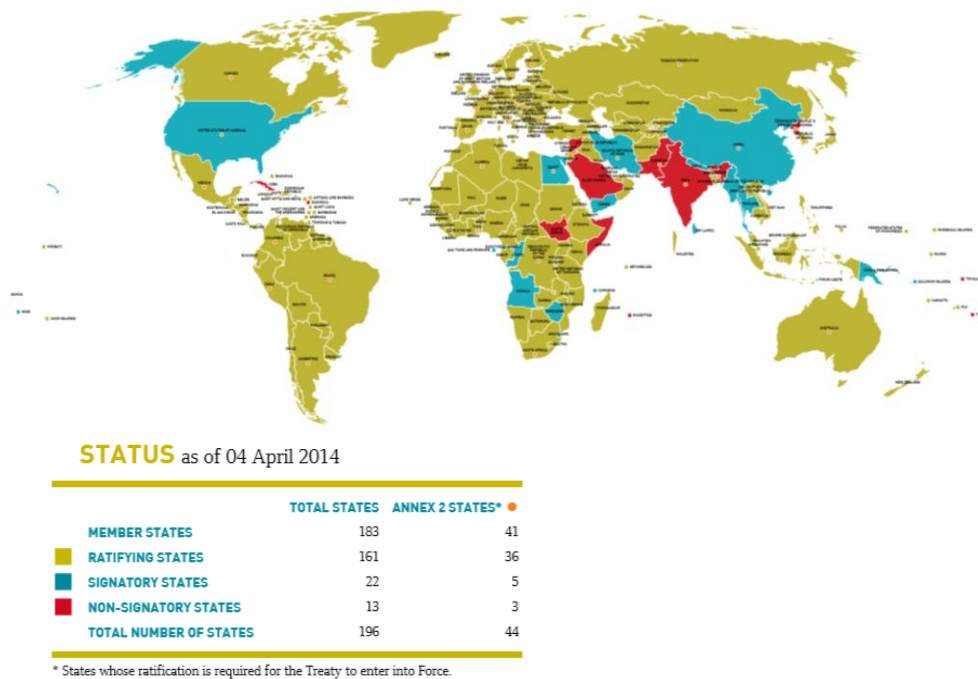


Figure 1: Signatures and ratifications of the CTBT [1]

The last major step of the CTBT is the establishment of a verification regime. This contains both the International Monitoring System (IMS) and the on-site inspection regime. The verification regime is used to ensure compliance with the CTBT. The IMS uses a radionuclide monitoring, infrasound, and hydroacoustic stations around the world to monitor for nuclear explosions. Once a potential test is identified, an on-site inspection would be used to verify that a nuclear explosion had taken place. Figure 2 shows the location of IMS stations.



Figure 2: Locations of the IMS stations. All blue and green points are seismic stations. The shape and color identify the specific type of seismic station. The orange squares are radionuclide stations. The red triangles are radionuclide laboratories. The yellow stars and brown tees are hydroacoustic stations. The purple diamonds are infrasound stations. The yellow circle is the CTBTO International Data Centre. [1]

One technology used to identify a nuclear explosion is monitoring for specific isotopes. Radioactive noble gasses may be the key nuclides for IMS stations, but during an on-site inspection, teams would be able to take soil sampled. As time passes, the

material from a nuclear test or accident will decay until the radionuclide is below detection levels. Short lived nuclides, such as  $^{91}\text{Sr}$  (9.6 hour half-life) will decay quickly so that weeks or months after a test or accident these nuclides should not be detectable. In fact, the detection of short lived radionuclides would suggest recent fission activity. However, a single nuclide should not be relied upon for positive test identification, rather, a signature, comprising several nuclides.

Detecting short lived radionuclides and knowing that there was recently fission activity, an organization may jump to the conclusion that there was recently nuclear weapon testing or an unreported nuclear release. However, plutonium released during past nuclear weapons testing and accidental releases will continue to undergo spontaneous fission and develop a steady state concentration of short lived isotopes. Spontaneous fission occurs as a result of quantum tunneling and does not require a neutron source for fission to occur.

There are a number of places worldwide where different countries have detonated nuclear weapons or suffered nuclear releases including: the Nevada Test Site (NTS), U.S.; the Pacific Proving Grounds (PPG), U.S.; The Semipalatinsk Test Site, U.S.S.R.; Pripyat, Ukraine; the Montebello Islands, U.K.; Lop Nur Nuclear Weapons Test Base, P.R.K; *etc.* These are sites where there has been a significant plutonium release. If a country were to test another nuclear weapon or release nuclear material, one of the sites listed above or a similar site would be an obvious choice. Therefore, it would be advantageous to be able to identify a recent radionuclide release, and eliminate any false-positive conclusions due to historical releases.

## **1.1 THEORY**

### **1.1.1 Fission**

Fission is a reaction in which the nucleus of an atom split into several smaller parts, producing neutrons, gamma rays, a large amount of energy, and two daughter products. There is a small chance of producing 3 daughter products, but two fission products, or binary fission is assumed. The resulting daughter products are similar, but usually different sizes. The distribution of the products is shown in Figure 3. The amount of free energy in radionuclides is much larger than the free energy in any other commonly used fuel, making nuclear material valuable as an energy source. However, the products of nuclear fission are usually more radioactive than the parent nuclei which are fissioned as fuel.

### **1.1.2 Spontaneous Fission**

Fission is usually used as a deliberate man-made nuclear reaction to produce energy. Outside of a reactor, however, fission can be encountered in naturally occurring radionuclides or radionuclides left from weapons testing in the form of spontaneous radioactive decay. Spontaneous radioactive decay, or spontaneous fission, occurs in very heavy isotopes. It is feasible over practical observation times only from isotopes above 232 amu.

### **1.1.3 Fission Products and Fission Decay Series**

Generally two daughter products are formed during fission. This is known as binary fission. There is a distribution of products as seen in Figure 3; the most likely products are at  $95 \pm 15$  and  $135 \pm 15$  amu.

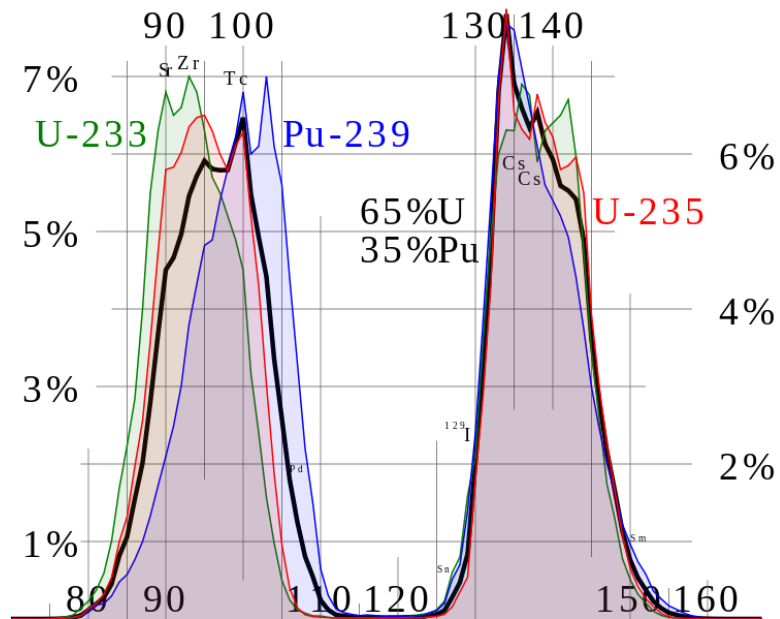


Figure 3: Product yield by mass for U-233, Pu-239, and U-235 [3]

However, the radioactive daughter products generally do not decay into a stable state, but undergo a series of decays until a stable isotope is reached. That series of decays is called a *decay chain*. Stages in the decay chain are known by their relationship to surrounding stages. A *parent* isotope undergoes decay to form a *daughter isotope*. The daughter isotope may be stable, or it may decay further to form its own daughter isotope. Figure 4 shows an example decay chain for uranium.

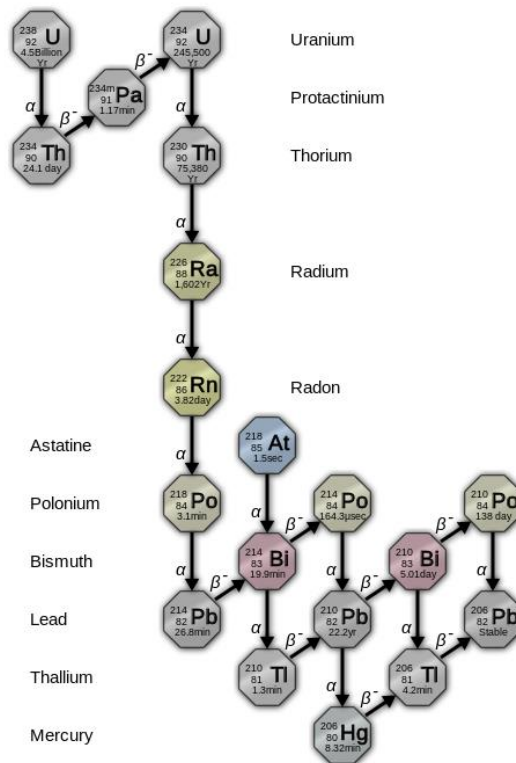


Figure 4: Uranium decay chain [4]

#### 1.1.4 Radiation Detections and HPGe Operation

Gamma-ray spectroscopy is the study of the energy spectra of gamma-ray sources. Gamma-ray sources have a characteristic signature, and by using a semiconductor detector, one can determine the nuclides in an unknown sample. Semiconductor detectors use a semiconductor crystal (germanium or silicon) to study incident ionizing radiation. Germanium detectors have an advantage over silicon detectors in that the germanium detector can be used as a total absorption detector for gamma rays up to several MeV. However, both germanium and silicon detectors need to be cooled with liquid nitrogen for the crystal to function properly.



## Chapter 2: Purpose

The purpose of this thesis is to characterize a background signature as a comparison point to determine whether a nuclear test has recently been performed. The steps to accomplish this are as follows:

- Determine which isotopes are characteristic of nuclear explosions and accidents;
- Quantify steady state levels of plutonium spontaneous fission products;
- Estimate historic isotope dispersal and concentration in soil after nuclear tests and accidents;
- Determine background readings for a high purity germanium detector (HPGe);
- Compare the estimated concentrations to the calculated HPGe background readings to determine relevant nuclei;
- Calculate soil concentrations of relevant nuclei after a recent nuclear test and compare to the background from past nuclear tests.

This information could be used to refute accusations of recent nuclear testing or as one piece of evidence in detecting unannounced nuclear releases.

### Chapter 3: Past Nuclear Weapon Tests

Although the U.S., U.S.S.R., U.K., France, and P.R.K. have all performed many nuclear weapons tests, the focus of this work is on tests performed at the Nevada Test Site (NTS) and the Pacific Proving Grounds. Test dates range from 1945 until 1992, and include underwater, atmospheric, and underground tests. The United States and Great Brittan have participated in tests at the NTS. Power plant accidents at Chernobyl, Three Mile Island, and Fukushima will also be addressed. Figures showing the location of the weapon test sites are shown below.

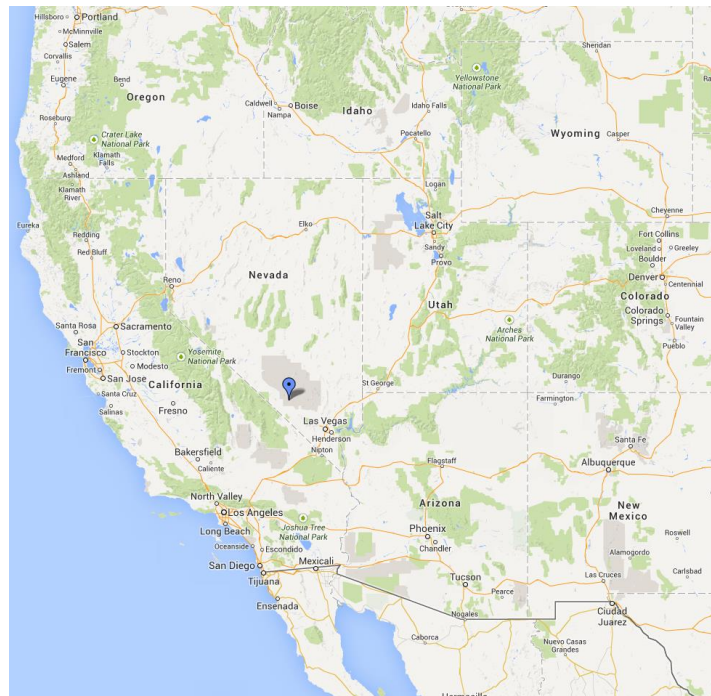


Figure 5: Location of the Nevada Test Site

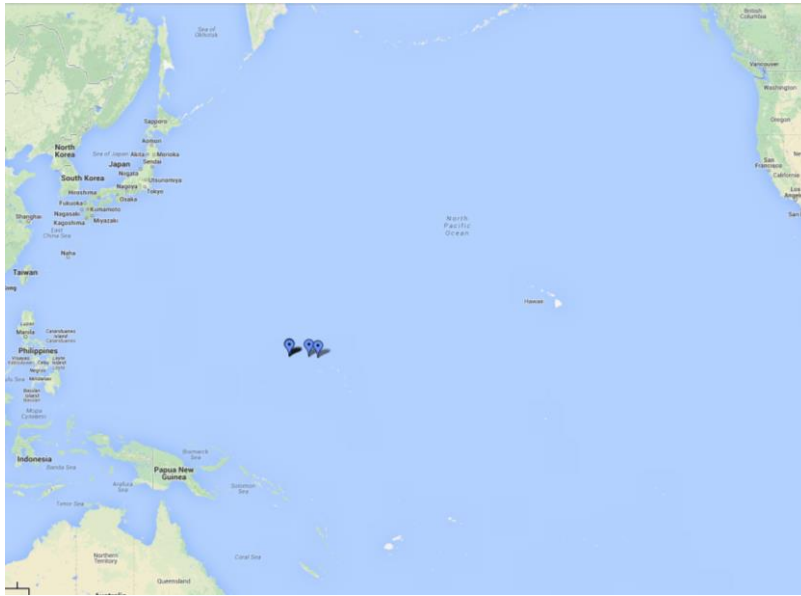


Figure 6: Location of the Pacific Proving Grounds

The image shows the global location of the islands. The indicators on the map show the location of nuclear tests.

There are just over 1000 tests performed at the NTS, and just over 100 tests at the Pacific Proving Grounds. A list of these tests and information specific to each test is presented in Appendices A and B. The information given in the database is: the country sponsoring the test, the type of test, the date, the coordinates of the test, the yield (in kiloton), and the test name [5]. Using the given data, a number of values were calculated to determine the current activity at the sites.

### 3.1 CALCULATED VALUES FOR TEST SITE DATA

Given the test date and the current date (assumed to be 01/01/2014), the difference is used in decay calculations.

Given the yield (in kt), that value can be converted to MeV and then to number of fissions (assuming 200 MeV/fission).

Finding specific information on the size and enrichment or isotope ratio of the pit for each test was more difficult to obtain. This information has not been released by the government. With the knowledge that plutonium is more difficult to obtain, and knowing the approximate mass that would cause a uranium or plutonium pit to become critical, it was assumed that prior to 1960 the pits were mostly uranium with 2.5 kg of plutonium [6]. After 1960, there was an assumption that all pits were 8 kg of plutonium [7]. These assumptions should be viewed as order-of-magnitude estimates and should not be viewed as specific nuclear weapon design information. As such, results based on these estimates should be viewed with similar uncertainty. At no point in this dissertation is specific nuclear weapon design information utilized, calculated, or addressed.

Plutonium isotopic ratios for  $^{240}\text{Pu}/^{239}\text{Pu}$  are based on measured value from the Pacific Proving Grounds. The  $^{240}\text{Pu}/^{239}\text{Pu}$  ratio is measured between 0.065 and 0.306 depending on the specific measurement [8]. This is a post-detonation isotopic ratio and should not be interpreted as the isotopic representation of the Pu prior to detonation. The ratio was calculated to be 0.11. The weapons used at the NTS are assumed to have a similar isotopic ratio for post-detonation debris. The method for determine the atom ratio is shown below.

$$\text{Atom ratio of } \frac{^{240}\text{Pu}}{^{239}\text{Pu}} = \text{mass ratio of } \frac{^{240}\text{Pu}}{^{239}\text{Pu}} * \frac{239}{240} \quad (3.1)$$

The mass ratio is ratio of the sum of the masses in Appendix A.

## **Chapter 4: Past Nuclear Power Accidents**

One of the difficulties in investigating past nuclear accidents are the units of measurement most commonly used. For example, the NRC reports that the maximum dose to a person at the site boundary would have been less than 100 millirem above background [9]. This information is useful for knowing how a person would be affected by the accident, but it does not translate well to concentration of specific isotopes in the soil. The other difficulty with information from nuclear accidents is that the accuracy of the information is more easily questioned and changes drastically with proximity. With the same TMI example, Randall Thompson, a health physics technician employed to monitor radioactive emissions at TMI after the accident, said "I think the numbers on the NRC's website are off by a factor of 100 to 1,000". [10]

### **4.1 TMI**

The Three Mile Island Unit 2 (TMI-2) reactor, near Middletown, PA., partially melted down on March 28, 1979. This was the most serious accident in U.S. commercial nuclear power plant operating history. Figure 7 shows the location of the TMI power plant.

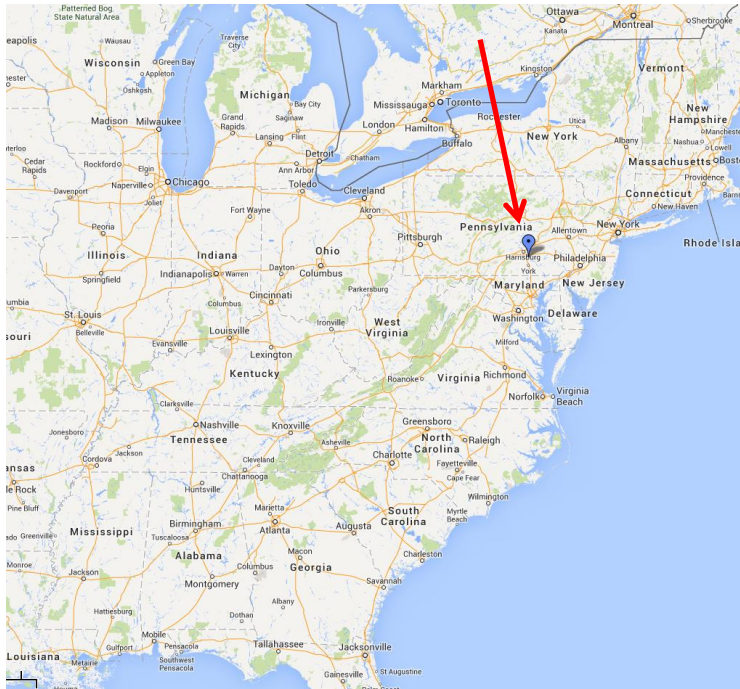


Figure 7: Location of the TMI power plant

An account of the nuclides released as a result of the TMI-2 meltdown is shown in Table 1. [11, 12] Since most of the reported release from TMI was a gas and reports indicate that there was no effect on cancer rates in the area, it is assumed that the levels of all isotopes of interest in this paper are below background levels [13].

Table 1: Total Airborne Radioactivity Released to the Environment During the TMI Accident [12]

| Nuclide                             | Half-Life     | Activity (Bq) |
|-------------------------------------|---------------|---------------|
| <b>Noble Gases</b>                  |               |               |
| $^{133}\text{Xe}$                   | 5.3 d         | 3.07E+17      |
| $^{133\text{m}}\text{Xe}$           | 2.3 d         | 6.29E+15      |
| $^{135}\text{Xe}$                   | 9.1 h         | 5.55E+16      |
| $^{135\text{m}}\text{Xe}$           | 15.6 m        | 5.18E+15      |
| $^{85}\text{Kr}$                    | 10.8 y        | 1.81E+15      |
| $^{88}\text{Kr}$                    | 2.8 h         | 2.26E+15      |
| <b>Radioactive Iodines</b>          |               |               |
| $^{129}\text{I}$                    | $\sim 10^6$ y | 1.11E+05      |
| $^{131}\text{I}$                    | 8 d           | 1.11E+12      |
| $^{133}\text{I}$                    | 20.3 h        | 1.48E+11      |
| <b>Radioactive Cesiums</b>          |               |               |
| $^{134}\text{Cs}$                   | 2.0 y         | 3.70E+05      |
| $^{136}\text{Cs}$                   | 13.7 d        | 1.11E+04      |
| $^{137}\text{Cs}$                   | 30.0 y        | 1.48E+06      |
| $^{138}\text{Cs}$                   | 32.2 m        | 7.40E+05      |
| <b>Radioactive Strontiums</b>       |               |               |
| $^{89}\text{Sr}$                    | 52.7 d        | 2.22E+06      |
| $^{90}\text{Sr}$                    | 27.7 y        | 2.22E+06      |
| <b>Activation Products</b>          |               |               |
| Tritium                             | 12.3 y        | 5.44E+12      |
| $^{58}\text{Co}$                    | 71.3 d        | 1.48E+07      |
| $^{60}\text{Co}$                    | 5.3 y         | 3.33E+06      |
| <b>Alpha-emitting Radionuclides</b> |               |               |
| Gross Alpha                         | $\sim 1000$ y | 2.22E+06      |

## 4.2 CHERNOBYL

The Chernobyl disaster was a catastrophic nuclear accident that occurred on 26 April 1986 at the Chernobyl Nuclear Power Plant in Ukraine (then officially the Ukrainian SSR), which was under the direct jurisdiction of the central authorities of the Soviet Union. An explosion and fire released large quantities of radioactive particles

into the atmosphere, which spread over much of the western USSR and Europe. Figure 8 shows the location of the Chernobyl power plant.

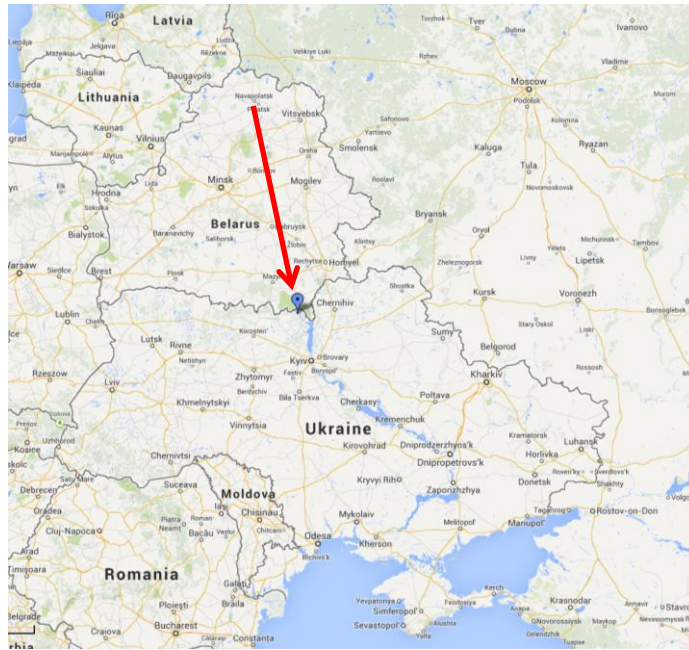


Figure 8: Location of the Chernobyl power plant

The Chernobyl disaster is widely considered to have been the worst nuclear power plant accident in history, and is one of only two classified as a level 7 event (the maximum classification) on the International Nuclear Event Scale (the other being the Fukushima Daiichi nuclear disaster in 2011). The Chernobyl disaster is unique as a commercial accident because there are well documented releases of many specific isotopes [14]. Because of the documentation and the fact that there was a significant release, we can estimate the concentration of certain isotopes. The method for estimating concentration as described in this paper is meant for weapons, not power plants. Because nuclear weapons are designed with explosive yield in mind, it is reasonable to suspect there are higher concentrations of isotopes over a smaller area near the plant. Table 2



shows the estimated concentration of isotopes compared to the background readings of an HPGe detector. As another reference point, Figure 9 shows the concentration of  $^{137}\text{Cs}$  near the Chernobyl plant with an upper range above  $100,000 \text{ Bq m}^{-2}$ . Assuming the nuclides only penetrates the first few centimeters of soil, the concentration equates to several million  $\text{Bq kg}^{-1}$ , which is similar to the value seen in Table 2.

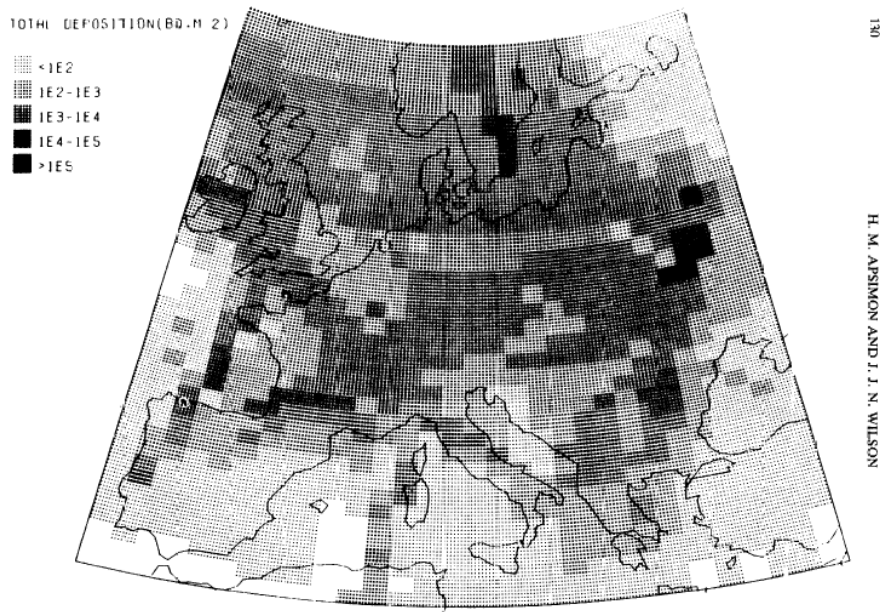


Figure 4. Total deposition of  $\text{Cs}^{137}$  revised following USSR presentation in Vienna.

Figure 9: Concentration of  $^{137}\text{Cs}$  [15]

Table 2: Estimated concentration of specific isotopes near the Chernobyl power plant compared to background readings of an HPGe (as of 01/01/2014) [14]

| <b>Nuclide</b>     | <b>Current Activity<br/>(Bq kg<sup>-1</sup> of<br/>sample)</b> | <b>HPGe Background<br/>Readings (Bq - Assume<br/>2kg Ge Crystal)</b> |
|--------------------|--|--|
| <sup>89</sup> Sr   | 1.687E-53  | 1.096E+00  |
| <sup>91</sup> Sr   | 0.000E+00  | 6.163E-04  |
| <sup>91</sup> Y    | 0.000E+00  | 3.059E-02  |
| <sup>93</sup> Y    | 0.000E+00  | 1.091E-02  |
| <sup>95</sup> Zr   | 1.461E-40  | 2.702E-04  |
| <sup>97</sup> Zr   | 0.000E+00  | 1.700E-04  |
| <sup>99</sup> Mo   | 0.000E+00  | 1.184E-02  |
| <sup>99</sup> Tc   | 0.000E+00  | 8.422E+01  |
| <sup>103</sup> Ru  | 1.350E-70  | 3.961E-04  |
| <sup>105</sup> Rh  | 0.000E+00  | 3.514E-03  |
| <sup>106</sup> Ru  | 1.297E-01  | 0.000E+00  |
| <sup>111</sup> Ag  | 0.000E+00  | 1.522E-01  |
| <sup>112</sup> Pd  | 0.000E+00  | 9.431E-02  |
| <sup>125</sup> Sb  | 0.000E+00  | 1.013E-02  |
| <sup>126</sup> Sb  | 0.000E+00  | 6.146E-04  |
| <sup>127</sup> Sb  | 0.000E+00  | 1.544E-03  |
| <sup>128</sup> Sb  | 0.000E+00  | 1.122E-03  |
| <sup>129m</sup> Te | 0.000E+00  | 2.099E-03  |
| <sup>131m</sup> Te | 0.000E+00  | 2.727E-04  |
| <sup>133</sup> I   | 0.000E+00  | 3.715E-04  |
| <sup>135</sup> I   | 0.000E+00  | 2.387E-02  |
| <sup>137</sup> Cs  | 1.184E+07  | 2.380E-04  |
| <sup>140</sup> Ba  | 0.000E+00  | 1.260E-03  |
| <sup>141</sup> Ce  | 1.123E-86  | 1.309E-03  |
| <sup>143</sup> Pr  | 0.000E+00  | 1.316E+04  |
| <sup>144</sup> Ce  | 6.149E-04  | 5.442E-03  |
| <sup>147</sup> Nd  | 0.000E+00  | 1.955E-03  |
| <sup>149</sup> Pm  | 0.000E+00  | 2.406E-02  |
| <sup>151</sup> Pm  | 0.000E+00  | 1.574E-02  |
| <sup>153</sup> Sm  | 0.000E+00  | 1.843E-03  |
| <sup>155</sup> Eu  | 0.000E+00  | 1.787E-03  |
| <sup>156</sup> Eu  | 0.000E+00  | 1.319E-03  |
| <sup>157</sup> Eu  | 0.000E+00  | 2.764E-03  |

Data is provided giving the activity released on 26 April 1986. For a given isotope, the current activity can be found with Equation 4.1.

$$A = A_0 e^{-\lambda t} \quad (4.1)$$

Where  $t$  is the time difference between the test data and the current date,  $\lambda$  is the decay constant, and  $A_0$  is given in the Chernobyl study [14]. Sections 5.1.3 and 5.4 also describe the process for taking initial releases and calculating current concentrations.

Although only  $^{137}\text{Cs}$  and  $^{106}\text{Ru}$  concentration is shown above the background reading of the HPGe,  $^{144}\text{Ce}$  is close and may in fact be concentrated enough to detect because the concentration assumed here applies to nuclear weapons. Another factor is that not all of the nuclei tracked in this study correspond to the 1986 study of Chernobyl [14]. Of the nuclei tracked in this Thesis, only  $^{137}\text{Cs}$  and  $^{106}\text{Ru}$  have half-lives on the order of years. This indicates that there is not a significant source of short lived nuclides in the region of Chernobyl.

### 4.3 FUKUSHIMA

A catastrophic failure occurred at the Fukushima Daiichi Nuclear Power Plant (FDNPP) on March 11, 2011. The Tōhoku earthquake cause a tsunami that hit the plant a caused the failure. The unique aspect of this accident is that a large portion of the contamination is in water. There are measurable amounts of plutonium in the Pacific Ocean, and the plutonium seems to be from the FDNPP [16, 17]. Figure 10 shows the location of the Fukushima power plant.

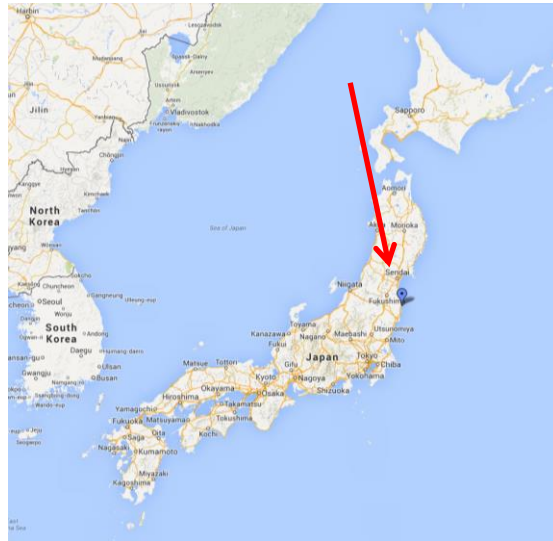


Figure 10: Location of the Fukushima Daiichi power plant

Only in the area immediately adjacent to the reactor, there are still significant radiation levels. As of January 2014, there is dosimetry data recording levels of  $100 \text{ mrem hr}^{-1}$ , seen in Figure 11. Approaching the edge of the power plant, the dose rates drop to  $0.5 \text{ mrem hr}^{-1}$ . Most of the radiation measurements are taken in or near water; however there have been studies of the isotopes seen over land (Figure 12).

Because of their long half-life,  $^{137}\text{Cs}$  and  $^{134}\text{Cs}$  are the only fission products still detectable today. The studies of the area also show detectable levels of plutonium, but it is difficult to directly attribute plutonium in the soil to the FDNPP. The activity of plutonium in the area surrounding the power plant show levels similar to global fallout, but there are studies that suggest gradient of plutonium isotope ratios indicate fallout near the power plant [17].

Survey Map of the Entire Fukushima Daiichi Nuclear Power Station  
 (Used in the Measurement Performed on January 10-14, 2014)

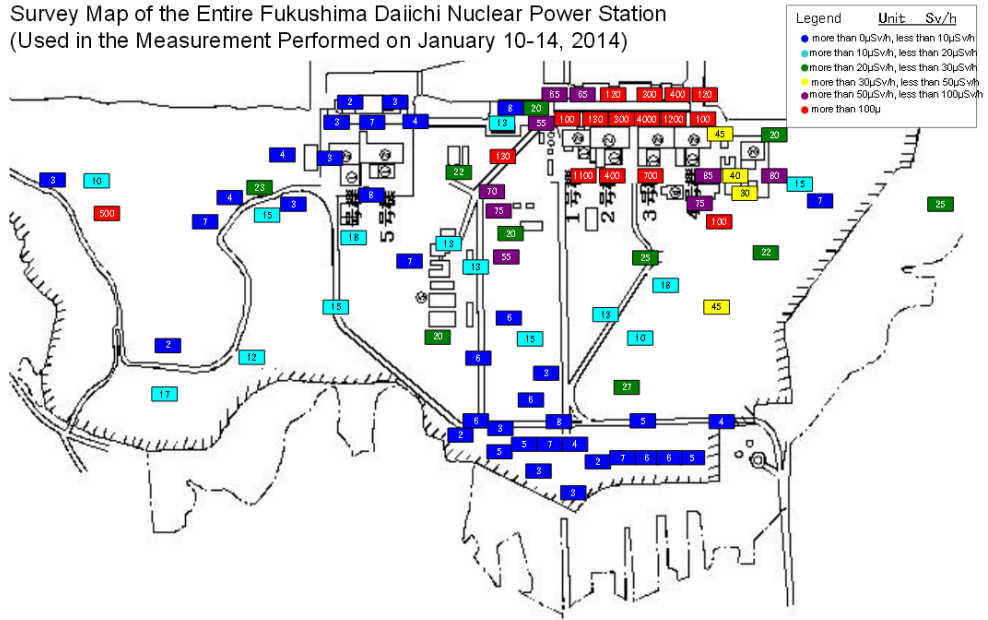


Figure 11: Survey map of the Fukushima power station, January 2014 [18]

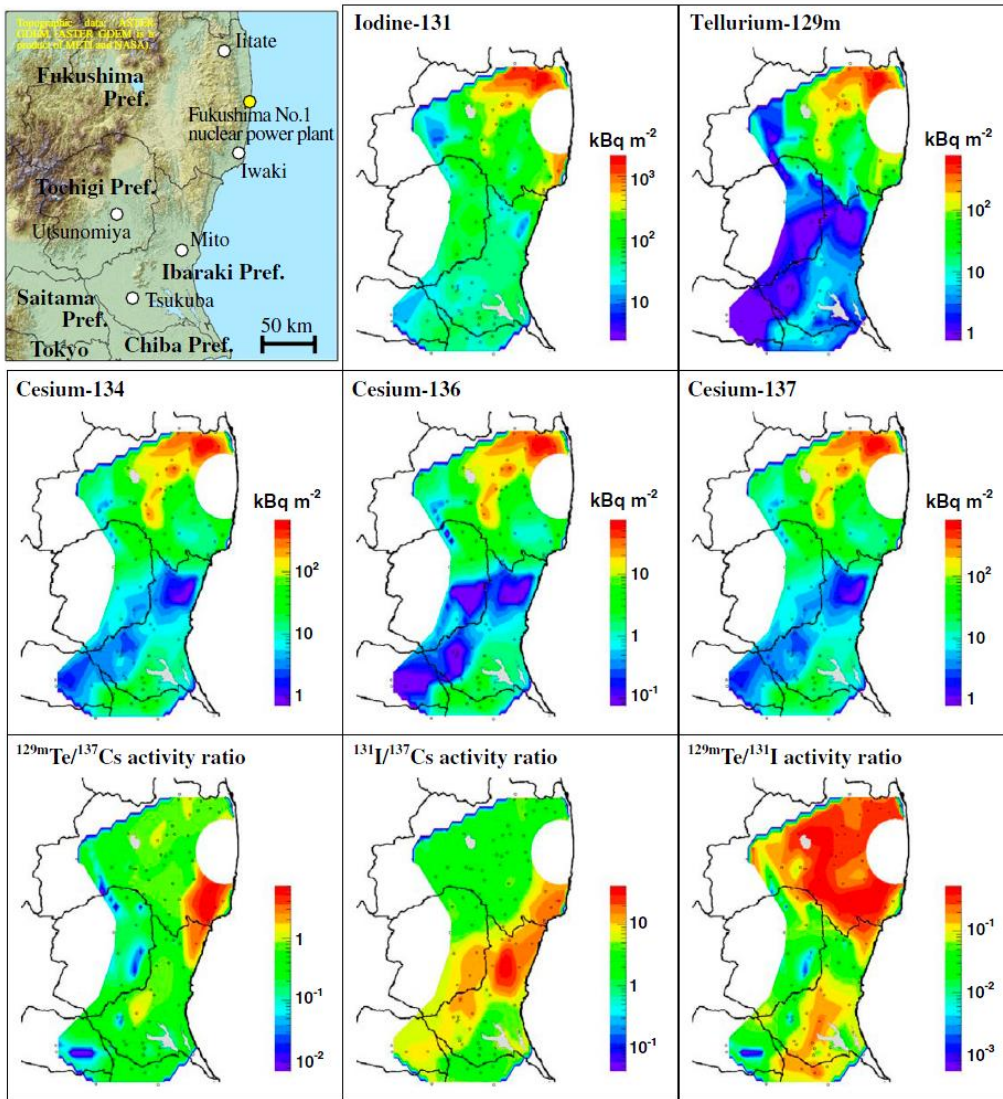


Figure 12: Topographical map of the area around the FDNPP showing the isotope concentration of particular isotopes on 03/29/2011. [19]

## Chapter 5: Calculations

### 5.1 ACTIVITY DUE TO FISSION PRODUCTS

In order to develop a background signature, one needs to determine the number of fissions per test, extrapolate the fission production from the tests, and then calculate the current activity.

#### 5.1.1 Calculate number of fissions

The first step in determining the number of radionuclides produced by a given test is to determine the number of fissions per test. Yield data is given for each test [5]. The yield, given in kiloton, is converted to MeV. Assuming 200 MeV per fission, the number of fission can be calculated. The raw data is presented in Appendix A.

$$\text{Number of Fissions}_t = \text{Yield}_t(kt) * \left( \frac{2.6115 * 10^{25} \text{ MeV}}{kt} \right) * \left( \frac{1 \text{ Fission}}{200 \text{ MeV}} \right) \quad (5.1)$$

#### 5.1.2 Calculate fission production (based on fission product yields)

A complete distribution of radionuclides produced by fission is available; however, many nuclides will not be produced in sufficient quantity to be detected, will have a very short half-life, or will not be unique to a nuclear incident [8]. I have chosen a group of isotopes to track based on an appropriate fission yield and half-life, the CTBTO's relevant radionuclide list [20], and the available data for <sup>239</sup>Pu spontaneous fission [21]. The nuclides are shown in Table 3. In this Thesis, more short lived nuclides are highlighted. There are nuclides relevant to a nuclear explosion or accident that are absent from the list; however representative nuclides were chosen in lieu of tacking all nuclides.

Table 3: List of nuclides, characteristic of a nuclear explosion.

| Tracked Nuclides  |          |           |  |                    |       |           |  |
|-------------------|----------|-----------|--|--------------------|-------|-----------|--|
| Nuclide           |          | Half Life |  | Nuclide            |       | Half Life |  |
| <sup>89</sup> Sr  | 5.05E+01 | d         |  | <sup>129m</sup> Te | 33.6  | d         |  |
| <sup>91</sup> Sr  | 9.5      | h         |  | <sup>131m</sup> Te | 1.35  | d         |  |
| <sup>91</sup> Y   | 58.5     | d         |  | <sup>133</sup> I   | 20.8  | h         |  |
| <sup>93</sup> Y   | 10.2     | h         |  | <sup>135</sup> I   | 6.57  | h         |  |
| <sup>95</sup> Zr  | 64.02    | d         |  | <sup>137</sup> Cs  | 30.17 | y         |  |
| <sup>97</sup> Zr  | 16.8     | h         |  | <sup>140</sup> Ba  | 12.75 | d         |  |
| <sup>99</sup> Mo  | 2.748    | d         |  | <sup>141</sup> Ce  | 32.5  | d         |  |
| <sup>99</sup> Tc  | 2.10E+05 | y         |  | <sup>143</sup> Pr  | 13.57 | d         |  |
| <sup>103</sup> Ru | 39.27    | d         |  | <sup>144</sup> Ce  | 284.6 | d         |  |
| <sup>105</sup> Rh | 35.4     | h         |  | <sup>147</sup> Nd  | 10.98 | d         |  |
| <sup>106</sup> Ru | 1.02     | y         |  | <sup>149</sup> Pm  | 2.212 | d         |  |
| <sup>111</sup> Ag | 7.6      | d         |  | <sup>151</sup> Pm  | 1.183 | d         |  |
| <sup>112</sup> Pd | 20.04    | h         |  | <sup>153</sup> Sm  | 1.929 | d         |  |
| <sup>125</sup> Sb | 2.758    | y         |  | <sup>155</sup> Eu  | 4.71  | y         |  |
| <sup>126</sup> Sb | 12.4     | d         |  | <sup>156</sup> Eu  | 15.2  | d         |  |
| <sup>127</sup> Sb | 3.84     | d         |  | <sup>157</sup> Eu  | 15.13 | h         |  |
| <sup>128</sup> Sb | 9.1      | h         |  |                    |       |           |  |

Two values are given in the fission product yield data: independent yield, and cumulative yield.

Independent fission yield of a specific nuclide is the number of atoms produced directly after emission of prompt neutrons but excluding radioactive decay.

The cumulative fission yield of a specific nuclide is the number of atoms produced directly and produced via decay of precursors nuclides. If the nuclide is stable, the cumulative yield is the total number of atoms of that nuclide remaining after the decay of all parent nuclides. For a nuclide with a much longer half-life than any of its precursors, the cumulative yield is very nearly equal to the amount produced at a time short compared to its half-life but long compared to the half-life of its precursors. This is the assumed case for all of the nuclides chosen.



$$N_i = \text{Number of Fissions} * \text{Yield}_i \quad (5.2)$$

Equation 5.2 is the formula used to determine the initial number of atoms of a given isotope ( $N_i$ ) produced in a single weapons test. The number of fissions was determined in section 5.1.1.

### 5.1.3 Calculate current activities based on decay

For a given isotope, the current activity can be found with Equation 5.3.

$$A = A_0 e^{-\lambda t} \quad (5.3)$$

Where  $t$  is the time difference between the test data and the current date,  $\lambda$  is the decay constant, and the calculation of  $A_0$  is shown in Equation 5.4.

$$A_0 = \lambda \cdot N_0 \quad (5.4)$$

The determination of  $N_0$  is shown in Equation 5.2. The general equation to account for all tests and isotopes is shown in Equation 5.5.

$$A_i = \sum_{t=1}^{t=N} (\text{fissions})_t * (\% \text{ yield})_i * \lambda_i * e^{\lambda_i * t} \quad (5.5)$$

Where the subscript 'i' indicates a value associated with a particular isotope and the subscript 't' indicates a value associated with a particular test. Values are shown in Appendix C.

## 5.2 ESTIMATE THE AMOUNT OF $^{240}\text{Pu}$ AND $^{239}\text{Pu}$ USED IN A WEAPON TEST

An assumed a pit size for each test, knowing approximately how much material is needed for the pit to become critical from IAEA determinations of significant quantities (Table 4), looking at yield vs special nuclear material [22], and knowing that uranium was easier to obtain for earlier tests. [6] The next step was to determine the isotopic ratio of the plutonium cores. The  $^{240}\text{Pu}/^{239}\text{Pu}$  atom ratio for the Pacific Proving Grounds was measured to be between 0.05 and 0.32 depending on the location [8]. To estimate the Pu isotopic ratios of the weapon debris, the ratio was varied until the calculated  $^{240}\text{Pu}/^{239}\text{Pu}$  value is within the range of the measured value. An assumed isotopic ratios of the pits used at NTS is the same. Section 3.1 shows the specific method for determining Pu isotopic ratios.

Table 4: A comparison of significant quantities between several types of special nuclear materials [23, 7]

| Material                           | SQ                     |
|------------------------------------|------------------------|
| <i>Direct use nuclear material</i> |                        |
| Pu <sup>a</sup>                    | 8 kg Pu                |
| $^{233}\text{U}$                   | 8 kg $^{233}\text{U}$  |
| HEU ( $^{235}\text{U} \geq 20\%$ ) | 25 kg $^{235}\text{U}$ |

A significant quantity is the approximate amount of material needed to make a nuclear weapon.

### 5.3 ACTIVITY DUE TO PLUTONIUM AND PLUTONIUM PRODUCTS

The decay rate of  $^{240}\text{Pu}$  is small enough to assume constant mass. Since the half-life of the fission products is short compared to the time between the last test and the present, and there is a constant mass of  $^{240}\text{Pu}$ , the activity of the spontaneous fission products of  $^{240}\text{Pu}$  has reached steady state. Activity for a particular isotope is determined by:

$$A = R_{\text{SF}} \cdot m \cdot \chi \quad (5.6)$$

Where  $R_{\text{SF}}$  is the  $^{240}\text{Pu}$  spontaneous fission rate,  $m$  is the mass of  $^{240}\text{Pu}$ , and  $\chi$  is the daughter product yield probability [24]. Spontaneous fissions product yields were determined from the information in Figure 13 [25]. Mass is calculated from the assumed core size and Pu isotopic ratios of each test (values for each test are shown in Appendix A and B).

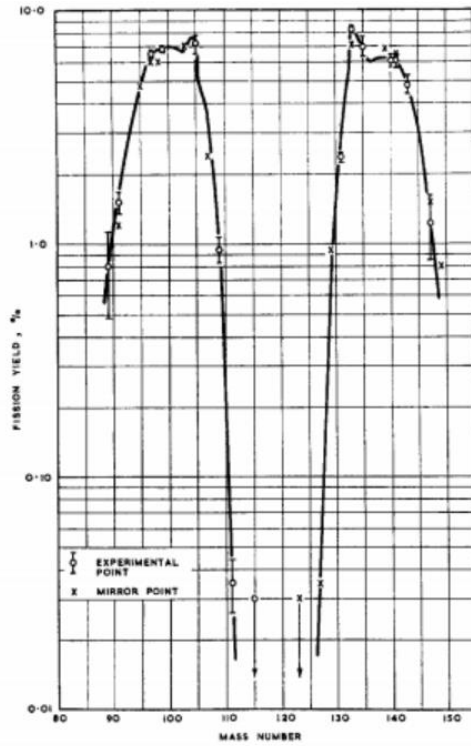


Figure 13: Spontaneous fission rates of  $^{240}\text{Pu}$  by mass number [25, 21]

Similar to fission from other nuclei,  $^{240}\text{Pu}$  fission products are bimodal with centers at atomic mass 102 and 135.

Calculated activity values for the relevant nuclei due to the spontaneous fission of  $^{240}\text{Pu}$  are shown in Table 5.

Table 5: Activity (calculated) for all relevant nuclei shown for the Nevada Test Site and the Pacific Proving Grounds due to the spontaneous fission of  $^{240}\text{Pu}$  (Pu SF)

| Nuclide           | NTS Pu SF (Bq) | PPG Pu SF (Bq) | Nuclide                   | NTS Pu SF (Bq) | PPG Pu SF (Bq) |
|-------------------|----------------|----------------|---------------------------|----------------|----------------|
| $^{89}\text{Sr}$  | 2.68E+06       | 2.98E+05       | $^{129\text{m}}\text{Te}$ | 0.00E+00       | 0.00E+00       |
| $^{91}\text{Sr}$  | 5.06E+06       | 5.62E+05       | $^{131\text{m}}\text{Te}$ | 0.00E+00       | 0.00E+00       |
| $^{91}\text{Y}$   | 0.00E+00       | 0.00E+00       | $^{133}\text{I}$          | 2.75E+07       | 3.05E+06       |
| $^{93}\text{Y}$   | 0.00E+00       | 0.00E+00       | $^{135}\text{I}$          | 2.14E+07       | 2.38E+06       |
| $^{95}\text{Zr}$  | 0.00E+00       | 0.00E+00       | $^{137}\text{Cs}$         | 0.00E+00       | 0.00E+00       |
| $^{97}\text{Zr}$  | 2.17E+07       | 2.40E+06       | $^{140}\text{Ba}$         | 2.01E+07       | 2.23E+06       |
| $^{99}\text{Mo}$  | 2.29E+07       | 2.54E+06       | $^{141}\text{Ce}$         | 2.02E+07       | 2.24E+06       |
| $^{99}\text{Tc}$  | 0.00E+00       | 0.00E+00       | $^{143}\text{Pr}$         | 1.60E+07       | 1.78E+06       |
| $^{103}\text{Ru}$ | 0.00E+00       | 0.00E+00       | $^{144}\text{Ce}$         | 0.00E+00       | 0.00E+00       |
| $^{105}\text{Rh}$ | 2.38E+07       | 2.64E+06       | $^{147}\text{Nd}$         | 4.09E+06       | 4.54E+05       |
| $^{106}\text{Ru}$ | 0.00E+00       | 0.00E+00       | $^{149}\text{Pm}$         | 0.00E+00       | 0.00E+00       |
| $^{111}\text{Ag}$ | 1.17E+05       | 1.30E+04       | $^{151}\text{Pm}$         | 0.00E+00       | 0.00E+00       |
| $^{112}\text{Pd}$ | 0.00E+00       | 0.00E+00       | $^{153}\text{Sm}$         | 0.00E+00       | 0.00E+00       |
| $^{125}\text{Sb}$ | 0.00E+00       | 0.00E+00       | $^{155}\text{Eu}$         | 0.00E+00       | 0.00E+00       |
| $^{126}\text{Sb}$ | 0.00E+00       | 0.00E+00       | $^{156}\text{Eu}$         | 0.00E+00       | 0.00E+00       |
| $^{127}\text{Sb}$ | 0.00E+00       | 0.00E+00       | $^{157}\text{Eu}$         | 0.00E+00       | 0.00E+00       |
| $^{128}\text{Sb}$ | 0.00E+00       | 0.00E+00       |                           |                |                |

## 5.4 CONCENTRATION

In order to determine whether fission products are at a detectable level, one needs to determine the concentration of radionuclides after a nuclear test. Determining concentration is made difficult by the fact that most measurements from old test and accident sites are made using dosimeters. Since detailed conditions of how the dosimeter data was obtained are rarely available, most data from old test sites is unusable.

The average specific activity for several isotopes at the Pacific Proving Grounds has been measured using an ICP mass spectrometer [8]. This measurement is the basis for the correlation between overall activity and concentration. Going through the calculations in section 5.1 to 5.3 for the Pacific Proving Grounds, I calculated current day activities (present day at 01 January 2014). The calculated values are then compared to measured concentrations in Table 6.

Table 6: Activity measurements from the PPG

| <b>Isotope</b>        | <b>Specific Activity (Bq kg<sup>-1</sup>) – Measured</b> | <b>Total Material Released (Bq) – Calculated</b> |
|-----------------------|--|--|
| <sup>239+240</sup> Pu | 542  | 2.41741E+12                                      |
| <sup>137</sup> Cs     | 1564   | 2.65E+17   |

The results for <sup>240</sup>Pu and <sup>239</sup>Pu are shown together because their characteristic energies are so close.

One observation from Table 6 is that the ratio of total material released to the specific activity for <sup>137</sup>Cs is higher than the ratio for plutonium. The conclusion from this is that <sup>137</sup>Cs is more mobile than plutonium. Since the testing at the Pacific Proving Grounds was less constrained than tests at the NTS, an assumption that isotopes to be more similar to plutonium, the less mobile isotope. Using this data and assuming the concentration at other sites is similar to the PPG, an estimation was made of the concentration of each isotope. The activities and concentrations of the tracked isotopes are shown in Table 7 for the NTS and in Table 8 for the PPG.

Table 7: Activities and concentrations at the NTS

| TOTAL at NTS       |           |   |                 |                     |               |                     |
|--------------------|-----------|---|-----------------|---------------------|---------------|---------------------|
| Nuclide            | Half Life |   | Decay Only (Bq) | Bq kg <sup>-1</sup> | Pu SF SS (Bq) | Bq kg <sup>-1</sup> |
| <sup>89</sup> Sr   | 5.05E+01  | d | 2.88E-36        | 6.45E-46            | 2.68E+06      | 6.01E-04            |
| <sup>91</sup> Sr   | 9.5       | h | 0.00E+00        | 0.00E+00            | 5.06E+06      | 1.13E-03            |
| <sup>91</sup> Y    | 58.5      | d | 5.07E-29        | 1.14E-38            | 0.00E+00      | 0.00E+00            |
| <sup>93</sup> Y    | 10.2      | h | 0.00E+00        | 0.00E+00            | 0.00E+00      | 0.00E+00            |
| <sup>95</sup> Zr   | 64.02     | d | 6.91E-25        | 1.55E-34            | 0.00E+00      | 0.00E+00            |
| <sup>97</sup> Zr   | 16.8      | h | 0.00E+00        | 0.00E+00            | 2.17E+07      | 4.85E-03            |
| <sup>99</sup> Mo   | 2.748     | d | 0.00E+00        | 0.00E+00            | 2.29E+07      | 5.13E-03            |
| <sup>99</sup> Tc   | 2.10E+05  | y | 4.00E+13        | 8.97E+03            | 0.00E+00      | 0.00E+00            |
| <sup>103</sup> Ru  | 39.27     | d | 1.53E-50        | 3.44E-60            | 0.00E+00      | 0.00E+00            |
| <sup>105</sup> Rh  | 35.4      | h | 0.00E+00        | 0.00E+00            | 2.38E+07      | 5.34E-03            |
| <sup>106</sup> Ru  | 1.02      | y | 8.41E+09        | 1.88E+00            | 0.00E+00      | 0.00E+00            |
| <sup>111</sup> Ag  | 7.6       | d | 0.00E+00        | 0.00E+00            | 1.17E+05      | 2.63E-05            |
| <sup>112</sup> Pd  | 20.04     | h | 0.00E+00        | 0.00E+00            | 0.00E+00      | 0.00E+00            |
| <sup>125</sup> Sb  | 2.758     | y | 1.43E+13        | 3.20E+03            | 0.00E+00      | 0.00E+00            |
| <sup>126</sup> Sb  | 12.4      | d | 2.13E-197       | 4.76E-207           | 0.00E+00      | 0.00E+00            |
| <sup>127</sup> Sb  | 3.84      | d | 0.00E+00        | 0.00E+00            | 0.00E+00      | 0.00E+00            |
| <sup>128</sup> Sb  | 9.1       | h | 0.00E+00        | 0.00E+00            | 0.00E+00      | 0.00E+00            |
| <sup>129m</sup> Te | 33.6      | d | 2.94E-63        | 6.59E-73            | 0.00E+00      | 0.00E+00            |
| <sup>131m</sup> Te | 1.35      | d | 0.00E+00        | 0.00E+00            | 0.00E+00      | 0.00E+00            |
| <sup>133</sup> I   | 20.8      | h | 0.00E+00        | 0.00E+00            | 2.75E+07      | 6.15E-03            |
| <sup>135</sup> I   | 6.57      | h | 0.00E+00        | 0.00E+00            | 2.14E+07      | 4.80E-03            |
| <sup>137</sup> Cs  | 30.17     | y | 1.19E+17        | 2.68E+07            | 0.00E+00      | 0.00E+00            |
| <sup>140</sup> Ba  | 12.75     | d | 1.86E-189       | 4.17E-199           | 2.01E+07      | 4.50E-03            |
| <sup>141</sup> Ce  | 32.5      | d | 1.44E-64        | 3.23E-74            | 2.02E+07      | 4.52E-03            |
| <sup>143</sup> Pr  | 13.57     | d | 4.01E-177       | 8.99E-187           | 1.60E+07      | 3.59E-03            |
| <sup>144</sup> Ce  | 284.6     | d | 4.20E+07        | 9.42E-03            | 0.00E+00      | 0.00E+00            |
| <sup>147</sup> Nd  | 10.98     | d | 5.00E-223       | 1.12E-232           | 4.09E+06      | 9.17E-04            |
| <sup>149</sup> Pm  | 2.212     | d | 0.00E+00        | 0.00E+00            | 0.00E+00      | 0.00E+00            |
| <sup>151</sup> Pm  | 1.183     | d | 0.00E+00        | 0.00E+00            | 0.00E+00      | 0.00E+00            |
| <sup>153</sup> Sm  | 1.929     | d | 0.00E+00        | 0.00E+00            | 0.00E+00      | 0.00E+00            |
| <sup>155</sup> Eu  | 4.71      | y | 2.53E+14        | 5.68E+04            | 0.00E+00      | 0.00E+00            |
| <sup>156</sup> Eu  | 15.2      | d | 7.36E-158       | 1.65E-167           | 0.00E+00      | 0.00E+00            |
| <sup>157</sup> Eu  | 15.13     | h | 0.00E+00        | 0.00E+00            | 0.00E+00      | 0.00E+00            |

Table 8: Activities and concentrations at the PPG

| TOTAL at Pacific Proving Ground |           |   |                 |                     |               |                     |
|---------------------------------|-----------|---|-----------------|---------------------|---------------|---------------------|
| Nuclide                         | Half Life |   | Decay Only (Bq) | Bq kg <sup>-1</sup> | Pu SF SS (Bq) | Bq kg <sup>-1</sup> |
| <sup>89</sup> Sr                | 50.52     | d | 5.60E-93        | 1.25E-102           | 2.98E+05      | 6.67E-05            |
| <sup>91</sup> Sr                | 9.5       | h | 0.00E+00        | 0.00E+00            | 5.62E+05      | 1.26E-04            |
| <sup>91</sup> Y                 | 58.5      | d | 1.05E-77        | 2.36E-87            | 0.00E+00      | 0.00E+00            |
| <sup>93</sup> Y                 | 10.2      | h | 0.00E+00        | 0.00E+00            | 0.00E+00      | 0.00E+00            |
| <sup>95</sup> Zr                | 64.02     | d | 3.45E-69        | 7.73E-79            | 0.00E+00      | 0.00E+00            |
| <sup>97</sup> Zr                | 16.8      | h | 0.00E+00        | 0.00E+00            | 2.40E+06      | 5.39E-04            |
| <sup>99</sup> Mo                | 2.748     | d | 0.00E+00        | 0.00E+00            | 2.54E+06      | 5.69E-04            |
| <sup>99</sup> Tc                | 2.10E+05  | y | 1.26E+14        | 2.82E+04            | 0.00E+00      | 0.00E+00            |
| <sup>103</sup> Ru               | 39.27     | d | 3.97E-124       | 8.89E-134           | 0.00E+00      | 0.00E+00            |
| <sup>105</sup> Rh               | 35.4      | h | 0.00E+00        | 0.00E+00            | 2.64E+06      | 5.92E-04            |
| <sup>106</sup> Ru               | 1.02      | y | 3.75E+03        | 8.41E-07            | 0.00E+00      | 0.00E+00            |
| <sup>111</sup> Ag               | 7.6       | d | 0.00E+00        | 0.00E+00            | 1.30E+04      | 2.92E-06            |
| <sup>112</sup> Pd               | 20.04     | h | 0.00E+00        | 0.00E+00            | 0.00E+00      | 0.00E+00            |
| <sup>125</sup> Sb               | 2.758     | y | 2.93E+11        | 6.58E+01            | 0.00E+00      | 0.00E+00            |
| <sup>126</sup> Sb               | 12.4      | d | 0.00E+00        | 0.00E+00            | 0.00E+00      | 0.00E+00            |
| <sup>127</sup> Sb               | 3.84      | d | 0.00E+00        | 0.00E+00            | 0.00E+00      | 0.00E+00            |
| <sup>128</sup> Sb               | 9.1       | h | 0.00E+00        | 0.00E+00            | 0.00E+00      | 0.00E+00            |
| <sup>129m</sup> Te              | 33.6      | d | 1.21E-149       | 2.72E-159           | 0.00E+00      | 0.00E+00            |
| <sup>131m</sup> Te              | 1.35      | d | 0.00E+00        | 0.00E+00            | 0.00E+00      | 0.00E+00            |
| <sup>133</sup> I                | 20.8      | h | 0.00E+00        | 0.00E+00            | 3.05E+06      | 6.83E-04            |
| <sup>135</sup> I                | 6.57      | h | 0.00E+00        | 0.00E+00            | 2.38E+06      | 5.33E-04            |
| <sup>137</sup> Cs               | 30.17     | y | 2.65E+17        | 5.94E+07            | 0.00E+00      | 0.00E+00            |
| <sup>140</sup> Ba               | 12.75     | d | 0.00E+00        | 0.00E+00            | 2.23E+06      | 5.00E-04            |
| <sup>141</sup> Ce               | 32.5      | d | 5.93E-154       | 1.33E-163           | 2.24E+06      | 5.02E-04            |
| <sup>143</sup> Pr               | 13.57     | d | 0.00E+00        | 0.00E+00            | 1.78E+06      | 3.99E-04            |
| <sup>144</sup> Ce               | 284.6     | d | 8.42E-02        | 1.89E-11            | 0.00E+00      | 0.00E+00            |
| <sup>147</sup> Nd               | 10.98     | d | 0.00E+00        | 0.00E+00            | 4.54E+05      | 1.02E-04            |
| <sup>149</sup> Pm               | 2.212     | d | 0.00E+00        | 0.00E+00            | 0.00E+00      | 0.00E+00            |
| <sup>151</sup> Pm               | 1.183     | d | 0.00E+00        | 0.00E+00            | 0.00E+00      | 0.00E+00            |
| <sup>153</sup> Sm               | 1.929     | d | 0.00E+00        | 0.00E+00            | 0.00E+00      | 0.00E+00            |
| <sup>155</sup> Eu               | 4.71      | y | 5.59E+13        | 1.25E+04            | 0.00E+00      | 0.00E+00            |
| <sup>156</sup> Eu               | 15.2      | d | 0.00E+00        | 0.00E+00            | 0.00E+00      | 0.00E+00            |
| <sup>157</sup> Eu               | 15.13     | h | 0.00E+00        | 0.00E+00            | 0.00E+00      | 0.00E+00            |



The Decay Only column is the activity due to the decay of the original fission products (short lived isotopes should decay to negligible quantities quickly), and the Bq kg<sup>-1</sup> column following is the concentration of the isotope per kilogram of soil. The Pu SF column is the activity due to the spontaneous fission of plutonium, and the Bq kg<sup>-1</sup> column following is the concentration of the isotope per kilogram of soil.

## **5.5 DETECTION**

To detect an isotope, a gamma-ray energy spectrum from a sample is compared to known peaks for all isotopes; the specific activity (converted to counts) must be higher than the background counts at the isotopes characteristic energy level. Figure 14 shows the idea that after a nuclear test, there will be a high concentration of characteristic isotopes. As time passes, the activity decays until it is below the background activity level for the detector. For an actual measurement, a reading will have to be some amount more than the background depending on the length of time of the measurement and the confidence desired; however, for this, any amount greater than background will be assumed detectable.

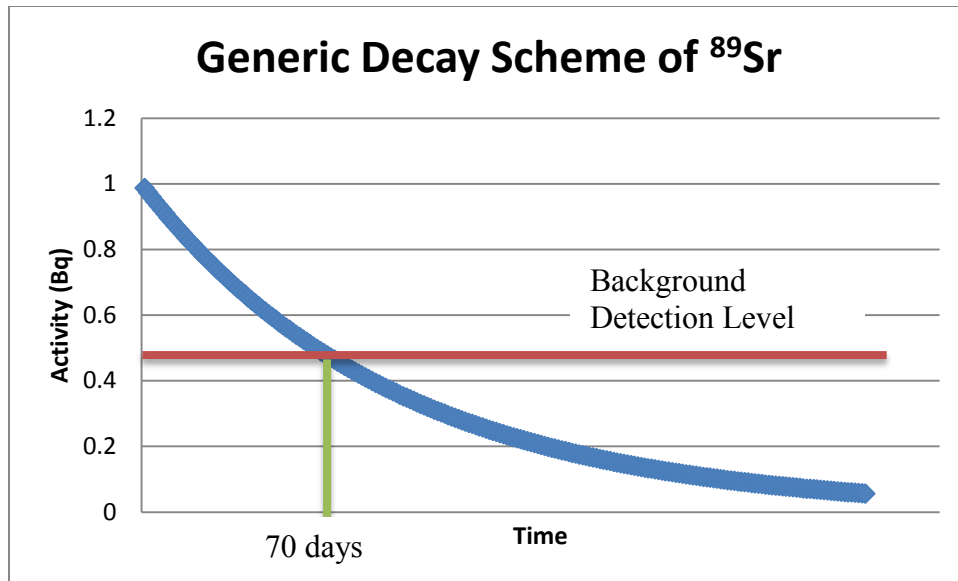


Figure 14: Generic radionuclide decay over time

To measure activity, high purity germanium detectors (HPGe) are often used, and will be assumed as the typical detection instrument for the purposes of this paper. HPGe detectors have a more complete absorption spectrum than silicon detectors and produce sharper peaks. However, the HPGe detectors are significantly more expensive and require liquid nitrogen cooling.

To convert activity to counts measured on an HPGe, Equation 5.7 is used.

$$\text{Counts (E)} = A_i * \varepsilon(E) * \gamma_i \quad (5.7)$$

The activity of a sample is represented by  $A_i$ , the detector efficiency is represented by  $\varepsilon(E)$ , and  $\gamma_i$  is the gamma-ray intensity.

The detector efficiency will change depending on the specific machine and configuration used. Figure 15 shows the detector efficiency for the University of Texas

Nuclear Engineering Teaching Laboratory (NETL) HPGe, using a 1 liter Marinelli beaker.

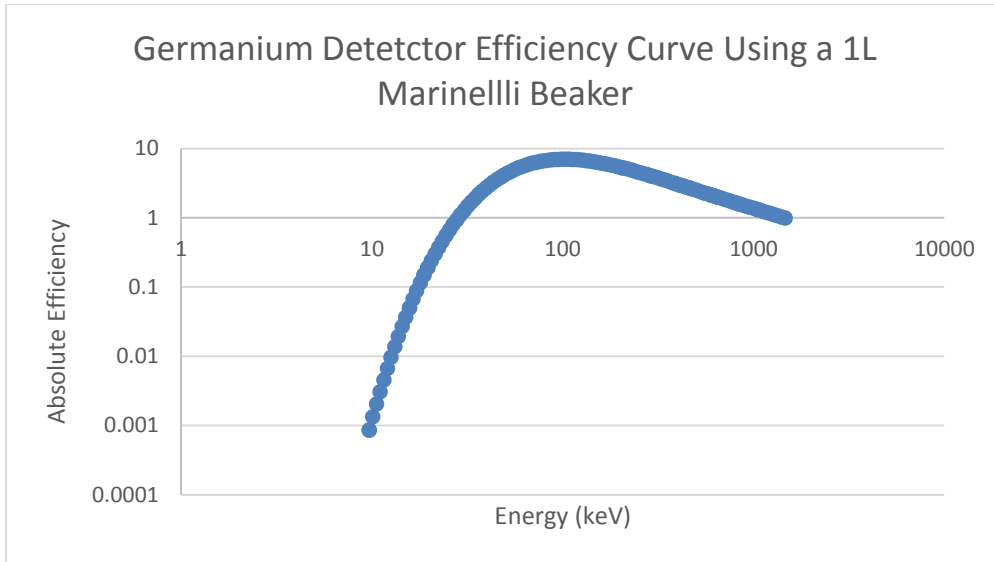


Figure 15: HPGe detector efficiency curve from the (NETL) using a 1L marinelli beaker.

Intensity is the fraction of photons emitted at a given energy. Nuclei often have a number of decay paths, each with characteristic photons. As an example, the decay scheme for  $^{137}\text{Cs}$  is shown in Figure 16. The energy of the photon and the likelihood of discharging that photon is shown in the diagram.

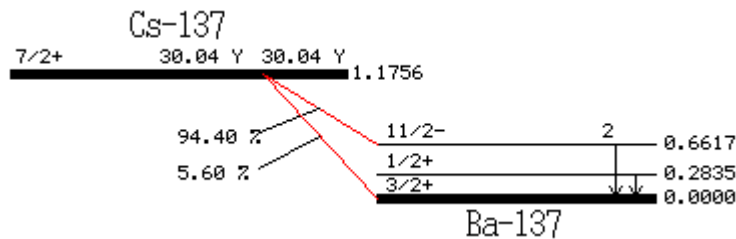


Figure 16: Photon discharge from  $^{137}\text{Cs}$  [8]

For isotopes with multiple decay gamma ray energies, the energy used is where the product of the intensity and the HPGe efficiency at that energy is at a maximum. However, if multiple characteristic energies are of interest, a reading can be compared to a complete gamma-ray energy spectrum if multiple characteristic energies are of interest, as shown in Figure 17.

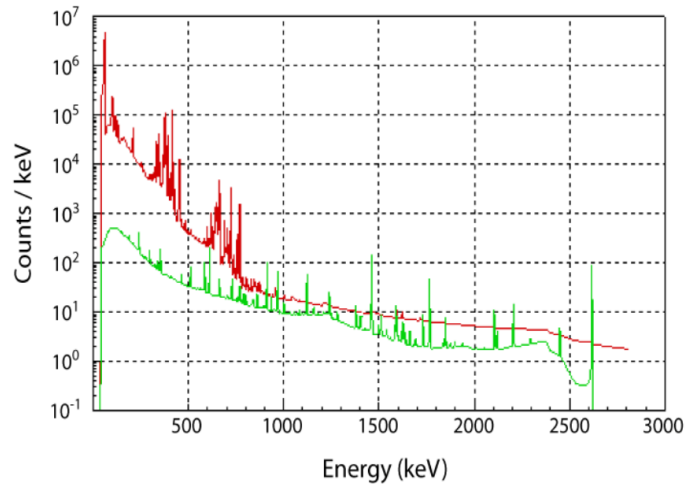


Figure 17: Gamma ray spectra of weapons-grade plutonium vs background measurements [7]

As seen in Figure 17, plutonium has many characteristic energies. For an isotope to be detectable, it must have an activity above the detector's background activity. To determine the background activity, we rearrange Equation 5.7 to get Equation 5.8, solving for activity.

$$A_{\text{Background}} = \frac{\text{Counts}_{\text{Background}}(E)}{\varepsilon(E) * \gamma_i} \quad (5.8)$$

The only unknown term is the background counts term. This is obtained by running the detector with no samples. Figure 18 shows the result from one particular background reading [26]. As with efficiency, background will change depending on the instrument used.

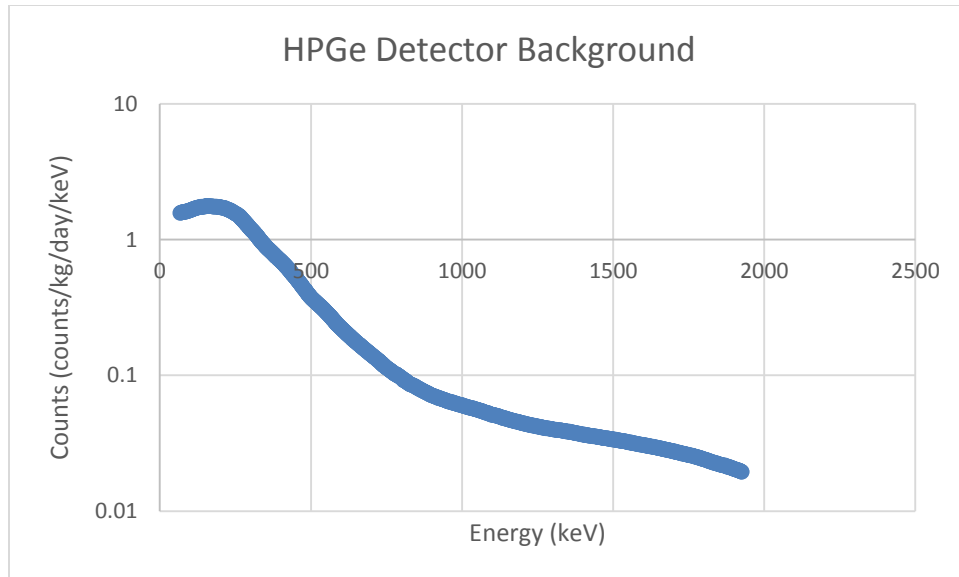


Figure 18: HPGe detector background

The readings have been normalized by the size of the germanium crystal, the length of time of the measurement, and the width of the energy bin. Table 9 uses the data to compare the background reading (B.R.) of the HPGe to the concentrations at the NTS and PPG.

Many of these isotopes are detectable, despite half-lives on the order of hours, because of the spontaneous fission of  $^{240}\text{Pu}$ ,  $^{155}\text{Eu}$ ,  $^{137}\text{Cs}$ ,  $^{125}\text{Sb}$ ,  $^{99}\text{Tc}$  all have half-lives on the order of years, and are still detectable from nuclear testing.

Table 9: Detectable isotopes at the NTS and PPG

| Nuclide            | Gamma Energy<br>(kEv) | HPGe B.R.<br>(Bq) | Concentration (Bq kg <sup>-1</sup> ) |           |
|--------------------|-----------------------|-------------------|--------------------------------------|-----------|
|                    |                       |                   | NTS                                  | PPG       |
| <sup>89</sup> Sr   | 908.96                | 1.10E+00          | 6.01E-04                             | 6.67E-05  |
| <sup>91</sup> Sr   | 749.8                 | 6.16E-04          | 1.13E-03                             | 1.26E-04  |
| <sup>91</sup> Y    | 1204.77               | 3.06E-02          | 1.14E-38                             | 2.36E-87  |
| <sup>93</sup> Y    | 266.9                 | 1.09E-02          | 0.00E+00                             | 0.00E+00  |
| <sup>95</sup> Zr   | 756.73                | 2.70E-04          | 1.55E-34                             | 7.73E-79  |
| <sup>97</sup> Zr   | 743.36                | 1.70E-04          | 4.85E-03                             | 5.39E-04  |
| <sup>99</sup> Mo   | 181.068               | 1.18E-02          | 5.13E-03                             | 5.69E-04  |
| <sup>99</sup> Tc   | 89.5                  | 8.42E+01          | 8.97E+03                             | 2.82E+04  |
| <sup>103</sup> Ru  | 497.084               | 3.96E-04          | 3.44E-60                             | 8.89E-134 |
| <sup>105</sup> Rh  | 318.9                 | 3.51E-03          | 5.34E-03                             | 5.92E-04  |
| <sup>106</sup> Ru  | 0                     | 0.00E+00          | 1.88E+00                             | 8.41E-07  |
| <sup>111</sup> Ag  | 245.4                 | 1.52E-01          | 2.63E-05                             | 2.92E-06  |
| <sup>112</sup> Pd  | 18.5                  | 9.43E-02          | 0.00E+00                             | 0.00E+00  |
| <sup>125</sup> Sb  | 176.314               | 1.01E-02          | 3.20E+03                             | 6.58E+01  |
| <sup>126</sup> Sb  | 414.8                 | 6.15E-04          | 4.76E-207                            | 0.00E+00  |
| <sup>127</sup> Sb  | 473                   | 1.54E-03          | 0.00E+00                             | 0.00E+00  |
| <sup>128</sup> Sb  | 314.1                 | 1.12E-03          | 0.00E+00                             | 0.00E+00  |
| <sup>129m</sup> Te | 695.88                | 2.10E-03          | 6.59E-73                             | 2.72E-159 |
| <sup>131m</sup> Te | 773.67                | 2.73E-04          | 0.00E+00                             | 0.00E+00  |
| <sup>133</sup> I   | 529.872               | 3.71E-04          | 6.15E-03                             | 6.83E-04  |
| <sup>135</sup> I   | 288.451               | 2.39E-02          | 4.80E-03                             | 5.33E-04  |
| <sup>137</sup> Cs  | 661.66                | 2.38E-04          | 2.68E+07                             | 5.94E+07  |
| <sup>140</sup> Ba  | 537.261               | 1.26E-03          | 4.50E-03                             | 5.00E-04  |
| <sup>141</sup> Ce  | 145.44                | 1.31E-03          | 4.52E-03                             | 5.02E-04  |
| <sup>143</sup> Pr  | 742.1                 | 1.32E+04          | 3.59E-03                             | 3.99E-04  |
| <sup>144</sup> Ce  | 133.515               | 5.44E-03          | 9.42E-03                             | 1.89E-11  |
| <sup>147</sup> Nd  | 91.105                | 1.95E-03          | 9.17E-04                             | 1.02E-04  |
| <sup>149</sup> Pm  | 285.95                | 2.41E-02          | 0.00E+00                             | 0.00E+00  |
| <sup>151</sup> Pm  | 104.84                | 1.57E-02          | 0.00E+00                             | 0.00E+00  |
| <sup>153</sup> Sm  | 103.18                | 1.84E-03          | 0.00E+00                             | 0.00E+00  |
| <sup>155</sup> Eu  | 86.545                | 1.79E-03          | 5.68E+04                             | 1.25E+04  |
| <sup>156</sup> Eu  | 811.77                | 1.32E-03          | 1.65E-167                            | 0.00E+00  |
| <sup>157</sup> Eu  | 63.93                 | 2.76E-03          | 0.00E+00                             | 0.00E+00  |

## Chapter 6: Conclusions

The goal of characterizing the background of old nuclear test sites is to distinguish a recent test from the remains of the past tests. If another bomb were to be detonated, more isotopes will be detectable if a soil sample is analyzed closer to the time of the detonation. However, there may be practical restrictions from getting a sample immediately. Table 10 shows nuclide concentration 1 week, 1 month, and 1 year after a detonation. I assume 1kg soil samples and an HPGe with a 2 kg crystal. The values highlighted in yellow are above the background reading and assumed detectable for the given isotope. There will be some contribution to activity due to spontaneous fission of  $^{240}\text{Pu}$ , however some time will need to pass before this contribution comes to steady state. Table 10 also compares the activities expected from a nuclear test to the background values calculated for the NTS and PPG. The activities from Chernobyl, Fukushima, and Three Mile Island are not shown on the table because the only characteristic, detectable nuclide that should be found in those areas is  $^{137}\text{Cs}$ .

The nuclides highlighted in blue show background levels that could currently be detectable at the NTS and PPG. By testing for time appropriate nuclides and excluding nuclides that have higher background levels in a particular area, one could distinguish a recent nuclear test from past nuclear incidents.

### 6.1 FUTURE WORK

The values in this paper relied heavily on assumptions on transport of nuclides. In order to more accurately determine which nuclides would be detectable, there needs to be better characterization of how each isotope is transported through the environment.

Table 10: Activity of relevant nuclei 1 week, 1 month, and 1 year after a single test compared to NTS and PPG background levels

| Nuclide            | Half Life | Activity - 1wk (Bq) | Activity - 1mo (Bq) | Activity - 1yr (Bq) | HPGe B.R. (Bq) | NTS Background (Bq) | PPG Background (Bq) |
|--------------------|-----------|---------------------|---------------------|---------------------|----------------|---------------------|---------------------|
| <sup>89</sup> Sr   | 50.52 d   | 7.31E+07            | 5.33E+07            | 2.12E+06            | 1.10E+00       | 6.01E-04            | 6.67E-05            |
| <sup>91</sup> Sr   | 9.5 h     | 7.07E+04            | 3.63E-07            | 3.63E-07            | 6.16E-04       | 1.13E-03            | 1.26E-04            |
| <sup>91</sup> Y    | 58.5 d    | 9.31E+07            | 7.09E+07            | 4.38E+06            | 3.06E-02       | 1.14E-38            | 2.36E-87            |
| <sup>93</sup> Y    | 10.2 h    | 2.32E+05            | 1.19E-11            | 4.20E-178           | 1.09E-02       | 0.00E+00            | 0.00E+00            |
| <sup>95</sup> Zr   | 64.02 d   | 1.59E+08            | 1.24E+08            | 9.72E+06            | 2.70E-04       | 1.55E-34            | 7.73E-79            |
| <sup>97</sup> Zr   | 16.8 h    | 1.73E+07            | 2.22E-03            | 1.55E-06            | 1.70E-04       | 4.85E-03            | 5.39E-04            |
| <sup>99</sup> Mo   | 2.748 d   | 8.74E+08            | 2.64E+06            | 1.64E-06            | 1.18E-02       | 5.13E-03            | 5.69E-04            |
| <sup>99</sup> Tc   | 210000 y  | 1.83E+02            | 1.83E+02            | 1.83E+02            | 8.42E+01       | 8.97E+03            | 2.82E+04            |
| <sup>103</sup> Ru  | 39.27 d   | 3.61E+08            | 2.41E+08            | 3.80E+06            | 3.96E-04       | 3.44E-60            | 8.89E-134           |
| <sup>105</sup> Rh  | 35.4 h    | 3.18E+08            | 6.43E+03            | 1.71E-06            | 3.51E-03       | 5.34E-03            | 5.92E-04            |
| <sup>106</sup> Ru  | 1.02 y    | 2.71E+07            | 2.60E+07            | 1.68E+07            | 0.00E+00       | 1.88E+00            | 8.41E-07            |
| <sup>111</sup> Ag  | 7.6 d     | 8.69E+07            | 1.07E+07            | 5.25E-03            | 1.52E-01       | 2.63E-05            | 2.92E-06            |
| <sup>112</sup> Pd  | 20.04 h   | 1.59E+06            | 8.13E-03            | 1.55E-87            | 9.43E-02       | 0.00E+00            | 0.00E+00            |
| <sup>125</sup> Sb  | 2.758 y   | 4.13E+05            | 4.07E+05            | 3.46E+05            | 1.01E-02       | 3.20E+03            | 6.58E+01            |
| <sup>126</sup> Sb  | 12.4 d    | 4.94E+06            | 1.37E+06            | 2.70E+00            | 6.15E-04       | 4.76E-207           | 0.00E+00            |
| <sup>127</sup> Sb  | 3.84 d    | 8.66E+07            | 1.36E+06            | 5.15E-13            | 1.54E-03       | 0.00E+00            | 0.00E+00            |
| <sup>128</sup> Sb  | 9.1 h     | 6.64E+02            | 3.65E-16            | 9.76E-203           | 1.12E-03       | 0.00E+00            | 0.00E+00            |
| <sup>129m</sup> Te | 33.6 d    | 1.46E+07            | 9.07E+06            | 7.12E+04            | 2.10E-03       | 6.59E-73            | 2.72E-159           |
| <sup>131m</sup> Te | 1.35 d    | 4.38E+07            | 3.26E+02            | 1.29E-50            | 2.73E-04       | 0.00E+00            | 0.00E+00            |
| <sup>133</sup> I   | 20.8 h    | 6.93E+07            | 7.11E-01            | 1.97E-06            | 3.71E-04       | 6.15E-03            | 6.83E-04            |
| <sup>135</sup> I   | 6.57 h    | 1.05E+03            | 1.54E-06            | 1.54E-06            | 2.39E-02       | 4.80E-03            | 5.33E-04            |
| <sup>137</sup> Cs  | 30.17 y   | 1.40E+06            | 1.40E+06            | 1.38E+06            | 2.38E-04       | 2.68E+07            | 5.94E+07            |
| <sup>140</sup> Ba  | 12.75 d   | 6.70E+08            | 1.92E+08            | 5.43E+02            | 1.26E-03       | 4.50E-03            | 5.00E-04            |
| <sup>141</sup> Ce  | 32.5 d    | 3.21E+08            | 1.96E+08            | 1.31E+06            | 1.31E-03       | 4.52E-03            | 5.02E-04            |
| <sup>143</sup> Pr  | 13.57 d   | 5.25E+08            | 1.62E+08            | 9.93E+02            | 1.32E+04       | 3.59E-03            | 3.99E-04            |
| <sup>144</sup> Ce  | 284.6 d   | 2.98E+07            | 2.82E+07            | 1.59E+07            | 5.44E-03       | 9.42E-03            | 1.89E-11            |
| <sup>147</sup> Nd  | 10.98 d   | 2.74E+08            | 6.41E+07            | 2.31E+01            | 1.95E-03       | 9.17E-04            | 1.02E-04            |
| <sup>149</sup> Pm  | 2.212 d   | 1.47E+08            | 1.09E+05            | 1.14E-27            | 2.41E-02       | 0.00E+00            | 0.00E+00            |
| <sup>151</sup> Pm  | 1.183 d   | 2.58E+07            | 3.62E+01            | 5.75E-59            | 1.57E-02       | 0.00E+00            | 0.00E+00            |
| <sup>153</sup> Sm  | 1.929 d   | 4.19E+07            | 1.08E+04            | 2.29E-33            | 1.84E-03       | 0.00E+00            | 0.00E+00            |
| <sup>155</sup> Eu  | 4.71 y    | 2.85E+05            | 2.82E+05            | 2.56E+05            | 1.79E-03       | 5.68E+04            | 1.25E+04            |
| <sup>156</sup> Eu  | 15.2 d    | 1.74E+07            | 6.10E+06            | 1.35E+02            | 1.32E-03       | 1.65E-167           | 0.00E+00            |
| <sup>157</sup> Eu  | 15.13 h   | 1.79E+05            | 1.87E-06            | 1.14E-118           | 2.76E-03       | 0.00E+00            | 0.00E+00            |



## Appendix A

Appendix A contains the test data for each nuclear weapon test at the NTS. These assumptions should be viewed as order-of-magnitude estimates and should not be viewed as specific nuclear weapon design information. As such, results based on these estimates should be viewed with similar uncertainty. At no point in this dissertation is specific nuclear weapon design information utilized, calculated, or addressed.

| Test Date  | Time Diff. (s) | Yield (kt) | Fissions    | Core (kg) | <sup>239/240</sup> Pu Isotopic Ratios | Pu-239 (kg) | Pu-240 (kg) |
|------------|----------------|------------|-------------|-----------|---------------------------------------|-------------|-------------|
| 1/27/1951  | 1985904000.00  | 1          | 1.30572E+23 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 1/28/1951  | 1985817600.00  | 8          | 1.04458E+24 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 2/1/1951   | 1985472000.00  | 1          | 1.30572E+23 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 2/2/1951   | 1985385600.00  | 8          | 1.04458E+24 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 2/6/1951   | 1985040000.00  | 22         | 2.87259E+24 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 10/28/1951 | 1962230400.00  | 3.5        | 4.57003E+23 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 10/30/1951 | 1962057600.00  | 14         | 1.82801E+24 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 11/1/1951  | 1961884800.00  | 21         | 2.74202E+24 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 11/5/1951  | 1961539200.00  | 31         | 4.04774E+24 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 11/19/1951 | 1960329600.00  | 1.2        | 1.56687E+23 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 11/29/1951 | 1959465600.00  | 1.2        | 1.56687E+23 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 4/1/1952   | 1948752000.00  | 1          | 1.30572E+23 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 4/15/1952  | 1947542400.00  | 1          | 1.30572E+23 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 4/22/1952  | 1946937600.00  | 31         | 4.04774E+24 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 5/1/1952   | 1946160000.00  | 19         | 2.48087E+24 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 5/7/1952   | 1945641600.00  | 12         | 1.56687E+24 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 5/25/1952  | 1944086400.00  | 11         | 1.4363E+24  | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 6/1/1952   | 1943481600.00  | 15         | 1.95858E+24 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 6/5/1952   | 1943136000.00  | 14         | 1.82801E+24 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 3/17/1953  | 1918512000.00  | 16         | 2.08916E+24 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 3/24/1953  | 1917907200.00  | 24         | 3.13374E+24 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 3/31/1953  | 1917302400.00  | 0.2        | 2.61145E+22 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 4/6/1953   | 1916784000.00  | 11         | 1.4363E+24  | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 4/11/1953  | 1916352000.00  | 0.2        | 2.61145E+22 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 4/18/1953  | 1915747200.00  | 23         | 3.00316E+24 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 4/25/1953  | 1915142400.00  | 43         | 5.61461E+24 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 5/8/1953   | 1914019200.00  | 27         | 3.52545E+24 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 5/19/1953  | 1913068800.00  | 32         | 4.17831E+24 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 5/25/1953  | 1912550400.00  | 15         | 1.95858E+24 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 6/4/1953   | 1911686400.00  | 61         | 7.96491E+24 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 2/18/1955  | 1857772800.00  | 1          | 1.30572E+23 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 2/22/1955  | 1857427200.00  | 2          | 2.61145E+23 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 3/1/1955   | 1856822400.00  | 7          | 9.14006E+23 | 2.5       | 0.9                                   | 2.25        | 0.25        |

| Test Date | Time Diff. (s) | Yield (kt) | Fissions    | Core (kg) | 239/240 Pu<br>Isotopic Ratios | Pu-239 (kg) | Pu-240 (kg) |
|-----------|----------------|------------|-------------|-----------|-------------------------------|-------------|-------------|
| 3/7/1955  | 1856304000.00  | 43         | 5.61461E+24 | 2.5       | 0.9                           | 2.25        | 0.25        |
| 3/12/1955 | 1855872000.00  | 4          | 5.22289E+23 | 2.5       | 0.9                           | 2.25        | 0.25        |
| 3/22/1955 | 1855008000.00  | 8          | 1.04458E+24 | 2.5       | 0.9                           | 2.25        | 0.25        |
| 3/23/1955 | 1854921600.00  | 1          | 1.30572E+23 | 2.5       | 0.9                           | 2.25        | 0.25        |
| 3/29/1955 | 1854403200.00  | 14         | 1.82801E+24 | 2.5       | 0.9                           | 2.25        | 0.25        |
| 3/29/1955 | 1854403200.00  | 3          | 3.91717E+23 | 2.5       | 0.9                           | 2.25        | 0.25        |
| 4/6/1955  | 1853712000.00  | 3          | 3.91717E+23 | 2.5       | 0.9                           | 2.25        | 0.25        |
| 4/9/1955  | 1853452800.00  | 2          | 2.61145E+23 | 2.5       | 0.9                           | 2.25        | 0.25        |
| 4/15/1955 | 1852934400.00  | 22         | 2.87259E+24 | 2.5       | 0.9                           | 2.25        | 0.25        |
| 5/5/1955  | 1851206400.00  | 29         | 3.7866E+24  | 2.5       | 0.9                           | 2.25        | 0.25        |
| 5/15/1955 | 1850342400.00  | 28         | 3.65602E+24 | 2.5       | 0.9                           | 2.25        | 0.25        |
| 5/28/1957 | 1786060800.00  | 12         | 1.56687E+24 | 2.5       | 0.9                           | 2.25        | 0.25        |
| 6/2/1957  | 1785628800.00  | 0.14       | 1.82801E+22 | 2.5       | 0.9                           | 2.25        | 0.25        |
| 6/5/1957  | 1785369600.00  | 0.0005     | 6.52862E+19 | 2.5       | 0.9                           | 2.25        | 0.25        |
| 6/18/1957 | 1784246400.00  | 10         | 1.30572E+24 | 2.5       | 0.9                           | 2.25        | 0.25        |
| 6/24/1957 | 1783728000.00  | 37         | 4.83118E+24 | 2.5       | 0.9                           | 2.25        | 0.25        |
| 7/5/1957  | 1782777600.00  | 74         | 9.66235E+24 | 2.5       | 0.9                           | 2.25        | 0.25        |
| 7/15/1957 | 1781913600.00  | 17         | 2.21973E+24 | 2.5       | 0.9                           | 2.25        | 0.25        |
| 7/19/1957 | 1781568000.00  | 2          | 2.61145E+23 | 2.5       | 0.9                           | 2.25        | 0.25        |
| 7/24/1957 | 1781136000.00  | 10         | 1.30572E+24 | 2.5       | 0.9                           | 2.25        | 0.25        |
| 7/25/1957 | 1781049600.00  | 9.7        | 1.26655E+24 | 2.5       | 0.9                           | 2.25        | 0.25        |
| 7/26/1957 | 1780934400.00  |            | 0           | 2.5       | 0.9                           | 2.25        | 0.25        |
| 8/7/1957  | 1779881700.00  | 19         | 2.48087E+24 | 2.5       | 0.9                           | 2.25        | 0.25        |
| 8/10/1957 | 1779663605.00  |            | 0           | 2.5       | 0.9                           | 2.25        | 0.25        |
| 8/18/1957 | 1778932800.00  | 17         | 2.21973E+24 | 2.5       | 0.9                           | 2.25        | 0.25        |
| 8/23/1957 | 1778499000.00  | 11         | 1.4363E+24  | 2.5       | 0.9                           | 2.25        | 0.25        |
| 8/27/1957 | 1778117100.00  |            | 0           | 2.5       | 0.9                           | 2.25        | 0.25        |
| 8/30/1957 | 1777893600.00  | 4.7        | 6.1369E+23  | 2.5       | 0.9                           | 2.25        | 0.25        |
| 8/31/1957 | 1777807800.00  | 44         | 5.74518E+24 | 2.5       | 0.9                           | 2.25        | 0.25        |
| 9/2/1957  | 1777634400.00  | 11         | 1.4363E+24  | 2.5       | 0.9                           | 2.25        | 0.25        |
| 9/6/1957  | 1777288500.00  | 0.197      | 2.57227E+22 | 2.5       | 0.9                           | 2.25        | 0.25        |
| 9/6/1957  | 1777262099.00  | 0.3        | 3.91717E+22 | 2.5       | 0.9                           | 2.25        | 0.25        |
| 9/8/1957  | 1777114800.00  | 1          | 1.30572E+23 | 2.5       | 0.9                           | 2.25        | 0.25        |
| 9/14/1957 | 1776582900.00  | 11         | 1.4363E+24  | 2.5       | 0.9                           | 2.25        | 0.25        |
| 9/16/1957 | 1776424200.00  | 12         | 1.56687E+24 | 2.5       | 0.9                           | 2.25        | 0.25        |
| 9/19/1957 | 1776150001.00  | 1.7        | 2.21973E+23 | 2.5       | 0.9                           | 2.25        | 0.25        |
| 9/23/1957 | 1775820600.00  | 19         | 2.48087E+24 | 2.5       | 0.9                           | 2.25        | 0.25        |
| 9/28/1957 | 1775386800.00  | 12         | 1.56687E+24 | 2.5       | 0.9                           | 2.25        | 0.25        |
| 10/7/1957 | 1774609200.00  | 8          | 1.04458E+24 | 2.5       | 0.9                           | 2.25        | 0.25        |
| 12/6/1957 | 1769391900.00  |            | 0           | 2.5       | 0.9                           | 2.25        | 0.25        |
| 12/9/1957 | 1769140800.00  | 0.5        | 6.52862E+22 | 2.5       | 0.9                           | 2.25        | 0.25        |
| 2/22/1958 | 1762729200.00  |            | 0           | 2.5       | 0.9                           | 2.25        | 0.25        |
| 3/14/1958 | 1760925600.00  |            | 0           | 2.5       | 0.9                           | 2.25        | 0.25        |
| 9/12/1958 | 1745208000.00  | 0.038      | 4.96175E+21 | 2.5       | 0.9                           | 2.25        | 0.25        |
| 9/17/1958 | 1744777800.00  | 0.015      | 1.95858E+21 | 2.5       | 0.9                           | 2.25        | 0.25        |
| 9/19/1958 | 1744624800.00  | 0.083      | 1.08375E+22 | 2.5       | 0.9                           | 2.25        | 0.25        |
| 9/21/1958 | 1744434000.00  | 0.0015     | 1.95858E+20 | 2.5       | 0.9                           | 2.25        | 0.25        |
| 9/23/1958 | 1744250400.00  |            | 0           | 2.5       | 0.9                           | 2.25        | 0.25        |

| Test Date  | Time Diff. (s) | Yield (kt) | Fissions    | Core (kg) | <sup>239/240</sup> Pu Isotopic Ratios | Pu-239 (kg) | Pu-240 (kg) |
|------------|----------------|------------|-------------|-----------|---------------------------------------|-------------|-------------|
| 9/26/1958  | 1743998400.00  | 0.002      | 2.61145E+20 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 9/28/1958  | 1743897600.00  | 0.013      | 1.69744E+21 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 9/29/1958  | 1743760500.00  | 2          | 2.61145E+23 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 10/5/1958  | 1743241800.00  | 0.077      | 1.00541E+22 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 10/5/1958  | 1743234300.00  | 0.0055     | 7.18148E+20 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 10/8/1958  | 1742954400.00  | 0.072      | 9.40121E+21 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 10/10/1958 | 1742808600.00  | 0.079      | 1.03152E+22 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 10/13/1958 | 1742553600.00  | 1.4        | 1.82801E+23 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 10/14/1958 | 1742450400.00  | 0.115      | 1.50158E+22 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 10/15/1958 | 1742371200.00  | 0.0012     | 1.56687E+20 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 10/16/1958 | 1742320800.00  | 5          | 6.52862E+23 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 10/16/1958 | 1742290800.00  | 0.037      | 4.83118E+21 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 10/17/1958 | 1742173200.00  | 0.024      | 3.13374E+21 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 10/18/1958 | 1742117700.00  | 0.09       | 1.17515E+22 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 10/20/1958 | 1741944600.00  |            | 0           | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 10/22/1958 | 1741775400.00  | 6          | 7.83434E+23 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 10/22/1958 | 1741763400.00  | 0.115      | 1.50158E+22 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 10/22/1958 | 1741750200.00  |            | 0           | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 10/22/1958 | 1741738800.00  | 0.188      | 2.45476E+22 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 10/24/1958 | 1741597200.00  | 0.021      | 2.74202E+21 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 10/24/1958 | 1741593540.00  | 0.0017     | 2.21973E+20 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 10/26/1958 | 1741464000.00  | 0.0007     | 9.14006E+19 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 10/26/1958 | 1741441200.00  | 4.9        | 6.39804E+23 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 10/26/1958 | 1741420800.00  | 2.2        | 2.87259E+23 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 10/27/1958 | 1741339800.00  | 0.0006     | 7.83434E+19 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 10/29/1958 | 1741219200.00  | 0.055      | 7.18148E+21 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 10/29/1958 | 1741178400.00  |            | 0           | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 10/29/1958 | 1741166100.00  | 0.0078     | 1.01846E+21 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 10/30/1958 | 1741122000.00  | 1.3        | 1.69744E+23 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 10/30/1958 | 1741093200.00  |            | 0           | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 10/30/1958 | 1741078800.00  | 22         | 2.87259E+24 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 10/30/1958 | 1741058760.00  | 0.0002     | 2.61145E+19 | 2.5       | 0.9                                   | 2.25        | 0.25        |
| 9/15/1961  | 1650265200.00  | 2.6        | 3.39488E+23 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/16/1961  | 1650168900.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/1/1961  | 1648866600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/10/1961 | 1648101600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/29/1961 | 1646458200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/3/1961  | 1643417700.00  | 13.4       | 1.74967E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/13/1961 | 1642572000.00  | 0.5        | 6.52862E+22 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/17/1961 | 1642231500.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/22/1961 | 1641799800.00  | 0.15       | 1.95858E+22 | 8         | 0.9                                   | 7.2         | 0.8         |
| 1/9/1962   | 1640244600.00  | 5.1        | 6.65919E+23 | 8         | 0.9                                   | 7.2         | 0.8         |
| 1/18/1962  | 1639461600.00  | 6.4        | 8.35663E+23 | 8         | 0.9                                   | 7.2         | 0.8         |
| 1/30/1962  | 1638424800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/8/1962   | 1637647200.00  | 3.07       | 4.00857E+23 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/9/1962   | 1637566200.00  | 7.1        | 9.27063E+23 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/15/1962  | 1637042400.00  | 5.7        | 7.44262E+23 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/19/1962  | 1636702200.00  | 1.9        | 2.48087E+23 | 8         | 0.9                                   | 7.2         | 0.8         |

| Test Date  | Time Diff. (s) | Yield (kt) | Fissions    | Core (kg) | <sup>239/240</sup> Pu<br>Isotopic Ratios | Pu-239 (kg) | Pu-240 (kg) |
|------------|----------------|------------|-------------|-----------|--|-------------|-------------|
| 2/19/1962  | 1636697400.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 2/23/1962  | 1636351200.00  | 11.9       | 1.55381E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 2/24/1962  | 1636270200.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 3/1/1962   | 1635828600.00  | 9.5        | 1.24044E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 3/5/1962   | 1635486300.00  | 0.43       | 5.61461E+22 | 8         | 0.9                                      | 7.2         | 0.8         |
| 3/6/1962   | 1635406200.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 3/8/1962   | 1635228000.00  | 8.4        | 1.09681E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 3/15/1962  | 1634628600.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 3/28/1962  | 1633500000.00  | 3.4        | 4.43946E+23 | 8         | 0.9                                      | 7.2         | 0.8         |
| 3/31/1962  | 1633240800.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 4/5/1962   | 1632808800.00  | 10.6       | 1.38407E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 4/6/1962   | 1632722400.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 4/12/1962  | 1632204000.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 4/14/1962  | 1632031200.00  | 1.85       | 2.41559E+23 | 8         | 0.9                                      | 7.2         | 0.8         |
| 4/21/1962  | 1631424000.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 4/27/1962  | 1630908000.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 5/7/1962   | 1630038420.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 5/10/1962  | 1629795600.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 5/12/1962  | 1629608400.00  | 40         | 5.22289E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 5/19/1962  | 1629018000.00  | 4.5        | 5.87575E+23 | 8         | 0.9                                      | 7.2         | 0.8         |
| 5/25/1962  | 1628499600.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 6/1/1962   | 1627887600.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 6/6/1962   | 1627455600.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 6/13/1962  | 1626836400.00  |            | 0           | 8         | 0.9                                      | 7.2         | 0.8         |
| 6/21/1962  | 1626159600.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 6/27/1962  | 1625637600.00  | 67         | 8.74835E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 6/28/1962  | 1625554800.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 6/30/1962  | 1625365800.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 7/6/1962   | 1624863600.00  | 104        | 1.35795E+25 | 8         | 0.9                                      | 7.2         | 0.8         |
| 7/7/1962   | 1624770000.00  | 0.022      | 2.87259E+21 | 8         | 0.9                                      | 7.2         | 0.8         |
| 7/11/1962  | 1624432500.00  | 0.5        | 6.52862E+22 | 8         | 0.9                                      | 7.2         | 0.8         |
| 7/13/1962  | 1624262400.00  | 110        | 1.4363E+25  | 8         | 0.9                                      | 7.2         | 0.8         |
| 7/14/1962  | 1624167000.00  | 1.85       | 2.41559E+23 | 8         | 0.9                                      | 7.2         | 0.8         |
| 7/17/1962  | 1623913200.00  | 0.018      | 2.3503E+21  | 8         | 0.9                                      | 7.2         | 0.8         |
| 7/27/1962  | 1623034800.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 8/24/1962  | 1620637200.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 8/24/1962  | 1620630000.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 9/6/1962   | 1619506800.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 9/14/1962  | 1618815000.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 9/20/1962  | 1618297200.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 9/29/1962  | 1617519600.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 10/5/1962  | 1617001200.00  | 115        | 1.50158E+25 | 8         | 0.9                                      | 7.2         | 0.8         |
| 10/12/1962 | 1616403600.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 10/12/1962 | 1616396400.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 10/18/1962 | 1615885200.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 10/19/1962 | 1615788000.00  | 12.5       | 1.63215E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 10/27/1962 | 1615107600.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 11/9/1962  | 1613973600.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |

| Test Date  | Time Diff. (s) | Yield (kt) | Fissions    | Core (kg) | <sup>239/240</sup> Pu Isotopic Ratios | Pu-239 (kg) | Pu-240 (kg) |
|------------|----------------|------------|-------------|-----------|---------------------------------------|-------------|-------------|
| 11/15/1962 | 1613460600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/27/1962 | 1612418400.00  | 5.2        | 6.78976E+23 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/4/1962  | 1611820800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/7/1962  | 1611550800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/12/1962 | 1611124500.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/12/1962 | 1611119700.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/14/1962 | 1610949600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/8/1963   | 1606118400.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/8/1963   | 1606118399.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/8/1963   | 1606109400.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/8/1963   | 1606109400.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/15/1963  | 1605510000.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/21/1963  | 1604981580.00  | 3          | 3.91717E+23 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/21/1963  | 1604981571.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 3/1/1963   | 1604293200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 3/15/1963  | 1603093027.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 3/29/1963  | 1601885460.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/5/1963   | 1601273280.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/10/1963  | 1600847910.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/11/1963  | 1600761420.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/24/1963  | 1599637830.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/24/1963  | 1599637830.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/9/1963   | 1598334060.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/17/1963  | 1597655100.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/17/1963  | 1597655100.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/22/1963  | 1597220400.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/29/1963  | 1596617790.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/5/1963   | 1596006000.00  | 3.1        | 4.04774E+23 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/6/1963   | 1595930400.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/6/1963   | 1595919720.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/14/1963  | 1595238600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/25/1963  | 1594256400.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/12/1963  | 1590106500.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/15/1963  | 1589886000.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/23/1963  | 1589193600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/23/1963  | 1589193000.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/13/1963  | 1587377220.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/13/1963  | 1587366000.00  | 249        | 3.25125E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/27/1963  | 1586166000.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/27/1963  | 1586154600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/11/1963 | 1584957600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/11/1963 | 1584932400.00  | 0.38       | 4.96175E+22 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/16/1963 | 1584514800.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/17/1963 | 1584435600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/14/1963 | 1582012800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/15/1963 | 1581930000.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/22/1963 | 1581316200.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/4/1963  | 1580282490.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |

| Test Date  | Time Diff. (s) | Yield (kt) | Fissions    | Core (kg) | <sup>239/240</sup> Pu Isotopic Ratios | Pu-239 (kg) | Pu-240 (kg) |
|------------|----------------|------------|-------------|-----------|---------------------------------------|-------------|-------------|
| 12/4/1963  | 1580282490.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/12/1963 | 1579593480.00  | 5.3        | 6.92033E+23 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/20/1963 | 1578904560.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 1/16/1964  | 1576569600.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 1/23/1964  | 1575964800.00  | 10.5       | 1.37101E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 1/30/1964  | 1575360000.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/12/1964  | 1574238120.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/13/1964  | 1574152200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/18/1964  | 1573719761.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/18/1964  | 1573719743.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/20/1964  | 1573547400.00  | 70         | 9.14006E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 3/12/1964  | 1571734800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 3/13/1964  | 1571644680.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/14/1964  | 1568884800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/15/1964  | 1568799000.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/17/1964  | 1568622608.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/24/1964  | 1568001000.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/29/1964  | 1567566780.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/7/1964   | 1566903600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/14/1964  | 1566292800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/15/1964  | 1566200700.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/11/1964  | 1563866100.00  | 3          | 3.91717E+23 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/12/1964  | 1563789540.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/18/1964  | 1563273000.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/25/1964  | 1562668200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/30/1964  | 1562236020.00  | 11.7       | 1.5277E+24  | 8         | 0.9                                   | 7.2         | 0.8         |
| 7/16/1964  | 1560854700.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 7/17/1964  | 1560753690.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 7/23/1964  | 1560249000.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 7/24/1964  | 1560144600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/19/1964  | 1557907200.00  | 4.4        | 5.74518E+23 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/22/1964  | 1557625380.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/27/1964  | 1557221400.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/28/1964  | 1557125640.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/4/1964   | 1556516700.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/11/1964  | 1555927200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/25/1964  | 1554706680.00  |            | 0           | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/2/1964  | 1554091020.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/9/1964  | 1553508000.00  | 38         | 4.96175E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/16/1964 | 1552896030.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/16/1964 | 1552896030.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/23/1964 | 1552294799.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/31/1964 | 1551596101.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/5/1964  | 1551171600.00  | 12         | 1.56687E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/5/1964  | 1548557100.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/5/1964  | 1548557100.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/5/1964  | 1548557100.00  | 3.4        | 4.43946E+23 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/16/1964 | 1547611200.00  | 1.3        | 1.69744E+23 | 8         | 0.9                                   | 7.2         | 0.8         |

| Test Date  | Time Diff. (s) | Yield (kt) | Fissions    | Core (kg) | <sup>239/240</sup> Pu Isotopic Ratios | Pu-239 (kg) | Pu-240 (kg) |
|------------|----------------|------------|-------------|-----------|---------------------------------------|-------------|-------------|
| 12/16/1964 | 1547611200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/16/1964 | 1547611200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/16/1964 | 1547610600.00  | 2.7        | 3.52545E+23 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/18/1964 | 1547439900.00  | 0.092      | 1.20127E+22 | 8         | 0.9                                   | 7.2         | 0.8         |
| 1/14/1965  | 1545120000.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 1/29/1965  | 1543815480.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/4/1965   | 1543307400.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/12/1965  | 1542617371.00  | 0.33       | 4.30889E+22 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/16/1965  | 1542263400.00  | 10.1       | 1.31878E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/18/1965  | 1542094873.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/19/1965  | 1542011466.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 3/3/1965   | 1540961220.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 3/20/1965  | 1539505751.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 3/26/1965  | 1538987152.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/5/1965   | 1538103600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/14/1965  | 1537353960.00  | 4.3        | 5.61461E+23 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/21/1965  | 1536717600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/22/1965  | 1536661260.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/23/1965  | 1536545760.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/7/1965   | 1535357569.00  | 7          | 9.14006E+23 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/12/1965  | 1534916700.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/14/1965  | 1534755728.00  | 0.75       | 9.79292E+22 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/14/1965  | 1534746444.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/21/1965  | 1534157468.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/11/1965  | 1532319300.00  | 1.3        | 1.69744E+23 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/11/1965  | 1532316683.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/16/1965  | 1531899000.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/17/1965  | 1531810800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 7/16/1965  | 1529319336.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 7/22/1965  | 1528799932.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 7/23/1965  | 1528700400.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/6/1965   | 1527489390.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/21/1965  | 1526206612.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/27/1965  | 1525687727.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/1/1965   | 1525233120.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/1/1965   | 1525233120.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/10/1965  | 1524466080.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/17/1965  | 1523868697.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/12/1965 | 1519020000.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/23/1965 | 1518068548.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/3/1965  | 1517215618.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/16/1965 | 1516090842.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/16/1965 | 1516077900.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 1/13/1966  | 1513671737.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 1/18/1966  | 1513229100.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 1/18/1966  | 1513229100.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 1/21/1966  | 1512970320.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 1/22/1966  | 1512895361.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |

| Test Date  | Time Diff. (s) | Yield (kt) | Fissions    | Core (kg) | <sup>239/240</sup> Pu<br>Isotopic Ratios | Pu-239 (kg) | Pu-240 (kg) |
|------------|----------------|------------|-------------|-----------|--|-------------|-------------|
| 2/3/1966   | 1511847743.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 2/24/1966  | 1510041893.00  | 19         | 2.48087E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 3/5/1966   | 1509255900.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 3/7/1966   | 1509081540.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 3/7/1966   | 1509081540.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 3/12/1966  | 1508651747.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 3/18/1966  | 1508130000.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 3/24/1966  | 1507626272.00  | 0.37       | 4.83118E+22 | 8         | 0.9                                      | 7.2         | 0.8         |
| 4/1/1966   | 1506921600.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 4/6/1966   | 1506506563.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 4/7/1966   | 1506389550.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 4/14/1966  | 1505814377.00  | 70         | 9.14006E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 4/23/1966  | 1505034274.00  | 1.4        | 1.82801E+23 | 8         | 0.9                                      | 7.2         | 0.8         |
| 4/25/1966  | 1504848120.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 4/29/1966  | 1504520820.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 5/4/1966   | 1504088863.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 5/5/1966   | 1504000800.00  | 12         | 1.56687E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 5/6/1966   | 1503910800.00  | 73         | 9.53178E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 5/12/1966  | 1503375754.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 5/13/1966  | 1503311400.00  | 110        | 1.4363E+25  | 8         | 0.9                                      | 7.2         | 0.8         |
| 5/19/1966  | 1502791412.00  | 110        | 1.4363E+25  | 8         | 0.9                                      | 7.2         | 0.8         |
| 5/27/1966  | 1502078400.00  | 22         | 2.87259E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 6/2/1966   | 1501576200.00  | 62         | 8.09548E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 6/3/1966   | 1501495200.00  | 110        | 1.4363E+25  | 8         | 0.9                                      | 7.2         | 0.8         |
| 6/10/1966  | 1500888600.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 6/15/1966  | 1500447600.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 6/15/1966  | 1500443833.00  | 110        | 1.4363E+25  | 8         | 0.9                                      | 7.2         | 0.8         |
| 6/25/1966  | 1499582820.00  | 25         | 3.26431E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 6/30/1966  | 1499132700.00  | 365        | 4.76589E+25 | 8         | 0.9                                      | 7.2         | 0.8         |
| 7/28/1966  | 1496737590.00  | 1.2        | 1.56687E+23 | 8         | 0.9                                      | 7.2         | 0.8         |
| 8/10/1966  | 1495622640.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 8/12/1966  | 1495441440.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 9/12/1966  | 1492763400.00  | 7.8        | 1.01846E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 9/23/1966  | 1491804000.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 9/29/1966  | 1491297270.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 10/15/1966 | 1489899600.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 11/5/1966  | 1488100500.00  | 2.3        | 3.00316E+23 | 8         | 0.9                                      | 7.2         | 0.8         |
| 11/11/1966 | 1487592000.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 11/18/1966 | 1486976280.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 11/22/1966 | 1486630800.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 12/13/1966 | 1484806200.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 12/13/1966 | 1484794800.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 12/20/1966 | 1484209800.00  | 870        | 1.13598E+26 | 8         | 0.9                                      | 7.2         | 0.8         |
| 1/18/1967  | 1481706300.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 1/19/1967  | 1481613300.00  | 39         | 5.09232E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 1/20/1967  | 1481523597.00  | 110        | 1.4363E+25  | 8         | 0.9                                      | 7.2         | 0.8         |
| 1/26/1967  | 1481005197.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 2/8/1967   | 1479890700.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |



| Test Date  | Time Diff. (s) | Yield (kt) | Fissions    | Core (kg) | <sup>239/240</sup> Pu<br>Isotopic Ratios | Pu-239 (kg) | Pu-240 (kg) |
|------------|----------------|------------|-------------|-----------|--|-------------|-------------|
| 2/23/1967  | 1478582760.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 2/23/1967  | 1478581800.00  | 110        | 1.4363E+25  | 8         | 0.9                                      | 7.2         | 0.8         |
| 3/2/1967   | 1477990800.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 3/3/1967   | 1477903260.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 3/10/1967  | 1477299600.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 4/4/1967   | 1475142000.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 4/6/1967   | 1474966800.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 4/7/1967   | 1474880400.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 4/21/1967  | 1473670260.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 4/27/1967  | 1473153300.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 5/10/1967  | 1472034000.00  | 110        | 1.4363E+25  | 8         | 0.9                                      | 7.2         | 0.8         |
| 5/20/1967  | 1471165200.00  | 250        | 3.26431E+25 | 8         | 0.9                                      | 7.2         | 0.8         |
| 5/23/1967  | 1470909600.00  | 155        | 2.02387E+25 | 8         | 0.9                                      | 7.2         | 0.8         |
| 5/26/1967  | 1470655800.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 5/26/1967  | 1470646799.00  | 76         | 9.9235E+24  | 8         | 0.9                                      | 7.2         | 0.8         |
| 6/22/1967  | 1468320600.00  | 3.1        | 4.04774E+23 | 8         | 0.9                                      | 7.2         | 0.8         |
| 6/26/1967  | 1467964800.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 6/29/1967  | 1467722100.00  | 10         | 1.30572E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 7/14/1967  | 1466418600.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 7/27/1967  | 1465297200.00  | 110        | 1.4363E+25  | 8         | 0.9                                      | 7.2         | 0.8         |
| 8/4/1967   | 1464602400.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 8/10/1967  | 1464083400.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 8/18/1967  | 1463370450.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 8/24/1967  | 1462876200.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 8/31/1967  | 1462260600.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 9/7/1967   | 1461665700.00  | 110        | 1.4363E+25  | 8         | 0.9                                      | 7.2         | 0.8         |
| 9/15/1967  | 1460961000.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 9/21/1967  | 1460430900.00  | 2.2        | 2.87259E+23 | 8         | 0.9                                      | 7.2         | 0.8         |
| 9/27/1967  | 1459926000.00  | 110        | 1.4363E+25  | 8         | 0.9                                      | 7.2         | 0.8         |
| 10/18/1967 | 1458120600.00  | 110        | 1.4363E+25  | 8         | 0.9                                      | 7.2         | 0.8         |
| 10/25/1967 | 1457515800.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 10/25/1967 | 1457515800.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 10/25/1967 | 1457514900.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 11/8/1967  | 1456304400.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 12/6/1967  | 1453892400.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 12/15/1967 | 1453107600.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 1/18/1968  | 1450164600.00  | 7.4        | 9.66235E+23 | 8         | 0.9                                      | 7.2         | 0.8         |
| 1/19/1968  | 1450083600.00  | 110        | 1.4363E+25  | 8         | 0.9                                      | 7.2         | 0.8         |
| 1/24/1968  | 1449651600.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 1/26/1968  | 1449475200.00  | 2.3        | 3.00316E+23 | 8         | 0.9                                      | 7.2         | 0.8         |
| 1/31/1968  | 1449045000.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 2/21/1968  | 1447232400.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 2/21/1968  | 1447230600.00  | 110        | 1.4363E+25  | 8         | 0.9                                      | 7.2         | 0.8         |
| 2/29/1968  | 1446533490.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 3/5/1968   | 1446107400.00  | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 3/12/1968  | 1445496960.00  | 1.08       | 1.41018E+23 | 8         | 0.9                                      | 7.2         | 0.8         |
| 3/12/1968  | 1445496960.00  | 1.08       | 1.41018E+23 | 8         | 0.9                                      | 7.2         | 0.8         |
| 3/12/1968  | 1445496960.00  | 1.08       | 1.41018E+23 | 8         | 0.9                                      | 7.2         | 0.8         |

| Test Date  | Time Diff. (s) | Yield (kt) | Fissions    | Core (kg) | <sup>239/240</sup> Pu Isotopic Ratios | Pu-239 (kg) | Pu-240 (kg) |
|------------|----------------|------------|-------------|-----------|---------------------------------------|-------------|-------------|
| 3/12/1968  | 1445496960.00  | 1.08       | 1.41018E+23 | 8         | 0.9                                   | 7.2         | 0.8         |
| 3/12/1968  | 1445496960.00  | 1.08       | 1.41018E+23 | 8         | 0.9                                   | 7.2         | 0.8         |
| 3/14/1968  | 1445330460.00  | 1.5        | 1.95858E+23 | 8         | 0.9                                   | 7.2         | 0.8         |
| 3/22/1968  | 1444640400.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 3/25/1968  | 1444367733.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/4/1968   | 1443517080.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/10/1968  | 1443002400.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/10/1968  | 1443002400.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/18/1968  | 1442310900.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/23/1968  | 1441868310.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/26/1968  | 1441616400.00  | 1300       | 1.69744E+26 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/3/1968   | 1441008000.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/8/1968   | 1440582600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/17/1968  | 1439809200.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/28/1968  | 1438852500.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/5/1968   | 1438162710.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/6/1968   | 1438050600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/6/1968   | 1438050600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/6/1968   | 1438050600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/6/1968   | 1438050600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/6/1968   | 1438050600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/15/1968  | 1437300000.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/25/1968  | 1436430600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/25/1968  | 1436430600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/28/1968  | 1436182680.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 7/17/1968  | 1434535200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 7/30/1968  | 1433415600.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/9/1968   | 1432551600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/15/1968  | 1432018800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/27/1968  | 1430983800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/29/1968  | 1430788500.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/6/1968   | 1430128800.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/12/1968  | 1429610400.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/17/1968  | 1429178400.00  | 31         | 4.04774E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/24/1968  | 1428562499.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/3/1968  | 1427796000.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/3/1968  | 1427794260.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/10/1968 | 1427189400.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/29/1968 | 1425543840.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/31/1968 | 1425360600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/31/1968 | 1425360600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/31/1968 | 1425360600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/4/1968  | 1425026700.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/4/1968  | 1425026700.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/4/1968  | 1425026700.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/15/1968 | 1424075400.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/15/1968 | 1424074500.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/20/1968 | 1423634400.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |

| Test Date  | Time Diff. (s) | Yield (kt) | Fissions    | Core (kg) | <sup>239/240</sup> Pu Isotopic Ratios | Pu-239 (kg) | Pu-240 (kg) |
|------------|----------------|------------|-------------|-----------|---------------------------------------|-------------|-------------|
| 11/22/1968 | 1423467660.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/8/1968  | 1422086400.00  | 30         | 3.91717E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/12/1968 | 1421744400.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/12/1968 | 1421743800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/12/1968 | 1421743800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/12/1968 | 1421743800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/12/1968 | 1421743800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/12/1968 | 1421743800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/12/1968 | 1421743800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/12/1968 | 1421743800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/12/1968 | 1421743200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/19/1968 | 1421134200.00  | 1150       | 1.50158E+26 | 8         | 0.9                                   | 7.2         | 0.8         |
| 1/15/1969  | 1418792400.00  | 10         | 1.30572E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 1/15/1969  | 1418790600.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 1/22/1969  | 1418202000.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 1/30/1969  | 1417510800.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 1/30/1969  | 1417509780.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/4/1969   | 1417078800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/4/1969   | 1417078800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/12/1969  | 1416382899.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 3/18/1969  | 1413451800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 3/18/1969  | 1413451200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 3/20/1969  | 1413265680.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 3/21/1969  | 1413192600.00  | 100        | 1.30572E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/24/1969  | 1410260160.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/24/1969  | 1410260160.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/30/1969  | 1409727600.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/30/1969  | 1409727600.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/7/1969   | 1409134500.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/15/1969  | 1408428000.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/27/1969  | 1407405600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/27/1969  | 1407405600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/27/1969  | 1407404700.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/12/1969  | 1406023200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/26/1969  | 1404806400.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/26/1969  | 1404806400.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 7/16/1969  | 1403089050.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 7/16/1969  | 1403082300.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/14/1969  | 1400578200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/14/1969  | 1400578200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/27/1969  | 1399457700.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/27/1969  | 1399457700.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/12/1969  | 1398059860.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/16/1969  | 1397727000.00  | 1000       | 1.30572E+26 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/20/1969  | 1397381400.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/20/1969  | 1397381400.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/1/1969  | 1396431000.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/1/1969  | 1396431000.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/1/1969  | 1396431000.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |

| Test Date  | Time Diff. (s) | Yield (kt) | Fissions    | Core (kg) | 239/240 Pu<br>Isotopic Ratios | Pu-239 (kg) | Pu-240 (kg) |
|------------|----------------|------------|-------------|-----------|-------------------------------|-------------|-------------|
| 10/8/1969  | 1395826200.00  | 600        | 7.83434E+25 | 8         | 0.9                           | 7.2         | 0.8         |
| 10/16/1969 | 1395136800.00  | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 10/29/1969 | 1393993800.00  | 11         | 1.4363E+24  | 8         | 0.9                           | 7.2         | 0.8         |
| 10/29/1969 | 1393992000.00  | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 10/29/1969 | 1393992000.00  | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 10/29/1969 | 1393992000.00  | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 10/29/1969 | 1393991962.00  | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 10/29/1969 | 1393984689.00  | 110        | 1.4363E+25  | 8         | 0.9                           | 7.2         | 0.8         |
| 11/13/1969 | 1392713100.00  | 1.7        | 2.21973E+23 | 8         | 0.9                           | 7.2         | 0.8         |
| 11/21/1969 | 1392023280.00  | 110        | 1.4363E+25  | 8         | 0.9                           | 7.2         | 0.8         |
| 11/21/1969 | 1392023280.00  | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 12/5/1969  | 1390806000.00  | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 12/10/1969 | 1390381200.00  | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 12/10/1969 | 1390381200.00  | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 12/10/1969 | 1390379400.00  | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 12/10/1969 | 1390379400.00  | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 12/10/1969 | 1390379400.00  | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 12/10/1969 | 1390379400.00  | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 12/10/1969 | 1390379400.00  | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 12/17/1969 | 1389776400.00  | 110        | 1.4363E+25  | 8         | 0.9                           | 7.2         | 0.8         |
| 12/17/1969 | 1389775500.00  | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 12/18/1969 | 1389675600.00  | 110        | 1.4363E+25  | 8         | 0.9                           | 7.2         | 0.8         |
| 12/18/1969 | 1389675600.00  | 110        | 1.4363E+25  | 8         | 0.9                           | 7.2         | 0.8         |
| 1/23/1970  | 1386574200.00  | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 1/23/1970  | 1386574200.00  | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 1/23/1970  | 1386574200.00  | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 1/30/1970  | 1385967600.00  | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 2/4/1970   | 1385535600.00  | 110        | 1.4363E+25  | 8         | 0.9                           | 7.2         | 0.8         |
| 2/4/1970   | 1385535600.00  | 110        | 1.4363E+25  | 8         | 0.9                           | 7.2         | 0.8         |
| 2/5/1970   | 1385456400.00  | 25         | 3.26431E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 2/11/1970  | 1384922700.00  | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 2/25/1970  | 1383730282.00  | 110        | 1.4363E+25  | 8         | 0.9                           | 7.2         | 0.8         |
| 2/26/1970  | 1383640200.00  | 110        | 1.4363E+25  | 8         | 0.9                           | 7.2         | 0.8         |
| 2/26/1970  | 1383640200.00  | 110        | 1.4363E+25  | 8         | 0.9                           | 7.2         | 0.8         |
| 2/26/1970  | 1383640200.00  | 110        | 1.4363E+25  | 8         | 0.9                           | 7.2         | 0.8         |
| 3/6/1970   | 1382952959.00  | 8.7        | 1.13598E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 3/6/1970   | 1382950800.00  | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 3/6/1970   | 1382950800.00  | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 3/6/1970   | 1382950800.00  | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 3/19/1970  | 1381830990.00  | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 3/23/1970  | 1381452900.00  | 110        | 1.4363E+25  | 8         | 0.9                           | 7.2         | 0.8         |
| 3/26/1970  | 1381208400.00  | 1000       | 1.30572E+26 | 8         | 0.9                           | 7.2         | 0.8         |
| 4/21/1970  | 1378978200.00  | 12.7       | 1.65827E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 4/21/1970  | 1378976400.00  | 110        | 1.4363E+25  | 8         | 0.9                           | 7.2         | 0.8         |
| 4/21/1970  | 1378976400.00  | 110        | 1.4363E+25  | 8         | 0.9                           | 7.2         | 0.8         |
| 5/1/1970   | 1378115220.00  | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 5/1/1970   | 1378113600.00  | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 5/1/1970   | 1378113600.00  | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 5/1/1970   | 1378113600.00  | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |

| Test Date  | Time Diff. (s) | Yield (kt) | Fissions    | Core (kg) | <sup>239/240</sup> Pu Isotopic Ratios | Pu-239 (kg) | Pu-240 (kg) |
|------------|----------------|------------|-------------|-----------|---------------------------------------|-------------|-------------|
| 5/5/1970   | 1377765000.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/12/1970  | 1377165600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/15/1970  | 1376908200.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/15/1970  | 1376908200.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/21/1970  | 1376388000.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/21/1970  | 1376387100.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/26/1970  | 1375955040.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/26/1970  | 1375952400.00  | 105        | 1.37101E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/26/1970  | 1375952400.00  | 0.035      | 4.57003E+21 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/26/1970  | 1375952400.00  | 0.09       | 1.17515E+22 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/28/1970  | 1375791300.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/28/1970  | 1375790400.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/28/1970  | 1375790400.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/26/1970  | 1373281200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/26/1970  | 1373281200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/13/1970 | 1363856100.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/13/1970 | 1363856100.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/13/1970 | 1363856100.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/14/1970 | 1363771800.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/28/1970 | 1362562200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/28/1970 | 1362562200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/28/1970 | 1362562200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/5/1970  | 1361869200.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/19/1970 | 1360659600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/3/1970  | 1359449580.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/3/1970  | 1359449580.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/16/1970 | 1358323200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/16/1970 | 1358323200.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/16/1970 | 1358323200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/16/1970 | 1358323200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/16/1970 | 1358323200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/16/1970 | 1358323200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/16/1970 | 1358323200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/16/1970 | 1358323200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/17/1970 | 1358236500.00  | 220        | 2.87259E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/18/1970 | 1358152200.00  | 10         | 1.30572E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/16/1971  | 1342602600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/23/1971  | 1342000800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/23/1971  | 1341995400.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/24/1971  | 1341914400.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/29/1971  | 1341466200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 7/1/1971   | 1341309600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 7/8/1971   | 1340704800.00  | 83         | 1.08375E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 7/9/1971   | 1340618400.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 7/21/1971  | 1339583220.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/4/1971   | 1338373800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/5/1971   | 1338270735.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/5/1971   | 1338270735.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/6/1971   | 1338197340.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/18/1971  | 1337162400.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |

| Test Date  | Time Diff. (s) | Yield (kt) | Fissions    | Core (kg) | <sup>239/240</sup> Pu Isotopic Ratios | Pu-239 (kg) | Pu-240 (kg) |
|------------|----------------|------------|-------------|-----------|---------------------------------------|-------------|-------------|
| 9/22/1971  | 1334138400.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/22/1971  | 1334138400.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/22/1971  | 1334138400.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/22/1971  | 1334138400.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/29/1971  | 1333533600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/29/1971  | 1333531800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/8/1971  | 1332754200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/14/1971 | 1332235800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/24/1971 | 1328672700.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/30/1971 | 1328170500.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/14/1971 | 1326941401.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/14/1971 | 1326941399.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/14/1971 | 1326941399.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 1/5/1972   | 1325062200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/3/1972   | 1322532900.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/17/1972  | 1321333080.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 3/23/1972  | 1318309800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 3/30/1972  | 1317697200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 3/30/1972  | 1317697200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/19/1972  | 1315985280.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/19/1972  | 1315984680.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/2/1972   | 1314852300.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/11/1972  | 1314093600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/17/1972  | 1313574600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/19/1972  | 1313391600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/7/1972   | 1311756000.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/28/1972  | 1309943940.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/28/1972  | 1309937400.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/28/1972  | 1309937397.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 7/20/1972  | 1308033840.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 7/25/1972  | 1307615400.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/9/1972   | 1306319330.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/9/1972   | 1306319330.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/9/1972   | 1306319330.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/21/1972  | 1302597000.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/26/1972  | 1302168600.00  | 15         | 1.95858E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/9/1972  | 1298364300.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/9/1972  | 1298353500.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/17/1972 | 1297663200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/17/1972 | 1297663200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/12/1972 | 1295508600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/14/1972 | 1295339400.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/21/1972 | 1294717500.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/21/1972 | 1294717500.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/21/1972 | 1294717500.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/14/1973  | 1289982600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 3/8/1973   | 1288079400.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 3/23/1973  | 1286768700.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |

| Test Date  | Time Diff. (s) | Yield (kt) | Fissions    | Core (kg) | <sup>239/240</sup> Pu Isotopic Ratios | Pu-239 (kg) | Pu-240 (kg) |
|------------|----------------|------------|-------------|-----------|---------------------------------------|-------------|-------------|
| 4/5/1973   | 1285665000.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/25/1973  | 1283909700.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/25/1973  | 1283909700.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/26/1973  | 1283849100.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/26/1973  | 1283841900.00  | 90         | 1.17515E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/9/1973   | 1282732200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/24/1973  | 1281436200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/24/1973  | 1281436200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/5/1973   | 1280386800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/6/1973   | 1280314800.00  | 600        | 7.83434E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/21/1973  | 1279012500.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/28/1973  | 1278391488.00  | 100        | 1.30572E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/28/1973  | 1278389700.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/2/1973  | 1270114200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/2/1973  | 1270111500.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/12/1973 | 1269241200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/28/1973 | 1265185800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/12/1973 | 1263963600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/13/1973 | 1263890580.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/19/1973 | 1263364200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/19/1973 | 1263357840.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 1/10/1974  | 1261470120.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 1/10/1974  | 1261470120.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 1/10/1974  | 1261470120.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/27/1974  | 1257318000.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 3/14/1974  | 1256022000.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/12/1974  | 1253522700.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/23/1974  | 1252572420.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/1/1974   | 1251885480.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/8/1974   | 1251270300.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/22/1974  | 1250070300.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/23/1974  | 1249986090.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/6/1974   | 1248772800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/19/1974  | 1247644800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 7/10/1974  | 1245830400.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 7/18/1974  | 1245146399.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 7/18/1974  | 1245146399.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/14/1974  | 1242813600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/30/1974  | 1241427600.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/25/1974  | 1239184800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/26/1974  | 1239096600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/26/1974  | 1239094500.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/17/1974 | 1237272420.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/28/1974 | 1236330000.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/2/1974  | 1235896200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/26/1974 | 1233824399.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/16/1974 | 1232087400.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/6/1975   | 1227601800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |

| Test Date  | Time Diff. (s) | Yield (kt) | Fissions    | Core (kg) | <sup>239/240</sup> Pu Isotopic Ratios | Pu-239 (kg) | Pu-240 (kg) |
|------------|----------------|------------|-------------|-----------|---------------------------------------|-------------|-------------|
| 2/6/1975   | 1227601800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/6/1975   | 1227599220.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/19/1975  | 1226461800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/28/1975  | 1225698300.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 3/7/1975   | 1225094400.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/5/1975   | 1222575300.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/24/1975  | 1220953800.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/30/1975  | 1220432398.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/14/1975  | 1219226400.00  | 600        | 7.83434E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/3/1975   | 1217497200.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/3/1975   | 1217496000.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/11/1975  | 1216810800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/18/1975  | 1216210260.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/19/1975  | 1216119600.00  | 600        | 7.83434E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/26/1975  | 1215516600.00  | 600        | 7.83434E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/6/1975   | 1209279600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/24/1975 | 1205131714.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/28/1975 | 1204795800.00  | 600        | 7.83434E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/18/1975 | 1202977800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/20/1975 | 1202806800.00  | 600        | 7.83434E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/26/1975 | 1202286600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/20/1975 | 1200196800.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 1/3/1976   | 1198989900.00  | 600        | 7.83434E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/4/1976   | 1196242800.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/4/1976   | 1196241600.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/12/1976  | 1195550100.00  | 600        | 7.83434E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/14/1976  | 1195389000.00  | 350        | 4.57003E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/26/1976  | 1194340200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 3/9/1976   | 1193306400.00  | 350        | 4.57003E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 3/14/1976  | 1192879800.00  | 750        | 9.79292E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 3/17/1976  | 1192614300.00  | 350        | 4.57003E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 3/17/1976  | 1192612500.00  | 350        | 4.57003E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/12/1976  | 1187755800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/20/1976  | 1187073000.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 7/27/1976  | 1181187000.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/26/1976  | 1178616600.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/6/1976  | 1175074200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/10/1976 | 1172048520.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/23/1976 | 1170924300.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/8/1976  | 1169629830.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/21/1976 | 1168505460.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/21/1976 | 1168502520.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/28/1976 | 1167890400.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/16/1977  | 1163570820.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/16/1977  | 1163570820.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 3/8/1977   | 1161855360.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 3/8/1977   | 1161855360.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/5/1977   | 1159434000.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |



| Test Date  | Time Diff. (s) | Yield (kt) | Fissions    | Core (kg) | <sup>239/240</sup> Pu Isotopic Ratios | Pu-239 (kg) | Pu-240 (kg) |
|------------|----------------|------------|-------------|-----------|---------------------------------------|-------------|-------------|
| 4/27/1977  | 1157533200.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/25/1977  | 1155106800.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/2/1977   | 1154414700.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 7/28/1977  | 1149587580.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/4/1977   | 1148973600.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/16/1977  | 1147943940.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/16/1977  | 1147943940.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/16/1977  | 1147939860.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/19/1977  | 1147674480.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/19/1977  | 1147673100.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/15/1977  | 1145352210.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/27/1977  | 1144317600.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/26/1977 | 1141811100.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/1/1977  | 1141278840.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/9/1977  | 1140573600.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/17/1977 | 1139891400.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/14/1977 | 1137574800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/14/1977 | 1137573000.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/13/1978  | 1132279620.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/23/1978  | 1131433200.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 3/16/1978  | 1129626000.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 3/23/1978  | 1129015800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 3/23/1978  | 1129015800.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/11/1978  | 1127377800.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/11/1978  | 1127369700.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/25/1978  | 1126171500.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/1/1978   | 1122966000.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 7/7/1978   | 1119866400.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 7/12/1978  | 1119423600.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/31/1978  | 1115114400.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/13/1978  | 1113986700.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/27/1978  | 1112772600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/27/1978  | 1112772600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/27/1978  | 1112770800.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/27/1978  | 1112769600.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/2/1978  | 1109666100.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/18/1978 | 1108270800.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/1/1978  | 1107154350.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/16/1978 | 1105864200.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 1/24/1979  | 1102485600.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/8/1979   | 1101182400.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/15/1979  | 1100584500.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 3/14/1979  | 1098250200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/11/1979  | 1093248000.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/11/1979  | 1090576800.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/20/1979  | 1089795586.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/28/1979  | 1089105360.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/3/1979   | 1085993550.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |

| Test Date  | Time Diff. (s) | Yield (kt) | Fissions    | Core (kg) | <sup>239/240</sup> Pu Isotopic Ratios | Pu-239 (kg) | Pu-240 (kg) |
|------------|----------------|------------|-------------|-----------|---------------------------------------|-------------|-------------|
| 8/8/1979   | 1085562000.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/29/1979  | 1083747120.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/6/1979   | 1083056400.00  | 140        | 1.82801E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/8/1979   | 1082876280.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/26/1979  | 1081328400.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/29/1979 | 1075798800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/14/1979 | 1074492000.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/28/1980  | 1067936400.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 3/8/1980   | 1067156700.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/3/1980   | 1064916000.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/16/1980  | 1063771200.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/26/1980  | 1062918000.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/2/1980   | 1062393210.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/22/1980  | 1060686000.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/12/1980  | 1058856300.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/24/1980  | 1057827000.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 7/25/1980  | 1055134500.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 7/31/1980  | 1054618860.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/25/1980  | 1049793300.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/25/1980  | 1049790810.00  | 1.07       | 1.39712E+23 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/24/1980 | 1047271500.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/31/1980 | 1046671200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/14/1980 | 1045465800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/17/1980 | 1042620600.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 1/15/1981  | 1040096100.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/5/1981   | 1038290400.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/25/1981  | 1036573200.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/30/1981  | 1031045100.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/29/1981  | 1028534400.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/6/1981   | 1027836000.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 7/10/1981  | 1024912800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 7/16/1981  | 1024390800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/5/1981   | 1022667540.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/27/1981  | 1020763740.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/4/1981   | 1020070800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/24/1981  | 1018342800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/1/1981  | 1017723600.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/11/1981 | 1014177591.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/12/1981 | 1014109200.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/3/1981  | 1012294800.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/16/1981 | 1011149700.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 1/28/1982  | 1007452800.00  | 139        | 1.81496E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/12/1982  | 1006160700.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/12/1982  | 1006158900.00  | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/17/1982  | 1000620000.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/25/1982  | 999928500.00   | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/6/1982   | 998971200.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/7/1982   | 998890980.00   | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |

| Test Date  | Time Diff. (s) | Yield (kt) | Fissions    | Core (kg) | <sup>239/240</sup> Pu Isotopic Ratios | Pu-239 (kg) | Pu-240 (kg) |
|------------|----------------|------------|-------------|-----------|---------------------------------------|-------------|-------------|
| 6/16/1982  | 995450400.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/24/1982  | 994758300.00   | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 7/29/1982  | 991713300.00   | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/5/1982   | 991130400.00   | 138        | 1.8019E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/11/1982  | 990608400.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/2/1982   | 988711200.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/23/1982  | 986889600.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/23/1982  | 986889600.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/23/1982  | 986886000.00   | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/29/1982  | 986380200.00   | 150        | 1.95858E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/12/1982 | 982557780.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/10/1982 | 980152800.00   | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/11/1983  | 974707200.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/17/1983  | 974185200.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 3/26/1983  | 970976400.00   | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/14/1983  | 969339300.00   | 150        | 1.95858E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/22/1983  | 968666820.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/5/1983   | 967538400.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/26/1983  | 965727000.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/26/1983  | 965725200.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/9/1983   | 964507800.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/3/1983   | 959768820.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/11/1983  | 959076000.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/27/1983  | 957693600.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/1/1983   | 957261600.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/21/1983  | 955530000.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/21/1983  | 955524900.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/21/1983  | 955524900.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/22/1983  | 955443600.00   | 150        | 1.95858E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/29/1983  | 954838800.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/9/1983  | 948700800.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/16/1983 | 948087000.00   | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 1/31/1984  | 944123400.00   | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/15/1984  | 942822000.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 3/1/1984   | 941523300.00   | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 3/31/1984  | 938943000.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/1/1984   | 936248100.00   | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/2/1984   | 936180600.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/16/1984  | 934963200.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/31/1984  | 933677760.00   | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/20/1984  | 931941900.00   | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 7/12/1984  | 930045600.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 7/25/1984  | 928917000.00   | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/2/1984   | 928227600.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/30/1984  | 925809300.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/30/1984  | 925809300.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/13/1984  | 924602400.00   | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/2/1984  | 922945560.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |

| Test Date  | Time Diff. (s) | Yield (kt) | Fissions    | Core (kg) | 239/240 Pu<br>Isotopic Ratios | Pu-239 (kg) | Pu-240 (kg) |
|------------|----------------|------------|-------------|-----------|-------------------------------|-------------|-------------|
| 11/10/1984 | 919581600.00   | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 12/9/1984  | 917065200.00   | 85         | 1.10986E+25 | 8         | 0.9                           | 7.2         | 0.8         |
| 12/15/1984 | 916564500.00   | 85         | 1.10986E+25 | 8         | 0.9                           | 7.2         | 0.8         |
| 12/20/1984 | 916126800.00   | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 3/15/1985  | 908782140.00   | 85         | 1.10986E+25 | 8         | 0.9                           | 7.2         | 0.8         |
| 3/23/1985  | 908083800.00   | 85         | 1.10986E+25 | 8         | 0.9                           | 7.2         | 0.8         |
| 4/2/1985   | 907214400.00   | 85         | 1.10986E+25 | 8         | 0.9                           | 7.2         | 0.8         |
| 4/6/1985   | 906857100.00   | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 5/2/1985   | 904639200.00   | 85         | 1.10986E+25 | 8         | 0.9                           | 7.2         | 0.8         |
| 6/12/1985  | 901097100.00   | 85         | 1.10986E+25 | 8         | 0.9                           | 7.2         | 0.8         |
| 6/12/1985  | 901089000.00   | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 6/26/1985  | 899877420.00   | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 7/25/1985  | 897386400.00   | 85         | 1.10986E+25 | 8         | 0.9                           | 7.2         | 0.8         |
| 8/14/1985  | 895662000.00   | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 8/17/1985  | 895390500.00   | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 9/27/1985  | 891855900.00   | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 10/9/1985  | 890792400.00   | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 10/9/1985  | 890786400.00   | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 10/16/1985 | 890187900.00   | 85         | 1.10986E+25 | 8         | 0.9                           | 7.2         | 0.8         |
| 10/30/1985 | 888998400.00   | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 12/5/1985  | 885891600.00   | 85         | 1.10986E+25 | 8         | 0.9                           | 7.2         | 0.8         |
| 12/28/1985 | 883889940.00   | 85         | 1.10986E+25 | 8         | 0.9                           | 7.2         | 0.8         |
| 3/22/1986  | 876642300.00   | 29         | 3.7866E+24  | 8         | 0.9                           | 7.2         | 0.8         |
| 4/10/1986  | 875008290.00   | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 4/20/1986  | 874140450.00   | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 4/22/1986  | 873970200.00   | 85         | 1.10986E+25 | 8         | 0.9                           | 7.2         | 0.8         |
| 5/21/1986  | 871466460.00   |            | 0           | 8         | 0.9                           | 7.2         | 0.8         |
| 6/5/1986   | 870166560.00   | 85         | 1.10986E+25 | 8         | 0.9                           | 7.2         | 0.8         |
| 6/25/1986  | 868419135.00   | 85         | 1.10986E+25 | 8         | 0.9                           | 7.2         | 0.8         |
| 7/17/1986  | 866516400.00   | 119        | 1.55381E+25 | 8         | 0.9                           | 7.2         | 0.8         |
| 7/24/1986  | 865932900.00   | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 9/4/1986   | 862300260.00   | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 9/11/1986  | 861699780.00   | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 9/30/1986  | 860031000.00   | 85         | 1.10986E+25 | 8         | 0.9                           | 7.2         | 0.8         |
| 10/16/1986 | 858659700.00   | 85         | 1.10986E+25 | 8         | 0.9                           | 7.2         | 0.8         |
| 11/14/1986 | 856166400.00   | 85         | 1.10986E+25 | 8         | 0.9                           | 7.2         | 0.8         |
| 12/13/1986 | 853654195.00   | 85         | 1.10986E+25 | 8         | 0.9                           | 7.2         | 0.8         |
| 2/3/1987   | 849170400.00   | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 2/3/1987   | 849170400.00   | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 2/3/1987   | 849170400.00   | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 2/11/1987  | 848474100.00   | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 3/18/1987  | 845443920.00   | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 4/18/1987  | 842782800.00   | 85         | 1.10986E+25 | 8         | 0.9                           | 7.2         | 0.8         |
| 4/22/1987  | 842432400.00   | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 4/30/1987  | 841746600.00   | 85         | 1.10986E+25 | 8         | 0.9                           | 7.2         | 0.8         |
| 6/18/1987  | 837506400.00   | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 6/20/1987  | 837331200.00   | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 6/30/1987  | 836466900.00   | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |

| Test Date  | Time Diff. (s) | Yield (kt) | Fissions    | Core (kg) | <sup>239/240</sup> Pu Isotopic Ratios | Pu-239 (kg) | Pu-240 (kg) |
|------------|----------------|------------|-------------|-----------|---------------------------------------|-------------|-------------|
| 7/16/1987  | 835074000.00   | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/13/1987  | 832672800.00   | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/24/1987  | 829040400.00   | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/23/1987 | 826531200.00   | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/1/1987  | 823159800.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/2/1987  | 823073400.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/15/1988  | 816587400.00   | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/7/1988   | 812097900.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/13/1988  | 808993500.00   | 150        | 1.95858E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/21/1988  | 808277400.00   | 150        | 1.95858E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/2/1988   | 807274800.00   | 150        | 1.95858E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/22/1988  | 805543200.00   | 150        | 1.95858E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/22/1988  | 805543200.00   | 150        | 1.95858E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 7/7/1988   | 804243270.00   | 150        | 1.95858E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/17/1988  | 800694000.00   | 125        | 1.63215E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/23/1988  | 800170200.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/23/1988  | 800170200.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 8/30/1988  | 799567200.00   | 150        | 1.95858E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/13/1988 | 795780000.00   | 150        | 1.95858E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/9/1988  | 793424700.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/9/1988  | 793424700.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/9/1988  | 790850700.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/9/1988  | 790850700.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/10/1988 | 790745400.00   | 150        | 1.95858E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/10/1989  | 785390040.00   | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/24/1989  | 784194300.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/24/1989  | 784194300.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 3/9/1989   | 783078900.00   | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/15/1989  | 777293400.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/15/1989  | 777293400.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/15/1989  | 777293400.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/26/1989  | 776325180.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/22/1989  | 773981100.00   | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/27/1989  | 773569800.00   | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/14/1989  | 766746000.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/31/1989 | 762683400.00   | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/15/1989 | 761370000.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/8/1989  | 759402000.00   | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/20/1989 | 758340000.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 12/20/1989 | 758340000.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 3/10/1990  | 751449600.00   | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/6/1990   | 749113200.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/13/1990  | 743241600.00   | 85         | 1.10986E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/21/1990  | 742542300.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 7/25/1990  | 739616400.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 7/25/1990  | 739616400.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/20/1990  | 734687100.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 9/20/1990  | 734687100.00   | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |

| Test Date  | Time Diff. (s) | Yield (kt) | Fissions    | Core (kg) | <sup>239/240</sup> Pu<br>Isotopic Ratios | Pu-239 (kg) | Pu-240 (kg) |
|------------|----------------|------------|-------------|-----------|--|-------------|-------------|
| 9/27/1990  | 734075834.00   | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 10/12/1990 | 732781800.00   | 85         | 1.10986E+25 | 8         | 0.9                                      | 7.2         | 0.8         |
| 11/14/1990 | 729924180.00   | 85         | 1.10986E+25 | 8         | 0.9                                      | 7.2         | 0.8         |
| 3/8/1991   | 720068235.00   | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 3/8/1991   | 720068235.00   | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 3/8/1991   | 720068235.00   | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 4/4/1991   | 717742800.00   | 85         | 1.10986E+25 | 8         | 0.9                                      | 7.2         | 0.8         |
| 4/16/1991  | 716718600.00   | 85         | 1.10986E+25 | 8         | 0.9                                      | 7.2         | 0.8         |
| 8/15/1991  | 706262400.00   | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 9/14/1991  | 703659600.00   | 85         | 1.10986E+25 | 8         | 0.9                                      | 7.2         | 0.8         |
| 9/19/1991  | 703236600.00   | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 10/18/1991 | 700721280.00   | 85         | 1.10986E+25 | 8         | 0.9                                      | 7.2         | 0.8         |
| 11/26/1991 | 697353900.00   | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 3/26/1992  | 686907000.00   | 85         | 1.10986E+25 | 8         | 0.9                                      | 7.2         | 0.8         |
| 4/30/1992  | 683883000.00   | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 6/19/1992  | 679562100.00   | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 6/23/1992  | 679222800.00   | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 6/23/1992  | 679222800.00   | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 6/23/1992  | 679222800.00   | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 9/18/1992  | 671698800.00   | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |
| 9/23/1992  | 671273760.00   | 20         | 2.61145E+24 | 8         | 0.9                                      | 7.2         | 0.8         |

## Appendix B

Appendix B contains the test data for each nuclear weapon test at the Pacific Proving Grounds.

| Test Date  | Time Diff. (s) | Yield (kt) | Fissions    | Core (kg) | <sup>239/240</sup> Pu Isotopic Ratios | Pu-239 (kg) | Pu-240 (kg) |
|------------|----------------|------------|-------------|-----------|---------------------------------------|-------------|-------------|
| 6/30/1946  | 2130289140.00  | 21         | 2.74202E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 7/24/1946  | 2128213500.00  | 21         | 2.74202E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/14/1948  | 2073793381.00  | 37         | 4.83118E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/30/1948  | 2072411461.00  | 49         | 6.39804E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/14/1948  | 2071202160.00  | 18         | 2.3503E+24  | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/7/1951   | 1979792762.00  | 81         | 1.05764E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/20/1951  | 1978669980.00  | 47         | 6.1369E+24  | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/8/1951   | 1977103799.00  | 225        | 2.93788E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/24/1951  | 1975732981.00  | 45.5       | 5.94104E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/31/1952 | 1930279501.00  | 10400      | 1.35795E+27 | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/15/1952 | 1928968200.00  | 500        | 6.52862E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 2/28/1954  | 1888377300.00  | 15000      | 1.95858E+27 | 8         | 0.9                                   | 7.2         | 0.8         |
| 3/26/1954  | 1886131800.00  | 11000      | 1.4363E+27  | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/6/1954   | 1885182000.00  | 110        | 1.4363E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/25/1954  | 1883540999.00  | 6900       | 9.00949E+26 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/4/1954   | 1882763400.00  | 13500      | 1.76273E+27 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/13/1954  | 1881985200.00  | 1690       | 2.20667E+26 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/14/1955  | 1850356800.00  | 30         | 3.91717E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/4/1956   | 1819604070.00  | 40         | 5.22289E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/20/1956  | 1818223761.00  | 3800       | 4.96175E+26 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/27/1956  | 1817618640.00  | 3500       | 4.57003E+26 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/27/1956  | 1817615040.00  | 0.19       | 2.48087E+22 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/30/1956  | 1817358271.00  | 14.9       | 1.94553E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/6/1956   | 1816815870.00  | 13.7       | 1.78884E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/11/1956  | 1816320840.00  | 365        | 4.76589E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/11/1956  | 1816320840.00  | 8          | 1.04458E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/13/1956  | 1816130040.00  | 1.49       | 1.94553E+23 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/16/1956  | 1815950767.00  | 1.7        | 2.21973E+23 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/21/1956  | 1815446040.00  | 15.2       | 1.9847E+24  | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/25/1956  | 1815112440.00  | 1100       | 1.4363E+26  | 8         | 0.9                                   | 7.2         | 0.8         |
| 7/2/1956   | 1814507640.00  | 360        | 4.7006E+25  | 8         | 0.9                                   | 7.2         | 0.8         |
| 7/8/1956   | 1813989240.00  | 1850       | 2.41559E+26 | 8         | 0.9                                   | 7.2         | 0.8         |
| 7/10/1956  | 1813817040.00  | 4500       | 5.87575E+26 | 8         | 0.9                                   | 7.2         | 0.8         |
| 7/20/1956  | 1812953640.00  | 5000       | 6.52862E+26 | 8         | 0.9                                   | 7.2         | 0.8         |
| 7/21/1956  | 1812865440.00  | 250        | 3.26431E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 4/28/1958  | 1757107200.00  | 1.7        | 2.21973E+23 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/5/1958   | 1756446300.00  | 18         | 2.3503E+24  | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/11/1958  | 1755929400.00  | 1360       | 1.77578E+26 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/11/1958  | 1755927900.00  | 81         | 1.05764E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 5/12/1958  | 1755840600.00  | 1370       | 1.78884E+26 | 8         | 0.9                                   | 7.2         | 0.8         |

| Test Date | Time Diff. (s) | Yield (kt) | Fissions    | Core (kg) | 239/240 Pu<br>Isotopic Ratios | Pu-239 (kg) | Pu-240 (kg) |
|-----------|----------------|------------|-------------|-----------|-------------------------------|-------------|-------------|
| 5/16/1958 | 1755556200.00  | 9          | 1.17515E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 5/20/1958 | 1755149400.00  | 5.9        | 7.70377E+23 | 8         | 0.9                           | 7.2         | 0.8         |
| 5/21/1958 | 1755052800.00  | 25.1       | 3.27737E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 5/26/1958 | 1754690400.00  | 330        | 4.30889E+25 | 8         | 0.9                           | 7.2         | 0.8         |
| 5/26/1958 | 1754632800.00  | 57         | 7.44262E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 5/30/1958 | 1754343900.00  | 11.6       | 1.51464E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 5/31/1958 | 1754254800.00  | 92         | 1.20127E+25 | 8         | 0.9                           | 7.2         | 0.8         |
| 6/2/1958  | 1754025300.00  | 15         | 1.95858E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 6/8/1958  | 1753490700.00  | 8          | 1.04458E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 6/10/1958 | 1753338600.00  | 213        | 2.78119E+25 | 8         | 0.9                           | 7.2         | 0.8         |
| 6/14/1958 | 1752993000.00  | 319        | 4.16526E+25 | 8         | 0.9                           | 7.2         | 0.8         |
| 6/14/1958 | 1752989400.00  | 1450       | 1.8933E+26  | 8         | 0.9                           | 7.2         | 0.8         |
| 6/18/1958 | 1752699600.00  | 11         | 1.4363E+24  | 8         | 0.9                           | 7.2         | 0.8         |
| 6/27/1958 | 1751869800.00  | 412        | 5.37958E+25 | 8         | 0.9                           | 7.2         | 0.8         |
| 6/27/1958 | 1751866200.00  | 880        | 1.14904E+26 | 8         | 0.9                           | 7.2         | 0.8         |
| 6/28/1958 | 1751776200.00  | 8900       | 1.16209E+27 | 8         | 0.9                           | 7.2         | 0.8         |
| 6/29/1958 | 1751760000.00  | 14         | 1.82801E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 7/1/1958  | 1751520600.00  | 5.2        | 6.78976E+23 | 8         | 0.9                           | 7.2         | 0.8         |
| 7/2/1958  | 1751437800.00  | 220        | 2.87259E+25 | 8         | 0.9                           | 7.2         | 0.8         |
| 7/5/1958  | 1751175000.00  | 397        | 5.18372E+25 | 8         | 0.9                           | 7.2         | 0.8         |
| 7/12/1958 | 1750624200.00  | 9300       | 1.21432E+27 | 8         | 0.9                           | 7.2         | 0.8         |
| 7/17/1958 | 1750122000.00  | 255        | 3.32959E+25 | 8         | 0.9                           | 7.2         | 0.8         |
| 7/22/1958 | 1749757200.00  | 65         | 8.4872E+24  | 8         | 0.9                           | 7.2         | 0.8         |
| 7/22/1958 | 1749699000.00  | 202        | 2.63756E+25 | 8         | 0.9                           | 7.2         | 0.8         |
| 7/26/1958 | 1749353400.00  | 2000       | 2.61145E+26 | 8         | 0.9                           | 7.2         | 0.8         |
| 8/1/1958  | 1748869794.00  | 3800       | 4.96175E+26 | 8         | 0.9                           | 7.2         | 0.8         |
| 8/12/1958 | 1747920591.00  | 3800       | 4.96175E+26 | 8         | 0.9                           | 7.2         | 0.8         |
| 8/18/1958 | 1747425600.00  | 0.02       | 2.61145E+21 | 8         | 0.9                           | 7.2         | 0.8         |
| 4/25/1962 | 1631088840.00  | 190        | 2.48087E+25 | 8         | 0.9                           | 7.2         | 0.8         |
| 4/27/1962 | 1630915080.00  | 410        | 5.35346E+25 | 8         | 0.9                           | 7.2         | 0.8         |
| 5/2/1962  | 1630475880.00  | 1090       | 1.42324E+26 | 8         | 0.9                           | 7.2         | 0.8         |
| 5/4/1962  | 1630299300.00  | 670        | 8.74835E+25 | 8         | 0.9                           | 7.2         | 0.8         |
| 5/6/1962  | 1630142984.00  | 600        | 7.83434E+25 | 8         | 0.9                           | 7.2         | 0.8         |
| 5/8/1962  | 1629957540.00  | 100        | 1.30572E+25 | 8         | 0.9                           | 7.2         | 0.8         |
| 5/9/1962  | 1629874740.00  | 100        | 1.30572E+25 | 8         | 0.9                           | 7.2         | 0.8         |
| 5/11/1962 | 1629706980.00  | 50         | 6.52862E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 5/11/1962 | 1629691068.00  | 20         | 2.61145E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 5/12/1962 | 1629615420.00  | 500        | 6.52862E+25 | 8         | 0.9                           | 7.2         | 0.8         |
| 5/14/1962 | 1629448680.00  | 97         | 1.26655E+25 | 8         | 0.9                           | 7.2         | 0.8         |
| 5/19/1962 | 1629015780.00  | 73         | 9.53178E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 5/25/1962 | 1628495460.00  | 2.6        | 3.39488E+23 | 8         | 0.9                           | 7.2         | 0.8         |
| 5/27/1962 | 1628319420.00  | 43         | 5.61461E+24 | 8         | 0.9                           | 7.2         | 0.8         |
| 6/8/1962  | 1627282620.00  | 782        | 1.02108E+26 | 8         | 0.9                           | 7.2         | 0.8         |
| 6/9/1962  | 1627201380.00  | 210        | 2.74202E+25 | 8         | 0.9                           | 7.2         | 0.8         |
| 6/10/1962 | 1627145940.00  | 3000       | 3.91717E+26 | 8         | 0.9                           | 7.2         | 0.8         |
| 6/12/1962 | 1626942180.00  | 1200       | 1.56687E+26 | 8         | 0.9                           | 7.2         | 0.8         |
| 6/15/1962 | 1626681540.00  | 800        | 1.04458E+26 | 8         | 0.9                           | 7.2         | 0.8         |
| 6/17/1962 | 1626508740.00  | 52         | 6.78976E+24 | 8         | 0.9                           | 7.2         | 0.8         |



| Test Date  | Time Diff. (s) | Yield (kt) | Fissions    | Core (kg) | <sup>239/240</sup> Pu Isotopic Ratios | Pu-239 (kg) | Pu-240 (kg) |
|------------|----------------|------------|-------------|-----------|---------------------------------------|-------------|-------------|
| 6/19/1962  | 1626339540.00  | 2.2        | 2.87259E+23 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/22/1962  | 1626076740.00  | 81.5       | 1.06416E+25 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/27/1962  | 1625647260.00  | 7650       | 9.98878E+26 | 8         | 0.9                                   | 7.2         | 0.8         |
| 6/30/1962  | 1625387940.00  | 1270       | 1.65827E+26 | 8         | 0.9                                   | 7.2         | 0.8         |
| 7/9/1962   | 1624633200.00  | 1400       | 1.82801E+26 | 8         | 0.9                                   | 7.2         | 0.8         |
| 7/10/1962  | 1624519620.00  | 1000       | 1.30572E+26 | 8         | 0.9                                   | 7.2         | 0.8         |
| 7/11/1962  | 1624436580.00  | 3880       | 5.06621E+26 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/2/1962  | 1617262920.00  | 75         | 9.79292E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/6/1962  | 1616918220.00  | 11.3       | 1.47547E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/18/1962 | 1615881540.00  | 1590       | 2.0761E+26  | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/20/1962 | 1615735800.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/26/1962 | 1615212000.00  | 1000       | 1.30572E+26 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/27/1962 | 1615104840.00  | 800        | 1.04458E+26 | 8         | 0.9                                   | 7.2         | 0.8         |
| 10/30/1962 | 1614844740.00  | 8300       | 1.08375E+27 | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/1/1962  | 1614685800.00  | 1000       | 1.30572E+26 | 8         | 0.9                                   | 7.2         | 0.8         |
| 11/4/1962  | 1614443400.00  | 20         | 2.61145E+24 | 8         | 0.9                                   | 7.2         | 0.8         |

## Appendix C

Appendix C contains activity per nuclide per test. The data is broken into two sets for two different series of nuclides.

### Nuclide set 1

| Nuclide                     | 89Sr            | 91Sr            | 91Y             | 93Y             | 95Zr            | 97Zr            | 99Mo            | 99Tc            | 103Ru           | 105Rh           | 106Ru           |
|-----------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| <b>Half Life</b>            | 50.52           | 9.5             | 58.5            | 10.2            | 64.02           | 16.8            | 2.748           | 2.10E+05        | 39.27           | 35.4            | 1.02            |
|                             | d               | h               | d               | h               | d               | h               | d               | y               | d               | h               | y               |
| <b>Decay Constant (1/s)</b> | 1.58799<br>E-07 | 2.02675<br>E-05 | 1.37137<br>E-07 | 1.88766<br>E-05 | 1.25313<br>E-07 | 1.14608<br>E-05 | 2.91941<br>E-06 | 1.05E-13        | 2.04292<br>E-07 | 5.43901<br>E-06 | 2.15338E-<br>08 |
| <b>Test Name</b>            |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |
| Able:Ranger                 | 1.0321E-<br>114 | 0               | 5.19835<br>E-96 | 0               | 8.40763<br>E-86 | 0               | 0               | 1.30545E<br>+23 | 5.457E-<br>154  | 0               | 33437.66<br>852 |
| BAKER:Ranger                | 8.371E-<br>114  | 0               | 4.20825<br>E-95 | 0               | 6.79933<br>E-85 | 0               | 0               | 1.04436E<br>+24 | 4.4434E-<br>153 | 0               | 267999.5<br>038 |
| EASY:Ranger                 | 1.1054E-<br>114 | 0               | 5.51562<br>E-96 | 0               | 8.87533<br>E-86 | 0               | 0               | 1.30545E<br>+23 | 5.9605E-<br>154 | 0               | 33750.17<br>761 |
| BAKER-2:Ranger              | 8.9654E-<br>114 | 0               | 4.46509<br>E-95 | 0               | 7.17756<br>E-85 | 0               | 0               | 1.04436E<br>+24 | 4.8533E-<br>153 | 0               | 270504.2<br>324 |
| FOX:Ranger                  | 2.6046E-<br>113 | 0               | 1.2875E-<br>94  | 0               | 2.06119<br>E-84 | 0               | 0               | 2.87199E<br>+24 | 1.4323E-<br>152 | 0               | 749443.3<br>632 |
| BAKER:Buster                | 1.5505E-<br>112 | 0               | 4.67612<br>E-94 | 0               | 5.71642<br>E-84 | 0               | 0               | 4.56909E<br>+23 | 2.4066E-<br>151 | 0               | 194849.8<br>691 |
| CHARLIE:Buster              | 6.3744E-<br>112 | 0               | 1.9153E-<br>93  | 0               | 2.33662<br>E-83 | 0               | 0               | 1.82764E<br>+24 | 9.9725E-<br>151 | 0               | 782305.0<br>605 |
| DOG:Buster                  | 9.8276E-<br>112 | 0               | 2.94185<br>E-93 | 0               | 3.58165<br>E-83 | 0               | 0               | 2.74146E<br>+24 | 1.5496E-<br>150 | 0               | 1177832.<br>215 |
| EASY:Buster                 | 1.5326E-<br>111 | 0               | 4.55351<br>E-93 | 0               | 5.52121<br>E-83 | 0               | 0               | 4.04691E<br>+24 | 2.4549E-<br>150 | 0               | 1751692.<br>567 |
| SUGAR:Jangle                | 7.189E-<br>113  | 0               | 2.08069<br>E-94 | 0               | 2.48705<br>E-84 | 0               | 0               | 1.56655E<br>+23 | 1.2167E-<br>151 | 0               | 69596.86<br>035 |
| UNCLE                       | 8.2462E-<br>113 | 0               | 2.34242<br>E-94 | 0               | 2.77144<br>E-84 | 0               | 0               | 1.56655E<br>+23 | 1.4515E-<br>151 | 0               | 70903.84<br>67  |
| ABLE:Tumbler-Snapper        | 3.7665E-<br>112 | 0               | 8.48329<br>E-94 | 0               | 8.84275<br>E-84 | 0               | 0               | 1.30546E<br>+23 | 1.0794E-<br>150 | 0               | 74418.75<br>504 |
| BAKER:Tumbler-Snapper       | 4.5642E-<br>112 | 0               | 1.0014E-<br>93  | 0               | 1.029E-<br>83   | 0               | 0               | 1.30546E<br>+23 | 1.382E-<br>150  | 0               | 76382.63<br>022 |
| CHARLIE:Tumbler-Snapper     | 1.5575E-<br>110 | 0               | 3.37278<br>E-92 | 0               | 3.44107<br>E-82 | 0               | 0               | 4.04692E<br>+24 | 4.8476E-<br>149 | 0               | 2398901.<br>452 |
| DOG:Tumbler-Snapper         | 1.0801E-<br>110 | 0               | 2.29981<br>E-92 | 0               | 2.3249E-<br>82  | 0               | 0               | 2.48037E<br>+24 | 3.4826E-<br>149 | 0               | 1495121.<br>369 |
| EASY:Tumbler-Snapper        | 7.4068E-<br>111 | 0               | 1.55953<br>E-92 | 0               | 1.56691<br>E-82 | 0               | 0               | 1.56655E<br>+24 | 2.4453E-<br>149 | 0               | 954887.4<br>451 |
| FOX:Tumbler-Snapper         | 8.6916E-<br>111 | 0               | 1.76942<br>E-92 | 0               | 1.7454E-<br>82  | 0               | 0               | 1.436E+2<br>4   | 3.0798E-<br>149 | 0               | 905123.6<br>043 |
| GEORGE:Tumbler-Snapper      | 1.3047E-<br>110 | 0               | 2.6215E-<br>92  | 0               | 2.56749<br>E-82 | 0               | 0               | 1.95819E<br>+24 | 4.7521E-<br>149 | 0               | 1250439.<br>169 |
| HOW:Tumbler-Snapper         | 1.2864E-<br>110 | 0               | 2.56549<br>E-92 | 0               | 2.50238<br>E-82 | 0               | 0               | 1.82764E<br>+24 | 4.7597E-<br>149 | 0               | 1175794.<br>449 |
| ANNIE:Upshot-Knothole       | 7.3381E-<br>109 | 0               | 8.58457<br>E-91 | 0               | 6.25822<br>E-81 | 0               | 0               | 2.08874E<br>+24 | 8.323E-<br>147  | 0               | 2283534.<br>631 |
| NANCY:Upshot-Knothole       | 1.2117E-<br>108 | 0               | 1.39904<br>E-90 | 0               | 1.01264<br>E-80 | 0               | 0               | 3.13311E<br>+24 | 1.4126E-<br>146 | 0               | 3470203.<br>678 |
| RUTH:Upshot-Knothole        | 1.1115E-<br>110 | 0               | 1.26669<br>E-92 | 0               | 9.10312<br>E-83 | 0               | 0               | 2.61092E<br>+22 | 1.332E-<br>148  | 0               | 29297.45<br>016 |
| DIXIE:Upshot-Knothole       | 6.6378E-<br>109 | 0               | 7.4801E-<br>91  | 0               | 5.34276<br>E-81 | 0               | 0               | 1.43601E<br>+24 | 8.1446E-<br>147 | 0               | 1629448.<br>366 |
| RAY:Upshot-Knothole         | 1.2926E-<br>110 | 0               | 1.44303<br>E-92 | 0               | 1.02545<br>E-82 | 0               | 0               | 2.61092E<br>+22 | 1.6175E-<br>148 | 0               | 29903.22<br>222 |
| BADGER:Upshot-Knothole      | 1.6363E-<br>108 | 0               | 1.80299<br>E-90 | 0               | 1.27212<br>E-80 | 0               | 0               | 3.00256E<br>+24 | 2.1047E-<br>146 | 0               | 3483950.<br>155 |
| SIMON:Upshot-Knothole       | 3.3676E-<br>108 | 0               | 3.6623E-<br>90  | 0               | 2.56556<br>E-80 | 0               | 0               | 5.61348E<br>+24 | 4.4524E-<br>146 | 0               | 6598856.<br>084 |
| ENCORE:Upshot-Knothole      | 2.5274E-<br>108 | 0               | 2.68253<br>E-90 | 0               | 1.85441<br>E-80 | 0               | 0               | 3.52475E<br>+24 | 3.5167E-<br>146 | 0               | 4244906.<br>799 |

| Nuclide                 | 89Sr        | 91Sr | 91Y         | 93Y | 95Zr        | 97Zr | 99Mo | 99Tc        | 103Ru       | 105Rh | 106Ru       |
|-------------------------|-------------|------|-------------|-----|-------------|------|------|-------------|-------------|-------|-------------|
| HARRY:Upshot-Knothole   | 3.4834E-108 | 0    | 3.62189E-90 | 0   | 2.47579E-80 | 0    | 0    | 4.17748E+24 | 5.0611E-146 | 0     | 5135024.707 |
| GRABLE:Upshot-Knothole  | 1.773E-108  | 0    | 1.82285E-90 | 0   | 1.23842E-80 | 0    | 0    | 1.95819E+24 | 2.6374E-146 | 0     | 2434063.521 |
| CLIMAX:Upshot-Knothole  | 8.2703E-108 | 0    | 8.34541E-90 | 0   | 5.61214E-80 | 0    | 0    | 7.96332E+24 | 1.2796E-145 | 0     | 10084413.21 |
| WASP:Teapot             | 7.0856E-106 | 0    | 2.22384E-88 | 0   | 7.9054E-79  | 0    | 0    | 1.30547E+23 | 1.2738E-142 | 0     | 527864.0713 |
| MOTH:Teapot             | 1.4971E-105 | 0    | 4.66356E-88 | 0   | 1.65106E-78 | 0    | 0    | 2.61094E+23 | 2.734E-142  | 0     | 1063614.277 |
| TESLA:Teapot            | 5.7679E-105 | 0    | 1.7734E-87  | 0   | 6.23369E-78 | 0    | 0    | 9.13829E+23 | 1.0828E-141 | 0     | 3771449.589 |
| TURK:Teapot             | 3.8472E-104 | 0    | 1.16964E-86 | 0   | 4.08629E-77 | 0    | 0    | 5.61352E+24 | 7.3943E-141 | 0     | 23427546.69 |
| HORNET:Teapot           | 3.8329E-105 | 0    | 1.15444E-87 | 0   | 4.01265E-78 | 0    | 0    | 5.22188E+23 | 7.5131E-142 | 0     | 2199674.511 |
| BEE:Teapot              | 8.7931E-105 | 0    | 2.59932E-87 | 0   | 8.94298E-78 | 0    | 0    | 1.04438E+24 | 1.7927E-141 | 0     | 4481966.099 |
| ESS                     | 1.1143E-105 | 0    | 3.28788E-88 | 0   | 1.13004E-78 | 0    | 0    | 1.30547E+23 | 2.2808E-142 | 0     | 561289.0828 |
| APPLE-1:Teapot          | 1.6939E-104 | 0    | 4.94219E-87 | 0   | 1.68824E-77 | 0    | 0    | 1.82766E+24 | 3.5498E-141 | 0     | 7946259.073 |
| WASP PRIME:Teapot       | 3.6298E-105 | 0    | 1.05904E-87 | 0   | 3.61766E-78 | 0    | 0    | 3.91641E+23 | 7.6067E-142 | 0     | 1702769.801 |
| HA :Teapot              | 4.0509E-105 | 0    | 1.16434E-87 | 0   | 3.94498E-78 | 0    | 0    | 3.91641E+23 | 8.7603E-142 | 0     | 1728303.696 |
| POST:Teapot             | 2.8141E-105 | 0    | 8.04313E-88 | 0   | 2.71682E-78 | 0    | 0    | 2.61094E+23 | 6.1578E-142 | 0     | 1158651.543 |
| MET:Teapot              | 3.3611E-104 | 0    | 9.49932E-87 | 0   | 3.18908E-77 | 0    | 0    | 2.87203E+24 | 7.5303E-141 | 0     | 12888240.13 |
| APPLE-2:Teapot          | 5.8295E-104 | 0    | 1.58703E-86 | 0   | 5.22016E-77 | 0    | 0    | 3.78586E+24 | 1.4129E-140 | 0     | 17633122.89 |
| ZUCCHINI:Teapot         | 6.4562E-104 | 0    | 1.72505E-86 | 0   | 5.61649E-77 | 0    | 0    | 3.65532E+24 | 1.6275E-140 | 0     | 17344804.81 |
| BOLTZMANN:Plumbbob      | 7.5028E-100 | 0    | 4.98092E-83 | 0   | 7.58348E-74 | 0    | 0    | 1.56657E+24 | 3.5219E-135 | 0     | 29672608.49 |
| FRANKLIN:Plumbbob       | 9.3748E-102 | 0    | 6.16574E-85 | 0   | 9.33955E-76 | 0    | 0    | 1.82767E+22 | 4.488E-137  | 0     | 349415.8413 |
| LASSEN:Plumbbob         | 3.4888E-104 | 0    | 2.28173E-87 | 0   | 3.44567E-78 | 0    | 0    | 6.5274E+19  | 1.69E-139   | 0     | 1254.898511 |
| WILSON:Plumbbob         | 8.3401E-100 | 0    | 5.32341E-83 | 0   | 7.9329E-74  | 0    | 0    | 1.30548E+24 | 4.2519E-135 | 0     | 25712410.53 |
| PRISCILLA:Plumbbob      | 3.3506E-99  | 0    | 2.11479E-82 | 0   | 3.13218E-73 | 0    | 0    | 4.83027E+24 | 1.7489E-134 | 0     | 96203884.22 |
| HOOD:Plumbbob           | 7.7929E-99  | 0    | 4.81838E-82 | 0   | 7.05667E-73 | 0    | 0    | 9.66055E+24 | 4.2474E-134 | 0     | 19638610.95 |
| DIABLO:Plumbbob         | 2.0535E-99  | 0    | 1.24617E-82 | 0   | 1.8065E-73  | 0    | 0    | 2.21932E+24 | 1.1641E-134 | 0     | 45962973.56 |
| JOHN:Plumbbob           | 2.5522E-100 | 0    | 1.53724E-83 | 0   | 2.21936E-74 | 0    | 0    | 2.61096E+23 | 1.4698E-135 | 0     | 5447801.205 |
| KEPLER:Plumbbob         | 1.3667E-99  | 0    | 8.15529E-83 | 0   | 1.17141E-73 | 0    | 0    | 1.30548E+24 | 8.0268E-135 | 0     | 27493582.3  |
| OWENS:Plumbbob          | 1.344E-99   | 0    | 8.00492E-83 | 0   | 1.14864E-73 | 0    | 0    | 1.26632E+24 | 7.9247E-135 | 0     | 26718438.89 |
| PASCAL A                | 0           | 0    | 0           | 0   | 0           | 0    | 0    | 0           | 0           | 0     | 0           |
| STOKES:Plumbbob         | 3.1691E-99  | 0    | 1.84033E-82 | 0   | 2.6045E-73  | 0    | 0    | 2.48041E+24 | 1.9705E-134 | 0     | 53667970.89 |
| SATURN                  | 0           | 0    | 0           | 0   | 0           | 0    | 0    | 0           | 0           | 0     | 0           |
| SHASTA:Plumbbob         | 3.2967E-99  | 0    | 1.87545E-82 | 0   | 2.62459E-73 | 0    | 0    | 2.21932E+24 | 2.1403E-134 | 0     | 49009992.04 |
| DOPPLER:Plumbbob        | 2.2853E-99  | 0    | 1.28791E-82 | 0   | 1.79314E-73 | 0    | 0    | 1.43603E+24 | 1.5132E-134 | 0     | 32009972.71 |
| PASCAL B                | 0           | 0    | 0           | 0   | 0           | 0    | 0    | 0           | 0           | 0     | 0           |
| FRANKLIN PRIME:Plumbbob | 1.075E-99   | 0    | 5.97927E-83 | 0   | 8.26545E-74 | 0    | 0    | 6.13576E+23 | 7.3167E-135 | 0     | 13856456.81 |
| SMOKY:Plumbbob          | 1.0201E-98  | 0    | 5.66387E-82 | 0   | 7.82151E-73 | 0    | 0    | 5.74411E+24 | 6.9708E-134 | 0     | 12995991.38 |
| GALILEO:Plumbbob        | 2.6216E-99  | 0    | 1.45004E-82 | 0   | 1.99833E-73 | 0    | 0    | 1.43603E+24 | 1.8055E-134 | 0     | 32611521.71 |
| WHEELER:Plumbbob        | 4.9601E-101 | 0    | 2.72305E-84 | 0   | 3.73737E-75 | 0    | 0    | 2.5718E+22  | 3.4703E-136 | 0     | 588409.2218 |
| COULOMB-B:Plumbbob      | 7.5853E-101 | 0    | 4.16181E-84 | 0   | 5.71029E-75 | 0    | 0    | 3.91644E+22 | 5.3133E-136 | 0     | 896564.2175 |

| Nuclide                | 89Sr        | 91Sr | 91Y         | 93Y | 95Zr        | 97Zr | 99Mo | 99Tc        | 103Ru       | 105Rh | 106Ru       |
|------------------------|-------------|------|-------------|-----|-------------|------|------|-------------|-------------|-------|-------------|
| LAPLACE:Plumbbob       | 2.5883E-100 | 0    | 1.41558E-83 | 0   | 1.93889E-74 | 0    | 0    | 1.30548E+23 | 1.8252E-135 | 0     | 2998041.851 |
| FIZEAU:Plumbbob        | 3.098E-99   | 0    | 1.67496E-82 | 0   | 2.27978E-73 | 0    | 0    | 1.43603E+24 | 2.2382E-134 | 0     | 33358362.05 |
| NEWTON:Plumbbob        | 3.4659E-99  | 0    | 1.86744E-82 | 0   | 2.53699E-73 | 0    | 0    | 1.56658E+24 | 2.5221E-134 | 0     | 36515516.26 |
| RAINIER                | 5.1286E-100 | 0    | 2.74691E-83 | 0   | 3.71971E-74 | 0    | 0    | 2.21932E+23 | 3.7789E-135 | 0     | 5203666.274 |
| WHITNEY:Plumbbob       | 6.0397E-99  | 0    | 3.21194E-82 | 0   | 4.33252E-73 | 0    | 0    | 2.48041E+24 | 4.5175E-134 | 0     | 58572624.21 |
| CHARLESTON:Plumbbob    | 4.0866E-99  | 0    | 2.15294E-82 | 0   | 2.88919E-73 | 0    | 0    | 1.56658E+24 | 3.1175E-134 | 0     | 37340423.16 |
| MORGAN:Plumbbob        | 3.0825E-99  | 0    | 1.59681E-82 | 0   | 2.12327E-73 | 0    | 0    | 1.04438E+24 | 2.4362E-134 | 0     | 25313961.22 |
| PASCAL C               | 0           | 0    | 0           | 0   | 0           | 0    | 0    | 0           | 0           | 0     | 0           |
| COULOMB-C:Project 58   | 4.591E-100  | 0    | 2.11261E-83 | 0   | 2.63324E-74 | 0    | 0    | 6.52741E+22 | 4.6533E-135 | 0     | 1779839.08  |
| VENUS                  | 0           | 0    | 0           | 0   | 0           | 0    | 0    | 0           | 0           | 0     | 0           |
| URANUS                 | 0           | 0    | 0           | 0   | 0           | 0    | 0    | 0           | 0           | 0     | 0           |
| OTERO                  | 1.5605E-99  | 0    | 4.27586E-83 | 0   | 4.01598E-74 | 0    | 0    | 4.96084E+21 | 4.6985E-134 | 0     | 226471.9718 |
| BERNALILLO             | 6.5954E-100 | 0    | 1.79041E-83 | 0   | 1.67306E-74 | 0    | 0    | 1.95823E+21 | 2.025E-134  | 0     | 90228.83805 |
| EDDY:Hardtack II       | 3.7392E-99  | 0    | 1.0117E-82  | 0   | 9.43682E-74 | 0    | 0    | 1.08355E+22 | 1.1561E-133 | 0     | 500913.8706 |
| LUNA                   | 6.9655E-101 | 0    | 1.87685E-84 | 0   | 1.74672E-75 | 0    | 0    | 1.95823E+20 | 2.1724E-135 | 0     | 9089.931085 |
| MERCURY                | 0           | 0    | 0           | 0   | 0           | 0    | 0    | 0           | 0           | 0     | 0           |
| VALENCIA               | 9.9525E-101 | 0    | 2.65651E-84 | 0   | 2.45962E-75 | 0    | 0    | 2.61097E+20 | 3.1661E-135 | 0     | 12234.12938 |
| MARS                   | 6.5735E-100 | 0    | 1.75076E-83 | 0   | 1.61908E-74 | 0    | 0    | 1.69713E+21 | 2.1008E-134 | 0     | 79694.63939 |
| MORA:Hardtack II       | 1.03357E-97 | 0    | 2.7446E-81  | 0   | 2.53405E-72 | 0    | 0    | 2.61097E+23 | 3.3238E-132 | 0     | 12296964.4  |
| HIDALGO:Hardtack II    | 4.3209E-99  | 0    | 1.13458E-82 | 0   | 1.04113E-73 | 0    | 0    | 1.00522E+22 | 1.4227E-133 | 0     | 478750.8305 |
| COLFAX                 | 3.09E-100   | 0    | 8.11245E-84 | 0   | 7.44364E-75 | 0    | 0    | 7.18017E+20 | 1.0178E-134 | 0     | 34202.0112  |
| TAMALPAIS              | 4.229E-99   | 0    | 1.10355E-82 | 0   | 1.00922E-73 | 0    | 0    | 9.39949E+21 | 1.4108E-133 | 0     | 450442.2129 |
| QUAY:Hardtack II       | 4.7488E-99  | 0    | 1.23529E-82 | 0   | 1.12776E-73 | 0    | 0    | 1.03133E+22 | 1.5947E-133 | 0     | 495789.3613 |
| LEA:Hardtack II        | 8.76336E-98 | 0    | 2.26704E-81 | 0   | 2.06346E-72 | 0    | 0    | 1.82768E+23 | 2.9772E-132 | 0     | 8834519.101 |
| NEPTUNE                | 7.3174E-99  | 0    | 1.88875E-82 | 0   | 1.71705E-73 | 0    | 0    | 1.50131E+22 | 2.4977E-133 | 0     | 727307.1343 |
| HAMILTON:Hardtack II   | 7.7322E-101 | 0    | 1.99239E-84 | 0   | 1.80957E-75 | 0    | 0    | 1.56658E+20 | 2.6488E-135 | 0     | 7602.246261 |
| LOGAN                  | 3.24764E-97 | 0    | 8.35921E-81 | 0   | 7.58766E-72 | 0    | 0    | 6.52742E+23 | 1.1151E-131 | 0     | 31710422.9  |
| DONA ANA:Hardtack II   | 2.4147E-99  | 0    | 6.21132E-83 | 0   | 5.63601E-74 | 0    | 0    | 4.83029E+21 | 8.3023E-134 | 0     | 234808.7705 |
| VESTA:Hardtack II      | 1.5958E-99  | 0    | 4.09447E-83 | 0   | 3.71007E-74 | 0    | 0    | 3.13316E+21 | 5.5162E-134 | 0     | 152694.583  |
| RIO ARRIBA:Hardtack II | 6.0374E-99  | 0    | 1.54716E-82 | 0   | 1.40098E-73 | 0    | 0    | 1.17494E+22 | 2.0922E-133 | 0     | 573289.4309 |
| SAN JUAN               | 0           | 0    | 0           | 0   | 0           | 0    | 0    | 0           | 0           | 0     | 0           |
| SOCORRO:Hardtack II    | 4.24975E-97 | 0    | 1.08101E-80 | 0   | 9.74925E-72 | 0    | 0    | 7.83291E+23 | 1.4958E-131 | 0     | 38502051.82 |
| WRANGELL:Hardtack II   | 8.1609E-99  | 0    | 2.07535E-82 | 0   | 1.87142E-73 | 0    | 0    | 1.50131E+22 | 2.874E-133  | 0     | 738146.7101 |
| OBERON:Hardtack II     | 0           | 0    | 0           | 0   | 0           | 0    | 0    | 0           | 0           | 0     | 0           |
| RUSHMORE:Hardtack II   | 1.33935E-98 | 0    | 3.40421E-82 | 0   | 3.06881E-73 | 0    | 0    | 2.45431E+22 | 4.722E-133  | 0     | 1207348.807 |
| CATRON:Hardtack II     | 1.5301E-99  | 0    | 3.87714E-83 | 0   | 3.48929E-74 | 0    | 0    | 2.74152E+21 | 5.4294E-134 | 0     | 135275.2824 |
| JUNO:Hardtack II       | 1.2394E-100 | 0    | 3.14021E-84 | 0   | 2.82596E-75 | 0    | 0    | 2.21932E+20 | 4.3985E-135 | 0     | 10951.71931 |
| CERES:Hardtack II      | 5.2094E-101 | 0    | 1.3162E-84  | 0   | 1.18267E-75 | 0    | 0    | 9.1384E+19  | 1.8597E-135 | 0     | 4522.128346 |

| Nuclide                   | 89Sr            | 91Sr | 91Y             | 93Y | 95Zr            | 97Zr | 99Mo | 99Tc            | 103Ru           | 105Rh | 106Ru           |
|---------------------------|-----------------|------|-----------------|-----|-----------------|------|------|-----------------|-----------------|-------|-----------------|
| SANFORD:Hardtack II       | 3.65979<br>E-97 | 0    | 9.24227<br>E-81 | 0   | 8.30241<br>E-72 | 0    | 0    | 6.39688E<br>+23 | 1.3079E-<br>131 | 0     | 31670443<br>.89 |
| DE BACA:Hardtack II       | 1.6485E-<br>97  | 0    | 4.16122<br>E-81 | 0   | 3.73715<br>E-72 | 0    | 0    | 2.87207E<br>+23 | 5.8967E-<br>132 | 0     | 14225630<br>.78 |
| CHAVES/CHAVEZ:Hardtack II | 4.5541E-<br>101 | 0    | 1.14755<br>E-84 | 0   | 1.02962<br>E-75 | 0    | 0    | 7.83291E<br>+19 | 1.635E-<br>135  | 0     | 3886.490<br>55  |
| EVANS                     | 4.2553E-<br>99  | 0    | 1.06947<br>E-82 | 0   | 9.58192<br>E-74 | 0    | 0    | 7.18017E<br>+21 | 1.5362E-<br>133 | 0     | 357188.0<br>405 |
| MAZAMA:Hardtack II        | 0               | 0    | 0               | 0   | 0               | 0    | 0    | 0               | 0               | 0     | 0               |
| HUMBOLDT:Hardtack II      | 6.0859E-<br>100 | 0    | 1.52778<br>E-83 | 0   | 1.36796<br>E-74 | 0    | 0    | 1.01828E<br>+21 | 2.2023E-<br>134 | 0     | 50713.71<br>375 |
| SANTA FE:Hardtack II      | 1.02145<br>E-97 | 0    | 2.56175<br>E-81 | 0   | 2.29257<br>E-72 | 0    | 0    | 1.69713E<br>+23 | 3.7037E-<br>132 | 0     | 8460316.<br>083 |
| GANYMEDE:Hardtack II      | 0               | 0    | 0               | 0   | 0               | 0    | 0    | 0               | 0               | 0     | 0               |
| BLANCA                    | 1.74051<br>E-96 | 0    | 4.36103<br>E-80 | 0   | 3.9008E-<br>71  | 0    | 0    | 2.87207E<br>+24 | 6.3234E-<br>131 | 0     | 14330783<br>.16 |
| TITANIA:Hardtack II       | 1.5873E-<br>101 | 0    | 3.97548<br>E-85 | 0   | 3.5551E-<br>76  | 0    | 0    | 2.61097E<br>+19 | 5.7721E-<br>136 | 0     | 1303.360<br>798 |
| ANTLER                    | 3.76915<br>E-91 | 0    | 1.32074<br>E-75 | 0   | 4.03672<br>E-67 | 0    | 0    | 3.39429E<br>+23 | 8.5258E-<br>124 | 0     | 11970480<br>9.4 |
| SHREW                     | 2.94402<br>E-90 | 0    | 1.02946<br>E-74 | 0   | 3.14287<br>E-66 | 0    | 0    | 2.611E+2<br>4   | 6.6886E-<br>123 | 0     | 92271769<br>0.6 |
| BOOMER                    | 3.62039<br>E-90 | 0    | 1.23075<br>E-74 | 0   | 3.69999<br>E-66 | 0    | 0    | 2.611E+2<br>4   | 8.7273E-<br>123 | 0     | 94896017<br>8.8 |
| CHENA                     | 4.08803<br>E-90 | 0    | 1.36689<br>E-74 | 0   | 4.07225<br>E-66 | 0    | 0    | 2.611E+2<br>4   | 1.0204E-<br>122 | 0     | 96472223<br>2.6 |
| MINK                      | 5.30704<br>E-90 | 0    | 1.71242<br>E-74 | 0   | 5.00348<br>E-66 | 0    | 0    | 2.611E+2<br>4   | 1.4275E-<br>122 | 0     | 99947377<br>7.2 |
| FISHER                    | 5.76258<br>E-90 | 0    | 1.74089<br>E-74 | 0   | 4.90704<br>E-66 | 0    | 0    | 1.74937E<br>+24 | 1.7799E-<br>122 | 0     | 71495883<br>5   |
| MAD                       | 2.45927<br>E-91 | 0    | 7.29466<br>E-76 | 0   | 2.03568<br>E-67 | 0    | 0    | 6.52749E<br>+22 | 7.894E-<br>124  | 0     | 27167848<br>.72 |
| RINGTAIL                  | 1.03836<br>E-89 | 0    | 3.05735<br>E-74 | 0   | 8.49769<br>E-66 | 0    | 0    | 2.611E+2<br>4   | 3.3851E-<br>122 | 0     | 10947113<br>12  |
| FEATHER                   | 8.34032<br>E-92 | 0    | 2.43286<br>E-76 | 0   | 6.72755<br>E-68 | 0    | 0    | 1.95825E<br>+22 | 2.7729E-<br>124 | 0     | 8287015.<br>255 |
| STOAT                     | 3.63009<br>E-90 | 0    | 1.02381<br>E-74 | 0   | 2.77955<br>E-66 | 0    | 0    | 6.65804E<br>+23 | 1.2954E-<br>122 | 0     | 29135422<br>7.3 |
| AGOUTI                    | 5.15854<br>E-90 | 0    | 1.43042<br>E-74 | 0   | 3.84766<br>E-66 | 0    | 0    | 8.35519E<br>+23 | 1.9075E-<br>122 | 0     | 37183798<br>8.3 |
| DORMOUSE                  | 1.90056<br>E-89 | 0    | 5.15305<br>E-74 | 0   | 1.36922<br>E-65 | 0    | 0    | 2.611E+2<br>4   | 7.3673E-<br>122 | 0     | 11882284<br>80  |
| STILLWATER                | 3.30078<br>E-90 | 0    | 8.80005<br>E-75 | 0   | 2.31686<br>E-66 | 0    | 0    | 4.00788E<br>+23 | 1.3256E-<br>122 | 0     | 18547290<br>3.8 |
| ARMADILLO                 | 7.73255<br>E-90 | 0    | 2.05792<br>E-74 | 0   | 5.41287<br>E-66 | 0    | 0    | 9.26904E<br>+23 | 3.1168E-<br>122 | 0     | 42969268<br>3.3 |
| HARD HAT                  | 6.74627<br>E-90 | 0    | 1.77518<br>E-74 | 0   | 4.64035<br>E-66 | 0    | 0    | 7.44135E<br>+23 | 2.7849E-<br>122 | 0     | 34887757<br>5.9 |
| CHINCHILLA I              | 2.37358<br>E-90 | 0    | 6.19987<br>E-75 | 0   | 1.61415<br>E-66 | 0    | 0    | 2.48045E<br>+23 | 9.9509E-<br>123 | 0     | 11714759<br>0.4 |
| CODSAW                    | 2.50041<br>E-89 | 0    | 6.53047<br>E-74 | 0   | 1.70013<br>E-65 | 0    | 0    | 2.611E+2<br>4   | 1.0485E-<br>121 | 0     | 12332599<br>97  |
| CIMARRON                  | 1.57183<br>E-89 | 0    | 4.07456<br>E-74 | 0   | 1.05643<br>E-65 | 0    | 0    | 1.55354E<br>+24 | 6.6958E-<br>122 | 0     | 73928055<br>1.2 |
| PLATYPUS                  | 2.67593<br>E-89 | 0    | 6.92449<br>E-74 | 0   | 1.79362<br>E-65 | 0    | 0    | 2.611E+2<br>4   | 1.1441E-<br>121 | 0     | 12446574<br>11  |
| PAMPAS                    | 1.3634E-<br>89  | 0    | 3.49448<br>E-74 | 0   | 9.00447<br>E-66 | 0    | 0    | 1.24022E<br>+24 | 5.9476E-<br>122 | 0     | 59686112<br>4.6 |
| DANNY BOY                 | 6.5159E-<br>91  | 0    | 1.65773<br>E-75 | 0   | 4.25434<br>E-67 | 0    | 0    | 5.61365E<br>+22 | 2.8871E-<br>123 | 0     | 27215689<br>.48 |
| ERMINE                    | 3.06945<br>E-89 | 0    | 7.79554<br>E-74 | 0   | 1.99872<br>E-65 | 0    | 0    | 2.611E+2<br>4   | 1.365E-<br>121  | 0     | 12680313<br>14  |
| BRAZOS                    | 1.32617<br>E-89 | 0    | 3.35512<br>E-74 | 0   | 8.5842E-<br>66  | 0    | 0    | 1.09662E<br>+24 | 5.9455E-<br>122 | 0     | 53462073<br>6.1 |
| HOGNOSE                   | 3.47287<br>E-89 | 0    | 8.67278<br>E-74 | 0   | 2.20329<br>E-65 | 0    | 0    | 2.611E+2<br>4   | 1.6E-121        | 0     | 12894428<br>92  |
| HOOSIC                    | 7.06271<br>E-90 | 0    | 1.72117<br>E-74 | 0   | 4.31462<br>E-66 | 0    | 0    | 4.4387E+<br>23  | 3.4253E-<br>122 | 0     | 22459791<br>9.4 |
| CHINCHILLA II             | 4.32911<br>E-89 | 0    | 1.04909<br>E-73 | 0   | 2.6218E-<br>65  | 0    | 0    | 2.611E+2<br>4   | 2.1244E-<br>121 | 0     | 13285590<br>20  |
| DORMOUSE PRIME            | 2.45735<br>E-89 | 0    | 5.89954<br>E-74 | 0   | 1.46685<br>E-65 | 0    | 0    | 1.38383E<br>+24 | 1.2298E-<br>121 | 0     | 71071715<br>1.6 |
| PASSAIC                   | 4.70057<br>E-89 | 0    | 1.12639<br>E-73 | 0   | 2.79777<br>E-65 | 0    | 0    | 2.611E+2<br>4   | 2.3618E-<br>121 | 0     | 13434729<br>96  |

| Nuclide                  | 89Sr        | 91Sr | 91Y         | 93Y | 95Zr        | 97Zr | 99Mo | 99Tc        | 103Ru       | 105Rh | 106Ru       |
|--------------------------|-------------|------|-------------|-----|-------------|------|------|-------------|-------------|-------|-------------|
| HUDSON                   | 5.1039E-89  | 0    | 1.20938E-73 | 0   | 2.98555E-65 | 0    | 0    | 2.611E+24   | 2.6256E-121 | 0     | 1358554393  |
| PLATTE                   | 4.85245E-90 | 0    | 1.1455E-74  | 0   | 2.82209E-66 | 0    | 0    | 2.41518E+23 | 2.516E-122  | 0     | 126134762.5 |
| DEAD                     | 5.7769E-89  | 0    | 1.34592E-73 | 0   | 3.29211E-65 | 0    | 0    | 2.611E+24   | 3.0792E-121 | 0     | 1381565915  |
| BLACK                    | 6.2702E-89  | 0    | 1.44461E-73 | 0   | 3.51202E-65 | 0    | 0    | 2.611E+24   | 3.4215E-121 | 0     | 1397002730  |
| PACA                     | 7.19867E-89 | 0    | 1.62757E-73 | 0   | 3.91635E-65 | 0    | 0    | 2.611E+24   | 4.0867E-121 | 0     | 1423408609  |
| ARIKAREE                 | 7.48167E-89 | 0    | 1.68268E-73 | 0   | 4.03735E-65 | 0    | 0    | 2.611E+24   | 4.2945E-121 | 0     | 1430870885  |
| AARDVARK                 | 1.54148E-88 | 0    | 3.45288E-73 | 0   | 8.26637E-65 | 0    | 0    | 5.222E+24   | 8.9238E-121 | 0     | 2873301115  |
| EEL                      | 1.90462E-89 | 0    | 4.21208E-74 | 0   | 1.00138E-65 | 0    | 0    | 5.87475E+23 | 1.1326E-121 | 0     | 327382227.3 |
| WHITE                    | 9.19133E-89 | 0    | 2.00997E-73 | 0   | 4.74929E-65 | 0    | 0    | 2.611E+24   | 5.5963E-121 | 0     | 1471365845  |
| RACCOON                  | 1.01294E-88 | 0    | 2.18594E-73 | 0   | 5.12785E-65 | 0    | 0    | 2.611E+24   | 6.3416E-121 | 0     | 1490884877  |
| PACKRAT                  | 1.08487E-88 | 0    | 2.31936E-73 | 0   | 5.4131E-65  | 0    | 0    | 2.611E+24   | 6.9267E-121 | 0     | 1504818716  |
| DES MOINES               | 0           | 0    | 0           | 0   | 0           | 0    | 0    | 0           | 0           | 0     | 0           |
| DAMAN I                  | 1.33278E-88 | 0    | 2.77048E-73 | 0   | 6.36763E-65 | 0    | 0    | 2.611E+24   | 9.0263E-121 | 0     | 1547406467  |
| HAYMAKER                 | 4.85068E-88 | 0    | 9.96986E-73 | 0   | 2.27736E-64 | 0    | 0    | 8.74686E+24 | 3.3641E-120 | 0     | 5242409856  |
| MARSHMALLOW              | 1.46713E-88 | 0    | 3.01006E-73 | 0   | 6.86899E-65 | 0    | 0    | 2.611E+24   | 1.0213E-120 | 0     | 1567691170  |
| SACRAMENTO               | 1.51183E-88 | 0    | 3.0891E-73  | 0   | 7.03361E-65 | 0    | 0    | 2.611E+24   | 1.0615E-120 | 0     | 1574084508  |
| SEDAN                    | 8.51414E-88 | 0    | 1.72086E-72 | 0   | 3.89505E-64 | 0    | 0    | 1.35772E+25 | 6.1164E-120 | 0     | 8274237356  |
| LITTLE FELLER II:Sunbeam | 1.82804E-91 | 0    | 3.68731E-76 | 0   | 8.33674E-68 | 0    | 0    | 2.8721E+21  | 1.3188E-123 | 0     | 1753850.884 |
| JOHNNIE BOY              | 4.38337E-90 | 0    | 8.77724E-75 | 0   | 1.97657E-66 | 0    | 0    | 6.52751E+22 | 3.2113E-122 | 0     | 40150993.67 |
| MERRIMAC                 | 9.90745E-88 | 0    | 1.97657E-72 | 0   | 4.44213E-64 | 0    | 0    | 1.43605E+25 | 7.3147E-120 | 0     | 8865633175  |
| SMALL BOY:Sunbeam        | 1.69169E-89 | 0    | 3.368E-74   | 0   | 7.5607E-66  | 0    | 0    | 2.41518E+23 | 1.2544E-121 | 0     | 149410453.6 |
| LITTLE FELLER I:Sunbeam  | 1.71366E-91 | 0    | 3.39304E-76 | 0   | 7.59409E-68 | 0    | 0    | 2.3499E+21  | 1.2855E-123 | 0     | 1461690.098 |
| WICHITA                  | 2.18908E-88 | 0    | 4.25267E-73 | 0   | 9.41972E-65 | 0    | 0    | 2.611E+24   | 1.709E-120  | 0     | 1655112862  |
| YORK                     | 3.20342E-88 | 0    | 5.90824E-73 | 0   | 1.2721E-64  | 0    | 0    | 2.611E+24   | 2.7892E-120 | 0     | 1742809937  |
| BOBAC                    | 3.20708E-88 | 0    | 5.91408E-73 | 0   | 1.27325E-64 | 0    | 0    | 2.611E+24   | 2.7933E-120 | 0     | 1743080169  |
| RARITAN                  | 3.8333E-88  | 0    | 6.89894E-73 | 0   | 1.46569E-64 | 0    | 0    | 2.611E+24   | 3.5137E-120 | 0     | 1785753689  |
| HYRAX                    | 4.27841E-88 | 0    | 7.58551E-73 | 0   | 1.59842E-64 | 0    | 0    | 2.611E+24   | 4.0471E-120 | 0     | 1812555387  |
| PEBA                     | 4.64508E-88 | 0    | 8.14374E-73 | 0   | 1.70558E-64 | 0    | 0    | 2.611E+24   | 4.4987E-120 | 0     | 1832878871  |
| ALLEGHENY                | 5.25558E-88 | 0    | 9.06017E-73 | 0   | 1.88014E-64 | 0    | 0    | 2.611E+24   | 5.2732E-120 | 0     | 1863828288  |
| MISSISSIPPI              | 3.28126E-87 | 0    | 5.59344E-72 | 0   | 1.15364E-63 | 0    | 0    | 1.50133E+25 | 3.3708E-119 | 0     | 10837318399 |
| ROANOKE                  | 6.27461E-88 | 0    | 1.05585E-72 | 0   | 2.16235E-64 | 0    | 0    | 2.611E+24   | 6.6235E-120 | 0     | 1909161897  |
| WOLVERINE                | 6.28178E-88 | 0    | 1.0569E-72  | 0   | 2.1643E-64  | 0    | 0    | 2.611E+24   | 6.6333E-120 | 0     | 1909457923  |
| TIOGA                    | 6.813E-88   | 0    | 1.13365E-72 | 0   | 2.30748E-64 | 0    | 0    | 2.611E+24   | 7.3635E-120 | 0     | 1930593536  |
| BANDICOOT                | 4.32436E-88 | 0    | 7.18037E-73 | 0   | 1.45985E-64 | 0    | 0    | 1.63188E+24 | 4.6945E-120 | 0     | 1209149169  |
| SANTEE                   | 7.70843E-88 | 0    | 1.26122E-72 | 0   | 2.54365E-64 | 0    | 0    | 2.611E+24   | 8.6312E-120 | 0     | 1963192932  |
| ST. LAWRENCE             | 9.22939E-88 | 0    | 1.47343E-72 | 0   | 2.93206E-64 | 0    | 0    | 2.611E+24   | 1.0881E-119 | 0     | 2011722983  |
| GUNDI                    | 1.00127E-87 | 0    | 1.58082E-72 | 0   | 3.12674E-64 | 0    | 0    | 2.61101E+24 | 1.2084E-119 | 0     | 2034069399  |
| ANACOSTIA                | 3.07186E-88 | 0    | 4.74162E-73 | 0   | 9.26371E-65 | 0    | 0    | 6.78861E+23 | 3.8872E-120 | 0     | 540861158.4 |

| Nuclide      | 89Sr        | 91Sr | 91Y         | 93Y | 95Zr        | 97Zr | 99Mo | 99Tc        | 103Ru       | 105Rh | 106Ru       |
|--------------|-------------|------|-------------|-----|-------------|------|------|-------------|-------------|-------|-------------|
| TAUNTON      | 1.2991E-87  | 0    | 1.97945E-72 | 0   | 3.84003E-64 | 0    | 0    | 2.61101E+24 | 1.6892E-119 | 0     | 2107177963  |
| TENDRAC      | 1.35601E-87 | 0    | 2.05412E-72 | 0   | 3.97218E-64 | 0    | 0    | 2.61101E+24 | 1.785E-119  | 0     | 2119465065  |
| MADISON      | 1.45098E-87 | 0    | 2.17779E-72 | 0   | 4.19015E-64 | 0    | 0    | 2.61101E+24 | 1.9474E-119 | 0     | 2139011062  |
| NUMBAT       | 1.45209E-87 | 0    | 2.17922E-72 | 0   | 4.19267E-64 | 0    | 0    | 2.61101E+24 | 1.9494E-119 | 0     | 2139232166  |
| MANATEE      | 1.49185E-87 | 0    | 2.23066E-72 | 0   | 4.283E-64   | 0    | 0    | 2.61101E+24 | 2.0183E-119 | 0     | 2147082339  |
| CASSELMAN    | 3.21301E-87 | 0    | 4.32682E-72 | 0   | 7.84648E-64 | 0    | 0    | 2.61101E+24 | 5.4153E-119 | 0     | 2382485137  |
| HATCHIE      | 3.21301E-87 | 0    | 4.32682E-72 | 0   | 7.84648E-64 | 0    | 0    | 2.61101E+24 | 5.4153E-119 | 0     | 2382485189  |
| FERRET       | 3.2176E-87  | 0    | 4.33217E-72 | 0   | 7.85533E-64 | 0    | 0    | 2.61101E+24 | 5.4252E-119 | 0     | 2382946918  |
| ACUSHI       | 3.2176E-87  | 0    | 4.33217E-72 | 0   | 7.85533E-64 | 0    | 0    | 2.61101E+24 | 5.4252E-119 | 0     | 2382946918  |
| CHIPMUNK     | 3.53892E-87 | 0    | 4.70332E-72 | 0   | 8.46809E-64 | 0    | 0    | 2.61101E+24 | 6.132E-119  | 0     | 2413903874  |
| KAWEAH       | 5.77304E-88 | 0    | 7.5852E-73  | 0   | 1.35717E-64 | 0    | 0    | 3.91651E+23 | 1.0246E-119 | 0     | 366229250   |
| CARMEL       | 3.8487E-87  | 0    | 5.05681E-72 | 0   | 9.04782E-64 | 0    | 0    | 2.61101E+24 | 6.831E-119  | 0     | 2441528806  |
| JERBOA       | 4.29327E-87 | 0    | 5.55743E-72 | 0   | 9.86296E-64 | 0    | 0    | 2.61101E+24 | 7.8624E-119 | 0     | 2477989804  |
| TOYAH        | 5.19468E-87 | 0    | 6.5517E-72  | 0   | 1.14637E-63 | 0    | 0    | 2.61101E+24 | 1.0047E-118 | 0     | 2542866511  |
| GERBIL       | 6.29273E-87 | 0    | 7.73169E-72 | 0   | 1.33365E-63 | 0    | 0    | 2.61101E+24 | 1.2858E-118 | 0     | 2609857279  |
| FERRET PRIME | 6.93519E-87 | 0    | 8.40881E-72 | 0   | 1.43999E-63 | 0    | 0    | 2.61101E+24 | 1.4571E-118 | 0     | 2644489706  |
| COYPU        | 7.41984E-87 | 0    | 8.91393E-72 | 0   | 1.51883E-63 | 0    | 0    | 2.61101E+24 | 1.5894E-118 | 0     | 2668824104  |
| CUMBERLAND   | 7.52245E-87 | 0    | 9.02028E-72 | 0   | 1.53538E-63 | 0    | 0    | 2.61101E+24 | 1.6177E-118 | 0     | 2673799317  |
| PAISANO      | 8.99183E-87 | 0    | 1.0523E-71  | 0   | 1.76752E-63 | 0    | 0    | 2.61101E+24 | 2.0351E-118 | 0     | 2739281403  |
| KOOTANAI     | 8.99183E-87 | 0    | 1.0523E-71  | 0   | 1.76752E-63 | 0    | 0    | 2.61101E+24 | 2.0351E-118 | 0     | 2739281403  |
| GUNDI PRIME  | 1.10602E-86 | 0    | 1.25831E-71 | 0   | 2.08123E-63 | 0    | 0    | 2.61101E+24 | 2.6562E-118 | 0     | 2817276924  |
| TEJON        | 1.23194E-86 | 0    | 1.3811E-71  | 0   | 2.26606E-63 | 0    | 0    | 2.61101E+24 | 3.0515E-118 | 0     | 2858769820  |
| HARKEE       | 1.23194E-86 | 0    | 1.3811E-71  | 0   | 2.26606E-63 | 0    | 0    | 2.61101E+24 | 3.0515E-118 | 0     | 2858769820  |
| STONES       | 7.2599E-86  | 0    | 8.06267E-71 | 0   | 1.31611E-62 | 0    | 0    | 1.43606E+25 | 1.8342E-117 | 0     | 15871106397 |
| PLEASANT     | 1.45254E-86 | 0    | 1.59223E-71 | 0   | 2.58062E-63 | 0    | 0    | 2.61101E+24 | 3.7717E-118 | 0     | 2923345439  |
| YUBA         | 2.48114E-87 | 0    | 2.68395E-72 | 0   | 4.31868E-64 | 0    | 0    | 4.04707E+23 | 6.6245E-119 | 0     | 4591275043  |
| HUTIA        | 1.62007E-86 | 0    | 1.74963E-71 | 0   | 2.81277E-63 | 0    | 0    | 2.61101E+24 | 4.3404E-118 | 0     | 2966939053  |
| APSHAPA      | 1.62282E-86 | 0    | 1.75219E-71 | 0   | 2.81653E-63 | 0    | 0    | 2.61101E+24 | 4.3499E-118 | 0     | 2967621472  |
| MATACO       | 1.80819E-86 | 0    | 1.92375E-71 | 0   | 3.06749E-63 | 0    | 0    | 2.61101E+24 | 4.9993E-118 | 0     | 3011468714  |
| KENNEBEC     | 2.1134E-86  | 0    | 2.20113E-71 | 0   | 3.46926E-63 | 0    | 0    | 2.61101E+24 | 6.1101E-118 | 0     | 3075841230  |
| PEKAN        | 4.08491E-86 | 0    | 3.88871E-71 | 0   | 5.83561E-63 | 0    | 0    | 2.61101E+24 | 1.4264E-117 | 0     | 3363364069  |
| SATSOP       | 4.23048E-86 | 0    | 4.0081E-71  | 0   | 5.9991E-63  | 0    | 0    | 2.61101E+24 | 1.4921E-117 | 0     | 3379372003  |
| KOHOCTON     | 4.72217E-86 | 0    | 4.40734E-71 | 0   | 6.54287E-63 | 0    | 0    | 2.61101E+24 | 1.7188E-117 | 0     | 3430136031  |
| NATCHES      | 4.72262E-86 | 0    | 4.4077E-71  | 0   | 6.54337E-63 | 0    | 0    | 2.61101E+24 | 1.7191E-117 | 0     | 3430180349  |
| AHTANUM      | 6.30099E-86 | 0    | 5.65401E-71 | 0   | 8.21525E-63 | 0    | 0    | 2.61101E+24 | 2.4911E-117 | 0     | 3566959461  |
| BILBY        | 7.85873E-85 | 0    | 7.05008E-70 | 0   | 1.02424E-61 | 0    | 0    | 3.25071E+25 | 3.1085E-116 | 0     | 44419376146 |
| CARP         | 7.63733E-86 | 0    | 6.67566E-71 | 0   | 9.56178E-63 | 0    | 0    | 2.61101E+24 | 3.1905E-117 | 0     | 3661217526  |
| NARRAGUAGUS  | 7.65117E-86 | 0    | 6.68611E-71 | 0   | 9.57545E-63 | 0    | 0    | 2.61101E+24 | 3.1979E-117 | 0     | 3662116413  |

| Nuclide    | 89Sr            | 91Sr | 91Y             | 93Y | 95Zr            | 97Zr | 99Mo | 99Tc            | 103Ru           | 105Rh | 106Ru           |
|------------|-----------------|------|-----------------|-----|-----------------|------|------|-----------------|-----------------|-------|-----------------|
| GRUNION    | 9.25294<br>E-86 | 0    | 7.87887<br>E-71 | 0   | 1.11251<br>E-62 | 0    | 0    | 2.61101E<br>+24 | 4.0838E-<br>117 | 0     | 37577381<br>94  |
| TORNILLO   | 1.76511<br>E-87 | 0    | 1.50217<br>E-72 | 0   | 2.12045<br>E-64 | 0    | 0    | 4.96092E<br>+22 | 7.7993E-<br>119 | 0     | 71435779<br>98  |
| CLEARWATER | 5.45984<br>E-85 | 0    | 4.60468<br>E-70 | 0   | 6.46792<br>E-62 | 0    | 0    | 1.43606E<br>+25 | 2.4587E-<br>116 | 0     | 20865571<br>526 |
| MULLETT    | 1.00526<br>E-85 | 0    | 8.46357<br>E-71 | 0   | 1.18771<br>E-62 | 0    | 0    | 2.61101E<br>+24 | 4.5434E-<br>117 | 0     | 38002159<br>44  |
| ANCHOVY    | 1.47696<br>E-85 | 0    | 1.17991<br>E-70 | 0   | 1.60904<br>E-62 | 0    | 0    | 2.61101E<br>+24 | 7.4531E-<br>117 | 0     | 40037445<br>51  |
| MUSTANG    | 1.49651<br>E-85 | 0    | 1.19339<br>E-70 | 0   | 1.62582<br>E-62 | 0    | 0    | 2.61101E<br>+24 | 7.5802E-<br>117 | 0     | 40108896<br>00  |
| GREYS      | 9.07348<br>E-85 | 0    | 7.14005<br>E-70 | 0   | 9.65697<br>E-62 | 0    | 0    | 1.43606E<br>+25 | 4.7261E-<br>116 | 0     | 22353404<br>154 |
| BARRACUDA  | 1.94402<br>E-85 | 0    | 1.49591<br>E-70 | 0   | 1.99864<br>E-62 | 0    | 0    | 2.61101E<br>+24 | 1.0613E-<br>116 | 0     | 41557389<br>81  |
| SARDINE    | 1.94402<br>E-85 | 0    | 1.49591<br>E-70 | 0   | 1.99864<br>E-62 | 0    | 0    | 2.61101E<br>+24 | 1.0613E-<br>116 | 0     | 41557389<br>81  |
| EAGLE      | 5.74732<br>E-86 | 0    | 4.35699<br>E-71 | 0   | 5.77403<br>E-63 | 0    | 0    | 6.91919E<br>+23 | 3.2377E-<br>117 | 0     | 11177322<br>31  |
| TUNA       | 2.41953<br>E-85 | 0    | 1.80705<br>E-70 | 0   | 2.37534<br>E-62 | 0    | 0    | 2.61101E<br>+24 | 1.4064E-<br>116 | 0     | 42808961<br>96  |
| FORE       | 1.92808<br>E-84 | 0    | 1.36899<br>E-69 | 0   | 1.75051<br>E-61 | 0    | 0    | 1.43606E<br>+25 | 1.2463E-<br>115 | 0     | 24759050<br>723 |
| OCONTO     | 2.02597<br>E-85 | 0    | 1.41977<br>E-70 | 0   | 1.8025E-<br>62  | 0    | 0    | 1.37078E<br>+24 | 1.3461E-<br>116 | 0     | 23943448<br>90  |
| CLUB       | 4.248E-<br>85   | 0    | 2.93818<br>E-70 | 0   | 3.70366<br>E-62 | 0    | 0    | 2.61102E<br>+24 | 2.9013E-<br>116 | 0     | 46204418<br>50  |
| SOLENDON   | 5.07639<br>E-85 | 0    | 3.42685<br>E-70 | 0   | 4.26272<br>E-62 | 0    | 0    | 2.61102E<br>+24 | 3.6486E-<br>116 | 0     | 47334234<br>50  |
| BUNKER     | 5.14613<br>E-85 | 0    | 3.46747<br>E-70 | 0   | 4.30886<br>E-62 | 0    | 0    | 2.61102E<br>+24 | 3.7132E-<br>116 | 0     | 47421892<br>75  |
| BONEFISH   | 5.51194<br>E-85 | 0    | 3.67932<br>E-70 | 0   | 4.5488E-<br>62  | 0    | 0    | 2.61102E<br>+24 | 4.0562E-<br>116 | 0     | 47865551<br>16  |
| MACKEREL   | 5.51195<br>E-85 | 0    | 3.67933<br>E-70 | 0   | 4.54881<br>E-62 | 0    | 0    | 2.61102E<br>+24 | 4.0562E-<br>116 | 0     | 47865569<br>71  |
| KLUCKITAT  | 1.98271<br>E-84 | 0    | 1.31856<br>E-69 | 0   | 1.62684<br>E-61 | 0    | 0    | 9.13856E<br>+24 | 1.4705E-<br>115 | 0     | 16815238<br>545 |
| HANDICAP   | 7.55437<br>E-85 | 0    | 4.83045<br>E-70 | 0   | 5.83343<br>E-62 | 0    | 0    | 2.61102E<br>+24 | 6.0846E-<br>116 | 0     | 49955863<br>22  |
| PIKE       | 7.66326<br>E-85 | 0    | 4.89052<br>E-70 | 0   | 5.89969<br>E-62 | 0    | 0    | 2.61102E<br>+24 | 6.1976E-<br>116 | 0     | 50052903<br>15  |
| HOOK       | 1.18782<br>E-84 | 0    | 7.14049<br>E-70 | 0   | 8.33737<br>E-62 | 0    | 0    | 2.61102E<br>+24 | 1.0892E-<br>115 | 0     | 53117758<br>19  |
| STURGEON   | 1.20411<br>E-84 | 0    | 7.22501<br>E-70 | 0   | 8.4275E-<br>62  | 0    | 0    | 2.61102E<br>+24 | 1.1084E-<br>115 | 0     | 53215989<br>43  |
| BOGEY      | 1.23832<br>E-84 | 0    | 7.40191<br>E-70 | 0   | 8.61585<br>E-62 | 0    | 0    | 2.61102E<br>+24 | 1.1491E-<br>115 | 0     | 53418509<br>19  |
| TURF       | 7.51735<br>E-84 | 0    | 4.43331<br>E-69 | 0   | 5.1226E-<br>61  | 0    | 0    | 1.43606E<br>+25 | 7.1757E-<br>115 | 0     | 29776095<br>333 |
| PIPEFISH   | 1.46436<br>E-84 | 0    | 8.55513<br>E-70 | 0   | 9.83466<br>E-62 | 0    | 0    | 2.61102E<br>+24 | 1.4257E-<br>115 | 0     | 54646945<br>60  |
| DRIVER     | 1.62699<br>E-84 | 0    | 9.36967<br>E-70 | 0   | 1.06869<br>E-61 | 0    | 0    | 2.61102E<br>+24 | 1.6325E-<br>115 | 0     | 55432947<br>08  |
| BACKSWING  | 1.79271<br>E-84 | 0    | 1.01883<br>E-69 | 0   | 1.1537E-<br>61  | 0    | 0    | 2.61102E<br>+24 | 1.8495E-<br>115 | 0     | 56166865<br>11  |
| MINNOW     | 1.81912<br>E-84 | 0    | 1.03178<br>E-69 | 0   | 1.16709<br>E-61 | 0    | 0    | 2.61102E<br>+24 | 1.8846E-<br>115 | 0     | 56278369<br>48  |
| ACE        | 3.9533E-<br>85  | 0    | 2.13169<br>E-70 | 0   | 2.34559<br>E-62 | 0    | 0    | 3.91653E<br>+23 | 4.5546E-<br>116 | 0     | 88769955<br>4   |
| BITTERLING | 2.66777<br>E-84 | 0    | 1.43612<br>E-69 | 0   | 1.5788E-<br>61  | 0    | 0    | 2.61102E<br>+24 | 3.0843E-<br>115 | 0     | 59277616<br>62  |
| DUFFER     | 2.89582<br>E-84 | 0    | 1.54154<br>E-69 | 0   | 1.68437<br>E-61 | 0    | 0    | 2.61102E<br>+24 | 3.4275E-<br>115 | 0     | 59940647<br>27  |
| FADE       | 3.18773<br>E-84 | 0    | 1.67485<br>E-69 | 0   | 1.81699<br>E-61 | 0    | 0    | 2.61102E<br>+24 | 3.8783E-<br>115 | 0     | 60726399<br>55  |
| DUB        | 1.9973E-<br>84  | 0    | 1.03961<br>E-69 | 0   | 1.1221E-<br>61  | 0    | 0    | 1.52745E<br>+24 | 2.4782E-<br>115 | 0     | 35857099<br>53  |
| BYE        | 2.33837<br>E-83 | 0    | 1.18127<br>E-68 | 0   | 1.25433<br>E-60 | 0    | 0    | 1.43606E<br>+25 | 3.0896E-<br>114 | 0     | 34729626<br>968 |
| CORMORANT  | 4.32033<br>E-84 | 0    | 2.17771<br>E-69 | 0   | 2.30965<br>E-61 | 0    | 0    | 2.61102E<br>+24 | 5.7346E-<br>115 | 0     | 63282274<br>04  |
| LINKS      | 4.68084<br>E-84 | 0    | 2.33378<br>E-69 | 0   | 2.46044<br>E-61 | 0    | 0    | 2.61102E<br>+24 | 6.3574E-<br>115 | 0     | 63973770<br>83  |
| TROGON     | 4.75909<br>E-84 | 0    | 2.36743<br>E-69 | 0   | 2.49284<br>E-61 | 0    | 0    | 2.61102E<br>+24 | 6.4945E-<br>115 | 0     | 64117754<br>11  |



| Nuclide              | 89Sr            | 91Sr | 91Y             | 93Y | 95Zr            | 97Zr | 99Mo | 99Tc            | 103Ru           | 105Rh | 106Ru           |
|----------------------|-----------------|------|-----------------|-----|-----------------|------|------|-----------------|-----------------|-------|-----------------|
| ALVA                 | 1.49365<br>E-84 | 0    | 7.07872<br>E-70 | 0   | 7.2591E-<br>62  | 0    | 0    | 5.74424E<br>+23 | 2.2567E-<br>115 | 0     | 14802163<br>67  |
| CANVASBACK           | 7.10008<br>E-84 | 0    | 3.34439<br>E-69 | 0   | 3.4182E-<br>61  | 0    | 0    | 2.61102E<br>+24 | 1.0866E-<br>114 | 0     | 67692118<br>91  |
| PLAYER               | 7.57049<br>E-84 | 0    | 3.5349E-<br>69  | 0   | 3.5957E-<br>61  | 0    | 0    | 2.61102E<br>+24 | 1.18E-<br>114   | 0     | 68283557<br>53  |
| HADDOCK              | 7.68649<br>E-84 | 0    | 3.58163<br>E-69 | 0   | 3.63911<br>E-61 | 0    | 0    | 2.61102E<br>+24 | 1.2034E-<br>114 | 0     | 68424508<br>95  |
| GUANAY               | 8.46689<br>E-84 | 0    | 3.89357<br>E-69 | 0   | 3.92767<br>E-61 | 0    | 0    | 2.61102E<br>+24 | 1.3628E-<br>114 | 0     | 69327655<br>10  |
| SPOON                | 9.29778<br>E-84 | 0    | 4.2214E-<br>69  | 0   | 4.2288E-<br>61  | 0    | 0    | 2.61102E<br>+24 | 1.5372E-<br>114 | 0     | 70213323<br>34  |
| COURSER              | 0               | 0    | 0               | 0   | 0               | 0    | 0    | 0               | 0               | 0     | 0               |
| AUK                  | 1.24455<br>E-83 | 0    | 5.4302E-<br>69  | 0   | 5.32288<br>E-61 | 0    | 0    | 2.61102E<br>+24 | 2.2368E-<br>114 | 0     | 73045174<br>31  |
| PAR                  | 2.59403<br>E-83 | 0    | 1.11762<br>E-68 | 0   | 1.088E-<br>60   | 0    | 0    | 4.96094E<br>+24 | 4.7876E-<br>114 | 0     | 14053922<br>297 |
| TURNSTONE            | 1.50462<br>E-83 | 0    | 6.39716<br>E-69 | 0   | 6.18275<br>E-61 | 0    | 0    | 2.61102E<br>+24 | 2.8553E-<br>114 | 0     | 74949217<br>93  |
| BARBEL               | 1.50462<br>E-83 | 0    | 6.39716<br>E-69 | 0   | 6.18275<br>E-61 | 0    | 0    | 2.61102E<br>+24 | 2.8553E-<br>114 | 0     | 74949217<br>93  |
| GARDEN               | 1.65535<br>E-83 | 0    | 6.94697<br>E-69 | 0   | 6.66657<br>E-61 | 0    | 0    | 2.61102E<br>+24 | 3.2285E-<br>114 | 0     | 75925879<br>70  |
| FOREST               | 1.84959<br>E-83 | 0    | 7.64555<br>E-69 | 0   | 7.27658<br>E-61 | 0    | 0    | 2.61102E<br>+24 | 3.7238E-<br>114 | 0     | 77076870<br>55  |
| HANDCAR              | 1.18714<br>E-83 | 0    | 4.86231<br>E-69 | 0   | 4.60449<br>E-61 | 0    | 0    | 1.56661E<br>+24 | 2.4367E-<br>114 | 0     | 46670802<br>37  |
| CREPE                | 1.64826<br>E-82 | 0    | 6.37923<br>E-68 | 0   | 5.85707<br>E-60 | 0    | 0    | 1.43606E<br>+25 | 3.8105E-<br>113 | 0     | 45259273<br>085 |
| DRILL TARGET (upper) | 2.99684<br>E-83 | 0    | 1.15986<br>E-68 | 0   | 1.06492<br>E-60 | 0    | 0    | 2.61102E<br>+24 | 6.9282E-<br>114 | 0     | 82289587<br>43  |
| DRILL SOURCE (lower) | 5.09462<br>E-84 | 0    | 1.97176<br>E-69 | 0   | 1.81037<br>E-61 | 0    | 0    | 4.43874E<br>+23 | 1.1778E-<br>114 | 0     | 13989229<br>86  |
| PARROT               | 2.26366<br>E-84 | 0    | 8.58331<br>E-70 | 0   | 7.79309<br>E-62 | 0    | 0    | 1.69716E<br>+23 | 5.4633E-<br>115 | 0     | 54588897<br>2.8 |
| CASSOWARY            | 3.48255<br>E-83 | 0    | 1.32051<br>E-68 | 0   | 1.19894<br>E-60 | 0    | 0    | 2.61102E<br>+24 | 8.4051E-<br>114 | 0     | 83982918<br>90  |
| HOOPOE               | 3.48255<br>E-83 | 0    | 1.32051<br>E-68 | 0   | 1.19894<br>E-60 | 0    | 0    | 2.61102E<br>+24 | 8.4051E-<br>114 | 0     | 83982918<br>90  |
| MUDPACK              | 4.70189<br>E-84 | 0    | 1.78283<br>E-69 | 0   | 1.61869<br>E-61 | 0    | 0    | 3.52488E<br>+23 | 1.1348E-<br>114 | 0     | 11337840<br>54  |
| SULKY                | 1.64615<br>E-85 | 0    | 6.21873<br>E-71 | 0   | 5.63478<br>E-63 | 0    | 0    | 1.20107E<br>+22 | 4.004E-<br>116  | 0     | 38774909<br>.99 |
| WOOL                 | 5.17255<br>E-83 | 0    | 1.85828<br>E-68 | 0   | 1.63823<br>E-60 | 0    | 0    | 2.61102E<br>+24 | 1.3982E-<br>113 | 0     | 88611222<br>49  |
| TERN                 | 6.36314<br>E-83 | 0    | 2.22232<br>E-68 | 0   | 1.92917<br>E-60 | 0    | 0    | 2.61102E<br>+24 | 1.8252E-<br>113 | 0     | 91135720<br>44  |
| CASHMERE             | 6.89782<br>E-83 | 0    | 2.38269<br>E-68 | 0   | 2.05599<br>E-60 | 0    | 0    | 2.61102E<br>+24 | 2.0248E-<br>113 | 0     | 92138302<br>68  |
| ALPACA               | 1.26994<br>E-84 | 0    | 4.32163<br>E-70 | 0   | 3.69878<br>E-62 | 0    | 0    | 4.30819E<br>+22 | 3.8467E-<br>115 | 0     | 15430404<br>8.2 |
| MERLIN               | 4.11153<br>E-83 | 0    | 1.38847<br>E-68 | 0   | 1.1834E-<br>60  | 0    | 0    | 1.31857E<br>+24 | 1.2656E-<br>113 | 0     | 47587742<br>10  |
| WISHBONE             | 8.36247<br>E-83 | 0    | 2.81373<br>E-68 | 0   | 2.39337<br>E-60 | 0    | 0    | 2.61102E<br>+24 | 2.594E-<br>113  | 0     | 94575749<br>09  |
| SEERSUCKER           | 8.47396<br>E-83 | 0    | 2.8461E-<br>68  | 0   | 2.41852<br>E-60 | 0    | 0    | 2.61102E<br>+24 | 2.6386E-<br>113 | 0     | 94745766<br>61  |
| WAGTAIL              | 5.50656<br>E-82 | 0    | 1.80786<br>E-67 | 0   | 1.51729<br>E-59 | 0    | 0    | 1.43606E<br>+25 | 1.7985E-<br>112 | 0     | 53302113<br>520 |
| SUEDE                | 1.26152<br>E-82 | 0    | 4.01315<br>E-68 | 0   | 3.31068<br>E-60 | 0    | 0    | 2.61103E<br>+24 | 4.4023E-<br>113 | 0     | 99998462<br>36  |
| CUP                  | 7.53395<br>E-82 | 0    | 2.36993<br>E-67 | 0   | 1.94314<br>E-59 | 0    | 0    | 1.43606E<br>+25 | 2.6919E-<br>112 | 0     | 55616795<br>473 |
| KESTREL              | 1.57614<br>E-82 | 0    | 4.86402<br>E-68 | 0   | 3.94663<br>E-60 | 0    | 0    | 2.61103E<br>+24 | 5.8625E-<br>113 | 0     | 10306382<br>883 |
| PALANQUIN            | 3.81709<br>E-83 | 0    | 1.15899<br>E-68 | 0   | 9.32099<br>E-61 | 0    | 0    | 5.61371E<br>+23 | 1.469E-<br>113  | 0     | 22519325<br>79  |
| GUM DROP             | 1.96418<br>E-82 | 0    | 5.88224<br>E-68 | 0   | 4.69522<br>E-60 | 0    | 0    | 2.61103E<br>+24 | 7.7813E-<br>113 | 0     | 10618622<br>422 |
| CHENILLE             | 1.98183<br>E-82 | 0    | 5.92786<br>E-68 | 0   | 4.72849<br>E-60 | 0    | 0    | 2.61103E<br>+24 | 7.8714E-<br>113 | 0     | 10631512<br>923 |
| MUSCOVY              | 2.01852<br>E-82 | 0    | 6.0225E-<br>68  | 0   | 4.79742<br>E-60 | 0    | 0    | 2.61103E<br>+24 | 8.0593E-<br>113 | 0     | 10657988<br>082 |
| TEE                  | 8.53188<br>E-83 | 0    | 2.48091<br>E-68 | 0   | 1.94868<br>E-60 | 0    | 0    | 9.13859E<br>+23 | 3.5957E-<br>113 | 0     | 38269718<br>34  |

| Nuclide        | 89Sr            | 91Sr | 91Y             | 93Y | 95Zr            | 97Zr | 99Mo | 99Tc            | 103Ru           | 105Rh | 106Ru           |
|----------------|-----------------|------|-----------------|-----|-----------------|------|------|-----------------|-----------------|-------|-----------------|
| BUTEO          | 2.61446<br>E-82 | 0    | 7.5301E-<br>68  | 0   | 5.88391<br>E-60 | 0    | 0    | 2.61103E<br>+24 | 1.1242E-<br>112 | 0     | 11038504<br>505 |
| CAMBRIC        | 1.00581<br>E-83 | 0    | 2.88681<br>E-69 | 0   | 2.25143<br>E-61 | 0    | 0    | 9.79135E<br>+22 | 4.3566E-<br>114 | 0     | 41538128<br>0.7 |
| SCAUP          | 2.68611<br>E-82 | 0    | 7.70798<br>E-68 | 0   | 6.01079<br>E-60 | 0    | 0    | 2.61103E<br>+24 | 1.164E-<br>112  | 0     | 11079048<br>855 |
| TWEED          | 2.94946<br>E-82 | 0    | 8.35639<br>E-68 | 0   | 6.47121<br>E-60 | 0    | 0    | 2.61103E<br>+24 | 1.3128E-<br>112 | 0     | 11220458<br>284 |
| PETREL         | 2.567E-<br>83   | 0    | 6.98892<br>E-69 | 0   | 5.29587<br>E-61 | 0    | 0    | 1.69717E<br>+23 | 1.2422E-<br>113 | 0     | 75877767<br>4.5 |
| ORGANDY        | 3.95088<br>E-82 | 0    | 1.0756E-<br>67  | 0   | 8.15016<br>E-60 | 0    | 0    | 2.61103E<br>+24 | 1.9121E-<br>112 | 0     | 11674160<br>552 |
| DILUTED WATERS | 4.22181<br>E-82 | 0    | 1.13901<br>E-67 | 0   | 8.58811<br>E-60 | 0    | 0    | 2.61103E<br>+24 | 2.0824E-<br>112 | 0     | 11779635<br>261 |
| TINY TOT       | 4.28136<br>E-82 | 0    | 1.15287<br>E-67 | 0   | 8.68355<br>E-60 | 0    | 0    | 2.61103E<br>+24 | 2.1203E-<br>112 | 0     | 11802029<br>394 |
| IZZER          | 6.35927<br>E-82 | 0    | 1.62244<br>E-67 | 0   | 1.18656<br>E-59 | 0    | 0    | 2.61103E<br>+24 | 3.5273E-<br>112 | 0     | 12452510<br>717 |
| PONGEE         | 6.90603<br>E-82 | 0    | 1.74222<br>E-67 | 0   | 1.26636<br>E-59 | 0    | 0    | 2.61103E<br>+24 | 3.9222E-<br>112 | 0     | 12592570<br>852 |
| BRONZE         | 3.85883<br>E-81 | 0    | 9.7139E-<br>67  | 0   | 7.0524E-<br>59  | 0    | 0    | 1.43607E<br>+25 | 2.2015E-<br>111 | 0     | 69407742<br>366 |
| MAUVE          | 8.50375<br>E-82 | 0    | 2.08524<br>E-67 | 0   | 1.49238<br>E-59 | 0    | 0    | 2.61103E<br>+24 | 5.1263E-<br>112 | 0     | 12953007<br>707 |
| TICKING        | 1.04251<br>E-81 | 0    | 2.48631<br>E-67 | 0   | 1.75264<br>E-59 | 0    | 0    | 2.61103E<br>+24 | 6.6622E-<br>112 | 0     | 13315797<br>903 |
| CENTAUR        | 1.13204<br>E-81 | 0    | 2.66968<br>E-67 | 0   | 1.87039<br>E-59 | 0    | 0    | 2.61103E<br>+24 | 7.4072E-<br>112 | 0     | 13465417<br>405 |
| SCREAMER       | 1.21679<br>E-81 | 0    | 2.84142<br>E-67 | 0   | 1.98003<br>E-59 | 0    | 0    | 2.61103E<br>+24 | 8.1281E-<br>112 | 0     | 13597883<br>503 |
| MOA            | 1.21679<br>E-81 | 0    | 2.84142<br>E-67 | 0   | 1.98003<br>E-59 | 0    | 0    | 2.61103E<br>+24 | 8.1281E-<br>112 | 0     | 13597883<br>503 |
| CHARCOAL       | 7.55924<br>E-81 | 0    | 1.73613<br>E-66 | 0   | 1.19889<br>E-58 | 0    | 0    | 1.43607E<br>+25 | 5.2288E-<br>111 | 0     | 76033920<br>161 |
| ELKHART        | 1.51117<br>E-81 | 0    | 3.42608<br>E-67 | 0   | 2.34925<br>E-59 | 0    | 0    | 2.61103E<br>+24 | 1.0741E-<br>111 | 0     | 14003333<br>545 |
| SEPIA          | 3.26368<br>E-81 | 0    | 6.66157<br>E-67 | 0   | 4.31328<br>E-59 | 0    | 0    | 2.61103E<br>+24 | 2.8922E-<br>111 | 0     | 15544493<br>165 |
| KERMET         | 3.79599<br>E-81 | 0    | 7.59002<br>E-67 | 0   | 4.85946<br>E-59 | 0    | 0    | 2.61103E<br>+24 | 3.5128E-<br>111 | 0     | 15866260<br>067 |
| CORDUROY       | 2.39062<br>E-80 | 0    | 4.6925E-<br>66  | 0   | 2.9742E-<br>58  | 0    | 0    | 1.43607E<br>+25 | 2.2998E-<br>110 | 0     | 88882012<br>669 |
| EMERSON        | 5.19659<br>E-81 | 0    | 9.95477<br>E-67 | 0   | 6.22616<br>E-59 | 0    | 0    | 2.61103E<br>+24 | 5.2616E-<br>111 | 0     | 16556560<br>616 |
| BUFF           | 2.86401<br>E-80 | 0    | 5.48485<br>E-66 | 0   | 3.42995<br>E-58 | 0    | 0    | 1.43607E<br>+25 | 2.9015E-<br>110 | 0     | 91086464<br>818 |
| MAXWELL        | 7.63051<br>E-81 | 0    | 1.3871E-<br>66  | 0   | 8.43092<br>E-59 | 0    | 0    | 2.61103E<br>+24 | 8.6247E-<br>111 | 0     | 17441894<br>392 |
| LAMPBLACK      | 4.50239<br>E-80 | 0    | 8.1065E-<br>66  | 0   | 4.90148<br>E-58 | 0    | 0    | 1.43607E<br>+25 | 5.1925E-<br>110 | 0     | 96849167<br>987 |
| SIENNA         | 8.18617<br>E-81 | 0    | 1.47391<br>E-66 | 0   | 8.91178<br>E-59 | 0    | 0    | 2.61103E<br>+24 | 9.441E-<br>111  | 0     | 17608939<br>634 |
| DOVEKIE        | 8.52958<br>E-81 | 0    | 1.52716<br>E-66 | 0   | 9.20551<br>E-59 | 0    | 0    | 2.61103E<br>+24 | 9.9535E-<br>111 | 0     | 17707339<br>806 |
| REO            | 8.63171<br>E-81 | 0    | 1.54293<br>E-66 | 0   | 9.29239<br>E-59 | 0    | 0    | 2.61103E<br>+24 | 1.0107E-<br>110 | 0     | 17735945<br>269 |
| PLAID II       | 1.0194E-<br>80  | 0    | 1.78132<br>E-66 | 0   | 1.0596E-<br>58  | 0    | 0    | 2.61103E<br>+24 | 1.2519E-<br>110 | 0     | 18140601<br>747 |
| REX            | 1.29007<br>E-80 | 0    | 2.16779<br>E-66 | 0   | 1.26225<br>E-58 | 0    | 0    | 2.48048E<br>+24 | 1.72E-<br>110   | 0     | 17916932<br>094 |
| RED HOT        | 1.53849<br>E-80 | 0    | 2.5416E-<br>66  | 0   | 1.46621<br>E-58 | 0    | 0    | 2.61103E<br>+24 | 2.1258E-<br>110 | 0     | 19181857<br>846 |
| CINNAMON       | 1.58168<br>E-80 | 0    | 2.6031E-<br>66  | 0   | 1.4986E-<br>58  | 0    | 0    | 2.61103E<br>+24 | 2.2029E-<br>110 | 0     | 19254014<br>172 |
| FINFOOT        | 1.58168<br>E-80 | 0    | 2.6031E-<br>66  | 0   | 1.4986E-<br>58  | 0    | 0    | 2.61103E<br>+24 | 2.2029E-<br>110 | 0     | 19254014<br>172 |
| CLYMER         | 1.6934E-<br>80  | 0    | 2.76114<br>E-66 | 0   | 1.58153<br>E-58 | 0    | 0    | 2.61103E<br>+24 | 2.4051E-<br>110 | 0     | 19433038<br>980 |
| PURPLE         | 1.83968<br>E-80 | 0    | 2.96594<br>E-66 | 0   | 1.68838<br>E-58 | 0    | 0    | 2.61103E<br>+24 | 2.6756E-<br>110 | 0     | 19652604<br>420 |
| TEMPLAR        | 3.68684<br>E-82 | 0    | 5.87944<br>E-68 | 0   | 3.32704<br>E-60 | 0    | 0    | 4.83041E<br>+22 | 5.4864E-<br>112 | 0     | 36753839<br>7.5 |
| LIME           | 2.22885<br>E-80 | 0    | 3.50052<br>E-66 | 0   | 1.96443<br>E-58 | 0    | 0    | 2.61103E<br>+24 | 3.4248E-<br>110 | 0     | 20170705<br>977 |
| STUTZ          | 2.3807E-<br>80  | 0    | 3.70554<br>E-66 | 0   | 2.0693E-<br>58  | 0    | 0    | 2.61103E<br>+24 | 3.7279E-<br>110 | 0     | 20351786<br>358 |

| Nuclide        | 89Sr            | 91Sr | 91Y             | 93Y | 95Zr            | 97Zr | 99Mo | 99Tc            | 103Ru           | 105Rh | 106Ru           |
|----------------|-----------------|------|-----------------|-----|-----------------|------|------|-----------------|-----------------|-------|-----------------|
| TOMATO         | 2.42535<br>E-80 | 0    | 3.76548<br>E-66 | 0   | 2.09987<br>E-58 | 0    | 0    | 2.61103E<br>+24 | 3.818E-<br>110  | 0     | 20403132<br>196 |
| DURVEA         | 9.30057<br>E-80 | 0    | 1.42608<br>E-65 | 0   | 7.89882<br>E-58 | 0    | 0    | 9.13862E<br>+24 | 1.5029E-<br>109 | 0     | 72300936<br>016 |
| FENTON         | 2.10543<br>E-81 | 0    | 3.17421<br>E-67 | 0   | 1.742E-<br>59   | 0    | 0    | 1.82772E<br>+23 | 3.5252E-<br>111 | 0     | 14705149<br>96  |
| PIN STRIPE     | 3.09799<br>E-80 | 0    | 4.65185<br>E-66 | 0   | 2.5473E-<br>58  | 0    | 0    | 2.61103E<br>+24 | 5.2312E-<br>110 | 0     | 21091736<br>377 |
| OCHRE          | 3.26327<br>E-80 | 0    | 4.8654E-<br>66  | 0   | 2.65395<br>E-58 | 0    | 0    | 2.61103E<br>+24 | 5.5929E-<br>110 | 0     | 21240916<br>520 |
| TRAVELER       | 3.49496<br>E-80 | 0    | 5.16232<br>E-66 | 0   | 2.80157<br>E-58 | 0    | 0    | 2.61103E<br>+24 | 6.1089E-<br>110 | 0     | 21439414<br>683 |
| CYCLAMEN       | 2.12651<br>E-80 | 0    | 3.13503<br>E-66 | 0   | 1.69959<br>E-58 | 0    | 0    | 1.56662E<br>+24 | 3.7319E-<br>110 | 0     | 12888065<br>727 |
| CHARTREUSE     | 1.31225<br>E-79 | 0    | 1.93083<br>E-65 | 0   | 1.04565<br>E-57 | 0    | 0    | 9.53028E<br>+24 | 2.3124E-<br>109 | 0     | 78554494<br>542 |
| TAPESTRY       | 3.91402<br>E-80 | 0    | 5.69268<br>E-66 | 0   | 3.06345<br>E-58 | 0    | 0    | 2.61104E<br>+24 | 7.067E-<br>110  | 0     | 21771178<br>438 |
| PIRANHA        | 2.17482<br>E-79 | 0    | 3.15873<br>E-65 | 0   | 1.69854<br>E-57 | 0    | 0    | 1.43607E<br>+25 | 3.9383E-<br>109 | 0     | 1.19908E<br>+11 |
| DUMONT         | 2.36203<br>E-79 | 0    | 3.3922E-<br>65  | 0   | 1.8129E-<br>57  | 0    | 0    | 1.43607E<br>+25 | 4.3797E-<br>109 | 0     | 1.21258E<br>+11 |
| DISCUS THROWER | 5.2904E-<br>80  | 0    | 7.4813E-<br>66  | 0   | 3.96469<br>E-58 | 0    | 0    | 2.87214E<br>+24 | 1.0133E-<br>109 | 0     | 24626773<br>088 |
| PILE DRIVER    | 1.6147E-<br>79  | 0    | 2.25869<br>E-65 | 0   | 1.1899E-<br>57  | 0    | 0    | 8.09421E<br>+24 | 3.1641E-<br>109 | 0     | 70157338<br>331 |
| TAN            | 2.90188<br>E-79 | 0    | 4.05211<br>E-65 | 0   | 2.13264<br>E-57 | 0    | 0    | 1.43607E<br>+25 | 5.7075E-<br>109 | 0     | 1.2469E+<br>11  |
| PUCE           | 5.80966<br>E-80 | 0    | 8.00657<br>E-66 | 0   | 4.18377<br>E-58 | 0    | 0    | 2.61104E<br>+24 | 1.1746E-<br>109 | 0     | 22968988<br>078 |
| DOUBLE PLAY    | 6.2311E-<br>80  | 0    | 8.50573<br>E-66 | 0   | 4.42149<br>E-58 | 0    | 0    | 2.61104E<br>+24 | 1.2854E-<br>109 | 0     | 23188150<br>216 |
| KANKAKEE       | 3.42916<br>E-79 | 0    | 4.68057<br>E-65 | 0   | 2.43297<br>E-57 | 0    | 0    | 1.43607E<br>+25 | 7.075E-<br>109  | 0     | 1.27545E<br>+11 |
| VULCAN         | 8.93542<br>E-80 | 0    | 1.19709<br>E-65 | 0   | 6.15946<br>E-58 | 0    | 0    | 3.2638E+<br>24  | 1.9172E-<br>109 | 0     | 29530007<br>810 |
| HALFBEAK       | 1.40123<br>E-78 | 0    | 1.85903<br>E-64 | 0   | 9.51463<br>E-57 | 0    | 0    | 4.76514E<br>+25 | 3.0687E-<br>108 | 0     | 4.35337E<br>+11 |
| SAXON          | 6.73875<br>E-81 | 0    | 8.48835<br>E-67 | 0   | 4.22307<br>E-59 | 0    | 0    | 1.56662E<br>+23 | 1.6457E-<br>110 | 0     | 15070007<br>20  |
| ROVENA         | 1.34067<br>E-79 | 0    | 1.64845<br>E-65 | 0   | 8.09387<br>E-58 | 0    | 0    | 2.61104E<br>+24 | 3.4444E-<br>109 | 0     | 25727006<br>071 |
| TANGERINE      | 1.3798E-<br>79  | 0    | 1.68993<br>E-65 | 0   | 8.27976<br>E-58 | 0    | 0    | 2.61104E<br>+24 | 3.5743E-<br>109 | 0     | 25827587<br>160 |
| DERRINGER      | 8.23332<br>E-80 | 0    | 9.5155E-<br>66  | 0   | 4.51677<br>E-58 | 0    | 0    | 1.0183E+<br>24  | 2.4091E-<br>109 | 0     | 10670715<br>436 |
| DAIQURI        | 2.45853<br>E-79 | 0    | 2.78296<br>E-65 | 0   | 1.3061E-<br>57  | 0    | 0    | 2.61104E<br>+24 | 7.5147E-<br>109 | 0     | 27931950<br>494 |
| NEWARK         | 2.66454<br>E-79 | 0    | 2.98323<br>E-65 | 0   | 1.39173<br>E-57 | 0    | 0    | 2.61104E<br>+24 | 8.3343E-<br>109 | 0     | 28238408<br>402 |
| KHAKI          | 3.3267E-<br>79  | 0    | 3.61351<br>E-65 | 0   | 1.65813<br>E-57 | 0    | 0    | 2.61104E<br>+24 | 1.1089E-<br>108 | 0     | 29101224<br>212 |
| SIMMS          | 5.09082<br>E-80 | 0    | 5.31836<br>E-66 | 0   | 2.38907<br>E-58 | 0    | 0    | 3.0027E+<br>23  | 1.8416E-<br>109 | 0     | 34788389<br>71  |
| AJAX           | 4.79909<br>E-79 | 0    | 4.95867<br>E-65 | 0   | 2.21414<br>E-57 | 0    | 0    | 2.61104E<br>+24 | 1.7767E-<br>108 | 0     | 30583838<br>424 |
| CERISE         | 5.29204<br>E-79 | 0    | 5.39556<br>E-65 | 0   | 2.39174<br>E-57 | 0    | 0    | 2.61104E<br>+24 | 2.0148E-<br>108 | 0     | 30992043<br>940 |
| VIGIL          | 5.59048<br>E-79 | 0    | 5.65734<br>E-65 | 0   | 2.49756<br>E-57 | 0    | 0    | 2.61104E<br>+24 | 2.1622E-<br>108 | 0     | 31223469<br>286 |
| SIDECAR        | 7.46936<br>E-79 | 0    | 7.26578<br>E-65 | 0   | 3.13918<br>E-57 | 0    | 0    | 2.61104E<br>+24 | 3.1389E-<br>108 | 0     | 32474678<br>506 |
| NEW POINT      | 7.4829E-<br>79  | 0    | 7.27715<br>E-65 | 0   | 3.14367<br>E-57 | 0    | 0    | 2.61104E<br>+24 | 3.1462E-<br>108 | 0     | 32482651<br>553 |
| GREELEY        | 3.57194<br>E-77 | 0    | 3.42998<br>E-63 | 0   | 1.47151<br>E-55 | 0    | 0    | 1.1358E+<br>26  | 1.5423E-<br>106 | 0     | 1.43091E<br>+12 |
| RIVET I        | 1.222E-<br>78   | 0    | 1.11149<br>E-64 | 0   | 4.62936<br>E-57 | 0    | 0    | 2.61104E<br>+24 | 5.913E-<br>108  | 0     | 34716441<br>350 |
| NASH           | 2.41835<br>E-78 | 0    | 2.19523<br>E-64 | 0   | 9.13308<br>E-57 | 0    | 0    | 5.09153E<br>+24 | 1.1751E-<br>107 | 0     | 67832769<br>749 |
| BOURBON        | 6.91884<br>E-78 | 0    | 6.2683E-<br>64  | 0   | 2.60512<br>E-56 | 0    | 0    | 1.43607E<br>+25 | 3.3758E-<br>107 | 0     | 1.91693E<br>+11 |
| RIVET II       | 1.36591<br>E-78 | 0    | 1.22366<br>E-64 | 0   | 5.05449<br>E-57 | 0    | 0    | 2.61104E<br>+24 | 6.8236E-<br>108 | 0     | 35244547<br>031 |
| WARD           | 1.63036<br>E-78 | 0    | 1.42574<br>E-64 | 0   | 5.81208<br>E-57 | 0    | 0    | 2.61104E<br>+24 | 8.5683E-<br>108 | 0     | 36100626<br>306 |

| Nuclide       | 89Sr            | 91Sr | 91Y             | 93Y | 95Zr            | 97Zr | 99Mo | 99Tc            | 103Ru           | 105Rh | 106Ru           |
|---------------|-----------------|------|-----------------|-----|-----------------|------|------|-----------------|-----------------|-------|-----------------|
| PERSIMMON     | 2.00672<br>E-78 | 0    | 1.70584<br>E-64 | 0   | 6.8472E-<br>57  | 0    | 0    | 2.61104E<br>+24 | 1.1193E-<br>107 | 0     | 37131853<br>076 |
| AGILE         | 1.10387<br>E-77 | 0    | 9.38334<br>E-64 | 0   | 3.76641<br>E-56 | 0    | 0    | 1.43607E<br>+25 | 6.1572E-<br>107 | 0     | 2.04229E<br>+11 |
| RIVET III     | 2.20451<br>E-78 | 0    | 1.85009<br>E-64 | 0   | 7.37444<br>E-57 | 0    | 0    | 2.61104E<br>+24 | 1.2632E-<br>107 | 0     | 37608208<br>659 |
| MUSHROOM      | 2.23537<br>E-78 | 0    | 1.87244<br>E-64 | 0   | 7.45578<br>E-57 | 0    | 0    | 2.61104E<br>+24 | 1.2859E-<br>107 | 0     | 37679169<br>689 |
| FIZZ          | 2.46026<br>E-78 | 0    | 2.03404<br>E-64 | 0   | 8.04167<br>E-57 | 0    | 0    | 2.61104E<br>+24 | 1.4547E-<br>107 | 0     | 38172162<br>771 |
| OAKLAND       | 3.46562<br>E-78 | 0    | 2.7344E-<br>64  | 0   | 1.05383<br>E-56 | 0    | 0    | 2.61104E<br>+24 | 2.2605E-<br>107 | 0     | 39987540<br>688 |
| HEILMAN       | 3.5634E-<br>78  | 0    | 2.8009E-<br>64  | 0   | 1.07722<br>E-56 | 0    | 0    | 2.61104E<br>+24 | 2.3429E-<br>107 | 0     | 40138687<br>717 |
| FAWN          | 3.61262<br>E-78 | 0    | 2.83428<br>E-64 | 0   | 1.08894<br>E-56 | 0    | 0    | 2.61104E<br>+24 | 2.3846E-<br>107 | 0     | 40213436<br>186 |
| CHOCOLATE     | 4.37805<br>E-78 | 0    | 3.34593<br>E-64 | 0   | 1.26726<br>E-56 | 0    | 0    | 2.61104E<br>+24 | 3.0534E-<br>107 | 0     | 41275129<br>398 |
| EFFENDI       | 4.75262<br>E-78 | 0    | 3.59175<br>E-64 | 0   | 1.35207<br>E-56 | 0    | 0    | 2.61104E<br>+24 | 3.3935E-<br>107 | 0     | 41737176<br>510 |
| MICKY         | 3.1224E-<br>77  | 0    | 2.3032E-<br>63  | 0   | 8.55613<br>E-56 | 0    | 0    | 1.43607E<br>+25 | 2.346E-<br>106  | 0     | 2.35155E<br>+11 |
| COMMODORE     | 8.14618<br>E-77 | 0    | 5.89689<br>E-63 | 0   | 2.16824<br>E-55 | 0    | 0    | 3.2638E+<br>25  | 6.3673E-<br>106 | 0     | 5.44535E<br>+11 |
| SCOTCH        | 5.25985<br>E-77 | 0    | 3.7865E-<br>63  | 0   | 1.38806<br>E-55 | 0    | 0    | 2.02356E<br>+25 | 4.1593E-<br>106 | 0     | 3.39475E<br>+11 |
| ABSINTHE      | 7.06602<br>E-78 | 0    | 5.05885<br>E-64 | 0   | 1.84893<br>E-56 | 0    | 0    | 2.61104E<br>+24 | 5.6525E-<br>107 | 0     | 44043289<br>402 |
| KNICKERBOCKER | 2.68893<br>E-77 | 0    | 1.92474<br>E-63 | 0   | 7.03385<br>E-56 | 0    | 0    | 9.92197E<br>+24 | 2.1519E-<br>106 | 0     | 1.67397E<br>+11 |
| SWITCH        | 1.58692<br>E-78 | 0    | 1.0801E-<br>64  | 0   | 3.84007<br>E-57 | 0    | 0    | 4.04712E<br>+23 | 1.4117E-<br>107 | 0     | 71787741<br>90  |
| MIDI MIST     | 1.08333<br>E-77 | 0    | 7.31682<br>E-64 | 0   | 2.59043<br>E-56 | 0    | 0    | 2.61104E<br>+24 | 9.7947E-<br>107 | 0     | 46670885<br>920 |
| UMBER         | 5.62949<br>E-78 | 0    | 3.78222<br>E-64 | 0   | 1.33521<br>E-56 | 0    | 0    | 1.30552E<br>+24 | 5.1463E-<br>107 | 0     | 23457719<br>323 |
| VITO          | 1.38483<br>E-77 | 0    | 9.04505<br>E-64 | 0   | 3.14427<br>E-56 | 0    | 0    | 2.61105E<br>+24 | 1.3433E-<br>106 | 0     | 48250980<br>731 |
| STANLEY       | 9.10116<br>E-77 | 0    | 5.80179<br>E-63 | 0   | 1.99027<br>E-55 | 0    | 0    | 1.43608E<br>+25 | 9.2903E-<br>106 | 0     | 2.71867E<br>+11 |
| GIBSON        | 1.84778<br>E-77 | 0    | 1.16033<br>E-63 | 0   | 3.94787<br>E-56 | 0    | 0    | 2.61105E<br>+24 | 1.9468E-<br>106 | 0     | 50175451<br>815 |
| WASHER        | 2.00652<br>E-77 | 0    | 1.24592<br>E-63 | 0   | 4.21316<br>E-56 | 0    | 0    | 2.61105E<br>+24 | 2.1645E-<br>106 | 0     | 50739360<br>889 |
| BORDEAUX      | 2.24705<br>E-77 | 0    | 1.37389<br>E-63 | 0   | 4.6069E-<br>56  | 0    | 0    | 2.61105E<br>+24 | 2.5039E-<br>106 | 0     | 51524349<br>609 |
| LEXINGTON     | 2.43052<br>E-77 | 0    | 1.47024<br>E-63 | 0   | 4.90125<br>E-56 | 0    | 0    | 2.61105E<br>+24 | 2.7699E-<br>106 | 0     | 52075656<br>838 |
| DOOR MIST     | 2.68013<br>E-77 | 0    | 1.59975<br>E-63 | 0   | 5.29431<br>E-56 | 0    | 0    | 2.61105E<br>+24 | 3.1411E-<br>106 | 0     | 52770579<br>417 |
| YARD          | 1.62011<br>E-76 | 0    | 9.54656<br>E-63 | 0   | 3.13724<br>E-55 | 0    | 0    | 1.43608E<br>+25 | 1.9509E-<br>105 | 0     | 2.9398E+<br>11  |
| GILROY        | 3.29445<br>E-77 | 0    | 1.91185<br>E-63 | 0   | 6.23071<br>E-56 | 0    | 0    | 2.61105E<br>+24 | 4.0963E-<br>106 | 0     | 54268242<br>088 |
| MARVEL        | 3.94216<br>E-78 | 0    | 2.26162<br>E-64 | 0   | 7.32453<br>E-57 | 0    | 0    | 2.87215E<br>+23 | 5.0213E-<br>107 | 0     | 60380394<br>61  |
| ZAZA          | 2.13562<br>E-76 | 0    | 1.21188<br>E-62 | 0   | 3.90146<br>E-55 | 0    | 0    | 1.43608E<br>+25 | 2.7834E-<br>105 | 0     | 3.05202E<br>+11 |
| LANPHER       | 2.84469<br>E-76 | 0    | 1.55234<br>E-62 | 0   | 4.89195<br>E-55 | 0    | 0    | 1.43608E<br>+25 | 4.0249E-<br>105 | 0     | 3.17301E<br>+11 |
| SAZERAC       | 5.69355<br>E-77 | 0    | 3.06651<br>E-63 | 0   | 9.59477<br>E-56 | 0    | 0    | 2.61105E<br>+24 | 8.2805E-<br>106 | 0     | 58447420<br>422 |
| COGNAC        | 5.69355<br>E-77 | 0    | 3.06651<br>E-63 | 0   | 9.59477<br>E-56 | 0    | 0    | 2.61105E<br>+24 | 8.2805E-<br>106 | 0     | 58447420<br>422 |
| WORTH         | 5.69436<br>E-77 | 0    | 3.06689<br>E-63 | 0   | 9.59585<br>E-56 | 0    | 0    | 2.61105E<br>+24 | 8.282E-<br>106  | 0     | 58448553<br>171 |
| COBBLER       | 6.90126<br>E-77 | 0    | 3.6207E-<br>63  | 0   | 1.11677<br>E-55 | 0    | 0    | 2.61105E<br>+24 | 1.0606E-<br>105 | 0     | 59992145<br>065 |
| POLKA         | 1.01222<br>E-76 | 0    | 5.04018<br>E-63 | 0   | 1.51088<br>E-55 | 0    | 0    | 2.61105E<br>+24 | 1.7359E-<br>105 | 0     | 63190453<br>723 |
| STILT         | 1.14656<br>E-76 | 0    | 5.6129E-<br>63  | 0   | 1.66702<br>E-55 | 0    | 0    | 2.61105E<br>+24 | 2.0378E-<br>105 | 0     | 64267431<br>378 |
| HUPMOBILE     | 6.76963<br>E-77 | 0    | 3.10934<br>E-63 | 0   | 8.91885<br>E-56 | 0    | 0    | 9.66088E<br>+23 | 1.3755E-<br>105 | 0     | 25334694<br>665 |
| STACCATO      | 1.01932<br>E-75 | 0    | 4.67362<br>E-62 | 0   | 1.3393E-<br>54  | 0    | 0    | 1.43608E<br>+25 | 2.0789E-<br>104 | 0     | 3.77254E<br>+11 |

| Nuclide      | 89Sr            | 91Sr | 91Y             | 93Y | 95Zr            | 97Zr | 99Mo | 99Tc            | 103Ru           | 105Rh | 106Ru           |
|--------------|-----------------|------|-----------------|-----|-----------------|------|------|-----------------|-----------------|-------|-----------------|
| BRUSH        | 1.98492<br>E-76 | 0    | 9.01613<br>E-63 | 0   | 2.57055<br>E-55 | 0    | 0    | 2.61105E<br>+24 | 4.1285E-<br>105 | 0     | 69232743<br>048 |
| CABRIOLET    | 2.3475E-<br>77  | 0    | 1.06224<br>E-63 | 0   | 3.0222E-<br>56  | 0    | 0    | 3.00271E<br>+23 | 4.922E-<br>106  | 0     | 79920662<br>71  |
| MALLET       | 2.18563<br>E-76 | 0    | 9.79824<br>E-63 | 0   | 2.77357<br>E-55 | 0    | 0    | 2.61105E<br>+24 | 4.6731E-<br>105 | 0     | 70143022<br>677 |
| TORCH        | 2.91464<br>E-76 | 0    | 1.25633<br>E-62 | 0   | 3.48085<br>E-55 | 0    | 0    | 2.61105E<br>+24 | 6.7675E-<br>105 | 0     | 72934994<br>836 |
| KNOX         | 1.60351<br>E-75 | 0    | 6.91151<br>E-62 | 0   | 1.9149E-<br>54  | 0    | 0    | 1.43608E<br>+25 | 3.7235E-<br>104 | 0     | 4.01158E<br>+11 |
| DORSAL FIN   | 3.25675<br>E-76 | 0    | 1.3827E-<br>62  | 0   | 3.79946<br>E-55 | 0    | 0    | 2.61105E<br>+24 | 7.8061E-<br>105 | 0     | 74040983<br>673 |
| RUSSET       | 3.48474<br>E-76 | 0    | 1.4659E-<br>62  | 0   | 4.00784<br>E-55 | 0    | 0    | 2.61105E<br>+24 | 8.5161E-<br>105 | 0     | 74723461<br>851 |
| BUGGY D      | 2.07331<br>E-77 | 0    | 8.60708<br>E-64 | 0   | 2.33629<br>E-56 | 0    | 0    | 1.40997E<br>+23 | 5.2095E-<br>106 | 0     | 40884584<br>99  |
| BUGGY B      | 2.07331<br>E-77 | 0    | 8.60708<br>E-64 | 0   | 2.33629<br>E-56 | 0    | 0    | 1.40997E<br>+23 | 5.2095E-<br>106 | 0     | 40884584<br>99  |
| BUGGY A      | 2.07331<br>E-77 | 0    | 8.60708<br>E-64 | 0   | 2.33629<br>E-56 | 0    | 0    | 1.40997E<br>+23 | 5.2095E-<br>106 | 0     | 40884584<br>99  |
| BUGGY E      | 2.07331<br>E-77 | 0    | 8.60708<br>E-64 | 0   | 2.33629<br>E-56 | 0    | 0    | 1.40997E<br>+23 | 5.2095E-<br>106 | 0     | 40884584<br>99  |
| BUGGY C      | 2.07331<br>E-77 | 0    | 8.60708<br>E-64 | 0   | 2.33629<br>E-56 | 0    | 0    | 1.40997E<br>+23 | 5.2095E-<br>106 | 0     | 40884584<br>99  |
| POMMARD      | 2.95675<br>E-77 | 0    | 1.22304<br>E-63 | 0   | 3.31326<br>E-56 | 0    | 0    | 1.95829E<br>+23 | 7.4857E-<br>106 | 0     | 56988104<br>15  |
| STINGER      | 2.41939<br>E-75 | 0    | 9.85916<br>E-62 | 0   | 2.64918<br>E-54 | 0    | 0    | 1.43608E<br>+25 | 6.3206E-<br>104 | 0     | 4.24169E<br>+11 |
| MILK SHAKE   | 4.59354<br>E-76 | 0    | 1.86087<br>E-62 | 0   | 4.98412<br>E-55 | 0    | 0    | 2.61105E<br>+24 | 1.215E-<br>104  | 0     | 77575823<br>118 |
| BEVEL        | 5.25792<br>E-76 | 0    | 2.09112<br>E-62 | 0   | 5.54477<br>E-55 | 0    | 0    | 2.61105E<br>+24 | 1.4456E-<br>104 | 0     | 79009937<br>820 |
| NOOR         | 3.13813<br>E-75 | 0    | 1.23423<br>E-61 | 0   | 3.25279<br>E-54 | 0    | 0    | 1.43608E<br>+25 | 8.8326E-<br>104 | 0     | 4.39398E<br>+11 |
| THROW        | 5.7057E-<br>76  | 0    | 2.24405<br>E-62 | 0   | 5.91417<br>E-55 | 0    | 0    | 2.61105E<br>+24 | 1.6059E-<br>104 | 0     | 79890478<br>059 |
| SHUFFLE      | 3.50236<br>E-75 | 0    | 1.357E-<br>61   | 0   | 3.54723<br>E-54 | 0    | 0    | 1.43608E<br>+25 | 1.0173E-<br>103 | 0     | 4.4599E+<br>11  |
| SCROLL       | 6.8316E-<br>76  | 0    | 2.62167<br>E-62 | 0   | 6.81732<br>E-55 | 0    | 0    | 2.61105E<br>+24 | 2.0246E-<br>104 | 0     | 81865526<br>147 |
| BOXCAR       | 4.62177<br>E-74 | 0    | 1.76398<br>E-60 | 0   | 4.57337<br>E-53 | 0    | 0    | 1.69718E<br>+26 | 1.3855E-<br>102 | 0     | 5.3502E+<br>12  |
| HATCHET      | 7.83166<br>E-76 | 0    | 2.94996<br>E-62 | 0   | 7.59336<br>E-55 | 0    | 0    | 2.61105E<br>+24 | 2.4136E-<br>104 | 0     | 83396283<br>594 |
| CROCK        | 8.379E-<br>76   | 0    | 3.12717<br>E-62 | 0   | 8.00914<br>E-55 | 0    | 0    | 2.61105E<br>+24 | 2.6328E-<br>104 | 0     | 84163744<br>390 |
| CLARKSMOBILE | 5.21066<br>E-75 | 0    | 1.91239<br>E-61 | 0   | 4.85332<br>E-54 | 0    | 0    | 1.43608E<br>+25 | 1.6959E-<br>103 | 0     | 4.70674E<br>+11 |
| ADZE         | 1.10283<br>E-75 | 0    | 3.96454<br>E-62 | 0   | 9.94815<br>E-55 | 0    | 0    | 2.61105E<br>+24 | 3.749E-<br>104  | 0     | 87358463<br>370 |
| WEMBLEY      | 1.2305E-<br>75  | 0    | 4.35788<br>E-62 | 0   | 1.08463<br>E-54 | 0    | 0    | 2.61105E<br>+24 | 4.3163E-<br>104 | 0     | 88665755<br>544 |
| TUB C        | 1.2526E-<br>75  | 0    | 4.4254E-<br>62  | 0   | 1.09998<br>E-54 | 0    | 0    | 2.61105E<br>+24 | 4.4163E-<br>104 | 0     | 88880067<br>267 |
| TUB A        | 1.2526E-<br>75  | 0    | 4.4254E-<br>62  | 0   | 1.09998<br>E-54 | 0    | 0    | 2.61105E<br>+24 | 4.4163E-<br>104 | 0     | 88880067<br>267 |
| TUB F        | 1.2526E-<br>75  | 0    | 4.4254E-<br>62  | 0   | 1.09998<br>E-54 | 0    | 0    | 2.61105E<br>+24 | 4.4163E-<br>104 | 0     | 88880067<br>267 |
| TUB B        | 1.2526E-<br>75  | 0    | 4.4254E-<br>62  | 0   | 1.09998<br>E-54 | 0    | 0    | 2.61105E<br>+24 | 4.4163E-<br>104 | 0     | 88880067<br>267 |
| TUB D        | 1.2526E-<br>75  | 0    | 4.4254E-<br>62  | 0   | 1.09998<br>E-54 | 0    | 0    | 2.61105E<br>+24 | 4.4163E-<br>104 | 0     | 88880067<br>267 |
| RICKEY       | 7.76142<br>E-75 | 0    | 2.69786<br>E-61 | 0   | 6.64655<br>E-54 | 0    | 0    | 1.43608E<br>+25 | 2.8315E-<br>103 | 0     | 4.96806E<br>+11 |
| SEVILLA      | 1.62008<br>E-75 | 0    | 5.52633<br>E-62 | 0   | 1.34756<br>E-54 | 0    | 0    | 2.61105E<br>+24 | 6.1488E-<br>104 | 0     | 92035347<br>032 |
| FUNNEL       | 1.62008<br>E-75 | 0    | 5.52633<br>E-62 | 0   | 1.34756<br>E-54 | 0    | 0    | 2.61105E<br>+24 | 6.1488E-<br>104 | 0     | 92035347<br>032 |
| CHATEAUGAY   | 9.26825<br>E-75 | 0    | 3.1446E-<br>61  | 0   | 7.64547<br>E-54 | 0    | 0    | 1.43608E<br>+25 | 3.5576E-<br>103 | 0     | 5.08904E<br>+11 |
| SPUD         | 2.18904<br>E-75 | 0    | 7.16676<br>E-62 | 0   | 1.70884<br>E-54 | 0    | 0    | 2.61105E<br>+24 | 9.0565E-<br>104 | 0     | 95869504<br>198 |
| TANYA        | 1.43824<br>E-74 | 0    | 4.59586<br>E-61 | 0   | 1.08142<br>E-53 | 0    | 0    | 1.43608E<br>+25 | 6.2612E-<br>103 | 0     | 5.40149E<br>+11 |
| IMP          | 2.99954<br>E-75 | 0    | 9.40723<br>E-62 | 0   | 2.19106<br>E-54 | 0    | 0    | 2.61105E<br>+24 | 1.3582E-<br>103 | 0     | 1.00053E<br>+11 |

| Nuclide     | 89Sr            | 91Sr | 91Y             | 93Y | 95Zr            | 97Zr | 99Mo | 99Tc            | 103Ru           | 105Rh | 106Ru           |
|-------------|-----------------|------|-----------------|-----|-----------------|------|------|-----------------|-----------------|-------|-----------------|
| RACK        | 3.26437<br>E-75 | 0    | 1.01203<br>E-61 | 0   | 2.34235<br>E-54 | 0    | 0    | 2.61105E<br>+24 | 1.5143E-<br>103 | 0     | 1.01208E<br>+11 |
| DIANA MOON  | 3.84751<br>E-75 | 0    | 1.16637<br>E-61 | 0   | 2.66673<br>E-54 | 0    | 0    | 2.61105E<br>+24 | 1.8709E-<br>103 | 0     | 1.03489E<br>+11 |
| SLED        | 2.18278<br>E-74 | 0    | 6.58918<br>E-61 | 0   | 1.50304<br>E-53 | 0    | 0    | 1.43608E<br>+25 | 1.0709E-<br>102 | 0     | 5.71587E<br>+11 |
| NOGGIN      | 2.42386<br>E-74 | 0    | 7.2131E-<br>61  | 0   | 1.63257<br>E-53 | 0    | 0    | 1.43608E<br>+25 | 1.2254E-<br>102 | 0     | 5.79765E<br>+11 |
| KNIFE A     | 4.78516<br>E-75 | 0    | 1.4081E-<br>61  | 0   | 3.16754<br>E-54 | 0    | 0    | 2.61106E<br>+24 | 2.4769E-<br>103 | 0     | 1.06595E<br>+11 |
| STODDARD    | 7.94367<br>E-75 | 0    | 2.31577<br>E-61 | 0   | 5.18281<br>E-54 | 0    | 0    | 4.04714E<br>+24 | 4.1933E-<br>103 | 0     | 1.66767E<br>+11 |
| HUDSON SEAL | 5.65153<br>E-75 | 0    | 1.62572<br>E-61 | 0   | 3.61204<br>E-54 | 0    | 0    | 2.61106E<br>+24 | 3.0681E-<br>103 | 0     | 1.09028E<br>+11 |
| WELDER      | 6.38304<br>E-75 | 0    | 1.80591<br>E-61 | 0   | 3.97619<br>E-54 | 0    | 0    | 2.61106E<br>+24 | 3.5882E-<br>103 | 0     | 1.10842E<br>+11 |
| KNIFE C     | 6.38481<br>E-75 | 0    | 1.80634<br>E-61 | 0   | 3.97706<br>E-54 | 0    | 0    | 2.61106E<br>+24 | 3.5895E-<br>103 | 0     | 1.10846E<br>+11 |
| VAT         | 7.0285E-<br>75  | 0    | 1.96256<br>E-61 | 0   | 4.29023<br>E-54 | 0    | 0    | 2.61106E<br>+24 | 4.0616E-<br>103 | 0     | 1.123E+1<br>1   |
| HULA        | 9.12745<br>E-75 | 0    | 2.45941<br>E-61 | 0   | 5.27274<br>E-54 | 0    | 0    | 2.61106E<br>+24 | 5.6846E-<br>103 | 0     | 1.1635E+<br>11  |
| BIT B       | 9.39695<br>E-75 | 0    | 2.52199<br>E-61 | 0   | 5.39521<br>E-54 | 0    | 0    | 2.61106E<br>+24 | 5.9014E-<br>103 | 0     | 1.1681E+<br>11  |
| FILE        | 9.39695<br>E-75 | 0    | 2.52199<br>E-61 | 0   | 5.39521<br>E-54 | 0    | 0    | 2.61106E<br>+24 | 5.9014E-<br>103 | 0     | 1.1681E+<br>11  |
| BIT A       | 9.39695<br>E-75 | 0    | 2.52199<br>E-61 | 0   | 5.39521<br>E-54 | 0    | 0    | 2.61106E<br>+24 | 5.9014E-<br>103 | 0     | 1.1681E+<br>11  |
| CREW 2nd    | 9.90865<br>E-75 | 0    | 2.64016<br>E-61 | 0   | 5.62575<br>E-54 | 0    | 0    | 2.61106E<br>+24 | 6.318E-<br>103  | 0     | 1.17653E<br>+11 |
| CREW 3rd    | 9.90865<br>E-75 | 0    | 2.64016<br>E-61 | 0   | 5.62575<br>E-54 | 0    | 0    | 2.61106E<br>+24 | 6.318E-<br>103  | 0     | 1.17653E<br>+11 |
| CREW        | 5.44976<br>E-74 | 0    | 1.45209<br>E-60 | 0   | 3.09416<br>E-53 | 0    | 0    | 1.43608E<br>+25 | 3.4749E-<br>102 | 0     | 6.47093E<br>+11 |
| AUGER       | 1.15245<br>E-74 | 0    | 3.00807<br>E-61 | 0   | 6.33801<br>E-54 | 0    | 0    | 2.61106E<br>+24 | 7.6733E-<br>103 | 0     | 1.20088E<br>+11 |
| KNIFE B     | 1.15261<br>E-74 | 0    | 3.00844<br>E-61 | 0   | 6.33872<br>E-54 | 0    | 0    | 2.61106E<br>+24 | 7.6747E-<br>103 | 0     | 1.20091E<br>+11 |
| MING VASE   | 1.23605<br>E-74 | 0    | 3.1956E-<br>61  | 0   | 6.69812<br>E-54 | 0    | 0    | 2.61106E<br>+24 | 8.3967E-<br>103 | 0     | 1.21234E<br>+11 |
| TINDERBOX   | 1.26921<br>E-74 | 0    | 3.26951<br>E-61 | 0   | 6.83955<br>E-54 | 0    | 0    | 2.61106E<br>+24 | 8.6876E-<br>103 | 0     | 1.2167E+<br>11  |
| SCHOONER    | 2.37075<br>E-74 | 0    | 5.92706<br>E-61 | 0   | 1.21981<br>E-53 | 0    | 0    | 3.91659E<br>+24 | 1.728E-<br>102  | 0     | 1.88015E<br>+11 |
| BAY LEAF    | 1.66871<br>E-74 | 0    | 4.14111<br>E-61 | 0   | 8.48813<br>E-54 | 0    | 0    | 2.61106E<br>+24 | 1.2354E-<br>102 | 0     | 1.2627E+<br>11  |
| TYG F       | 1.66887<br>E-74 | 0    | 4.14146<br>E-61 | 0   | 8.48877<br>E-54 | 0    | 0    | 2.61106E<br>+24 | 1.2355E-<br>102 | 0     | 1.26272E<br>+11 |
| TYG A       | 1.66887<br>E-74 | 0    | 4.14146<br>E-61 | 0   | 8.48877<br>E-54 | 0    | 0    | 2.61106E<br>+24 | 1.2355E-<br>102 | 0     | 1.26272E<br>+11 |
| TYG D       | 1.66887<br>E-74 | 0    | 4.14146<br>E-61 | 0   | 8.48877<br>E-54 | 0    | 0    | 2.61106E<br>+24 | 1.2355E-<br>102 | 0     | 1.26272E<br>+11 |
| TYG C       | 1.66887<br>E-74 | 0    | 4.14146<br>E-61 | 0   | 8.48877<br>E-54 | 0    | 0    | 2.61106E<br>+24 | 1.2355E-<br>102 | 0     | 1.26272E<br>+11 |
| TYG B       | 1.66887<br>E-74 | 0    | 4.14146<br>E-61 | 0   | 8.48877<br>E-54 | 0    | 0    | 2.61106E<br>+24 | 1.2355E-<br>102 | 0     | 1.26272E<br>+11 |
| TYG E       | 1.66887<br>E-74 | 0    | 4.14146<br>E-61 | 0   | 8.48877<br>E-54 | 0    | 0    | 2.61106E<br>+24 | 1.2355E-<br>102 | 0     | 1.26272E<br>+11 |
| SCISSORS    | 1.66903<br>E-74 | 0    | 4.1418E-<br>61  | 0   | 8.48941<br>E-54 | 0    | 0    | 2.61106E<br>+24 | 1.2357E-<br>102 | 0     | 1.26273E<br>+11 |
| BENHAM      | 1.05714<br>E-72 | 0    | 2.58897<br>E-59 | 0   | 5.26852<br>E-52 | 0    | 0    | 1.50136E<br>+26 | 8.0464E-<br>101 | 0     | 7.35656E<br>+12 |
| PACKARD     | 1.33333<br>E-74 | 0    | 3.10386<br>E-61 | 0   | 6.14381<br>E-54 | 0    | 0    | 1.30553E<br>+24 | 1.1289E-<br>102 | 0     | 67278691<br>482 |
| WINESKIN    | 1.46708<br>E-73 | 0    | 3.41509<br>E-60 | 0   | 6.75972<br>E-53 | 0    | 0    | 1.43608E<br>+25 | 1.2423E-<br>101 | 0     | 7.40094E<br>+11 |
| SHAVE       | 2.92876<br>E-74 | 0    | 6.73125<br>E-61 | 0   | 1.32312<br>E-53 | 0    | 0    | 2.61106E<br>+24 | 2.5473E-<br>102 | 0     | 1.36279E<br>+11 |
| WISE        | 1.79769<br>E-73 | 0    | 4.07028<br>E-60 | 0   | 7.93558<br>E-53 | 0    | 0    | 1.43608E<br>+25 | 1.6135E-<br>101 | 0     | 7.60774E<br>+11 |
| BIGGIN      | 3.26906<br>E-74 | 0    | 7.40155<br>E-61 | 0   | 1.44302<br>E-53 | 0    | 0    | 2.61106E<br>+24 | 2.9343E-<br>102 | 0     | 1.38326E<br>+11 |
| NIPPER      | 3.50063<br>E-74 | 0    | 7.8522E-<br>61  | 0   | 1.52309<br>E-53 | 0    | 0    | 2.61106E<br>+24 | 3.2043E-<br>102 | 0     | 1.39615E<br>+11 |
| WINCH       | 3.50063<br>E-74 | 0    | 7.8522E-<br>61  | 0   | 1.52309<br>E-53 | 0    | 0    | 2.61106E<br>+24 | 3.2043E-<br>102 | 0     | 1.39615E<br>+11 |

| Nuclide      | 89Sr            | 91Sr | 91Y             | 93Y | 95Zr            | 97Zr | 99Mo | 99Tc            | 103Ru           | 105Rh | 106Ru           |
|--------------|-----------------|------|-----------------|-----|-----------------|------|------|-----------------|-----------------|-------|-----------------|
| CYPRESS      | 3.90966<br>E-74 | 0    | 8.63848<br>E-61 | 0   | 1.66188<br>E-53 | 0    | 0    | 2.61106E<br>+24 | 3.6939E-<br>102 | 0     | 1.41723E<br>+11 |
| VALISE       | 6.22708<br>E-74 | 0    | 1.29124<br>E-60 | 0   | 2.39948<br>E-53 | 0    | 0    | 2.61106E<br>+24 | 6.7226E-<br>102 | 0     | 1.50957E<br>+11 |
| CHATTY       | 6.22768<br>E-74 | 0    | 1.29135<br>E-60 | 0   | 2.39966<br>E-53 | 0    | 0    | 2.61106E<br>+24 | 6.7234E-<br>102 | 0     | 1.50959E<br>+11 |
| BARSAC       | 6.41387<br>E-74 | 0    | 1.32462<br>E-60 | 0   | 2.45611<br>E-53 | 0    | 0    | 2.61106E<br>+24 | 6.9831E-<br>102 | 0     | 1.51563E<br>+11 |
| COFFER       | 3.24437<br>E-73 | 0    | 6.68984<br>E-60 | 0   | 1.23935<br>E-52 | 0    | 0    | 1.30553E<br>+25 | 3.5441E-<br>101 | 0     | 7.59009E<br>+11 |
| GOURD BROWN  | 1.03371<br>E-73 | 0    | 2.0003E-<br>60  | 0   | 3.57945<br>E-53 | 0    | 0    | 2.61106E<br>+24 | 1.2903E-<br>101 | 0     | 1.61697E<br>+11 |
| GOURD AMBER  | 1.03371<br>E-73 | 0    | 2.0003E-<br>60  | 0   | 3.57945<br>E-53 | 0    | 0    | 2.61106E<br>+24 | 1.2903E-<br>101 | 0     | 1.61697E<br>+11 |
| BLENTON      | 6.18713<br>E-73 | 0    | 1.18352<br>E-59 | 0   | 2.10456<br>E-52 | 0    | 0    | 1.43608E<br>+25 | 7.9126E-<br>101 | 0     | 8.9959E+<br>11  |
| THISTLE      | 6.18713<br>E-73 | 0    | 1.18352<br>E-59 | 0   | 2.10456<br>E-52 | 0    | 0    | 1.43608E<br>+25 | 7.9126E-<br>101 | 0     | 8.9959E+<br>11  |
| PURSE        | 6.79818<br>E-73 | 0    | 1.28381<br>E-59 | 0   | 2.26694<br>E-52 | 0    | 0    | 1.43608E<br>+25 | 8.9319E-<br>101 | 0     | 9.11153E<br>+11 |
| ALIMENT      | 1.38278<br>E-73 | 0    | 2.57167<br>E-60 | 0   | 4.50326<br>E-53 | 0    | 0    | 2.61106E<br>+24 | 1.8761E-<br>101 | 0     | 1.68204E<br>+11 |
| IPECAC A     | 1.62654<br>E-73 | 0    | 2.95875<br>E-60 | 0   | 5.11881<br>E-53 | 0    | 0    | 2.61106E<br>+24 | 2.3119E-<br>101 | 0     | 1.71948E<br>+11 |
| IPECAC B     | 1.62654<br>E-73 | 0    | 2.95875<br>E-60 | 0   | 5.11881<br>E-53 | 0    | 0    | 2.61106E<br>+24 | 2.3119E-<br>101 | 0     | 1.71948E<br>+11 |
| TORRIDO      | 8.94724<br>E-73 | 0    | 1.62751<br>E-59 | 0   | 2.81566<br>E-52 | 0    | 0    | 1.43608E<br>+25 | 1.2718E-<br>100 | 0     | 9.45732E<br>+11 |
| TAPPER       | 2.02583<br>E-73 | 0    | 3.57635<br>E-60 | 0   | 6.08699<br>E-53 | 0    | 0    | 2.61106E<br>+24 | 3.0664E-<br>101 | 0     | 1.77144E<br>+11 |
| BOWL-1       | 2.45765<br>E-73 | 0    | 4.22582<br>E-60 | 0   | 7.08964<br>E-53 | 0    | 0    | 2.61106E<br>+24 | 3.9317E-<br>101 | 0     | 1.81846E<br>+11 |
| BOWL-2       | 2.45765<br>E-73 | 0    | 4.22582<br>E-60 | 0   | 7.08964<br>E-53 | 0    | 0    | 2.61106E<br>+24 | 3.9317E-<br>101 | 0     | 1.81846E<br>+11 |
| ILDRIM       | 1.7755E-<br>72  | 0    | 2.94141<br>E-59 | 0   | 4.83559<br>E-52 | 0    | 0    | 1.43608E<br>+25 | 3.0712E-<br>100 | 0     | 1.03784E<br>+12 |
| HUTCH        | 1.7774E-<br>72  | 0    | 2.94413<br>E-59 | 0   | 4.83969<br>E-52 | 0    | 0    | 1.43608E<br>+25 | 3.0755E-<br>100 | 0     | 1.03799E<br>+12 |
| SPIDER B     | 4.80973<br>E-73 | 0    | 7.5463E-<br>60  | 0   | 1.2043E-<br>52  | 0    | 0    | 2.61106E<br>+24 | 9.3265E-<br>101 | 0     | 1.99181E<br>+11 |
| SPIDER A     | 4.80973<br>E-73 | 0    | 7.5463E-<br>60  | 0   | 1.2043E-<br>52  | 0    | 0    | 2.61106E<br>+24 | 9.3265E-<br>101 | 0     | 1.99181E<br>+11 |
| PLIERS       | 5.74641<br>E-73 | 0    | 8.79972<br>E-60 | 0   | 1.38585<br>E-52 | 0    | 0    | 2.61106E<br>+24 | 1.1726E-<br>100 | 0     | 2.04045E<br>+11 |
| HOREHOUND    | 5.74641<br>E-73 | 0    | 8.79972<br>E-60 | 0   | 1.38585<br>E-52 | 0    | 0    | 2.61106E<br>+24 | 1.1726E-<br>100 | 0     | 2.04045E<br>+11 |
| MINUTE STEAK | 7.17463<br>E-73 | 0    | 1.06591<br>E-59 | 0   | 1.65116<br>E-52 | 0    | 0    | 2.61106E<br>+24 | 1.5601E-<br>100 | 0     | 2.1028E+<br>11  |
| JORUM        | 3.78203<br>E-71 | 0    | 5.57848<br>E-58 | 0   | 8.60745<br>E-51 | 0    | 0    | 1.30553E<br>+26 | 8.3494E-<br>99  | 0     | 1.05897E<br>+13 |
| KYACK A      | 7.99079<br>E-73 | 0    | 1.16985<br>E-59 | 0   | 1.79768<br>E-52 | 0    | 0    | 2.61106E<br>+24 | 1.792E-<br>100  | 0     | 2.13375E<br>+11 |
| KYACK B      | 7.99079<br>E-73 | 0    | 1.16985<br>E-59 | 0   | 1.79768<br>E-52 | 0    | 0    | 2.61106E<br>+24 | 1.792E-<br>100  | 0     | 2.13375E<br>+11 |
| SEAWEED D    | 9.29255<br>E-73 | 0    | 1.3327E-<br>59  | 0   | 2.02505<br>E-52 | 0    | 0    | 2.61106E<br>+24 | 2.176E-<br>100  | 0     | 2.17787E<br>+11 |
| SEAWEED E    | 9.29255<br>E-73 | 0    | 1.3327E-<br>59  | 0   | 2.02505<br>E-52 | 0    | 0    | 2.61106E<br>+24 | 2.176E-<br>100  | 0     | 2.17787E<br>+11 |
| SEAWEED C    | 9.29255<br>E-73 | 0    | 1.3327E-<br>59  | 0   | 2.02505<br>E-52 | 0    | 0    | 2.61106E<br>+24 | 2.176E-<br>100  | 0     | 2.17787E<br>+11 |
| PIPKIN       | 3.06878<br>E-71 | 0    | 4.34385<br>E-58 | 0   | 6.55349<br>E-51 | 0    | 0    | 7.83319E<br>+25 | 7.3867E-<br>99  | 0     | 6.61926E<br>+12 |
| SEAWEED B    | 1.14127<br>E-72 | 0    | 1.59152<br>E-59 | 0   | 2.38161<br>E-52 | 0    | 0    | 2.61106E<br>+24 | 2.8346E-<br>100 | 0     | 2.23942E<br>+11 |
| CRUET        | 7.52628<br>E-73 | 0    | 1.02388<br>E-59 | 0   | 1.5116E-<br>52  | 0    | 0    | 1.43609E<br>+24 | 1.9691E-<br>100 | 0     | 1.26237E<br>+11 |
| POD D        | 1.36881<br>E-72 | 0    | 1.86207<br>E-59 | 0   | 2.74899<br>E-52 | 0    | 0    | 2.61107E<br>+24 | 3.5815E-<br>100 | 0     | 2.29531E<br>+11 |
| POD C        | 1.36881<br>E-72 | 0    | 1.86207<br>E-59 | 0   | 2.74899<br>E-52 | 0    | 0    | 2.61107E<br>+24 | 3.5815E-<br>100 | 0     | 2.29531E<br>+11 |
| POD B        | 1.36881<br>E-72 | 0    | 1.86207<br>E-59 | 0   | 2.74899<br>E-52 | 0    | 0    | 2.61107E<br>+24 | 3.5815E-<br>100 | 0     | 2.29531E<br>+11 |
| POD A        | 1.36881<br>E-72 | 0    | 1.86208<br>E-59 | 0   | 2.74901<br>E-52 | 0    | 0    | 2.61107E<br>+24 | 3.5815E-<br>100 | 0     | 2.29531E<br>+11 |
| CALABASH     | 7.53718<br>E-72 | 0    | 1.02516<br>E-58 | 0   | 1.51333<br>E-51 | 0    | 0    | 1.43609E<br>+25 | 1.9728E-<br>99  | 0     | 1.26262E<br>+12 |

| Nuclide        | 89Sr        | 91Sr | 91Y         | 93Y | 95Zr        | 97Zr | 99Mo | 99Tc        | 103Ru       | 105Rh | 106Ru       |
|----------------|-------------|------|-------------|-----|-------------|------|------|-------------|-------------|-------|-------------|
| SCUTTLE        | 1.42548E-73 | 0    | 1.88618E-60 | 0   | 2.7428E-53  | 0    | 0    | 2.21941E+23 | 3.9532E-101 | 0     | 20054909603 |
| PICCALILLI     | 1.02915E-71 | 0    | 1.34156E-58 | 0   | 1.93499E-51 | 0    | 0    | 1.43609E+25 | 2.9451E-99  | 0     | 1.31709E+12 |
| PLANER         | 1.87118E-72 | 0    | 2.4392E-59  | 0   | 3.51817E-52 | 0    | 0    | 2.61107E+24 | 5.3547E-100 | 0     | 2.39471E+11 |
| DIESEL TRAIN   | 2.27021E-72 | 0    | 2.88235E-59 | 0   | 4.09793E-52 | 0    | 0    | 2.61107E+24 | 6.8665E-100 | 0     | 2.45831E+11 |
| CULANTRO B     | 2.42864E-72 | 0    | 3.05525E-59 | 0   | 4.32198E-52 | 0    | 0    | 2.61107E+24 | 7.489E-100  | 0     | 2.4809E+11  |
| CULANTRO A     | 2.42864E-72 | 0    | 3.05525E-59 | 0   | 4.32198E-52 | 0    | 0    | 2.61107E+24 | 7.489E-100  | 0     | 2.4809E+11  |
| TUN A          | 2.42933E-72 | 0    | 3.05601E-59 | 0   | 4.32296E-52 | 0    | 0    | 2.61107E+24 | 7.4918E-100 | 0     | 2.481E+11   |
| TUN C          | 2.42933E-72 | 0    | 3.05601E-59 | 0   | 4.32296E-52 | 0    | 0    | 2.61107E+24 | 7.4918E-100 | 0     | 2.481E+11   |
| TUN B          | 2.42933E-72 | 0    | 3.05601E-59 | 0   | 4.32296E-52 | 0    | 0    | 2.61107E+24 | 7.4918E-100 | 0     | 2.481E+11   |
| TUN D          | 2.42933E-72 | 0    | 3.05601E-59 | 0   | 4.32296E-52 | 0    | 0    | 2.61107E+24 | 7.4918E-100 | 0     | 2.481E+11   |
| GRAPE A        | 1.4704E-71  | 0    | 1.8257E-58  | 0   | 2.56425E-51 | 0    | 0    | 1.43609E+25 | 4.6606E-99  | 0     | 1.38238E+12 |
| LOVAGE         | 2.67384E-72 | 0    | 3.31987E-59 | 0   | 4.6628E-52  | 0    | 0    | 2.61107E+24 | 8.4755E-100 | 0     | 2.51347E+11 |
| TERRINE WHITE  | 1.49413E-71 | 0    | 1.85112E-58 | 0   | 2.59685E-51 | 0    | 0    | 1.43609E+25 | 4.7576E-99  | 0     | 1.38539E+12 |
| TERRINE YELLOW | 1.49413E-71 | 0    | 1.85112E-58 | 0   | 2.59685E-51 | 0    | 0    | 1.43609E+25 | 4.7576E-99  | 0     | 1.38539E+12 |
| FOB BLUE       | 4.44544E-72 | 0    | 5.14973E-59 | 0   | 6.96419E-52 | 0    | 0    | 2.61107E+24 | 1.63E-99    | 0     | 2.69285E+11 |
| FOB RED        | 4.44544E-72 | 0    | 5.14973E-59 | 0   | 6.96419E-52 | 0    | 0    | 2.61107E+24 | 1.63E-99    | 0     | 2.69285E+11 |
| FOB GREEN      | 4.44544E-72 | 0    | 5.14973E-59 | 0   | 6.96419E-52 | 0    | 0    | 2.61107E+24 | 1.63E-99    | 0     | 2.69285E+11 |
| AJO            | 4.89497E-72 | 0    | 5.59644E-59 | 0   | 7.51421E-52 | 0    | 0    | 2.61107E+24 | 1.8451E-99  | 0     | 2.72826E+11 |
| GRAPE B        | 2.8834E-71  | 0    | 3.26591E-58 | 0   | 4.36271E-51 | 0    | 0    | 1.43609E+25 | 1.10841E-98 | 0     | 1.51457E+12 |
| BELEN          | 2.8834E-71  | 0    | 3.26591E-58 | 0   | 4.36271E-51 | 0    | 0    | 1.43609E+25 | 1.10841E-98 | 0     | 1.51457E+12 |
| LABIS          | 6.63613E-72 | 0    | 7.50358E-59 | 0   | 1.00142E-51 | 0    | 0    | 3.26383E+24 | 2.5602E-99  | 0     | 3.44807E+11 |
| DIANA MIST     | 5.77846E-72 | 0    | 6.45869E-59 | 0   | 8.56544E-52 | 0    | 0    | 2.61107E+24 | 2.2841E-99  | 0     | 2.79034E+11 |
| CUMARIN        | 3.8407E-71  | 0    | 4.18336E-58 | 0   | 5.47025E-51 | 0    | 0    | 1.43609E+25 | 1.60278E-98 | 0     | 1.57461E+12 |
| YANNIGAN RED   | 3.89604E-71 | 0    | 4.23536E-58 | 0   | 5.53235E-51 | 0    | 0    | 1.43609E+25 | 1.63255E-98 | 0     | 1.57766E+12 |
| YANNIGAN BLUE  | 3.89604E-71 | 0    | 4.23536E-58 | 0   | 5.53235E-51 | 0    | 0    | 1.43609E+25 | 1.63255E-98 | 0     | 1.57766E+12 |
| YANNIGAN WHITE | 3.89604E-71 | 0    | 4.23536E-58 | 0   | 5.53235E-51 | 0    | 0    | 1.43609E+25 | 1.63255E-98 | 0     | 1.57766E+12 |
| CYATHUS        | 3.43673E-72 | 0    | 3.68084E-59 | 0   | 4.76911E-52 | 0    | 0    | 1.13581E+24 | 1.4858E-99  | 0     | 1.26639E+11 |
| ARABIS RED     | 7.90324E-72 | 0    | 8.46422E-59 | 0   | 1.09664E-51 | 0    | 0    | 2.61107E+24 | 3.4172E-99  | 0     | 2.91138E+11 |
| ARABIS BLUE    | 7.90324E-72 | 0    | 8.46422E-59 | 0   | 1.09664E-51 | 0    | 0    | 2.61107E+24 | 3.4172E-99  | 0     | 2.91138E+11 |
| ARABIS GREEN   | 7.90324E-72 | 0    | 8.46422E-59 | 0   | 1.09664E-51 | 0    | 0    | 2.61107E+24 | 3.4172E-99  | 0     | 2.91138E+11 |
| JAL            | 9.44134E-72 | 0    | 9.86917E-59 | 0   | 1.26185E-51 | 0    | 0    | 2.61107E+24 | 4.2956E-99  | 0     | 2.98244E+11 |
| SHAPER         | 5.51406E-71 | 0    | 5.71691E-58 | 0   | 7.27693E-51 | 0    | 0    | 1.43609E+25 | 2.55229E-98 | 0     | 1.65375E+12 |
| HANDLEY        | 5.21124E-70 | 0    | 5.37441E-57 | 0   | 6.82122E-50 | 0    | 0    | 1.30553E+26 | 2.4391E-97  | 0     | 1.51135E+13 |
| SNUBBER        | 9.43087E-72 | 0    | 9.26746E-59 | 0   | 1.14562E-51 | 0    | 0    | 1.65803E+24 | 4.8854E-99  | 0     | 2.01384E+11 |
| CAN RED        | 8.1708E-71  | 0    | 8.02891E-58 | 0   | 9.9249E-51  | 0    | 0    | 1.43609E+25 | 4.23304E-98 | 0     | 1.74434E+12 |
| CAN GREEN      | 8.1708E-71  | 0    | 8.02891E-58 | 0   | 9.9249E-51  | 0    | 0    | 1.43609E+25 | 4.23304E-98 | 0     | 1.74434E+12 |
| BEEBALM        | 1.70331E-71 | 0    | 1.6428E-58  | 0   | 2.01016E-51 | 0    | 0    | 2.61107E+24 | 9.1769E-99  | 0     | 3.23089E+11 |
| HOD C (BLUE)   | 1.70375E-71 | 0    | 1.64316E-58 | 0   | 2.01057E-51 | 0    | 0    | 2.61107E+24 | 9.1799E-99  | 0     | 3.231E+11   |



| Nuclide          | 89Sr            | 91Sr | 91Y             | 93Y | 95Zr            | 97Zr | 99Mo | 99Tc            | 103Ru           | 105Rh | 106Ru           |
|------------------|-----------------|------|-----------------|-----|-----------------|------|------|-----------------|-----------------|-------|-----------------|
| HOD B (RED)      | 1.70375<br>E-71 | 0    | 1.64316<br>E-58 | 0   | 2.01057<br>E-51 | 0    | 0    | 2.61107E<br>+24 | 9.1799E-<br>99  | 0     | 3.231E+1<br>1   |
| HOD A (GREEN )   | 1.70375<br>E-71 | 0    | 1.64316<br>E-58 | 0   | 2.01057<br>E-51 | 0    | 0    | 2.61107E<br>+24 | 9.1799E-<br>99  | 0     | 3.231E+1<br>1   |
| MINT LEAF        | 1.80072<br>E-71 | 0    | 1.72362<br>E-58 | 0   | 2.10035<br>E-51 | 0    | 0    | 2.61107E<br>+24 | 9.8575E-<br>99  | 0     | 3.25534E<br>+11 |
| DIAMOND DUST     | 1.98055<br>E-71 | 0    | 1.87129<br>E-58 | 0   | 2.26419<br>E-51 | 0    | 0    | 2.61107E<br>+24 | 1.11416<br>E-98 | 0     | 3.29763E<br>+11 |
| CORNICE YELLOW   | 1.13475<br>E-70 | 0    | 1.06619<br>E-57 | 0   | 1.28613<br>E-50 | 0    | 0    | 1.43609E<br>+25 | 6.45875<br>E-98 | 0     | 1.82378E<br>+12 |
| CORNICE GREEN    | 1.13475<br>E-70 | 0    | 1.06619<br>E-57 | 0   | 1.28613<br>E-50 | 0    | 0    | 1.43609E<br>+25 | 6.45875<br>E-98 | 0     | 1.82378E<br>+12 |
| MANZANAS         | 2.24085<br>E-71 | 0    | 2.08187<br>E-58 | 0   | 2.49592<br>E-51 | 0    | 0    | 2.61107E<br>+24 | 1.30599<br>E-98 | 0     | 3.35332E<br>+11 |
| MORRONES         | 1.23264<br>E-70 | 0    | 1.14517<br>E-57 | 0   | 1.37291<br>E-50 | 0    | 0    | 1.43609E<br>+25 | 7.18426<br>E-98 | 0     | 1.84436E<br>+12 |
| HUDSON MOON      | 2.40034<br>E-71 | 0    | 2.20923<br>E-58 | 0   | 2.63508<br>E-51 | 0    | 0    | 2.61107E<br>+24 | 1.42677<br>E-98 | 0     | 3.38473E<br>+11 |
| FLASK GREEN      | 1.26071<br>E-70 | 0    | 1.16026<br>E-57 | 0   | 1.38388<br>E-50 | 0    | 0    | 1.37081E<br>+25 | 7.49456<br>E-98 | 0     | 1.77708E<br>+12 |
| FLASK RED        | 4.20235<br>E-74 | 0    | 3.86755<br>E-61 | 0   | 4.61292<br>E-54 | 0    | 0    | 4.56937E<br>+21 | 2.4982E-<br>101 | 0     | 59236079<br>5.8 |
| FLASK YELLOW     | 1.0806E-<br>73  | 0    | 9.94512<br>E-61 | 0   | 1.18618<br>E-53 | 0    | 0    | 1.17498E<br>+22 | 6.4239E-<br>101 | 0     | 15232134<br>75  |
| PITON C          | 2.46357<br>E-71 | 0    | 2.2594E-<br>58  | 0   | 2.68971<br>E-51 | 0    | 0    | 2.61107E<br>+24 | 1.4753E-<br>98  | 0     | 3.39668E<br>+11 |
| PITON B          | 2.46392<br>E-71 | 0    | 2.25967<br>E-58 | 0   | 2.69001<br>E-51 | 0    | 0    | 2.61107E<br>+24 | 1.47557<br>E-98 | 0     | 3.39675E<br>+11 |
| PITON A          | 2.46392<br>E-71 | 0    | 2.25967<br>E-58 | 0   | 2.69001<br>E-51 | 0    | 0    | 2.61107E<br>+24 | 1.47557<br>E-98 | 0     | 3.39675E<br>+11 |
| ARNICA YELLOW    | 3.67008<br>E-71 | 0    | 3.18778<br>E-58 | 0   | 3.68393<br>E-51 | 0    | 0    | 2.61107E<br>+24 | 2.46367<br>E-98 | 0     | 3.58533E<br>+11 |
| ARNICA VIOLET    | 3.67008<br>E-71 | 0    | 3.18778<br>E-58 | 0   | 3.68393<br>E-51 | 0    | 0    | 2.61107E<br>+24 | 2.46367<br>E-98 | 0     | 3.58533E<br>+11 |
| SCREE CHAMOIS    | 1.63939<br>E-70 | 0    | 1.16099<br>E-57 | 0   | 1.20019<br>E-50 | 0    | 0    | 2.61107E<br>+24 | 1.68968<br>E-97 | 0     | 4.39211E<br>+11 |
| SCREE ACAJOU     | 1.63939<br>E-70 | 0    | 1.16099<br>E-57 | 0   | 1.20019<br>E-50 | 0    | 0    | 2.61107E<br>+24 | 1.68968<br>E-97 | 0     | 4.39211E<br>+11 |
| SCREE ALHAMBRA   | 1.63939<br>E-70 | 0    | 1.16099<br>E-57 | 0   | 1.20019<br>E-50 | 0    | 0    | 2.61107E<br>+24 | 1.68968<br>E-97 | 0     | 4.39211E<br>+11 |
| TIJERAS          | 9.13818<br>E-70 | 0    | 6.4597E-<br>57  | 0   | 6.67117<br>E-50 | 0    | 0    | 1.43609E<br>+25 | 9.45467<br>E-97 | 0     | 2.42005E<br>+12 |
| TRUCHAS CHACON   | 2.01334<br>E-70 | 0    | 1.38641<br>E-57 | 0   | 1.41146<br>E-50 | 0    | 0    | 2.61107E<br>+24 | 2.20091<br>E-97 | 0     | 4.51621E<br>+11 |
| TRUCHAS CHAMISAL | 2.01334<br>E-70 | 0    | 1.38641<br>E-57 | 0   | 1.41146<br>E-50 | 0    | 0    | 2.61107E<br>+24 | 2.20091<br>E-97 | 0     | 4.51621E<br>+11 |
| TRUCHAS RODARTE  | 2.01334<br>E-70 | 0    | 1.38641<br>E-57 | 0   | 1.41146<br>E-50 | 0    | 0    | 2.61107E<br>+24 | 2.20091<br>E-97 | 0     | 4.51621E<br>+11 |
| ABEYAS           | 1.23616<br>E-69 | 0    | 8.38547<br>E-57 | 0   | 8.46734<br>E-50 | 0    | 0    | 1.43609E<br>+25 | 1.3946E-<br>96  | 0     | 2.52126E<br>+12 |
| PENASCO          | 2.72353<br>E-70 | 0    | 1.79973<br>E-57 | 0   | 1.79149<br>E-50 | 0    | 0    | 2.61107E<br>+24 | 3.24644<br>E-97 | 0     | 4.70508E<br>+11 |
| CARRIZOZO        | 3.30051<br>E-70 | 0    | 2.12458<br>E-57 | 0   | 2.08481<br>E-50 | 0    | 0    | 2.61107E<br>+24 | 4.15684<br>E-97 | 0     | 4.82929E<br>+11 |
| CORAZON          | 3.30051<br>E-70 | 0    | 2.12458<br>E-57 | 0   | 2.08481<br>E-50 | 0    | 0    | 2.61107E<br>+24 | 4.15684<br>E-97 | 0     | 4.82929E<br>+11 |
| CANJILON         | 3.94696<br>E-70 | 0    | 2.47946<br>E-57 | 0   | 2.40086<br>E-50 | 0    | 0    | 2.61107E<br>+24 | 5.23237<br>E-97 | 0     | 4.94786E<br>+11 |
| ARTESIA          | 2.17083<br>E-69 | 0    | 1.3637E-<br>56  | 0   | 1.32047<br>E-49 | 0    | 0    | 1.43609E<br>+25 | 2.8778E-<br>96  | 0     | 2.72132E<br>+12 |
| AVENS ALKERMES   | 3.94696<br>E-70 | 0    | 2.47946<br>E-57 | 0   | 2.40086<br>E-50 | 0    | 0    | 2.61107E<br>+24 | 5.23237<br>E-97 | 0     | 4.94786E<br>+11 |
| AVENS ANDORRE    | 3.94696<br>E-70 | 0    | 2.47946<br>E-57 | 0   | 2.40086<br>E-50 | 0    | 0    | 2.61107E<br>+24 | 5.23237<br>E-97 | 0     | 4.94786E<br>+11 |
| AVENS CREAM      | 3.94696<br>E-70 | 0    | 2.47946<br>E-57 | 0   | 2.40086<br>E-50 | 0    | 0    | 2.61107E<br>+24 | 5.23237<br>E-97 | 0     | 4.94786E<br>+11 |
| AVENS ASAMITE    | 3.94696<br>E-70 | 0    | 2.47946<br>E-57 | 0   | 2.40086<br>E-50 | 0    | 0    | 2.61107E<br>+24 | 5.23237<br>E-97 | 0     | 4.94786E<br>+11 |
| CARPETBAG        | 4.40185<br>E-69 | 0    | 2.76003<br>E-56 | 0   | 2.6698E-<br>49  | 0    | 0    | 2.87218E<br>+25 | 5.85846<br>E-96 | 0     | 5.45281E<br>+12 |
| BANEBERRY        | 2.0278E-<br>70  | 0    | 1.26915<br>E-57 | 0   | 1.22643<br>E-50 | 0    | 0    | 1.30554E<br>+24 | 2.70919<br>E-97 | 0     | 2.48305E<br>+11 |
| EMBUDO           | 4.7912E-<br>69  | 0    | 2.14114<br>E-56 | 0   | 1.72157<br>E-49 | 0    | 0    | 2.61108E<br>+24 | 1.2986E-<br>95  | 0     | 6.94123E<br>+11 |
| DEXTER           | 5.27166<br>E-69 | 0    | 2.32534<br>E-56 | 0   | 1.85642<br>E-49 | 0    | 0    | 2.61108E<br>+24 | 1.46848<br>E-95 | 0     | 7.03177E<br>+11 |

| Nuclide         | 89Sr        | 91Sr | 91Y         | 93Y | 95Zr        | 97Zr | 99Mo | 99Tc        | 103Ru       | 105Rh | 106Ru       |
|-----------------|-------------|------|-------------|-----|-------------|------|------|-------------|-------------|-------|-------------|
| LAGUNA          | 2.9019E-68  | 0    | 1.27989E-55 | 0   | 1.02172E-48 | 0    | 0    | 1.43609E+25 | 8.08554E-95 | 0     | 3.86792E+12 |
| HAREBELL        | 2.93947E-68 | 0    | 1.29418E-55 | 0   | 1.03215E-48 | 0    | 0    | 1.43609E+25 | 8.22045E-95 | 0     | 3.87467E+12 |
| CAMPHOR         | 5.73874E-69 | 0    | 2.50223E-56 | 0   | 1.98505E-49 | 0    | 0    | 2.61108E+24 | 1.63794E-95 | 0     | 7.11318E+11 |
| DIAMOND MINE    | 5.88324E-69 | 0    | 2.55655E-56 | 0   | 2.02439E-49 | 0    | 0    | 2.61108E+24 | 1.69119E-95 | 0     | 7.13721E+11 |
| MINIATA         | 2.68766E-68 | 0    | 1.15272E-55 | 0   | 9.06268E-49 | 0    | 0    | 1.0836E+25  | 7.94146E-95 | 0     | 3.00077E+12 |
| BRACKEN         | 6.56577E-69 | 0    | 2.81074E-56 | 0   | 2.20755E-49 | 0    | 0    | 2.61108E+24 | 1.94768E-95 | 0     | 7.24424E+11 |
| APODACA         | 7.73887E-69 | 0    | 3.23947E-56 | 0   | 2.51332E-49 | 0    | 0    | 2.61108E+24 | 2.40637E-95 | 0     | 7.40754E+11 |
| BARRANCA        | 9.37747E-69 | 0    | 3.82388E-56 | 0   | 2.92461E-49 | 0    | 0    | 2.61108E+24 | 3.08081E-95 | 0     | 7.60299E+11 |
| NAMA MEPHISTO   | 9.53222E-69 | 0    | 3.87831E-56 | 0   | 2.96263E-49 | 0    | 0    | 2.61108E+24 | 3.14636E-95 | 0     | 7.61988E+11 |
| NAMA AMARYLIS   | 9.53222E-69 | 0    | 3.87831E-56 | 0   | 2.96263E-49 | 0    | 0    | 2.61108E+24 | 3.14636E-95 | 0     | 7.61988E+11 |
| BALTIC          | 9.64396E-69 | 0    | 3.91754E-56 | 0   | 2.99E-49    | 0    | 0    | 2.61108E+24 | 3.1939E-95  | 0     | 7.63193E+11 |
| ALGODONES       | 6.25163E-68 | 0    | 2.48322E-55 | 0   | 1.87223E-48 | 0    | 0    | 1.43609E+25 | 2.17023E-94 | 0     | 4.29216E+12 |
| FRIJOLE GUAJE   | 1.83731E-68 | 0    | 6.83528E-56 | 0   | 4.97245E-49 | 0    | 0    | 2.61108E+24 | 7.31882E-95 | 0     | 8.32902E+11 |
| FRIJOLE PETACA  | 1.83731E-68 | 0    | 6.83528E-56 | 0   | 4.97245E-49 | 0    | 0    | 2.61108E+24 | 7.31882E-95 | 0     | 8.32902E+11 |
| FRIJOLE DEMING  | 1.83731E-68 | 0    | 6.83528E-56 | 0   | 4.97245E-49 | 0    | 0    | 2.61108E+24 | 7.31882E-95 | 0     | 8.32902E+11 |
| FRIJOLE ESPUELA | 1.83731E-68 | 0    | 6.83528E-56 | 0   | 4.97245E-49 | 0    | 0    | 2.61108E+24 | 7.31882E-95 | 0     | 8.32902E+11 |
| PEDERNAL        | 2.02252E-68 | 0    | 7.42637E-56 | 0   | 5.36395E-49 | 0    | 0    | 2.61108E+24 | 8.28134E-95 | 0     | 8.4382E+11  |
| CHANTILLY       | 2.0231E-68  | 0    | 7.42821E-56 | 0   | 5.36516E-49 | 0    | 0    | 2.61108E+24 | 8.28439E-95 | 0     | 8.43853E+11 |
| CATHAY          | 2.289E-68   | 0    | 8.26411E-56 | 0   | 5.91428E-49 | 0    | 0    | 2.61108E+24 | 9.71072E-95 | 0     | 8.58102E+11 |
| LAGOON          | 2.4854E-68  | 0    | 8.87301E-56 | 0   | 6.31124E-49 | 0    | 0    | 2.61108E+24 | 1.07956E-94 | 0     | 8.67735E+11 |
| DIAGONAL LINE   | 4.37651E-68 | 0    | 1.44638E-55 | 0   | 9.86344E-49 | 0    | 0    | 2.61108E+24 | 2.23549E-94 | 0     | 9.36934E+11 |
| PARNIASSIA      | 4.73983E-68 | 0    | 1.5495E-55  | 0   | 1.05041E-48 | 0    | 0    | 2.61108E+24 | 2.47702E-94 | 0     | 9.47122E+11 |
| CHAENACTIS      | 3.16877E-67 | 0    | 1.00869E-54 | 0   | 6.73927E-48 | 0    | 0    | 1.4361E+25  | 1.75122E-93 | 0     | 5.34888E+12 |
| HOSPAH          | 5.76141E-68 | 0    | 1.83398E-55 | 0   | 1.22532E-48 | 0    | 0    | 2.61108E+24 | 3.18404E-94 | 0     | 9.72524E+11 |
| YERBA           | 5.76141E-68 | 0    | 1.83398E-55 | 0   | 1.22532E-48 | 0    | 0    | 2.61108E+24 | 3.18404E-94 | 0     | 9.72524E+11 |
| MESCALERO       | 7.76477E-68 | 0    | 2.3731E-55  | 0   | 1.55068E-48 | 0    | 0    | 2.61108E+24 | 4.6742E-94  | 0     | 1.01269E+12 |
| COWLES          | 1.16028E-67 | 0    | 3.35704E-55 | 0   | 2.12899E-48 | 0    | 0    | 2.61108E+24 | 7.83634E-94 | 0     | 1.06937E+12 |
| DIANTHUS        | 1.40381E-67 | 0    | 3.95745E-55 | 0   | 2.4744E-48  | 0    | 0    | 2.61108E+24 | 1.0013E-93  | 0     | 1.09736E+12 |
| SAPPHO          | 2.26888E-67 | 0    | 5.99068E-55 | 0   | 3.61415E-48 | 0    | 0    | 2.61109E+24 | 1.85694E-93 | 0     | 1.17118E+12 |
| ONAJA           | 2.50069E-67 | 0    | 6.5157E-55  | 0   | 3.90252E-48 | 0    | 0    | 2.61109E+24 | 2.10451E-93 | 0     | 1.18673E+12 |
| OCATE           | 2.50069E-67 | 0    | 6.5157E-55  | 0   | 3.90252E-48 | 0    | 0    | 2.61109E+24 | 2.10451E-93 | 0     | 1.18673E+12 |
| LONGCHAMPS      | 3.28189E-67 | 0    | 8.23986E-55 | 0   | 4.83629E-48 | 0    | 0    | 2.61109E+24 | 2.98563E-93 | 0     | 1.2313E+12  |
| JICARILLA       | 3.2822E-67  | 0    | 8.24054E-55 | 0   | 4.83666E-48 | 0    | 0    | 2.61109E+24 | 2.986E-93   | 0     | 1.23131E+12 |
| MISTY NORTH     | 3.92881E-67 | 0    | 9.62494E-55 | 0   | 5.57407E-48 | 0    | 0    | 2.61109E+24 | 3.7632E-93  | 0     | 1.26171E+12 |
| KARA            | 4.43185E-67 | 0    | 1.06803E-54 | 0   | 6.13003E-48 | 0    | 0    | 2.61109E+24 | 4.39412E-93 | 0     | 1.28249E+12 |
| ZINNIA          | 4.81258E-67 | 0    | 1.14682E-54 | 0   | 6.54197E-48 | 0    | 0    | 2.61109E+24 | 4.88561E-93 | 0     | 1.2969E+12  |
| MONERO          | 4.95449E-67 | 0    | 1.17596E-54 | 0   | 6.69372E-48 | 0    | 0    | 2.61109E+24 | 5.07172E-93 | 0     | 1.30202E+12 |
| MERIDA          | 6.42391E-67 | 0    | 1.47166E-54 | 0   | 8.2164E-48  | 0    | 0    | 2.61109E+24 | 7.08386E-93 | 0     | 1.3487E+12  |

| Nuclide        | 89Sr            | 91Sr | 91Y             | 93Y | 95Zr            | 97Zr | 99Mo | 99Tc            | 103Ru           | 105Rh | 106Ru           |
|----------------|-----------------|------|-----------------|-----|-----------------|------|------|-----------------|-----------------|-------|-----------------|
| CAPITAN        | 8.56582<br>E-67 | 0    | 1.88682<br>E-54 | 0   | 1.0311E-<br>47  | 0    | 0    | 2.61109E<br>+24 | 1.02575<br>E-92 | 0     | 1.40236E<br>+12 |
| TAJIQUE        | 8.57472<br>E-67 | 0    | 1.88851<br>E-54 | 0   | 1.03194<br>E-47 | 0    | 0    | 2.61109E<br>+24 | 1.02712<br>E-92 | 0     | 1.40256E<br>+12 |
| HAPLOPAPPUS    | 8.57473<br>E-67 | 0    | 1.88851<br>E-54 | 0   | 1.03194<br>E-47 | 0    | 0    | 2.61109E<br>+24 | 1.02712<br>E-92 | 0     | 1.40256E<br>+12 |
| DIAMOND SCULLS | 1.16011<br>E-66 | 0    | 2.45184<br>E-54 | 0   | 1.30994<br>E-47 | 0    | 0    | 2.61109E<br>+24 | 1.51534<br>E-92 | 0     | 1.46125E<br>+12 |
| ATARQUE        | 1.23982<br>E-66 | 0    | 2.59665<br>E-54 | 0   | 1.38046<br>E-47 | 0    | 0    | 2.61109E<br>+24 | 1.65058<br>E-92 | 0     | 1.47448E<br>+12 |
| CEBOLLA        | 1.52315<br>E-66 | 0    | 3.10173<br>E-54 | 0   | 1.6239E-<br>47  | 0    | 0    | 2.61109E<br>+24 | 2.15093<br>E-92 | 0     | 1.51621E<br>+12 |
| SOLANO         | 1.52315<br>E-66 | 0    | 3.10173<br>E-54 | 0   | 1.6239E-<br>47  | 0    | 0    | 2.61109E<br>+24 | 2.15093<br>E-92 | 0     | 1.51621E<br>+12 |
| CUCHILLO       | 1.52315<br>E-66 | 0    | 3.10173<br>E-54 | 0   | 1.6239E-<br>47  | 0    | 0    | 2.61109E<br>+24 | 2.15093<br>E-92 | 0     | 1.51621E<br>+12 |
| OSCURO         | 1.51293<br>E-65 | 0    | 2.84225<br>E-53 | 0   | 1.42397<br>E-46 | 0    | 0    | 1.4361E+<br>25  | 2.53072<br>E-91 | 0     | 9.03509E<br>+12 |
| DELPHINIUM     | 2.20832<br>E-66 | 0    | 4.11031<br>E-54 | 0   | 2.04887<br>E-47 | 0    | 0    | 1.95832E<br>+24 | 3.76662<br>E-92 | 0     | 1.24348E<br>+12 |
| AKBAR          | 5.38724<br>E-66 | 0    | 9.23401<br>E-54 | 0   | 4.40042<br>E-47 | 0    | 0    | 2.61109E<br>+24 | 1.09249<br>E-91 | 0     | 1.79951E<br>+12 |
| ARSENATE       | 5.39649<br>E-66 | 0    | 9.24769<br>E-54 | 0   | 4.40638<br>E-47 | 0    | 0    | 2.61109E<br>+24 | 1.09491<br>E-91 | 0     | 1.79993E<br>+12 |
| CANNA UMBRINUS | 6.02168<br>E-66 | 0    | 1.01659<br>E-53 | 0   | 4.80452<br>E-47 | 0    | 0    | 2.61109E<br>+24 | 1.26073<br>E-91 | 0     | 1.82688E<br>+12 |
| CANNA LIMOGES  | 6.02168<br>E-66 | 0    | 1.01659<br>E-53 | 0   | 4.80452<br>E-47 | 0    | 0    | 2.61109E<br>+24 | 1.26073<br>E-91 | 0     | 1.82688E<br>+12 |
| TULOSO         | 8.47835<br>E-66 | 0    | 1.36606<br>E-53 | 0   | 6.29375<br>E-47 | 0    | 0    | 2.61109E<br>+24 | 1.95787<br>E-91 | 0     | 1.91364E<br>+12 |
| SOLANUM        | 8.70924<br>E-66 | 0    | 1.39813<br>E-53 | 0   | 6.42862<br>E-47 | 0    | 0    | 2.61109E<br>+24 | 2.02673<br>E-91 | 0     | 1.92063E<br>+12 |
| FLAX SOURCE    | 9.61324<br>E-66 | 0    | 1.5226E-<br>53  | 0   | 6.94966<br>E-47 | 0    | 0    | 2.61109E<br>+24 | 2.3013E-<br>91  | 0     | 1.94652E<br>+12 |
| FLAX TEST      | 5.28728<br>E-65 | 0    | 8.37431<br>E-53 | 0   | 3.82231<br>E-46 | 0    | 0    | 1.4361E+<br>25  | 1.26571<br>E-90 | 0     | 1.07059E<br>+13 |
| FLAX BACKUP    | 9.61324<br>E-66 | 0    | 1.5226E-<br>53  | 0   | 6.94966<br>E-47 | 0    | 0    | 2.61109E<br>+24 | 2.3013E-<br>91  | 0     | 1.94652E<br>+12 |
| ALUMROOT       | 2.03899<br>E-65 | 0    | 2.91466<br>E-53 | 0   | 1.25791<br>E-46 | 0    | 0    | 2.61109E<br>+24 | 6.05434<br>E-91 | 0     | 2.15546E<br>+12 |
| MIERA          | 1.51717<br>E-64 | 0    | 2.08114<br>E-52 | 0   | 8.78192<br>E-46 | 0    | 0    | 1.4361E+<br>25  | 4.91232<br>E-90 | 0     | 1.2351E+<br>13  |
| GAZOOK         | 3.39675<br>E-65 | 0    | 4.52899<br>E-53 | 0   | 1.88174<br>E-46 | 0    | 0    | 2.61109E<br>+24 | 1.16738<br>E-90 | 0     | 2.30992E<br>+12 |
| NATOMA         | 4.04745<br>E-65 | 0    | 5.26909<br>E-53 | 0   | 2.16085<br>E-46 | 0    | 0    | 2.61109E<br>+24 | 1.46263<br>E-90 | 0     | 2.36547E<br>+12 |
| ANGUS          | 5.34856<br>E-65 | 0    | 6.70313<br>E-53 | 0   | 2.69248<br>E-46 | 0    | 0    | 2.6111E+<br>24  | 2.09349<br>E-90 | 0     | 2.4566E+<br>12  |
| VELARDE        | 5.34856<br>E-65 | 0    | 6.70313<br>E-53 | 0   | 2.69248<br>E-46 | 0    | 0    | 2.6111E+<br>24  | 2.09349<br>E-90 | 0     | 2.4566E+<br>12  |
| COLMOR         | 5.40028<br>E-65 | 0    | 6.75907<br>E-53 | 0   | 2.71301<br>E-46 | 0    | 0    | 2.6111E+<br>24  | 2.11957<br>E-90 | 0     | 2.4598E+<br>12  |
| STARWORT       | 2.4329E-<br>64  | 0    | 3.04458<br>E-52 | 0   | 1.22196<br>E-45 | 0    | 0    | 1.17499E<br>+25 | 9.5521E-<br>90  | 0     | 1.10708E<br>+13 |
| MESITA         | 6.44828<br>E-65 | 0    | 7.87784<br>E-53 | 0   | 3.12059<br>E-46 | 0    | 0    | 2.6111E+<br>24  | 2.66282<br>E-90 | 0     | 2.51968E<br>+12 |
| CABRESTO       | 7.92179<br>E-65 | 0    | 9.4101E-<br>53  | 0   | 3.67086<br>E-46 | 0    | 0    | 2.6111E+<br>24  | 3.46998<br>E-90 | 0     | 2.59099E<br>+12 |
| KASHAN         | 7.92179<br>E-65 | 0    | 9.4101E-<br>53  | 0   | 3.67086<br>E-46 | 0    | 0    | 2.6111E+<br>24  | 3.46998<br>E-90 | 0     | 2.59099E<br>+12 |
| DIDO QUEEN     | 9.35827<br>E-65 | 0    | 1.08666<br>E-52 | 0   | 4.18677<br>E-46 | 0    | 0    | 2.6111E+<br>24  | 4.29964<br>E-90 | 0     | 2.65021E<br>+12 |
| ALMENDRO       | 2.83977<br>E-63 | 0    | 3.29233<br>E-51 | 0   | 1.26741<br>E-44 | 0    | 0    | 7.83329E<br>+25 | 1.30901<br>E-88 | 0     | 7.96296E<br>+13 |
| POTRILLO       | 6.40233<br>E-64 | 0    | 7.21618<br>E-52 | 0   | 2.73549<br>E-45 | 0    | 0    | 1.4361E+<br>25  | 3.13132<br>E-89 | 0     | 1.5014E+<br>13  |
| PORTULACA      | 6.42353<br>E-64 | 0    | 7.14334<br>E-52 | 0   | 2.68806<br>E-45 | 0    | 0    | 1.30555E<br>+25 | 3.23171<br>E-89 | 0     | 1.38328E<br>+13 |
| SILENE         | 1.28507<br>E-64 | 0    | 1.42902<br>E-52 | 0   | 5.37733<br>E-46 | 0    | 0    | 2.6111E+<br>24  | 6.46578<br>E-90 | 0     | 2.76667E<br>+12 |
| POLYGONUM      | 4.78247<br>E-64 | 0    | 4.44539<br>E-52 | 0   | 1.51685<br>E-45 | 0    | 0    | 2.6111E+<br>24  | 3.50628<br>E-89 | 0     | 3.30636E<br>+12 |
| WALLER         | 4.78452<br>E-64 | 0    | 4.44704<br>E-52 | 0   | 1.51736<br>E-45 | 0    | 0    | 2.6111E+<br>24  | 3.50821<br>E-89 | 0     | 3.30655E<br>+12 |
| HUSKY ACE      | 5.49362<br>E-64 | 0    | 5.01077<br>E-52 | 0   | 1.69221<br>E-45 | 0    | 0    | 2.6111E+<br>24  | 4.19084<br>E-89 | 0     | 3.3691E+<br>12  |

| Nuclide          | 89Sr            | 91Sr | 91Y             | 93Y | 95Zr            | 97Zr | 99Mo | 99Tc             | 103Ru           | 105Rh | 106Ru           |
|------------------|-----------------|------|-----------------|-----|-----------------|------|------|------------------|-----------------|-------|-----------------|
| BERNAL           | 1.04603<br>E-63 | 0    | 8.73847<br>E-52 | 0   | 2.81293<br>E-45 | 0    | 0    | 2.6111E+<br>24   | 9.59638<br>E-89 | 0     | 3.67655E<br>+12 |
| PAJARA           | 1.27008<br>E-63 | 0    | 1.0333E-<br>51  | 0   | 3.2785E-<br>45  | 0    | 0    | 2.6111E+<br>24   | 1.23181<br>E-88 | 0     | 3.77459E<br>+12 |
| SEAFOAM          | 1.2849E-<br>63  | 0    | 1.0437E-<br>51  | 0   | 3.30863<br>E-45 | 0    | 0    | 2.6111E+<br>24   | 1.25033<br>E-88 | 0     | 3.78053E<br>+12 |
| SPAR             | 1.39692<br>E-63 | 0    | 1.12183<br>E-51 | 0   | 3.53424<br>E-45 | 0    | 0    | 2.6111E+<br>24   | 1.39227<br>E-88 | 0     | 3.82363E<br>+12 |
| ELIDA            | 1.39833<br>E-63 | 0    | 1.12281<br>E-51 | 0   | 3.53705<br>E-45 | 0    | 0    | 2.6111E+<br>24   | 1.39408<br>E-88 | 0     | 3.82415E<br>+12 |
| PINEDROPS TAWNY  | 1.88711<br>E-63 | 0    | 1.45457<br>E-51 | 0   | 4.48102<br>E-45 | 0    | 0    | 2.6111E+<br>24   | 2.05009<br>E-88 | 0     | 3.98281E<br>+12 |
| PINEDROPS BAYOU  | 1.88711<br>E-63 | 0    | 1.45457<br>E-51 | 0   | 4.48102<br>E-45 | 0    | 0    | 2.6111E+<br>24   | 2.05009<br>E-88 | 0     | 3.98281E<br>+12 |
| PINEDROPS SLOAT  | 1.88711<br>E-63 | 0    | 1.45457<br>E-51 | 0   | 4.48102<br>E-45 | 0    | 0    | 2.6111E+<br>24   | 2.05009<br>E-88 | 0     | 3.98281E<br>+12 |
| LATIR            | 2.00684<br>E-62 | 0    | 1.4138E-<br>50  | 0   | 4.14676<br>E-44 | 0    | 0    | 1.43611E+<br>+25 | 2.63344<br>E-87 | 0     | 2.39543E<br>+13 |
| HULSEA           | 4.48259<br>E-63 | 0    | 3.07053<br>E-51 | 0   | 8.86907<br>E-45 | 0    | 0    | 2.6111E+<br>24   | 6.23943<br>E-88 | 0     | 4.47858E<br>+12 |
| SAPELLO          | 6.66646<br>E-63 | 0    | 4.3258E-<br>51  | 0   | 1.2131E-<br>44  | 0    | 0    | 2.6111E+<br>24   | 1.03966<br>E-87 | 0     | 4.72622E<br>+12 |
| POTRERO          | 7.75232<br>E-63 | 0    | 4.92792<br>E-51 | 0   | 1.36651<br>E-44 | 0    | 0    | 2.6111E+<br>24   | 1.26241<br>E-87 | 0     | 4.82393E<br>+12 |
| PLOMO            | 8.64584<br>E-63 | 0    | 5.41472<br>E-51 | 0   | 1.48936<br>E-44 | 0    | 0    | 2.6111E+<br>24   | 1.45261<br>E-87 | 0     | 4.89582E<br>+12 |
| JIB              | 9.53308<br>E-63 | 0    | 5.89135<br>E-51 | 0   | 1.60871<br>E-44 | 0    | 0    | 2.6111E+<br>24   | 1.64714<br>E-87 | 0     | 4.9611E+<br>12  |
| GROVE            | 1.15343<br>E-62 | 0    | 6.9452E-<br>51  | 0   | 1.86976<br>E-44 | 0    | 0    | 2.6111E+<br>24   | 2.10473<br>E-87 | 0     | 5.09097E<br>+12 |
| FALLON           | 6.42928<br>E-62 | 0    | 3.86423<br>E-50 | 0   | 1.03928<br>E-43 | 0    | 0    | 1.43611E+<br>+25 | 1.17769<br>E-86 | 0     | 2.80512E<br>+13 |
| JARA             | 1.41734<br>E-62 | 0    | 8.29777<br>E-51 | 0   | 2.19988<br>E-44 | 0    | 0    | 2.6111E+<br>24   | 2.74356<br>E-87 | 0     | 5.23522E<br>+12 |
| MING BLADE       | 1.69538<br>E-62 | 0    | 9.68596<br>E-51 | 0   | 2.53389<br>E-44 | 0    | 0    | 2.6111E+<br>24   | 3.45457<br>E-87 | 0     | 5.36394E<br>+12 |
| ESCABOSA         | 1.24383<br>E-61 | 0    | 6.83231<br>E-50 | 0   | 1.74943<br>E-43 | 0    | 0    | 1.43611E+<br>+25 | 2.75255<br>E-86 | 0     | 3.06772E<br>+13 |
| CRESTLAKE TANSAN | 2.521E-<br>62   | 0    | 1.3644E-<br>50  | 0   | 3.46544<br>E-44 | 0    | 0    | 2.6111E+<br>+24  | 5.75518<br>E-87 | 0     | 5.66043E<br>+12 |
| CRESTLAKE BRIAR  | 2.521E-<br>62   | 0    | 1.3644E-<br>50  | 0   | 3.46544<br>E-44 | 0    | 0    | 2.6111E+<br>+24  | 5.75518<br>E-87 | 0     | 5.66043E<br>+12 |
| PUYE             | 3.65136<br>E-62 | 0    | 1.87879<br>E-50 | 0   | 4.64211<br>E-44 | 0    | 0    | 2.6111E+<br>+24  | 9.26896<br>E-87 | 0     | 5.95204E<br>+12 |
| PORTMANTEAU      | 2.50267<br>E-61 | 0    | 1.24965<br>E-49 | 0   | 3.03744<br>E-43 | 0    | 0    | 1.43611E+<br>+25 | 6.76649<br>E-86 | 0     | 3.3728E+<br>13  |
| PRATT            | 6.49707<br>E-62 | 0    | 3.09032<br>E-50 | 0   | 7.31484<br>E-44 | 0    | 0    | 2.6111E+<br>+24  | 1.94531<br>E-86 | 0     | 6.43579E<br>+12 |
| TRUMBULL         | 6.58871<br>E-62 | 0    | 3.12793<br>E-50 | 0   | 7.39613<br>E-44 | 0    | 0    | 2.6111E+<br>+24  | 1.98068<br>E-86 | 0     | 6.44803E<br>+12 |
| STANYAN          | 3.625E-<br>61   | 0    | 1.72085<br>E-49 | 0   | 4.06894<br>E-43 | 0    | 0    | 1.43611E+<br>+25 | 1.08984<br>E-85 | 0     | 3.54658E<br>+13 |
| ESTACA           | 8.8025E-<br>62  | 0    | 4.01699<br>E-50 | 0   | 9.29569<br>E-44 | 0    | 0    | 2.6111E+<br>+24  | 2.87515<br>E-86 | 0     | 6.70636E<br>+12 |
| HYBLA FAIR       | 1.02235<br>E-61 | 0    | 4.57119<br>E-50 | 0   | 1.04609<br>E-43 | 0    | 0    | 2.6111E+<br>+24  | 3.48557<br>E-86 | 0     | 6.84385E<br>+12 |
| TEMESCAL         | 1.09526<br>E-61 | 0    | 4.85139<br>E-50 | 0   | 1.10453<br>E-43 | 0    | 0    | 2.6111E+<br>+24  | 3.80857<br>E-86 | 0     | 6.90808E<br>+12 |
| PUDDLE           | 1.52195<br>E-61 | 0    | 6.44552<br>E-50 | 0   | 1.43196<br>E-43 | 0    | 0    | 2.6111E+<br>+24  | 5.81538<br>E-86 | 0     | 7.22325E<br>+12 |
| KEEL             | 2.00537<br>E-61 | 0    | 8.17919<br>E-50 | 0   | 1.78018<br>E-43 | 0    | 0    | 2.6111E+<br>+24  | 8.29258<br>E-86 | 0     | 7.49855E<br>+12 |
| PORTOLA LARKIN   | 4.08833<br>E-61 | 0    | 1.51309<br>E-49 | 0   | 3.12308<br>E-43 | 0    | 0    | 2.6111E+<br>+24  | 2.07331<br>E-85 | 0     | 8.25899E<br>+12 |
| PORTOLA          | 4.08833<br>E-61 | 0    | 1.51309<br>E-49 | 0   | 3.12308<br>E-43 | 0    | 0    | 2.6111E+<br>+24  | 2.07331<br>E-85 | 0     | 8.25899E<br>+12 |
| TELEME           | 4.09001<br>E-61 | 0    | 1.51362<br>E-49 | 0   | 3.12409<br>E-43 | 0    | 0    | 2.6111E+<br>+24  | 2.0744E-<br>85  | 0     | 8.25944E<br>+12 |
| BILGE            | 4.89967<br>E-61 | 0    | 1.76913<br>E-49 | 0   | 3.60268<br>E-43 | 0    | 0    | 2.6111E+<br>+24  | 2.61703<br>E-85 | 0     | 8.46424E<br>+12 |
| TOPGALLANT       | 3.04218<br>E-60 | 0    | 1.08043<br>E-48 | 0   | 2.18042<br>E-42 | 0    | 0    | 1.43611E+<br>+25 | 1.68233<br>E-84 | 0     | 4.7325E+<br>13  |
| CABRILLO         | 3.34837<br>E-60 | 0    | 1.17371<br>E-48 | 0   | 2.35183<br>E-42 | 0    | 0    | 1.43611E+<br>+25 | 1.90323<br>E-84 | 0     | 4.79445E<br>+13 |
| DINING CAR       | 9.08243<br>E-61 | 0    | 3.01462<br>E-49 | 0   | 5.86326<br>E-43 | 0    | 0    | 2.6111E+<br>+24  | 5.78934<br>E-85 | 0     | 9.20311E<br>+12 |

| Nuclide     | 89Sr            | 91Sr | 91Y             | 93Y | 95Zr            | 97Zr | 99Mo | 99Tc            | 103Ru           | 105Rh | 106Ru           |
|-------------|-----------------|------|-----------------|-----|-----------------|------|------|-----------------|-----------------|-------|-----------------|
| EDAM        | 6.46238<br>E-60 | 0    | 2.07094<br>E-48 | 0   | 3.95137<br>E-42 | 0    | 0    | 1.43611E<br>+25 | 4.43462<br>E-84 | 0     | 5.24157E<br>+13 |
| OBAR        | 7.02023<br>E-60 | 0    | 2.22445<br>E-48 | 0   | 4.21817<br>E-42 | 0    | 0    | 1.43611E<br>+25 | 4.93306<br>E-84 | 0     | 5.30076E<br>+13 |
| TYBO        | 4.63748<br>E-59 | 0    | 1.43155<br>E-47 | 0   | 2.67619<br>E-41 | 0    | 0    | 7.83334E<br>+25 | 3.4425E-<br>83  | 0     | 2.96739E<br>+14 |
| STILTON     | 1.11887<br>E-59 | 0    | 3.32687<br>E-48 | 0   | 6.09349<br>E-42 | 0    | 0    | 1.43611E<br>+25 | 8.98535<br>E-84 | 0     | 5.64661E<br>+13 |
| MIZZEN      | 1.11908<br>E-59 | 0    | 3.32742<br>E-48 | 0   | 6.0944E-<br>42  | 0    | 0    | 1.43611E<br>+25 | 8.98756<br>E-84 | 0     | 5.64676E<br>+13 |
| ALVISO      | 2.26858<br>E-60 | 0    | 6.64591<br>E-49 | 0   | 1.20742<br>E-42 | 0    | 0    | 2.61111E<br>+24 | 1.87963<br>E-84 | 0     | 1.04194E<br>+13 |
| FUTTOCK     | 2.49558<br>E-60 | 0    | 7.21641<br>E-49 | 0   | 1.30179<br>E-42 | 0    | 0    | 2.61111E<br>+24 | 2.12497<br>E-84 | 0     | 1.05551E<br>+13 |
| MAST        | 7.5953E-<br>59  | 0    | 2.19201<br>E-47 | 0   | 3.95E-41        | 0    | 0    | 7.83334E<br>+25 | 6.49409<br>E-83 | 0     | 3.17271E<br>+14 |
| CAMEMBERT   | 8.35855<br>E-59 | 0    | 2.38098<br>E-47 | 0   | 4.26004<br>E-41 | 0    | 0    | 7.83334E<br>+25 | 7.34544<br>E-83 | 0     | 3.21417E<br>+14 |
| MARSH       | 7.5015E-<br>60  | 0    | 1.8668E-<br>48  | 0   | 3.10261<br>E-42 | 0    | 0    | 2.61112E<br>+24 | 8.75509<br>E-84 | 0     | 1.2254E+<br>13  |
| HUSKY PUP   | 1.44947<br>E-59 | 0    | 3.29714<br>E-48 | 0   | 5.21755<br>E-42 | 0    | 0    | 2.61112E<br>+24 | 2.04302<br>E-83 | 0     | 1.33988E<br>+13 |
| KASSERI     | 4.58667<br>E-58 | 0    | 1.03577<br>E-46 | 0   | 1.63256<br>E-40 | 0    | 0    | 7.83335E<br>+25 | 6.56443<br>E-82 | 0     | 4.04884E<br>+14 |
| DECK        | 2.04059<br>E-59 | 0    | 4.43017<br>E-48 | 0   | 6.83421<br>E-42 | 0    | 0    | 2.61112E<br>+24 | 3.1723E-<br>83  | 0     | 1.4035E+<br>13  |
| INLET       | 6.29028<br>E-58 | 0    | 1.36059<br>E-46 | 0   | 2.09467<br>E-40 | 0    | 0    | 7.83335E<br>+25 | 9.85523<br>E-82 | 0     | 4.22602E<br>+14 |
| LEYDEN      | 2.27732<br>E-59 | 0    | 4.87065<br>E-48 | 0   | 7.45256<br>E-42 | 0    | 0    | 2.61112E<br>+24 | 3.65342<br>E-83 | 0     | 1.42454E<br>+13 |
| CHIBERTA    | 1.74547<br>E-58 | 0    | 3.56791<br>E-47 | 0   | 5.326E-<br>41   | 0    | 0    | 1.43611E<br>+25 | 3.07946<br>E-82 | 0     | 8.19562E<br>+13 |
| MUENSTER    | 1.1532E-<br>57  | 0    | 2.29643<br>E-46 | 0   | 3.37942<br>E-40 | 0    | 0    | 7.83335E<br>+25 | 2.14938<br>E-81 | 0     | 4.58804E<br>+14 |
| KEELSON     | 3.27041<br>E-58 | 0    | 6.13629<br>E-47 | 0   | 8.74155<br>E-41 | 0    | 0    | 1.43612E<br>+25 | 6.90692<br>E-82 | 0     | 8.924E+1<br>3   |
| ESROM       | 3.27103<br>E-58 | 0    | 6.1373E-<br>47  | 0   | 8.74286<br>E-41 | 0    | 0    | 1.43612E<br>+25 | 6.90862<br>E-82 | 0     | 8.92423E<br>+13 |
| FONTINA     | 1.99128<br>E-57 | 0    | 3.68062<br>E-46 | 0   | 5.20051<br>E-40 | 0    | 0    | 7.83336E<br>+25 | 4.34012<br>E-81 | 0     | 4.94079E<br>+14 |
| CHESHIRE    | 1.19168<br>E-57 | 0    | 2.19499<br>E-46 | 0   | 3.09549<br>E-40 | 0    | 0    | 4.56946E<br>+25 | 2.61644<br>E-81 | 0     | 2.89214E<br>+14 |
| SHALLOWS    | 8.04365<br>E-59 | 0    | 1.4483E-<br>47  | 0   | 2.0173E-<br>41  | 0    | 0    | 2.61112E<br>+24 | 1.85236<br>E-82 | 0     | 1.6904E+<br>13  |
| ESTUARY     | 1.65878<br>E-57 | 0    | 2.92057<br>E-46 | 0   | 4.01856<br>E-40 | 0    | 0    | 4.56946E<br>+25 | 4.00392<br>E-81 | 0     | 3.0248E+<br>14  |
| COLBY       | 3.80366<br>E-57 | 0    | 6.63542<br>E-46 | 0   | 9.08407<br>E-40 | 0    | 0    | 9.7917E+<br>25  | 9.36112<br>E-81 | 0     | 6.54152E<br>+14 |
| POOL        | 1.85148<br>E-57 | 0    | 3.21135<br>E-46 | 0   | 4.38265<br>E-40 | 0    | 0    | 4.56946E<br>+25 | 4.61201<br>E-81 | 0     | 3.07021E<br>+14 |
| STRAIT      | 1.85201<br>E-57 | 0    | 3.21214<br>E-46 | 0   | 4.38364<br>E-40 | 0    | 0    | 4.56946E<br>+25 | 4.61371<br>E-81 | 0     | 3.07033E<br>+14 |
| MIGHTY EPIC | 2.2885E-<br>58  | 0    | 3.57283<br>E-47 | 0   | 4.60375<br>E-41 | 0    | 0    | 2.61112E<br>+24 | 7.1107E-<br>82  | 0     | 1.9479E+<br>13  |
| RIVOLI      | 2.55059<br>E-58 | 0    | 3.92354<br>E-47 | 0   | 5.015E-<br>41   | 0    | 0    | 2.61112E<br>+24 | 8.17508<br>E-82 | 0     | 1.97676E<br>+13 |
| BILLET      | 2.76033<br>E-57 | 0    | 3.73788<br>E-46 | 0   | 4.45649<br>E-40 | 0    | 0    | 1.10973E<br>+25 | 1.15639<br>E-80 | 0     | 9.53648E<br>+13 |
| BANON       | 4.15174<br>E-57 | 0    | 5.31758<br>E-46 | 0   | 6.15008<br>E-40 | 0    | 0    | 1.10973E<br>+25 | 1.95504<br>E-80 | 0     | 1.00792E<br>+14 |
| GOUDA       | 1.71453<br>E-57 | 0    | 2.03378<br>E-46 | 0   | 2.25569<br>E-40 | 0    | 0    | 2.61112E<br>+24 | 9.48547<br>E-81 | 0     | 2.55956E<br>+13 |
| SPRIT       | 2.77213<br>E-57 | 0    | 3.07969<br>E-46 | 0   | 3.29568<br>E-40 | 0    | 0    | 2.61113E<br>+24 | 1.75997<br>E-80 | 0     | 2.73188E<br>+13 |
| CHEVRE      | 3.31395<br>E-57 | 0    | 3.59305<br>E-46 | 0   | 3.79427<br>E-40 | 0    | 0    | 2.61113E<br>+24 | 2.21437<br>E-80 | 0     | 2.79883E<br>+13 |
| REDMUD      | 4.07024<br>E-57 | 0    | 4.291E-<br>46   | 0   | 4.46248<br>E-40 | 0    | 0    | 2.61113E<br>+24 | 2.88469<br>E-80 | 0     | 2.87794E<br>+13 |
| ASIAGO      | 4.86589<br>E-57 | 0    | 5.00638<br>E-46 | 0   | 5.13769<br>E-40 | 0    | 0    | 2.61113E<br>+24 | 3.62957<br>E-80 | 0     | 2.94847E<br>+13 |
| SUTTER      | 4.86816<br>E-57 | 0    | 5.0084E-<br>46  | 0   | 5.13958<br>E-40 | 0    | 0    | 2.61113E<br>+24 | 3.63176<br>E-80 | 0     | 2.94866E<br>+13 |
| RUDDER      | 2.28018<br>E-56 | 0    | 2.31497<br>E-45 | 0   | 2.35847<br>E-39 | 0    | 0    | 1.10973E<br>+25 | 1.7491E-<br>79  | 0     | 1.26981E<br>+14 |
| OARLOCK     | 1.06533<br>E-56 | 0    | 9.84966<br>E-46 | 0   | 9.53508<br>E-40 | 0    | 0    | 2.61113E<br>+24 | 9.94651<br>E-80 | 0     | 3.27903E<br>+13 |

| Nuclide            | 89Sr            | 91Sr | 91Y             | 93Y | 95Zr            | 97Zr | 99Mo | 99Tc            | 103Ru           | 105Rh | 106Ru           |
|--------------------|-----------------|------|-----------------|-----|-----------------|------|------|-----------------|-----------------|-------|-----------------|
| COVE               | 1.06533<br>E-56 | 0    | 9.84966<br>E-46 | 0   | 9.53508<br>E-40 | 0    | 0    | 2.61113E<br>+24 | 9.94651<br>E-80 | 0     | 3.27903E<br>+13 |
| DOFINO             | 1.39891<br>E-56 | 0    | 1.24621<br>E-45 | 0   | 1.18218<br>E-39 | 0    | 0    | 2.61113E<br>+24 | 1.41212<br>E-79 | 0     | 3.40243E<br>+13 |
| DOFINO LAWTON      | 1.39891<br>E-56 | 0    | 1.24621<br>E-45 | 0   | 1.18218<br>E-39 | 0    | 0    | 2.61113E<br>+24 | 1.41212<br>E-79 | 0     | 3.40243E<br>+13 |
| MARSILLY           | 8.73314<br>E-56 | 0    | 7.38229<br>E-45 | 0   | 6.80535<br>E-39 | 0    | 0    | 1.10973E<br>+25 | 9.84215<br>E-79 | 0     | 1.52343E<br>+14 |
| BULKHEAD           | 1.18103<br>E-55 | 0    | 9.58074<br>E-45 | 0   | 8.63569<br>E-39 | 0    | 0    | 1.10973E<br>+25 | 1.45122<br>E-78 | 0     | 1.58708E<br>+14 |
| CREWLINE           | 1.73619<br>E-55 | 0    | 1.33632<br>E-44 | 0   | 1.17044<br>E-38 | 0    | 0    | 1.10973E<br>+25 | 2.38238<br>E-78 | 0     | 1.67221E<br>+14 |
| FOREFOOT           | 4.55974<br>E-56 | 0    | 3.45734<br>E-45 | 0   | 3.00348<br>E-39 | 0    | 0    | 2.61113E<br>+24 | 6.45695<br>E-79 | 0     | 3.99369E<br>+13 |
| CARNELIAN          | 9.814E-<br>56   | 0    | 6.70248<br>E-45 | 0   | 5.49959<br>E-39 | 0    | 0    | 2.61113E<br>+24 | 1.73102<br>E-78 | 0     | 4.43116E<br>+13 |
| STRAKE             | 4.5981E-<br>55  | 0    | 3.09879<br>E-44 | 0   | 2.52426<br>E-38 | 0    | 0    | 1.10973E<br>+25 | 8.33999<br>E-78 | 0     | 1.90831E<br>+14 |
| GRUYERE GRADINO    | 1.27409<br>E-55 | 0    | 8.39706<br>E-45 | 0   | 6.75743<br>E-39 | 0    | 0    | 2.61113E<br>+24 | 2.42176<br>E-78 | 0     | 4.59081E<br>+13 |
| GRUYERE            | 1.27409<br>E-55 | 0    | 8.39706<br>E-45 | 0   | 6.75743<br>E-39 | 0    | 0    | 2.61113E<br>+24 | 2.42176<br>E-78 | 0     | 4.59081E<br>+13 |
| FLOTOST            | 1.27492<br>E-55 | 0    | 8.40176<br>E-45 | 0   | 6.76089<br>E-39 | 0    | 0    | 2.61113E<br>+24 | 2.42378<br>E-78 | 0     | 4.59121E<br>+13 |
| SCUPPER            | 1.32979<br>E-55 | 0    | 8.71316<br>E-45 | 0   | 6.98951<br>E-39 | 0    | 0    | 2.61113E<br>+24 | 2.55881<br>E-78 | 0     | 4.61752E<br>+13 |
| SCANTLING          | 5.65286<br>E-55 | 0    | 3.70379<br>E-44 | 0   | 2.97105<br>E-38 | 0    | 0    | 1.10973E<br>+25 | 1.0878E-<br>77  | 0     | 1.96251E<br>+14 |
| EBBTIDE            | 1.92283<br>E-55 | 0    | 1.19808<br>E-44 | 0   | 9.35041<br>E-39 | 0    | 0    | 2.61113E<br>+24 | 4.11222<br>E-78 | 0     | 4.8543E+<br>13  |
| COULOMMIERS        | 9.63124<br>E-55 | 0    | 5.86805<br>E-44 | 0   | 4.52404<br>E-38 | 0    | 0    | 1.10973E<br>+25 | 2.15903<br>E-77 | 0     | 2.10956E<br>+14 |
| BOBSTAY            | 3.37408<br>E-55 | 0    | 1.94709<br>E-44 | 0   | 1.4573E-<br>38  | 0    | 0    | 2.61113E<br>+24 | 8.47722<br>E-78 | 0     | 5.23894E<br>+13 |
| HYBLA GOLD         | 3.67167<br>E-55 | 0    | 2.09453<br>E-44 | 0   | 1.55781<br>E-38 | 0    | 0    | 2.61113E<br>+24 | 9.45099<br>E-78 | 0     | 5.29933E<br>+13 |
| SANDREEF           | 1.74538<br>E-54 | 0    | 9.80571<br>E-44 | 0   | 7.23244<br>E-38 | 0    | 0    | 1.10973E<br>+25 | 4.63913<br>E-77 | 0     | 2.28668E<br>+14 |
| SEAMOUNT           | 4.57666<br>E-55 | 0    | 2.5335E-<br>44  | 0   | 1.85363<br>E-38 | 0    | 0    | 2.61113E<br>+24 | 1.2548E-<br>77  | 0     | 5.46005E<br>+13 |
| RIB                | 6.61173<br>E-55 | 0    | 3.48091<br>E-44 | 0   | 2.47799<br>E-38 | 0    | 0    | 2.61114E<br>+24 | 2.01423<br>E-77 | 0     | 5.73933E<br>+13 |
| FARALLONES         | 2.81079<br>E-54 | 0    | 1.47975<br>E-43 | 0   | 1.05338<br>E-37 | 0    | 0    | 1.10973E<br>+25 | 8.56364<br>E-77 | 0     | 2.43931E<br>+14 |
| CAMPOS             | 1.53285<br>E-54 | 0    | 7.19553<br>E-44 | 0   | 4.81146<br>E-38 | 0    | 0    | 2.61114E<br>+24 | 5.94173<br>E-77 | 0     | 6.43253E<br>+13 |
| REBLOCHON          | 7.45183<br>E-54 | 0    | 3.4345E-<br>43  | 0   | 2.27369<br>E-37 | 0    | 0    | 1.10973E<br>+25 | 3.00192<br>E-76 | 0     | 2.78411E<br>+14 |
| KARAB              | 2.33619<br>E-54 | 0    | 1.0354E-<br>43  | 0   | 6.70956<br>E-38 | 0    | 0    | 2.61114E<br>+24 | 1.02176<br>E-76 | 0     | 6.81081E<br>+13 |
| TOPMAST            | 2.5739E-<br>54  | 0    | 1.12577<br>E-43 | 0   | 7.24274<br>E-38 | 0    | 0    | 2.61114E<br>+24 | 1.15741<br>E-76 | 0     | 6.90089E<br>+13 |
| ICEBERG            | 1.09391<br>E-53 | 0    | 4.78452<br>E-43 | 0   | 3.07816<br>E-37 | 0    | 0    | 1.10973E<br>+25 | 4.919E-<br>76   | 0     | 2.93288E<br>+14 |
| FONDUTTA           | 1.41888<br>E-53 | 0    | 5.98955<br>E-43 | 0   | 3.77952<br>E-37 | 0    | 0    | 1.10973E<br>+25 | 6.87393<br>E-76 | 0     | 3.03818E<br>+14 |
| BACKBEACH          | 1.42071<br>E-53 | 0    | 5.99621<br>E-43 | 0   | 3.78335<br>E-37 | 0    | 0    | 1.10973E<br>+25 | 6.88531<br>E-76 | 0     | 3.03871E<br>+14 |
| ASCO               | 4.04344<br>E-54 | 0    | 1.66284<br>E-43 | 0   | 1.03442<br>E-37 | 0    | 0    | 2.61114E<br>+24 | 2.06939<br>E-76 | 0     | 7.33678E<br>+13 |
| JACKPOTS           | 6.72698<br>E-54 | 0    | 2.58085<br>E-43 | 0   | 1.54579<br>E-37 | 0    | 0    | 2.61114E<br>+24 | 3.9833E-<br>76  | 0     | 7.8611E+<br>13  |
| SATZ               | 1.10049<br>E-53 | 0    | 3.94793<br>E-43 | 0   | 2.27949<br>E-37 | 0    | 0    | 2.61114E<br>+24 | 7.50323<br>E-76 | 0     | 8.4037E+<br>13  |
| LOWBALL            | 5.01779<br>E-53 | 0    | 1.78292<br>E-42 | 0   | 1.02406<br>E-36 | 0    | 0    | 1.10973E<br>+25 | 3.49079<br>E-75 | 0     | 3.60579E<br>+14 |
| PANIR              | 9.94716<br>E-53 | 0    | 3.21942<br>E-42 | 0   | 1.75729<br>E-36 | 0    | 0    | 1.10974E<br>+25 | 8.41875<br>E-75 | 0     | 3.9564E+<br>14  |
| DIABLO HAWK        | 2.79952<br>E-53 | 0    | 8.84205<br>E-43 | 0   | 4.76242<br>E-37 | 0    | 0    | 2.61114E<br>+24 | 2.49409<br>E-75 | 0     | 9.53801E<br>+13 |
| CREMINO CAERPHILLY | 3.3948E-<br>53  | 0    | 1.04439<br>E-42 | 0   | 5.54501<br>E-37 | 0    | 0    | 2.61114E<br>+24 | 3.19617<br>E-75 | 0     | 9.79066E<br>+13 |
| CREMINO            | 3.3948E-<br>53  | 0    | 1.04439<br>E-42 | 0   | 5.54501<br>E-37 | 0    | 0    | 2.61114E<br>+24 | 3.19617<br>E-75 | 0     | 9.79066E<br>+13 |
| DRAUGHTS           | 1.4432E-<br>52  | 0    | 4.43975<br>E-42 | 0   | 2.35716<br>E-36 | 0    | 0    | 1.10974E<br>+25 | 1.35887<br>E-74 | 0     | 4.16119E<br>+14 |

| Nuclide       | 89Sr            | 91Sr | 91Y             | 93Y | 95Zr            | 97Zr | 99Mo | 99Tc            | 103Ru           | 105Rh | 106Ru           |
|---------------|-----------------|------|-----------------|-----|-----------------|------|------|-----------------|-----------------|-------|-----------------|
| RUMMY         | 1.44348<br>E-52 | 0    | 4.44048<br>E-42 | 0   | 2.35751<br>E-36 | 0    | 0    | 1.10974E<br>+25 | 1.35921<br>E-74 | 0     | 4.1613E+<br>14  |
| EMMENTHAL     | 5.55976<br>E-53 | 0    | 1.59911<br>E-42 | 0   | 8.18402<br>E-37 | 0    | 0    | 2.61114E<br>+24 | 6.02903<br>E-75 | 0     | 1.0468E+<br>14  |
| QUARGEL       | 2.94898<br>E-52 | 0    | 8.22942<br>E-42 | 0   | 4.14278<br>E-36 | 0    | 0    | 1.10974E<br>+25 | 3.40746<br>E-74 | 0     | 4.58461E<br>+14 |
| CONCENTRATION | 8.28477<br>E-53 | 0    | 2.2567E-<br>42  | 0   | 1.12115<br>E-36 | 0    | 0    | 2.61114E<br>+24 | 1.00716<br>E-74 | 0     | 1.10498E<br>+14 |
| FARM          | 4.32161<br>E-52 | 0    | 1.14473<br>E-41 | 0   | 5.601E-<br>36   | 0    | 0    | 1.10974E<br>+25 | 5.57123<br>E-74 | 0     | 4.82846E<br>+14 |
| BACCARAT      | 1.73886<br>E-52 | 0    | 4.2809E-<br>42  | 0   | 2.01256<br>E-36 | 0    | 0    | 2.61114E<br>+24 | 2.61409<br>E-74 | 0     | 1.22185E<br>+14 |
| QUINELLA      | 9.08926<br>E-52 | 0    | 2.17541<br>E-41 | 0   | 1.00707<br>E-35 | 0    | 0    | 1.10974E<br>+25 | 1.44988<br>E-73 | 0     | 5.34064E<br>+14 |
| KLOSTER       | 9.99454<br>E-52 | 0    | 2.36129<br>E-41 | 0   | 1.08543<br>E-35 | 0    | 0    | 1.10974E<br>+25 | 1.63825<br>E-73 | 0     | 5.40984E<br>+14 |
| MEMORY        | 3.40691<br>E-52 | 0    | 7.65222<br>E-42 | 0   | 3.42177<br>E-36 | 0    | 0    | 2.61115E<br>+24 | 6.21008<br>E-74 | 0     | 1.33852E<br>+14 |
| FREEZEOUT     | 7.53946<br>E-52 | 0    | 1.51953<br>E-41 | 0   | 6.40449<br>E-36 | 0    | 0    | 2.61115E<br>+24 | 1.72547<br>E-73 | 0     | 1.49076E<br>+14 |
| PEPATO        | 4.89723<br>E-51 | 0    | 9.31513<br>E-41 | 0   | 3.80406<br>E-35 | 0    | 0    | 1.10974E<br>+25 | 1.26559<br>E-72 | 0     | 6.71084E<br>+14 |
| CHESS         | 1.30448<br>E-51 | 0    | 2.43965<br>E-41 | 0   | 9.8713E-<br>36  | 0    | 0    | 2.61115E<br>+24 | 3.49313<br>E-73 | 0     | 1.60581E<br>+14 |
| FAJY          | 6.18627<br>E-51 | 0    | 1.13979<br>E-40 | 0   | 4.57433<br>E-35 | 0    | 0    | 1.10974E<br>+25 | 1.70939<br>E-72 | 0     | 6.92688E<br>+14 |
| BURZET        | 1.014E-<br>50   | 0    | 1.74646<br>E-40 | 0   | 6.75585<br>E-35 | 0    | 0    | 1.10974E<br>+25 | 3.22798<br>E-72 | 0     | 7.40695E<br>+14 |
| OFFSHORE      | 1.08592<br>E-50 | 0    | 1.85294<br>E-40 | 0   | 7.13126<br>E-35 | 0    | 0    | 1.10974E<br>+25 | 3.52548<br>E-72 | 0     | 7.4761E+<br>14  |
| NESSSEL       | 1.44865<br>E-50 | 0    | 2.37657<br>E-40 | 0   | 8.95235<br>E-35 | 0    | 0    | 1.10974E<br>+25 | 5.10787<br>E-72 | 0     | 7.77406E<br>+14 |
| HEARTS        | 2.66262<br>E-50 | 0    | 4.30326<br>E-40 | 0   | 1.60782<br>E-34 | 0    | 0    | 1.8278E+<br>25  | 9.68795<br>E-72 | 0     | 1.29962E<br>+15 |
| PERA          | 3.91411<br>E-51 | 0    | 6.30126<br>E-41 | 0   | 2.34932<br>E-35 | 0    | 0    | 2.61115E<br>+24 | 1.43587<br>E-72 | 0     | 1.86382E<br>+14 |
| SHEEPSHEAD    | 2.12702<br>E-50 | 0    | 3.31135<br>E-40 | 0   | 1.21219<br>E-34 | 0    | 0    | 1.10974E<br>+25 | 8.37212<br>E-72 | 0     | 8.1897E+<br>14  |
| BACKGAMMON    | 1.2043E-<br>50  | 0    | 1.66321<br>E-40 | 0   | 5.70319<br>E-35 | 0    | 0    | 2.61115E<br>+24 | 6.09604<br>E-72 | 0     | 2.17066E<br>+14 |
| AZUL          | 1.48204<br>E-50 | 0    | 1.98966<br>E-40 | 0   | 6.71796<br>E-35 | 0    | 0    | 2.61115E<br>+24 | 7.96143<br>E-72 | 0     | 2.23261E<br>+14 |
| TARKO         | 4.19731<br>E-50 | 0    | 4.88897<br>E-40 | 0   | 1.5276E-<br>34  | 0    | 0    | 2.61115E<br>+24 | 3.03824<br>E-71 | 0     | 2.57111E<br>+14 |
| NORBO         | 4.75054<br>E-50 | 0    | 5.44069<br>E-40 | 0   | 1.6844E-<br>34  | 0    | 0    | 2.61115E<br>+24 | 3.56286<br>E-71 | 0     | 2.61465E<br>+14 |
| LIPTAUER      | 2.8818E-<br>49  | 0    | 3.14409<br>E-39 | 0   | 9.47934<br>E-34 | 0    | 0    | 1.10974E<br>+25 | 2.39326<br>E-70 | 0     | 1.16661E<br>+15 |
| PYRAMID       | 3.45633<br>E-49 | 0    | 3.67855<br>E-39 | 0   | 1.09416<br>E-33 | 0    | 0    | 1.10974E<br>+25 | 3.02384<br>E-70 | 0     | 1.19526E<br>+15 |
| COLWICK       | 3.95783<br>E-49 | 0    | 4.13515<br>E-39 | 0   | 1.21763<br>E-33 | 0    | 0    | 1.10974E<br>+25 | 3.59963<br>E-70 | 0     | 1.21743E<br>+15 |
| CANFIELD      | 1.01219<br>E-49 | 0    | 1.04558<br>E-39 | 0   | 3.05975<br>E-34 | 0    | 0    | 2.61116E<br>+24 | 9.42821<br>E-71 | 0     | 2.89709E<br>+14 |
| FLORA         | 1.32739<br>E-49 | 0    | 1.32141<br>E-39 | 0   | 3.78964<br>E-34 | 0    | 0    | 2.61116E<br>+24 | 1.33628<br>E-70 | 0     | 3.00557E<br>+14 |
| KASH          | 7.54353<br>E-49 | 0    | 7.2177E-<br>39  | 0   | 2.02565<br>E-33 | 0    | 0    | 1.10974E<br>+25 | 8.25321<br>E-70 | 0     | 1.3287E+<br>15  |
| HURON KING    | 2.09012<br>E-49 | 0    | 1.95575<br>E-39 | 0   | 5.42241<br>E-34 | 0    | 0    | 2.61116E<br>+24 | 2.39638<br>E-70 | 0     | 3.19643E<br>+14 |
| TAFI          | 1.36223<br>E-48 | 0    | 1.20243<br>E-38 | 0   | 3.22934<br>E-33 | 0    | 0    | 1.10974E<br>+25 | 1.76535<br>E-69 | 0     | 1.43957E<br>+15 |
| VERDELLO      | 3.47875<br>E-49 | 0    | 3.03657<br>E-39 | 0   | 8.10565<br>E-34 | 0    | 0    | 2.61116E<br>+24 | 4.61521<br>E-70 | 0     | 3.42505E<br>+14 |
| BONARDA       | 3.18134<br>E-48 | 0    | 2.50134<br>E-38 | 0   | 6.30662<br>E-33 | 0    | 0    | 1.10974E<br>+25 | 5.25675<br>E-69 | 0     | 1.61505E<br>+15 |
| RIOLA         | 4.00633<br>E-50 | 0    | 3.14982<br>E-40 | 0   | 7.9414E-<br>35  | 0    | 0    | 1.39697E<br>+23 | 6.62069<br>E-71 | 0     | 2.03317E<br>+13 |
| DUTCHESS      | 1.11722<br>E-48 | 0    | 8.3172E-<br>39  | 0   | 2.03541<br>E-33 | 0    | 0    | 2.61116E<br>+24 | 2.07047<br>E-69 | 0     | 4.01218E<br>+14 |
| MINERS IRON   | 1.22896<br>E-48 | 0    | 9.03088<br>E-39 | 0   | 2.19443<br>E-33 | 0    | 0    | 2.61116E<br>+24 | 2.34061<br>E-69 | 0     | 4.06438E<br>+14 |
| DAUPHIN       | 1.48823<br>E-48 | 0    | 1.06542<br>E-38 | 0   | 2.55225<br>E-33 | 0    | 0    | 2.61116E<br>+24 | 2.99417<br>E-69 | 0     | 4.17126E<br>+14 |
| SERPA         | 9.93756<br>E-48 | 0    | 6.68905<br>E-38 | 0   | 1.54937<br>E-32 | 0    | 0    | 1.10974E<br>+25 | 2.27562<br>E-68 | 0     | 1.8848E+<br>15  |

| Nuclide       | 89Sr            | 91Sr | 91Y             | 93Y | 95Zr            | 97Zr | 99Mo | 99Tc            | 103Ru           | 105Rh | 106Ru           |
|---------------|-----------------|------|-----------------|-----|-----------------|------|------|-----------------|-----------------|-------|-----------------|
| BASEBALL      | 1.48383<br>E-47 | 0    | 9.45624<br>E-38 | 0   | 2.12591<br>E-32 | 0    | 0    | 1.10974E<br>+25 | 3.81136<br>E-68 | 0     | 1.99009E<br>+15 |
| CLAIRETTE     | 4.65078<br>E-48 | 0    | 2.85019<br>E-38 | 0   | 6.27231<br>E-33 | 0    | 0    | 2.61116E<br>+24 | 1.29687<br>E-68 | 0     | 4.86824E<br>+14 |
| SECO          | 6.10877<br>E-48 | 0    | 3.607E-<br>38   | 0   | 7.77825<br>E-33 | 0    | 0    | 2.61116E<br>+24 | 1.84184<br>E-68 | 0     | 5.05162E<br>+14 |
| VIDE          | 1.46961<br>E-47 | 0    | 7.6982E-<br>38  | 0   | 1.55502<br>E-32 | 0    | 0    | 2.61116E<br>+24 | 5.69798<br>E-68 | 0     | 5.69023E<br>+14 |
| ALIGOTE       | 2.18955<br>E-47 | 0    | 1.08623<br>E-37 | 0   | 2.12998<br>E-32 | 0    | 0    | 2.61116E<br>+24 | 9.51649<br>E-68 | 0     | 6.00634E<br>+14 |
| HARZER        | 1.0397E-<br>46  | 0    | 5.08049<br>E-37 | 0   | 9.88037<br>E-32 | 0    | 0    | 1.10975E<br>+25 | 4.66477<br>E-67 | 0     | 2.59138E<br>+15 |
| NIZA          | 3.89153<br>E-47 | 0    | 1.78491<br>E-37 | 0   | 3.3533E-<br>32  | 0    | 0    | 2.61117E<br>+24 | 1.99432<br>E-67 | 0     | 6.49351E<br>+14 |
| PINEAU        | 4.22786<br>E-47 | 0    | 1.91737<br>E-37 | 0   | 3.57999<br>E-32 | 0    | 0    | 2.61117E<br>+24 | 2.21875<br>E-67 | 0     | 6.56691E<br>+14 |
| HAVARTI       | 5.55861<br>E-47 | 0    | 2.42851<br>E-37 | 0   | 4.44289<br>E-32 | 0    | 0    | 2.61117E<br>+24 | 3.15501<br>E-67 | 0     | 6.81517E<br>+14 |
| ISLAY         | 7.52078<br>E-47 | 0    | 3.15302<br>E-37 | 0   | 5.63996<br>E-32 | 0    | 0    | 2.61117E<br>+24 | 4.65491<br>E-67 | 0     | 7.10038E<br>+14 |
| TREBBIANO     | 8.3956E-<br>47  | 0    | 3.46734<br>E-37 | 0   | 6.15159<br>E-32 | 0    | 0    | 2.61117E<br>+24 | 5.36279<br>E-67 | 0     | 7.20712E<br>+14 |
| CERNADA       | 1.10465<br>E-46 | 0    | 4.39454<br>E-37 | 0   | 7.63889<br>E-32 | 0    | 0    | 2.61117E<br>+24 | 7.63315<br>E-67 | 0     | 7.48035E<br>+14 |
| PALIZA        | 5.17985<br>E-46 | 0    | 2.0332E-<br>36  | 0   | 3.50847<br>E-31 | 0    | 0    | 1.10975E<br>+25 | 3.68154<br>E-66 | 0     | 3.22182E<br>+15 |
| TILCI         | 9.0964E-<br>46  | 0    | 3.30654<br>E-36 | 0   | 5.47143<br>E-31 | 0    | 0    | 1.10975E<br>+25 | 7.59699<br>E-66 | 0     | 3.47748E<br>+15 |
| ROUSANNE      | 9.19573<br>E-46 | 0    | 3.3377E-<br>36  | 0   | 5.51853<br>E-31 | 0    | 0    | 1.10975E<br>+25 | 7.70388<br>E-66 | 0     | 3.4826E+<br>15  |
| AKAVI         | 1.22664<br>E-45 | 0    | 4.28064<br>E-36 | 0   | 6.92736<br>E-31 | 0    | 0    | 1.10975E<br>+25 | 1.11606<br>E-65 | 0     | 3.62136E<br>+15 |
| CABOC         | 3.46179<br>E-46 | 0    | 1.17847<br>E-36 | 0   | 1.88147<br>E-31 | 0    | 0    | 2.61117E<br>+24 | 3.31815<br>E-66 | 0     | 8.73357E<br>+14 |
| JORNADA       | 4.32758<br>E-45 | 0    | 1.35983<br>E-35 | 0   | 2.07816<br>E-30 | 0    | 0    | 1.81476E<br>+25 | 4.90772<br>E-65 | 0     | 6.5728E+<br>15  |
| MOLBO         | 3.24907<br>E-45 | 0    | 9.92758<br>E-36 | 0   | 1.49418<br>E-30 | 0    | 0    | 1.10975E<br>+25 | 3.90771<br>E-65 | 0     | 4.13274E<br>+15 |
| HOSTA         | 3.25E-45        | 0    | 9.93003<br>E-36 | 0   | 1.49452<br>E-30 | 0    | 0    | 1.10975E<br>+25 | 3.90915<br>E-65 | 0     | 4.1329E+<br>15  |
| TENAJA        | 1.84284<br>E-45 | 0    | 4.99399<br>E-36 | 0   | 7.03969<br>E-31 | 0    | 0    | 2.61117E<br>+24 | 2.85181<br>E-65 | 0     | 1.09564E<br>+15 |
| GIBNE         | 8.74112<br>E-45 | 0    | 2.33357<br>E-35 | 0   | 3.26269<br>E-30 | 0    | 0    | 1.10975E<br>+25 | 1.39592<br>E-64 | 0     | 4.72631E<br>+15 |
| KRYDDOST      | 2.39441<br>E-45 | 0    | 6.26105<br>E-36 | 0   | 8.65537<br>E-31 | 0    | 0    | 2.61117E<br>+24 | 3.99398<br>E-65 | 0     | 1.13523E<br>+15 |
| BOUSCHET      | 1.03067<br>E-44 | 0    | 2.69038<br>E-35 | 0   | 3.7157E-<br>30  | 0    | 0    | 1.10975E<br>+25 | 1.72549<br>E-64 | 0     | 4.83309E<br>+15 |
| KESTI         | 4.18806<br>E-45 | 0    | 1.0147E-<br>35  | 0   | 1.34554<br>E-30 | 0    | 0    | 2.61117E<br>+24 | 8.19939<br>E-65 | 0     | 1.22465E<br>+15 |
| NEBBIOLO      | 1.9867E-<br>44  | 0    | 4.74185<br>E-35 | 0   | 6.23666<br>E-30 | 0    | 0    | 1.10975E<br>+25 | 4.01398<br>E-64 | 0     | 5.28292E<br>+15 |
| MONTEREY      | 3.22206<br>E-44 | 0    | 7.19949<br>E-35 | 0   | 9.13418<br>E-30 | 0    | 0    | 1.10975E<br>+25 | 7.47715<br>E-64 | 0     | 5.64093E<br>+15 |
| ATRISCO       | 5.73844<br>E-44 | 0    | 1.26613<br>E-34 | 0   | 1.59534<br>E-29 | 0    | 0    | 1.80171E<br>+25 | 1.36745<br>E-63 | 0     | 9.27389E<br>+15 |
| QUESO         | 9.03534<br>E-45 | 0    | 1.97115<br>E-35 | 0   | 2.46838<br>E-30 | 0    | 0    | 2.61118E<br>+24 | 2.20484<br>E-64 | 0     | 1.35924E<br>+15 |
| CERRO         | 1.2212E-<br>44  | 0    | 2.55689<br>E-35 | 0   | 3.13085<br>E-30 | 0    | 0    | 2.61118E<br>+24 | 3.24864<br>E-64 | 0     | 1.41592E<br>+15 |
| HURON LANDING | 1.63085<br>E-44 | 0    | 3.28249<br>E-35 | 0   | 3.93368<br>E-30 | 0    | 0    | 2.61118E<br>+24 | 4.71324<br>E-64 | 0     | 1.47256E<br>+15 |
| DIAMOND ACE   | 1.63085<br>E-44 | 0    | 3.28249<br>E-35 | 0   | 3.93368<br>E-30 | 0    | 0    | 2.61118E<br>+24 | 4.71324<br>E-64 | 0     | 1.47256E<br>+15 |
| FRISCO        | 6.93508<br>E-44 | 0    | 1.39575<br>E-34 | 0   | 1.67257<br>E-29 | 0    | 0    | 1.10975E<br>+25 | 2.0046E-<br>63  | 0     | 6.25887E<br>+15 |
| BORREGO       | 1.32619<br>E-43 | 0    | 2.63999<br>E-34 | 0   | 3.14473<br>E-29 | 0    | 0    | 1.95838E<br>+25 | 3.92262<br>E-63 | 0     | 1.1166E+<br>16  |
| SEYVAL        | 3.2446E-<br>44  | 0    | 5.94562<br>E-35 | 0   | 6.76938<br>E-30 | 0    | 0    | 2.61118E<br>+24 | 1.14196<br>E-63 | 0     | 1.61653E<br>+15 |
| MANTECA       | 2.02028<br>E-43 | 0    | 3.51417<br>E-34 | 0   | 3.88887<br>E-29 | 0    | 0    | 1.10975E<br>+25 | 7.9326E-<br>63  | 0     | 7.23544E<br>+15 |
| COALORA       | 1.12871<br>E-43 | 0    | 1.74487<br>E-34 | 0   | 1.8105E-<br>29  | 0    | 0    | 2.61118E<br>+24 | 5.67774<br>E-63 | 0     | 1.91427E<br>+15 |
| CHEEDAM       | 1.22626<br>E-43 | 0    | 1.87435<br>E-34 | 0   | 1.93289<br>E-29 | 0    | 0    | 2.61118E<br>+24 | 6.31668<br>E-63 | 0     | 1.93591E<br>+15 |



| Nuclide                  | 89Sr            | 91Sr | 91Y             | 93Y | 95Zr            | 97Zr | 99Mo | 99Tc            | 103Ru           | 105Rh | 106Ru           |
|--------------------------|-----------------|------|-----------------|-----|-----------------|------|------|-----------------|-----------------|-------|-----------------|
| CABRA                    | 8.67495<br>E-43 | 0    | 1.23694<br>E-33 | 0   | 1.22808<br>E-28 | 0    | 0    | 1.10975E<br>+25 | 5.17096<br>E-62 | 0     | 8.81622E<br>+15 |
| TURQUOISE                | 1.98538<br>E-42 | 0    | 2.73228<br>E-33 | 0   | 2.6607E<br>E-28 | 0    | 0    | 1.95839E<br>+25 | 1.27495<br>E-61 | 0     | 1.61163E<br>+16 |
| ARMADA                   | 2.9455E-<br>43  | 0    | 3.99499<br>E-34 | 0   | 3.85952<br>E-29 | 0    | 0    | 2.61118E<br>+24 | 1.95027<br>E-62 | 0     | 2.18018E<br>+15 |
| CROWDIE                  | 3.52356<br>E-43 | 0    | 4.66361<br>E-34 | 0   | 4.44575<br>E-29 | 0    | 0    | 2.61118E<br>+24 | 2.4559E-<br>62  | 0     | 2.23381E<br>+15 |
| MINI JADE                | 4.69792<br>E-43 | 0    | 5.97868<br>E-34 | 0   | 5.57861<br>E-29 | 0    | 0    | 2.61118E<br>+24 | 3.55569<br>E-62 | 0     | 2.32266E<br>+15 |
| FAHADA                   | 4.69927<br>E-43 | 0    | 5.98015<br>E-34 | 0   | 5.57987<br>E-29 | 0    | 0    | 2.61118E<br>+24 | 3.557E-<br>62   | 0     | 2.32275E<br>+15 |
| DANABLU                  | 5.7015E-<br>43  | 0    | 7.06673<br>E-34 | 0   | 6.49947<br>E-29 | 0    | 0    | 2.61118E<br>+24 | 4.56136<br>E-62 | 0     | 2.38445E<br>+15 |
| LABAN                    | 1.21008<br>E-42 | 0    | 1.35351<br>E-33 | 0   | 1.17703<br>E-28 | 0    | 0    | 2.61118E<br>+24 | 1.20102<br>E-61 | 0     | 2.64063E<br>+15 |
| SABADO                   | 1.35082<br>E-42 | 0    | 1.48842<br>E-33 | 0   | 1.28378<br>E-28 | 0    | 0    | 2.61118E<br>+24 | 1.38363<br>E-61 | 0     | 2.68032E<br>+15 |
| JARLSBERG                | 1.68242<br>E-42 | 0    | 1.79911<br>E-33 | 0   | 1.5266E-<br>28  | 0    | 0    | 2.61118E<br>+24 | 1.83514<br>E-61 | 0     | 2.76131E<br>+15 |
| CHANCELLOR               | 1.80189<br>E-42 | 0    | 1.90892<br>E-33 | 0   | 1.61152<br>E-28 | 0    | 0    | 2.61118E<br>+24 | 2.00446<br>E-61 | 0     | 2.78711E<br>+15 |
| TOMME/MIDNIGHT<br>ZEPHYR | 2.37219<br>E-42 | 0    | 2.42057<br>E-33 | 0   | 2.00205<br>E-28 | 0    | 0    | 2.61118E<br>+24 | 2.85516<br>E-61 | 0     | 2.893E+1<br>5   |
| BRANCO                   | 2.37411<br>E-42 | 0    | 2.42227<br>E-33 | 0   | 2.00333<br>E-28 | 0    | 0    | 2.61118E<br>+24 | 2.85813<br>E-61 | 0     | 2.89332E<br>+15 |
| BRANCO HERKIMER          | 2.37411<br>E-42 | 0    | 2.42227<br>E-33 | 0   | 2.00333<br>E-28 | 0    | 0    | 2.61118E<br>+24 | 2.85813<br>E-61 | 0     | 2.89332E<br>+15 |
| TECHADO                  | 1.80372<br>E-41 | 0    | 1.83707<br>E-32 | 0   | 1.51788<br>E-27 | 0    | 0    | 1.95839E<br>+25 | 2.1795E-<br>60  | 0     | 2.17379E<br>+16 |
| NAVATA                   | 2.64739<br>E-42 | 0    | 2.66124<br>E-33 | 0   | 2.18319<br>E-28 | 0    | 0    | 2.61118E<br>+24 | 3.28818<br>E-61 | 0     | 2.93638E<br>+15 |
| MUGGINS                  | 7.01663<br>E-42 | 0    | 6.17521<br>E-33 | 0   | 4.71127<br>E-28 | 0    | 0    | 2.61119E<br>+24 | 1.15222<br>E-60 | 0     | 3.35132E<br>+15 |
| ROMANO                   | 3.28737<br>E-41 | 0    | 2.85494<br>E-32 | 0   | 2.16238<br>E-27 | 0    | 0    | 1.10975E<br>+25 | 5.55115<br>E-60 | 0     | 1.44326E<br>+16 |
| GORBEA                   | 6.1688E-<br>41  | 0    | 4.91656<br>E-32 | 0   | 3.55338<br>E-27 | 0    | 0    | 1.10975E<br>+25 | 1.24751<br>E-59 | 0     | 1.57186E<br>+16 |
| MIDAS MYTH/MILAGRO       | 1.78469<br>E-41 | 0    | 1.38287<br>E-32 | 0   | 9.84189<br>E-28 | 0    | 0    | 2.61119E<br>+24 | 3.8293E-<br>60  | 0     | 3.8036E+<br>15  |
| TORTUGAS                 | 9.3222E-<br>41  | 0    | 7.02293<br>E-32 | 0   | 4.92205<br>E-27 | 0    | 0    | 1.10976E<br>+25 | 2.12194<br>E-59 | 0     | 1.66237E<br>+16 |
| AGRINI                   | 3.30431<br>E-41 | 0    | 2.354E-<br>32   | 0   | 1.60024<br>E-27 | 0    | 0    | 2.61119E<br>+24 | 8.45814<br>E-60 | 0     | 4.13496E<br>+15 |
| MUNDO                    | 2.1544E-<br>40  | 0    | 1.44777<br>E-31 | 0   | 9.53317<br>E-27 | 0    | 0    | 1.10976E<br>+25 | 6.23394<br>E-59 | 0     | 1.86236E<br>+16 |
| ORKNEY                   | 5.1238E-<br>41  | 0    | 3.43819<br>E-32 | 0   | 2.26215<br>E-27 | 0    | 0    | 2.61119E<br>+24 | 1.48718<br>E-59 | 0     | 4.38839E<br>+15 |
| BELLOW                   | 6.21657<br>E-41 | 0    | 4.0629E-<br>32  | 0   | 2.63497<br>E-27 | 0    | 0    | 2.61119E<br>+24 | 1.9071E-<br>59  | 0     | 4.50495E<br>+15 |
| CAPROCK                  | 3.24034<br>E-40 | 0    | 2.0596E-<br>31  | 0   | 1.31559<br>E-26 | 0    | 0    | 1.10976E<br>+25 | 1.05393<br>E-58 | 0     | 1.96834E<br>+16 |
| DUORO                    | 4.2688E-<br>40  | 0    | 2.61317<br>E-31 | 0   | 1.63528<br>E-26 | 0    | 0    | 1.10976E<br>+25 | 1.50252<br>E-58 | 0     | 2.04331E<br>+16 |
| NORMANNA                 | 1.35736<br>E-40 | 0    | 7.97477<br>E-32 | 0   | 4.87984<br>E-27 | 0    | 0    | 2.61119E<br>+24 | 5.20807<br>E-59 | 0     | 5.00818E<br>+15 |
| KAPPELI                  | 6.90112<br>E-40 | 0    | 3.95662<br>E-31 | 0   | 2.389E-<br>26   | 0    | 0    | 1.10976E<br>+25 | 2.78739<br>E-58 | 0     | 2.18084E<br>+16 |
| CORREO                   | 1.81166<br>E-40 | 0    | 1.02328<br>E-31 | 0   | 6.12838<br>E-27 | 0    | 0    | 2.61119E<br>+24 | 7.55048<br>E-59 | 0     | 5.20813E<br>+15 |
| WEXFORD                  | 2.65984<br>E-40 | 0    | 1.42569<br>E-31 | 0   | 8.29767<br>E-27 | 0    | 0    | 2.61119E<br>+24 | 1.23747<br>E-58 | 0     | 5.48653E<br>+15 |
| DOLCETTO                 | 2.65984<br>E-40 | 0    | 1.42569<br>E-31 | 0   | 8.29767<br>E-27 | 0    | 0    | 2.61119E<br>+24 | 1.23747<br>E-58 | 0     | 5.48653E<br>+15 |
| BRETON                   | 1.36924<br>E-39 | 0    | 7.14979<br>E-31 | 0   | 4.10231<br>E-26 | 0    | 0    | 1.10976E<br>+25 | 6.72979<br>E-58 | 0     | 2.39317E<br>+16 |
| VERMEJO                  | 4.19136<br>E-40 | 0    | 2.11146<br>E-31 | 0   | 1.18798<br>E-26 | 0    | 0    | 2.61119E<br>+24 | 2.22132<br>E-58 | 0     | 5.83552E<br>+15 |
| V ILLITA                 | 7.15076<br>E-40 | 0    | 3.34914<br>E-31 | 0   | 1.81086<br>E-26 | 0    | 0    | 2.61119E<br>+24 | 4.41644<br>E-58 | 0     | 6.27392E<br>+15 |
| EGMONT                   | 4.53196<br>E-39 | 0    | 2.00999<br>E-30 | 0   | 1.05493<br>E-25 | 0    | 0    | 1.10976E<br>+25 | 3.13851<br>E-57 | 0     | 2.81489E<br>+16 |
| TIERRA                   | 4.90702<br>E-39 | 0    | 2.15285<br>E-30 | 0   | 1.12324<br>E-25 | 0    | 0    | 1.10976E<br>+25 | 3.47653<br>E-57 | 0     | 2.8454E+<br>16  |
| MINERO                   | 1.2377E-<br>39  | 0    | 5.37891<br>E-31 | 0   | 2.79193<br>E-26 | 0    | 0    | 2.6112E+<br>24  | 8.94523<br>E-58 | 0     | 6.75847E<br>+15 |

| Nuclide                          | 89Sr            | 91Sr | 91Y             | 93Y | 95Zr            | 97Zr | 99Mo | 99Tc            | 103Ru           | 105Rh | 106Ru           |
|----------------------------------|-----------------|------|-----------------|-----|-----------------|------|------|-----------------|-----------------|-------|-----------------|
| VAUGHN                           | 1.68862<br>E-38 | 0    | 6.25917<br>E-30 | 0   | 2.97858<br>E-25 | 0    | 0    | 1.10976E<br>+25 | 1.70459<br>E-56 | 0     | 3.36453E<br>+16 |
| COTTAGE                          | 1.88666<br>E-38 | 0    | 6.88824<br>E-30 | 0   | 3.25099<br>E-25 | 0    | 0    | 1.10976E<br>+25 | 1.96597<br>E-56 | 0     | 3.41551E<br>+16 |
| HERMOSA                          | 2.16597<br>E-38 | 0    | 7.76047<br>E-30 | 0   | 3.62519<br>E-25 | 0    | 0    | 1.10976E<br>+25 | 2.34808<br>E-56 | 0     | 3.48006E<br>+16 |
| MISTY RAIN                       | 5.39393<br>E-39 | 0    | 1.91769<br>E-30 | 0   | 8.92045<br>E-26 | 0    | 0    | 2.6112E+<br>24  | 5.94326<br>E-57 | 0     | 8.25162E<br>+15 |
| TOWANDA                          | 3.26027<br>E-38 | 0    | 1.10474<br>E-29 | 0   | 5.00587<br>E-25 | 0    | 0    | 1.10976E<br>+25 | 3.97367<br>E-56 | 0     | 3.67849E<br>+16 |
| SALUT                            | 5.72185<br>E-38 | 0    | 1.79565<br>E-29 | 0   | 7.8028E-<br>25  | 0    | 0    | 1.10976E<br>+25 | 8.19327<br>E-56 | 0     | 3.97005E<br>+16 |
| VILLE                            | 1.34805<br>E-38 | 0    | 4.22976<br>E-30 | 0   | 1.83782<br>E-25 | 0    | 0    | 2.6112E+<br>24  | 1.93102<br>E-56 | 0     | 9.34291E<br>+15 |
| MARIBO                           | 1.63404<br>E-38 | 0    | 4.9943E-<br>30  | 0   | 2.13914<br>E-25 | 0    | 0    | 2.6112E+<br>24  | 2.47333<br>E-56 | 0     | 9.58988E<br>+15 |
| SERENA                           | 1.03145<br>E-37 | 0    | 2.98692<br>E-29 | 0   | 1.24222<br>E-24 | 0    | 0    | 1.10976E<br>+25 | 1.74856<br>E-55 | 0     | 4.30029E<br>+16 |
| CEBRERO                          | 3.19141<br>E-38 | 0    | 8.90301<br>E-30 | 0   | 3.6279E-<br>25  | 0    | 0    | 2.6112E+<br>24  | 5.85174<br>E-56 | 0     | 1.05011E<br>+16 |
| CHAMITA                          | 3.33201<br>E-38 | 0    | 9.24075<br>E-30 | 0   | 3.75345<br>E-25 | 0    | 0    | 2.6112E+<br>24  | 6.18548<br>E-56 | 0     | 1.05627E<br>+16 |
| PONIL                            | 5.84081<br>E-38 | 0    | 1.50045<br>E-29 | 0   | 5.84512<br>E-25 | 0    | 0    | 2.6112E+<br>24  | 1.27342<br>E-55 | 0     | 1.13981E<br>+16 |
| MILL YARD                        | 6.91541<br>E-38 | 0    | 1.73604<br>E-29 | 0   | 6.67839<br>E-25 | 0    | 0    | 2.6112E+<br>24  | 1.58245<br>E-55 | 0     | 1.16621E<br>+16 |
| DIAMOND BEECH                    | 6.922E-<br>38   | 0    | 1.73747<br>E-29 | 0   | 6.68341<br>E-25 | 0    | 0    | 2.6112E+<br>24  | 1.58439<br>E-55 | 0     | 1.16636E<br>+16 |
| ROQUEFORT                        | 3.23516<br>E-37 | 0    | 8.0159E-<br>29  | 0   | 3.06168<br>E-24 | 0    | 0    | 1.10976E<br>+25 | 7.60942<br>E-55 | 0     | 5.02133E<br>+16 |
| ABO                              | 9.1948E-<br>38  | 0    | 2.22028<br>E-29 | 0   | 8.36192<br>E-25 | 0    | 0    | 2.6112E+<br>24  | 2.28296<br>E-55 | 0     | 1.21214E<br>+16 |
| KINIBITO                         | 6.4002E-<br>37  | 0    | 1.44488<br>E-28 | 0   | 5.24536<br>E-24 | 0    | 0    | 1.10976E<br>+25 | 1.83034<br>E-54 | 0     | 5.50805E<br>+16 |
| GOLDSTONE                        | 8.79507<br>E-37 | 0    | 1.90128<br>E-28 | 0   | 6.7408E-<br>24  | 0    | 0    | 1.10976E<br>+25 | 2.75502<br>E-54 | 0     | 5.75066E<br>+16 |
| GLENCOE                          | 9.48541<br>E-37 | 0    | 1.75259<br>E-28 | 0   | 5.70331<br>E-24 | 0    | 0    | 3.78625E<br>+24 | 4.13175<br>E-54 | 0     | 2.29338E<br>+16 |
| MIGHTY OAK                       | 8.47967<br>E-37 | 0    | 1.51228<br>E-28 | 0   | 4.8271E-<br>24  | 0    | 0    | 2.61121E<br>+24 | 3.97869<br>E-54 | 0     | 1.63829E<br>+16 |
| MOGOLLON                         | 9.73262<br>E-37 | 0    | 1.7034E-<br>28  | 0   | 5.38166<br>E-24 | 0    | 0    | 2.61121E<br>+24 | 4.75047<br>E-54 | 0     | 1.66919E<br>+16 |
| JEFFERSON                        | 4.24972<br>E-36 | 0    | 7.41048<br>E-28 | 0   | 2.33653<br>E-23 | 0    | 0    | 1.10976E<br>+25 | 2.09041<br>E-53 | 0     | 7.12011E<br>+16 |
| PANAMINT                         | 0               | 0    | 0               | 0   | 0               | 0    | 0    | 0               | 0               | 0     | 0               |
| TAJO                             | 7.77465<br>E-36 | 0    | 1.24849<br>E-27 | 0   | 3.76336<br>E-23 | 0    | 0    | 1.10976E<br>+25 | 4.54674<br>E-53 | 0     | 7.72785E<br>+16 |
| DARWIN                           | 1.02611<br>E-35 | 0    | 1.58656<br>E-27 | 0   | 4.68463<br>E-23 | 0    | 0    | 1.10976E<br>+25 | 6.49736<br>E-53 | 0     | 8.02418E<br>+16 |
| CYBAR                            | 1.94332<br>E-35 | 0    | 2.88342<br>E-27 | 0   | 8.32444<br>E-23 | 0    | 0    | 1.55367E<br>+25 | 1.34178<br>E-52 | 0     | 1.17037E<br>+17 |
| CORNUCOPIA                       | 3.58318<br>E-36 | 0    | 5.2498E-<br>28  | 0   | 1.5052E-<br>23  | 0    | 0    | 2.61121E<br>+24 | 2.54058<br>E-53 | 0     | 1.99188E<br>+16 |
| GALVESTON                        | 6.37964<br>E-36 | 0    | 8.63964<br>E-28 | 0   | 2.37297<br>E-23 | 0    | 0    | 2.61121E<br>+24 | 5.33619<br>E-53 | 0     | 2.15395E<br>+16 |
| ALEMAN                           | 7.01792<br>E-36 | 0    | 9.38122<br>E-28 | 0   | 2.55842<br>E-23 | 0    | 0    | 2.61121E<br>+24 | 6.03265<br>E-53 | 0     | 2.18198E<br>+16 |
| LABQUARK                         | 3.88764<br>E-35 | 0    | 5.0123E-<br>27  | 0   | 1.34023<br>E-22 | 0    | 0    | 1.10976E<br>+25 | 3.60542<br>E-52 | 0     | 9.61273E<br>+16 |
| BELMONT                          | 4.83346<br>E-35 | 0    | 6.04936<br>E-27 | 0   | 1.59151<br>E-22 | 0    | 0    | 1.10976E<br>+25 | 4.77113<br>E-52 | 0     | 9.90082E<br>+16 |
| GASCON                           | 7.18142<br>E-35 | 0    | 8.5154E-<br>27  | 0   | 2.17522<br>E-22 | 0    | 0    | 1.10977E<br>+25 | 7.94024<br>E-52 | 0     | 1.04469E<br>+17 |
| BODIE                            | 1.0702E-<br>34  | 0    | 1.20179<br>E-26 | 0   | 2.98005<br>E-22 | 0    | 0    | 1.10977E<br>+25 | 1.32655<br>E-51 | 0     | 1.10276E<br>+17 |
| HAZEBROOK CHECKER<br>BERRY (RED) | 5.13222<br>E-35 | 0    | 5.22979<br>E-27 | 0   | 1.22986<br>E-22 | 0    | 0    | 2.61121E<br>+24 | 7.80098<br>E-52 | 0     | 2.85776E<br>+16 |
| HAZEBROOK APRICOT<br>(ORANGE)    | 5.13222<br>E-35 | 0    | 5.22979<br>E-27 | 0   | 1.22986<br>E-22 | 0    | 0    | 2.61121E<br>+24 | 7.80098<br>E-52 | 0     | 2.85776E<br>+16 |
| HAZEBROOK EMERALD<br>(GREEN)     | 5.13222<br>E-35 | 0    | 5.22979<br>E-27 | 0   | 1.22986<br>E-22 | 0    | 0    | 2.61121E<br>+24 | 7.80098<br>E-52 | 0     | 2.85776E<br>+16 |
| TORNERO                          | 5.73226<br>E-35 | 0    | 5.75379<br>E-27 | 0   | 1.34199<br>E-22 | 0    | 0    | 2.61121E<br>+24 | 8.99346<br>E-52 | 0     | 2.90094E<br>+16 |
| MIDDLE NOTE                      | 9.27479<br>E-35 | 0    | 8.71818<br>E-27 | 0   | 1.96182<br>E-22 | 0    | 0    | 2.61121E<br>+24 | 1.67022<br>E-51 | 0     | 3.09654E<br>+16 |

| Nuclide       | 89Sr            | 91Sr | 91Y             | 93Y | 95Zr            | 97Zr | 99Mo | 99Tc            | 103Ru           | 105Rh | 106Ru           |
|---------------|-----------------|------|-----------------|-----|-----------------|------|------|-----------------|-----------------|-------|-----------------|
| DELAMAR       | 6.01477<br>E-34 | 0    | 5.33711<br>E-26 | 0   | 1.16379<br>E-21 | 0    | 0    | 1.10977E<br>+25 | 1.22254<br>E-50 | 0     | 1.39365E<br>+17 |
| PRESIDIO      | 1.49622<br>E-34 | 0    | 1.31761<br>E-26 | 0   | 2.86125<br>E-22 | 0    | 0    | 2.61122E<br>+24 | 3.09003<br>E-51 | 0     | 3.304E+1<br>6   |
| HARDIN        | 7.09057<br>E-34 | 0    | 6.15205<br>E-26 | 0   | 1.32516<br>E-21 | 0    | 0    | 1.10977E<br>+25 | 1.51077<br>E-50 | 0     | 1.42509E<br>+17 |
| BRIE          | 3.2713E-<br>34  | 0    | 2.58922<br>E-26 | 0   | 5.30447<br>E-22 | 0    | 0    | 2.61122E<br>+24 | 8.45302<br>E-51 | 0     | 3.67374E<br>+16 |
| MISSION GHOST | 3.36359<br>E-34 | 0    | 2.65218<br>E-26 | 0   | 5.42221<br>E-22 | 0    | 0    | 2.61122E<br>+24 | 8.76104<br>E-51 | 0     | 3.68763E<br>+16 |
| PANCHUELA     | 3.85842<br>E-34 | 0    | 2.98593<br>E-26 | 0   | 6.04246<br>E-22 | 0    | 0    | 2.61122E<br>+24 | 1.0453E-<br>50  | 0     | 3.7569E+<br>16  |
| MIDLAND       | 2.04579<br>E-33 | 0    | 1.53613<br>E-25 | 0   | 3.0578E-<br>21  | 0    | 0    | 1.10977E<br>+25 | 5.90486<br>E-50 | 0     | 1.6453E+<br>17  |
| TAHOKA        | 2.99544<br>E-33 | 0    | 2.13519<br>E-25 | 0   | 4.13131<br>E-21 | 0    | 0    | 1.10977E<br>+25 | 9.64386<br>E-50 | 0     | 1.73261E<br>+17 |
| LOCKNEY       | 5.33301<br>E-33 | 0    | 3.51379<br>E-25 | 0   | 6.51288<br>E-21 | 0    | 0    | 1.10977E<br>+25 | 2.02548<br>E-49 | 0     | 1.87358E<br>+17 |
| BORATE        | 7.94366<br>E-33 | 0    | 4.957E-<br>25   | 0   | 8.9193E-<br>21  | 0    | 0    | 1.10977E<br>+25 | 3.38182<br>E-49 | 0     | 1.9776E+<br>17  |
| WACO          | 3.19258<br>E-33 | 0    | 1.85193<br>E-25 | 0   | 3.20201<br>E-21 | 0    | 0    | 2.61122E<br>+24 | 1.58446<br>E-49 | 0     | 5.00355E<br>+16 |
| MISSION CYBER | 3.23669<br>E-33 | 0    | 1.874E-<br>25   | 0   | 3.23687<br>E-21 | 0    | 0    | 2.61122E<br>+24 | 1.61268<br>E-49 | 0     | 5.01287E<br>+16 |
| KERNVILLE     | 3.85302<br>E-32 | 0    | 1.93844<br>E-24 | 0   | 3.10099<br>E-20 | 0    | 0    | 1.10977E<br>+25 | 2.57865<br>E-48 | 0     | 2.44981E<br>+17 |
| ABILENE       | 1.84941<br>E-32 | 0    | 8.44206<br>E-25 | 0   | 1.28068<br>E-20 | 0    | 0    | 2.61122E<br>+24 | 1.51818<br>E-48 | 0     | 6.34935E<br>+16 |
| SHELLBOURNE   | 2.27087<br>E-31 | 0    | 9.69173<br>E-24 | 0   | 1.41727<br>E-19 | 0    | 0    | 1.95842E<br>+25 | 2.14692<br>E-47 | 0     | 5.09123E<br>+17 |
| LAREDO        | 2.54435<br>E-31 | 0    | 1.06918<br>E-23 | 0   | 1.55033<br>E-19 | 0    | 0    | 1.95842E<br>+25 | 2.48514<br>E-47 | 0     | 5.17035E<br>+17 |
| COMSTOCK      | 2.98348<br>E-31 | 0    | 1.22677<br>E-23 | 0   | 1.75788<br>E-19 | 0    | 0    | 1.95842E<br>+25 | 3.05003<br>E-47 | 0     | 5.28319E<br>+17 |
| RHYOLITE      | 3.92775<br>E-31 | 0    | 1.55559<br>E-23 | 0   | 2.18387<br>E-19 | 0    | 0    | 1.95842E<br>+25 | 4.34447<br>E-47 | 0     | 5.48391E<br>+17 |
| NIGHTINGALE   | 3.92775<br>E-31 | 0    | 1.55559<br>E-23 | 0   | 2.18387<br>E-19 | 0    | 0    | 1.95842E<br>+25 | 4.34447<br>E-47 | 0     | 5.48391E<br>+17 |
| ALAMO         | 4.8283E-<br>31  | 0    | 1.85916<br>E-23 | 0   | 2.57024<br>E-19 | 0    | 0    | 1.95842E<br>+25 | 5.66592<br>E-47 | 0     | 5.63959E<br>+17 |
| KEARSARGE     | 7.06953<br>E-31 | 0    | 2.5207E-<br>23  | 0   | 3.34159<br>E-19 | 0    | 0    | 1.63202E<br>+25 | 9.74967<br>E-47 | 0     | 5.07293E<br>+17 |
| HARLINGEN A   | 1.22923<br>E-31 | 0    | 4.3335E-<br>24  | 0   | 5.70926<br>E-20 | 0    | 0    | 2.61123E<br>+24 | 1.73613<br>E-47 | 0     | 8.20876E<br>+16 |
| HARLINGEN B   | 1.22923<br>E-31 | 0    | 4.3335E-<br>24  | 0   | 5.70926<br>E-20 | 0    | 0    | 2.61123E<br>+24 | 1.73613<br>E-47 | 0     | 8.20876E<br>+16 |
| BULLFROG      | 1.01457<br>E-30 | 0    | 3.53031<br>E-23 | 0   | 4.61804<br>E-19 | 0    | 0    | 1.95842E<br>+25 | 1.4728E-<br>46  | 0     | 6.23703E<br>+17 |
| DALHART       | 1.85127<br>E-30 | 0    | 5.93432<br>E-23 | 0   | 7.4228E-<br>19  | 0    | 0    | 1.95842E<br>+25 | 3.19268<br>E-46 | 0     | 6.767E+1<br>7   |
| MONAHANS B    | 3.58792<br>E-31 | 0    | 1.09292<br>E-23 | 0   | 1.3295E-<br>19  | 0    | 0    | 2.61123E<br>+24 | 6.88751<br>E-47 | 0     | 9.49208E<br>+16 |
| MONAHANS A    | 3.58792<br>E-31 | 0    | 1.09292<br>E-23 | 0   | 1.3295E-<br>19  | 0    | 0    | 2.61123E<br>+24 | 6.88751<br>E-47 | 0     | 9.49208E<br>+16 |
| KAWICH BLUE   | 5.39958<br>E-31 | 0    | 1.55557<br>E-23 | 0   | 1.83558<br>E-19 | 0    | 0    | 2.61123E<br>+24 | 1.16529<br>E-46 | 0     | 1.00331E<br>+17 |
| KAWICH WHITE  | 5.39958<br>E-31 | 0    | 1.55557<br>E-23 | 0   | 1.83558<br>E-19 | 0    | 0    | 2.61123E<br>+24 | 1.16529<br>E-46 | 0     | 1.00331E<br>+17 |
| MISTY ECHO    | 4.11797<br>E-30 | 0    | 1.18365<br>E-22 | 0   | 1.39497<br>E-18 | 0    | 0    | 1.95842E<br>+25 | 8.92974<br>E-46 | 0     | 7.54188E<br>+17 |
| TEXARKANA     | 5.46193<br>E-30 | 0    | 1.39799<br>E-22 | 0   | 1.54648<br>E-18 | 0    | 0    | 1.10977E<br>+25 | 1.51115<br>E-45 | 0     | 4.79613E<br>+17 |
| KAWICH BLACK  | 1.5539E-<br>30  | 0    | 3.87553<br>E-23 | 0   | 4.227E-<br>19   | 0    | 0    | 2.61123E<br>+24 | 4.53951<br>E-46 | 0     | 1.15794E<br>+17 |
| KAWICH RED    | 1.5539E-<br>30  | 0    | 3.87553<br>E-23 | 0   | 4.227E-<br>19   | 0    | 0    | 2.61123E<br>+24 | 4.53951<br>E-46 | 0     | 1.15794E<br>+17 |
| INGOT         | 7.8838E-<br>30  | 0    | 1.91934<br>E-22 | 0   | 2.06597<br>E-18 | 0    | 0    | 1.10977E<br>+25 | 2.42303<br>E-45 | 0     | 5.04086E<br>+17 |
| PALISADE 3    | 4.64887<br>E-30 | 0    | 9.9847E-<br>23  | 0   | 1.00369<br>E-18 | 0    | 0    | 2.61123E<br>+24 | 1.85899<br>E-45 | 0     | 1.34345E<br>+17 |
| PALISADE 2    | 4.64887<br>E-30 | 0    | 9.9847E-<br>23  | 0   | 1.00369<br>E-18 | 0    | 0    | 2.61123E<br>+24 | 1.85899<br>E-45 | 0     | 1.34345E<br>+17 |
| PALISADE I    | 4.64887<br>E-30 | 0    | 9.9847E-<br>23  | 0   | 1.00369<br>E-18 | 0    | 0    | 2.61123E<br>+24 | 1.85899<br>E-45 | 0     | 1.34345E<br>+17 |
| TULIA         | 5.42152<br>E-30 | 0    | 1.14025<br>E-22 | 0   | 1.13316<br>E-18 | 0    | 0    | 2.61123E<br>+24 | 2.26558<br>E-45 | 0     | 1.37176E<br>+17 |

| Nuclide         | 89Sr            | 91Sr | 91Y             | 93Y | 95Zr            | 97Zr | 99Mo | 99Tc            | 103Ru           | 105Rh | 106Ru           |
|-----------------|-----------------|------|-----------------|-----|-----------------|------|------|-----------------|-----------------|-------|-----------------|
| CONTACT         | 3.34327<br>E-29 | 0    | 6.68341<br>E-22 | 0   | 6.46028<br>E-18 | 0    | 0    | 1.10977E<br>+25 | 1.55432<br>E-44 | 0     | 6.13179E<br>+17 |
| AMARILLO        | 3.56892<br>E-29 | 0    | 7.07122<br>E-22 | 0   | 6.80198<br>E-18 | 0    | 0    | 1.10977E<br>+25 | 1.69057<br>E-44 | 0     | 6.18634E<br>+17 |
| DISKO ELM       | 2.48174<br>E-29 | 0    | 4.24148<br>E-22 | 0   | 3.76371<br>E-18 | 0    | 0    | 2.61124E<br>+24 | 1.60351<br>E-44 | 0     | 1.68601E<br>+17 |
| HORNITOS        | 2.01059<br>E-28 | 0    | 3.14678<br>E-21 | 0   | 2.66135<br>E-17 | 0    | 0    | 1.10978E<br>+25 | 1.56281<br>E-43 | 0     | 7.82067E<br>+17 |
| MULESHOE        | 5.82793<br>E-29 | 0    | 8.86546<br>E-22 | 0   | 7.38232<br>E-18 | 0    | 0    | 2.61124E<br>+24 | 4.80889<br>E-44 | 0     | 1.89294E<br>+17 |
| BARNWELL        | 3.38554<br>E-28 | 0    | 4.93515<br>E-21 | 0   | 4.015E-<br>17   | 0    | 0    | 1.10978E<br>+25 | 3.0552E-<br>43  | 0     | 8.39328E<br>+17 |
| WHITEFACE B     | 9.42932<br>E-29 | 0    | 1.34327<br>E-21 | 0   | 1.07918<br>E-17 | 0    | 0    | 2.61124E<br>+24 | 8.93047<br>E-44 | 0     | 2.02057E<br>+17 |
| WHITEFACE A     | 9.42932<br>E-29 | 0    | 1.34327<br>E-21 | 0   | 1.07918<br>E-17 | 0    | 0    | 2.61124E<br>+24 | 8.93047<br>E-44 | 0     | 2.02057E<br>+17 |
| METROPOLIS      | 1.19693<br>E-27 | 0    | 1.46869<br>E-20 | 0   | 1.08762<br>E-16 | 0    | 0    | 1.10978E<br>+25 | 1.55095<br>E-42 | 0     | 9.96099E<br>+17 |
| BOWIE           | 4.08143<br>E-28 | 0    | 4.76093<br>E-21 | 0   | 3.42958<br>E-17 | 0    | 0    | 2.61124E<br>+24 | 5.88169<br>E-43 | 0     | 2.4647E+<br>17  |
| BULLION         | 4.40697<br>E-27 | 0    | 4.5267E-<br>20  | 0   | 3.04214<br>E-16 | 0    | 0    | 1.10978E<br>+25 | 8.29536<br>E-42 | 0     | 1.18868E<br>+18 |
| AUSTIN          | 1.15872<br>E-27 | 0    | 1.17231<br>E-20 | 0   | 7.81354<br>E-17 | 0    | 0    | 2.61124E<br>+24 | 2.2516E-<br>42  | 0     | 2.83932E<br>+17 |
| RANDSBURG       | 1.84402<br>E-27 | 0    | 1.75106<br>E-20 | 0   | 1.12741<br>E-16 | 0    | 0    | 2.61124E<br>+24 | 4.0934E-<br>42  | 0     | 3.02397E<br>+17 |
| MINERAL QUARRY  | 1.84402<br>E-27 | 0    | 1.75106<br>E-20 | 0   | 1.12741<br>E-16 | 0    | 0    | 2.61124E<br>+24 | 4.0934E-<br>42  | 0     | 3.02397E<br>+17 |
| SUNDOWN A       | 4.03383<br>E-27 | 0    | 3.44256<br>E-20 | 0   | 2.09098<br>E-16 | 0    | 0    | 2.61125E<br>+24 | 1.12054<br>E-41 | 0     | 3.36261E<br>+17 |
| SUNDOWN B       | 4.03383<br>E-27 | 0    | 3.44256<br>E-20 | 0   | 2.09098<br>E-16 | 0    | 0    | 2.61125E<br>+24 | 1.12054<br>E-41 | 0     | 3.36261E<br>+17 |
| LEDOUX          | 4.44502<br>E-27 | 0    | 3.74358<br>E-20 | 0   | 2.25744<br>E-16 | 0    | 0    | 2.61125E<br>+24 | 1.26958<br>E-41 | 0     | 3.40717E<br>+17 |
| TENABO          | 2.3201E-<br>26  | 0    | 1.89997<br>E-19 | 0   | 1.12831<br>E-15 | 0    | 0    | 1.10978E<br>+25 | 7.02842<br>E-41 | 0     | 1.48896E<br>+18 |
| HOUSTON         | 3.65245<br>E-26 | 0    | 2.81151<br>E-19 | 0   | 1.61417<br>E-15 | 0    | 0    | 1.10978E<br>+25 | 1.26007<br>E-40 | 0     | 1.58347E<br>+18 |
| COSO GRAY       | 4.11071<br>E-26 | 0    | 2.55595<br>E-19 | 0   | 1.30601<br>E-15 | 0    | 0    | 2.61125E<br>+24 | 2.22051<br>E-40 | 0     | 4.60673E<br>+17 |
| COSO SILVER     | 4.11071<br>E-26 | 0    | 2.55595<br>E-19 | 0   | 1.30601<br>E-15 | 0    | 0    | 2.61125E<br>+24 | 2.22051<br>E-40 | 0     | 4.60673E<br>+17 |
| COSO BRONZE     | 4.11071<br>E-26 | 0    | 2.55595<br>E-19 | 0   | 1.30601<br>E-15 | 0    | 0    | 2.61125E<br>+24 | 2.22051<br>E-40 | 0     | 4.60673E<br>+17 |
| BEXAR           | 2.52744<br>E-25 | 0    | 1.4943E-<br>18  | 0   | 7.42836<br>E-15 | 0    | 0    | 1.10978E<br>+25 | 1.51761<br>E-39 | 0     | 2.0584E+<br>18  |
| MONTELLO        | 2.97382<br>E-25 | 0    | 1.71964<br>E-18 | 0   | 8.44565<br>E-15 | 0    | 0    | 1.10978E<br>+25 | 1.87081<br>E-39 | 0     | 2.1043E+<br>18  |
| FLOYDADA        | 3.68167<br>E-25 | 0    | 1.69746<br>E-18 | 0   | 7.36714<br>E-15 | 0    | 0    | 2.61125E<br>+24 | 3.72687<br>E-39 | 0     | 6.20163E<br>+17 |
| HOYA            | 2.36558<br>E-24 | 0    | 1.03088<br>E-17 | 0   | 4.3385E-<br>14  | 0    | 0    | 1.10978E<br>+25 | 2.69563<br>E-38 | 0     | 2.78763E<br>+18 |
| DISTANT ZENITH  | 5.9528E-<br>25  | 0    | 2.57046<br>E-18 | 0   | 1.07639<br>E-14 | 0    | 0    | 2.61125E<br>+24 | 6.91514<br>E-39 | 0     | 6.61916E<br>+17 |
| LUBBOCK         | 3.77208<br>E-24 | 0    | 1.54244<br>E-17 | 0   | 6.26976<br>E-14 | 0    | 0    | 1.10978E<br>+25 | 4.91311<br>E-38 | 0     | 2.96972E<br>+18 |
| BRISTOL         | 1.51504<br>E-24 | 0    | 5.75934<br>E-18 | 0   | 2.2497E-<br>14  | 0    | 0    | 2.61126E<br>+24 | 2.30002<br>E-38 | 0     | 7.51308E<br>+17 |
| JUNCTION        | 3.38291<br>E-23 | 0    | 1.02555<br>E-16 | 0   | 3.54048<br>E-13 | 0    | 0    | 1.10978E<br>+25 | 8.26033<br>E-37 | 0     | 3.99859E<br>+18 |
| DIAMOND FORTUNE | 1.28663<br>E-23 | 0    | 3.65319<br>E-17 | 0   | 1.21688<br>E-13 | 0    | 0    | 2.61126E<br>+24 | 3.60501<br>E-37 | 0     | 1.00415E<br>+18 |
| VICTORIA        | 2.55533<br>E-23 | 0    | 6.60719<br>E-17 | 0   | 2.09123<br>E-13 | 0    | 0    | 2.61126E<br>+24 | 8.71502<br>E-37 | 0     | 1.10207E<br>+18 |
| GALENA YELLOW   | 2.69679<br>E-23 | 0    | 6.92189<br>E-17 | 0   | 2.18207<br>E-13 | 0    | 0    | 2.61126E<br>+24 | 9.34055<br>E-37 | 0     | 1.11015E<br>+18 |
| GALENA GREEN    | 2.69679<br>E-23 | 0    | 6.92189<br>E-17 | 0   | 2.18207<br>E-13 | 0    | 0    | 2.61126E<br>+24 | 9.34055<br>E-37 | 0     | 1.11015E<br>+18 |
| GALENA ORANGE   | 2.69679<br>E-23 | 0    | 6.92189<br>E-17 | 0   | 2.18207<br>E-13 | 0    | 0    | 2.61126E<br>+24 | 9.34055<br>E-37 | 0     | 1.11015E<br>+18 |
| HUNTERS TROPHY  | 8.90728<br>E-23 | 0    | 1.9424E-<br>16  | 0   | 5.60202<br>E-13 | 0    | 0    | 2.61126E<br>+24 | 4.34433<br>E-36 | 0     | 1.3054E+<br>18  |
| DIVIDER         | 9.52924<br>E-23 | 0    | 2.05899<br>E-16 | 0   | 5.90849<br>E-13 | 0    | 0    | 2.61126E<br>+24 | 4.73842<br>E-36 | 0     | 1.31741E<br>+18 |

## Nuclide set 2

| Nuclide                 | 111Ag      | 112Pd       | 125Sb       | 126Sb       | 127Sb      | 128Sb       | 129Te-m     | 131Te-m     | 133I        | 135I        | 137Cs       |
|-------------------------|------------|-------------|-------------|-------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Half Life               | 7.6        | 20.04       | 2.758       | 12.4        | 3.84       | 9.1         | 33.6        | 1.35        | 20.8        | 6.57        | 30.17       |
|                         | d          | h           | y           | d           | d          | h           | d           | d           | h           | h           | y           |
| Decay Constant (1/s)    | 1.0556E-06 | 9.60783E-06 | 7.96393E-09 | 6.46979E-07 | 2.0892E-06 | 2.11583E-05 | 2.38766E-07 | 5.94262E-06 | 9.25677E-06 | 2.93061E-05 | 7.28025E-10 |
| Test Name               |            |             |             |             |            |             |             |             |             |             |             |
| Trinity                 | 0          | 0           | 9.08525E+16 | 0           | 0          | 0           | 1.544E-200  | 0           | 0           | 0           | 5.67948E+23 |
| Able:Ranger             | 0          | 0           | 1.73802E+16 | 0           | 0          | 0           | 9.3976E-184 | 0           | 0           | 0           | 3.07113E+22 |
| BAKER:Ranger            | 0          | 0           | 1.39137E+17 | 0           | 0          | 0           | 7.6748E-183 | 0           | 0           | 0           | 2.45706E+23 |
| EASY:Ranger             | 0          | 0           | 1.74401E+16 | 0           | 0          | 0           | 1.0419E-183 | 0           | 0           | 0           | 3.07209E+22 |
| BAKER-2:Ranger          | 0          | 0           | 1.39617E+17 | 0           | 0          | 0           | 8.5087E-183 | 0           | 0           | 0           | 2.45783E+23 |
| FOX:Ranger              | 0          | 0           | 3.85004E+17 | 0           | 0          | 0           | 2.5412E-182 | 0           | 0           | 0           | 6.76073E+23 |
| BAKER:Buster            | 0          | 0           | 7.34517E+16 | 0           | 0          | 0           | 9.3738E-181 | 0           | 0           | 0           | 1.09358E+23 |
| CHARLIE:Buster          | 0          | 0           | 2.94212E+17 | 0           | 0          | 0           | 3.9074E-180 | 0           | 0           | 0           | 4.37488E+23 |
| DOG:Buster              | 0          | 0           | 4.41925E+17 | 0           | 0          | 0           | 6.1081E-180 | 0           | 0           | 0           | 6.56314E+23 |
| EASY:Buster             | 0          | 0           | 6.54164E+17 | 0           | 0          | 0           | 9.7922E-180 | 0           | 0           | 0           | 9.69088E+23 |
| SUGAR:Jangle            | 0          | 0           | 2.55676E+16 | 0           | 0          | 0           | 5.0598E-181 | 0           | 0           | 0           | 3.75461E+22 |
| UNCLE                   | 0          | 0           | 2.57441E+16 | 0           | 0          | 0           | 6.219E-181  | 0           | 0           | 0           | 3.75698E+22 |
| ABLE:Tumbler-Snapper    | 0          | 0           | 2.33642E+16 | 0           | 0          | 0           | 6.6909E-180 | 0           | 0           | 0           | 3.15533E+22 |
| BAKER:Tumbler-Snapper   | 0          | 0           | 2.35904E+16 | 0           | 0          | 0           | 8.9313E-180 | 0           | 0           | 0           | 3.15811E+22 |
| CHARLIE:Tumbler-Snapper | 0          | 0           | 7.34833E+17 | 0           | 0          | 0           | 3.1988E-178 | 0           | 0           | 0           | 9.79445E+23 |
| DOG:Tumbler-Snapper     | 0          | 0           | 4.53179E+17 | 0           | 0          | 0           | 2.3606E-178 | 0           | 0           | 0           | 6.00645E+23 |
| EASY:Tumbler-Snapper    | 0          | 0           | 2.87403E+17 | 0           | 0          | 0           | 1.6873E-178 | 0           | 0           | 0           | 3.79498E+23 |
| FOX:Tumbler-Snapper     | 0          | 0           | 2.66736E+17 | 0           | 0          | 0           | 2.2422E-178 | 0           | 0           | 0           | 3.48267E+23 |
| GEORGE:Tumbler-Snapper  | 0          | 0           | 3.65487E+17 | 0           | 0          | 0           | 3.5326E-178 | 0           | 0           | 0           | 4.75119E+23 |
| HOW:Tumbler-Snapper     | 0          | 0           | 3.42061E+17 | 0           | 0          | 0           | 3.5807E-178 | 0           | 0           | 0           | 4.43556E+23 |
| ANNIE:Upshot-Knothole   | 0          | 0           | 4.75622E+17 | 0           | 0          | 0           | 1.4633E-175 | 0           | 0           | 0           | 5.1609E+23  |
| NANCY:Upshot-Knothole   | 0          | 0           | 7.16878E+17 | 0           | 0          | 0           | 2.536E-175  | 0           | 0           | 0           | 7.74477E+23 |
| RUTH:Upshot-Knothole    | 0          | 0           | 6.00283E+15 | 0           | 0          | 0           | 2.4416E-177 | 0           | 0           | 0           | 6.45681E+21 |
| DIXIE:Upshot-Knothole   | 0          | 0           | 3.31521E+17 | 0           | 0          | 0           | 1.5198E-175 | 0           | 0           | 0           | 3.55259E+23 |
| RAY:Upshot-Knothole     | 0          | 0           | 6.04844E+15 | 0           | 0          | 0           | 3.0636E-177 | 0           | 0           | 0           | 6.46128E+21 |
| BADGER:Upshot-Knothole  | 0          | 0           | 6.98929E+17 | 0           | 0          | 0           | 4.0704E-175 | 0           | 0           | 0           | 7.43375E+23 |
| SIMON:Upshot-Knothole   | 0          | 0           | 1.313E+18   | 0           | 0          | 0           | 8.7921E-175 | 0           | 0           | 0           | 1.3904E+24  |
| ENCORE:Upshot-Knothole  | 0          | 0           | 8.31851E+17 | 0           | 0          | 0           | 7.2187E-175 | 0           | 0           | 0           | 8.73756E+23 |
| HARRY:Upshot-Knothole   | 0          | 0           | 9.93387E+17 | 0           | 0          | 0           | 1.0735E-174 | 0           | 0           | 0           | 1.03628E+24 |
| GRABLE:Upshot-Knothole  | 0          | 0           | 4.67577E+17 | 0           | 0          | 0           | 5.695E-175  | 0           | 0           | 0           | 4.85939E+23 |
| CLIMAX:Upshot-Knothole  | 0          | 0           | 1.91461E+18 | 0           | 0          | 0           | 2.8466E-174 | 0           | 0           | 0           | 1.9774E+24  |
| WASP:Teapot             | 0          | 0           | 4.82192E+16 | 0           | 0          | 0           | 1.8178E-170 | 0           | 0           | 0           | 3.3714E+22  |

| Nuclide                 | 111Ag | 112Pd | 125Sb       | 126Sb | 127Sb | 128Sb | 129Te-m     | 131Te-m | 133I | 135I | 137Cs       |
|-------------------------|-------|-------|-------------|-------|-------|-------|-------------|---------|------|------|-------------|
| MOTH:Teapot             | 0     | 0     | 9.67043E+16 | 0     | 0     | 0     | 3.9484E-170 | 0       | 0    | 0    | 6.74449E+22 |
| TESLA:Teapot            | 0     | 0     | 3.40099E+17 | 0     | 0     | 0     | 1.5966E-169 | 0       | 0    | 0    | 2.36161E+23 |
| TURK:Teapot             | 0     | 0     | 2.09782E+18 | 0     | 0     | 0     | 1.11E-168   | 0       | 0    | 0    | 1.45125E+24 |
| HORNET:Teapot           | 0     | 0     | 1.95819E+17 | 0     | 0     | 0     | 1.1448E-169 | 0       | 0    | 0    | 1.35043E+23 |
| BEE:Teapot              | 0     | 0     | 3.94342E+17 | 0     | 0     | 0     | 2.8141E-169 | 0       | 0    | 0    | 2.70255E+23 |
| ESS                     | 0     | 0     | 4.93267E+16 | 0     | 0     | 0     | 3.5909E-170 | 0       | 0    | 0    | 3.3784E+22  |
| APPLE-1:Teapot          | 0     | 0     | 6.9343E+17  | 0     | 0     | 0     | 5.6897E-169 | 0       | 0    | 0    | 4.73155E+23 |
| WASP PRIME:Teapot       | 0     | 0     | 1.48592E+17 | 0     | 0     | 0     | 1.2192E-169 | 0       | 0    | 0    | 1.0139E+23  |
| HA :Teapot              | 0     | 0     | 1.49412E+17 | 0     | 0     | 0     | 1.438E-169  | 0       | 0    | 0    | 1.01441E+23 |
| POST:Teapot             | 0     | 0     | 9.98141E+16 | 0     | 0     | 0     | 1.0199E-169 | 0       | 0    | 0    | 6.76404E+22 |
| MET:Teapot              | 0     | 0     | 1.1025E+18  | 0     | 0     | 0     | 1.2697E-168 | 0       | 0    | 0    | 7.44325E+23 |
| APPLE-2:Teapot          | 0     | 0     | 1.47343E+18 | 0     | 0     | 0     | 2.5284E-168 | 0       | 0    | 0    | 9.82391E+23 |
| ZUCCHINI:Teapot         | 0     | 0     | 1.43244E+18 | 0     | 0     | 0     | 3.0006E-168 | 0       | 0    | 0    | 9.49112E+23 |
| BOLTZMANN:Plumbbob      | 0     | 0     | 1.02431E+18 | 0     | 0     | 0     | 5.9551E-162 | 0       | 0    | 0    | 4.26251E+23 |
| FRANKLIN:Plumbbob       | 0     | 0     | 1.19915E+16 | 0     | 0     | 0     | 7.7025E-164 | 0       | 0    | 0    | 4.97449E+21 |
| LASSEN:Plumbbob         | 0     | 0     | 4.29151E+13 | 0     | 0     | 0     | 2.9265E-166 | 0       | 0    | 0    | 1.77694E+19 |
| WILSON:Plumbbob         | 0     | 0     | 8.66015E+17 | 0     | 0     | 0     | 7.6534E-162 | 0       | 0    | 0    | 3.55678E+23 |
| PRISCILLA:Plumbbob      | 0     | 0     | 3.21751E+18 | 0     | 0     | 0     | 3.2049E-161 | 0       | 0    | 0    | 1.31651E+24 |
| HOOD:Plumbbob           | 0     | 0     | 6.48391E+18 | 0     | 0     | 0     | 8.0425E-161 | 0       | 0    | 0    | 2.63484E+24 |
| DIABLO:Plumbbob         | 0     | 0     | 1.49983E+18 | 0     | 0     | 0     | 2.2709E-161 | 0       | 0    | 0    | 6.05681E+23 |
| JOHN:Plumbbob           | 0     | 0     | 1.76937E+17 | 0     | 0     | 0     | 2.9015E-162 | 0       | 0    | 0    | 7.12745E+22 |
| KEPLER:Plumbbob         | 0     | 0     | 8.87735E+17 | 0     | 0     | 0     | 1.6084E-161 | 0       | 0    | 0    | 3.56485E+23 |
| OWENS:Plumbbob          | 0     | 0     | 8.61695E+17 | 0     | 0     | 0     | 1.5926E-161 | 0       | 0    | 0    | 3.45812E+23 |
| PASCAL A                | 0     | 0     | 0           | 0     | 0     | 0     | 0           | 0       | 0    | 0    | 0           |
| STOKES:Plumbbob         | 0     | 0     | 1.70363E+18 | 0     | 0     | 0     | 4.1229E-161 | 0       | 0    | 0    | 6.7794E+23  |
| SATURN                  | 0     | 0     | 0           | 0     | 0     | 0     | 0           | 0       | 0    | 0    | 0           |
| SHASTA:Plumbbob         | 0     | 0     | 1.53586E+18 | 0     | 0     | 0     | 4.6269E-161 | 0       | 0    | 0    | 6.06997E+23 |
| DOPPLER:Plumbbob        | 0     | 0     | 9.97233E+17 | 0     | 0     | 0     | 3.3206E-161 | 0       | 0    | 0    | 3.92887E+23 |
| PASCAL B                | 0     | 0     | 0           | 0     | 0     | 0     | 0           | 0       | 0    | 0    | 0           |
| FRANKLIN PRIME:Plumbbob | 0     | 0     | 4.2815E+17  | 0     | 0     | 0     | 1.6395E-161 | 0       | 0    | 0    | 1.67944E+23 |
| SMOKY:Plumbbob          | 0     | 0     | 4.01095E+18 | 0     | 0     | 0     | 1.5666E-160 | 0       | 0    | 0    | 1.57234E+24 |
| GALILEO:Plumbbob        | 0     | 0     | 1.00412E+18 | 0     | 0     | 0     | 4.082E-161  | 0       | 0    | 0    | 3.93134E+23 |
| WHEELER:Plumbbob        | 0     | 0     | 1.80325E+16 | 0     | 0     | 0     | 7.9399E-163 | 0       | 0    | 0    | 7.04245E+21 |
| COULOMB-B:Plumbbob      | 0     | 0     | 2.74665E+16 | 0     | 0     | 0     | 1.2168E-162 | 0       | 0    | 0    | 1.07247E+22 |
| LAPLACE:Plumbbob        | 0     | 0     | 9.16624E+16 | 0     | 0     | 0     | 4.2011E-162 | 0       | 0    | 0    | 3.5753E+22  |
| FIZEAU:Plumbbob         | 0     | 0     | 1.01257E+18 | 0     | 0     | 0     | 5.247E-161  | 0       | 0    | 0    | 3.93435E+23 |
| NEWTON:Plumbbob         | 0     | 0     | 1.10602E+18 | 0     | 0     | 0     | 5.945E-161  | 0       | 0    | 0    | 4.29252E+23 |
| RAINIER                 | 0     | 0     | 1.57028E+17 | 0     | 0     | 0     | 8.992E-162  | 0       | 0    | 0    | 6.08228E+22 |

| Nuclide                   | 111Ag | 112Pd | 125Sb       | 126Sb | 127Sb | 128Sb | 129Te-m     | 131Te-m | 133I | 135I | 137Cs       |
|---------------------------|-------|-------|-------------|-------|-------|-------|-------------|---------|------|------|-------------|
| WHITNEY:Plumbbob          | 0     | 0     | 1.75963E+18 | 0     | 0     | 0     | 1.0872E-160 | 0       | 0    | 0    | 6.79947E+23 |
| CHARLESTON:Plumbbob       | 0     | 0     | 1.11519E+18 | 0     | 0     | 0     | 7.616E-161  | 0       | 0    | 0    | 4.29576E+23 |
| MORGAN:Plumbbob           | 0     | 0     | 7.48079E+17 | 0     | 0     | 0     | 6.1132E-161 | 0       | 0    | 0    | 2.86546E+23 |
| PASCAL C                  | 0     | 0     | 0           | 0     | 0     | 0     | 0           | 0       | 0    | 0    | 0           |
| COULOMB-C:Project 58      | 0     | 0     | 4.88361E+16 | 0     | 0     | 0     | 1.4099E-161 | 0       | 0    | 0    | 1.79806E+22 |
| VENUS                     | 0     | 0     | 0           | 0     | 0     | 0     | 0           | 0       | 0    | 0    | 0           |
| URANUS                    | 0     | 0     | 0           | 0     | 0     | 0     | 0           | 0       | 0    | 0    | 0           |
| OTERO                     | 0     | 0     | 4.49087E+15 | 0     | 0     | 0     | 3.2487E-160 | 0       | 0    | 0    | 1.39054E+21 |
| BERNALILLO                | 0     | 0     | 1.7788E+15  | 0     | 0     | 0     | 1.4211E-160 | 0       | 0    | 0    | 5.4907E+20  |
| EDDY:Hardtack II          | 0     | 0     | 9.85467E+15 | 0     | 0     | 0     | 8.1561E-160 | 0       | 0    | 0    | 3.03853E+21 |
| LUNA                      | 0     | 0     | 1.78367E+14 | 0     | 0     | 0     | 1.5427E-161 | 0       | 0    | 0    | 5.49208E+19 |
| MERCURY                   | 0     | 0     | 0           | 0     | 0     | 0     | 0           | 0       | 0    | 0    | 0           |
| VALENCIA                  | 0     | 0     | 2.3865E+14  | 0     | 0     | 0     | 2.2824E-161 | 0       | 0    | 0    | 7.32509E+19 |
| MARS                      | 0     | 0     | 1.55247E+15 | 0     | 0     | 0     | 1.5197E-160 | 0       | 0    | 0    | 4.76166E+20 |
| MORA:Hardtack II          | 0     | 0     | 2.39102E+17 | 0     | 0     | 0     | 2.4158E-158 | 0       | 0    | 0    | 7.32636E+22 |
| HIDALGO:Hardtack II       | 0     | 0     | 9.24354E+15 | 0     | 0     | 0     | 1.0527E-159 | 0       | 0    | 0    | 2.82171E+21 |
| COLFAX                    | 0     | 0     | 6.60292E+14 | 0     | 0     | 0     | 7.5328E-161 | 0       | 0    | 0    | 2.01552E+20 |
| TAMALPAIS                 | 0     | 0     | 8.66311E+15 | 0     | 0     | 0     | 1.0543E-159 | 0       | 0    | 0    | 2.63904E+21 |
| QUAY:Hardtack II          | 0     | 0     | 9.5164E+15  | 0     | 0     | 0     | 1.1977E-159 | 0       | 0    | 0    | 2.89592E+21 |
| LEA:Hardtack II           | 0     | 0     | 1.68988E+17 | 0     | 0     | 0     | 2.2558E-158 | 0       | 0    | 0    | 5.13296E+22 |
| NEPTUNE                   | 0     | 0     | 1.38926E+16 | 0     | 0     | 0     | 1.8992E-159 | 0       | 0    | 0    | 4.21668E+21 |
| HAMILTON:Hardtack II      | 0     | 0     | 1.45057E+14 | 0     | 0     | 0     | 2.0196E-161 | 0       | 0    | 0    | 4.40026E+19 |
| LOGAN                     | 0     | 0     | 6.04648E+17 | 0     | 0     | 0     | 8.517E-158  | 0       | 0    | 0    | 1.83351E+23 |
| DONA ANA:Hardtack II      | 0     | 0     | 4.47547E+15 | 0     | 0     | 0     | 6.3479E-160 | 0       | 0    | 0    | 1.35683E+21 |
| VESTA:Hardtack II         | 0     | 0     | 2.90573E+15 | 0     | 0     | 0     | 4.2348E-160 | 0       | 0    | 0    | 8.8018E+20  |
| RIO ARRIBA:Hardtack II    | 0     | 0     | 1.09013E+16 | 0     | 0     | 0     | 1.6092E-159 | 0       | 0    | 0    | 3.30081E+21 |
| SAN JUAN                  | 0     | 0     | 0           | 0     | 0     | 0     | 0           | 0       | 0    | 0    | 0           |
| SOCORRO:Hardtack II       | 0     | 0     | 7.28737E+17 | 0     | 0     | 0     | 1.1642E-157 | 0       | 0    | 0    | 2.20109E+23 |
| WRANGELL:Hardtack II      | 0     | 0     | 1.39688E+16 | 0     | 0     | 0     | 2.2378E-159 | 0       | 0    | 0    | 4.21879E+21 |
| OBERON:Hardtack II        | 0     | 0     | 0           | 0     | 0     | 0     | 0           | 0       | 0    | 0    | 0           |
| RUSHMORE:Hardtack II      | 0     | 0     | 2.28404E+16 | 0     | 0     | 0     | 3.6798E-159 | 0       | 0    | 0    | 6.89692E+21 |
| CATRON:Hardtack II        | 0     | 0     | 2.5542E+15  | 0     | 0     | 0     | 4.2518E-160 | 0       | 0    | 0    | 7.7048E+20  |
| JUNO:Hardtack II          | 0     | 0     | 2.06775E+14 | 0     | 0     | 0     | 3.4449E-161 | 0       | 0    | 0    | 6.23724E+19 |
| CERES:Hardtack II         | 0     | 0     | 8.52304E+13 | 0     | 0     | 0     | 1.4631E-161 | 0       | 0    | 0    | 2.56852E+19 |
| SANFORD:Hardtack II       | 0     | 0     | 5.96721E+17 | 0     | 0     | 0     | 1.0297E-157 | 0       | 0    | 0    | 1.79799E+23 |
| DE BACA:Hardtack II       | 0     | 0     | 2.67959E+17 | 0     | 0     | 0     | 4.6458E-158 | 0       | 0    | 0    | 8.07273E+22 |
| CHAVES/CHAVEZ:Hardtack II | 0     | 0     | 7.31269E+13 | 0     | 0     | 0     | 1.2918E-161 | 0       | 0    | 0    | 2.20178E+19 |
| EVANS                     | 0     | 0     | 6.70974E+15 | 0     | 0     | 0     | 1.2187E-159 | 0       | 0    | 0    | 2.01848E+21 |

| Nuclide              | 111Ag | 112Pd | 125Sb       | 126Sb | 127Sb | 128Sb | 129Te-m     | 131Te-m | 133I | 135I | 137Cs       |
|----------------------|-------|-------|-------------|-------|-------|-------|-------------|---------|------|------|-------------|
| MAZAMA:Hardtack II   | 0     | 0     | 0           | 0     | 0     | 0     | 0           | 0       | 0    | 0    | 0           |
| HUMBOLDT:Hardtack II | 0     | 0     | 9.51966E+14 | 0     | 0     | 0     | 1.7504E-160 | 0       | 0    | 0    | 2.86268E+20 |
| SANTA FE:Hardtack II | 0     | 0     | 1.58717E+17 | 0     | 0     | 0     | 2.9483E-158 | 0       | 0    | 0    | 4.77129E+22 |
| GANYMEDE:Hardtack II | 0     | 0     | 0           | 0     | 0     | 0     | 0           | 0       | 0    | 0    | 0           |
| BLANCA               | 0     | 0     | 2.6869E+18  | 0     | 0     | 0     | 5.0411E-157 | 0       | 0    | 0    | 8.07474E+23 |
| TITANIA:Hardtack II  | 0     | 0     | 2.44303E+13 | 0     | 0     | 0     | 4.6048E-162 | 0       | 0    | 0    | 7.34078E+18 |
| ANTLER               | 0     | 0     | 6.54482E+17 | 0     | 0     | 0     | 1.5559E-148 | 0       | 0    | 0    | 1.01951E+23 |
| SHREW                | 0     | 0     | 5.03834E+18 | 0     | 0     | 0     | 1.2247E-147 | 0       | 0    | 0    | 7.84296E+23 |
| BOOMER               | 0     | 0     | 5.09087E+18 | 0     | 0     | 0     | 1.6713E-147 | 0       | 0    | 0    | 7.8504E+23  |
| CHENA                | 0     | 0     | 5.12198E+18 | 0     | 0     | 0     | 2.0062E-147 | 0       | 0    | 0    | 7.85477E+23 |
| MINK                 | 0     | 0     | 5.18946E+18 | 0     | 0     | 0     | 2.9703E-147 | 0       | 0    | 0    | 7.86417E+23 |
| FISHER               | 0     | 0     | 3.56216E+18 | 0     | 0     | 0     | 4.1129E-147 | 0       | 0    | 0    | 5.28067E+23 |
| MAD                  | 0     | 0     | 1.33814E+17 | 0     | 0     | 0     | 1.8781E-148 | 0       | 0    | 0    | 1.97161E+22 |
| RINGTAIL             | 0     | 0     | 5.36711E+18 | 0     | 0     | 0     | 8.1486E-147 | 0       | 0    | 0    | 7.88841E+23 |
| FEATHER              | 0     | 0     | 4.0392E+16  | 0     | 0     | 0     | 6.775E-149  | 0       | 0    | 0    | 5.91817E+21 |
| STOAT                | 0     | 0     | 1.39044E+18 | 0     | 0     | 0     | 3.3393E-147 | 0       | 0    | 0    | 2.01446E+23 |
| AGOUTI               | 0     | 0     | 1.75578E+18 | 0     | 0     | 0     | 5.0519E-147 | 0       | 0    | 0    | 2.52939E+23 |
| DORMOUSE             | 0     | 0     | 5.53232E+18 | 0     | 0     | 0     | 2.0222E-146 | 0       | 0    | 0    | 7.9103E+23  |
| STILLWATER           | 0     | 0     | 8.54486E+17 | 0     | 0     | 0     | 3.7373E-147 | 0       | 0    | 0    | 1.21492E+23 |
| ARMADILLO            | 0     | 0     | 1.97745E+18 | 0     | 0     | 0     | 8.812E-147  | 0       | 0    | 0    | 2.80991E+23 |
| HARD HAT             | 0     | 0     | 1.59416E+18 | 0     | 0     | 0     | 8.0169E-147 | 0       | 0    | 0    | 2.25671E+23 |
| CHINCHILLA I         | 0     | 0     | 5.3283E+17  | 0     | 0     | 0     | 2.8984E-147 | 0       | 0    | 0    | 7.52422E+22 |
| CODSAW               | 0     | 0     | 5.60895E+18 | 0     | 0     | 0     | 3.0545E-146 | 0       | 0    | 0    | 7.92025E+23 |
| CIMARRON             | 0     | 0     | 3.34654E+18 | 0     | 0     | 0     | 1.974E-146  | 0       | 0    | 0    | 4.71374E+23 |
| PLATYPUS             | 0     | 0     | 5.62806E+18 | 0     | 0     | 0     | 3.3825E-146 | 0       | 0    | 0    | 7.92272E+23 |
| PAMPAS               | 0     | 0     | 2.68275E+18 | 0     | 0     | 0     | 1.7853E-146 | 0       | 0    | 0    | 3.7645E+23  |
| DANNY BOY            | 0     | 0     | 1.21761E+17 | 0     | 0     | 0     | 8.7692E-148 | 0       | 0    | 0    | 1.70436E+22 |
| ERMINE               | 0     | 0     | 5.66692E+18 | 0     | 0     | 0     | 4.1575E-146 | 0       | 0    | 0    | 7.9277E+23  |
| BRAZOS               | 0     | 0     | 2.38349E+18 | 0     | 0     | 0     | 1.822E-146  | 0       | 0    | 0    | 3.33007E+23 |
| HOGNOSE              | 0     | 0     | 5.70213E+18 | 0     | 0     | 0     | 5.0057E-146 | 0       | 0    | 0    | 7.93219E+23 |
| HOOSIC               | 0     | 0     | 9.78113E+17 | 0     | 0     | 0     | 1.1141E-146 | 0       | 0    | 0    | 1.34958E+23 |
| CHINCHILLA II        | 0     | 0     | 5.7655E+18  | 0     | 0     | 0     | 6.9722E-146 | 0       | 0    | 0    | 7.94021E+23 |
| DORMOUSE PRIME       | 0     | 0     | 3.06624E+18 | 0     | 0     | 0     | 4.0968E-146 | 0       | 0    | 0    | 4.20964E+23 |
| PASSAIC              | 0     | 0     | 5.78935E+18 | 0     | 0     | 0     | 7.8909E-146 | 0       | 0    | 0    | 7.94321E+23 |
| HUDSON               | 0     | 0     | 5.8133E+18  | 0     | 0     | 0     | 8.9306E-146 | 0       | 0    | 0    | 7.94621E+23 |
| PLATTE               | 0     | 0     | 5.38471E+17 | 0     | 0     | 0     | 8.6088E-147 | 0       | 0    | 0    | 7.35117E+22 |
| DEAD                 | 0     | 0     | 5.84952E+18 | 0     | 0     | 0     | 1.0759E-145 | 0       | 0    | 0    | 7.95072E+23 |
| BLACK                | 0     | 0     | 5.87361E+18 | 0     | 0     | 0     | 1.2169E-145 | 0       | 0    | 0    | 7.95371E+23 |



| Nuclide                  | 111Ag | 112Pd | 125Sb       | 126Sb | 127Sb | 128Sb | 129Te-m     | 131Te-m | 133I | 135I | 137Cs       |
|--------------------------|-------|-------|-------------|-------|-------|-------|-------------|---------|------|------|-------------|
| PACA                     | 0     | 0     | 5.91443E+18 | 0     | 0     | 0     | 1.4978E-145 | 0       | 0    | 0    | 7.95874E+23 |
| ARIKAREE                 | 0     | 0     | 5.92588E+18 | 0     | 0     | 0     | 1.5872E-145 | 0       | 0    | 0    | 7.96015E+23 |
| AARDVARK                 | 0     | 0     | 1.18694E+19 | 0     | 0     | 0     | 3.3194E-145 | 0       | 0    | 0    | 1.59225E+24 |
| EEL                      | 0     | 0     | 1.3416E+18  | 0     | 0     | 0     | 4.2997E-146 | 0       | 0    | 0    | 1.79205E+23 |
| WHITE                    | 0     | 0     | 5.98736E+18 | 0     | 0     | 0     | 2.1628E-145 | 0       | 0    | 0    | 7.96767E+23 |
| RACCOON                  | 0     | 0     | 6.01661E+18 | 0     | 0     | 0     | 2.503E-145  | 0       | 0    | 0    | 7.97122E+23 |
| PACKRAT                  | 0     | 0     | 6.03734E+18 | 0     | 0     | 0     | 2.775E-145  | 0       | 0    | 0    | 7.97372E+23 |
| DES MOINES               | 0     | 0     | 0           | 0     | 0     | 0     | 0           | 0       | 0    | 0    | 0           |
| DAMAN I                  | 0     | 0     | 6.09998E+18 | 0     | 0     | 0     | 3.7814E-145 | 0       | 0    | 0    | 7.98125E+23 |
| HAYMAKER                 | 0     | 0     | 2.05201E+19 | 0     | 0     | 0     | 1.4349E-144 | 0       | 0    | 0    | 2.67474E+24 |
| MARSHMALLOW              | 0     | 0     | 6.12943E+18 | 0     | 0     | 0     | 4.3689E-145 | 0       | 0    | 0    | 7.98477E+23 |
| SACRAMENTO               | 0     | 0     | 6.13867E+18 | 0     | 0     | 0     | 4.5705E-145 | 0       | 0    | 0    | 7.98586E+23 |
| SEDAN                    | 0     | 0     | 3.2049E+19  | 0     | 0     | 0     | 2.6794E-144 | 0       | 0    | 0    | 4.15417E+24 |
| LITTLE FELLER II:Sunbeam | 0     | 0     | 6.78465E+15 | 0     | 0     | 0     | 5.7962E-148 | 0       | 0    | 0    | 8.78826E+20 |
| JOHNNIE BOY              | 0     | 0     | 1.54612E+17 | 0     | 0     | 0     | 1.4279E-146 | 0       | 0    | 0    | 1.99782E+22 |
| MERRIMAC                 | 0     | 0     | 3.40607E+19 | 0     | 0     | 0     | 3.2715E-144 | 0       | 0    | 0    | 4.39576E+24 |
| SMALL BOY:Sunbeam        | 0     | 0     | 5.73274E+17 | 0     | 0     | 0     | 5.6288E-146 | 0       | 0    | 0    | 7.39337E+22 |
| LITTLE FELLER I:Sunbeam  | 0     | 0     | 5.58908E+15 | 0     | 0     | 0     | 5.8188E-148 | 0       | 0    | 0    | 7.19488E+20 |
| WICHITA                  | 0     | 0     | 6.25369E+18 | 0     | 0     | 0     | 7.974E-145  | 0       | 0    | 0    | 7.99943E+23 |
| YORK                     | 0     | 0     | 6.37424E+18 | 0     | 0     | 0     | 1.4135E-144 | 0       | 0    | 0    | 8.0134E+23  |
| BOBAC                    | 0     | 0     | 6.37461E+18 | 0     | 0     | 0     | 1.4159E-144 | 0       | 0    | 0    | 8.01345E+23 |
| RARITAN                  | 0     | 0     | 6.43189E+18 | 0     | 0     | 0     | 1.8515E-144 | 0       | 0    | 0    | 8.02E+23    |
| HYRAX                    | 0     | 0     | 6.46742E+18 | 0     | 0     | 0     | 2.184E-144  | 0       | 0    | 0    | 8.02404E+23 |
| PEBA                     | 0     | 0     | 6.49415E+18 | 0     | 0     | 0     | 2.4714E-144 | 0       | 0    | 0    | 8.02707E+23 |
| ALLEGHENY                | 0     | 0     | 6.53449E+18 | 0     | 0     | 0     | 2.9756E-144 | 0       | 0    | 0    | 8.03161E+23 |
| MISSISSIPPI              | 0     | 0     | 3.77287E+19 | 0     | 0     | 0     | 1.9364E-143 | 0       | 0    | 0    | 4.61992E+24 |
| ROANOKE                  | 0     | 0     | 6.59282E+18 | 0     | 0     | 0     | 3.8842E-144 | 0       | 0    | 0    | 8.03814E+23 |
| WOLVERINE                | 0     | 0     | 6.5932E+18  | 0     | 0     | 0     | 3.8909E-144 | 0       | 0    | 0    | 8.03818E+23 |
| TIOGA                    | 0     | 0     | 6.6201E+18  | 0     | 0     | 0     | 4.396E-144  | 0       | 0    | 0    | 8.04117E+23 |
| BANDICOOT                | 0     | 0     | 4.14077E+18 | 0     | 0     | 0     | 2.812E-144  | 0       | 0    | 0    | 5.02609E+23 |
| SANTEE                   | 0     | 0     | 6.66122E+18 | 0     | 0     | 0     | 5.2928E-144 | 0       | 0    | 0    | 8.04573E+23 |
| ST. LAWRENCE             | 0     | 0     | 6.72165E+18 | 0     | 0     | 0     | 6.9387E-144 | 0       | 0    | 0    | 8.05237E+23 |
| GUNDI                    | 0     | 0     | 6.74917E+18 | 0     | 0     | 0     | 7.8428E-144 | 0       | 0    | 0    | 8.05538E+23 |
| ANACOSTIA                | 0     | 0     | 1.76941E+18 | 0     | 0     | 0     | 2.6153E-144 | 0       | 0    | 0    | 2.09599E+23 |
| TAUNTON                  | 0     | 0     | 6.83789E+18 | 0     | 0     | 0     | 1.1601E-143 | 0       | 0    | 0    | 8.065E+23   |
| TENDRAC                  | 0     | 0     | 6.85261E+18 | 0     | 0     | 0     | 1.2374E-143 | 0       | 0    | 0    | 8.06659E+23 |
| MADISON                  | 0     | 0     | 6.87591E+18 | 0     | 0     | 0     | 1.37E-143   | 0       | 0    | 0    | 8.06909E+23 |
| NUMBAT                   | 0     | 0     | 6.87617E+18 | 0     | 0     | 0     | 1.3715E-143 | 0       | 0    | 0    | 8.06912E+23 |

| Nuclide      | 111Ag | 112Pd | 125Sb       | 126Sb | 127Sb | 128Sb | 129Te-m     | 131Te-m | 133I | 135I | 137Cs       |
|--------------|-------|-------|-------------|-------|-------|-------|-------------|---------|------|------|-------------|
| MANATEE      | 0     | 0     | 6.88549E+18 | 0     | 0     | 0     | 1.4284E-143 | 0       | 0    | 0    | 8.07012E+23 |
| CASSELMAN    | 0     | 0     | 7.15558E+18 | 0     | 0     | 0     | 4.5271E-143 | 0       | 0    | 0    | 8.09855E+23 |
| HATCHIE      | 0     | 0     | 7.15558E+18 | 0     | 0     | 0     | 4.5271E-143 | 0       | 0    | 0    | 8.09855E+23 |
| FERRET       | 0     | 0     | 7.15609E+18 | 0     | 0     | 0     | 4.5368E-143 | 0       | 0    | 0    | 8.09861E+23 |
| ACUSHI       | 0     | 0     | 7.15609E+18 | 0     | 0     | 0     | 4.5368E-143 | 0       | 0    | 0    | 8.09861E+23 |
| CHIPMUNK     | 0     | 0     | 7.19033E+18 | 0     | 0     | 0     | 5.2349E-143 | 0       | 0    | 0    | 8.10214E+23 |
| KAWEAH       | 0     | 0     | 1.0831E+18  | 0     | 0     | 0     | 8.9083E-144 | 0       | 0    | 0    | 1.21579E+23 |
| CARMEL       | 0     | 0     | 7.22066E+18 | 0     | 0     | 0     | 5.9389E-143 | 0       | 0    | 0    | 8.10526E+23 |
| JERBOA       | 0     | 0     | 7.26035E+18 | 0     | 0     | 0     | 6.9998E-143 | 0       | 0    | 0    | 8.10932E+23 |
| TOYAH        | 0     | 0     | 7.33008E+18 | 0     | 0     | 0     | 9.3226E-143 | 0       | 0    | 0    | 8.11641E+23 |
| GERBIL       | 0     | 0     | 7.40091E+18 | 0     | 0     | 0     | 1.2438E-142 | 0       | 0    | 0    | 8.12355E+23 |
| FERRET PRIME | 0     | 0     | 7.43708E+18 | 0     | 0     | 0     | 1.4396E-142 | 0       | 0    | 0    | 8.12717E+23 |
| COYPU        | 0     | 0     | 7.46232E+18 | 0     | 0     | 0     | 1.5935E-142 | 0       | 0    | 0    | 8.12969E+23 |
| CUMBERLAND   | 0     | 0     | 7.46746E+18 | 0     | 0     | 0     | 1.6267E-142 | 0       | 0    | 0    | 8.1302E+23  |
| PAISANO      | 0     | 0     | 7.53458E+18 | 0     | 0     | 0     | 2.1273E-142 | 0       | 0    | 0    | 8.13685E+23 |
| KOOTANAI     | 0     | 0     | 7.53458E+18 | 0     | 0     | 0     | 2.1273E-142 | 0       | 0    | 0    | 8.13685E+23 |
| GUNDI PRIME  | 0     | 0     | 7.61322E+18 | 0     | 0     | 0     | 2.9041E-142 | 0       | 0    | 0    | 8.14458E+23 |
| TEJON        | 0     | 0     | 7.6545E+18  | 0     | 0     | 0     | 3.4152E-142 | 0       | 0    | 0    | 8.14861E+23 |
| HARKEE       | 0     | 0     | 7.6545E+18  | 0     | 0     | 0     | 3.4152E-142 | 0       | 0    | 0    | 8.14861E+23 |
| STONES       | 0     | 0     | 4.22457E+19 | 0     | 0     | 0     | 2.0838E-141 | 0       | 0    | 0    | 4.48315E+24 |
| PLEASANT     | 0     | 0     | 7.71799E+18 | 0     | 0     | 0     | 4.3751E-142 | 0       | 0    | 0    | 8.15476E+23 |
| YUBA         | 0     | 0     | 1.20213E+18 | 0     | 0     | 0     | 7.8479E-143 | 0       | 0    | 0    | 1.26455E+23 |
| HUTIA        | 0     | 0     | 7.76036E+18 | 0     | 0     | 0     | 5.1554E-142 | 0       | 0    | 0    | 8.15885E+23 |
| APSHAPA      | 0     | 0     | 7.76102E+18 | 0     | 0     | 0     | 5.1686E-142 | 0       | 0    | 0    | 8.15891E+23 |
| MATACO       | 0     | 0     | 7.80323E+18 | 0     | 0     | 0     | 6.0813E-142 | 0       | 0    | 0    | 8.16296E+23 |
| KENNEBEC     | 0     | 0     | 7.86451E+18 | 0     | 0     | 0     | 7.6886E-142 | 0       | 0    | 0    | 8.1688E+23  |
| PEKAN        | 0     | 0     | 8.12877E+18 | 0     | 0     | 0     | 2.071E-141  | 0       | 0    | 0    | 8.19351E+23 |
| SATSOP       | 0     | 0     | 8.14306E+18 | 0     | 0     | 0     | 2.1829E-141 | 0       | 0    | 0    | 8.19483E+23 |
| KOHOCTON     | 0     | 0     | 8.18809E+18 | 0     | 0     | 0     | 2.5753E-141 | 0       | 0    | 0    | 8.19896E+23 |
| NATCHES      | 0     | 0     | 8.18812E+18 | 0     | 0     | 0     | 2.5757E-141 | 0       | 0    | 0    | 8.19896E+23 |
| AHTANUM      | 0     | 0     | 8.30739E+18 | 0     | 0     | 0     | 3.9736E-141 | 0       | 0    | 0    | 8.20981E+23 |
| BILBY        | 0     | 0     | 1.03436E+20 | 0     | 0     | 0     | 4.9604E-140 | 0       | 0    | 0    | 1.02213E+25 |
| CARP         | 0     | 0     | 8.38791E+18 | 0     | 0     | 0     | 5.3061E-141 | 0       | 0    | 0    | 8.21705E+23 |
| NARRAGUAGUS  | 0     | 0     | 8.38867E+18 | 0     | 0     | 0     | 5.3206E-141 | 0       | 0    | 0    | 8.21712E+23 |
| GRUNION      | 0     | 0     | 8.46902E+18 | 0     | 0     | 0     | 7.0808E-141 | 0       | 0    | 0    | 8.22428E+23 |
| TORNILLO     | 0     | 0     | 1.60944E+17 | 0     | 0     | 0     | 1.3535E-142 | 0       | 0    | 0    | 1.56264E+22 |
| CLEARWATER   | 0     | 0     | 4.67442E+19 | 0     | 0     | 0     | 4.3288E-140 | 0       | 0    | 0    | 4.52481E+24 |
| MULLETT      | 0     | 0     | 8.5043E+18  | 0     | 0     | 0     | 8.0207E-141 | 0       | 0    | 0    | 8.22741E+23 |

| Nuclide    | 111Ag | 112Pd | 125Sb       | 126Sb | 127Sb | 128Sb | 129Te-m     | 131Te-m | 133I | 135I | 137Cs       |
|------------|-------|-------|-------------|-------|-------|-------|-------------|---------|------|------|-------------|
| ANCHOVY    | 0     | 0     | 8.66999E+18 | 0     | 0     | 0     | 1.4304E-140 | 0       | 0    | 0    | 8.24193E+23 |
| MUSTANG    | 0     | 0     | 8.67571E+18 | 0     | 0     | 0     | 1.4589E-140 | 0       | 0    | 0    | 8.24243E+23 |
| GREYS      | 0     | 0     | 4.79502E+19 | 0     | 0     | 0     | 9.2905E-140 | 0       | 0    | 0    | 4.53536E+24 |
| BARRACUDA  | 0     | 0     | 8.79029E+18 | 0     | 0     | 0     | 2.1621E-140 | 0       | 0    | 0    | 8.25232E+23 |
| SARDINE    | 0     | 0     | 8.79029E+18 | 0     | 0     | 0     | 2.1621E-140 | 0       | 0    | 0    | 8.25232E+23 |
| EAGLE      | 0     | 0     | 2.34224E+18 | 0     | 0     | 0     | 6.754E-141  | 0       | 0    | 0    | 2.18796E+23 |
| TUNA       | 0     | 0     | 8.88728E+18 | 0     | 0     | 0     | 3.0044E-140 | 0       | 0    | 0    | 8.26061E+23 |
| FORE       | 0     | 0     | 4.97975E+19 | 0     | 0     | 0     | 2.8856E-139 | 0       | 0    | 0    | 4.55106E+24 |
| OCONTO     | 0     | 0     | 4.77635E+18 | 0     | 0     | 0     | 3.1824E-140 | 0       | 0    | 0    | 4.34611E+23 |
| CLUB       | 0     | 0     | 9.14173E+18 | 0     | 0     | 0     | 7.0033E-140 | 0       | 0    | 0    | 8.28195E+23 |
| SOLENDON   | 0     | 0     | 9.22378E+18 | 0     | 0     | 0     | 9.1546E-140 | 0       | 0    | 0    | 8.28872E+23 |
| BUNKER     | 0     | 0     | 9.23009E+18 | 0     | 0     | 0     | 9.3443E-140 | 0       | 0    | 0    | 8.28924E+23 |
| BONEFISH   | 0     | 0     | 9.26193E+18 | 0     | 0     | 0     | 1.0361E-139 | 0       | 0    | 0    | 8.29185E+23 |
| MACKEREL   | 0     | 0     | 9.26193E+18 | 0     | 0     | 0     | 1.0361E-139 | 0       | 0    | 0    | 8.29185E+23 |
| KLUCKITAT  | 0     | 0     | 3.24613E+19 | 0     | 0     | 0     | 3.7786E-139 | 0       | 0    | 0    | 2.90251E+24 |
| HANDICAP   | 0     | 0     | 9.40951E+18 | 0     | 0     | 0     | 1.6643E-139 | 0       | 0    | 0    | 8.30384E+23 |
| PIKE       | 0     | 0     | 9.41626E+18 | 0     | 0     | 0     | 1.7004E-139 | 0       | 0    | 0    | 8.30438E+23 |
| HOOK       | 0     | 0     | 9.62552E+18 | 0     | 0     | 0     | 3.2866E-139 | 0       | 0    | 0    | 8.32108E+23 |
| STURGEON   | 0     | 0     | 9.6321E+18  | 0     | 0     | 0     | 3.3546E-139 | 0       | 0    | 0    | 8.3216E+23  |
| BOGEY      | 0     | 0     | 9.64564E+18 | 0     | 0     | 0     | 3.4989E-139 | 0       | 0    | 0    | 8.32267E+23 |
| TURF       | 0     | 0     | 5.33143E+19 | 0     | 0     | 0     | 2.2323E-138 | 0       | 0    | 0    | 4.57954E+24 |
| PIPEFISH   | 0     | 0     | 9.72709E+18 | 0     | 0     | 0     | 4.5022E-139 | 0       | 0    | 0    | 8.32907E+23 |
| DRIVER     | 0     | 0     | 9.7786E+18  | 0     | 0     | 0     | 5.2746E-139 | 0       | 0    | 0    | 8.3331E+23  |
| BACKSWING  | 0     | 0     | 9.82628E+18 | 0     | 0     | 0     | 6.1027E-139 | 0       | 0    | 0    | 8.3368E+23  |
| MINNOW     | 0     | 0     | 9.83349E+18 | 0     | 0     | 0     | 6.2384E-139 | 0       | 0    | 0    | 8.33736E+23 |
| ACE        | 0     | 0     | 1.5027E+18  | 0     | 0     | 0     | 1.634E-139  | 0       | 0    | 0    | 1.25273E+23 |
| BITTERLING | 0     | 0     | 1.00241E+19 | 0     | 0     | 0     | 1.1094E-138 | 0       | 0    | 0    | 8.35201E+23 |
| DUFFER     | 0     | 0     | 1.00655E+19 | 0     | 0     | 0     | 1.2551E-138 | 0       | 0    | 0    | 8.35515E+23 |
| FADE       | 0     | 0     | 1.01141E+19 | 0     | 0     | 0     | 1.45E-138   | 0       | 0    | 0    | 8.35883E+23 |
| DUB        | 0     | 0     | 5.93712E+18 | 0     | 0     | 0     | 9.4048E-139 | 0       | 0    | 0    | 4.89145E+23 |
| BYE        | 0     | 0     | 5.64366E+19 | 0     | 0     | 0     | 1.2297E-137 | 0       | 0    | 0    | 4.60343E+24 |
| CORMORANT  | 0     | 0     | 1.02694E+19 | 0     | 0     | 0     | 2.2904E-138 | 0       | 0    | 0    | 8.37049E+23 |
| LINKS      | 0     | 0     | 1.03108E+19 | 0     | 0     | 0     | 2.5837E-138 | 0       | 0    | 0    | 8.37356E+23 |
| TROGON     | 0     | 0     | 1.03194E+19 | 0     | 0     | 0     | 2.6489E-138 | 0       | 0    | 0    | 8.3742E+23  |
| ALVA       | 0     | 0     | 2.31108E+18 | 0     | 0     | 0     | 9.9424E-139 | 0       | 0    | 0    | 1.84533E+23 |
| CANVASBACK | 0     | 0     | 1.05285E+19 | 0     | 0     | 0     | 4.8338E-138 | 0       | 0    | 0    | 8.38957E+23 |
| PLAYER     | 0     | 0     | 1.05624E+19 | 0     | 0     | 0     | 5.3233E-138 | 0       | 0    | 0    | 8.39204E+23 |
| HADDOCK    | 0     | 0     | 1.05705E+19 | 0     | 0     | 0     | 5.4464E-138 | 0       | 0    | 0    | 8.39263E+23 |

| Nuclide              | 111Ag | 112Pd | 125Sb       | 126Sb | 127Sb | 128Sb | 129Te-m     | 131Te-m | 133I | 135I | 137Cs       |
|----------------------|-------|-------|-------------|-------|-------|-------|-------------|---------|------|------|-------------|
| GUANAY               | 0     | 0     | 1.06219E+19 | 0     | 0     | 0     | 6.2988E-138 | 0       | 0    | 0    | 8.39635E+23 |
| SPOON                | 0     | 0     | 1.06719E+19 | 0     | 0     | 0     | 7.2508E-138 | 0       | 0    | 0    | 8.39995E+23 |
| COURSER              | 0     | 0     | 0           | 0     | 0     | 0     | 0           | 0       | 0    | 0    | 0           |
| AUK                  | 0     | 0     | 1.08291E+19 | 0     | 0     | 0     | 1.1241E-137 | 0       | 0    | 0    | 8.41119E+23 |
| PAR                  | 0     | 0     | 2.0671E+19  | 0     | 0     | 0     | 2.4547E-137 | 0       | 0    | 0    | 1.5988E+24  |
| TURNSTONE            | 0     | 0     | 1.09326E+19 | 0     | 0     | 0     | 1.4952E-137 | 0       | 0    | 0    | 8.41851E+23 |
| BARBEL               | 0     | 0     | 1.09326E+19 | 0     | 0     | 0     | 1.4952E-137 | 0       | 0    | 0    | 8.41851E+23 |
| GARDEN               | 0     | 0     | 1.09851E+19 | 0     | 0     | 0     | 1.726E-137  | 0       | 0    | 0    | 8.4222E+23  |
| FOREST               | 0     | 0     | 1.10464E+19 | 0     | 0     | 0     | 2.0394E-137 | 0       | 0    | 0    | 8.42648E+23 |
| HANDCAR              | 0     | 0     | 6.65028E+18 | 0     | 0     | 0     | 1.3541E-137 | 0       | 0    | 0    | 5.05745E+23 |
| CREPE                | 0     | 0     | 6.22435E+19 | 0     | 0     | 0     | 2.3173E-136 | 0       | 0    | 0    | 4.64483E+24 |
| DRILL TARGET (upper) | 0     | 0     | 1.1317E+19  | 0     | 0     | 0     | 4.2133E-137 | 0       | 0    | 0    | 8.44514E+23 |
| DRILL SOURCE (lower) | 0     | 0     | 1.92389E+18 | 0     | 0     | 0     | 7.1626E-138 | 0       | 0    | 0    | 1.43567E+23 |
| PARROT               | 0     | 0     | 7.41167E+17 | 0     | 0     | 0     | 3.4326E-138 | 0       | 0    | 0    | 5.49313E+22 |
| CASSOWARY            | 0     | 0     | 1.14026E+19 | 0     | 0     | 0     | 5.2809E-137 | 0       | 0    | 0    | 8.45096E+23 |
| HOPOE                | 0     | 0     | 1.14026E+19 | 0     | 0     | 0     | 5.2809E-137 | 0       | 0    | 0    | 8.45096E+23 |
| MUDPACK              | 0     | 0     | 1.53936E+18 | 0     | 0     | 0     | 7.1303E-138 | 0       | 0    | 0    | 1.14088E+23 |
| SULKY                | 0     | 0     | 5.25235E+16 | 0     | 0     | 0     | 2.5306E-139 | 0       | 0    | 0    | 3.88793E+21 |
| WOOL                 | 0     | 0     | 1.16311E+19 | 0     | 0     | 0     | 9.5727E-137 | 0       | 0    | 0    | 8.4663E+23  |
| TERN                 | 0     | 0     | 1.17525E+19 | 0     | 0     | 0     | 1.3071E-136 | 0       | 0    | 0    | 8.47435E+23 |
| CASHMERE             | 0     | 0     | 1.18002E+19 | 0     | 0     | 0     | 1.4757E-136 | 0       | 0    | 0    | 8.47748E+23 |
| ALPACA               | 0     | 0     | 1.95776E+17 | 0     | 0     | 0     | 2.871E-138  | 0       | 0    | 0    | 1.39949E+22 |
| MERLIN               | 0     | 0     | 6.00884E+18 | 0     | 0     | 0     | 9.5618E-137 | 0       | 0    | 0    | 4.28438E+23 |
| WISHBONE             | 0     | 0     | 1.19147E+19 | 0     | 0     | 0     | 1.9712E-136 | 0       | 0    | 0    | 8.48497E+23 |
| SEERSUCKER           | 0     | 0     | 1.19226E+19 | 0     | 0     | 0     | 2.0108E-136 | 0       | 0    | 0    | 8.48548E+23 |
| WAGTAIL              | 0     | 0     | 6.6125E+19  | 0     | 0     | 0     | 1.4212E-135 | 0       | 0    | 0    | 4.67059E+24 |
| SUEDE                | 0     | 0     | 1.21629E+19 | 0     | 0     | 0     | 3.6576E-136 | 0       | 0    | 0    | 8.50098E+23 |
| CUP                  | 0     | 0     | 6.71728E+19 | 0     | 0     | 0     | 2.2769E-135 | 0       | 0    | 0    | 4.6773E+24  |
| KESTREL              | 0     | 0     | 1.22995E+19 | 0     | 0     | 0     | 5.1121E-136 | 0       | 0    | 0    | 8.50966E+23 |
| PALANQUIN            | 0     | 0     | 2.66022E+18 | 0     | 0     | 0     | 1.3145E-136 | 0       | 0    | 0    | 1.83058E+23 |
| GUM DROP             | 0     | 0     | 1.2436E+19  | 0     | 0     | 0     | 7.1174E-136 | 0       | 0    | 0    | 8.51825E+23 |
| CHENILLE             | 0     | 0     | 1.24416E+19 | 0     | 0     | 0     | 7.2137E-136 | 0       | 0    | 0    | 8.5186E+23  |
| MUSCOVY              | 0     | 0     | 1.2453E+19  | 0     | 0     | 0     | 7.4154E-136 | 0       | 0    | 0    | 8.51932E+23 |
| TEE                  | 0     | 0     | 4.4E+18     | 0     | 0     | 0     | 3.4468E-136 | 0       | 0    | 0    | 2.98434E+23 |
| BUTEO                | 0     | 0     | 1.26156E+19 | 0     | 0     | 0     | 1.0941E-135 | 0       | 0    | 0    | 8.52943E+23 |
| CAMBRIC              | 0     | 0     | 4.73693E+17 | 0     | 0     | 0     | 4.2637E-137 | 0       | 0    | 0    | 3.19891E+22 |
| SCAUP                | 0     | 0     | 1.26328E+19 | 0     | 0     | 0     | 1.1395E-135 | 0       | 0    | 0    | 8.53048E+23 |
| TWEED                | 0     | 0     | 1.26922E+19 | 0     | 0     | 0     | 1.3116E-135 | 0       | 0    | 0    | 8.53414E+23 |

| Nuclide        | 111Ag | 112Pd | 125Sb       | 126Sb | 127Sb | 128Sb | 129Te-m     | 131Te-m | 133I | 135I | 137Cs       |
|----------------|-------|-------|-------------|-------|-------|-------|-------------|---------|------|------|-------------|
| PETREL         | 0     | 0     | 8.37156E+17 | 0     | 0     | 0     | 1.3222E-136 | 0       | 0    | 0    | 5.55462E+22 |
| ORGANDY        | 0     | 0     | 1.28796E+19 | 0     | 0     | 0     | 2.0355E-135 | 0       | 0    | 0    | 8.54559E+23 |
| DILUTED WATERS | 0     | 0     | 1.29225E+19 | 0     | 0     | 0     | 2.249E-135  | 0       | 0    | 0    | 8.54819E+23 |
| TINY TOT       | 0     | 0     | 1.29316E+19 | 0     | 0     | 0     | 2.2968E-135 | 0       | 0    | 0    | 8.54874E+23 |
| IZZER          | 0     | 0     | 1.31907E+19 | 0     | 0     | 0     | 4.1637E-135 | 0       | 0    | 0    | 8.56426E+23 |
| PONGEE         | 0     | 0     | 1.32454E+19 | 0     | 0     | 0     | 4.7135E-135 | 0       | 0    | 0    | 8.56749E+23 |
| BRONZE         | 0     | 0     | 7.29075E+19 | 0     | 0     | 0     | 2.6547E-134 | 0       | 0    | 0    | 4.71246E+24 |
| MAUVE          | 0     | 0     | 1.33844E+19 | 0     | 0     | 0     | 6.4452E-135 | 0       | 0    | 0    | 8.57567E+23 |
| TICKING        | 0     | 0     | 1.35218E+19 | 0     | 0     | 0     | 8.7549E-135 | 0       | 0    | 0    | 8.58369E+23 |
| CENTAUR        | 0     | 0     | 1.35778E+19 | 0     | 0     | 0     | 9.9096E-135 | 0       | 0    | 0    | 8.58693E+23 |
| SCREAMER       | 0     | 0     | 1.3627E+19  | 0     | 0     | 0     | 1.1046E-134 | 0       | 0    | 0    | 8.58977E+23 |
| MOA            | 0     | 0     | 1.3627E+19  | 0     | 0     | 0     | 1.1046E-134 | 0       | 0    | 0    | 8.58977E+23 |
| CHARCOAL       | 0     | 0     | 7.5408E+19  | 0     | 0     | 0     | 7.2962E-134 | 0       | 0    | 0    | 4.72701E+24 |
| ELKHART        | 0     | 0     | 1.37759E+19 | 0     | 0     | 0     | 1.53E-134   | 0       | 0    | 0    | 8.59831E+23 |
| SEPIA          | 0     | 0     | 1.43183E+19 | 0     | 0     | 0     | 4.8693E-134 | 0       | 0    | 0    | 8.62871E+23 |
| KERMET         | 0     | 0     | 1.44272E+19 | 0     | 0     | 0     | 6.1112E-134 | 0       | 0    | 0    | 8.63469E+23 |
| CORDUROY       | 0     | 0     | 7.98904E+19 | 0     | 0     | 0     | 4.1203E-133 | 0       | 0    | 0    | 4.75203E+24 |
| EMERSON        | 0     | 0     | 1.46562E+19 | 0     | 0     | 0     | 9.7995E-134 | 0       | 0    | 0    | 8.64713E+23 |
| BUFF           | 0     | 0     | 8.06175E+19 | 0     | 0     | 0     | 5.4064E-133 | 0       | 0    | 0    | 4.75597E+24 |
| MAXWELL        | 0     | 0     | 1.49413E+19 | 0     | 0     | 0     | 1.746E-133  | 0       | 0    | 0    | 8.66238E+23 |
| LAMPBLACK      | 0     | 0     | 8.24675E+19 | 0     | 0     | 0     | 1.0674E-132 | 0       | 0    | 0    | 4.76584E+24 |
| SIENNA         | 0     | 0     | 1.49941E+19 | 0     | 0     | 0     | 1.9407E-133 | 0       | 0    | 0    | 8.66517E+23 |
| DOVEKIE        | 0     | 0     | 1.5025E+19  | 0     | 0     | 0     | 2.0644E-133 | 0       | 0    | 0    | 8.6668E+23  |
| REO            | 0     | 0     | 1.5034E+19  | 0     | 0     | 0     | 2.1016E-133 | 0       | 0    | 0    | 8.66727E+23 |
| PLAID II       | 0     | 0     | 1.51599E+19 | 0     | 0     | 0     | 2.6989E-133 | 0       | 0    | 0    | 8.67389E+23 |
| REX            | 0     | 0     | 1.46106E+19 | 0     | 0     | 0     | 3.9461E-133 | 0       | 0    | 0    | 8.25103E+23 |
| RED HOT        | 0     | 0     | 1.54761E+19 | 0     | 0     | 0     | 5.0113E-133 | 0       | 0    | 0    | 8.69027E+23 |
| CINNAMON       | 0     | 0     | 1.54976E+19 | 0     | 0     | 0     | 5.2244E-133 | 0       | 0    | 0    | 8.69137E+23 |
| FINFOOT        | 0     | 0     | 1.54976E+19 | 0     | 0     | 0     | 5.2244E-133 | 0       | 0    | 0    | 8.69137E+23 |
| CLYMER         | 0     | 0     | 1.55508E+19 | 0     | 0     | 0     | 5.789E-133  | 0       | 0    | 0    | 8.69409E+23 |
| PURPLE         | 0     | 0     | 1.56155E+19 | 0     | 0     | 0     | 6.557E-133  | 0       | 0    | 0    | 8.6974E+23  |
| TEMPLAR        | 0     | 0     | 2.90048E+17 | 0     | 0     | 0     | 1.3681E-134 | 0       | 0    | 0    | 1.60961E+22 |
| LIME           | 0     | 0     | 1.57665E+19 | 0     | 0     | 0     | 8.75E-133   | 0       | 0    | 0    | 8.70505E+23 |
| STUTZ          | 0     | 0     | 1.58187E+19 | 0     | 0     | 0     | 9.6615E-133 | 0       | 0    | 0    | 8.70768E+23 |
| TOMATO         | 0     | 0     | 1.58335E+19 | 0     | 0     | 0     | 9.9352E-133 | 0       | 0    | 0    | 8.70842E+23 |
| DURYEY         | 0     | 0     | 5.56715E+19 | 0     | 0     | 0     | 3.9892E-132 | 0       | 0    | 0    | 3.04922E+24 |
| FENTON         | 0     | 0     | 1.12037E+18 | 0     | 0     | 0     | 9.6119E-134 | 0       | 0    | 0    | 6.10191E+22 |
| PIN STRIPE     | 0     | 0     | 1.6029E+19  | 0     | 0     | 0     | 1.4355E-132 | 0       | 0    | 0    | 8.7182E+23  |

| Nuclide        | 111Ag | 112Pd | 125Sb       | 126Sb | 127Sb | 128Sb | 129Te-m     | 131Te-m | 133I | 135I | 137Cs       |
|----------------|-------|-------|-------------|-------|-------|-------|-------------|---------|------|------|-------------|
| OCHRE          | 0     | 0     | 1.60709E+19 | 0     | 0     | 0     | 1.5522E-132 | 0       | 0    | 0    | 8.72028E+23 |
| TRAVELER       | 0     | 0     | 1.61262E+19 | 0     | 0     | 0     | 1.7209E-132 | 0       | 0    | 0    | 8.72302E+23 |
| CYCLAMEN       | 0     | 0     | 9.68253E+18 | 0     | 0     | 0     | 1.0545E-132 | 0       | 0    | 0    | 5.23415E+23 |
| CHARTREUSE     | 0     | 0     | 5.89443E+19 | 0     | 0     | 0     | 6.554E-132  | 0       | 0    | 0    | 3.18432E+24 |
| TAPESTRY       | 0     | 0     | 1.62181E+19 | 0     | 0     | 0     | 2.0403E-132 | 0       | 0    | 0    | 8.72755E+23 |
| PIRANHA        | 0     | 0     | 8.92452E+19 | 0     | 0     | 0     | 1.1395E-131 | 0       | 0    | 0    | 4.80038E+24 |
| DUMONT         | 0     | 0     | 8.96155E+19 | 0     | 0     | 0     | 1.2902E-131 | 0       | 0    | 0    | 4.8022E+24  |
| DISCUS THROWER | 0     | 0     | 1.80252E+19 | 0     | 0     | 0     | 3.0592E-132 | 0       | 0    | 0    | 9.60938E+23 |
| PILE DRIVER    | 0     | 0     | 5.10018E+19 | 0     | 0     | 0     | 9.7198E-132 | 0       | 0    | 0    | 2.70909E+24 |
| TAN            | 0     | 0     | 9.05454E+19 | 0     | 0     | 0     | 1.7582E-131 | 0       | 0    | 0    | 4.80673E+24 |
| PUCE           | 0     | 0     | 1.65425E+19 | 0     | 0     | 0     | 3.6949E-132 | 0       | 0    | 0    | 8.74337E+23 |
| DOUBLE PLAY    | 0     | 0     | 1.66007E+19 | 0     | 0     | 0     | 4.1051E-132 | 0       | 0    | 0    | 8.74618E+23 |
| KANKAKEE       | 0     | 0     | 9.13068E+19 | 0     | 0     | 0     | 2.2599E-131 | 0       | 0    | 0    | 4.81041E+24 |
| VULCAN         | 0     | 0     | 2.08943E+19 | 0     | 0     | 0     | 6.3083E-132 | 0       | 0    | 0    | 1.09396E+24 |
| HALFBEAK       | 0     | 0     | 3.06153E+20 | 0     | 0     | 0     | 1.0255E-130 | 0       | 0    | 0    | 1.59771E+25 |
| SAXON          | 0     | 0     | 1.02591E+18 | 0     | 0     | 0     | 5.9729E-133 | 0       | 0    | 0    | 5.2619E+22  |
| ROVENA         | 0     | 0     | 1.7251E+19  | 0     | 0     | 0     | 1.2991E-131 | 0       | 0    | 0    | 8.77695E+23 |
| TANGERINE      | 0     | 0     | 1.7276E+19  | 0     | 0     | 0     | 1.3566E-131 | 0       | 0    | 0    | 8.77811E+23 |
| DERRINGER      | 0     | 0     | 6.88286E+18 | 0     | 0     | 0     | 1.0028E-131 | 0       | 0    | 0    | 3.43014E+23 |
| DAIQURI        | 0     | 0     | 1.77837E+19 | 0     | 0     | 0     | 3.2331E-131 | 0       | 0    | 0    | 8.80139E+23 |
| NEWARK         | 0     | 0     | 1.78556E+19 | 0     | 0     | 0     | 3.649E-131  | 0       | 0    | 0    | 8.80463E+23 |
| KHAKI          | 0     | 0     | 1.80555E+19 | 0     | 0     | 0     | 5.0945E-131 | 0       | 0    | 0    | 8.8136E+23  |
| SIMMS          | 0     | 0     | 2.10635E+18 | 0     | 0     | 0     | 9.0023E-132 | 0       | 0    | 0    | 1.01489E+23 |
| AJAX           | 0     | 0     | 1.83904E+19 | 0     | 0     | 0     | 8.8386E-131 | 0       | 0    | 0    | 8.82842E+23 |
| CERISE         | 0     | 0     | 1.84808E+19 | 0     | 0     | 0     | 1.0238E-130 | 0       | 0    | 0    | 8.83238E+23 |
| VIGIL          | 0     | 0     | 1.85317E+19 | 0     | 0     | 0     | 1.1119E-130 | 0       | 0    | 0    | 8.8346E+23  |
| SIDECAR        | 0     | 0     | 1.88029E+19 | 0     | 0     | 0     | 1.7189E-130 | 0       | 0    | 0    | 8.84634E+23 |
| NEW POINT      | 0     | 0     | 1.88047E+19 | 0     | 0     | 0     | 1.7236E-130 | 0       | 0    | 0    | 8.84641E+23 |
| GREELEY        | 0     | 0     | 8.21822E+20 | 0     | 0     | 0     | 8.6217E-129 | 0       | 0    | 0    | 3.84983E+25 |
| RIVET I        | 0     | 0     | 1.92729E+19 | 0     | 0     | 0     | 3.6033E-130 | 0       | 0    | 0    | 8.86633E+23 |
| NASH           | 0     | 0     | 3.761E+19   | 0     | 0     | 0     | 7.1842E-130 | 0       | 0    | 0    | 1.72905E+24 |
| BOURBON        | 0     | 0     | 1.06155E+20 | 0     | 0     | 0     | 2.0702E-129 | 0       | 0    | 0    | 4.87713E+24 |
| RIVET II       | 0     | 0     | 1.93808E+19 | 0     | 0     | 0     | 4.2599E-130 | 0       | 0    | 0    | 8.87085E+23 |
| WARD           | 0     | 0     | 1.95536E+19 | 0     | 0     | 0     | 5.5586E-130 | 0       | 0    | 0    | 8.87806E+23 |
| PERSIMMON      | 0     | 0     | 1.97584E+19 | 0     | 0     | 0     | 7.5962E-130 | 0       | 0    | 0    | 8.88651E+23 |
| AGILE          | 0     | 0     | 1.08672E+20 | 0     | 0     | 0     | 4.1789E-129 | 0       | 0    | 0    | 4.88759E+24 |
| RIVET III      | 0     | 0     | 1.98517E+19 | 0     | 0     | 0     | 8.7494E-130 | 0       | 0    | 0    | 8.89034E+23 |
| MUSHROOM       | 0     | 0     | 1.98656E+19 | 0     | 0     | 0     | 8.9342E-130 | 0       | 0    | 0    | 8.89091E+23 |

| Nuclide       | 111Ag | 112Pd | 125Sb       | 126Sb | 127Sb | 128Sb | 129Te-m     | 131Te-m | 133I | 135I | 137Cs       |
|---------------|-------|-------|-------------|-------|-------|-------|-------------|---------|------|------|-------------|
| FIZZ          | 0     | 0     | 1.99613E+19 | 0     | 0     | 0     | 1.0319E-129 | 0       | 0    | 0    | 8.89482E+23 |
| OAKLAND       | 0     | 0     | 2.03073E+19 | 0     | 0     | 0     | 1.7274E-129 | 0       | 0    | 0    | 8.9088E+23  |
| HEILMAN       | 0     | 0     | 2.03356E+19 | 0     | 0     | 0     | 1.8012E-129 | 0       | 0    | 0    | 8.90994E+23 |
| FAWN          | 0     | 0     | 2.03496E+19 | 0     | 0     | 0     | 1.8387E-129 | 0       | 0    | 0    | 8.9105E+23  |
| CHOCOLATE     | 0     | 0     | 2.05467E+19 | 0     | 0     | 0     | 2.4547E-129 | 0       | 0    | 0    | 8.91835E+23 |
| EFFENDI       | 0     | 0     | 2.06314E+19 | 0     | 0     | 0     | 2.7772E-129 | 0       | 0    | 0    | 8.92171E+23 |
| MICKEY        | 0     | 0     | 1.14489E+20 | 0     | 0     | 0     | 1.9954E-128 | 0       | 0    | 0    | 4.91094E+24 |
| COMMODORE     | 0     | 0     | 2.62009E+20 | 0     | 0     | 0     | 5.5804E-128 | 0       | 0    | 0    | 1.11683E+25 |
| SCOTCH        | 0     | 0     | 1.62776E+20 | 0     | 0     | 0     | 3.6776E-128 | 0       | 0    | 0    | 6.92563E+24 |
| ABSINTHE      | 0     | 0     | 2.10459E+19 | 0     | 0     | 0     | 5.0417E-129 | 0       | 0    | 0    | 8.93795E+23 |
| KNICKERBOCKER | 0     | 0     | 7.99802E+19 | 0     | 0     | 0     | 1.92E-128   | 0       | 0    | 0    | 3.39644E+24 |
| SWITCH        | 0     | 0     | 3.32335E+18 | 0     | 0     | 0     | 1.3648E-129 | 0       | 0    | 0    | 1.38774E+23 |
| MIDI MIST     | 0     | 0     | 2.15018E+19 | 0     | 0     | 0     | 9.5857E-129 | 0       | 0    | 0    | 8.95547E+23 |
| UMBER         | 0     | 0     | 1.07717E+19 | 0     | 0     | 0     | 5.0788E-129 | 0       | 0    | 0    | 4.47853E+23 |
| VITO          | 0     | 0     | 2.17682E+19 | 0     | 0     | 0     | 1.3866E-128 | 0       | 0    | 0    | 8.96556E+23 |
| STANLEY       | 0     | 0     | 1.20799E+20 | 0     | 0     | 0     | 9.9678E-128 | 0       | 0    | 0    | 4.93509E+24 |
| GIBSON        | 0     | 0     | 2.20854E+19 | 0     | 0     | 0     | 2.1394E-128 | 0       | 0    | 0    | 8.97742E+23 |
| WASHER        | 0     | 0     | 2.21768E+19 | 0     | 0     | 0     | 2.4216E-128 | 0       | 0    | 0    | 8.98081E+23 |
| BORDEAUX      | 0     | 0     | 2.23031E+19 | 0     | 0     | 0     | 2.871E-128  | 0       | 0    | 0    | 8.98548E+23 |
| LEXINGTON     | 0     | 0     | 2.23911E+19 | 0     | 0     | 0     | 3.2306E-128 | 0       | 0    | 0    | 8.98871E+23 |
| DOOR MIST     | 0     | 0     | 2.25011E+19 | 0     | 0     | 0     | 3.7421E-128 | 0       | 0    | 0    | 8.99274E+23 |
| YARD          | 0     | 0     | 1.24344E+20 | 0     | 0     | 0     | 2.3723E-127 | 0       | 0    | 0    | 4.94815E+24 |
| GILROY        | 0     | 0     | 2.27352E+19 | 0     | 0     | 0     | 5.1036E-128 | 0       | 0    | 0    | 9.00125E+23 |
| MARVEL        | 0     | 0     | 2.51145E+18 | 0     | 0     | 0     | 6.3715E-129 | 0       | 0    | 0    | 9.9052E+22  |
| ZAZA          | 0     | 0     | 1.26079E+20 | 0     | 0     | 0     | 3.5939E-127 | 0       | 0    | 0    | 4.95442E+24 |
| LANPHER       | 0     | 0     | 1.27904E+20 | 0     | 0     | 0     | 5.5307E-127 | 0       | 0    | 0    | 4.96094E+24 |
| SAZERAC       | 0     | 0     | 2.33676E+19 | 0     | 0     | 0     | 1.1618E-127 | 0       | 0    | 0    | 9.02386E+23 |
| COGNAC        | 0     | 0     | 2.33676E+19 | 0     | 0     | 0     | 1.1618E-127 | 0       | 0    | 0    | 9.02386E+23 |
| WORTH         | 0     | 0     | 2.33678E+19 | 0     | 0     | 0     | 1.162E-127  | 0       | 0    | 0    | 9.02386E+23 |
| COBBLER       | 0     | 0     | 2.35942E+19 | 0     | 0     | 0     | 1.5515E-127 | 0       | 0    | 0    | 9.03182E+23 |
| POLKA         | 0     | 0     | 2.40518E+19 | 0     | 0     | 0     | 2.7597E-127 | 0       | 0    | 0    | 9.04769E+23 |
| STILT         | 0     | 0     | 2.42026E+19 | 0     | 0     | 0     | 3.3284E-127 | 0       | 0    | 0    | 9.05286E+23 |
| HUPMOBILE     | 0     | 0     | 9.16732E+18 | 0     | 0     | 0     | 2.4866E-127 | 0       | 0    | 0    | 3.35674E+23 |
| STACCATO      | 0     | 0     | 1.36359E+20 | 0     | 0     | 0     | 3.7685E-126 | 0       | 0    | 0    | 4.99005E+24 |
| BRUSH         | 0     | 0     | 2.4878E+19  | 0     | 0     | 0     | 7.5964E-127 | 0       | 0    | 0    | 9.07567E+23 |
| CABRIOLET     | 0     | 0     | 2.86499E+18 | 0     | 0     | 0     | 9.1116E-128 | 0       | 0    | 0    | 1.04384E+23 |
| MALLET        | 0     | 0     | 2.49984E+19 | 0     | 0     | 0     | 8.7802E-127 | 0       | 0    | 0    | 9.07968E+23 |
| TORCH         | 0     | 0     | 2.53619E+19 | 0     | 0     | 0     | 1.3535E-126 | 0       | 0    | 0    | 9.09167E+23 |

| Nuclide      | 111Ag | 112Pd | 125Sb       | 126Sb | 127Sb | 128Sb | 129Te-m     | 131Te-m | 133I | 135I | 137Cs       |
|--------------|-------|-------|-------------|-------|-------|-------|-------------|---------|------|------|-------------|
| KNOX         | 0     | 0     | 1.39493E+20 | 0     | 0     | 0     | 7.4475E-126 | 0       | 0    | 0    | 5.00042E+24 |
| DORSAL FIN   | 0     | 0     | 2.55035E+19 | 0     | 0     | 0     | 1.5993E-126 | 0       | 0    | 0    | 9.0963E+23  |
| RUSSET       | 0     | 0     | 2.55902E+19 | 0     | 0     | 0     | 1.7706E-126 | 0       | 0    | 0    | 9.09912E+23 |
| BUGGY D      | 0     | 0     | 1.3886E+18  | 0     | 0     | 0     | 1.1061E-127 | 0       | 0    | 0    | 4.91571E+22 |
| BUGGY B      | 0     | 0     | 1.3886E+18  | 0     | 0     | 0     | 1.1061E-127 | 0       | 0    | 0    | 4.91571E+22 |
| BUGGY A      | 0     | 0     | 1.3886E+18  | 0     | 0     | 0     | 1.1061E-127 | 0       | 0    | 0    | 4.91571E+22 |
| BUGGY E      | 0     | 0     | 1.3886E+18  | 0     | 0     | 0     | 1.1061E-127 | 0       | 0    | 0    | 4.91571E+22 |
| BUGGY C      | 0     | 0     | 1.3886E+18  | 0     | 0     | 0     | 1.1061E-127 | 0       | 0    | 0    | 4.91571E+22 |
| POMMARD      | 0     | 0     | 1.93117E+18 | 0     | 0     | 0     | 1.5986E-127 | 0       | 0    | 0    | 6.8282E+22  |
| STINGER      | 0     | 0     | 1.424E+20   | 0     | 0     | 0     | 1.3823E-125 | 0       | 0    | 0    | 5.00986E+24 |
| MILK SHAKE   | 0     | 0     | 2.59472E+19 | 0     | 0     | 0     | 2.6823E-126 | 0       | 0    | 0    | 9.11065E+23 |
| BEVEL        | 0     | 0     | 2.61235E+19 | 0     | 0     | 0     | 3.2864E-126 | 0       | 0    | 0    | 9.11629E+23 |
| NOOR         | 0     | 0     | 1.4427E+20  | 0     | 0     | 0     | 2.0439E-125 | 0       | 0    | 0    | 5.01584E+24 |
| THROW        | 0     | 0     | 2.62308E+19 | 0     | 0     | 0     | 3.7161E-126 | 0       | 0    | 0    | 9.11971E+23 |
| SHUFFLE      | 0     | 0     | 1.45066E+20 | 0     | 0     | 0     | 2.4108E-125 | 0       | 0    | 0    | 5.01837E+24 |
| SCROLL       | 0     | 0     | 2.64688E+19 | 0     | 0     | 0     | 4.8718E-126 | 0       | 0    | 0    | 9.12724E+23 |
| BOXCAR       | 0     | 0     | 1.72393E+21 | 0     | 0     | 0     | 3.363E-124  | 0       | 0    | 0    | 5.9338E+25  |
| HATCHET      | 0     | 0     | 2.66508E+19 | 0     | 0     | 0     | 5.9828E-126 | 0       | 0    | 0    | 9.13296E+23 |
| CROCK        | 0     | 0     | 2.67412E+19 | 0     | 0     | 0     | 6.6224E-126 | 0       | 0    | 0    | 9.13579E+23 |
| CLARKSMOBILE | 0     | 0     | 1.47986E+20 | 0     | 0     | 0     | 4.381E-125  | 0       | 0    | 0    | 5.02752E+24 |
| ADZE         | 0     | 0     | 2.71122E+19 | 0     | 0     | 0     | 1.001E-125  | 0       | 0    | 0    | 9.14731E+23 |
| WEMBLEY      | 0     | 0     | 2.72616E+19 | 0     | 0     | 0     | 1.1802E-125 | 0       | 0    | 0    | 9.1519E+23  |
| TUB C        | 0     | 0     | 2.72859E+19 | 0     | 0     | 0     | 1.2122E-125 | 0       | 0    | 0    | 9.15265E+23 |
| TUB A        | 0     | 0     | 2.72859E+19 | 0     | 0     | 0     | 1.2122E-125 | 0       | 0    | 0    | 9.15265E+23 |
| TUB F        | 0     | 0     | 2.72859E+19 | 0     | 0     | 0     | 1.2122E-125 | 0       | 0    | 0    | 9.15265E+23 |
| TUB B        | 0     | 0     | 2.72859E+19 | 0     | 0     | 0     | 1.2122E-125 | 0       | 0    | 0    | 9.15265E+23 |
| TUB D        | 0     | 0     | 2.72859E+19 | 0     | 0     | 0     | 1.2122E-125 | 0       | 0    | 0    | 9.15265E+23 |
| RICKEY       | 0     | 0     | 1.50972E+20 | 0     | 0     | 0     | 7.9756E-125 | 0       | 0    | 0    | 5.03671E+24 |
| SEVILLA      | 0     | 0     | 2.76403E+19 | 0     | 0     | 0     | 1.7847E-125 | 0       | 0    | 0    | 9.16345E+23 |
| FUNNEL       | 0     | 0     | 2.76403E+19 | 0     | 0     | 0     | 1.7847E-125 | 0       | 0    | 0    | 9.16345E+23 |
| CHATEAUGAY   | 0     | 0     | 1.52322E+20 | 0     | 0     | 0     | 1.0414E-124 | 0       | 0    | 0    | 5.04081E+24 |
| SPUD         | 0     | 0     | 2.80606E+19 | 0     | 0     | 0     | 2.8061E-125 | 0       | 0    | 0    | 9.1761E+23  |
| TANYA        | 0     | 0     | 1.55716E+20 | 0     | 0     | 0     | 2.0163E-124 | 0       | 0    | 0    | 5.05097E+24 |
| IMP          | 0     | 0     | 2.85074E+19 | 0     | 0     | 0     | 4.5059E-125 | 0       | 0    | 0    | 9.18936E+23 |
| RACK         | 0     | 0     | 2.86287E+19 | 0     | 0     | 0     | 5.1172E-125 | 0       | 0    | 0    | 9.19293E+23 |
| DIANA MOON   | 0     | 0     | 2.88656E+19 | 0     | 0     | 0     | 6.5518E-125 | 0       | 0    | 0    | 9.19986E+23 |
| SLED         | 0     | 0     | 1.59008E+20 | 0     | 0     | 0     | 3.7755E-124 | 0       | 0    | 0    | 5.06064E+24 |
| NOGGIN       | 0     | 0     | 1.59846E+20 | 0     | 0     | 0     | 4.4196E-124 | 0       | 0    | 0    | 5.06307E+24 |



| Nuclide     | 111Ag | 112Pd | 125Sb       | 126Sb | 127Sb | 128Sb | 129Te-m     | 131Te-m | 133I | 135I | 137Cs       |
|-------------|-------|-------|-------------|-------|-------|-------|-------------|---------|------|------|-------------|
| KNIFE A     | 0     | 0     | 2.91831E+19 | 0     | 0     | 0     | 9.0944E-125 | 0       | 0    | 0    | 9.20906E+23 |
| STODDARD    | 0     | 0     | 4.53897E+19 | 0     | 0     | 0     | 1.5628E-124 | 0       | 0    | 0    | 1.42785E+24 |
| HUDSON SEAL | 0     | 0     | 2.94276E+19 | 0     | 0     | 0     | 1.168E-124  | 0       | 0    | 0    | 9.21609E+23 |
| WELDER      | 0     | 0     | 2.96078E+19 | 0     | 0     | 0     | 1.4025E-124 | 0       | 0    | 0    | 9.22123E+23 |
| KNIFE C     | 0     | 0     | 2.96082E+19 | 0     | 0     | 0     | 1.4031E-124 | 0       | 0    | 0    | 9.22124E+23 |
| VAT         | 0     | 0     | 2.97512E+19 | 0     | 0     | 0     | 1.6211E-124 | 0       | 0    | 0    | 9.22531E+23 |
| HULA        | 0     | 0     | 3.01437E+19 | 0     | 0     | 0     | 2.4013E-124 | 0       | 0    | 0    | 9.23636E+23 |
| BIT B       | 0     | 0     | 3.01877E+19 | 0     | 0     | 0     | 2.5087E-124 | 0       | 0    | 0    | 9.2376E+23  |
| FILE        | 0     | 0     | 3.01877E+19 | 0     | 0     | 0     | 2.5087E-124 | 0       | 0    | 0    | 9.2376E+23  |
| BIT A       | 0     | 0     | 3.01877E+19 | 0     | 0     | 0     | 2.5087E-124 | 0       | 0    | 0    | 9.2376E+23  |
| CREW 2nd    | 0     | 0     | 3.02681E+19 | 0     | 0     | 0     | 2.7169E-124 | 0       | 0    | 0    | 9.23984E+23 |
| CREW 3rd    | 0     | 0     | 3.02681E+19 | 0     | 0     | 0     | 2.7169E-124 | 0       | 0    | 0    | 9.23984E+23 |
| CREW        | 0     | 0     | 1.66474E+20 | 0     | 0     | 0     | 1.4943E-123 | 0       | 0    | 0    | 5.08191E+24 |
| AUGER       | 0     | 0     | 3.04982E+19 | 0     | 0     | 0     | 3.4098E-124 | 0       | 0    | 0    | 9.24624E+23 |
| KNIFE B     | 0     | 0     | 3.04985E+19 | 0     | 0     | 0     | 3.4105E-124 | 0       | 0    | 0    | 9.24625E+23 |
| MING VASE   | 0     | 0     | 3.06055E+19 | 0     | 0     | 0     | 3.7884E-124 | 0       | 0    | 0    | 9.24921E+23 |
| TINDERBOX   | 0     | 0     | 3.06462E+19 | 0     | 0     | 0     | 3.9422E-124 | 0       | 0    | 0    | 9.25034E+23 |
| SCHOONER    | 0     | 0     | 4.64778E+19 | 0     | 0     | 0     | 8.2236E-124 | 0       | 0    | 0    | 1.38895E+24 |
| BAY LEAF    | 0     | 0     | 3.10697E+19 | 0     | 0     | 0     | 5.9489E-124 | 0       | 0    | 0    | 9.26195E+23 |
| TYG F       | 0     | 0     | 3.10699E+19 | 0     | 0     | 0     | 5.9497E-124 | 0       | 0    | 0    | 9.26195E+23 |
| TYG A       | 0     | 0     | 3.10699E+19 | 0     | 0     | 0     | 5.9497E-124 | 0       | 0    | 0    | 9.26195E+23 |
| TYG D       | 0     | 0     | 3.10699E+19 | 0     | 0     | 0     | 5.9497E-124 | 0       | 0    | 0    | 9.26195E+23 |
| TYG C       | 0     | 0     | 3.10699E+19 | 0     | 0     | 0     | 5.9497E-124 | 0       | 0    | 0    | 9.26195E+23 |
| TYG B       | 0     | 0     | 3.10699E+19 | 0     | 0     | 0     | 5.9497E-124 | 0       | 0    | 0    | 9.26195E+23 |
| TYG E       | 0     | 0     | 3.10699E+19 | 0     | 0     | 0     | 5.9497E-124 | 0       | 0    | 0    | 9.26195E+23 |
| SCISSORS    | 0     | 0     | 3.107E+19   | 0     | 0     | 0     | 5.9506E-124 | 0       | 0    | 0    | 9.26196E+23 |
| BENHAM      | 0     | 0     | 1.79521E+21 | 0     | 0     | 0     | 3.9571E-122 | 0       | 0    | 0    | 5.32799E+25 |
| PACKARD     | 0     | 0     | 1.59044E+19 | 0     | 0     | 0     | 6.0188E-124 | 0       | 0    | 0    | 4.64094E+23 |
| WINESKIN    | 0     | 0     | 1.74951E+20 | 0     | 0     | 0     | 6.6236E-123 | 0       | 0    | 0    | 5.10504E+24 |
| SHAVE       | 0     | 0     | 3.19587E+19 | 0     | 0     | 0     | 1.386E-123  | 0       | 0    | 0    | 9.28587E+23 |
| WISE        | 0     | 0     | 1.76743E+20 | 0     | 0     | 0     | 8.9908E-123 | 0       | 0    | 0    | 5.1098E+24  |
| BIGGIN      | 0     | 0     | 3.21354E+19 | 0     | 0     | 0     | 1.6351E-123 | 0       | 0    | 0    | 9.29055E+23 |
| NIPPER      | 0     | 0     | 3.22459E+19 | 0     | 0     | 0     | 1.8123E-123 | 0       | 0    | 0    | 9.29346E+23 |
| WINCH       | 0     | 0     | 3.22459E+19 | 0     | 0     | 0     | 1.8123E-123 | 0       | 0    | 0    | 9.29346E+23 |
| CYPRESS     | 0     | 0     | 3.24251E+19 | 0     | 0     | 0     | 2.1399E-123 | 0       | 0    | 0    | 9.29817E+23 |
| VALISE      | 0     | 0     | 3.31909E+19 | 0     | 0     | 0     | 4.3086E-123 | 0       | 0    | 0    | 9.31803E+23 |
| CHATTY      | 0     | 0     | 3.3191E+19  | 0     | 0     | 0     | 4.3092E-123 | 0       | 0    | 0    | 9.31804E+23 |
| BARSAC      | 0     | 0     | 3.32401E+19 | 0     | 0     | 0     | 4.5044E-123 | 0       | 0    | 0    | 9.3193E+23  |

| Nuclide      | 111Ag | 112Pd | 125Sb       | 126Sb | 127Sb | 128Sb | 129Te-m     | 131Te-m | 133I | 135I | 137Cs       |
|--------------|-------|-------|-------------|-------|-------|-------|-------------|---------|------|------|-------------|
| COFFER       | 0     | 0     | 1.66297E+20 | 0     | 0     | 0     | 2.2918E-122 | 0       | 0    | 0    | 4.6599E+24  |
| GOURD BROWN  | 0     | 0     | 3.40453E+19 | 0     | 0     | 0     | 9.2319E-123 | 0       | 0    | 0    | 9.33971E+23 |
| GOURD AMBER  | 0     | 0     | 3.40453E+19 | 0     | 0     | 0     | 9.2319E-123 | 0       | 0    | 0    | 9.33971E+23 |
| BLENTON      | 0     | 0     | 1.88045E+20 | 0     | 0     | 0     | 5.766E-122  | 0       | 0    | 0    | 5.13883E+24 |
| THISTLE      | 0     | 0     | 1.88045E+20 | 0     | 0     | 0     | 5.766E-122  | 0       | 0    | 0    | 5.13883E+24 |
| PURSE        | 0     | 0     | 1.88935E+20 | 0     | 0     | 0     | 6.6432E-122 | 0       | 0    | 0    | 5.14105E+24 |
| ALIMENT      | 0     | 0     | 3.45457E+19 | 0     | 0     | 0     | 1.4298E-122 | 0       | 0    | 0    | 9.35218E+23 |
| IPECAC A     | 0     | 0     | 3.48282E+19 | 0     | 0     | 0     | 1.8251E-122 | 0       | 0    | 0    | 9.35914E+23 |
| IPECAC B     | 0     | 0     | 3.48282E+19 | 0     | 0     | 0     | 1.8251E-122 | 0       | 0    | 0    | 9.35914E+23 |
| TORRIDO      | 0     | 0     | 1.91556E+20 | 0     | 0     | 0     | 1.004E-121  | 0       | 0    | 0    | 5.14753E+24 |
| TAPPER       | 0     | 0     | 3.52137E+19 | 0     | 0     | 0     | 2.5389E-122 | 0       | 0    | 0    | 9.36856E+23 |
| BOWL-1       | 0     | 0     | 3.55566E+19 | 0     | 0     | 0     | 3.3948E-122 | 0       | 0    | 0    | 9.37687E+23 |
| BOWL-2       | 0     | 0     | 3.55566E+19 | 0     | 0     | 0     | 3.3948E-122 | 0       | 0    | 0    | 9.37687E+23 |
| ILDRIM       | 0     | 0     | 1.98254E+20 | 0     | 0     | 0     | 2.8136E-121 | 0       | 0    | 0    | 5.16373E+24 |
| HUTCH        | 0     | 0     | 1.98265E+20 | 0     | 0     | 0     | 2.8181E-121 | 0       | 0    | 0    | 5.16375E+24 |
| SPIDER B     | 0     | 0     | 3.67743E+19 | 0     | 0     | 0     | 9.3166E-122 | 0       | 0    | 0    | 9.40578E+23 |
| SPIDER A     | 0     | 0     | 3.67743E+19 | 0     | 0     | 0     | 9.3166E-122 | 0       | 0    | 0    | 9.40578E+23 |
| PLIERS       | 0     | 0     | 3.71039E+19 | 0     | 0     | 0     | 1.2174E-121 | 0       | 0    | 0    | 9.41345E+23 |
| HOREHOUND    | 0     | 0     | 3.71039E+19 | 0     | 0     | 0     | 1.2174E-121 | 0       | 0    | 0    | 9.41345E+23 |
| MINUTE STEAK | 0     | 0     | 3.75193E+19 | 0     | 0     | 0     | 1.6998E-121 | 0       | 0    | 0    | 9.42304E+23 |
| JORUM        | 0     | 0     | 1.88094E+21 | 0     | 0     | 0     | 9.202E-120  | 0       | 0    | 0    | 4.71266E+25 |
| KYACK A      | 0     | 0     | 3.77226E+19 | 0     | 0     | 0     | 1.9987E-121 | 0       | 0    | 0    | 9.42769E+23 |
| KYACK B      | 0     | 0     | 3.77226E+19 | 0     | 0     | 0     | 1.9987E-121 | 0       | 0    | 0    | 9.42769E+23 |
| SEAWEED D    | 0     | 0     | 3.80092E+19 | 0     | 0     | 0     | 2.5079E-121 | 0       | 0    | 0    | 9.43422E+23 |
| SEAWEED E    | 0     | 0     | 3.80092E+19 | 0     | 0     | 0     | 2.5079E-121 | 0       | 0    | 0    | 9.43422E+23 |
| SEAWEED C    | 0     | 0     | 3.80092E+19 | 0     | 0     | 0     | 2.5079E-121 | 0       | 0    | 0    | 9.43422E+23 |
| PIPKIN       | 0     | 0     | 1.14578E+21 | 0     | 0     | 0     | 8.6924E-120 | 0       | 0    | 0    | 2.83151E+25 |
| SEAWEED B    | 0     | 0     | 3.84029E+19 | 0     | 0     | 0     | 3.4159E-121 | 0       | 0    | 0    | 9.44311E+23 |
| CRUET        | 0     | 0     | 2.13148E+19 | 0     | 0     | 0     | 2.4683E-121 | 0       | 0    | 0    | 5.19803E+23 |
| POD D        | 0     | 0     | 3.87547E+19 | 0     | 0     | 0     | 4.4897E-121 | 0       | 0    | 0    | 9.45098E+23 |
| POD C        | 0     | 0     | 3.87547E+19 | 0     | 0     | 0     | 4.4897E-121 | 0       | 0    | 0    | 9.45098E+23 |
| POD B        | 0     | 0     | 3.87547E+19 | 0     | 0     | 0     | 4.4897E-121 | 0       | 0    | 0    | 9.45098E+23 |
| POD A        | 0     | 0     | 3.87547E+19 | 0     | 0     | 0     | 4.4897E-121 | 0       | 0    | 0    | 9.45098E+23 |
| CALABASH     | 0     | 0     | 2.13163E+20 | 0     | 0     | 0     | 2.4736E-120 | 0       | 0    | 0    | 5.19807E+24 |
| SCUTTLE      | 0     | 0     | 3.32787E+18 | 0     | 0     | 0     | 5.179E-122  | 0       | 0    | 0    | 8.04082E+22 |
| PICCALILLI   | 0     | 0     | 2.16519E+20 | 0     | 0     | 0     | 3.9511E-120 | 0       | 0    | 0    | 5.2055E+24  |
| PLANER       | 0     | 0     | 3.93671E+19 | 0     | 0     | 0     | 7.1839E-121 | 0       | 0    | 0    | 9.46454E+23 |
| DIESEL TRAIN | 0     | 0     | 3.97506E+19 | 0     | 0     | 0     | 9.6069E-121 | 0       | 0    | 0    | 9.47293E+23 |

| Nuclide        | 111Ag | 112Pd | 125Sb       | 126Sb | 127Sb | 128Sb | 129Te-m     | 131Te-m | 133I | 135I | 137Cs       |
|----------------|-------|-------|-------------|-------|-------|-------|-------------|---------|------|------|-------------|
| CULANTRO B     | 0     | 0     | 3.98853E+19 | 0     | 0     | 0     | 1.0632E-120 | 0       | 0    | 0    | 9.47586E+23 |
| CULANTRO A     | 0     | 0     | 3.98853E+19 | 0     | 0     | 0     | 1.0632E-120 | 0       | 0    | 0    | 9.47586E+23 |
| TUN A          | 0     | 0     | 3.98859E+19 | 0     | 0     | 0     | 1.0637E-120 | 0       | 0    | 0    | 9.47587E+23 |
| TUN C          | 0     | 0     | 3.98859E+19 | 0     | 0     | 0     | 1.0637E-120 | 0       | 0    | 0    | 9.47587E+23 |
| TUN B          | 0     | 0     | 3.98859E+19 | 0     | 0     | 0     | 1.0637E-120 | 0       | 0    | 0    | 9.47587E+23 |
| TUN D          | 0     | 0     | 3.98859E+19 | 0     | 0     | 0     | 1.0637E-120 | 0       | 0    | 0    | 9.47587E+23 |
| GRAPE A        | 0     | 0     | 2.20428E+20 | 0     | 0     | 0     | 6.7563E-120 | 0       | 0    | 0    | 5.21402E+24 |
| LOVAGE         | 0     | 0     | 4.00781E+19 | 0     | 0     | 0     | 1.2287E-120 | 0       | 0    | 0    | 9.48004E+23 |
| TERRINE WHITE  | 0     | 0     | 2.20605E+20 | 0     | 0     | 0     | 6.9209E-120 | 0       | 0    | 0    | 5.2144E+24  |
| TERRINE YELLOW | 0     | 0     | 2.20605E+20 | 0     | 0     | 0     | 6.9209E-120 | 0       | 0    | 0    | 5.2144E+24  |
| FOB BLUE       | 0     | 0     | 4.11131E+19 | 0     | 0     | 0     | 2.6388E-120 | 0       | 0    | 0    | 9.50216E+23 |
| FOB RED        | 0     | 0     | 4.11131E+19 | 0     | 0     | 0     | 2.6388E-120 | 0       | 0    | 0    | 9.50216E+23 |
| FOB GREEN      | 0     | 0     | 4.11131E+19 | 0     | 0     | 0     | 2.6388E-120 | 0       | 0    | 0    | 9.50216E+23 |
| AJO            | 0     | 0     | 4.13122E+19 | 0     | 0     | 0     | 3.05E-120   | 0       | 0    | 0    | 9.50636E+23 |
| GRAPE B        | 0     | 0     | 2.28E+20    | 0     | 0     | 0     | 1.8598E-119 | 0       | 0    | 0    | 5.23014E+24 |
| BELEN          | 0     | 0     | 2.28E+20    | 0     | 0     | 0     | 1.8598E-119 | 0       | 0    | 0    | 5.23014E+24 |
| LABIS          | 0     | 0     | 5.18509E+19 | 0     | 0     | 0     | 4.3074E-120 | 0       | 0    | 0    | 1.18874E+24 |
| DIANA MIST     | 0     | 0     | 4.16574E+19 | 0     | 0     | 0     | 3.9143E-120 | 0       | 0    | 0    | 9.51359E+23 |
| CUMARIN        | 0     | 0     | 2.31302E+20 | 0     | 0     | 0     | 2.862E-119  | 0       | 0    | 0    | 5.23702E+24 |
| YANNIGAN RED   | 0     | 0     | 2.31468E+20 | 0     | 0     | 0     | 2.9242E-119 | 0       | 0    | 0    | 5.23736E+24 |
| YANNIGAN BLUE  | 0     | 0     | 2.31468E+20 | 0     | 0     | 0     | 2.9242E-119 | 0       | 0    | 0    | 5.23736E+24 |
| YANNIGAN WHITE | 0     | 0     | 2.31468E+20 | 0     | 0     | 0     | 2.9242E-119 | 0       | 0    | 0    | 5.23736E+24 |
| CYATHUS        | 0     | 0     | 1.84075E+19 | 0     | 0     | 0     | 2.7252E-120 | 0       | 0    | 0    | 4.14435E+23 |
| ARABIS RED     | 0     | 0     | 4.23167E+19 | 0     | 0     | 0     | 6.268E-120  | 0       | 0    | 0    | 9.52726E+23 |
| ARABIS BLUE    | 0     | 0     | 4.23167E+19 | 0     | 0     | 0     | 6.268E-120  | 0       | 0    | 0    | 9.52726E+23 |
| ARABIS GREEN   | 0     | 0     | 4.23167E+19 | 0     | 0     | 0     | 6.268E-120  | 0       | 0    | 0    | 9.52726E+23 |
| JAL            | 0     | 0     | 4.26958E+19 | 0     | 0     | 0     | 8.1893E-120 | 0       | 0    | 0    | 9.53503E+23 |
| SHAPER         | 0     | 0     | 2.35535E+20 | 0     | 0     | 0     | 4.9296E-119 | 0       | 0    | 0    | 5.24571E+24 |
| HANDLEY        | 0     | 0     | 2.1454E+21  | 0     | 0     | 0     | 4.7509E-118 | 0       | 0    | 0    | 4.76968E+25 |
| SNUBBER        | 0     | 0     | 2.77348E+19 | 0     | 0     | 0     | 1.0276E-119 | 0       | 0    | 0    | 6.06733E+23 |
| CAN RED        | 0     | 0     | 2.40227E+20 | 0     | 0     | 0     | 8.9046E-119 | 0       | 0    | 0    | 5.25518E+24 |
| CAN GREEN      | 0     | 0     | 2.40227E+20 | 0     | 0     | 0     | 8.9046E-119 | 0       | 0    | 0    | 5.25518E+24 |
| BEEBALM        | 0     | 0     | 4.39781E+19 | 0     | 0     | 0     | 1.9886E-119 | 0       | 0    | 0    | 9.56086E+23 |
| HOD C (BLUE)   | 0     | 0     | 4.39787E+19 | 0     | 0     | 0     | 1.9894E-119 | 0       | 0    | 0    | 9.56087E+23 |
| HOD B (RED)    | 0     | 0     | 4.39787E+19 | 0     | 0     | 0     | 1.9894E-119 | 0       | 0    | 0    | 9.56087E+23 |
| HOD A (GREEN)  | 0     | 0     | 4.39787E+19 | 0     | 0     | 0     | 1.9894E-119 | 0       | 0    | 0    | 9.56087E+23 |
| MINT LEAF      | 0     | 0     | 4.4101E+19  | 0     | 0     | 0     | 2.1621E-119 | 0       | 0    | 0    | 9.5633E+23  |
| DIAMOND DUST   | 0     | 0     | 4.4312E+19  | 0     | 0     | 0     | 2.4947E-119 | 0       | 0    | 0    | 9.56747E+23 |

| Nuclide          | 111Ag | 112Pd | 125Sb       | 126Sb | 127Sb | 128Sb | 129Te-m     | 131Te-m | 133I | 135I | 137Cs       |
|------------------|-------|-------|-------------|-------|-------|-------|-------------|---------|------|------|-------------|
| CORNICE YELLOW   | 0     | 0     | 2.44216E+20 | 0     | 0     | 0     | 1.4591E-118 | 0       | 0    | 0    | 5.2631E+24  |
| CORNICE GREEN    | 0     | 0     | 2.44216E+20 | 0     | 0     | 0     | 1.4591E-118 | 0       | 0    | 0    | 5.2631E+24  |
| MANZANAS         | 0     | 0     | 4.45873E+19 | 0     | 0     | 0     | 3.0037E-119 | 0       | 0    | 0    | 9.57289E+23 |
| MORRONES         | 0     | 0     | 2.45232E+20 | 0     | 0     | 0     | 1.6524E-118 | 0       | 0    | 0    | 5.26509E+24 |
| HUDSON MOON      | 0     | 0     | 4.47413E+19 | 0     | 0     | 0     | 3.3308E-119 | 0       | 0    | 0    | 9.57591E+23 |
| FLASK GREEN      | 0     | 0     | 2.34897E+20 | 0     | 0     | 0     | 1.7498E-118 | 0       | 0    | 0    | 5.02736E+24 |
| FLASK RED        | 0     | 0     | 7.82989E+16 | 0     | 0     | 0     | 5.8326E-122 | 0       | 0    | 0    | 1.67579E+21 |
| FLASK YELLOW     | 0     | 0     | 2.0134E+17  | 0     | 0     | 0     | 1.4998E-121 | 0       | 0    | 0    | 4.30917E+21 |
| PITON C          | 0     | 0     | 4.47996E+19 | 0     | 0     | 0     | 3.4636E-119 | 0       | 0    | 0    | 9.57705E+23 |
| PITON B          | 0     | 0     | 4.48E+19    | 0     | 0     | 0     | 3.4644E-119 | 0       | 0    | 0    | 9.57705E+23 |
| PITON A          | 0     | 0     | 4.48E+19    | 0     | 0     | 0     | 3.4644E-119 | 0       | 0    | 0    | 9.57705E+23 |
| ARNICA YELLOW    | 0     | 0     | 4.57042E+19 | 0     | 0     | 0     | 6.3069E-119 | 0       | 0    | 0    | 9.59457E+23 |
| ARNICA VIOLET    | 0     | 0     | 4.57042E+19 | 0     | 0     | 0     | 6.3069E-119 | 0       | 0    | 0    | 9.59457E+23 |
| SCREE CHAMOIS    | 0     | 0     | 4.92668E+19 | 0     | 0     | 0     | 5.9862E-118 | 0       | 0    | 0    | 9.66063E+23 |
| SCREE ACAJOU     | 0     | 0     | 4.92668E+19 | 0     | 0     | 0     | 5.9862E-118 | 0       | 0    | 0    | 9.66063E+23 |
| SCREE ALHAMBRA   | 0     | 0     | 4.92668E+19 | 0     | 0     | 0     | 5.9862E-118 | 0       | 0    | 0    | 9.66063E+23 |
| TIJERAS          | 0     | 0     | 2.7115E+20  | 0     | 0     | 0     | 3.3593E-117 | 0       | 0    | 0    | 5.31367E+24 |
| TRUCHAS CHACON   | 0     | 0     | 4.97771E+19 | 0     | 0     | 0     | 8.153E-118  | 0       | 0    | 0    | 9.66973E+23 |
| TRUCHAS CHAMISAL | 0     | 0     | 4.97771E+19 | 0     | 0     | 0     | 8.153E-118  | 0       | 0    | 0    | 9.66973E+23 |
| TRUCHAS RODARTE  | 0     | 0     | 4.97771E+19 | 0     | 0     | 0     | 8.153E-118  | 0       | 0    | 0    | 9.66973E+23 |
| ABEYAS           | 0     | 0     | 2.75289E+20 | 0     | 0     | 0     | 5.291E-117  | 0       | 0    | 0    | 5.32104E+24 |
| PENASCO          | 0     | 0     | 5.05371E+19 | 0     | 0     | 0     | 1.2841E-117 | 0       | 0    | 0    | 9.68314E+23 |
| CARRIZOZO        | 0     | 0     | 5.10265E+19 | 0     | 0     | 0     | 1.7143E-117 | 0       | 0    | 0    | 9.69167E+23 |
| CORAZON          | 0     | 0     | 5.10265E+19 | 0     | 0     | 0     | 1.7143E-117 | 0       | 0    | 0    | 9.69167E+23 |
| CANJILON         | 0     | 0     | 5.14863E+19 | 0     | 0     | 0     | 2.2433E-117 | 0       | 0    | 0    | 9.69962E+23 |
| ARTESIA          | 0     | 0     | 2.83174E+20 | 0     | 0     | 0     | 1.2338E-116 | 0       | 0    | 0    | 5.33479E+24 |
| AVENS ALKERMES   | 0     | 0     | 5.14863E+19 | 0     | 0     | 0     | 2.2433E-117 | 0       | 0    | 0    | 9.69962E+23 |
| AVENS ANDORRE    | 0     | 0     | 5.14863E+19 | 0     | 0     | 0     | 2.2433E-117 | 0       | 0    | 0    | 9.69962E+23 |
| AVENS CREAM      | 0     | 0     | 5.14863E+19 | 0     | 0     | 0     | 2.2433E-117 | 0       | 0    | 0    | 9.69962E+23 |
| AVENS ASAMITE    | 0     | 0     | 5.14863E+19 | 0     | 0     | 0     | 2.2433E-117 | 0       | 0    | 0    | 9.69962E+23 |
| CARPETBAG        | 0     | 0     | 5.6674E+20  | 0     | 0     | 0     | 2.5192E-116 | 0       | 0    | 0    | 1.06703E+25 |
| BANE BERRY       | 0     | 0     | 2.57782E+19 | 0     | 0     | 0     | 1.1684E-117 | 0       | 0    | 0    | 4.85041E+23 |
| EMBUDO           | 0     | 0     | 5.83531E+19 | 0     | 0     | 0     | 9.5725E-116 | 0       | 0    | 0    | 9.81127E+23 |
| DEXTER           | 0     | 0     | 5.86334E+19 | 0     | 0     | 0     | 1.1052E-115 | 0       | 0    | 0    | 9.81557E+23 |
| LAGUNA           | 0     | 0     | 3.22498E+20 | 0     | 0     | 0     | 6.0863E-115 | 0       | 0    | 0    | 5.39858E+24 |
| HAREBELL         | 0     | 0     | 3.22706E+20 | 0     | 0     | 0     | 6.2051E-115 | 0       | 0    | 0    | 5.3989E+24  |
| CAMPHOR          | 0     | 0     | 5.88836E+19 | 0     | 0     | 0     | 1.2556E-115 | 0       | 0    | 0    | 9.81939E+23 |
| DIAMOND MINE     | 0     | 0     | 5.89571E+19 | 0     | 0     | 0     | 1.3035E-115 | 0       | 0    | 0    | 9.82051E+23 |

| Nuclide          | 111Ag | 112Pd | 125Sb       | 126Sb | 127Sb | 128Sb | 129Te-m     | 131Te-m | 133I | 135I | 137Cs       |
|------------------|-------|-------|-------------|-------|-------|-------|-------------|---------|------|------|-------------|
| MINIATA          | 0     | 0     | 2.45853E+20 | 0     | 0     | 0     | 6.2498E-115 | 0       | 0    | 0    | 4.07731E+24 |
| BRACKEN          | 0     | 0     | 5.92825E+19 | 0     | 0     | 0     | 1.5374E-115 | 0       | 0    | 0    | 9.82545E+23 |
| APODACA          | 0     | 0     | 5.97733E+19 | 0     | 0     | 0     | 1.9684E-115 | 0       | 0    | 0    | 9.83286E+23 |
| BARRANCA         | 0     | 0     | 6.03518E+19 | 0     | 0     | 0     | 2.6274E-115 | 0       | 0    | 0    | 9.84152E+23 |
| NAMA MEPHISTO    | 0     | 0     | 6.04013E+19 | 0     | 0     | 0     | 2.6929E-115 | 0       | 0    | 0    | 9.84226E+23 |
| NAMA AMARYLIS    | 0     | 0     | 6.04013E+19 | 0     | 0     | 0     | 2.6929E-115 | 0       | 0    | 0    | 9.84226E+23 |
| BALTIC           | 0     | 0     | 6.04367E+19 | 0     | 0     | 0     | 2.7405E-115 | 0       | 0    | 0    | 9.84279E+23 |
| ALGODONES        | 0     | 0     | 3.35153E+20 | 0     | 0     | 0     | 1.9298E-114 | 0       | 0    | 0    | 5.41761E+24 |
| FRIJOLAS GUAJE   | 0     | 0     | 6.24222E+19 | 0     | 0     | 0     | 7.223E-115  | 0       | 0    | 0    | 9.87191E+23 |
| FRIJOLAS PETACA  | 0     | 0     | 6.24222E+19 | 0     | 0     | 0     | 7.223E-115  | 0       | 0    | 0    | 9.87191E+23 |
| FRIJOLAS DEMING  | 0     | 0     | 6.24222E+19 | 0     | 0     | 0     | 7.223E-115  | 0       | 0    | 0    | 9.87191E+23 |
| FRIJOLAS ESPUELA | 0     | 0     | 6.24222E+19 | 0     | 0     | 0     | 7.223E-115  | 0       | 0    | 0    | 9.87191E+23 |
| PEDERNAL         | 0     | 0     | 6.27236E+19 | 0     | 0     | 0     | 8.3451E-115 | 0       | 0    | 0    | 9.87626E+23 |
| CHANTILLY        | 0     | 0     | 6.27245E+19 | 0     | 0     | 0     | 8.3487E-115 | 0       | 0    | 0    | 9.87628E+23 |
| CATHAY           | 0     | 0     | 6.31141E+19 | 0     | 0     | 0     | 1.0052E-114 | 0       | 0    | 0    | 9.88187E+23 |
| LAGOON           | 0     | 0     | 6.33752E+19 | 0     | 0     | 0     | 1.1376E-114 | 0       | 0    | 0    | 9.8856E+23  |
| DIAGONAL LINE    | 0     | 0     | 6.51993E+19 | 0     | 0     | 0     | 2.6637E-114 | 0       | 0    | 0    | 9.91127E+23 |
| PARNASSIA        | 0     | 0     | 6.54606E+19 | 0     | 0     | 0     | 3.003E-114  | 0       | 0    | 0    | 9.9149E+23  |
| CHAENACTIS       | 0     | 0     | 3.63575E+20 | 0     | 0     | 0     | 2.215E-113  | 0       | 0    | 0    | 5.45808E+24 |
| HOSPAH           | 0     | 0     | 6.61045E+19 | 0     | 0     | 0     | 4.0272E-114 | 0       | 0    | 0    | 9.92378E+23 |
| YERBA            | 0     | 0     | 6.61045E+19 | 0     | 0     | 0     | 4.0272E-114 | 0       | 0    | 0    | 9.92378E+23 |
| MESCALERO        | 0     | 0     | 6.71013E+19 | 0     | 0     | 0     | 6.3077E-114 | 0       | 0    | 0    | 9.93736E+23 |
| COWLES           | 0     | 0     | 6.84666E+19 | 0     | 0     | 0     | 1.1538E-113 | 0       | 0    | 0    | 9.95568E+23 |
| DIANTHUS         | 0     | 0     | 6.9124E+19  | 0     | 0     | 0     | 1.5366E-113 | 0       | 0    | 0    | 9.96438E+23 |
| SAPPHO           | 0     | 0     | 7.08085E+19 | 0     | 0     | 0     | 3.1627E-113 | 0       | 0    | 0    | 9.98633E+23 |
| ONAJA            | 0     | 0     | 7.11548E+19 | 0     | 0     | 0     | 3.6609E-113 | 0       | 0    | 0    | 9.99079E+23 |
| OCATE            | 0     | 0     | 7.11548E+19 | 0     | 0     | 0     | 3.6609E-113 | 0       | 0    | 0    | 9.99079E+23 |
| LONGCHAMPS       | 0     | 0     | 7.21315E+19 | 0     | 0     | 0     | 5.5093E-113 | 0       | 0    | 0    | 1.00032E+24 |
| JICARILLA        | 0     | 0     | 7.21319E+19 | 0     | 0     | 0     | 5.5101E-113 | 0       | 0    | 0    | 1.00033E+24 |
| MISTY NORTH      | 0     | 0     | 7.27853E+19 | 0     | 0     | 0     | 7.2208E-113 | 0       | 0    | 0    | 1.00115E+24 |
| KARA             | 0     | 0     | 7.32264E+19 | 0     | 0     | 0     | 8.6548E-113 | 0       | 0    | 0    | 1.0017E+24  |
| ZINNIA           | 0     | 0     | 7.35297E+19 | 0     | 0     | 0     | 9.7966E-113 | 0       | 0    | 0    | 1.00208E+24 |
| MONERO           | 0     | 0     | 7.36369E+19 | 0     | 0     | 0     | 1.0234E-112 | 0       | 0    | 0    | 1.00222E+24 |
| MERIDA           | 0     | 0     | 7.46024E+19 | 0     | 0     | 0     | 1.5124E-112 | 0       | 0    | 0    | 1.00341E+24 |
| CAPITAN          | 0     | 0     | 7.56868E+19 | 0     | 0     | 0     | 2.3311E-112 | 0       | 0    | 0    | 1.00473E+24 |
| TAJIQUE          | 0     | 0     | 7.56907E+19 | 0     | 0     | 0     | 2.3347E-112 | 0       | 0    | 0    | 1.00474E+24 |
| HAPLOPAPPUS      | 0     | 0     | 7.56907E+19 | 0     | 0     | 0     | 2.3347E-112 | 0       | 0    | 0    | 1.00474E+24 |
| DIAMOND SCULLS   | 0     | 0     | 7.68469E+19 | 0     | 0     | 0     | 3.6781E-112 | 0       | 0    | 0    | 1.00613E+24 |

| Nuclide        | 111Ag | 112Pd | 125Sb       | 126Sb | 127Sb | 128Sb | 129Te-m     | 131Te-m | 133I | 135I | 137Cs       |
|----------------|-------|-------|-------------|-------|-------|-------|-------------|---------|------|------|-------------|
| ATARQUE        | 0     | 0     | 7.71035E+19 | 0     | 0     | 0     | 4.0646E-112 | 0       | 0    | 0    | 1.00644E+24 |
| CEBOLLA        | 0     | 0     | 7.79034E+19 | 0     | 0     | 0     | 5.5387E-112 | 0       | 0    | 0    | 1.00739E+24 |
| SOLANO         | 0     | 0     | 7.79034E+19 | 0     | 0     | 0     | 5.5387E-112 | 0       | 0    | 0    | 1.00739E+24 |
| CUCHILLO       | 0     | 0     | 7.79034E+19 | 0     | 0     | 0     | 5.5387E-112 | 0       | 0    | 0    | 1.00739E+24 |
| OSCURO         | 0     | 0     | 4.41361E+20 | 0     | 0     | 0     | 7.409E-111  | 0       | 0    | 0    | 5.55567E+24 |
| DELPHINIUM     | 0     | 0     | 6.03912E+19 | 0     | 0     | 0     | 1.1191E-111 | 0       | 0    | 0    | 7.57828E+23 |
| AKBAR          | 0     | 0     | 8.29986E+19 | 0     | 0     | 0     | 3.7009E-111 | 0       | 0    | 0    | 1.01324E+24 |
| ARSENATE       | 0     | 0     | 8.30057E+19 | 0     | 0     | 0     | 3.7104E-111 | 0       | 0    | 0    | 1.01325E+24 |
| CANNA UMBRINUS | 0     | 0     | 8.34633E+19 | 0     | 0     | 0     | 4.3753E-111 | 0       | 0    | 0    | 1.01376E+24 |
| CANNA LIMOGES  | 0     | 0     | 8.34633E+19 | 0     | 0     | 0     | 4.3753E-111 | 0       | 0    | 0    | 1.01376E+24 |
| TULOSO         | 0     | 0     | 8.49078E+19 | 0     | 0     | 0     | 7.3185E-111 | 0       | 0    | 0    | 1.01535E+24 |
| SOLANUM        | 0     | 0     | 8.50223E+19 | 0     | 0     | 0     | 7.6203E-111 | 0       | 0    | 0    | 1.01547E+24 |
| FLAX SOURCE    | 0     | 0     | 8.54444E+19 | 0     | 0     | 0     | 8.8401E-111 | 0       | 0    | 0    | 1.01593E+24 |
| FLAX TEST      | 0     | 0     | 4.69944E+20 | 0     | 0     | 0     | 4.8621E-110 | 0       | 0    | 0    | 5.58764E+24 |
| FLAX BACKUP    | 0     | 0     | 8.54444E+19 | 0     | 0     | 0     | 8.8401E-111 | 0       | 0    | 0    | 1.01593E+24 |
| ALUMROOT       | 0     | 0     | 8.87279E+19 | 0     | 0     | 0     | 2.7381E-110 | 0       | 0    | 0    | 1.01944E+24 |
| MIERA          | 0     | 0     | 4.95456E+20 | 0     | 0     | 0     | 2.3722E-109 | 0       | 0    | 0    | 5.6147E+24  |
| GAZOOK         | 0     | 0     | 9.10282E+19 | 0     | 0     | 0     | 5.898E-110  | 0       | 0    | 0    | 1.02183E+24 |
| NATOMA         | 0     | 0     | 9.18319E+19 | 0     | 0     | 0     | 7.6763E-110 | 0       | 0    | 0    | 1.02265E+24 |
| ANGUS          | 0     | 0     | 9.31246E+19 | 0     | 0     | 0     | 1.1673E-109 | 0       | 0    | 0    | 1.02396E+24 |
| VELARDE        | 0     | 0     | 9.31246E+19 | 0     | 0     | 0     | 1.1673E-109 | 0       | 0    | 0    | 1.02396E+24 |
| COLMOR         | 0     | 0     | 9.31696E+19 | 0     | 0     | 0     | 1.1843E-109 | 0       | 0    | 0    | 1.024E+24   |
| STARWORT       | 0     | 0     | 4.19287E+20 | 0     | 0     | 0     | 5.3384E-109 | 0       | 0    | 0    | 4.60804E+24 |
| MESITA         | 0     | 0     | 9.4002E+19  | 0     | 0     | 0     | 1.5462E-109 | 0       | 0    | 0    | 1.02484E+24 |
| CABRESTO       | 0     | 0     | 9.49772E+19 | 0     | 0     | 0     | 2.107E-109  | 0       | 0    | 0    | 1.0258E+24  |
| KASHAN         | 0     | 0     | 9.49772E+19 | 0     | 0     | 0     | 2.107E-109  | 0       | 0    | 0    | 1.0258E+24  |
| DIDO QUEEN     | 0     | 0     | 9.57743E+19 | 0     | 0     | 0     | 2.7069E-109 | 0       | 0    | 0    | 1.02659E+24 |
| ALMENDRO       | 0     | 0     | 2.87488E+21 | 0     | 0     | 0     | 8.2616E-108 | 0       | 0    | 0    | 3.07993E+25 |
| POTRILLO       | 0     | 0     | 5.32556E+20 | 0     | 0     | 0     | 2.067E-108  | 0       | 0    | 0    | 5.65189E+24 |
| PORTULACA      | 0     | 0     | 4.86542E+20 | 0     | 0     | 0     | 2.1795E-108 | 0       | 0    | 0    | 5.1404E+24  |
| SILENE         | 0     | 0     | 9.73098E+19 | 0     | 0     | 0     | 4.3608E-109 | 0       | 0    | 0    | 1.02808E+24 |
| POLYGONUM      | 0     | 0     | 1.03939E+20 | 0     | 0     | 0     | 3.1455E-108 | 0       | 0    | 0    | 1.03429E+24 |
| WALLER         | 0     | 0     | 1.03941E+20 | 0     | 0     | 0     | 3.1475E-108 | 0       | 0    | 0    | 1.0343E+24  |
| HUSKY ACE      | 0     | 0     | 1.04664E+20 | 0     | 0     | 0     | 3.8745E-108 | 0       | 0    | 0    | 1.03495E+24 |
| BERNAL         | 0     | 0     | 1.081E+20   | 0     | 0     | 0     | 1.0203E-107 | 0       | 0    | 0    | 1.03801E+24 |
| PAJARA         | 0     | 0     | 1.09157E+20 | 0     | 0     | 0     | 1.3661E-107 | 0       | 0    | 0    | 1.03894E+24 |
| SEAFOAM        | 0     | 0     | 1.09221E+20 | 0     | 0     | 0     | 1.3901E-107 | 0       | 0    | 0    | 1.03899E+24 |
| SPAR           | 0     | 0     | 1.09679E+20 | 0     | 0     | 0     | 1.5763E-107 | 0       | 0    | 0    | 1.03939E+24 |

| Nuclide          | 111Ag | 112Pd | 125Sb       | 126Sb | 127Sb | 128Sb | 129Te-m     | 131Te-m | 133I | 135I | 137Cs       |
|------------------|-------|-------|-------------|-------|-------|-------|-------------|---------|------|------|-------------|
| ELIDA            | 0     | 0     | 1.09685E+20 | 0     | 0     | 0     | 1.5787E-107 | 0       | 0    | 0    | 1.03939E+24 |
| PINEDROPS TAWNY  | 0     | 0     | 1.11346E+20 | 0     | 0     | 0     | 2.4776E-107 | 0       | 0    | 0    | 1.04082E+24 |
| PINEDROPS BAYOU  | 0     | 0     | 1.11346E+20 | 0     | 0     | 0     | 2.4776E-107 | 0       | 0    | 0    | 1.04082E+24 |
| PINEDROPS SLOAT  | 0     | 0     | 1.11346E+20 | 0     | 0     | 0     | 2.4776E-107 | 0       | 0    | 0    | 1.04082E+24 |
| LATIR            | 0     | 0     | 6.32994E+20 | 0     | 0     | 0     | 3.6724E-106 | 0       | 0    | 0    | 5.74186E+24 |
| HULSEA           | 0     | 0     | 1.16284E+20 | 0     | 0     | 0     | 9.0987E-107 | 0       | 0    | 0    | 1.04496E+24 |
| SAPELLO          | 0     | 0     | 1.18622E+20 | 0     | 0     | 0     | 1.6525E-106 | 0       | 0    | 0    | 1.04686E+24 |
| POTRERO          | 0     | 0     | 1.19523E+20 | 0     | 0     | 0     | 2.0734E-106 | 0       | 0    | 0    | 1.04759E+24 |
| PLOMO            | 0     | 0     | 1.20178E+20 | 0     | 0     | 0     | 2.4429E-106 | 0       | 0    | 0    | 1.04811E+24 |
| JIB              | 0     | 0     | 1.20769E+20 | 0     | 0     | 0     | 2.8295E-106 | 0       | 0    | 0    | 1.04858E+24 |
| GROVE            | 0     | 0     | 1.21928E+20 | 0     | 0     | 0     | 3.7682E-106 | 0       | 0    | 0    | 1.0495E+24  |
| FALLON           | 0     | 0     | 6.71055E+20 | 0     | 0     | 0     | 2.1146E-105 | 0       | 0    | 0    | 5.7726E+24  |
| JARA             | 0     | 0     | 1.23195E+20 | 0     | 0     | 0     | 5.1367E-106 | 0       | 0    | 0    | 1.05049E+24 |
| MING BLADE       | 0     | 0     | 1.24306E+20 | 0     | 0     | 0     | 6.7243E-106 | 0       | 0    | 0    | 1.05135E+24 |
| ESCABOSA         | 0     | 0     | 6.93636E+20 | 0     | 0     | 0     | 5.7037E-105 | 0       | 0    | 0    | 5.79009E+24 |
| CRESTLAKE TANSAN | 0     | 0     | 1.26805E+20 | 0     | 0     | 0     | 1.221E-105  | 0       | 0    | 0    | 1.05327E+24 |
| CRESTLAKE BRIAR  | 0     | 0     | 1.26805E+20 | 0     | 0     | 0     | 1.221E-105  | 0       | 0    | 0    | 1.05327E+24 |
| PUYE             | 0     | 0     | 1.29182E+20 | 0     | 0     | 0     | 2.1312E-105 | 0       | 0    | 0    | 1.05506E+24 |
| PORTMANTEAU      | 0     | 0     | 7.18389E+20 | 0     | 0     | 0     | 1.6319E-104 | 0       | 0    | 0    | 5.80868E+24 |
| PRATT            | 0     | 0     | 1.3297E+20  | 0     | 0     | 0     | 5.0688E-105 | 0       | 0    | 0    | 1.05785E+24 |
| TRUMBULL         | 0     | 0     | 1.33064E+20 | 0     | 0     | 0     | 5.1767E-105 | 0       | 0    | 0    | 1.05792E+24 |
| STANYAN          | 0     | 0     | 7.31862E+20 | 0     | 0     | 0     | 2.8486E-104 | 0       | 0    | 0    | 5.81855E+24 |
| ESTACA           | 0     | 0     | 1.35011E+20 | 0     | 0     | 0     | 8.0022E-105 | 0       | 0    | 0    | 1.05932E+24 |
| HYBLA FAIR       | 0     | 0     | 1.36028E+20 | 0     | 0     | 0     | 1.0022E-104 | 0       | 0    | 0    | 1.06005E+24 |
| TEMESCAL         | 0     | 0     | 1.36499E+20 | 0     | 0     | 0     | 1.1115E-104 | 0       | 0    | 0    | 1.06038E+24 |
| PUDDLE           | 0     | 0     | 1.38769E+20 | 0     | 0     | 0     | 1.8229E-104 | 0       | 0    | 0    | 1.06198E+24 |
| KEEL             | 0     | 0     | 1.40702E+20 | 0     | 0     | 0     | 2.7597E-104 | 0       | 0    | 0    | 1.06333E+24 |
| PORTOLA LARKIN   | 0     | 0     | 1.4582E+20  | 0     | 0     | 0     | 8.0538E-104 | 0       | 0    | 0    | 1.06681E+24 |
| PORTOLA          | 0     | 0     | 1.4582E+20  | 0     | 0     | 0     | 8.0538E-104 | 0       | 0    | 0    | 1.06681E+24 |
| TELEME           | 0     | 0     | 1.45823E+20 | 0     | 0     | 0     | 8.0588E-104 | 0       | 0    | 0    | 1.06681E+24 |
| BILGE            | 0     | 0     | 1.4715E+20  | 0     | 0     | 0     | 1.0573E-103 | 0       | 0    | 0    | 1.06769E+24 |
| TOPGALLANT       | 0     | 0     | 8.14259E+20 | 0     | 0     | 0     | 6.9783E-103 | 0       | 0    | 0    | 5.87557E+24 |
| CABRILLO         | 0     | 0     | 8.18184E+20 | 0     | 0     | 0     | 8.0606E-103 | 0       | 0    | 0    | 5.87816E+24 |
| DINING CAR       | 0     | 0     | 1.51775E+20 | 0     | 0     | 0     | 2.6744E-103 | 0       | 0    | 0    | 1.07072E+24 |
| EDAM             | 0     | 0     | 8.45614E+20 | 0     | 0     | 0     | 2.1663E-102 | 0       | 0    | 0    | 5.8959E+24  |
| OBAR             | 0     | 0     | 8.49132E+20 | 0     | 0     | 0     | 2.4535E-102 | 0       | 0    | 0    | 5.89814E+24 |
| TYBO             | 0     | 0     | 4.67633E+21 | 0     | 0     | 0     | 1.7849E-101 | 0       | 0    | 0    | 3.21999E+25 |
| STILTON          | 0     | 0     | 8.69215E+20 | 0     | 0     | 0     | 4.9449E-102 | 0       | 0    | 0    | 5.91076E+24 |

| Nuclide       | 111Ag | 112Pd | 125Sb       | 126Sb | 127Sb | 128Sb | 129Te-m     | 131Te-m | 133I | 135I | 137Cs       |
|---------------|-------|-------|-------------|-------|-------|-------|-------------|---------|------|------|-------------|
| MIZZEN        | 0     | 0     | 8.69224E+20 | 0     | 0     | 0     | 4.9463E-102 | 0       | 0    | 0    | 5.91077E+24 |
| ALVISO        | 0     | 0     | 1.58905E+20 | 0     | 0     | 0     | 1.0592E-102 | 0       | 0    | 0    | 1.07522E+24 |
| FUTTOCK       | 0     | 0     | 1.59667E+20 | 0     | 0     | 0     | 1.2225E-102 | 0       | 0    | 0    | 1.07569E+24 |
| MAST          | 0     | 0     | 4.79348E+21 | 0     | 0     | 0     | 3.7477E-101 | 0       | 0    | 0    | 3.22729E+25 |
| CAMEMBERT     | 0     | 0     | 4.81655E+21 | 0     | 0     | 0     | 4.3281E-101 | 0       | 0    | 0    | 3.2287E+25  |
| MARSH         | 0     | 0     | 1.68728E+20 | 0     | 0     | 0     | 6.3961E-102 | 0       | 0    | 0    | 1.08113E+24 |
| HUSKY PUP     | 0     | 0     | 1.74395E+20 | 0     | 0     | 0     | 1.722E-101  | 0       | 0    | 0    | 1.0844E+24  |
| KASSERI       | 0     | 0     | 5.24585E+21 | 0     | 0     | 0     | 5.5974E-100 | 0       | 0    | 0    | 3.254E+25   |
| DECK          | 0     | 0     | 1.77412E+20 | 0     | 0     | 0     | 2.8799E-101 | 0       | 0    | 0    | 1.0861E+24  |
| INLET         | 0     | 0     | 5.32961E+21 | 0     | 0     | 0     | 8.9998E-100 | 0       | 0    | 0    | 3.25872E+25 |
| LEYDEN        | 0     | 0     | 1.78391E+20 | 0     | 0     | 0     | 3.3967E-101 | 0       | 0    | 0    | 1.08665E+24 |
| CHIBERTA      | 0     | 0     | 9.97618E+20 | 0     | 0     | 0     | 3.0769E-100 | 0       | 0    | 0    | 5.98568E+24 |
| MUENSTER      | 0     | 0     | 5.4941E+21  | 0     | 0     | 0     | 2.2389E-99  | 0       | 0    | 0    | 3.26779E+25 |
| KEELSON       | 0     | 0     | 1.02953E+21 | 0     | 0     | 0     | 7.9091E-100 | 0       | 0    | 0    | 6.00293E+24 |
| ESROM         | 0     | 0     | 1.02954E+21 | 0     | 0     | 0     | 7.9114E-100 | 0       | 0    | 0    | 6.00294E+24 |
| FONTINA       | 0     | 0     | 5.64669E+21 | 0     | 0     | 0     | 5.09E-99    | 0       | 0    | 0    | 3.27598E+25 |
| CHESHIRE      | 0     | 0     | 3.29813E+21 | 0     | 0     | 0     | 3.0856E-99  | 0       | 0    | 0    | 1.91121E+25 |
| SHALLOWS      | 0     | 0     | 1.90045E+20 | 0     | 0     | 0     | 2.2649E-100 | 0       | 0    | 0    | 1.09296E+24 |
| ESTUARY       | 0     | 0     | 3.35329E+21 | 0     | 0     | 0     | 5.0733E-99  | 0       | 0    | 0    | 1.91411E+25 |
| COLBY         | 0     | 0     | 7.21008E+21 | 0     | 0     | 0     | 1.20371E-98 | 0       | 0    | 0    | 4.10294E+25 |
| POOL          | 0     | 0     | 3.37182E+21 | 0     | 0     | 0     | 5.985E-99   | 0       | 0    | 0    | 1.91508E+25 |
| STRAIT        | 0     | 0     | 3.37187E+21 | 0     | 0     | 0     | 5.9875E-99  | 0       | 0    | 0    | 1.91508E+25 |
| MIGHTY EPIC   | 0     | 0     | 2.00277E+20 | 0     | 0     | 0     | 1.091E-99   | 0       | 0    | 0    | 1.09821E+24 |
| RIVOLI        | 0     | 0     | 2.01369E+20 | 0     | 0     | 0     | 1.2842E-99  | 0       | 0    | 0    | 1.09875E+24 |
| BILLET        | 0     | 0     | 8.9689E+20  | 0     | 0     | 0     | 2.22517E-98 | 0       | 0    | 0    | 4.68975E+24 |
| BANON         | 0     | 0     | 9.15439E+20 | 0     | 0     | 0     | 4.11055E-98 | 0       | 0    | 0    | 4.69854E+24 |
| GOUDA         | 0     | 0     | 2.21561E+20 | 0     | 0     | 0     | 2.2534E-98  | 0       | 0    | 0    | 1.10839E+24 |
| SPRIT         | 0     | 0     | 2.26964E+20 | 0     | 0     | 0     | 4.64073E-98 | 0       | 0    | 0    | 1.11084E+24 |
| CHEVRE        | 0     | 0     | 2.29005E+20 | 0     | 0     | 0     | 6.06962E-98 | 0       | 0    | 0    | 1.11175E+24 |
| REDMUD        | 0     | 0     | 2.31379E+20 | 0     | 0     | 0     | 8.26783E-98 | 0       | 0    | 0    | 1.1128E+24  |
| ASIAGO        | 0     | 0     | 2.3346E+20  | 0     | 0     | 0     | 1.08139E-97 | 0       | 0    | 0    | 1.11371E+24 |
| SUTTER        | 0     | 0     | 2.33465E+20 | 0     | 0     | 0     | 1.08215E-97 | 0       | 0    | 0    | 1.11371E+24 |
| RUDDER        | 0     | 0     | 9.97076E+20 | 0     | 0     | 0     | 5.32292E-97 | 0       | 0    | 0    | 4.73537E+24 |
| OARLOCK       | 0     | 0     | 2.42817E+20 | 0     | 0     | 0     | 3.51301E-97 | 0       | 0    | 0    | 1.11771E+24 |
| COVE          | 0     | 0     | 2.42817E+20 | 0     | 0     | 0     | 3.51301E-97 | 0       | 0    | 0    | 1.11771E+24 |
| DOFINO        | 0     | 0     | 2.46157E+20 | 0     | 0     | 0     | 5.29131E-97 | 0       | 0    | 0    | 1.11911E+24 |
| DOFINO LAWTON | 0     | 0     | 2.46157E+20 | 0     | 0     | 0     | 5.29131E-97 | 0       | 0    | 0    | 1.11911E+24 |
| MARSILLY      | 0     | 0     | 1.06654E+21 | 0     | 0     | 0     | 4.00898E-96 | 0       | 0    | 0    | 4.76462E+24 |



| Nuclide            | 111Ag | 112Pd | 125Sb       | 126Sb       | 127Sb | 128Sb | 129Te-m     | 131Te-m | 133I | 135I | 137Cs       |
|--------------------|-------|-------|-------------|-------------|-------|-------|-------------|---------|------|------|-------------|
| BULKHEAD           | 0     | 0     | 1.08281E+21 | 0           | 0     | 0     | 6.31157E-96 | 0       | 0    | 0    | 4.77121E+24 |
| CREWLINE           | 0     | 0     | 1.10393E+21 | 0           | 0     | 0     | 1.12653E-95 | 0       | 0    | 0    | 4.77965E+24 |
| FOREFOOT           | 0     | 0     | 2.61185E+20 | 0           | 0     | 0     | 3.12695E-96 | 0       | 0    | 0    | 1.12519E+24 |
| CARNELIAN          | 0     | 0     | 2.71421E+20 | 1.2902E-299 | 0     | 0     | 9.90074E-96 | 0       | 0    | 0    | 1.12915E+24 |
| STRAKE             | 0     | 0     | 1.15919E+21 | 5.4835E-299 | 0     | 0     | 4.87218E-95 | 0       | 0    | 0    | 4.80104E+24 |
| GRUYERE GRADINO    | 0     | 0     | 2.74997E+20 | 1.2902E-299 | 0     | 0     | 1.4659E-95  | 0       | 0    | 0    | 1.1305E+24  |
| GRUYERE            | 0     | 0     | 2.74997E+20 | 1.2902E-299 | 0     | 0     | 1.4659E-95  | 0       | 0    | 0    | 1.1305E+24  |
| FLOTOST            | 0     | 0     | 2.75006E+20 | 2.5805E-299 | 0     | 0     | 1.46733E-95 | 0       | 0    | 0    | 1.13051E+24 |
| SCUPPER            | 0     | 0     | 2.75588E+20 | 2.5805E-299 | 0     | 0     | 1.56331E-95 | 0       | 0    | 0    | 1.13073E+24 |
| SCANTLING          | 0     | 0     | 1.17126E+21 | 1.0967E-298 | 0     | 0     | 6.64627E-95 | 0       | 0    | 0    | 4.80559E+24 |
| EBBTIDE            | 0     | 0     | 2.80732E+20 | 1.0322E-298 | 0     | 0     | 2.72178E-95 | 0       | 0    | 0    | 1.13264E+24 |
| COULOMMIERS        | 0     | 0     | 1.20298E+21 | 8.7735E-298 | 0     | 0     | 1.4809E-94  | 0       | 0    | 0    | 4.81734E+24 |
| BOBSTAY            | 0     | 0     | 2.88762E+20 | 1.0193E-297 | 0     | 0     | 6.33939E-95 | 0       | 0    | 0    | 1.13556E+24 |
| HYBLA GOLD         | 0     | 0     | 2.89988E+20 | 1.4451E-297 | 0     | 0     | 7.19847E-95 | 0       | 0    | 0    | 1.136E+24   |
| SANDREEF           | 0     | 0     | 1.23939E+21 | 9.6509E-297 | 0     | 0     | 3.62042E-94 | 0       | 0    | 0    | 4.83049E+24 |
| SEAMOUNT           | 0     | 0     | 2.9321E+20  | 3.5352E-297 | 0     | 0     | 1.00256E-94 | 0       | 0    | 0    | 1.13715E+24 |
| RIB                | 0     | 0     | 2.9867E+20  | 1.5818E-296 | 0     | 0     | 1.74313E-94 | 0       | 0    | 0    | 1.13907E+24 |
| FARALLONES         | 0     | 0     | 1.26937E+21 | 6.7337E-296 | 0     | 0     | 7.41148E-94 | 0       | 0    | 0    | 4.84105E+24 |
| CAMPOS             | 0     | 0     | 3.11534E+20 | 4.8652E-295 | 0     | 0     | 6.1718E-94  | 0       | 0    | 0    | 1.14347E+24 |
| REBLOCHON          | 0     | 0     | 1.33298E+21 | 3.5753E-294 | 0     | 0     | 3.21048E-93 | 0       | 0    | 0    | 4.86274E+24 |
| KARAB              | 0     | 0     | 3.18188E+20 | 2.7084E-294 | 0     | 0     | 1.163E-93   | 0       | 0    | 0    | 1.14568E+24 |
| TOPMAST            | 0     | 0     | 3.19738E+20 | 4.0194E-294 | 0     | 0     | 1.3454E-93  | 0       | 0    | 0    | 1.14619E+24 |
| ICEBERG            | 0     | 0     | 1.35889E+21 | 1.7082E-293 | 0     | 0     | 5.71797E-93 | 0       | 0    | 0    | 4.87131E+24 |
| FONDUTTA           | 0     | 0     | 1.37673E+21 | 4.9294E-293 | 0     | 0     | 8.45462E-93 | 0       | 0    | 0    | 4.87712E+24 |
| BACKBEACH          | 0     | 0     | 1.37682E+21 | 4.9553E-293 | 0     | 0     | 8.47098E-93 | 0       | 0    | 0    | 4.87715E+24 |
| ASCO               | 0     | 0     | 3.27063E+20 | 2.5313E-293 | 0     | 0     | 2.65333E-93 | 0       | 0    | 0    | 1.14857E+24 |
| JACKPOTS           | 0     | 0     | 3.3552E+20  | 2.0139E-292 | 0     | 0     | 5.70408E-93 | 0       | 0    | 0    | 1.15125E+24 |
| SATZ               | 0     | 0     | 3.43906E+20 | 1.4961E-291 | 0     | 0     | 1.19563E-92 | 0       | 0    | 0    | 1.15385E+24 |
| LOWBALL            | 0     | 0     | 1.46676E+21 | 8.4676E-291 | 0     | 0     | 5.6481E-92  | 0       | 0    | 0    | 4.90544E+24 |
| PANIR              | 0     | 0     | 1.51797E+21 | 1.3758E-289 | 0     | 0     | 1.58032E-91 | 0       | 0    | 0    | 4.92086E+24 |
| DIABLO HAWK        | 0     | 0     | 3.60392E+20 | 6.7147E-290 | 0     | 0     | 4.86734E-92 | 0       | 0    | 0    | 1.1588E+24  |
| CREMINO CAERPHILLY | 0     | 0     | 3.63894E+20 | 1.4729E-289 | 0     | 0     | 6.5041E-92  | 0       | 0    | 0    | 1.15982E+24 |
| CREMINO            | 0     | 0     | 3.63894E+20 | 1.4729E-289 | 0     | 0     | 6.5041E-92  | 0       | 0    | 0    | 1.15982E+24 |
| DRAUGHTS           | 0     | 0     | 1.54657E+21 | 6.267E-289  | 0     | 0     | 2.76543E-91 | 0       | 0    | 0    | 4.92926E+24 |
| RUMMY              | 0     | 0     | 1.54659E+21 | 6.2718E-289 | 0     | 0     | 2.76622E-91 | 0       | 0    | 0    | 4.92926E+24 |
| EMMENTHAL          | 0     | 0     | 3.73009E+20 | 1.0991E-288 | 0     | 0     | 1.36557E-91 | 0       | 0    | 0    | 1.16245E+24 |
| QUARGEL            | 0     | 0     | 1.603E+21   | 1.152E-287  | 0     | 0     | 8.09822E-91 | 0       | 0    | 0    | 4.94543E+24 |
| CONCENTRATION      | 0     | 0     | 3.80545E+20 | 5.5818E-288 | 0     | 0     | 2.48754E-91 | 0       | 0    | 0    | 1.16458E+24 |

| Nuclide     | 111Ag | 112Pd | 125Sb       | 126Sb       | 127Sb | 128Sb | 129Te-m     | 131Te-m | 133I | 135I | 137Cs       |
|-------------|-------|-------|-------------|-------------|-------|-------|-------------|---------|------|------|-------------|
| FARM        | 0     | 0     | 1.63402E+21 | 5.466E-287  | 0     | 0     | 1.4386E-90  | 0       | 0    | 0    | 4.95411E+24 |
| BACCARAT    | 0     | 0     | 3.94961E+20 | 1.1445E-286 | 0     | 0     | 7.58395E-91 | 0       | 0    | 0    | 1.16854E+24 |
| QUINELLA    | 0     | 0     | 1.6961E+21  | 1.1302E-285 | 0     | 0     | 4.39966E-90 | 0       | 0    | 0    | 4.97102E+24 |
| KLOSTER     | 0     | 0     | 1.70419E+21 | 1.664E-285  | 0     | 0     | 5.07479E-90 | 0       | 0    | 0    | 4.97319E+24 |
| MEMORY      | 0     | 0     | 4.0851E+20  | 1.7728E-285 | 0     | 0     | 2.08489E-90 | 0       | 0    | 0    | 1.17215E+24 |
| FREEZEOUT   | 0     | 0     | 4.25113E+20 | 4.5099E-284 | 0     | 0     | 6.88313E-90 | 0       | 0    | 0    | 1.17643E+24 |
| PEPATO      | 0     | 0     | 1.84558E+21 | 1.0792E-282 | 0     | 0     | 5.53559E-89 | 0       | 0    | 0    | 5.00955E+24 |
| CHESS       | 0     | 0     | 4.36963E+20 | 4.2095E-283 | 0     | 0     | 1.56958E-89 | 0       | 0    | 0    | 1.17939E+24 |
| FAJY        | 0     | 0     | 1.86733E+21 | 2.7961E-282 | 0     | 0     | 7.86584E-89 | 0       | 0    | 0    | 5.01492E+24 |
| BURZET      | 0     | 0     | 1.91418E+21 | 2.0937E-281 | 0     | 0     | 1.65357E-88 | 0       | 0    | 0    | 5.0263E+24  |
| OFFSHORE    | 0     | 0     | 1.92077E+21 | 2.768E-281  | 0     | 0     | 1.83304E-88 | 0       | 0    | 0    | 5.02788E+24 |
| NESSSEL     | 0     | 0     | 1.94874E+21 | 8.9559E-281 | 0     | 0     | 2.82726E-88 | 0       | 0    | 0    | 5.03452E+24 |
| HEARTS      | 0     | 0     | 3.22739E+21 | 2.3062E-280 | 0     | 0     | 5.49161E-88 | 0       | 0    | 0    | 8.29633E+24 |
| PERA        | 0     | 0     | 4.61718E+20 | 3.7018E-281 | 0     | 0     | 8.1899E-89  | 0       | 0    | 0    | 1.18534E+24 |
| SHEEPSHEAD  | 0     | 0     | 1.98664E+21 | 4.2827E-280 | 0     | 0     | 5.03703E-88 | 0       | 0    | 0    | 5.0434E+24  |
| BACKGAMMON  | 0     | 0     | 4.8849E+20  | 3.6061E-279 | 0     | 0     | 4.43789E-88 | 0       | 0    | 0    | 1.19147E+24 |
| AZUL        | 0     | 0     | 4.936E+20   | 8.3988E-279 | 0     | 0     | 6.06296E-88 | 0       | 0    | 0    | 1.1926E+24  |
| TARKO       | 0     | 0     | 5.20055E+20 | 5.8372E-277 | 0     | 0     | 2.90045E-87 | 0       | 0    | 0    | 1.19831E+24 |
| NORBO       | 0     | 0     | 5.23294E+20 | 9.6669E-277 | 0     | 0     | 3.49395E-87 | 0       | 0    | 0    | 1.19899E+24 |
| LIPTAUER    | 0     | 0     | 2.26404E+21 | 1.7509E-275 | 0     | 0     | 2.53545E-86 | 0       | 0    | 0    | 5.10402E+24 |
| PYRAMID     | 0     | 0     | 2.28478E+21 | 3.6722E-275 | 0     | 0     | 3.33245E-86 | 0       | 0    | 0    | 5.10827E+24 |
| COLWICK     | 0     | 0     | 2.30036E+21 | 6.3777E-275 | 0     | 0     | 4.08542E-86 | 0       | 0    | 0    | 5.11145E+24 |
| CANFIELD    | 0     | 0     | 5.43527E+20 | 2.1073E-275 | 0     | 0     | 1.0896E-86  | 0       | 0    | 0    | 1.20315E+24 |
| FLORA       | 0     | 0     | 5.50967E+20 | 6.3595E-275 | 0     | 0     | 1.63793E-86 | 0       | 0    | 0    | 1.20465E+24 |
| KASH        | 0     | 0     | 2.37598E+21 | 8.8291E-274 | 0     | 0     | 1.07749E-85 | 0       | 0    | 0    | 5.12659E+24 |
| HURON KING  | 0     | 0     | 5.63656E+20 | 4.0433E-274 | 0     | 0     | 3.24159E-86 | 0       | 0    | 0    | 1.20716E+24 |
| TAFI        | 0     | 0     | 2.44746E+21 | 9.8099E-273 | 0     | 0     | 2.62026E-85 | 0       | 0    | 0    | 5.1405E+24  |
| VERDELLO    | 0     | 0     | 5.78243E+20 | 3.2223E-273 | 0     | 0     | 6.97308E-86 | 0       | 0    | 0    | 1.20998E+24 |
| BONARDA     | 0     | 0     | 2.55381E+21 | 3.1077E-271 | 0     | 0     | 9.37992E-85 | 0       | 0    | 0    | 5.16052E+24 |
| RIOLA       | 0     | 0     | 3.21487E+19 | 3.9183E-273 | 0     | 0     | 1.18147E-86 | 0       | 0    | 0    | 6.4962E+22  |
| DUTCHESS    | 0     | 0     | 6.13088E+20 | 3.7378E-271 | 0     | 0     | 4.03002E-85 | 0       | 0    | 0    | 1.21647E+24 |
| MINERS IRON | 0     | 0     | 6.16026E+20 | 5.5117E-271 | 0     | 0     | 4.6511E-85  | 0       | 0    | 0    | 1.217E+24   |
| DAUPHIN     | 0     | 0     | 6.21968E+20 | 1.2022E-270 | 0     | 0     | 6.20225E-85 | 0       | 0    | 0    | 1.21807E+24 |
| SERPA       | 0     | 0     | 2.70394E+21 | 3.2197E-269 | 0     | 0     | 5.1996E-84  | 0       | 0    | 0    | 5.18754E+24 |
| BASEBALL    | 0     | 0     | 2.75886E+21 | 1.6487E-268 | 0     | 0     | 9.50053E-84 | 0       | 0    | 0    | 5.19708E+24 |
| CLAIRETTE   | 0     | 0     | 6.58545E+20 | 1.2477E-268 | 0     | 0     | 3.44033E-84 | 0       | 0    | 0    | 1.22445E+24 |
| SECO        | 0     | 0     | 6.67613E+20 | 3.7898E-268 | 0     | 0     | 5.184E-84   | 0       | 0    | 0    | 1.22598E+24 |
| VIDE        | 0     | 0     | 6.97661E+20 | 1.3549E-266 | 0     | 0     | 1.94044E-83 | 0       | 0    | 0    | 1.23093E+24 |

| Nuclide       | 111Ag | 112Pd | 125Sb       | 126Sb       | 127Sb | 128Sb | 129Te-m     | 131Te-m | 133I | 135I | 137Cs       |
|---------------|-------|-------|-------------|-------------|-------|-------|-------------|---------|------|------|-------------|
| ALIGOTE       | 0     | 0     | 7.11751E+20 | 6.8763E-266 | 0     | 0     | 3.53383E-83 | 0       | 0    | 0    | 1.23318E+24 |
| HARZER        | 0     | 0     | 3.04181E+21 | 4.5918E-265 | 0     | 0     | 1.77442E-82 | 0       | 0    | 0    | 5.24368E+24 |
| NIZA          | 0     | 0     | 7.32579E+20 | 7.1606E-265 | 0     | 0     | 8.39049E-83 | 0       | 0    | 0    | 1.23644E+24 |
| PINEAU        | 0     | 0     | 7.3563E+20  | 1.0037E-264 | 0     | 0     | 9.5042E-83  | 0       | 0    | 0    | 1.23691E+24 |
| HAVARTI       | 0     | 0     | 7.45796E+20 | 3.0607E-264 | 0     | 0     | 1.4342E-82  | 0       | 0    | 0    | 1.23846E+24 |
| ISLAY         | 0     | 0     | 7.5719E+20  | 1.0489E-263 | 0     | 0     | 2.25955E-82 | 0       | 0    | 0    | 1.24018E+24 |
| TREBBIANO     | 0     | 0     | 7.6138E+20  | 1.6423E-263 | 0     | 0     | 2.6661E-82  | 0       | 0    | 0    | 1.2408E+24  |
| CERNADA       | 0     | 0     | 7.7193E+20  | 5.0232E-263 | 0     | 0     | 4.02774E-82 | 0       | 0    | 0    | 1.24236E+24 |
| PALIZA        | 0     | 0     | 3.29692E+21 | 3.1868E-262 | 0     | 0     | 1.98453E-81 | 0       | 0    | 0    | 5.28243E+24 |
| TILCI         | 0     | 0     | 3.39135E+21 | 3.1602E-261 | 0     | 0     | 4.62765E-81 | 0       | 0    | 0    | 5.29608E+24 |
| ROUSANNE      | 0     | 0     | 3.3932E+21  | 3.3031E-261 | 0     | 0     | 4.70384E-81 | 0       | 0    | 0    | 5.29634E+24 |
| AKAVI         | 0     | 0     | 3.44259E+21 | 1.0684E-260 | 0     | 0     | 7.25431E-81 | 0       | 0    | 0    | 5.30335E+24 |
| CABOC         | 0     | 0     | 8.17441E+20 | 5.2735E-261 | 0     | 0     | 2.24361E-81 | 0       | 0    | 0    | 1.24889E+24 |
| JORNADA       | 0     | 0     | 5.85097E+21 | 4.0071E-259 | 0     | 0     | 3.76949E-80 | 0       | 0    | 0    | 8.70315E+24 |
| MOLBO         | 0     | 0     | 3.61494E+21 | 5.6531E-259 | 0     | 0     | 3.13813E-80 | 0       | 0    | 0    | 5.32708E+24 |
| HOSTA         | 0     | 0     | 3.61499E+21 | 5.6597E-259 | 0     | 0     | 3.13947E-80 | 0       | 0    | 0    | 5.32709E+24 |
| TENAJA        | 0     | 0     | 8.88946E+20 | 4.7943E-258 | 0     | 0     | 2.77219E-80 | 0       | 0    | 0    | 1.2585E+24  |
| GIBNE         | 0     | 0     | 3.79888E+21 | 3.1872E-257 | 0     | 0     | 1.38969E-79 | 0       | 0    | 0    | 5.35131E+24 |
| KRYDDOST      | 0     | 0     | 9.00696E+20 | 1.3932E-257 | 0     | 0     | 4.10955E-80 | 0       | 0    | 0    | 1.26001E+24 |
| BOUSCHET      | 0     | 0     | 3.8304E+21  | 6.2364E-257 | 0     | 0     | 1.78034E-79 | 0       | 0    | 0    | 5.35535E+24 |
| KESTI         | 0     | 0     | 9.26308E+20 | 1.3592E-256 | 0     | 0     | 9.5254E-80  | 0       | 0    | 0    | 1.26324E+24 |
| NEBBIOLO      | 0     | 0     | 3.95857E+21 | 9.0392E-256 | 0     | 0     | 4.77572E-79 | 0       | 0    | 0    | 5.37149E+24 |
| MONTEREY      | 0     | 0     | 4.05574E+21 | 6.482E-255  | 0     | 0     | 9.88075E-79 | 0       | 0    | 0    | 5.38341E+24 |
| ATRISCO       | 0     | 0     | 6.61525E+21 | 1.5345E-254 | 0     | 0     | 1.84371E-78 | 0       | 0    | 0    | 8.74383E+24 |
| QUESO         | 0     | 0     | 9.62726E+20 | 3.1173E-255 | 0     | 0     | 3.02673E-79 | 0       | 0    | 0    | 1.2677E+24  |
| CERRO         | 0     | 0     | 9.77382E+20 | 1.0638E-254 | 0     | 0     | 4.76105E-79 | 0       | 0    | 0    | 1.26946E+24 |
| HURON LANDING | 0     | 0     | 9.91664E+20 | 3.4569E-254 | 0     | 0     | 7.35518E-79 | 0       | 0    | 0    | 1.27114E+24 |
| DIAMOND ACE   | 0     | 0     | 9.91664E+20 | 3.4569E-254 | 0     | 0     | 7.35518E-79 | 0       | 0    | 0    | 1.27114E+24 |
| FRISCO        | 0     | 0     | 4.21469E+21 | 1.4726E-253 | 0     | 0     | 3.12864E-78 | 0       | 0    | 0    | 5.40236E+24 |
| BORREGO       | 0     | 0     | 7.46772E+21 | 3.6047E-253 | 0     | 0     | 6.22984E-78 | 0       | 0    | 0    | 9.53709E+24 |
| SEYVAL        | 0     | 0     | 1.02647E+21 | 5.6995E-253 | 0     | 0     | 2.06909E-78 | 0       | 0    | 0    | 1.27516E+24 |
| MANTECA       | 0     | 0     | 4.44687E+21 | 1.1481E-251 | 0     | 0     | 1.56154E-77 | 0       | 0    | 0    | 5.42891E+24 |
| COALORA       | 0     | 0     | 1.0927E+21  | 9.1555E-251 | 0     | 0     | 1.34848E-77 | 0       | 0    | 0    | 1.28246E+24 |
| CHEEDAM       | 0     | 0     | 1.09725E+21 | 1.2834E-250 | 0     | 0     | 1.52747E-77 | 0       | 0    | 0    | 1.28295E+24 |
| CABRA         | 0     | 0     | 4.78401E+21 | 4.3486E-249 | 0     | 0     | 1.39668E-76 | 0       | 0    | 0    | 5.4653E+24  |
| TURQUOISE     | 0     | 0     | 8.55317E+21 | 2.2132E-248 | 0     | 0     | 3.64358E-76 | 0       | 0    | 0    | 9.65615E+24 |
| ARMADA        | 0     | 0     | 1.14655E+21 | 4.5594E-249 | 0     | 0     | 5.70427E-77 | 0       | 0    | 0    | 1.28812E+24 |
| CROWDIE       | 0     | 0     | 1.1569E+21  | 9.4617E-249 | 0     | 0     | 7.46811E-77 | 0       | 0    | 0    | 1.28918E+24 |

| Nuclide               | 111Ag | 112Pd | 125Sb       | 126Sb       | 127Sb | 128Sb | 129Te-m     | 131Te-m | 133I | 135I | 137Cs       |
|-----------------------|-------|-------|-------------|-------------|-------|-------|-------------|---------|------|------|-------------|
| MINI JADE             | 0     | 0     | 1.17371E+21 | 3.0545E-248 | 0     | 0     | 1.15092E-76 | 0       | 0    | 0    | 1.29088E+24 |
| FAHADA                | 0     | 0     | 1.17372E+21 | 3.058E-248  | 0     | 0     | 1.15141E-76 | 0       | 0    | 0    | 1.29088E+24 |
| DANABLU               | 0     | 0     | 1.18516E+21 | 6.7221E-248 | 0     | 0     | 1.53981E-76 | 0       | 0    | 0    | 1.29202E+24 |
| LABAN                 | 0     | 0     | 1.23074E+21 | 1.4423E-246 | 0     | 0     | 4.77392E-76 | 0       | 0    | 0    | 1.29649E+24 |
| SABADO                | 0     | 0     | 1.23755E+21 | 2.258E-246  | 0     | 0     | 5.63271E-76 | 0       | 0    | 0    | 1.29714E+24 |
| JARLSBERG             | 0     | 0     | 1.25125E+21 | 5.5227E-246 | 0     | 0     | 7.83547E-76 | 0       | 0    | 0    | 1.29845E+24 |
| CHANCELLOR            | 0     | 0     | 1.25556E+21 | 7.3036E-246 | 0     | 0     | 8.68683E-76 | 0       | 0    | 0    | 1.29886E+24 |
| TOMME/MIDNIGHT ZEPHYR | 0     | 0     | 1.273E+21   | 2.2391E-245 | 0     | 0     | 1.31347E-75 | 0       | 0    | 0    | 1.3005E+24  |
| BRANCO                | 0     | 0     | 1.27305E+21 | 2.2465E-245 | 0     | 0     | 1.31507E-75 | 0       | 0    | 0    | 1.3005E+24  |
| BRANCO HERKIMER       | 0     | 0     | 1.27305E+21 | 2.2465E-245 | 0     | 0     | 1.31507E-75 | 0       | 0    | 0    | 1.3005E+24  |
| TECHADO               | 0     | 0     | 9.55406E+21 | 1.7759E-244 | 0     | 0     | 1.00563E-74 | 0       | 0    | 0    | 9.75433E+24 |
| NAVATA                | 0     | 0     | 1.28003E+21 | 3.5018E-245 | 0     | 0     | 1.54915E-75 | 0       | 0    | 0    | 1.30115E+24 |
| MUGGINS               | 0     | 0     | 1.34415E+21 | 1.8576E-243 | 0     | 0     | 6.70766E-75 | 0       | 0    | 0    | 1.30698E+24 |
| ROMANO                | 0     | 0     | 5.74063E+21 | 1.1744E-242 | 0     | 0     | 3.30071E-74 | 0       | 0    | 0    | 5.55714E+24 |
| GORBEA                | 0     | 0     | 5.92473E+21 | 1.5258E-241 | 0     | 0     | 8.50379E-74 | 0       | 0    | 0    | 5.57319E+24 |
| MIDAS MYTH/MILAGRO    | 0     | 0     | 1.40858E+21 | 8.3323E-242 | 0     | 0     | 2.73006E-74 | 0       | 0    | 0    | 1.31258E+24 |
| TORTUGAS              | 0     | 0     | 6.04869E+21 | 8.2047E-241 | 0     | 0     | 1.58208E-73 | 0       | 0    | 0    | 5.58375E+24 |
| AGRINI                | 0     | 0     | 1.45277E+21 | 1.0249E-240 | 0     | 0     | 6.89293E-74 | 0       | 0    | 0    | 1.31629E+24 |
| MUNDO                 | 0     | 0     | 6.30822E+21 | 2.4905E-239 | 0     | 0     | 5.57493E-73 | 0       | 0    | 0    | 5.60524E+24 |
| ORKNEY                | 0     | 0     | 1.48509E+21 | 6.1216E-240 | 0     | 0     | 1.33306E-73 | 0       | 0    | 0    | 1.31894E+24 |
| BELLOW                | 0     | 0     | 1.49955E+21 | 1.3456E-239 | 0     | 0     | 1.78274E-73 | 0       | 0    | 0    | 1.32011E+24 |
| CAPROCK               | 0     | 0     | 6.43868E+21 | 1.3137E-238 | 0     | 0     | 1.02984E-72 | 0       | 0    | 0    | 5.61574E+24 |
| DUORO                 | 0     | 0     | 6.52831E+21 | 4.0387E-238 | 0     | 0     | 1.55873E-72 | 0       | 0    | 0    | 5.62284E+24 |
| NORMANNA              | 0     | 0     | 1.55945E+21 | 3.2409E-238 | 0     | 0     | 5.76789E-73 | 0       | 0    | 0    | 1.32485E+24 |
| KAPPELI               | 0     | 0     | 6.68749E+21 | 2.8587E-237 | 0     | 0     | 3.20949E-72 | 0       | 0    | 0    | 5.63524E+24 |
| CORREO                | 0     | 0     | 1.58219E+21 | 1.0507E-237 | 0     | 0     | 8.90296E-73 | 0       | 0    | 0    | 1.3266E+24  |
| WEXFORD               | 0     | 0     | 1.61296E+21 | 5.0232E-237 | 0     | 0     | 1.58599E-72 | 0       | 0    | 0    | 1.32894E+24 |
| DOLCETTO              | 0     | 0     | 1.61296E+21 | 5.0232E-237 | 0     | 0     | 1.58599E-72 | 0       | 0    | 0    | 1.32894E+24 |
| BRETON                | 0     | 0     | 6.92127E+21 | 4.6611E-236 | 0     | 0     | 8.99161E-72 | 0       | 0    | 0    | 5.65296E+24 |
| VERMEJO               | 0     | 0     | 1.65016E+21 | 3.2036E-236 | 0     | 0     | 3.14235E-72 | 0       | 0    | 0    | 1.33171E+24 |
| V ILLITA              | 0     | 0     | 1.69497E+21 | 2.8238E-235 | 0     | 0     | 7.01583E-72 | 0       | 0    | 0    | 1.33498E+24 |
| EGMONT                | 0     | 0     | 7.34945E+21 | 6.1134E-234 | 0     | 0     | 5.43758E-71 | 0       | 0    | 0    | 5.68407E+24 |
| TIERRA                | 0     | 0     | 7.37881E+21 | 8.4522E-234 | 0     | 0     | 6.1281E-71  | 0       | 0    | 0    | 5.68614E+24 |
| MINERO                | 0     | 0     | 1.74225E+21 | 2.6398E-234 | 0     | 0     | 1.60075E-71 | 0       | 0    | 0    | 1.33834E+24 |
| VAUGHN                | 0     | 0     | 7.8506E+21  | 1.2991E-231 | 0     | 0     | 3.9293E-70  | 0       | 0    | 0    | 5.71845E+24 |
| COTTAGE               | 0     | 0     | 7.89439E+21 | 2.0411E-231 | 0     | 0     | 4.64226E-70 | 0       | 0    | 0    | 5.72136E+24 |
| HERMOSA               | 0     | 0     | 7.94924E+21 | 3.5822E-231 | 0     | 0     | 5.71323E-70 | 0       | 0    | 0    | 5.72498E+24 |
| MISTY RAIN            | 0     | 0     | 1.87574E+21 | 1.0621E-231 | 0     | 0     | 1.46401E-70 | 0       | 0    | 0    | 1.3474E+24  |

| Nuclide                       | 111Ag | 112Pd | 125Sb       | 126Sb       | 127Sb | 128Sb | 129Te-m     | 131Te-m | 133I | 135I | 137Cs       |
|-------------------------------|-------|-------|-------------|-------------|-------|-------|-------------|---------|------|------|-------------|
| TOWANDA                       | 0     | 0     | 8.11395E+21 | 1.8955E-230 | 0     | 0     | 1.05661E-69 | 0       | 0    | 0    | 5.73572E+24 |
| SALUT                         | 0     | 0     | 8.34609E+21 | 1.8749E-229 | 0     | 0     | 2.46158E-69 | 0       | 0    | 0    | 5.75053E+24 |
| VILLE                         | 0     | 0     | 1.96391E+21 | 4.4348E-230 | 0     | 0     | 5.80316E-70 | 0       | 0    | 0    | 1.35307E+24 |
| MARIBO                        | 0     | 0     | 1.98295E+21 | 9.7119E-230 | 0     | 0     | 7.74995E-70 | 0       | 0    | 0    | 1.35427E+24 |
| SERENA                        | 0     | 0     | 8.59642E+21 | 2.0683E-228 | 0     | 0     | 5.97027E-69 | 0       | 0    | 0    | 5.76609E+24 |
| CEBRERO                       | 0     | 0     | 2.05066E+21 | 1.4851E-228 | 0     | 0     | 2.12039E-69 | 0       | 0    | 0    | 1.35843E+24 |
| CHAMITA                       | 0     | 0     | 2.05509E+21 | 1.7703E-228 | 0     | 0     | 2.2624E-69  | 0       | 0    | 0    | 1.3587E+24  |
| PONIL                         | 0     | 0     | 2.11377E+21 | 1.7426E-227 | 0     | 0     | 5.26125E-69 | 0       | 0    | 0    | 1.3622E+24  |
| MILL YARD                     | 0     | 0     | 2.13174E+21 | 3.4674E-227 | 0     | 0     | 6.78216E-69 | 0       | 0    | 0    | 1.36326E+24 |
| DIAMOND BEECH                 | 0     | 0     | 2.13185E+21 | 3.4809E-227 | 0     | 0     | 6.79188E-69 | 0       | 0    | 0    | 1.36326E+24 |
| ROQUEFORT                     | 0     | 0     | 9.10363E+21 | 2.179E-226  | 0     | 0     | 3.32997E-68 | 0       | 0    | 0    | 5.79639E+24 |
| ABO                           | 0     | 0     | 2.16242E+21 | 1.1068E-226 | 0     | 0     | 1.04087E-68 | 0       | 0    | 0    | 1.36504E+24 |
| KINIBITO                      | 0     | 0     | 9.42051E+21 | 3.5109E-225 | 0     | 0     | 9.28847E-68 | 0       | 0    | 0    | 5.81454E+24 |
| GOLDSTONE                     | 0     | 0     | 9.57188E+21 | 1.2819E-224 | 0     | 0     | 1.49798E-67 | 0       | 0    | 0    | 5.82302E+24 |
| GLENCOE                       | 0     | 0     | 3.45974E+21 | 4.7562E-223 | 0     | 0     | 2.88421E-67 | 0       | 0    | 0    | 1.99719E+24 |
| MIGHTY OAK                    | 0     | 0     | 2.41728E+21 | 9.4409E-223 | 0     | 0     | 2.93831E-67 | 0       | 0    | 0    | 1.37901E+24 |
| MOGOLLON                      | 0     | 0     | 2.43405E+21 | 1.6552E-222 | 0     | 0     | 3.61483E-67 | 0       | 0    | 0    | 1.37988E+24 |
| JEFFERSON                     | 0     | 0     | 1.03587E+22 | 7.8539E-222 | 0     | 0     | 1.60004E-66 | 0       | 0    | 0    | 5.86523E+24 |
| PANAMINT                      | 0     | 0     | 0           | 0           | 0     | 0     | 0           | 0       | 0    | 0    | 0           |
| TAJO                          | 0     | 0     | 1.06773E+22 | 9.2009E-221 | 0     | 0     | 3.96778E-66 | 0       | 0    | 0    | 5.88149E+24 |
| DARWIN                        | 0     | 0     | 1.0827E+22  | 2.8498E-220 | 0     | 0     | 6.02209E-66 | 0       | 0    | 0    | 5.88898E+24 |
| CYBAR                         | 0     | 0     | 1.53892E+22 | 1.3664E-219 | 0     | 0     | 1.32794E-65 | 0       | 0    | 0    | 8.256E+24   |
| CORNUCOPIA                    | 0     | 0     | 2.59846E+21 | 3.3497E-220 | 0     | 0     | 2.56547E-66 | 0       | 0    | 0    | 1.38815E+24 |
| GALVESTON                     | 0     | 0     | 2.67473E+21 | 3.5132E-219 | 0     | 0     | 6.10736E-66 | 0       | 0    | 0    | 1.39183E+24 |
| ALEMAN                        | 0     | 0     | 2.68756E+21 | 5.1812E-219 | 0     | 0     | 7.04887E-66 | 0       | 0    | 0    | 1.39244E+24 |
| LABQUARK                      | 0     | 0     | 1.15749E+22 | 6.4821E-218 | 0     | 0     | 4.46224E-65 | 0       | 0    | 0    | 5.92505E+24 |
| BELMONT                       | 0     | 0     | 1.1702E+22  | 1.5741E-217 | 0     | 0     | 6.19083E-65 | 0       | 0    | 0    | 5.93097E+24 |
| GASCON                        | 0     | 0     | 1.19367E+22 | 7.8992E-217 | 0     | 0     | 1.12277E-64 | 0       | 0    | 0    | 5.94175E+24 |
| BODIE                         | 0     | 0     | 1.21779E+22 | 4.0129E-216 | 0     | 0     | 2.04547E-64 | 0       | 0    | 0    | 5.95262E+24 |
| HAZEBROOK CHECKER BERRY (RED) | 0     | 0     | 2.96956E+21 | 1.7176E-215 | 0     | 0     | 1.40395E-64 | 0       | 0    | 0    | 1.4052E+24  |
| HAZEBROOK APRICOT (ORANGE)    | 0     | 0     | 2.96956E+21 | 1.7176E-215 | 0     | 0     | 1.40395E-64 | 0       | 0    | 0    | 1.4052E+24  |
| HAZEBROOK EMERALD (GREEN)     | 0     | 0     | 2.96956E+21 | 1.7176E-215 | 0     | 0     | 1.40395E-64 | 0       | 0    | 0    | 1.4052E+24  |
| TORNERO                       | 0     | 0     | 2.98608E+21 | 2.6951E-215 | 0     | 0     | 1.65788E-64 | 0       | 0    | 0    | 1.40591E+24 |
| MIDDLE NOTE                   | 0     | 0     | 3.05901E+21 | 1.9142E-214 | 0     | 0     | 3.41796E-64 | 0       | 0    | 0    | 1.40901E+24 |
| DELAMAR                       | 0     | 0     | 1.32793E+22 | 4.5509E-213 | 0     | 0     | 2.74221E-63 | 0       | 0    | 0    | 5.99992E+24 |
| PRESIDIO                      | 0     | 0     | 3.13327E+21 | 1.3433E-213 | 0     | 0     | 7.01529E-64 | 0       | 0    | 0    | 1.41211E+24 |
| HARDIN                        | 0     | 0     | 1.33893E+22 | 8.8971E-213 | 0     | 0     | 3.51195E-63 | 0       | 0    | 0    | 6.00445E+24 |
| BRIE                          | 0     | 0     | 3.25863E+21 | 3.2529E-212 | 0     | 0     | 2.27429E-63 | 0       | 0    | 0    | 1.41718E+24 |

| Nuclide       | 111Ag | 112Pd | 125Sb       | 126Sb       | 127Sb | 128Sb | 129Te-m     | 131Te-m | 133I | 135I | 137Cs       |
|---------------|-------|-------|-------------|-------------|-------|-------|-------------|---------|------|------|-------------|
| MISSION GHOST | 0     | 0     | 3.26318E+21 | 3.6433E-212 | 0     | 0     | 2.37145E-63 | 0       | 0    | 0    | 1.41736E+24 |
| PANCHUELA     | 0     | 0     | 3.28572E+21 | 6.3731E-212 | 0     | 0     | 2.91499E-63 | 0       | 0    | 0    | 1.41825E+24 |
| MIDLAND       | 0     | 0     | 1.41201E+22 | 6.6698E-211 | 0     | 0     | 1.72768E-62 | 0       | 0    | 0    | 6.03369E+24 |
| TAHOKA        | 0     | 0     | 1.43927E+22 | 3.1536E-210 | 0     | 0     | 3.06517E-62 | 0       | 0    | 0    | 6.04425E+24 |
| LOCKNEY       | 0     | 0     | 1.48151E+22 | 3.307E-209  | 0     | 0     | 7.2965E-62  | 0       | 0    | 0    | 6.06025E+24 |
| BORATE        | 0     | 0     | 1.51141E+22 | 1.6767E-208 | 0     | 0     | 1.32833E-61 | 0       | 0    | 0    | 6.07133E+24 |
| WACO          | 0     | 0     | 3.65305E+21 | 3.4944E-208 | 0     | 0     | 6.99058E-62 | 0       | 0    | 0    | 1.43206E+24 |
| MISSION CYBER | 0     | 0     | 3.65556E+21 | 3.6953E-208 | 0     | 0     | 7.13629E-62 | 0       | 0    | 0    | 1.43215E+24 |
| KERNVILLE     | 0     | 0     | 1.63597E+22 | 1.0434E-205 | 0     | 0     | 1.42701E-60 | 0       | 0    | 0    | 6.11545E+24 |
| ABILENE       | 0     | 0     | 3.98947E+21 | 4.4826E-205 | 0     | 0     | 9.80786E-61 | 0       | 0    | 0    | 1.44364E+24 |
| SCHELLBOURNE  | 0     | 0     | 3.067E+22   | 2.5053E-203 | 0     | 0     | 1.54364E-59 | 0       | 0    | 0    | 1.08518E+25 |
| LAREDO        | 0     | 0     | 3.08454E+22 | 3.9818E-203 | 0     | 0     | 1.83148E-59 | 0       | 0    | 0    | 1.08575E+25 |
| COMSTOCK      | 0     | 0     | 3.10927E+22 | 7.617E-203  | 0     | 0     | 2.32683E-59 | 0       | 0    | 0    | 1.08654E+25 |
| RHYOLITE      | 0     | 0     | 3.15244E+22 | 2.3352E-202 | 0     | 0     | 3.51822E-59 | 0       | 0    | 0    | 1.08791E+25 |
| NIGHTINGALE   | 0     | 0     | 3.15244E+22 | 2.3352E-202 | 0     | 0     | 3.51822E-59 | 0       | 0    | 0    | 1.08791E+25 |
| ALAMO         | 0     | 0     | 3.18525E+22 | 5.4148E-202 | 0     | 0     | 4.79865E-59 | 0       | 0    | 0    | 1.08894E+25 |
| KEARSARGE     | 0     | 0     | 2.73047E+22 | 4.4841E-201 | 0     | 0     | 9.33208E-59 | 0       | 0    | 0    | 9.09797E+24 |
| HARLINGEN A   | 0     | 0     | 4.38701E+21 | 1.0069E-201 | 0     | 0     | 1.69205E-59 | 0       | 0    | 0    | 1.45623E+24 |
| HARLINGEN B   | 0     | 0     | 4.38701E+21 | 1.0069E-201 | 0     | 0     | 1.69205E-59 | 0       | 0    | 0    | 1.45623E+24 |
| BULLFROG      | 0     | 0     | 3.3061E+22  | 1.1155E-200 | 0     | 0     | 1.46556E-58 | 0       | 0    | 0    | 1.09265E+25 |
| DALHART       | 0     | 0     | 3.40733E+22 | 1.293E-199  | 0     | 0     | 3.62006E-58 | 0       | 0    | 0    | 1.09567E+25 |
| MONAHANS B    | 0     | 0     | 4.62913E+21 | 7.9125E-200 | 0     | 0     | 8.47007E-59 | 0       | 0    | 0    | 1.4634E+24  |
| MONAHANS A    | 0     | 0     | 4.62913E+21 | 7.9125E-200 | 0     | 0     | 8.47007E-59 | 0       | 0    | 0    | 1.4634E+24  |
| KAWICH BLUE   | 0     | 0     | 4.72501E+21 | 4.1837E-199 | 0     | 0     | 1.56602E-58 | 0       | 0    | 0    | 1.46614E+24 |
| KAWICH WHITE  | 0     | 0     | 4.72501E+21 | 4.1837E-199 | 0     | 0     | 1.56602E-58 | 0       | 0    | 0    | 1.46614E+24 |
| MISTY ECHO    | 0     | 0     | 3.54673E+22 | 3.359E-198  | 0     | 0     | 1.20442E-57 | 0       | 0    | 0    | 1.09969E+25 |
| TEXARKANA     | 0     | 0     | 2.09738E+22 | 6.0852E-197 | 0     | 0     | 2.45148E-57 | 0       | 0    | 0    | 6.25593E+24 |
| KAWICH BLACK  | 0     | 0     | 4.98224E+21 | 3.1036E-197 | 0     | 0     | 7.67416E-58 | 0       | 0    | 0    | 1.47327E+24 |
| KAWICH RED    | 0     | 0     | 4.98224E+21 | 3.1036E-197 | 0     | 0     | 7.67416E-58 | 0       | 0    | 0    | 1.47327E+24 |
| INGOT         | 0     | 0     | 2.13635E+22 | 2.7143E-196 | 0     | 0     | 4.25678E-57 | 0       | 0    | 0    | 6.26647E+24 |
| PALISADE 3    | 0     | 0     | 5.26372E+21 | 2.697E-195  | 0     | 0     | 3.98674E-57 | 0       | 0    | 0    | 1.48069E+24 |
| PALISADE 2    | 0     | 0     | 5.26372E+21 | 2.697E-195  | 0     | 0     | 3.98674E-57 | 0       | 0    | 0    | 1.48069E+24 |
| PALISADE I    | 0     | 0     | 5.26372E+21 | 2.697E-195  | 0     | 0     | 3.98674E-57 | 0       | 0    | 0    | 1.48069E+24 |
| TULIA         | 0     | 0     | 5.30447E+21 | 5.0458E-195 | 0     | 0     | 5.02363E-57 | 0       | 0    | 0    | 1.48173E+24 |
| CONTACT       | 0     | 0     | 2.29688E+22 | 9.7713E-194 | 0     | 0     | 3.73659E-56 | 0       | 0    | 0    | 6.30811E+24 |
| AMARILLO      | 0     | 0     | 2.30441E+22 | 1.275E-193  | 0     | 0     | 4.12216E-56 | 0       | 0    | 0    | 6.31E+24    |
| DISKO ELM     | 0     | 0     | 5.72497E+21 | 2.4802E-192 | 0     | 0     | 4.94684E-56 | 0       | 0    | 0    | 1.4921E+24  |
| HORNITOS      | 0     | 0     | 2.51312E+22 | 1.4601E-190 | 0     | 0     | 5.54609E-55 | 0       | 0    | 0    | 6.36021E+24 |

| Nuclide         | 111Ag       | 112Pd | 125Sb       | 126Sb       | 127Sb | 128Sb | 129Te-m     | 131Te-m | 133I | 135I | 137Cs       |
|-----------------|-------------|-------|-------------|-------------|-------|-------|-------------|---------|------|------|-------------|
| MULESHOE        | 0           | 0     | 5.9754E+21  | 8.0357E-191 | 0     | 0     | 1.78563E-55 | 0       | 0    | 0    | 1.49795E+24 |
| BARNWELL        | 0           | 0     | 2.57966E+22 | 1.2201E-189 | 0     | 0     | 1.21409E-54 | 0       | 0    | 0    | 6.37542E+24 |
| WHITEFACE B     | 0           | 0     | 6.12134E+21 | 5.7068E-190 | 0     | 0     | 3.68117E-55 | 0       | 0    | 0    | 1.50126E+24 |
| WHITEFACE A     | 0           | 0     | 6.12134E+21 | 5.7068E-190 | 0     | 0     | 3.68117E-55 | 0       | 0    | 0    | 1.50126E+24 |
| METROPOLIS      | 0           | 0     | 2.74832E+22 | 2.0933E-187 | 0     | 0     | 8.10724E-54 | 0       | 0    | 0    | 6.41244E+24 |
| BOWIE           | 0           | 0     | 6.58809E+21 | 2.2332E-187 | 0     | 0     | 3.3324E-54  | 0       | 0    | 0    | 1.51138E+24 |
| BULLION         | 0           | 0     | 2.93397E+22 | 4.2376E-185 | 0     | 0     | 5.75439E-53 | 0       | 0    | 0    | 6.45087E+24 |
| AUSTIN          | 0           | 0     | 6.94202E+21 | 1.5675E-185 | 0     | 0     | 1.60002E-53 | 0       | 0    | 0    | 1.51863E+24 |
| RANDBURG        | 0           | 0     | 7.10568E+21 | 1.0407E-184 | 0     | 0     | 3.21755E-53 | 0       | 0    | 0    | 1.52186E+24 |
| MINERAL QUARRY  | 0           | 0     | 7.10568E+21 | 1.0407E-184 | 0     | 0     | 3.21755E-53 | 0       | 0    | 0    | 1.52186E+24 |
| SUNDOWN A       | 0           | 0     | 7.39018E+21 | 2.5256E-183 | 0     | 0     | 1.04392E-52 | 0       | 0    | 0    | 1.52733E+24 |
| SUNDOWN B       | 0           | 0     | 7.39018E+21 | 2.5256E-183 | 0     | 0     | 1.04392E-52 | 0       | 0    | 0    | 1.52733E+24 |
| LEDOUX          | 0           | 0     | 7.42624E+21 | 3.7508E-183 | 0     | 0     | 1.20796E-52 | 0       | 0    | 0    | 1.52801E+24 |
| TENABO          | 0           | 0     | 3.18885E+22 | 3.6822E-182 | 0     | 0     | 6.99239E-52 | 0       | 0    | 0    | 6.50018E+24 |
| HOUSTON         | 0           | 0     | 3.26225E+22 | 2.339E-181  | 0     | 0     | 1.38339E-51 | 0       | 0    | 0    | 6.51372E+24 |
| COSO GRAY       | 0           | 0     | 8.30265E+21 | 3.2357E-179 | 0     | 0     | 3.42426E-51 | 0       | 0    | 0    | 1.54368E+24 |
| COSO SILVER     | 0           | 0     | 8.30265E+21 | 3.2357E-179 | 0     | 0     | 3.42426E-51 | 0       | 0    | 0    | 1.54368E+24 |
| COSO BRONZE     | 0           | 0     | 8.30265E+21 | 3.2357E-179 | 0     | 0     | 3.42426E-51 | 0       | 0    | 0    | 1.54368E+24 |
| BEXAR           | 0           | 0     | 3.59459E+22 | 6.1909E-178 | 0     | 0     | 2.53566E-50 | 0       | 0    | 0    | 6.57174E+24 |
| MONTELLO        | 0           | 0     | 3.62402E+22 | 1.201E-177  | 0     | 0     | 3.23814E-50 | 0       | 0    | 0    | 6.57664E+24 |
| FLOYDADA        | 0           | 0     | 9.26759E+21 | 2.4497E-175 | 0     | 0     | 9.25038E-50 | 0       | 0    | 0    | 1.55927E+24 |
| HOYA            | 5.4835E-299 | 0     | 4.02122E+22 | 5.6084E-174 | 0     | 0     | 7.31889E-49 | 0       | 0    | 0    | 6.63947E+24 |
| DISTANT ZENITH  | 1.2902E-299 | 0     | 9.49363E+21 | 1.735E-174  | 0     | 0     | 1.90511E-49 | 0       | 0    | 0    | 1.56271E+24 |
| LUBBOCK         | 7.1285E-298 | 0     | 4.11643E+22 | 3.7536E-173 | 0     | 0     | 1.47616E-48 | 0       | 0    | 0    | 6.65369E+24 |
| BRISTOL         | 5.9092E-297 | 0     | 9.94898E+21 | 7.8023E-173 | 0     | 0     | 7.76111E-49 | 0       | 0    | 0    | 1.56942E+24 |
| JUNCTION        | 1.5454E-291 | 0     | 4.59516E+22 | 2.8574E-169 | 0     | 0     | 3.99578E-47 | 0       | 0    | 0    | 6.72094E+24 |
| DIAMOND FORTUNE | 8.8509E-291 | 0     | 1.10757E+22 | 4.7563E-169 | 0     | 0     | 1.93547E-47 | 0       | 0    | 0    | 1.58488E+24 |
| VICTORIA        | 8.4695E-289 | 0     | 1.14634E+22 | 7.7867E-168 | 0     | 0     | 5.43051E-47 | 0       | 0    | 0    | 1.58988E+24 |
| GALENA YELLOW   | 1.2117E-288 | 0     | 1.14945E+22 | 9.6981E-168 | 0     | 0     | 5.88876E-47 | 0       | 0    | 0    | 1.59027E+24 |
| GALENA GREEN    | 1.2117E-288 | 0     | 1.14945E+22 | 9.6981E-168 | 0     | 0     | 5.88876E-47 | 0       | 0    | 0    | 1.59027E+24 |
| GALENA ORANGE   | 1.2117E-288 | 0     | 1.14945E+22 | 9.6981E-168 | 0     | 0     | 5.88876E-47 | 0       | 0    | 0    | 1.59027E+24 |
| HUNTERS TROPHY  | 3.4096E-285 | 0     | 1.22043E+22 | 1.2612E-165 | 0     | 0     | 3.54996E-46 | 0       | 0    | 0    | 1.599E+24   |
| DIVIDER         | 5.3403E-285 | 0     | 1.22456E+22 | 1.6604E-165 | 0     | 0     | 3.92914E-46 | 0       | 0    | 0    | 1.5995E+24  |

Part 3

| Nuclide                 | 140Ba           | 141Ce           | 143Pr           | 144Ce           | 147Nd          | 149Pm           | 151Pm           | 153Sm           | 155Eu           | 156Eu           | 157Eu           |
|-------------------------|-----------------|-----------------|-----------------|-----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Half Life               | 12.75           | 32.5            | 13.57           | 284.6           | 10.98          | 2.212           | 1.183           | 1.929           | 4.71            | 15.2            | 15.13           |
|                         | d               | d               | d               | d               | d              | d               | d               | d               | y               | d               | h               |
| Decay Constant (1/s)    | 6.29219<br>E-07 | 2.46847<br>E-07 | 5.91197<br>E-07 | 2.81888E-<br>08 | 7.3065E-<br>07 | 3.62682<br>E-06 | 6.78152<br>E-06 | 4.15891<br>E-06 | 4.66338E<br>-09 | 5.27798<br>E-07 | 1.27258<br>E-05 |
| Test Name               |                 |                 |                 |                 |                |                 |                 |                 |                 |                 |                 |
| Trinity                 | 0               | 3.9688E-<br>208 | 0               | 0.009185<br>127 | 0              | 0               | 0               | 0               | 1.14345E<br>+20 | 0               | 0               |
| Able:Ranger             | 0               | 9.9055E-<br>191 | 0               | 0.060053<br>523 | 0              | 0               | 0               | 0               | 1.22925E<br>+19 | 0               | 0               |
| BAKER:Ranger            | 0               | 8.0952E-<br>190 | 0               | 0.481599<br>7   | 0              | 0               | 0               | 0               | 9.83799E<br>+19 | 0               | 0               |
| EASY:Ranger             | 0               | 1.102E-<br>190  | 0               | 0.060789<br>3   | 0              | 0               | 0               | 0               | 1.23173E<br>+19 | 0               | 0               |
| BAKER-2:Ranger          | 0               | 9.0062E-<br>190 | 0               | 0.487500<br>268 | 0              | 0               | 0               | 0               | 9.85783E<br>+19 | 0               | 0               |
| FOX:Ranger              | 0               | 2.6973E-<br>189 | 0               | 1.353750<br>011 | 0              | 0               | 0               | 0               | 2.71528E<br>+20 | 0               | 0               |
| BAKER:Buster            | 0               | 1.1964E-<br>187 | 0               | 0.409660<br>972 | 0              | 0               | 0               | 0               | 4.80458E<br>+19 | 0               | 0               |
| CHARLIE:Buster          | 0               | 4.9939E-<br>187 | 0               | 1.646645<br>24  | 0              | 0               | 0               | 0               | 1.92338E<br>+20 | 0               | 0               |
| DOG:Buster              | 0               | 7.8174E-<br>187 | 0               | 2.482028<br>491 | 0              | 0               | 0               | 0               | 2.8874E+<br>20  | 0               | 0               |
| EASY:Buster             | 0               | 1.2568E-<br>186 | 0               | 3.699815<br>624 | 0              | 0               | 0               | 0               | 4.26922E<br>+20 | 0               | 0               |
| SUGAR:Jangle            | 0               | 6.5576E-<br>188 | 0               | 0.148186<br>232 | 0              | 0               | 0               | 0               | 1.66195E<br>+19 | 0               | 0               |
| UNCLE                   | 0               | 8.1165E-<br>188 | 0               | 0.151839<br>637 | 0              | 0               | 0               | 0               | 1.66866E<br>+19 | 0               | 0               |
| ABLE:Tumbler-Snapper    | 0               | 9.5222E-<br>187 | 0               | 0.171144<br>303 | 0              | 0               | 0               | 0               | 1.46179E<br>+19 | 0               | 0               |
| BAKER:Tumbler-Snapper   | 0               | 1.2835E-<br>186 | 0               | 0.177080<br>472 | 0              | 0               | 0               | 0               | 1.47006E<br>+19 | 0               | 0               |
| CHARLIE:Tumbler-Snapper | 0               | 4.6196E-<br>185 | 0               | 5.583885<br>116 | 0              | 0               | 0               | 0               | 4.57005E<br>+20 | 0               | 0               |
| DOG:Tumbler-Snapper     | 0               | 3.4305E-<br>185 | 0               | 3.498226<br>721 | 0              | 0               | 0               | 0               | 2.81117E<br>+20 | 0               | 0               |
| EASY:Tumbler-Snapper    | 0               | 2.4624E-<br>185 | 0               | 2.241929<br>64  | 0              | 0               | 0               | 0               | 1.77978E<br>+20 | 0               | 0               |
| FOX:Tumbler-Snapper     | 0               | 3.3136E-<br>185 | 0               | 2.147200<br>305 | 0              | 0               | 0               | 0               | 1.64334E<br>+20 | 0               | 0               |
| GEORGE:Tumbler-Snapper  | 0               | 5.2461E-<br>185 | 0               | 2.978346<br>657 | 0              | 0               | 0               | 0               | 2.24724E<br>+20 | 0               | 0               |
| HOW:Tumbler-Snapper     | 0               | 5.3324E-<br>185 | 0               | 2.807003<br>422 | 0              | 0               | 0               | 0               | 2.10081E<br>+20 | 0               | 0               |
| ANNIE:Upshot-Knothole   | 0               | 2.659E-<br>182  | 0               | 6.422261<br>378 | 0              | 0               | 0               | 0               | 2.69308E<br>+20 | 0               | 0               |
| NANCY:Upshot-Knothole   | 0               | 4.6307E-<br>182 | 0               | 9.799035<br>855 | 0              | 0               | 0               | 0               | 4.05103E<br>+20 | 0               | 0               |
| RUTH:Upshot-Knothole    | 0               | 4.4802E-<br>184 | 0               | 0.083062<br>732 | 0              | 0               | 0               | 0               | 3.38539E<br>+18 | 0               | 0               |
| DIXIE:Upshot-Knothole   | 0               | 2.8005E-<br>182 | 0               | 4.635699<br>564 | 0              | 0               | 0               | 0               | 1.86647E<br>+20 | 0               | 0               |
| RAY:Upshot-Knothole     | 0               | 5.6648E-<br>184 | 0               | 0.085318<br>113 | 0              | 0               | 0               | 0               | 3.40043E<br>+18 | 0               | 0               |
| BADGER:Upshot-Knothole  | 0               | 7.5635E-<br>182 | 0               | 9.980290<br>77  | 0              | 0               | 0               | 0               | 3.92154E<br>+20 | 0               | 0               |
| SIMON:Upshot-Knothole   | 0               | 1.6417E-<br>181 | 0               | 18.97963<br>8   | 0              | 0               | 0               | 0               | 7.35228E<br>+20 | 0               | 0               |
| ENCORE:Upshot-Knothole  | 0               | 1.3602E-<br>181 | 0               | 12.30081<br>042 | 0              | 0               | 0               | 0               | 4.64079E<br>+20 | 0               | 0               |
| HARRY:Upshot-Knothole   | 0               | 2.0384E-<br>181 | 0               | 14.97459<br>105 | 0              | 0               | 0               | 0               | 5.52463E<br>+20 | 0               | 0               |
| GRABLE:Upshot-Knothole  | 0               | 1.0859E-<br>181 | 0               | 7.122666<br>864 | 0              | 0               | 0               | 0               | 2.59594E<br>+20 | 0               | 0               |
| CLIMAX:Upshot-Knothole  | 0               | 5.4659E-<br>181 | 0               | 29.67963<br>185 | 0              | 0               | 0               | 0               | 1.05994E<br>+21 | 0               | 0               |
| WASP:Teapot             | 0               | 5.3964E-<br>177 | 0               | 2.224089<br>589 | 0              | 0               | 0               | 0               | 2.23431E<br>+19 | 0               | 0               |



| Nuclide                 | 140Ba | 141Ce       | 143Pr | 144Ce       | 147Nd | 149Pm | 151Pm | 153Sm | 155Eu       | 156Eu | 157Eu |
|-------------------------|-------|-------------|-------|-------------|-------|-------|-------|-------|-------------|-------|-------|
| MOTH:Teapot             | 0     | 1.1754E-176 | 0     | 4.491725352 | 0     | 0     | 0     | 0     | 4.47582E+19 | 0     | 0     |
| TESLA:Teapot            | 0     | 4.7763E-176 | 0     | 15.9913581  | 0     | 0     | 0     | 0     | 1.57096E+20 | 0     | 0     |
| TURK:Teapot             | 0     | 3.3345E-175 | 0     | 99.67864943 | 0     | 0     | 0     | 0     | 9.67355E+20 | 0     | 0     |
| HORNET:Teapot           | 0     | 3.451E-176  | 0     | 9.386038503 | 0     | 0     | 0     | 0     | 9.0168E+19  | 0     | 0     |
| BEE:Teapot              | 0     | 8.5427E-176 | 0     | 19.23488652 | 0     | 0     | 0     | 0     | 1.81064E+20 | 0     | 0     |
| ESS                     | 0     | 1.0909E-176 | 0     | 2.410223805 | 0     | 0     | 0     | 0     | 2.26421E+19 | 0     | 0     |
| APPLE-1:Teapot          | 0     | 1.7357E-175 | 0     | 34.23984484 | 0     | 0     | 0     | 0     | 3.17757E+20 | 0     | 0     |
| WASP PRIME:Teapot       | 0     | 3.7193E-176 | 0     | 7.337109609 | 0     | 0     | 0     | 0     | 6.80908E+19 | 0     | 0     |
| HA :Teapot              | 0     | 4.4113E-176 | 0     | 7.481468438 | 0     | 0     | 0     | 0     | 6.83107E+19 | 0     | 0     |
| POST:Teapot             | 0     | 3.1352E-176 | 0     | 5.024221521 | 0     | 0     | 0     | 0     | 4.55955E+19 | 0     | 0     |
| MET:Teapot              | 0     | 3.9195E-175 | 0     | 56.0799794  | 0     | 0     | 0     | 0     | 5.02765E+20 | 0     | 0     |
| APPLE-2:Teapot          | 0     | 7.915E-175  | 0     | 77.61358876 | 0     | 0     | 0     | 0     | 6.68097E+20 | 0     | 0     |
| ZUCCHINI:Teapot         | 0     | 9.4588E-175 | 0     | 76.78477215 | 0     | 0     | 0     | 0     | 6.47664E+20 | 0     | 0     |
| BOLTZMANN:Plumbbob      | 0     | 3.156E-168  | 0     | 201.488161  | 0     | 0     | 0     | 0     | 3.74594E+20 | 0     | 0     |
| FRANKLIN:Plumbbob       | 0     | 4.0963E-170 | 0     | 2.379495969 | 0     | 0     | 0     | 0     | 4.37908E+18 | 0     | 0     |
| LASSEN:Plumbbob         | 0     | 1.5596E-172 | 0     | 0.00856052  | 0     | 0     | 0     | 0     | 1.56585E+16 | 0     | 0     |
| WILSON:Plumbbob         | 0     | 4.1159E-168 | 0     | 176.7179316 | 0     | 0     | 0     | 0     | 3.14814E+20 | 0     | 0     |
| PRISCILLA:Plumbbob      | 0     | 1.7308E-167 | 0     | 663.4813576 | 0     | 0     | 0     | 0     | 1.16763E+21 | 0     | 0     |
| HOOD:Plumbbob           | 0     | 4.3768E-167 | 0     | 1362.993397 | 0     | 0     | 0     | 0     | 2.34564E+21 | 0     | 0     |
| DIABLO:Plumbbob         | 0     | 1.2445E-167 | 0     | 320.8398132 | 0     | 0     | 0     | 0     | 5.41038E+20 | 0     | 0     |
| JOHN:Plumbbob           | 0     | 1.5945E-168 | 0     | 38.11537962 | 0     | 0     | 0     | 0     | 6.37542E+19 | 0     | 0     |
| KEPLER:Plumbbob         | 0     | 8.8697E-168 | 0     | 192.9118494 | 0     | 0     | 0     | 0     | 3.19414E+20 | 0     | 0     |
| OWENS:Plumbbob          | 0     | 8.7891E-168 | 0     | 187.5807936 | 0     | 0     | 0     | 0     | 3.09956E+20 | 0     | 0     |
| PASCAL A                | 0     | 0           | 0     | 0           | 0     | 0     | 0     | 0     | 0           | 0     | 0     |
| STOKES:Plumbbob         | 0     | 2.2968E-167 | 0     | 379.7239202 | 0     | 0     | 0     | 0     | 6.10447E+20 | 0     | 0     |
| SATURN                  | 0     | 0           | 0     | 0           | 0     | 0     | 0     | 0     | 0           | 0     | 0     |
| SHASTA:Plumbbob         | 0     | 2.5975E-167 | 0     | 348.963452  | 0     | 0     | 0     | 0     | 5.48611E+20 | 0     | 0     |
| DOPPLER:Plumbbob        | 0     | 1.8707E-167 | 0     | 228.5779823 | 0     | 0     | 0     | 0     | 3.55703E+20 | 0     | 0     |
| PASCAL B                | 0     | 0           | 0     | 0           | 0     | 0     | 0     | 0     | 0           | 0     | 0     |
| FRANKLIN PRIME:Plumbbob | 0     | 9.2813E-168 | 0     | 99.34614599 | 0     | 0     | 0     | 0     | 1.52412E+20 | 0     | 0     |
| SMOKY:Plumbbob          | 0     | 8.8748E-167 | 0     | 932.3011656 | 0     | 0     | 0     | 0     | 1.4274E+21  | 0     | 0     |
| GALILEO:Plumbbob        | 0     | 2.3157E-167 | 0     | 234.217384  | 0     | 0     | 0     | 0     | 3.5714E+20  | 0     | 0     |
| WHEELER:Plumbbob        | 0     | 4.517E-169  | 0     | 4.235719338 | 0     | 0     | 0     | 0     | 6.40637E+18 | 0     | 0     |
| COULOMB-B:Plumbbob      | 0     | 6.9236E-169 | 0     | 6.455136225 | 0     | 0     | 0     | 0     | 9.7571E+18  | 0     | 0     |
| LAPLACE:Plumbbob        | 0     | 2.3933E-168 | 0     | 21.60664954 | 0     | 0     | 0     | 0     | 3.2546E+19  | 0     | 0     |
| FIZEAU:Plumbbob         | 0     | 3.002E-167  | 0     | 241.2635779 | 0     | 0     | 0     | 0     | 3.58895E+20 | 0     | 0     |
| NEWTON:Plumbbob         | 0     | 3.4058E-167 | 0     | 264.3766953 | 0     | 0     | 0     | 0     | 3.91812E+20 | 0     | 0     |
| RAINIER                 | 0     | 5.1627E-168 | 0     | 37.74397681 | 0     | 0     | 0     | 0     | 5.55777E+19 | 0     | 0     |

| Nuclide                   | 140Ba | 141Ce       | 143Pr | 144Ce       | 147Nd | 149Pm | 151Pm | 153Sm | 155Eu       | 156Eu | 157Eu |
|---------------------------|-------|-------------|-------|-------------|-------|-------|-------|-------|-------------|-------|-------|
| WHITNEY:Plumbbob          | 0     | 6.2589E-167 | 0     | 425.7796932 | 0     | 0     | 0     | 0     | 6.22118E+20 | 0     | 0     |
| CHARLESTON:Plumbbob       | 0     | 4.3998E-167 | 0     | 272.2220352 | 0     | 0     | 0     | 0     | 3.93712E+20 | 0     | 0     |
| MORGAN:Plumbbob           | 0     | 3.5539E-167 | 0     | 185.5032781 | 0     | 0     | 0     | 0     | 2.63428E+20 | 0     | 0     |
| PASCAL C                  | 0     | 0           | 0     | 0           | 0     | 0     | 0     | 0     | 0           | 0     | 0     |
| COULOMB-C:Project 58      | 0     | 8.5668E-168 | 0     | 13.52624062 | 0     | 0     | 0     | 0     | 1.68895E+19 | 0     | 0     |
| VENUS                     | 0     | 0           | 0     | 0           | 0     | 0     | 0     | 0     | 0           | 0     | 0     |
| URANUS                    | 0     | 0           | 0     | 0           | 0     | 0     | 0     | 0     | 0           | 0     | 0     |
| OTERO                     | 0     | 2.3952E-166 | 0     | 2.018282469 | 0     | 0     | 0     | 0     | 1.43516E+18 | 0     | 0     |
| BERNALILLO                | 0     | 1.0514E-166 | 0     | 0.806410595 | 0     | 0     | 0     | 0     | 5.6765E+17  | 0     | 0     |
| EDDY:Hardtack II          | 0     | 6.0416E-166 | 0     | 4.481424891 | 0     | 0     | 0     | 0     | 3.14324E+18 | 0     | 0     |
| LUNA                      | 0     | 1.1445E-167 | 0     | 0.081426377 | 0     | 0     | 0     | 0     | 5.68561E+16 | 0     | 0     |
| MERCURY                   | 0     | 0           | 0     | 0           | 0     | 0     | 0     | 0     | 0           | 0     | 0     |
| VALENCIA                  | 0     | 1.6992E-167 | 0     | 0.109909838 | 0     | 0     | 0     | 0     | 7.59623E+16 | 0     | 0     |
| MARS                      | 0     | 1.1323E-166 | 0     | 0.716446794 | 0     | 0     | 0     | 0     | 4.93987E+17 | 0     | 0     |
| MORA:Hardtack II          | 0     | 1.802E-164  | 0     | 110.6493837 | 0     | 0     | 0     | 0     | 7.60466E+19 | 0     | 0     |
| HIDALGO:Hardtack II       | 0     | 7.8854E-166 | 0     | 4.322746644 | 0     | 0     | 0     | 0     | 2.93488E+18 | 0     | 0     |
| COLFAX                    | 0     | 5.6429E-167 | 0     | 0.308832903 | 0     | 0     | 0     | 0     | 2.09642E+17 | 0     | 0     |
| TAMALPAIS                 | 0     | 7.9155E-166 | 0     | 4.074928335 | 0     | 0     | 0     | 0     | 2.74799E+18 | 0     | 0     |
| QUAY:Hardtack II          | 0     | 9.0033E-166 | 0     | 4.48951565  | 0     | 0     | 0     | 0     | 3.0172E+18  | 0     | 0     |
| LEA:Hardtack II           | 0     | 1.6992E-164 | 0     | 80.1349937  | 0     | 0     | 0     | 0     | 5.35331E+19 | 0     | 0     |
| NEPTUNE                   | 0     | 1.4318E-165 | 0     | 6.601694327 | 0     | 0     | 0     | 0     | 4.39947E+18 | 0     | 0     |
| HAMILTON:Hardtack II      | 0     | 1.5235E-167 | 0     | 0.069041211 | 0     | 0     | 0     | 0     | 4.59245E+16 | 0     | 0     |
| LOGAN                     | 0     | 6.4275E-164 | 0     | 288.0807048 | 0     | 0     | 0     | 0     | 1.91397E+20 | 0     | 0     |
| DONA ANA:Hardtack II      | 0     | 4.7917E-166 | 0     | 2.133600763 | 0     | 0     | 0     | 0     | 1.41654E+18 | 0     | 0     |
| VESTA:Hardtack II         | 0     | 3.1997E-166 | 0     | 1.388552689 | 0     | 0     | 0     | 0     | 9.19339E+17 | 0     | 0     |
| RIO ARRIBA:Hardtack II    | 0     | 1.2164E-165 | 0     | 5.215225317 | 0     | 0     | 0     | 0     | 3.44841E+18 | 0     | 0     |
| SAN JUAN                  | 0     | 0           | 0     | 0           | 0     | 0     | 0     | 0     | 0           | 0     | 0     |
| SOCORRO:Hardtack II       | 0     | 8.8245E-164 | 0     | 351.0527168 | 0     | 0     | 0     | 0     | 2.30261E+20 | 0     | 0     |
| WRANGELL:Hardtack II      | 0     | 1.6964E-165 | 0     | 6.730786815 | 0     | 0     | 0     | 0     | 4.41359E+18 | 0     | 0     |
| OBERON:Hardtack II        | 0     | 0           | 0     | 0           | 0     | 0     | 0     | 0     | 0           | 0     | 0     |
| RUSHMORE:Hardtack II      | 0     | 2.7901E-165 | 0     | 11.01100611 | 0     | 0     | 0     | 0     | 7.21609E+18 | 0     | 0     |
| CATRON:Hardtack II        | 0     | 3.2275E-166 | 0     | 1.234872022 | 0     | 0     | 0     | 0     | 8.06585E+17 | 0     | 0     |
| JUNO:Hardtack II          | 0     | 2.6151E-167 | 0     | 0.099976144 | 0     | 0     | 0     | 0     | 6.52961E+16 | 0     | 0     |
| CERES:Hardtack II         | 0     | 1.1118E-167 | 0     | 0.041317246 | 0     | 0     | 0     | 0     | 2.69029E+16 | 0     | 0     |
| SANFORD:Hardtack II       | 0     | 7.8264E-164 | 0     | 289.4066639 | 0     | 0     | 0     | 0     | 1.8834E+20  | 0     | 0     |
| DE BACA:Hardtack II       | 0     | 3.5316E-164 | 0     | 130.0124282 | 0     | 0     | 0     | 0     | 8.45689E+19 | 0     | 0     |
| CHAVES/CHAVEZ:Hardtack II | 0     | 9.8263E-168 | 0     | 0.035538988 | 0     | 0     | 0     | 0     | 2.3073E+16  | 0     | 0     |
| EVANS                     | 0     | 9.2796E-166 | 0     | 3.268834366 | 0     | 0     | 0     | 0     | 2.11621E+18 | 0     | 0     |

| Nuclide              | 140Ba | 141Ce       | 143Pr | 144Ce       | 147Nd | 149Pm | 151Pm | 153Sm | 155Eu       | 156Eu | 157Eu |
|----------------------|-------|-------------|-------|-------------|-------|-------|-------|-------|-------------|-------|-------|
| MAZAMA:Hardtack II   | 0     | 0           | 0     | 0           | 0     | 0     | 0     | 0     | 0           | 0     | 0     |
| HUMBOLDT:Hardtack II | 0     | 1.3334E-166 | 0     | 0.464274565 | 0     | 0     | 0     | 0     | 3.00192E+17 | 0     | 0     |
| SANTA FE:Hardtack II | 0     | 2.2466E-164 | 0     | 77.47534599 | 0     | 0     | 0     | 0     | 5.00422E+19 | 0     | 0     |
| GANYMEDE:Hardtack II | 0     | 0           | 0     | 0           | 0     | 0     | 0     | 0     | 0           | 0     | 0     |
| BLANCA               | 0     | 3.8427E-163 | 0     | 1312.718839 | 0     | 0     | 0     | 0     | 8.47039E+20 | 0     | 0     |
| TITANIA:Hardtack II  | 0     | 3.5107E-168 | 0     | 0.011940551 | 0     | 0     | 0     | 0     | 7.70108E+15 | 0     | 0     |
| ANTLER               | 0     | 2.4706E-154 | 0     | 2006.71131  | 0     | 0     | 0     | 0     | 1.52889E+20 | 0     | 0     |
| SHREW                | 0     | 1.9462E-153 | 0     | 15478.20073 | 0     | 0     | 0     | 0     | 1.1766E+21  | 0     | 0     |
| BOOMER               | 0     | 2.6841E-153 | 0     | 16056.9684  | 0     | 0     | 0     | 0     | 1.18377E+21 | 0     | 0     |
| CHENA                | 0     | 3.242E-153  | 0     | 16406.98842 | 0     | 0     | 0     | 0     | 1.188E+21   | 0     | 0     |
| MINK                 | 0     | 4.864E-153  | 0     | 17184.9305  | 0     | 0     | 0     | 0     | 1.19714E+21 | 0     | 0     |
| FISHER               | 0     | 6.9028E-153 | 0     | 12544.26253 | 0     | 0     | 0     | 0     | 8.13536E+20 | 0     | 0     |
| MAD                  | 0     | 3.1736E-154 | 0     | 479.362055  | 0     | 0     | 0     | 0     | 3.04758E+19 | 0     | 0     |
| RINGTAIL             | 0     | 1.3808E-152 | 0     | 19359.40855 | 0     | 0     | 0     | 0     | 1.22097E+21 | 0     | 0     |
| FEATHER              | 0     | 1.152E-154  | 0     | 146.9732597 | 0     | 0     | 0     | 0     | 9.17571E+18 | 0     | 0     |
| STOAT                | 0     | 5.7499E-153 | 0     | 5221.03237  | 0     | 0     | 0     | 0     | 3.14245E+20 | 0     | 0     |
| AGOUTI               | 0     | 8.7541E-153 | 0     | 6698.103639 | 0     | 0     | 0     | 0     | 3.95789E+20 | 0     | 0     |
| DORMOUSE             | 0     | 3.5335E-152 | 0     | 21552.35075 | 0     | 0     | 0     | 0     | 1.24284E+21 | 0     | 0     |
| STILLWATER           | 0     | 6.5718E-153 | 0     | 3381.602823 | 0     | 0     | 0     | 0     | 1.91468E+20 | 0     | 0     |
| ARMADILLO            | 0     | 1.5505E-152 | 0     | 7838.522198 | 0     | 0     | 0     | 0     | 4.42977E+20 | 0     | 0     |
| HARD HAT             | 0     | 1.4166E-152 | 0     | 6386.503999 | 0     | 0     | 0     | 0     | 3.56499E+20 | 0     | 0     |
| CHINCHILLA I         | 0     | 5.1358E-153 | 0     | 2149.348042 | 0     | 0     | 0     | 0     | 1.19022E+20 | 0     | 0     |
| CODSAW               | 0     | 5.4125E-152 | 0     | 22627.77771 | 0     | 0     | 0     | 0     | 1.25289E+21 | 0     | 0     |
| CIMARRON             | 0     | 3.5077E-152 | 0     | 13595.56108 | 0     | 0     | 0     | 0     | 7.46673E+20 | 0     | 0     |
| PLATYPUS             | 0     | 6.0144E-152 | 0     | 22901.91463 | 0     | 0     | 0     | 0     | 1.25539E+21 | 0     | 0     |
| PAMPAS               | 0     | 3.1859E-152 | 0     | 11014.67221 | 0     | 0     | 0     | 0     | 5.97538E+20 | 0     | 0     |
| DANNY BOY            | 0     | 1.5692E-153 | 0     | 503.3927411 | 0     | 0     | 0     | 0     | 2.70897E+19 | 0     | 0     |
| ERMINE               | 0     | 7.4442E-152 | 0     | 23466.54176 | 0     | 0     | 0     | 0     | 1.26046E+21 | 0     | 0     |
| BRAZOS               | 0     | 3.2672E-152 | 0     | 9905.580954 | 0     | 0     | 0     | 0     | 5.29831E+20 | 0     | 0     |
| HOGNOSE              | 0     | 9.0195E-152 | 0     | 23986.5984  | 0     | 0     | 0     | 0     | 1.26503E+21 | 0     | 0     |
| HOOSIC               | 0     | 2.0259E-152 | 0     | 4209.535586 | 0     | 0     | 0     | 0     | 2.16191E+20 | 0     | 0     |
| CHINCHILLA II        | 0     | 1.2705E-151 | 0     | 24943.56099 | 0     | 0     | 0     | 0     | 1.27325E+21 | 0     | 0     |
| DORMOUSE PRIME       | 0     | 7.4911E-152 | 0     | 13382.06005 | 0     | 0     | 0     | 0     | 6.76182E+20 | 0     | 0     |
| PASSAIC              | 0     | 1.4439E-151 | 0     | 25310.73956 | 0     | 0     | 0     | 0     | 1.27633E+21 | 0     | 0     |
| HUDSON               | 0     | 1.641E-151  | 0     | 25683.32313 | 0     | 0     | 0     | 0     | 1.27942E+21 | 0     | 0     |
| PLATTE               | 0     | 1.5841E-152 | 0     | 2387.307755 | 0     | 0     | 0     | 0     | 1.18442E+20 | 0     | 0     |
| DEAD                 | 0     | 1.9894E-151 | 0     | 26254.28337 | 0     | 0     | 0     | 0     | 1.28408E+21 | 0     | 0     |
| BLACK                | 0     | 2.2597E-151 | 0     | 26638.954   | 0     | 0     | 0     | 0     | 1.28717E+21 | 0     | 0     |

| Nuclide                  | 140Ba | 141Ce       | 143Pr | 144Ce       | 147Nd | 149Pm | 151Pm | 153Sm | 155Eu       | 156Eu | 157Eu |
|--------------------------|-------|-------------|-------|-------------|-------|-------|-------|-------|-------------|-------|-------|
| PACA                     | 0     | 2.8007E-151 | 0     | 27300.00841 | 0     | 0     | 0     | 0     | 1.2924E+21  | 0     | 0     |
| ARIKAREE                 | 0     | 2.9737E-151 | 0     | 27487.51272 | 0     | 0     | 0     | 0     | 1.29387E+21 | 0     | 0     |
| AARDVARK                 | 0     | 6.2287E-151 | 0     | 55265.89246 | 0     | 0     | 0     | 0     | 2.59E+21    | 0     | 0     |
| EEL                      | 0     | 8.1067E-152 | 0     | 6321.753135 | 0     | 0     | 0     | 0     | 2.92178E+20 | 0     | 0     |
| WHITE                    | 0     | 4.0948E-151 | 0     | 28510.27427 | 0     | 0     | 0     | 0     | 1.30171E+21 | 0     | 0     |
| RACCOON                  | 0     | 4.7626E-151 | 0     | 29006.38789 | 0     | 0     | 0     | 0     | 1.30543E+21 | 0     | 0     |
| PACKRAT                  | 0     | 5.2986E-151 | 0     | 29361.77464 | 0     | 0     | 0     | 0     | 1.30807E+21 | 0     | 0     |
| DES MOINES               | 0     | 0           | 0     | 0           | 0     | 0     | 0     | 0     | 0           | 0     | 0     |
| DAMAN I                  | 0     | 7.2962E-151 | 0     | 30454.27416 | 0     | 0     | 0     | 0     | 1.316E+21   | 0     | 0     |
| HAYMAKER                 | 0     | 2.7804E-150 | 0     | 103534.1239 | 0     | 0     | 0     | 0     | 4.41933E+21 | 0     | 0     |
| MARSHMALLOW              | 0     | 8.4709E-151 | 0     | 30977.92785 | 0     | 0     | 0     | 0     | 1.31971E+21 | 0     | 0     |
| SACRAMENTO               | 0     | 8.8755E-151 | 0     | 31143.40895 | 0     | 0     | 0     | 0     | 1.32088E+21 | 0     | 0     |
| SEDAN                    | 0     | 5.2244E-150 | 0     | 164254.6029 | 0     | 0     | 0     | 0     | 6.88466E+21 | 0     | 0     |
| LITTLE FELLER II:Sunbeam | 0     | 1.131E-153  | 0     | 34.83796387 | 0     | 0     | 0     | 0     | 1.45701E+18 | 0     | 0     |
| JOHNNIE BOY              | 0     | 2.7937E-152 | 0     | 799.3405524 | 0     | 0     | 0     | 0     | 3.31659E+19 | 0     | 0     |
| MERRIMAC                 | 0     | 6.4098E-150 | 0     | 176700.1562 | 0     | 0     | 0     | 0     | 7.30229E+21 | 0     | 0     |
| SMALL BOY:Sunbeam        | 0     | 1.1037E-151 | 0     | 2979.777846 | 0     | 0     | 0     | 0     | 1.22866E+20 | 0     | 0     |
| LITTLE FELLER I:Sunbeam  | 0     | 1.1433E-153 | 0     | 29.20059803 | 0     | 0     | 0     | 0     | 1.19687E+18 | 0     | 0     |
| WICHITA                  | 0     | 1.5779E-150 | 0     | 33258.51287 | 0     | 0     | 0     | 0     | 1.33531E+21 | 0     | 0     |
| YORK                     | 0     | 2.8518E-150 | 0     | 35584.00588 | 0     | 0     | 0     | 0     | 1.35033E+21 | 0     | 0     |
| BOBAC                    | 0     | 2.8569E-150 | 0     | 35591.22872 | 0     | 0     | 0     | 0     | 1.35037E+21 | 0     | 0     |
| RARITAN                  | 0     | 3.7697E-150 | 0     | 36736.13592 | 0     | 0     | 0     | 0     | 1.35746E+21 | 0     | 0     |
| HYRAX                    | 0     | 4.4717E-150 | 0     | 37459.55895 | 0     | 0     | 0     | 0     | 1.36185E+21 | 0     | 0     |
| PEBA                     | 0     | 5.0813E-150 | 0     | 38010.33481 | 0     | 0     | 0     | 0     | 1.36514E+21 | 0     | 0     |
| ALLEGHENY                | 0     | 6.1566E-150 | 0     | 38852.70551 | 0     | 0     | 0     | 0     | 1.3701E+21  | 0     | 0     |
| MISSISSIPPI              | 0     | 4.0233E-149 | 0     | 226691.6334 | 0     | 0     | 0     | 0     | 7.89715E+21 | 0     | 0     |
| ROANOKE                  | 0     | 8.1092E-150 | 0     | 40094.39031 | 0     | 0     | 0     | 0     | 1.37725E+21 | 0     | 0     |
| WOLVERINE                | 0     | 8.1237E-150 | 0     | 40102.52867 | 0     | 0     | 0     | 0     | 1.3773E+21  | 0     | 0     |
| TIOGA                    | 0     | 9.2163E-150 | 0     | 40684.59476 | 0     | 0     | 0     | 0     | 1.38058E+21 | 0     | 0     |
| BANDICOOT                | 0     | 5.9001E-150 | 0     | 25497.63843 | 0     | 0     | 0     | 0     | 8.63256E+20 | 0     | 0     |
| SANTEE                   | 0     | 1.1167E-149 | 0     | 41586.2314  | 0     | 0     | 0     | 0     | 1.3856E+21  | 0     | 0     |
| ST. LAWRENCE             | 0     | 1.4774E-149 | 0     | 42937.05701 | 0     | 0     | 0     | 0     | 1.39295E+21 | 0     | 0     |
| GUNDI                    | 0     | 1.6768E-149 | 0     | 43562.47502 | 0     | 0     | 0     | 0     | 1.39628E+21 | 0     | 0     |
| ANACOSTIA                | 0     | 5.6388E-150 | 0     | 11663.92623 | 0     | 0     | 0     | 0     | 3.64802E+20 | 0     | 0     |
| TAUNTON                  | 0     | 2.5135E-149 | 0     | 45623.37224 | 0     | 0     | 0     | 0     | 1.407E+21   | 0     | 0     |
| TENDRAC                  | 0     | 2.6867E-149 | 0     | 45971.93559 | 0     | 0     | 0     | 0     | 1.40877E+21 | 0     | 0     |
| MADISON                  | 0     | 2.9849E-149 | 0     | 46527.70801 | 0     | 0     | 0     | 0     | 1.41158E+21 | 0     | 0     |
| NUMBAT                   | 0     | 2.9884E-149 | 0     | 46534.00393 | 0     | 0     | 0     | 0     | 1.41161E+21 | 0     | 0     |

| Nuclide      | 140Ba | 141Ce       | 143Pr | 144Ce       | 147Nd | 149Pm | 151Pm | 153Sm | 155Eu       | 156Eu | 157Eu |
|--------------|-------|-------------|-------|-------------|-------|-------|-------|-------|-------------|-------|-------|
| MANATEE      | 0     | 3.1165E-149 | 0     | 46757.66643 | 0     | 0     | 0     | 0     | 1.41273E+21 | 0     | 0     |
| CASSELMAN    | 0     | 1.0271E-148 | 0     | 53579.36616 | 0     | 0     | 0     | 0     | 1.44492E+21 | 0     | 0     |
| HATCHIE      | 0     | 1.0271E-148 | 0     | 53579.36767 | 0     | 0     | 0     | 0     | 1.44492E+21 | 0     | 0     |
| FERRET       | 0     | 1.0294E-148 | 0     | 53592.96094 | 0     | 0     | 0     | 0     | 1.44498E+21 | 0     | 0     |
| ACUSHI       | 0     | 1.0294E-148 | 0     | 53592.96094 | 0     | 0     | 0     | 0     | 1.44498E+21 | 0     | 0     |
| CHIPMUNK     | 0     | 1.1935E-148 | 0     | 54506.18107 | 0     | 0     | 0     | 0     | 1.44902E+21 | 0     | 0     |
| KAWEAH       | 0     | 2.0397E-149 | 0     | 8298.623505 | 0     | 0     | 0     | 0     | 2.1789E+20  | 0     | 0     |
| CARMEL       | 0     | 1.3598E-148 | 0     | 55324.17074 | 0     | 0     | 0     | 0     | 1.4526E+21  | 0     | 0     |
| JERBOA       | 0     | 1.6116E-148 | 0     | 56408.18431 | 0     | 0     | 0     | 0     | 1.45727E+21 | 0     | 0     |
| TOYAH        | 0     | 2.1674E-148 | 0     | 58349.20388 | 0     | 0     | 0     | 0     | 1.46545E+21 | 0     | 0     |
| GERBIL       | 0     | 2.92E-148   | 0     | 60369.59582 | 0     | 0     | 0     | 0     | 1.47372E+21 | 0     | 0     |
| FERRET PRIME | 0     | 3.3964E-148 | 0     | 61420.41223 | 0     | 0     | 0     | 0     | 1.47794E+21 | 0     | 0     |
| COYPU        | 0     | 3.7724E-148 | 0     | 62161.31762 | 0     | 0     | 0     | 0     | 1.48087E+21 | 0     | 0     |
| CUMBERLAND   | 0     | 3.8538E-148 | 0     | 62313.05495 | 0     | 0     | 0     | 0     | 1.48147E+21 | 0     | 0     |
| PAISANO      | 0     | 5.0856E-148 | 0     | 64318.26336 | 0     | 0     | 0     | 0     | 1.48925E+21 | 0     | 0     |
| KOOTANAI     | 0     | 5.0856E-148 | 0     | 64318.26336 | 0     | 0     | 0     | 0     | 1.48925E+21 | 0     | 0     |
| GUNDI PRIME  | 0     | 7.0164E-148 | 0     | 66726.04498 | 0     | 0     | 0     | 0     | 1.49833E+21 | 0     | 0     |
| TEJON        | 0     | 8.2966E-148 | 0     | 68015.41932 | 0     | 0     | 0     | 0     | 1.50309E+21 | 0     | 0     |
| HARKEE       | 0     | 8.2966E-148 | 0     | 68015.41932 | 0     | 0     | 0     | 0     | 1.50309E+21 | 0     | 0     |
| STONES       | 0     | 5.08E-147   | 0     | 378696.921  | 0     | 0     | 0     | 0     | 8.28375E+21 | 0     | 0     |
| PLEASANT     | 0     | 1.0718E-147 | 0     | 70033.5893  | 0     | 0     | 0     | 0     | 1.51037E+21 | 0     | 0     |
| YUBA         | 0     | 1.9321E-148 | 0     | 11044.03482 | 0     | 0     | 0     | 0     | 2.34777E+20 | 0     | 0     |
| HUTIA        | 0     | 1.27E-147   | 0     | 71403.84245 | 0     | 0     | 0     | 0     | 1.51522E+21 | 0     | 0     |
| APSHAPA      | 0     | 1.2733E-147 | 0     | 71425.34228 | 0     | 0     | 0     | 0     | 1.5153E+21  | 0     | 0     |
| MATACO       | 0     | 1.5065E-147 | 0     | 72809.95615 | 0     | 0     | 0     | 0     | 1.52012E+21 | 0     | 0     |
| KENNEBEC     | 0     | 1.9198E-147 | 0     | 74854.01578 | 0     | 0     | 0     | 0     | 1.5271E+21  | 0     | 0     |
| PEKAN        | 0     | 5.3474E-147 | 0     | 84143.23496 | 0     | 0     | 0     | 0     | 1.55694E+21 | 0     | 0     |
| SATSOP       | 0     | 5.6466E-147 | 0     | 84667.86726 | 0     | 0     | 0     | 0     | 1.55854E+21 | 0     | 0     |
| KOHOCTON     | 0     | 6.699E-147  | 0     | 86336.64179 | 0     | 0     | 0     | 0     | 1.56358E+21 | 0     | 0     |
| NATCHES      | 0     | 6.7E-147    | 0     | 86338.10203 | 0     | 0     | 0     | 0     | 1.56359E+21 | 0     | 0     |
| AHTANUM      | 0     | 1.0489E-146 | 0     | 90872.34272 | 0     | 0     | 0     | 0     | 1.57688E+21 | 0     | 0     |
| BILBY        | 0     | 1.3095E-145 | 0     | 1131718.548 | 0     | 0     | 0     | 0     | 1.96332E+22 | 0     | 0     |
| CARP         | 0     | 1.4144E-146 | 0     | 94028.55861 | 0     | 0     | 0     | 0     | 1.58581E+21 | 0     | 0     |
| NARRAGUAGUS  | 0     | 1.4184E-146 | 0     | 94058.77977 | 0     | 0     | 0     | 0     | 1.5859E+21  | 0     | 0     |
| GRUNION      | 0     | 1.906E-146  | 0     | 97286.66364 | 0     | 0     | 0     | 0     | 1.59478E+21 | 0     | 0     |
| TORNILLO     | 0     | 3.6441E-148 | 0     | 1849.760135 | 0     | 0     | 0     | 0     | 3.03043E+19 | 0     | 0     |
| CLEARWATER   | 0     | 1.1694E-145 | 0     | 541797.3373 | 0     | 0     | 0     | 0     | 8.7894E+21  | 0     | 0     |
| MULLETT      | 0     | 2.1682E-146 | 0     | 98728.77826 | 0     | 0     | 0     | 0     | 1.59866E+21 | 0     | 0     |

| Nuclide    | 140Ba | 141Ce       | 143Pr | 144Ce       | 147Nd | 149Pm | 151Pm | 153Sm | 155Eu       | 156Eu | 157Eu |
|------------|-------|-------------|-------|-------------|-------|-------|-------|-------|-------------|-------|-------|
| ANCHOVY    | 0     | 3.943E-146  | 0     | 105707.1292 | 0     | 0     | 0     | 0     | 1.61683E+21 | 0     | 0     |
| MUSTANG    | 0     | 4.0244E-146 | 0     | 105954.1414 | 0     | 0     | 0     | 0     | 1.61745E+21 | 0     | 0     |
| GREYS      | 0     | 2.5755E-145 | 0     | 592918.3853 | 0     | 0     | 0     | 0     | 8.92149E+21 | 0     | 0     |
| BARRACUDA  | 0     | 6.044E-146  | 0     | 110990.8458 | 0     | 0     | 0     | 0     | 1.62993E+21 | 0     | 0     |
| SARDINE    | 0     | 6.044E-146  | 0     | 110990.8458 | 0     | 0     | 0     | 0     | 1.62993E+21 | 0     | 0     |
| EAGLE      | 0     | 1.8986E-146 | 0     | 29989.41991 | 0     | 0     | 0     | 0     | 4.33321E+20 | 0     | 0     |
| TUNA       | 0     | 8.4927E-146 | 0     | 115386.7975 | 0     | 0     | 0     | 0     | 1.64043E+21 | 0     | 0     |
| FORE       | 0     | 8.3124E-145 | 0     | 677803.7486 | 0     | 0     | 0     | 0     | 9.12117E+21 | 0     | 0     |
| OCONTO     | 0     | 9.2121E-146 | 0     | 65811.93972 | 0     | 0     | 0     | 0     | 8.73116E+20 | 0     | 0     |
| CLUB       | 0     | 2.0372E-145 | 0     | 127511.5423 | 0     | 0     | 0     | 0     | 1.66778E+21 | 0     | 0     |
| SOLENDON   | 0     | 2.6872E-145 | 0     | 131608.4671 | 0     | 0     | 0     | 0     | 1.67652E+21 | 0     | 0     |
| BUNKER     | 0     | 2.7448E-145 | 0     | 131927.6069 | 0     | 0     | 0     | 0     | 1.6772E+21  | 0     | 0     |
| BONEFISH   | 0     | 3.0541E-145 | 0     | 133545.6387 | 0     | 0     | 0     | 0     | 1.68058E+21 | 0     | 0     |
| MACKEREL   | 0     | 3.0541E-145 | 0     | 133545.7065 | 0     | 0     | 0     | 0     | 1.68058E+21 | 0     | 0     |
| KLUCKITAT  | 0     | 1.1154E-144 | 0     | 469686.2428 | 0     | 0     | 0     | 0     | 5.88677E+21 | 0     | 0     |
| HANDICAP   | 0     | 4.9851E-145 | 0     | 141231.0189 | 0     | 0     | 0     | 0     | 1.69621E+21 | 0     | 0     |
| PIKE       | 0     | 5.0972E-145 | 0     | 141590.2549 | 0     | 0     | 0     | 0     | 1.69692E+21 | 0     | 0     |
| HOOK       | 0     | 1.0074E-144 | 0     | 153045.4758 | 0     | 0     | 0     | 0     | 1.7189E+21  | 0     | 0     |
| STURGEON   | 0     | 1.029E-144  | 0     | 153416.0796 | 0     | 0     | 0     | 0     | 1.71959E+21 | 0     | 0     |
| BOGEY      | 0     | 1.0748E-144 | 0     | 154180.8072 | 0     | 0     | 0     | 0     | 1.72101E+21 | 0     | 0     |
| TURF       | 0     | 6.8915E-144 | 0     | 862984.2769 | 0     | 0     | 0     | 0     | 9.49302E+21 | 0     | 0     |
| PIPEFISH   | 0     | 1.3948E-144 | 0     | 158838.5896 | 0     | 0     | 0     | 0     | 1.7295E+21  | 0     | 0     |
| DRIVER     | 0     | 1.6429E-144 | 0     | 161835.8881 | 0     | 0     | 0     | 0     | 1.73486E+21 | 0     | 0     |
| BACKSWING  | 0     | 1.9102E-144 | 0     | 164646.4609 | 0     | 0     | 0     | 0     | 1.73981E+21 | 0     | 0     |
| MINNOW     | 0     | 1.9541E-144 | 0     | 165074.4697 | 0     | 0     | 0     | 0     | 1.74056E+21 | 0     | 0     |
| ACE        | 0     | 5.2158E-145 | 0     | 26445.50834 | 0     | 0     | 0     | 0     | 2.63941E+20 | 0     | 0     |
| BITTERLING | 0     | 3.5436E-144 | 0     | 176684.2864 | 0     | 0     | 0     | 0     | 1.76024E+21 | 0     | 0     |
| DUFFER     | 0     | 4.0255E-144 | 0     | 179275.7455 | 0     | 0     | 0     | 0     | 1.76448E+21 | 0     | 0     |
| FADE       | 0     | 4.6736E-144 | 0     | 182358.3475 | 0     | 0     | 0     | 0     | 1.76947E+21 | 0     | 0     |
| DUB        | 0     | 3.0419E-144 | 0     | 107987.2218 | 0     | 0     | 0     | 0     | 1.03723E+21 | 0     | 0     |
| BYE        | 0     | 4.0219E-143 | 0     | 1055576.352 | 0     | 0     | 0     | 0     | 9.81471E+21 | 0     | 0     |
| CORMORANT  | 0     | 7.4972E-144 | 0     | 192470.2242 | 0     | 0     | 0     | 0     | 1.78533E+21 | 0     | 0     |
| LINKS      | 0     | 8.4918E-144 | 0     | 195227.9939 | 0     | 0     | 0     | 0     | 1.78954E+21 | 0     | 0     |
| TROGON     | 0     | 8.7135E-144 | 0     | 195803.379  | 0     | 0     | 0     | 0     | 1.79041E+21 | 0     | 0     |
| ALVA       | 0     | 3.3302E-144 | 0     | 45881.0836  | 0     | 0     | 0     | 0     | 3.98022E+20 | 0     | 0     |
| CANVASBACK | 0     | 1.6228E-143 | 0     | 210213.7383 | 0     | 0     | 0     | 0     | 1.81157E+21 | 0     | 0     |
| PLAYER     | 0     | 1.793E-143  | 0     | 212621.2752 | 0     | 0     | 0     | 0     | 1.81499E+21 | 0     | 0     |
| HADDOCK    | 0     | 1.8359E-143 | 0     | 213195.9921 | 0     | 0     | 0     | 0     | 1.8158E+21  | 0     | 0     |

| Nuclide              | 140Ba | 141Ce       | 143Pr | 144Ce       | 147Nd | 149Pm | 151Pm | 153Sm | 155Eu       | 156Eu | 157Eu |
|----------------------|-------|-------------|-------|-------------|-------|-------|-------|-------|-------------|-------|-------|
| GUANAY               | 0     | 2.1336E-143 | 0     | 216887.1539 | 0     | 0     | 0     | 0     | 1.82096E+21 | 0     | 0     |
| SPOON                | 0     | 2.4678E-143 | 0     | 220521.3459 | 0     | 0     | 0     | 0     | 1.82597E+21 | 0     | 0     |
| COURSER              | 0     | 0           | 0     | 0           | 0     | 0     | 0     | 0     | 0           | 0     | 0     |
| AUK                  | 0     | 3.883E-143  | 0     | 232236.0324 | 0     | 0     | 0     | 0     | 1.84168E+21 | 0     | 0     |
| PAR                  | 0     | 8.5196E-143 | 0     | 448560.1404 | 0     | 0     | 0     | 0     | 3.50871E+21 | 0     | 0     |
| TURNSTONE            | 0     | 5.2152E-143 | 0     | 240192.2364 | 0     | 0     | 0     | 0     | 1.85197E+21 | 0     | 0     |
| BARBEL               | 0     | 5.2152E-143 | 0     | 240192.2364 | 0     | 0     | 0     | 0     | 1.85197E+21 | 0     | 0     |
| GARDEN               | 0     | 6.0496E-143 | 0     | 244297.7034 | 0     | 0     | 0     | 0     | 1.85717E+21 | 0     | 0     |
| FOREST               | 0     | 7.1884E-143 | 0     | 249156.9567 | 0     | 0     | 0     | 0     | 1.86323E+21 | 0     | 0     |
| HANDCAR              | 0     | 4.7895E-143 | 0     | 151293.7941 | 0     | 0     | 0     | 0     | 1.12015E+21 | 0     | 0     |
| CREPE                | 0     | 8.3712E-142 | 0     | 1492931.59  | 0     | 0     | 0     | 0     | 1.0394E+22  | 0     | 0     |
| DRILL TARGET (upper) | 0     | 1.522E-142  | 0     | 271442.1073 | 0     | 0     | 0     | 0     | 1.88982E+21 | 0     | 0     |
| DRILL SOURCE (lower) | 0     | 2.5875E-143 | 0     | 46145.15824 | 0     | 0     | 0     | 0     | 3.2127E+20  | 0     | 0     |
| PARROT               | 0     | 1.2495E-143 | 0     | 18120.51415 | 0     | 0     | 0     | 0     | 1.23382E+20 | 0     | 0     |
| CASSOWARY            | 0     | 1.9223E-142 | 0     | 278777.1408 | 0     | 0     | 0     | 0     | 1.89818E+21 | 0     | 0     |
| HOPOE                | 0     | 1.9223E-142 | 0     | 278777.1408 | 0     | 0     | 0     | 0     | 1.89818E+21 | 0     | 0     |
| MUDPACK              | 0     | 2.5955E-143 | 0     | 37635.55055 | 0     | 0     | 0     | 0     | 2.56255E+20 | 0     | 0     |
| SULKY                | 0     | 9.2247E-145 | 0     | 1288.582082 | 0     | 0     | 0     | 0     | 8.73859E+18 | 0     | 0     |
| WOOL                 | 0     | 3.5555E-142 | 0     | 299057.7387 | 0     | 0     | 0     | 0     | 1.92036E+21 | 0     | 0     |
| TERN                 | 0     | 4.9062E-142 | 0     | 310259.652  | 0     | 0     | 0     | 0     | 1.93208E+21 | 0     | 0     |
| CASHMERE             | 0     | 5.5618E-142 | 0     | 314735.2179 | 0     | 0     | 0     | 0     | 1.93666E+21 | 0     | 0     |
| ALPACA               | 0     | 1.0881E-143 | 0     | 5295.132006 | 0     | 0     | 0     | 0     | 3.20579E+19 | 0     | 0     |
| MERLIN               | 0     | 3.6344E-142 | 0     | 163688.2952 | 0     | 0     | 0     | 0     | 9.82786E+20 | 0     | 0     |
| WISHBONE             | 0     | 7.5025E-142 | 0     | 325678.7307 | 0     | 0     | 0     | 0     | 1.94764E+21 | 0     | 0     |
| SEERSUCKER           | 0     | 7.6585E-142 | 0     | 326445.3493 | 0     | 0     | 0     | 0     | 1.9484E+21  | 0     | 0     |
| WAGTAIL              | 0     | 5.4588E-141 | 0     | 1849398.692 | 0     | 0     | 0     | 0     | 1.07688E+22 | 0     | 0     |
| SUEDE                | 0     | 1.4216E-141 | 0     | 350337.049  | 0     | 0     | 0     | 0     | 1.9713E+21  | 0     | 0     |
| CUP                  | 0     | 8.8865E-141 | 0     | 1955228.748 | 0     | 0     | 0     | 0     | 1.08684E+22 | 0     | 0     |
| KESTREL              | 0     | 2.0095E-141 | 0     | 364461.406  | 0     | 0     | 0     | 0     | 1.98423E+21 | 0     | 0     |
| PALANQUIN            | 0     | 5.1986E-142 | 0     | 80032.666   | 0     | 0     | 0     | 0     | 4.28104E+20 | 0     | 0     |
| GUM DROP             | 0     | 2.8293E-141 | 0     | 378982.6258 | 0     | 0     | 0     | 0     | 1.9971E+21  | 0     | 0     |
| CHENILLE             | 0     | 2.8689E-141 | 0     | 379584.9882 | 0     | 0     | 0     | 0     | 1.99762E+21 | 0     | 0     |
| MUSCOVY              | 0     | 2.9518E-141 | 0     | 380822.8581 | 0     | 0     | 0     | 0     | 1.9987E+21  | 0     | 0     |
| TEE                  | 0     | 1.3853E-141 | 0     | 137827.913  | 0     | 0     | 0     | 0     | 7.03431E+20 | 0     | 0     |
| BUTEO                | 0     | 4.413E-141  | 0     | 398718.478  | 0     | 0     | 0     | 0     | 2.01394E+21 | 0     | 0     |
| CAMBRIC              | 0     | 1.722E-142  | 0     | 15019.94317 | 0     | 0     | 0     | 0     | 7.55795E+19 | 0     | 0     |
| SCAUP                | 0     | 4.6024E-141 | 0     | 400636.6529 | 0     | 0     | 0     | 0     | 2.01554E+21 | 0     | 0     |
| TWEED                | 0     | 5.3227E-141 | 0     | 407343.7606 | 0     | 0     | 0     | 0     | 2.02108E+21 | 0     | 0     |

| Nuclide        | 140Ba | 141Ce       | 143Pr | 144Ce       | 147Nd | 149Pm | 151Pm | 153Sm | 155Eu       | 156Eu | 157Eu |
|----------------|-------|-------------|-------|-------------|-------|-------|-------|-------|-------------|-------|-------|
| PETREL         | 0     | 5.4463E-142 | 0     | 27885.45477 | 0     | 0     | 0     | 0     | 1.32501E+20 | 0     | 0     |
| ORGANDY        | 0     | 8.3843E-141 | 0     | 429038.6456 | 0     | 0     | 0     | 0     | 2.03851E+21 | 0     | 0     |
| DILUTED WATERS | 0     | 9.2949E-141 | 0     | 434119.997  | 0     | 0     | 0     | 0     | 2.04248E+21 | 0     | 0     |
| TINY TOT       | 0     | 9.4995E-141 | 0     | 435200.6722 | 0     | 0     | 0     | 0     | 2.04332E+21 | 0     | 0     |
| IZZER          | 0     | 1.7571E-140 | 0     | 466864.3099 | 0     | 0     | 0     | 0     | 2.0672E+21  | 0     | 0     |
| PONGEE         | 0     | 1.9975E-140 | 0     | 473750.1353 | 0     | 0     | 0     | 0     | 2.07221E+21 | 0     | 0     |
| BRONZE         | 0     | 1.1259E-139 | 0     | 2612946.585 | 0     | 0     | 0     | 0     | 1.14025E+22 | 0     | 0     |
| MAUVE          | 0     | 2.7604E-140 | 0     | 491579.0045 | 0     | 0     | 0     | 0     | 2.08492E+21 | 0     | 0     |
| TICKING        | 0     | 3.7887E-140 | 0     | 509679.7872 | 0     | 0     | 0     | 0     | 2.09743E+21 | 0     | 0     |
| CENTAUR        | 0     | 4.3065E-140 | 0     | 517189.5355 | 0     | 0     | 0     | 0     | 2.10251E+21 | 0     | 0     |
| SCREAMER       | 0     | 4.8179E-140 | 0     | 523859.8812 | 0     | 0     | 0     | 0     | 2.10697E+21 | 0     | 0     |
| MOA            | 0     | 4.8179E-140 | 0     | 523859.8812 | 0     | 0     | 0     | 0     | 2.10697E+21 | 0     | 0     |
| CHARCOAL       | 0     | 3.2022E-139 | 0     | 2944205.521 | 0     | 0     | 0     | 0     | 1.16299E+22 | 0     | 0     |
| ELKHART        | 0     | 6.7473E-140 | 0     | 544400.7858 | 0     | 0     | 0     | 0     | 2.12042E+21 | 0     | 0     |
| SEPIA          | 0     | 2.2332E-139 | 0     | 624133.781  | 0     | 0     | 0     | 0     | 2.16891E+21 | 0     | 0     |
| KERMET         | 0     | 2.8244E-139 | 0     | 641099.7382 | 0     | 0     | 0     | 0     | 2.17856E+21 | 0     | 0     |
| CORDUROY       | 0     | 1.9175E-138 | 0     | 3611853.018 | 0     | 0     | 0     | 0     | 1.20298E+22 | 0     | 0     |
| EMERSON        | 0     | 4.602E-139  | 0     | 677855.5632 | 0     | 0     | 0     | 0     | 2.19874E+21 | 0     | 0     |
| BUFF           | 0     | 2.5392E-138 | 0     | 3729565.968 | 0     | 0     | 0     | 0     | 1.20938E+22 | 0     | 0     |
| MAXWELL        | 0     | 8.3616E-139 | 0     | 725692.1836 | 0     | 0     | 0     | 0     | 2.22369E+21 | 0     | 0     |
| LAMPBLACK      | 0     | 5.1299E-138 | 0     | 4041420.186 | 0     | 0     | 0     | 0     | 1.22555E+22 | 0     | 0     |
| SIENNA         | 0     | 9.327E-139  | 0     | 734803.6701 | 0     | 0     | 0     | 0     | 2.22828E+21 | 0     | 0     |
| DOVEKIE        | 0     | 9.9423E-139 | 0     | 740183.4417 | 0     | 0     | 0     | 0     | 2.23097E+21 | 0     | 0     |
| REO            | 0     | 1.0128E-138 | 0     | 741749.1068 | 0     | 0     | 0     | 0     | 2.23175E+21 | 0     | 0     |
| PLAID II       | 0     | 1.3117E-138 | 0     | 763980.4236 | 0     | 0     | 0     | 0     | 2.24268E+21 | 0     | 0     |
| REX            | 0     | 1.946E-138  | 0     | 763683.6577 | 0     | 0     | 0     | 0     | 2.14857E+21 | 0     | 0     |
| RED HOT        | 0     | 2.4871E-138 | 0     | 821887.1912 | 0     | 0     | 0     | 0     | 2.26995E+21 | 0     | 0     |
| CINNAMON       | 0     | 2.5964E-138 | 0     | 825936.7118 | 0     | 0     | 0     | 0     | 2.2718E+21  | 0     | 0     |
| FINFOOT        | 0     | 2.5964E-138 | 0     | 825936.7118 | 0     | 0     | 0     | 0     | 2.2718E+21  | 0     | 0     |
| CLYMER         | 0     | 2.8871E-138 | 0     | 836004.0904 | 0     | 0     | 0     | 0     | 2.27636E+21 | 0     | 0     |
| PURPLE         | 0     | 3.2839E-138 | 0     | 848390.4242 | 0     | 0     | 0     | 0     | 2.2819E+21  | 0     | 0     |
| TEMPLAR        | 0     | 6.8796E-140 | 0     | 15919.67689 | 0     | 0     | 0     | 0     | 4.23145E+19 | 0     | 0     |
| LIME           | 0     | 4.4252E-138 | 0     | 877787.292  | 0     | 0     | 0     | 0     | 2.2948E+21  | 0     | 0     |
| STUTZ          | 0     | 4.9026E-138 | 0     | 888117.1867 | 0     | 0     | 0     | 0     | 2.29924E+21 | 0     | 0     |
| TOMATO         | 0     | 5.0463E-138 | 0     | 891051.4404 | 0     | 0     | 0     | 0     | 2.3005E+21  | 0     | 0     |
| DURYEY         | 0     | 2.0356E-137 | 0     | 3169656.727 | 0     | 0     | 0     | 0     | 8.07337E+21 | 0     | 0     |
| FENTON         | 0     | 4.9359E-139 | 0     | 64802.60136 | 0     | 0     | 0     | 0     | 1.62056E+20 | 0     | 0     |
| PIN STRIPE     | 0     | 7.3828E-138 | 0     | 930622.0603 | 0     | 0     | 0     | 0     | 2.3171E+21  | 0     | 0     |



| Nuclide        | 140Ba | 141Ce       | 143Pr | 144Ce       | 147Nd | 149Pm | 151Pm | 153Sm | 155Eu       | 156Eu | 157Eu |
|----------------|-------|-------------|-------|-------------|-------|-------|-------|-------|-------------|-------|-------|
| OCHRE          | 0     | 8.004E-138  | 0     | 939247.8955 | 0     | 0     | 0     | 0     | 2.32063E+21 | 0     | 0     |
| TRAVELER       | 0     | 8.9046E-138 | 0     | 950754.4239 | 0     | 0     | 0     | 0     | 2.32531E+21 | 0     | 0     |
| CYCLAMEN       | 0     | 5.4602E-138 | 0     | 571870.5004 | 0     | 0     | 0     | 0     | 1.39576E+21 | 0     | 0     |
| CHARTREUSE     | 0     | 3.3962E-137 | 0     | 3487715.975 | 0     | 0     | 0     | 0     | 8.49445E+21 | 0     | 0     |
| TAPESTRY       | 0     | 1.0619E-137 | 0     | 970059.5853 | 0     | 0     | 0     | 0     | 2.33306E+21 | 0     | 0     |
| PIRANHA        | 0     | 5.9337E-137 | 0     | 5345015.124 | 0     | 0     | 0     | 0     | 1.28357E+22 | 0     | 0     |
| DUMONT         | 0     | 6.7464E-137 | 0     | 5423938.541 | 0     | 0     | 0     | 0     | 1.28668E+22 | 0     | 0     |
| DISCUS THROWER | 0     | 1.6089E-137 | 0     | 1106811.402 | 0     | 0     | 0     | 0     | 2.58194E+21 | 0     | 0     |
| PILE DRIVER    | 0     | 5.1327E-137 | 0     | 3163666.455 | 0     | 0     | 0     | 0     | 7.29344E+21 | 0     | 0     |
| TAN            | 0     | 9.2903E-137 | 0     | 5625787.286 | 0     | 0     | 0     | 0     | 1.29449E+22 | 0     | 0     |
| PUCE           | 0     | 1.962E-137  | 0     | 1040511.213 | 0     | 0     | 0     | 0     | 2.36028E+21 | 0     | 0     |
| DOUBLE PLAY    | 0     | 2.1876E-137 | 0     | 1053526.819 | 0     | 0     | 0     | 0     | 2.36514E+21 | 0     | 0     |
| KANKAKEE       | 0     | 1.2043E-136 | 0     | 5795012.827 | 0     | 0     | 0     | 0     | 1.30085E+22 | 0     | 0     |
| VULCAN         | 0     | 3.3853E-137 | 0     | 1349405.447 | 0     | 0     | 0     | 0     | 2.96837E+21 | 0     | 0     |
| HALFBEAK       | 0     | 5.5233E-136 | 0     | 19952889.38 | 0     | 0     | 0     | 0     | 4.34292E+22 | 0     | 0     |
| SAXON          | 0     | 3.2799E-138 | 0     | 70180.37822 | 0     | 0     | 0     | 0     | 1.44385E+20 | 0     | 0     |
| ROVENA         | 0     | 7.1983E-137 | 0     | 1207018.557 | 0     | 0     | 0     | 0     | 2.41896E+21 | 0     | 0     |
| TANGERINE      | 0     | 7.5276E-137 | 0     | 1213199.555 | 0     | 0     | 0     | 0     | 2.421E+21   | 0     | 0     |
| DERRINGER      | 0     | 5.6862E-137 | 0     | 510248.899  | 0     | 0     | 0     | 0     | 9.56056E+20 | 0     | 0     |
| DAIQURI        | 0     | 1.8476E-136 | 0     | 1344196.254 | 0     | 0     | 0     | 0     | 2.46242E+21 | 0     | 0     |
| NEWARK         | 0     | 2.0938E-136 | 0     | 1363534.7   | 0     | 0     | 0     | 0     | 2.46824E+21 | 0     | 0     |
| KHAKI          | 0     | 2.9564E-136 | 0     | 1418328.455 | 0     | 0     | 0     | 0     | 2.48438E+21 | 0     | 0     |
| SIMMS          | 0     | 5.3007E-137 | 0     | 171593.0456 | 0     | 0     | 0     | 0     | 2.88111E+20 | 0     | 0     |
| AJAX           | 0     | 5.2258E-136 | 0     | 1513655.436 | 0     | 0     | 0     | 0     | 2.51126E+21 | 0     | 0     |
| CERISE         | 0     | 6.0836E-136 | 0     | 1540156.387 | 0     | 0     | 0     | 0     | 2.51849E+21 | 0     | 0     |
| VIGIL          | 0     | 6.6252E-136 | 0     | 1555228.738 | 0     | 0     | 0     | 0     | 2.52255E+21 | 0     | 0     |
| SIDECAR        | 0     | 1.0394E-135 | 0     | 1637312.119 | 0     | 0     | 0     | 0     | 2.5441E+21  | 0     | 0     |
| NEW POINT      | 0     | 1.0424E-135 | 0     | 1637838.357 | 0     | 0     | 0     | 0     | 2.54424E+21 | 0     | 0     |
| GREELEY        | 0     | 5.2388E-134 | 0     | 72430587.74 | 0     | 0     | 0     | 0     | 1.10977E+23 | 0     | 0     |
| RIVET I        | 0     | 2.2342E-135 | 0     | 1786821.697 | 0     | 0     | 0     | 0     | 2.58115E+21 | 0     | 0     |
| NASH           | 0     | 4.4579E-135 | 0     | 3493448.6   | 0     | 0     | 0     | 0     | 5.03542E+21 | 0     | 0     |
| BOURBON        | 0     | 1.2855E-134 | 0     | 9878263.398 | 0     | 0     | 0     | 0     | 1.42084E+22 | 0     | 0     |
| RIVET II       | 0     | 2.6564E-135 | 0     | 1822486.389 | 0     | 0     | 0     | 0     | 2.5896E+21  | 0     | 0     |
| WARD           | 0     | 3.4976E-135 | 0     | 1880651.137 | 0     | 0     | 0     | 0     | 2.60309E+21 | 0     | 0     |
| PERSIMMON      | 0     | 4.8304E-135 | 0     | 1951283.469 | 0     | 0     | 0     | 0     | 2.61902E+21 | 0     | 0     |
| AGILE          | 0     | 2.6573E-134 | 0     | 10732349.51 | 0     | 0     | 0     | 0     | 1.44047E+22 | 0     | 0     |
| RIVET III      | 0     | 5.5904E-135 | 0     | 1984117.035 | 0     | 0     | 0     | 0     | 2.62626E+21 | 0     | 0     |
| MUSHROOM       | 0     | 5.7125E-135 | 0     | 1989019.185 | 0     | 0     | 0     | 0     | 2.62733E+21 | 0     | 0     |

| Nuclide       | 140Ba | 141Ce       | 143Pr | 144Ce       | 147Nd | 149Pm | 151Pm | 153Sm | 155Eu       | 156Eu | 157Eu |
|---------------|-------|-------------|-------|-------------|-------|-------|-------|-------|-------------|-------|-------|
| FIZZ          | 0     | 6.6305E-135 | 0     | 2023154.861 | 0     | 0     | 0     | 0     | 2.63474E+21 | 0     | 0     |
| OAKLAND       | 0     | 1.1294E-134 | 0     | 2150022.47  | 0     | 0     | 0     | 0     | 2.66138E+21 | 0     | 0     |
| HEILMAN       | 0     | 1.1793E-134 | 0     | 2160667.007 | 0     | 0     | 0     | 0     | 2.66356E+21 | 0     | 0     |
| FAWN          | 0     | 1.2047E-134 | 0     | 2165935.755 | 0     | 0     | 0     | 0     | 2.66463E+21 | 0     | 0     |
| CHOCOLATE     | 0     | 1.6241E-134 | 0     | 2241095.705 | 0     | 0     | 0     | 0     | 2.67971E+21 | 0     | 0     |
| EFFENDI       | 0     | 1.8452E-134 | 0     | 2273993.166 | 0     | 0     | 0     | 0     | 2.68618E+21 | 0     | 0     |
| MICKEY        | 0     | 1.3378E-133 | 0     | 12907870.26 | 0     | 0     | 0     | 0     | 1.48513E+22 | 0     | 0     |
| COMMODORE     | 0     | 3.7678E-133 | 0     | 30063391.97 | 0     | 0     | 0     | 0     | 3.389E+22   | 0     | 0     |
| SCOTCH        | 0     | 2.4882E-133 | 0     | 18774085.31 | 0     | 0     | 0     | 0     | 2.10368E+22 | 0     | 0     |
| ABSINTHE      | 0     | 3.4181E-134 | 0     | 2439855.841 | 0     | 0     | 0     | 0     | 2.71765E+21 | 0     | 0     |
| KNICKERBOCKER | 0     | 1.3018E-133 | 0     | 9273804.918 | 0     | 0     | 0     | 0     | 1.03275E+22 | 0     | 0     |
| SWITCH        | 0     | 9.429E-135  | 0     | 403909.3996 | 0     | 0     | 0     | 0     | 4.25847E+20 | 0     | 0     |
| MIDI MIST     | 0     | 6.6416E-134 | 0     | 2632134.352 | 0     | 0     | 0     | 0     | 2.75197E+21 | 0     | 0     |
| UMBER         | 0     | 3.5258E-134 | 0     | 1325101.821 | 0     | 0     | 0     | 0     | 1.37754E+21 | 0     | 0     |
| VITO          | 0     | 9.7283E-134 | 0     | 2749394.221 | 0     | 0     | 0     | 0     | 2.77188E+21 | 0     | 0     |
| STANLEY       | 0     | 7.0569E-133 | 0     | 15607313.74 | 0     | 0     | 0     | 0     | 1.53253E+22 | 0     | 0     |
| GIBSON        | 0     | 1.5231E-133 | 0     | 2893819.136 | 0     | 0     | 0     | 0     | 2.79546E+21 | 0     | 0     |
| WASHER        | 0     | 1.7313E-133 | 0     | 2936466.904 | 0     | 0     | 0     | 0     | 2.80223E+21 | 0     | 0     |
| BORDEAUX      | 0     | 2.0645E-133 | 0     | 2996078.722 | 0     | 0     | 0     | 0     | 2.81156E+21 | 0     | 0     |
| LEXINGTON     | 0     | 2.3324E-133 | 0     | 3038113.194 | 0     | 0     | 0     | 0     | 2.81805E+21 | 0     | 0     |
| DOOR MIST     | 0     | 2.7151E-133 | 0     | 3091293.766 | 0     | 0     | 0     | 0     | 2.82615E+21 | 0     | 0     |
| YARD          | 0     | 1.7295E-132 | 0     | 17289637.2  | 0     | 0     | 0     | 0     | 1.5587E+22  | 0     | 0     |
| GILROY        | 0     | 3.7421E-133 | 0     | 3206640.712 | 0     | 0     | 0     | 0     | 2.84333E+21 | 0     | 0     |
| MARVEL        | 0     | 4.6918E-134 | 0     | 358040.8688 | 0     | 0     | 0     | 0     | 3.13541E+20 | 0     | 0     |
| ZAZA          | 0     | 2.6573E-132 | 0     | 18158656.66 | 0     | 0     | 0     | 0     | 1.5714E+22  | 0     | 0     |
| LANPHER       | 0     | 4.1493E-132 | 0     | 19106708.14 | 0     | 0     | 0     | 0     | 1.58468E+22 | 0     | 0     |
| SAZERAC       | 0     | 8.759E-133  | 0     | 3533680.591 | 0     | 0     | 0     | 0     | 2.88938E+21 | 0     | 0     |
| COGNAC        | 0     | 8.759E-133  | 0     | 3533680.591 | 0     | 0     | 0     | 0     | 2.88938E+21 | 0     | 0     |
| WORTH         | 0     | 8.7609E-133 | 0     | 3533770.242 | 0     | 0     | 0     | 0     | 2.88939E+21 | 0     | 0     |
| COBBLER       | 0     | 1.1812E-132 | 0     | 3656432.403 | 0     | 0     | 0     | 0     | 2.90575E+21 | 0     | 0     |
| POLKA         | 0     | 2.1424E-132 | 0     | 3913684.827 | 0     | 0     | 0     | 0     | 2.93862E+21 | 0     | 0     |
| STILT         | 0     | 2.6004E-132 | 0     | 4001230.438 | 0     | 0     | 0     | 0     | 2.94939E+21 | 0     | 0     |
| HUPMOBILE     | 0     | 1.9895E-132 | 0     | 1608511.687 | 0     | 0     | 0     | 0     | 1.10636E+21 | 0     | 0     |
| STACCATO      | 0     | 3.017E-131  | 0     | 23964965.5  | 0     | 0     | 0     | 0     | 1.64521E+22 | 0     | 0     |
| BRUSH         | 0     | 6.1028E-132 | 0     | 4410651.755 | 0     | 0     | 0     | 0     | 2.99731E+21 | 0     | 0     |
| CABRIOLET     | 0     | 7.3306E-133 | 0     | 509753.4126 | 0     | 0     | 0     | 0     | 3.44975E+20 | 0     | 0     |
| MALLET        | 0     | 7.0886E-132 | 0     | 4486719.469 | 0     | 0     | 0     | 0     | 3.00581E+21 | 0     | 0     |
| TORCH         | 0     | 1.1089E-131 | 0     | 4721926.394 | 0     | 0     | 0     | 0     | 3.03132E+21 | 0     | 0     |

| Nuclide      | 140Ba | 141Ce       | 143Pr | 144Ce        | 147Nd | 149Pm | 151Pm | 153Sm | 155Eu       | 156Eu | 157Eu |
|--------------|-------|-------------|-------|--------------|-------|-------|-------|-------|-------------|-------|-------|
| KNOX         | 0     | 6.1015E-131 | 0     | 25971912.94  | 0     | 0     | 0     | 0     | 1.66724E+22 | 0     | 0     |
| DORSAL FIN   | 0     | 1.3177E-131 | 0     | 4815877.615  | 0     | 0     | 0     | 0     | 3.04122E+21 | 0     | 0     |
| RUSSET       | 0     | 1.4638E-131 | 0     | 4874069.76   | 0     | 0     | 0     | 0     | 3.04727E+21 | 0     | 0     |
| BUGGY D      | 0     | 9.1901E-133 | 0     | 267767.9895  | 0     | 0     | 0     | 0     | 1.65021E+20 | 0     | 0     |
| BUGGY B      | 0     | 9.1901E-133 | 0     | 267767.9895  | 0     | 0     | 0     | 0     | 1.65021E+20 | 0     | 0     |
| BUGGY A      | 0     | 9.1901E-133 | 0     | 267767.9895  | 0     | 0     | 0     | 0     | 1.65021E+20 | 0     | 0     |
| BUGGY E      | 0     | 9.1901E-133 | 0     | 267767.9895  | 0     | 0     | 0     | 0     | 1.65021E+20 | 0     | 0     |
| BUGGY C      | 0     | 9.1901E-133 | 0     | 267767.9895  | 0     | 0     | 0     | 0     | 1.65021E+20 | 0     | 0     |
| POMMARD      | 0     | 1.33E-132   | 0     | 373649.5774  | 0     | 0     | 0     | 0     | 2.29374E+20 | 0     | 0     |
| STINGER      | 0     | 1.1564E-130 | 0     | 27939189.7   | 0     | 0     | 0     | 0     | 1.6875E+22  | 0     | 0     |
| MILK SHAKE   | 0     | 2.249E-131  | 0     | 5119047.668  | 0     | 0     | 0     | 0     | 3.07209E+21 | 0     | 0     |
| BEVEL        | 0     | 2.7745E-131 | 0     | 5243280.329  | 0     | 0     | 0     | 0     | 3.0843E+21  | 0     | 0     |
| NOOR         | 0     | 1.7327E-130 | 0     | 29259480.22  | 0     | 0     | 0     | 0     | 1.70044E+22 | 0     | 0     |
| THROW        | 0     | 3.1503E-131 | 0     | 5319905.494  | 0     | 0     | 0     | 0     | 3.09171E+21 | 0     | 0     |
| SHUFFLE      | 0     | 2.0552E-130 | 0     | 29835417.57  | 0     | 0     | 0     | 0     | 1.70593E+22 | 0     | 0     |
| SCROLL       | 0     | 4.1681E-131 | 0     | 5492723.369  | 0     | 0     | 0     | 0     | 3.1081E+21  | 0     | 0     |
| BOXCAR       | 0     | 2.8831E-129 | 0     | 35957130.6.6 | 0     | 0     | 0     | 0     | 2.02264E+23 | 0     | 0     |
| HATCHET      | 0     | 5.1542E-131 | 0     | 5627556.378  | 0     | 0     | 0     | 0     | 3.1206E+21  | 0     | 0     |
| CROCK        | 0     | 5.7249E-131 | 0     | 5695445.578  | 0     | 0     | 0     | 0     | 3.1268E+21  | 0     | 0     |
| CLARKSMOBILE | 0     | 3.811E-130  | 0     | 32015371.79  | 0     | 0     | 0     | 0     | 1.72595E+22 | 0     | 0     |
| ADZE         | 0     | 8.7749E-131 | 0     | 5980094.098  | 0     | 0     | 0     | 0     | 3.15213E+21 | 0     | 0     |
| WEMBLEY      | 0     | 1.0404E-130 | 0     | 6097511.067  | 0     | 0     | 0     | 0     | 3.16228E+21 | 0     | 0     |
| TUB C        | 0     | 1.0696E-130 | 0     | 6116811.195  | 0     | 0     | 0     | 0     | 3.16393E+21 | 0     | 0     |
| TUB A        | 0     | 1.0696E-130 | 0     | 6116811.195  | 0     | 0     | 0     | 0     | 3.16393E+21 | 0     | 0     |
| TUB F        | 0     | 1.0696E-130 | 0     | 6116811.195  | 0     | 0     | 0     | 0     | 3.16393E+21 | 0     | 0     |
| TUB B        | 0     | 1.0696E-130 | 0     | 6116811.195  | 0     | 0     | 0     | 0     | 3.16393E+21 | 0     | 0     |
| TUB D        | 0     | 1.0696E-130 | 0     | 6116811.195  | 0     | 0     | 0     | 0     | 3.16393E+21 | 0     | 0     |
| RICKEY       | 0     | 7.0801E-130 | 0     | 34361870.4   | 0     | 0     | 0     | 0     | 1.74627E+22 | 0     | 0     |
| SEVILLA      | 0     | 1.5954E-130 | 0     | 6402616.883  | 0     | 0     | 0     | 0     | 3.18793E+21 | 0     | 0     |
| FUNNEL       | 0     | 1.5954E-130 | 0     | 6402616.883  | 0     | 0     | 0     | 0     | 3.18793E+21 | 0     | 0     |
| CHATEAUGAY   | 0     | 9.3287E-130 | 0     | 35461353.09  | 0     | 0     | 0     | 0     | 1.75539E+22 | 0     | 0     |
| SPUD         | 0     | 2.5473E-130 | 0     | 6754006.438  | 0     | 0     | 0     | 0     | 3.21623E+21 | 0     | 0     |
| TANYA        | 0     | 1.847E-129  | 0     | 38338099.43  | 0     | 0     | 0     | 0     | 1.77819E+22 | 0     | 0     |
| IMP          | 0     | 4.1565E-130 | 0     | 7142416.819  | 0     | 0     | 0     | 0     | 3.24612E+21 | 0     | 0     |
| RACK         | 0     | 4.7407E-130 | 0     | 7250498.389  | 0     | 0     | 0     | 0     | 3.2542E+21  | 0     | 0     |
| DIANA MOON   | 0     | 6.1207E-130 | 0     | 7465150.814  | 0     | 0     | 0     | 0     | 3.26994E+21 | 0     | 0     |
| SLED         | 0     | 3.5327E-129 | 0     | 41284990.24  | 0     | 0     | 0     | 0     | 1.80011E+22 | 0     | 0     |
| NOGGIN       | 0     | 4.1574E-129 | 0     | 42059915.57  | 0     | 0     | 0     | 0     | 1.80565E+22 | 0     | 0     |

| Nuclide     | 140Ba | 141Ce       | 143Pr | 144Ce        | 147Nd | 149Pm | 151Pm | 153Sm | 155Eu       | 156Eu | 157Eu |
|-------------|-------|-------------|-------|--------------|-------|-------|-------|-------|-------------|-------|-------|
| KNIFE A     | 0     | 8.5909E-130 | 0     | 7759827.871  | 0     | 0     | 0     | 0     | 3.29095E+21 | 0     | 0     |
| STODDARD    | 0     | 1.4814E-129 | 0     | 12175097.19  | 0     | 0     | 0     | 0     | 5.11126E+21 | 0     | 0     |
| HUDSON SEAL | 0     | 1.1127E-129 | 0     | 7992465.138  | 0     | 0     | 0     | 0     | 3.30707E+21 | 0     | 0     |
| WELDER      | 0     | 1.3445E-129 | 0     | 8167035.072  | 0     | 0     | 0     | 0     | 3.31891E+21 | 0     | 0     |
| KNIFE C     | 0     | 1.345E-129  | 0     | 8167435.663  | 0     | 0     | 0     | 0     | 3.31894E+21 | 0     | 0     |
| VAT         | 0     | 1.5616E-129 | 0     | 8307886.747  | 0     | 0     | 0     | 0     | 3.32832E+21 | 0     | 0     |
| HULA        | 0     | 2.3442E-129 | 0     | 8702337.44   | 0     | 0     | 0     | 0     | 3.35395E+21 | 0     | 0     |
| BIT B       | 0     | 2.4526E-129 | 0     | 8747404.076  | 0     | 0     | 0     | 0     | 3.35682E+21 | 0     | 0     |
| FILE        | 0     | 2.4526E-129 | 0     | 8747404.076  | 0     | 0     | 0     | 0     | 3.35682E+21 | 0     | 0     |
| BIT A       | 0     | 2.4526E-129 | 0     | 8747404.076  | 0     | 0     | 0     | 0     | 3.35682E+21 | 0     | 0     |
| CREW 2nd    | 0     | 2.6634E-129 | 0     | 8830125.476  | 0     | 0     | 0     | 0     | 3.36205E+21 | 0     | 0     |
| CREW 3rd    | 0     | 2.6634E-129 | 0     | 8830125.476  | 0     | 0     | 0     | 0     | 3.36205E+21 | 0     | 0     |
| CREW        | 0     | 1.4648E-128 | 0     | 48565690.12  | 0     | 0     | 0     | 0     | 1.84913E+22 | 0     | 0     |
| AUGER       | 0     | 3.3683E-129 | 0     | 9070117.734  | 0     | 0     | 0     | 0     | 3.377E+21   | 0     | 0     |
| KNIFE B     | 0     | 3.3691E-129 | 0     | 9070347.845  | 0     | 0     | 0     | 0     | 3.37702E+21 | 0     | 0     |
| MING VASE   | 0     | 3.7557E-129 | 0     | 9183574.539  | 0     | 0     | 0     | 0     | 3.38395E+21 | 0     | 0     |
| TINDERBOX   | 0     | 3.9135E-129 | 0     | 9226840.805  | 0     | 0     | 0     | 0     | 3.38659E+21 | 0     | 0     |
| SCHOONER    | 0     | 8.2553E-129 | 0     | 14389775.31  | 0     | 0     | 0     | 0     | 5.11271E+21 | 0     | 0     |
| BAY LEAF    | 0     | 5.9883E-129 | 0     | 9686114.576  | 0     | 0     | 0     | 0     | 3.41391E+21 | 0     | 0     |
| TYG F       | 0     | 5.9892E-129 | 0     | 9686278.401  | 0     | 0     | 0     | 0     | 3.41392E+21 | 0     | 0     |
| TYG A       | 0     | 5.9892E-129 | 0     | 9686278.401  | 0     | 0     | 0     | 0     | 3.41392E+21 | 0     | 0     |
| TYG D       | 0     | 5.9892E-129 | 0     | 9686278.401  | 0     | 0     | 0     | 0     | 3.41392E+21 | 0     | 0     |
| TYG C       | 0     | 5.9892E-129 | 0     | 9686278.401  | 0     | 0     | 0     | 0     | 3.41392E+21 | 0     | 0     |
| TYG B       | 0     | 5.9892E-129 | 0     | 9686278.401  | 0     | 0     | 0     | 0     | 3.41392E+21 | 0     | 0     |
| TYG E       | 0     | 5.9892E-129 | 0     | 9686278.401  | 0     | 0     | 0     | 0     | 3.41392E+21 | 0     | 0     |
| SCISSORS    | 0     | 5.9901E-129 | 0     | 9686442.23   | 0     | 0     | 0     | 0     | 3.41393E+21 | 0     | 0     |
| BENHAM      | 0     | 4.003E-127  | 0     | 56661447.5.9 | 0     | 0     | 0     | 0     | 1.96859E+23 | 0     | 0     |
| PACKARD     | 0     | 6.205E-129  | 0     | 5263307.203  | 0     | 0     | 0     | 0     | 1.73062E+21 | 0     | 0     |
| WINESKIN    | 0     | 6.8286E-128 | 0     | 57899316.96  | 0     | 0     | 0     | 0     | 1.90369E+22 | 0     | 0     |
| SHAVE       | 0     | 1.4357E-128 | 0     | 10703271.39  | 0     | 0     | 0     | 0     | 3.47078E+21 | 0     | 0     |
| WISE        | 0     | 9.3655E-128 | 0     | 60026230     | 0     | 0     | 0     | 0     | 1.91509E+22 | 0     | 0     |
| BIGGIN      | 0     | 1.7032E-128 | 0     | 10914173.81  | 0     | 0     | 0     | 0     | 3.482E+21   | 0     | 0     |
| NIPPER      | 0     | 1.8944E-128 | 0     | 11047576.79  | 0     | 0     | 0     | 0     | 3.489E+21   | 0     | 0     |
| WINCH       | 0     | 1.8944E-128 | 0     | 11047576.79  | 0     | 0     | 0     | 0     | 3.489E+21   | 0     | 0     |
| CYPRESS     | 0     | 2.2495E-128 | 0     | 11266432.55  | 0     | 0     | 0     | 0     | 3.50034E+21 | 0     | 0     |
| VALISE      | 0     | 4.6378E-128 | 0     | 12236850.62  | 0     | 0     | 0     | 0     | 3.54852E+21 | 0     | 0     |
| CHATTY      | 0     | 4.6385E-128 | 0     | 12237057.59  | 0     | 0     | 0     | 0     | 3.54853E+21 | 0     | 0     |
| BARSAC      | 0     | 4.8558E-128 | 0     | 12301220     | 0     | 0     | 0     | 0     | 3.5516E+21  | 0     | 0     |

| Nuclide      | 140Ba | 141Ce       | 143Pr | 144Ce       | 147Nd | 149Pm | 151Pm | 153Sm | 155Eu       | 156Eu       | 157Eu |
|--------------|-------|-------------|-------|-------------|-------|-------|-------|-------|-------------|-------------|-------|
| COFFER       | 0     | 2.4721E-127 | 0     | 61632935.53 | 0     | 0     | 0     | 0     | 1.7764E+22  | 0           | 0     |
| GOURD BROWN  | 0     | 1.0197E-127 | 0     | 13388826.18 | 0     | 0     | 0     | 0     | 3.60173E+21 | 0           | 0     |
| GOURD AMBER  | 0     | 1.0197E-127 | 0     | 13388826.18 | 0     | 0     | 0     | 0     | 3.60173E+21 | 0           | 0     |
| BLENTON      | 0     | 6.3962E-127 | 0     | 74752362.71 | 0     | 0     | 0     | 0     | 1.98588E+22 | 0           | 0     |
| THISTLE      | 0     | 6.3962E-127 | 0     | 74752362.71 | 0     | 0     | 0     | 0     | 1.98588E+22 | 0           | 0     |
| PURSE        | 0     | 7.4047E-127 | 0     | 76012637.26 | 0     | 0     | 0     | 0     | 1.99138E+22 | 7.0962E-299 | 0     |
| ALIMENT      | 0     | 1.6028E-127 | 0     | 14098478.9  | 0     | 0     | 0     | 0     | 3.63263E+21 | 1.2902E-299 | 0     |
| IPECAC A     | 0     | 2.063E-127  | 0     | 14510712.31 | 0     | 0     | 0     | 0     | 3.64999E+21 | 2.5805E-299 | 0     |
| IPECAC B     | 0     | 2.063E-127  | 0     | 14510712.31 | 0     | 0     | 0     | 0     | 3.64999E+21 | 2.5805E-299 | 0     |
| TORRIDO      | 0     | 1.1349E-126 | 0     | 79810942.48 | 0     | 0     | 0     | 0     | 2.00751E+22 | 1.4192E-298 | 0     |
| TAPPER       | 0     | 2.9019E-127 | 0     | 15087330.85 | 0     | 0     | 0     | 0     | 3.6736E+21  | 3.8707E-299 | 0     |
| BOWL-1       | 0     | 3.9186E-127 | 0     | 15613806.04 | 0     | 0     | 0     | 0     | 3.69451E+21 | 9.0316E-299 | 0     |
| BOWL-2       | 0     | 3.9186E-127 | 0     | 15613806.04 | 0     | 0     | 0     | 0     | 3.69451E+21 | 9.0316E-299 | 0     |
| ILDRIM       | 0     | 3.2931E-126 | 0     | 90135462.64 | 0     | 0     | 0     | 0     | 2.04832E+22 | 1.1354E-297 | 0     |
| HUTCH        | 0     | 3.2986E-126 | 0     | 90152614.76 | 0     | 0     | 0     | 0     | 2.04838E+22 | 1.1354E-297 | 0     |
| SPIDER B     | 0     | 1.1128E-126 | 0     | 17590227.18 | 0     | 0     | 0     | 0     | 3.76808E+21 | 7.9994E-298 | 0     |
| SPIDER A     | 0     | 1.1128E-126 | 0     | 17590227.18 | 0     | 0     | 0     | 0     | 3.76808E+21 | 7.9994E-298 | 0     |
| PLIERS       | 0     | 1.4674E-126 | 0     | 18154692.03 | 0     | 0     | 0     | 0     | 3.78782E+21 | 1.4322E-297 | 0     |
| HOREHOUND    | 0     | 1.4674E-126 | 0     | 18154692.03 | 0     | 0     | 0     | 0     | 3.78782E+21 | 1.4322E-297 | 0     |
| MINUTE STEAK | 0     | 2.072E-126  | 0     | 18884330.32 | 0     | 0     | 0     | 0     | 3.81259E+21 | 3.0062E-297 | 0     |
| JORUM        | 0     | 1.1247E-124 | 0     | 95311772.7  | 0     | 0     | 0     | 0     | 1.90926E+23 | 1.7934E-295 | 0     |
| KYACK A      | 0     | 2.4498E-126 | 0     | 19248968.56 | 0     | 0     | 0     | 0     | 3.82467E+21 | 4.3094E-297 | 0     |
| KYACK B      | 0     | 2.4498E-126 | 0     | 19248968.56 | 0     | 0     | 0     | 0     | 3.82467E+21 | 4.3094E-297 | 0     |
| SEAWEED D    | 0     | 3.0975E-126 | 0     | 19771630.91 | 0     | 0     | 0     | 0     | 3.84166E+21 | 7.1091E-297 | 0     |
| SEAWEED E    | 0     | 3.0975E-126 | 0     | 19771630.91 | 0     | 0     | 0     | 0     | 3.84166E+21 | 7.1091E-297 | 0     |
| SEAWEED C    | 0     | 3.0975E-126 | 0     | 19771630.91 | 0     | 0     | 0     | 0     | 3.84166E+21 | 7.1091E-297 | 0     |
| PIPKIN       | 0     | 1.0789E-124 | 0     | 60334797.62 | 0     | 0     | 0     | 0     | 1.15575E+23 | 2.934E-295  | 0     |
| SEAWEED B    | 0     | 4.2634E-126 | 0     | 20506257.69 | 0     | 0     | 0     | 0     | 3.86492E+21 | 1.4076E-296 | 0     |
| CRUET        | 0     | 3.1093E-126 | 0     | 11647748.6  | 0     | 0     | 0     | 0     | 2.13706E+21 | 1.415E-296  | 0     |
| POD D        | 0     | 5.6557E-126 | 0     | 21178799.3  | 0     | 0     | 0     | 0     | 3.8856E+21  | 2.5753E-296 | 0     |
| POD C        | 0     | 5.6557E-126 | 0     | 21178799.3  | 0     | 0     | 0     | 0     | 3.8856E+21  | 2.5753E-296 | 0     |
| POD B        | 0     | 5.6557E-126 | 0     | 21178799.3  | 0     | 0     | 0     | 0     | 3.8856E+21  | 2.5753E-296 | 0     |
| POD A        | 0     | 5.6557E-126 | 0     | 21178821.99 | 0     | 0     | 0     | 0     | 3.8856E+21  | 2.5753E-296 | 0     |
| CALABASH     | 0     | 3.1163E-125 | 0     | 11650740.45 | 0     | 0     | 0     | 0     | 2.13715E+22 | 1.4214E-295 | 0     |
| SCUTTLE      | 0     | 6.5919E-127 | 0     | 1866280.293 | 0     | 0     | 0     | 0     | 3.32252E+20 | 4.299E-297  | 0     |
| PICCALILLI   | 0     | 5.0571E-125 | 0     | 12313048.23 | 0     | 0     | 0     | 0     | 2.15679E+22 | 4.003E-295  | 0     |
| PLANER       | 0     | 9.1948E-126 | 0     | 22387360.42 | 0     | 0     | 0     | 0     | 3.92144E+21 | 7.2782E-296 | 0     |
| DIESEL TRAIN | 0     | 1.2418E-125 | 0     | 23168884.98 | 0     | 0     | 0     | 0     | 3.94377E+21 | 1.3838E-295 | 0     |

| Nuclide        | 140Ba | 141Ce       | 143Pr | 144Ce        | 147Nd | 149Pm | 151Pm | 153Sm | 155Eu       | 156Eu       | 157Eu |
|----------------|-------|-------------|-------|--------------|-------|-------|-------|-------|-------------|-------------|-------|
| CULANTRO B     | 0     | 1.379E-125  | 0     | 23447991.07  | 0     | 0     | 0     | 0     | 3.95159E+21 | 1.7316E-295 | 0     |
| CULANTRO A     | 0     | 1.379E-125  | 0     | 23447991.07  | 0     | 0     | 0     | 0     | 3.95159E+21 | 1.7316E-295 | 0     |
| TUN A          | 0     | 1.3797E-125 | 0     | 23449180.85  | 0     | 0     | 0     | 0     | 3.95162E+21 | 1.7332E-295 | 0     |
| TUN C          | 0     | 1.3797E-125 | 0     | 23449180.85  | 0     | 0     | 0     | 0     | 3.95162E+21 | 1.7332E-295 | 0     |
| TUN B          | 0     | 1.3797E-125 | 0     | 23449180.85  | 0     | 0     | 0     | 0     | 3.95162E+21 | 1.7332E-295 | 0     |
| TUN D          | 0     | 1.3797E-125 | 0     | 23449180.85  | 0     | 0     | 0     | 0     | 3.95162E+21 | 1.7332E-295 | 0     |
| GRAPE A        | 0     | 8.806E-125  | 0     | 13118145.4   | 0     | 0     | 0     | 0     | 2.17951E+22 | 1.3105E-294 | 0     |
| LOVAGE         | 0     | 1.6015E-125 | 0     | 23851778.57  | 0     | 0     | 0     | 0     | 3.96276E+21 | 2.3838E-295 | 0     |
| TERRINE WHITE  | 0     | 9.0279E-125 | 0     | 13155472.7.4 | 0     | 0     | 0     | 0     | 2.18054E+22 | 1.3821E-294 | 0     |
| TERRINE YELLOW | 0     | 9.0279E-125 | 0     | 13155472.7.4 | 0     | 0     | 0     | 0     | 2.18054E+22 | 1.3821E-294 | 0     |
| FOB BLUE       | 0     | 3.5294E-125 | 0     | 26104289.31  | 0     | 0     | 0     | 0     | 4.02237E+21 | 1.2915E-294 | 0     |
| FOB RED        | 0     | 3.5294E-125 | 0     | 26104289.31  | 0     | 0     | 0     | 0     | 4.02237E+21 | 1.2915E-294 | 0     |
| FOB GREEN      | 0     | 3.5294E-125 | 0     | 26104289.31  | 0     | 0     | 0     | 0     | 4.02237E+21 | 1.2915E-294 | 0     |
| AJO            | 0     | 4.0996E-125 | 0     | 26554493.43  | 0     | 0     | 0     | 0     | 4.03376E+21 | 1.7788E-294 | 0     |
| GRAPE B        | 0     | 2.5085E-124 | 0     | 14783911.7.4 | 0     | 0     | 0     | 0     | 2.22304E+22 | 1.2289E-293 | 0     |
| BELEN          | 0     | 2.5085E-124 | 0     | 14783911.7.4 | 0     | 0     | 0     | 0     | 2.22304E+22 | 1.2289E-293 | 0     |
| LABIS          | 0     | 5.8137E-125 | 0     | 33674896.57  | 0     | 0     | 0     | 0     | 5.05424E+21 | 2.9122E-294 | 0     |
| DIANA MIST     | 0     | 5.3059E-125 | 0     | 27348275.4   | 0     | 0     | 0     | 0     | 4.05346E+21 | 3.0877E-294 | 0     |
| CUMARIN        | 0     | 3.917E-124  | 0     | 15555734.0.6 | 0     | 0     | 0     | 0     | 2.24184E+22 | 3.1866E-293 | 0     |
| YANNIGAN RED   | 0     | 4.005E-124  | 0     | 15595285.0   | 0     | 0     | 0     | 0     | 2.24278E+22 | 3.3418E-293 | 0     |
| YANNIGAN BLUE  | 0     | 4.005E-124  | 0     | 15595285.0   | 0     | 0     | 0     | 0     | 2.24278E+22 | 3.3418E-293 | 0     |
| YANNIGAN WHITE | 0     | 4.005E-124  | 0     | 15595285.0   | 0     | 0     | 0     | 0     | 2.24278E+22 | 3.3418E-293 | 0     |
| CYATHUS        | 0     | 3.7533E-125 | 0     | 12575731.53  | 0     | 0     | 0     | 0     | 1.77953E+21 | 3.7987E-294 | 0     |
| ARABIS RED     | 0     | 8.6328E-125 | 0     | 28911487.14  | 0     | 0     | 0     | 0     | 4.09091E+21 | 8.7425E-294 | 0     |
| ARABIS BLUE    | 0     | 8.6328E-125 | 0     | 28911487.14  | 0     | 0     | 0     | 0     | 4.09091E+21 | 8.7425E-294 | 0     |
| ARABIS GREEN   | 0     | 8.6328E-125 | 0     | 28911487.14  | 0     | 0     | 0     | 0     | 4.09091E+21 | 8.7425E-294 | 0     |
| JAL            | 0     | 1.1382E-124 | 0     | 29838667.28  | 0     | 0     | 0     | 0     | 4.11233E+21 | 1.5788E-293 | 0     |
| SHAPER         | 0     | 6.8722E-124 | 0     | 16587112.2.1 | 0     | 0     | 0     | 0     | 2.26577E+22 | 1.0601E-292 | 0     |
| HANDLEY        | 0     | 6.6361E-123 | 0     | 15183480.17  | 0     | 0     | 0     | 0     | 2.06214E+23 | 1.0965E-291 | 0     |
| SNUBBER        | 0     | 1.4615E-124 | 0     | 20534196.17  | 0     | 0     | 0     | 0     | 2.6463E+21  | 4.5187E-293 | 0     |
| CAN RED        | 0     | 1.2664E-123 | 0     | 17786426.7   | 0     | 0     | 0     | 0     | 2.29209E+22 | 3.9175E-292 | 0     |
| CAN GREEN      | 0     | 1.2664E-123 | 0     | 17786426.7   | 0     | 0     | 0     | 0     | 2.29209E+22 | 3.9175E-292 | 0     |
| BEEBALM        | 0     | 2.848E-124  | 0     | 33133613.02  | 0     | 0     | 0     | 0     | 4.18421E+21 | 1.1221E-292 | 0     |
| HOD C (BLUE)   | 0     | 2.8492E-124 | 0     | 33135126.13  | 0     | 0     | 0     | 0     | 4.18424E+21 | 1.1231E-292 | 0     |
| HOD B (RED)    | 0     | 2.8492E-124 | 0     | 33135126.13  | 0     | 0     | 0     | 0     | 4.18424E+21 | 1.1231E-292 | 0     |
| HOD A (GREEN)  | 0     | 2.8492E-124 | 0     | 33135126.13  | 0     | 0     | 0     | 0     | 4.18424E+21 | 1.1231E-292 | 0     |
| MINT LEAF      | 0     | 3.1052E-124 | 0     | 33462337.51  | 0     | 0     | 0     | 0     | 4.19105E+21 | 1.35E-292   | 0     |
| DIAMOND DUST   | 0     | 3.6004E-124 | 0     | 34032533.3   | 0     | 0     | 0     | 0     | 4.20278E+21 | 1.8523E-292 | 0     |

| Nuclide          | 140Ba | 141Ce       | 143Pr | 144Ce           | 147Nd | 149Pm | 151Pm | 153Sm | 155Eu       | 156Eu       | 157Eu |
|------------------|-------|-------------|-------|-----------------|-------|-------|-------|-------|-------------|-------------|-------|
| CORNICE YELLOW   | 0     | 2.1101E-123 | 0     | 18854200<br>5.4 | 0     | 0     | 0     | 0     | 2.31431E+22 | 1.167E-291  | 0     |
| CORNICE GREEN    | 0     | 2.1101E-123 | 0     | 18854200<br>5.4 | 0     | 0     | 0     | 0     | 2.31431E+22 | 1.167E-291  | 0     |
| MANZANAS         | 0     | 4.3623E-124 | 0     | 34786749<br>.46 | 0     | 0     | 0     | 0     | 4.21805E+21 | 2.7923E-292 | 0     |
| MORRONES         | 0     | 2.3998E-123 | 0     | 19133197<br>6.1 | 0     | 0     | 0     | 0     | 2.31994E+22 | 1.5365E-291 | 0     |
| HUDSON MOON      | 0     | 4.8543E-124 | 0     | 35213910<br>.21 | 0     | 0     | 0     | 0     | 4.22657E+21 | 3.5092E-292 | 0     |
| FLASK GREEN      | 0     | 2.5502E-123 | 0     | 18488678<br>7.1 | 0     | 0     | 0     | 0     | 2.21898E+22 | 1.8449E-291 | 0     |
| FLASK RED        | 0     | 8.5006E-127 | 0     | 61628.92<br>904 | 0     | 0     | 0     | 0     | 7.39659E+18 | 6.1496E-295 | 0     |
| FLASK YELLOW     | 0     | 2.1859E-126 | 0     | 158474.3<br>889 | 0     | 0     | 0     | 0     | 1.90198E+19 | 1.5813E-294 | 0     |
| PITON C          | 0     | 5.0545E-124 | 0     | 35376820<br>.51 | 0     | 0     | 0     | 0     | 4.2298E+21  | 3.8259E-292 | 0     |
| PITON B          | 0     | 5.0557E-124 | 0     | 35377718<br>.02 | 0     | 0     | 0     | 0     | 4.22982E+21 | 3.8277E-292 | 0     |
| PITON A          | 0     | 5.0557E-124 | 0     | 35377718<br>.02 | 0     | 0     | 0     | 0     | 4.22982E+21 | 3.8277E-292 | 0     |
| ARNICA YELLOW    | 0     | 9.3924E-124 | 0     | 37970652<br>.65 | 0     | 0     | 0     | 0     | 4.2796E+21  | 1.4391E-291 | 0     |
| ARNICA VIOLET    | 0     | 9.3924E-124 | 0     | 37970652<br>.65 | 0     | 0     | 0     | 0     | 4.2796E+21  | 1.4391E-291 | 0     |
| SCREE CHAMOIS    | 0     | 9.6203E-123 | 0     | 49525909<br>.91 | 0     | 0     | 0     | 0     | 4.4719E+21  | 2.0822E-289 | 0     |
| SCREE ACAJOU     | 0     | 9.6203E-123 | 0     | 49525909<br>.91 | 0     | 0     | 0     | 0     | 4.4719E+21  | 2.0822E-289 | 0     |
| SCREE ALHAMBRA   | 0     | 9.6203E-123 | 0     | 49525909<br>.91 | 0     | 0     | 0     | 0     | 4.4719E+21  | 2.0822E-289 | 0     |
| TIJERAS          | 0     | 5.4024E-122 | 0     | 27304056<br>5.2 | 0     | 0     | 0     | 0     | 2.46051E+22 | 1.1973E-288 | 0     |
| TRUCHAS CHACON   | 0     | 1.324E-122  | 0     | 51365640<br>.34 | 0     | 0     | 0     | 0     | 4.49897E+21 | 4.122E-289  | 0     |
| TRUCHAS CHAMISAL | 0     | 1.324E-122  | 0     | 51365640<br>.34 | 0     | 0     | 0     | 0     | 4.49897E+21 | 4.122E-289  | 0     |
| TRUCHAS RODARTE  | 0     | 1.324E-122  | 0     | 51365640<br>.34 | 0     | 0     | 0     | 0     | 4.49897E+21 | 4.122E-289  | 0     |
| ABEYAS           | 0     | 8.6408E-122 | 0     | 28808408<br>9.3 | 0     | 0     | 0     | 0     | 2.48244E+22 | 3.2683E-288 | 0     |
| PENASCO          | 0     | 2.1177E-122 | 0     | 54195696<br>.94 | 0     | 0     | 0     | 0     | 4.53906E+21 | 1.1252E-288 | 0     |
| CARRIZOZO        | 0     | 2.8549E-122 | 0     | 56076147<br>.46 | 0     | 0     | 0     | 0     | 4.56475E+21 | 2.131E-288  | 0     |
| CORAZON          | 0     | 2.8549E-122 | 0     | 56076147<br>.46 | 0     | 0     | 0     | 0     | 4.56475E+21 | 2.131E-288  | 0     |
| CANJILON         | 0     | 3.77E-122   | 0     | 57885207<br>.07 | 0     | 0     | 0     | 0     | 4.58879E+21 | 3.8617E-288 | 0     |
| ARTESIA          | 0     | 2.0735E-121 | 0     | 31836863<br>8.9 | 0     | 0     | 0     | 0     | 2.52383E+22 | 2.1239E-287 | 0     |
| AVENS ALKERMES   | 0     | 3.77E-122   | 0     | 57885207<br>.07 | 0     | 0     | 0     | 0     | 4.58879E+21 | 3.8617E-288 | 0     |
| AVENS ANDORRE    | 0     | 3.77E-122   | 0     | 57885207<br>.07 | 0     | 0     | 0     | 0     | 4.58879E+21 | 3.8617E-288 | 0     |
| AVENS CREAM      | 0     | 3.77E-122   | 0     | 57885207<br>.07 | 0     | 0     | 0     | 0     | 4.58879E+21 | 3.8617E-288 | 0     |
| AVENS ASAMITE    | 0     | 3.77E-122   | 0     | 57885207<br>.07 | 0     | 0     | 0     | 0     | 4.58879E+21 | 3.8617E-288 | 0     |
| CARPETBAG        | 0     | 4.2367E-121 | 0     | 63829534<br>7.9 | 0     | 0     | 0     | 0     | 5.04971E+22 | 4.4467E-287 | 0     |
| BANE BERRY       | 0     | 1.9663E-122 | 0     | 29082451<br>.98 | 0     | 0     | 0     | 0     | 2.29622E+21 | 2.1132E-288 | 0     |
| EMBUDO           | 0     | 1.8267E-120 | 0     | 90161900<br>.57 | 0     | 0     | 0     | 0     | 4.93783E+21 | 1.5497E-284 | 0     |
| DEXTER           | 0     | 2.1192E-120 | 0     | 91704456<br>.65 | 0     | 0     | 0     | 0     | 4.95171E+21 | 2.1291E-284 | 0     |
| LAGUNA           | 0     | 1.1671E-119 | 0     | 50445129<br>3.1 | 0     | 0     | 0     | 0     | 2.72351E+22 | 1.1743E-283 | 0     |
| HAREBELL         | 0     | 1.1907E-119 | 0     | 50560441<br>9.7 | 0     | 0     | 0     | 0     | 2.72454E+22 | 1.2256E-283 | 0     |
| CAMPHOR          | 0     | 2.4182E-120 | 0     | 93096884<br>.44 | 0     | 0     | 0     | 0     | 4.96407E+21 | 2.8232E-284 | 0     |
| DIAMOND MINE     | 0     | 2.5135E-120 | 0     | 93508756<br>.8  | 0     | 0     | 0     | 0     | 4.9677E+21  | 3.0664E-284 | 0     |

| Nuclide          | 140Ba | 141Ce       | 143Pr | 144Ce           | 147Nd | 149Pm | 151Pm | 153Sm | 155Eu       | 156Eu       | 157Eu |
|------------------|-------|-------------|-------|-----------------|-------|-------|-------|-------|-------------|-------------|-------|
| MINIATA          | 0     | 1.211E-119  | 0     | 39473395<br>9.3 | 0     | 0     | 0     | 0     | 2.06742E+22 | 1.7511E-283 | 0     |
| BRACKEN          | 0     | 2.9811E-120 | 0     | 95348556<br>.85 | 0     | 0     | 0     | 0     | 4.98374E+21 | 4.4164E-284 | 0     |
| APODACA          | 0     | 3.849E-120  | 0     | 98171867<br>.67 | 0     | 0     | 0     | 0     | 5.00785E+21 | 7.627E-284  | 0     |
| BARRANCA         | 0     | 5.188E-120  | 0     | 10157645<br>9.6 | 0     | 0     | 0     | 0     | 5.03618E+21 | 1.444E-283  | 0     |
| NAMA MEPHISTO    | 0     | 5.3217E-120 | 0     | 10187199<br>6.8 | 0     | 0     | 0     | 0     | 5.0386E+21  | 1.5248E-283 | 0     |
| NAMA AMARYLIS    | 0     | 5.3217E-120 | 0     | 10187199<br>6.8 | 0     | 0     | 0     | 0     | 5.0386E+21  | 1.5248E-283 | 0     |
| BALTIC           | 0     | 5.419E-120  | 0     | 10208297<br>9.8 | 0     | 0     | 0     | 0     | 5.04032E+21 | 1.585E-283  | 0     |
| ALGODONES        | 0     | 3.848E-119  | 0     | 57807743<br>7.3 | 0     | 0     | 0     | 0     | 2.78559E+22 | 1.5053E-282 | 0     |
| FRIJOLAS GUAJE   | 0     | 1.4759E-119 | 0     | 11445740<br>2   | 0     | 0     | 0     | 0     | 5.13664E+21 | 1.3502E-282 | 0     |
| FRIJOLAS PETACA  | 0     | 1.4759E-119 | 0     | 11445740<br>2   | 0     | 0     | 0     | 0     | 5.13664E+21 | 1.3502E-282 | 0     |
| FRIJOLAS DEMING  | 0     | 1.4759E-119 | 0     | 11445740<br>2   | 0     | 0     | 0     | 0     | 5.13664E+21 | 1.3502E-282 | 0     |
| FRIJOLAS ESPUELA | 0     | 1.4759E-119 | 0     | 11445740<br>2   | 0     | 0     | 0     | 0     | 5.13664E+21 | 1.3502E-282 | 0     |
| PEDERNAL         | 0     | 1.7135E-119 | 0     | 11642546<br>8.7 | 0     | 0     | 0     | 0     | 5.15114E+21 | 1.858E-282  | 0     |
| CHANTILLY        | 0     | 1.7143E-119 | 0     | 11643137<br>6.3 | 0     | 0     | 0     | 0     | 5.15119E+21 | 1.8598E-282 | 0     |
| CATHAY           | 0     | 2.0771E-119 | 0     | 11901168<br>4.5 | 0     | 0     | 0     | 0     | 5.1699E+21  | 2.8035E-282 | 0     |
| LAGOON           | 0     | 2.3606E-119 | 0     | 12076358<br>1.1 | 0     | 0     | 0     | 0     | 5.18241E+21 | 3.6858E-282 | 0     |
| DIAGONAL LINE    | 0     | 5.6886E-119 | 0     | 13352307<br>7.3 | 0     | 0     | 0     | 0     | 5.26924E+21 | 2.4169E-281 | 0     |
| PARNASSIA        | 0     | 6.4393E-119 | 0     | 13542672<br>9.1 | 0     | 0     | 0     | 0     | 5.2816E+21  | 3.1505E-281 | 0     |
| CHAENACTIS       | 0     | 4.797E-118  | 0     | 77110587<br>5.5 | 0     | 0     | 0     | 0     | 2.92158E+22 | 3.3149E-280 | 0     |
| HOSPAH           | 0     | 8.7218E-119 | 0     | 14020107<br>6.2 | 0     | 0     | 0     | 0     | 5.31196E+21 | 6.0271E-281 | 0     |
| YERBA            | 0     | 8.7218E-119 | 0     | 14020107<br>6.2 | 0     | 0     | 0     | 0     | 5.31196E+21 | 6.0271E-281 | 0     |
| MESCALERO        | 0     | 1.387E-118  | 0     | 14782808<br>9.9 | 0     | 0     | 0     | 0     | 5.35871E+21 | 1.625E-280  | 0     |
| COWLES           | 0     | 2.5895E-118 | 0     | 15875275<br>8.5 | 0     | 0     | 0     | 0     | 5.42229E+21 | 6.1748E-280 | 0     |
| DIANTHUS         | 0     | 3.4821E-118 | 0     | 16421384<br>6.2 | 0     | 0     | 0     | 0     | 5.45272E+21 | 1.1632E-279 | 0     |
| SAPPHO           | 0     | 7.3443E-118 | 0     | 17882223<br>2.9 | 0     | 0     | 0     | 0     | 5.53014E+21 | 5.7365E-279 | 0     |
| ONAJA            | 0     | 8.5433E-118 | 0     | 18193703<br>5.4 | 0     | 0     | 0     | 0     | 5.54596E+21 | 7.9262E-279 | 0     |
| OCATE            | 0     | 8.5433E-118 | 0     | 18193703<br>5.4 | 0     | 0     | 0     | 0     | 5.54596E+21 | 7.9262E-279 | 0     |
| LONGCHAMPS       | 0     | 1.3036E-117 | 0     | 19093206<br>1.3 | 0     | 0     | 0     | 0     | 5.59041E+21 | 1.9565E-278 | 0     |
| JICARILLA        | 0     | 1.3038E-117 | 0     | 19093529<br>0.6 | 0     | 0     | 0     | 0     | 5.59043E+21 | 1.9571E-278 | 0     |
| MISTY NORTH      | 0     | 1.7243E-117 | 0     | 19712834<br>7.8 | 0     | 0     | 0     | 0     | 5.62003E+21 | 3.5577E-278 | 0     |
| KARA             | 0     | 2.0794E-117 | 0     | 20138970<br>9.2 | 0     | 0     | 0     | 0     | 5.63995E+21 | 5.3098E-278 | 0     |
| ZINNIA           | 0     | 2.3637E-117 | 0     | 20435769<br>7.5 | 0     | 0     | 0     | 0     | 5.65361E+21 | 6.9831E-278 | 0     |
| MONERO           | 0     | 2.4729E-117 | 0     | 20541461<br>1.3 | 0     | 0     | 0     | 0     | 5.65844E+21 | 7.6912E-278 | 0     |
| MERIDA           | 0     | 3.703E-117  | 0     | 21510710<br>2.9 | 0     | 0     | 0     | 0     | 5.70177E+21 | 1.8235E-277 | 0     |
| CAPITAN          | 0     | 5.7917E-117 | 0     | 22638019<br>8.8 | 0     | 0     | 0     | 0     | 5.75015E+21 | 4.7453E-277 | 0     |
| TAJIQUE          | 0     | 5.8011E-117 | 0     | 22642193<br>7   | 0     | 0     | 0     | 0     | 5.75033E+21 | 4.7617E-277 | 0     |
| HAPLOPAPPUS      | 0     | 5.8011E-117 | 0     | 22642195<br>6.1 | 0     | 0     | 0     | 0     | 5.75033E+21 | 4.7617E-277 | 0     |
| DIAMOND SCULLS   | 0     | 9.2807E-117 | 0     | 23890341<br>2.3 | 0     | 0     | 0     | 0     | 5.8016E+21  | 1.3005E-276 | 0     |



| Nuclide        | 140Ba | 141Ce       | 143Pr | 144Ce           | 147Nd | 149Pm | 151Pm | 153Sm | 155Eu       | 156Eu       | 157Eu |
|----------------|-------|-------------|-------|-----------------|-------|-------|-------|-------|-------------|-------------|-------|
| ATARQUE        | 0     | 1.0291E-116 | 0     | 24173804<br>1.2 | 0     | 0     | 0     | 0     | 5.81293E+21 | 1.6219E-276 | 0     |
| CEBOLLA        | 0     | 1.417E-116  | 0     | 25073317<br>9.3 | 0     | 0     | 0     | 0     | 5.84817E+21 | 3.2144E-276 | 0     |
| SOLANO         | 0     | 1.417E-116  | 0     | 25073317<br>9.3 | 0     | 0     | 0     | 0     | 5.84817E+21 | 3.2144E-276 | 0     |
| CUCHILLO       | 0     | 1.417E-116  | 0     | 25073317<br>9.3 | 0     | 0     | 0     | 0     | 5.84817E+21 | 3.2144E-276 | 0     |
| OSCURO         | 0     | 1.9534E-115 | 0     | 15315958<br>47  | 0     | 0     | 0     | 0     | 3.27282E+22 | 1.2609E-274 | 0     |
| DELPHINIUM     | 0     | 2.9609E-116 | 0     | 21139140<br>8.5 | 0     | 0     | 0     | 0     | 4.47186E+21 | 2.1557E-275 | 0     |
| AKBAR          | 0     | 1.0097E-115 | 0     | 31376120<br>8.4 | 0     | 0     | 0     | 0     | 6.0692E+21  | 2.1407E-274 | 0     |
| ARSENATE       | 0     | 1.0124E-115 | 0     | 31385674<br>4.2 | 0     | 0     | 0     | 0     | 6.0695E+21  | 2.1529E-274 | 0     |
| CANNA UMBRINUS | 0     | 1.2005E-115 | 0     | 32002380<br>7.7 | 0     | 0     | 0     | 0     | 6.08907E+21 | 3.0993E-274 | 0     |
| CANNA LIMOGES  | 0     | 1.2005E-115 | 0     | 32002380<br>7.7 | 0     | 0     | 0     | 0     | 6.08907E+21 | 3.0993E-274 | 0     |
| TULOSO         | 0     | 2.0433E-115 | 0     | 34006304<br>0.4 | 0     | 0     | 0     | 0     | 6.15056E+21 | 9.6635E-274 | 0     |
| SOLANUM        | 0     | 2.1305E-115 | 0     | 34168886<br>1.4 | 0     | 0     | 0     | 0     | 6.15542E+21 | 1.0566E-273 | 0     |
| FLAX SOURCE    | 0     | 2.484E-115  | 0     | 34773169<br>3   | 0     | 0     | 0     | 0     | 6.1733E+21  | 1.4671E-273 | 0     |
| FLAX TEST      | 0     | 1.3662E-114 | 0     | 19125243<br>11  | 0     | 0     | 0     | 0     | 3.39531E+22 | 8.0693E-273 | 0     |
| FLAX BACKUP    | 0     | 2.484E-115  | 0     | 34773169<br>3   | 0     | 0     | 0     | 0     | 6.1733E+21  | 1.4671E-273 | 0     |
| ALUMROOT       | 0     | 7.9938E-115 | 0     | 39738373<br>7.2 | 0     | 0     | 0     | 0     | 6.31112E+21 | 1.7857E-272 | 0     |
| MIERA          | 0     | 7.0331E-114 | 0     | 23060686<br>07  | 0     | 0     | 0     | 0     | 3.50206E+22 | 2.6817E-271 | 0     |
| GAZOOK         | 0     | 1.7672E-114 | 0     | 43506630<br>2.8 | 0     | 0     | 0     | 0     | 6.40642E+21 | 9.7385E-272 | 0     |
| NATOMA         | 0     | 2.3207E-114 | 0     | 44881484<br>6.9 | 0     | 0     | 0     | 0     | 6.43948E+21 | 1.7438E-271 | 0     |
| ANGUS          | 0     | 3.5793E-114 | 0     | 47158070<br>9   | 0     | 0     | 0     | 0     | 6.49241E+21 | 4.4039E-271 | 0     |
| VELARDE        | 0     | 3.5793E-114 | 0     | 47158070<br>9   | 0     | 0     | 0     | 0     | 6.49241E+21 | 4.4039E-271 | 0     |
| COLMOR         | 0     | 3.6332E-114 | 0     | 47238697<br>1.5 | 0     | 0     | 0     | 0     | 6.49424E+21 | 4.547E-271  | 0     |
| STARWORT       | 0     | 1.6379E-113 | 0     | 21261728<br>55  | 0     | 0     | 0     | 0     | 2.92251E+22 | 2.0539E-270 | 0     |
| MESITA         | 0     | 4.7866E-114 | 0     | 48749624<br>7.2 | 0     | 0     | 0     | 0     | 6.52816E+21 | 8.1986E-271 | 0     |
| CABRESTO       | 0     | 6.5912E-114 | 0     | 50563511<br>7.1 | 0     | 0     | 0     | 0     | 6.56773E+21 | 1.6248E-270 | 0     |
| KASHAN         | 0     | 6.5912E-114 | 0     | 50563511<br>7.1 | 0     | 0     | 0     | 0     | 6.56773E+21 | 1.6248E-270 | 0     |
| DIDO QUEEN     | 0     | 8.5401E-114 | 0     | 52081591<br>0   | 0     | 0     | 0     | 0     | 6.59995E+21 | 2.8272E-270 | 0     |
| ALMENDRO       | 0     | 2.608E-112  | 0     | 15656220<br>857 | 0     | 0     | 0     | 0     | 1.98065E+23 | 8.81E-269   | 0     |
| POTRILLO       | 0     | 6.5941E-113 | 0     | 29776349<br>41  | 0     | 0     | 0     | 0     | 3.65331E+22 | 3.2117E-269 | 0     |
| PORTULACA      | 0     | 6.9878E-113 | 0     | 27547446<br>55  | 0     | 0     | 0     | 0     | 3.33083E+22 | 4.0522E-269 | 0     |
| SILENE         | 0     | 1.3982E-113 | 0     | 55097670<br>0.5 | 0     | 0     | 0     | 0     | 6.66171E+21 | 8.112E-270  | 0     |
| POLYGONUM      | 0     | 1.0783E-112 | 0     | 69573515<br>4.5 | 0     | 0     | 0     | 0     | 6.92382E+21 | 6.3979E-268 | 0     |
| WALLER         | 0     | 1.079E-112  | 0     | 69578810<br>8.8 | 0     | 0     | 0     | 0     | 6.92391E+21 | 6.407E-268  | 0     |
| HUSKY ACE      | 0     | 1.3376E-112 | 0     | 71306879<br>2.1 | 0     | 0     | 0     | 0     | 6.95206E+21 | 1.0143E-267 | 0     |
| BERNAL         | 0     | 3.6398E-112 | 0     | 79942667<br>9.1 | 0     | 0     | 0     | 0     | 7.08479E+21 | 8.6243E-267 | 0     |
| PAJARA         | 0     | 4.9216E-112 | 0     | 82744876<br>4.8 | 0     | 0     | 0     | 0     | 7.12529E+21 | 1.6439E-266 | 0     |
| SEAFOAM        | 0     | 5.0111E-112 | 0     | 82915369<br>5.8 | 0     | 0     | 0     | 0     | 7.12771E+21 | 1.7085E-266 | 0     |
| SPAR           | 0     | 5.7064E-112 | 0     | 84154843<br>1.3 | 0     | 0     | 0     | 0     | 7.14523E+21 | 2.2557E-266 | 0     |

| Nuclide          | 140Ba | 141Ce       | 143Pr       | 144Ce       | 147Nd | 149Pm | 151Pm | 153Sm | 155Eu       | 156Eu       | 157Eu |
|------------------|-------|-------------|-------------|-------------|-------|-------|-------|-------|-------------|-------------|-------|
| ELIDA            | 0     | 5.7154E-112 | 0           | 841699318.3 | 0     | 0     | 0     | 0     | 7.14544E+21 | 2.2632E-266 | 0     |
| PINEDROPS TAWNY  | 0     | 9.1079E-112 | 0           | 887701410.2 | 0     | 0     | 0     | 0     | 7.20862E+21 | 6.1296E-266 | 0     |
| PINEDROPS BAYOU  | 0     | 9.1079E-112 | 0           | 887701410.2 | 0     | 0     | 0     | 0     | 7.20862E+21 | 6.1296E-266 | 0     |
| PINEDROPS SLOAT  | 0     | 9.1079E-112 | 0           | 887701410.2 | 0     | 0     | 0     | 0     | 7.20862E+21 | 6.1296E-266 | 0     |
| LATIR            | 0     | 1.3961E-110 | 7.0962E-299 | 5488591105  | 0     | 0     | 0     | 0     | 4.04226E+22 | 3.0168E-264 | 0     |
| HULSEA           | 0     | 3.4953E-111 | 2.5805E-299 | 1035056698  | 0     | 0     | 0     | 0     | 7.39412E+21 | 1.0871E-264 | 0     |
| SAPELLO          | 0     | 6.4776E-111 | 1.0322E-298 | 1110608998  | 0     | 0     | 0     | 0     | 7.4808E+21  | 4.0658E-264 | 0     |
| POTRERO          | 0     | 8.1901E-111 | 1.9353E-298 | 1140761223  | 0     | 0     | 0     | 0     | 7.51403E+21 | 6.7137E-264 | 0     |
| PLOMO            | 0     | 9.7036E-111 | 2.8385E-298 | 1163066212  | 0     | 0     | 0     | 0     | 7.53813E+21 | 9.6477E-264 | 0     |
| JIB              | 0     | 1.1295E-110 | 4.1287E-298 | 1183411062  | 0     | 0     | 0     | 0     | 7.55979E+21 | 1.3349E-263 | 0     |
| GROVE            | 0     | 1.5189E-110 | 8.3865E-298 | 1224126560  | 0     | 0     | 0     | 0     | 7.60221E+21 | 2.5148E-263 | 0     |
| FALLON           | 0     | 8.5294E-110 | 4.8254E-297 | 674869702   | 0     | 0     | 0     | 0     | 4.18286E+22 | 1.446E-262  | 0     |
| JARA             | 0     | 2.0923E-110 | 1.8063E-297 | 1269727823  | 0     | 0     | 0     | 0     | 7.64835E+21 | 4.9878E-263 | 0     |
| MING BLADE       | 0     | 2.7641E-110 | 3.5223E-297 | 1310750073  | 0     | 0     | 0     | 0     | 7.68869E+21 | 9.0463E-263 | 0     |
| ESCABOSA         | 0     | 2.3792E-109 | 5.6699E-296 | 7587433767  | 0     | 0     | 0     | 0     | 4.26471E+22 | 1.2964E-261 | 0     |
| CRESTLAKE TANSAN | 0     | 5.1214E-110 | 1.5444E-296 | 1406390527  | 0     | 0     | 0     | 0     | 7.7788E+21  | 3.3819E-262 | 0     |
| CRESTLAKE BRIAR  | 0     | 5.1214E-110 | 1.5444E-296 | 1406390527  | 0     | 0     | 0     | 0     | 7.7788E+21  | 3.3819E-262 | 0     |
| PUYE             | 0     | 9.1091E-110 | 6.1363E-296 | 1501981675  | 0     | 0     | 0     | 0     | 7.86388E+21 | 1.1585E-261 | 0     |
| PORTMANTEAU      | 0     | 7.0538E-109 | 7.6576E-295 | 8590037854  | 0     | 0     | 0     | 0     | 4.35318E+22 | 1.3242E-260 | 0     |
| PRATT            | 0     | 2.231E-109  | 5.2431E-295 | 1663754716  | 0     | 0     | 0     | 0     | 7.99809E+21 | 7.8646E-261 | 0     |
| TRUMBULL         | 0     | 2.2801E-109 | 5.5237E-295 | 1667896378  | 0     | 0     | 0     | 0     | 8.00138E+21 | 8.2393E-261 | 0     |
| STANYAN          | 0     | 1.2547E-108 | 3.0418E-294 | 9173973133  | 0     | 0     | 0     | 0     | 4.4008E+22  | 4.5367E-260 | 0     |
| ESTACA           | 0     | 3.577E-109  | 1.624E-294  | 1755905453  | 0     | 0     | 0     | 0     | 8.06974E+21 | 2.1579E-260 | 0     |
| HYBLA FAIR       | 0     | 4.5139E-109 | 2.8351E-294 | 1803177443  | 0     | 0     | 0     | 0     | 8.10528E+21 | 3.5486E-260 | 0     |
| TEMESCAL         | 0     | 5.024E-109  | 3.6639E-294 | 1825362620  | 0     | 0     | 0     | 0     | 8.12169E+21 | 4.4616E-260 | 0     |
| PUDDLE           | 0     | 8.3784E-109 | 1.247E-293  | 1935141167  | 0     | 0     | 0     | 0     | 8.20054E+21 | 1.3316E-259 | 0     |
| KEEL             | 0     | 1.2864E-108 | 3.4823E-293 | 2032251359  | 0     | 0     | 0     | 0     | 8.26724E+21 | 3.3307E-259 | 0     |
| PORTOLA LARKIN   | 0     | 3.8927E-108 | 4.9381E-292 | 2306169613  | 0     | 0     | 0     | 0     | 8.442E+21   | 3.5541E-258 | 0     |
| PORTOLA          | 0     | 3.8927E-108 | 4.9381E-292 | 2306169613  | 0     | 0     | 0     | 0     | 8.442E+21   | 3.5541E-258 | 0     |
| TELEME           | 0     | 3.8952E-108 | 4.9456E-292 | 2306337340  | 0     | 0     | 0     | 0     | 8.4421E+21  | 3.5589E-258 | 0     |
| BILGE            | 0     | 5.1578E-108 | 9.6885E-292 | 2381482568  | 0     | 0     | 0     | 0     | 8.48699E+21 | 6.4869E-258 | 0     |
| TOPGALLANT       | 0     | 3.4251E-107 | 8.3685E-291 | 13383110132 | 0     | 0     | 0     | 0     | 4.6845E+22  | 5.3384E-257 | 0     |
| CABRILLO         | 0     | 3.9757E-107 | 1.1959E-290 | 13612884031 | 0     | 0     | 0     | 0     | 4.69771E+22 | 7.3424E-257 | 0     |
| DINING CAR       | 0     | 1.3462E-107 | 9.6411E-291 | 2657216249  | 0     | 0     | 0     | 0     | 8.64222E+21 | 5.0455E-257 | 0     |
| EDAM             | 0     | 1.1049E-106 | 1.383E-289  | 15298202041 | 0     | 0     | 0     | 0     | 4.7893E+22  | 6.5305E-256 | 0     |
| OBAR             | 0     | 1.2566E-106 | 1.8823E-289 | 15524710999 | 0     | 0     | 0     | 0     | 4.80096E+22 | 8.5993E-256 | 0     |
| TYBO             | 0     | 9.231E-106  | 2.0945E-288 | 87608493994 | 0     | 0     | 0     | 0     | 2.63347E+23 | 8.8646E-255 | 0     |
| STILTON          | 0     | 2.5934E-106 | 1.0674E-288 | 16863858244 | 0     | 0     | 0     | 0     | 4.86712E+22 | 4.0483E-255 | 0     |

| Nuclide       | 140Ba       | 141Ce       | 143Pr       | 144Ce       | 147Nd | 149Pm | 151Pm | 153Sm | 155Eu       | 156Eu       | 157Eu |
|---------------|-------------|-------------|-------------|-------------|-------|-------|-------|-------|-------------|-------------|-------|
| MIZZEN        | 0           | 2.5942E-106 | 1.0681E-288 | 16864428701 | 0     | 0     | 0     | 0     | 4.86715E+22 | 4.0508E-255 | 0     |
| ALVISO        | 0           | 5.5859E-107 | 2.9119E-289 | 3126060161  | 0     | 0     | 0     | 0     | 8.87769E+21 | 1.0574E-255 | 0     |
| FUTTOCK       | 0           | 6.4785E-107 | 4.1531E-289 | 3179430168  | 0     | 0     | 0     | 0     | 8.90259E+21 | 1.4518E-255 | 0     |
| MAST          | 0           | 1.9875E-105 | 1.3145E-287 | 95626977128 | 0     | 0     | 0     | 0     | 2.67191E+23 | 4.5688E-254 | 0     |
| CAMEMBERT     | 0           | 2.3065E-105 | 1.8776E-287 | 97266323893 | 0     | 0     | 0     | 0     | 2.67943E+23 | 6.2809E-254 | 0     |
| MARSH         | 0           | 3.5848E-106 | 2.4994E-287 | 3865415124  | 0     | 0     | 0     | 0     | 9.19502E+21 | 5.6304E-254 | 0     |
| HUSKY PUP     | 0           | 9.9803E-106 | 2.9029E-286 | 4344857988  | 0     | 0     | 0     | 0     | 9.37461E+21 | 5.0271E-253 | 0     |
| KASSERI       | 0           | 3.2529E-104 | 1.0622E-284 | 1.31586E+11 | 0     | 0     | 0     | 0     | 2.81679E+23 | 1.8007E-251 | 0     |
| DECK          | 0           | 1.6984E-105 | 1.0372E-285 | 4616834781  | 0     | 0     | 0     | 0     | 9.46925E+21 | 1.5669E-252 | 0     |
| INLET         | 0           | 5.315E-104  | 3.4425E-284 | 1.39174E+11 | 0     | 0     | 0     | 0     | 2.84304E+23 | 5.1447E-251 | 0     |
| LEYDEN        | 0           | 2.0144E-105 | 1.5607E-285 | 4707671759  | 0     | 0     | 0     | 0     | 9.49982E+21 | 2.2567E-252 | 0     |
| CHIBERTA      | 0           | 1.8559E-104 | 2.9529E-284 | 27463299381 | 0     | 0     | 0     | 0     | 5.27607E+22 | 3.7399E-251 | 0     |
| MUENSTER      | 0           | 1.3636E-103 | 3.2876E-283 | 1.54984E+11 | 0     | 0     | 0     | 0     | 2.8941E+23  | 3.8572E-250 | 0     |
| KEELSON       | 0           | 4.9253E-104 | 3.0581E-283 | 30701426544 | 0     | 0     | 0     | 0     | 5.37426E+22 | 3.0144E-250 | 0     |
| ESROM         | 0           | 4.9268E-104 | 3.0602E-283 | 30702465086 | 0     | 0     | 0     | 0     | 5.37429E+22 | 3.0163E-250 | 0     |
| FONTINA       | 0           | 3.1875E-103 | 2.5122E-282 | 1.70764E+11 | 0     | 0     | 0     | 0     | 2.9409E+23  | 2.37E-249   | 0     |
| CHESHIRE      | 0           | 1.9348E-103 | 1.6119E-282 | 1.00066E+11 | 0     | 0     | 0     | 0     | 1.71681E+23 | 1.5052E-249 | 0     |
| SHALLOWS      | 0           | 1.4323E-104 | 1.7123E-283 | 5889629358  | 0     | 0     | 0     | 0     | 9.85846E+21 | 1.4961E-250 | 0     |
| ESTUARY       | 0           | 3.2352E-103 | 5.5215E-282 | 1.06116E+11 | 0     | 0     | 0     | 0     | 1.73357E+23 | 4.5181E-249 | 0     |
| COLBY         | 0           | 7.7025E-103 | 1.5226E-281 | 2.30143E+11 | 0     | 0     | 0     | 0     | 3.72219E+23 | 1.2127E-248 | 0     |
| POOL          | 0           | 3.838E-103  | 8.3129E-282 | 1.08207E+11 | 0     | 0     | 0     | 0     | 1.73917E+23 | 6.5103E-249 | 0     |
| STRAIT        | 0           | 3.8397E-103 | 8.3218E-282 | 1.08212E+11 | 0     | 0     | 0     | 0     | 1.73919E+23 | 6.5165E-249 | 0     |
| MIGHTY EPIC   | 0           | 7.2764E-104 | 8.3975E-282 | 7090809460  | 0     | 0     | 0     | 0     | 1.01659E+22 | 4.8331E-249 | 0     |
| RIVOLI        | 0           | 8.6122E-104 | 1.2574E-281 | 7228610456  | 0     | 0     | 0     | 0     | 1.01983E+22 | 6.9301E-249 | 0     |
| BILLET        | 5.4835E-299 | 1.565E-102  | 1.7342E-279 | 36266163648 | 0     | 0     | 0     | 0     | 4.45489E+22 | 6.5814E-247 | 0     |
| BANON         | 2.7417E-298 | 2.9517E-102 | 7.9261E-279 | 38991423290 | 0     | 0     | 0     | 0     | 4.50861E+22 | 2.5557E-246 | 0     |
| GOUDA         | 5.548E-298  | 1.6651E-102 | 1.5142E-278 | 10137878774 | 0     | 0     | 0     | 0     | 1.07852E+22 | 3.9003E-246 | 0     |
| SPRIT         | 3.7029E-297 | 3.514E-102  | 9.0584E-278 | 11040486610 | 0     | 0     | 0     | 0     | 1.09385E+22 | 1.926E-245  | 0     |
| CHEVRE        | 7.522E-297  | 4.638E-102  | 1.7607E-277 | 11395967294 | 0     | 0     | 0     | 0     | 1.0996E+22  | 3.4861E-245 | 0     |
| REDMUD        | 1.6979E-296 | 6.3841E-102 | 3.7849E-277 | 11819481236 | 0     | 0     | 0     | 0     | 1.10625E+22 | 6.9034E-245 | 0     |
| ASIAGO        | 3.4449E-296 | 8.4263E-102 | 7.3577E-277 | 12200095511 | 0     | 0     | 0     | 0     | 1.11207E+22 | 1.2497E-244 | 0     |
| SUTTER        | 3.4514E-296 | 8.4324E-102 | 7.3705E-277 | 12201106638 | 0     | 0     | 0     | 0     | 1.11208E+22 | 1.2516E-244 | 0     |
| RUDDER        | 2.1561E-295 | 4.1684E-101 | 4.4983E-276 | 52757216893 | 0     | 0     | 0     | 0     | 4.73987E+22 | 7.3479E-244 | 0     |
| OARLOCK       | 7.6863E-295 | 2.8487E-101 | 1.3606E-275 | 14020848993 | 0     | 0     | 0     | 0     | 1.13796E+22 | 1.6901E-243 | 0     |
| COVE          | 7.6863E-295 | 2.8487E-101 | 1.3606E-275 | 14020848993 | 0     | 0     | 0     | 0     | 1.13796E+22 | 1.6901E-243 | 0     |
| DOFINO        | 2.262E-294  | 4.3507E-101 | 3.7513E-275 | 14715512664 | 0     | 0     | 0     | 0     | 1.1471E+22  | 4.1795E-243 | 0     |
| DOFINO LAWTON | 2.262E-294  | 4.3507E-101 | 3.7513E-275 | 14715512664 | 0     | 0     | 0     | 0     | 1.1471E+22  | 4.1795E-243 | 0     |
| MARSILLY      | 4.4112E-293 | 3.3615E-100 | 6.672E-274  | 66958730919 | 0     | 0     | 0     | 0     | 4.93052E+22 | 6.3759E-242 | 0     |

| Nuclide            | 140Ba       | 141Ce       | 143Pr       | 144Ce       | 147Nd | 149Pm | 151Pm | 153Sm | 155Eu       | 156Eu       | 157Eu |
|--------------------|-------------|-------------|-------------|-------------|-------|-------|-------|-------|-------------|-------------|-------|
| BULKHEAD           | 1.4587E-292 | 5.3741E-100 | 2.0526E-273 | 70644324491 | 0     | 0     | 0     | 0     | 4.97442E+22 | 1.7388E-241 | 0     |
| CREWLINE           | 6.7148E-292 | 9.7819E-100 | 8.6155E-273 | 75645285197 | 0     | 0     | 0     | 0     | 5.03103E+22 | 6.2578E-241 | 0     |
| FOREFOOT           | 2.4421E-292 | 2.7304E-100 | 3.0521E-273 | 18149547159 | 0     | 0     | 0     | 0     | 1.1876E+22  | 2.1216E-241 | 0     |
| CARNELIAN          | 5.0917E-291 | 8.9892E-100 | 5.2963E-272 | 20795079666 | 0     | 0     | 0     | 0     | 1.21463E+22 | 2.7111E-240 | 0     |
| STRAKE             | 3.1844E-290 | 4.4456E-99  | 3.236E-271  | 89922011512 | 0     | 0     | 0     | 0     | 5.177E+22   | 1.5932E-239 | 0     |
| GRUYERE GRADINO    | 1.4322E-290 | 1.3487E-99  | 1.3995E-271 | 21781231715 | 0     | 0     | 0     | 0     | 1.22398E+22 | 6.4551E-240 | 0     |
| GRUYERE            | 1.4322E-290 | 1.3487E-99  | 1.3995E-271 | 21781231715 | 0     | 0     | 0     | 0     | 1.22398E+22 | 6.4551E-240 | 0     |
| FLOTOST            | 1.4359E-290 | 1.3501E-99  | 1.4029E-271 | 21783736926 | 0     | 0     | 0     | 0     | 1.224E+22   | 6.469E-240  | 0     |
| SCUPPER            | 1.6969E-290 | 1.4415E-99  | 1.6412E-271 | 21947306617 | 0     | 0     | 0     | 0     | 1.22552E+22 | 7.4416E-240 | 0     |
| SCANTLING          | 7.2179E-290 | 6.1284E-99  | 6.9809E-271 | 93279681683 | 0     | 0     | 0     | 0     | 5.20849E+22 | 3.165E-239  | 0     |
| EBBTIDE            | 7.3155E-290 | 2.5572E-99  | 6.4777E-271 | 23432090378 | 0     | 0     | 0     | 0     | 1.23886E+22 | 2.535E-239  | 0     |
| COULOMMIERS        | 5.9615E-289 | 1.40305E-98 | 5.0751E-270 | 1.02534E+11 | 0     | 0     | 0     | 0     | 5.29064E+22 | 1.86E-238   | 0     |
| BOBSTAY            | 6.7906E-289 | 6.129E-99   | 5.2554E-270 | 25891796006 | 0     | 0     | 0     | 0     | 1.25949E+22 | 1.6431E-238 | 0     |
| HYBLA GOLD         | 9.492E-289  | 6.9896E-99  | 7.1989E-270 | 26283199711 | 0     | 0     | 0     | 0     | 1.26262E+22 | 2.1761E-238 | 0     |
| SANDREEF           | 6.2873E-288 | 3.53546E-98 | 4.6423E-269 | 1.13946E+11 | 0     | 0     | 0     | 0     | 5.38382E+22 | 1.3419E-237 | 0     |
| SEAMOUNT           | 2.2725E-288 | 9.8445E-99  | 1.6349E-269 | 27331509495 | 0     | 0     | 0     | 0     | 1.27082E+22 | 4.5259E-238 | 0     |
| RIB                | 9.7622E-288 | 1.74398E-98 | 6.4312E-269 | 29175882900 | 0     | 0     | 0     | 0     | 1.28462E+22 | 1.5371E-237 | 0     |
| FARALLONES         | 4.1536E-287 | 7.41521E-98 | 2.7362E-268 | 1.24004E+11 | 0     | 0     | 0     | 0     | 5.45968E+22 | 6.5391E-237 | 0     |
| CAMPOS             | 2.7324E-286 | 6.44478E-98 | 1.4718E-267 | 33872629216 | 0     | 0     | 0     | 0     | 1.31674E+22 | 2.5146E-236 | 0     |
| REBLOCHON          | 1.978E-285  | 3.37549E-97 | 1.0317E-266 | 1.47435E+11 | 0     | 0     | 0     | 0     | 5.61827E+22 | 1.6706E-235 | 0     |
| KARAB              | 1.4511E-285 | 1.24076E-97 | 7.066E-267  | 36503556506 | 0     | 0     | 0     | 0     | 1.33313E+22 | 1.0203E-235 | 0     |
| TOPMAST            | 2.1302E-285 | 1.44246E-97 | 1.0136E-266 | 37136878643 | 0     | 0     | 0     | 0     | 1.33693E+22 | 1.408E-235  | 0     |
| ICEBERG            | 9.0536E-285 | 6.13046E-97 | 4.3076E-266 | 1.57832E+11 | 0     | 0     | 0     | 0     | 5.68196E+22 | 5.9841E-235 | 0     |
| FONDUTTA           | 2.5376E-284 | 9.18532E-97 | 1.1345E-265 | 1.6529E+11  | 0     | 0     | 0     | 0     | 5.72553E+22 | 1.4206E-234 | 0     |
| BACKBEACH          | 2.5506E-284 | 9.2037E-97  | 1.1399E-265 | 1.65328E+11 | 0     | 0     | 0     | 0     | 5.72575E+22 | 1.4266E-234 | 0     |
| ASCO               | 1.2755E-284 | 2.91089E-97 | 5.4467E-266 | 40237039682 | 0     | 0     | 0     | 0     | 1.35478E+22 | 6.318E-235  | 0     |
| JACKPOTS           | 9.586E-284  | 6.42199E-97 | 3.6237E-265 | 44042153251 | 0     | 0     | 0     | 0     | 1.37519E+22 | 3.4304E-234 | 0     |
| SATZ               | 6.7399E-283 | 1.38026E-96 | 2.2646E-264 | 48063413587 | 0     | 0     | 0     | 0     | 1.39521E+22 | 1.7613E-233 | 0     |
| LOWBALL            | 3.7848E-282 | 6.54364E-96 | 1.2504E-263 | 2.06835E+11 | 0     | 0     | 0     | 0     | 5.9419E+22  | 9.4563E-233 | 0     |
| PANIR              | 5.6964E-281 | 1.89577E-95 | 1.5976E-262 | 2.33549E+11 | 0     | 0     | 0     | 0     | 6.06251E+22 | 9.1934E-232 | 0     |
| DIABLO HAWK        | 2.7251E-281 | 5.89237E-96 | 7.3218E-263 | 5672772955  | 0     | 0     | 0     | 0     | 1.43399E+22 | 3.9226E-232 | 0     |
| CREMINO CAERPHILLY | 5.8499E-281 | 7.95146E-96 | 1.5009E-262 | 58702779275 | 0     | 0     | 0     | 0     | 1.44214E+22 | 7.4452E-232 | 0     |
| CREMINO            | 5.8499E-281 | 7.95146E-96 | 1.5009E-262 | 58702779275 | 0     | 0     | 0     | 0     | 1.44214E+22 | 7.4452E-232 | 0     |
| DRAUGHTS           | 2.489E-280  | 3.38087E-95 | 6.3855E-262 | 2.49499E+11 | 0     | 0     | 0     | 0     | 6.12913E+22 | 3.1672E-231 | 0     |
| RUMMY              | 2.4909E-280 | 3.38188E-95 | 6.39E-262   | 2.49508E+11 | 0     | 0     | 0     | 0     | 6.12916E+22 | 3.1692E-231 | 0     |
| EMMENTHAL          | 4.1309E-280 | 1.7119E-95  | 9.4177E-262 | 64075086825 | 0     | 0     | 0     | 0     | 1.46318E+22 | 3.8366E-231 | 0     |
| QUARGEL            | 4.224E-279  | 1.02671E-94 | 9.1324E-261 | 2.83243E+11 | 0     | 0     | 0     | 0     | 6.25911E+22 | 3.4054E-230 | 0     |
| CONCENTRATION      | 2.0064E-279 | 3.18235E-95 | 4.1576E-261 | 68776277653 | 0     | 0     | 0     | 0     | 1.48042E+22 | 1.4444E-230 | 0     |

| Nuclide     | 140Ba       | 141Ce       | 143Pr       | 144Ce       | 147Nd | 149Pm | 151Pm | 153Sm | 155Eu       | 156Eu       | 157Eu |
|-------------|-------------|-------------|-------------|-------------|-------|-------|-------|-------|-------------|-------------|-------|
| FARM        | 1.9203E-278 | 1.8597E-94  | 3.7887E-260 | 3.03125E+11 | 0     | 0     | 0     | 0     | 6.32975E+22 | 1.2128E-229 | 0     |
| BACCARAT    | 3.7865E-278 | 1.00753E-94 | 6.57E-260   | 78450308765 | 0     | 0     | 0     | 0     | 1.513E+22   | 1.6977E-229 | 0     |
| QUINELLA    | 3.6538E-277 | 5.90686E-94 | 6.0333E-259 | 3.4589E+11  | 0     | 0     | 0     | 0     | 6.46947E+22 | 1.4354E-228 | 0     |
| KLOSTER     | 5.3227E-277 | 6.84627E-94 | 8.5915E-259 | 3.51769E+11 | 0     | 0     | 0     | 0     | 6.48753E+22 | 1.968E-228  | 0     |
| MEMORY      | 5.4404E-277 | 2.86624E-94 | 8.0356E-259 | 88398616846 | 0     | 0     | 0     | 0     | 1.54319E+22 | 1.5874E-228 | 0     |
| FREEZEOUT   | 1.2664E-275 | 9.85304E-94 | 1.5465E-257 | 1.01785E+11 | 0     | 0     | 0     | 0     | 1.57961E+22 | 2.2249E-227 | 0     |
| PEPATO      | 2.89E-274   | 8.09699E-93 | 3.1884E-256 | 4.66417E+11 | 0     | 0     | 0     | 0     | 6.79748E+22 | 3.8724E-226 | 0     |
| CHESS       | 1.1117E-274 | 2.31039E-93 | 1.1906E-256 | 1.12189E+11 | 0     | 0     | 0     | 0     | 1.60524E+22 | 1.3761E-226 | 0     |
| FAJY        | 7.2944E-274 | 1.16431E-92 | 7.6098E-256 | 4.8617E+11  | 0     | 0     | 0     | 0     | 6.84428E+22 | 8.4191E-226 | 0     |
| BURZET      | 5.1683E-273 | 2.50997E-92 | 4.7901E-255 | 5.30742E+11 | 0     | 0     | 0     | 0     | 6.94433E+22 | 4.3507E-225 | 0     |
| OFFSHORE    | 6.7807E-273 | 2.79211E-92 | 6.1822E-255 | 5.37238E+11 | 0     | 0     | 0     | 0     | 6.95832E+22 | 5.4636E-225 | 0     |
| NESSSEL     | 2.1243E-272 | 4.37014E-92 | 1.8077E-254 | 5.65438E+11 | 0     | 0     | 0     | 0     | 7.01746E+22 | 1.4239E-224 | 0     |
| HEARTS      | 5.4035E-272 | 8.53597E-92 | 4.4789E-254 | 9.4962E+11  | 0     | 0     | 0     | 0     | 1.15955E+23 | 3.3769E-224 | 0     |
| PERA        | 8.6457E-273 | 1.27487E-92 | 7.1174E-255 | 1.36351E+11 | 0     | 0     | 0     | 0     | 1.65789E+22 | 5.3053E-225 | 0     |
| SHEEPSHEAD  | 9.7313E-272 | 7.9395E-92  | 7.5533E-254 | 6.05334E+11 | 0     | 0     | 0     | 0     | 7.09706E+22 | 5.1039E-224 | 0     |
| BACKGAMMON  | 7.4274E-271 | 7.31479E-92 | 4.6719E-253 | 1.66457E+11 | 0     | 0     | 0     | 0     | 1.71352E+22 | 2.2233E-223 | 0     |
| AZUL        | 1.6902E-270 | 1.00994E-91 | 1.0116E-252 | 1.72703E+11 | 0     | 0     | 0     | 0     | 1.72399E+22 | 4.4315E-223 | 0     |
| TARKO       | 1.0456E-268 | 5.09431E-91 | 4.8774E-251 | 2.07756E+11 | 0     | 0     | 0     | 0     | 1.77751E+22 | 1.41E-221   | 0     |
| NORBO       | 1.7078E-268 | 6.17551E-91 | 7.7336E-251 | 2.12373E+11 | 0     | 0     | 0     | 0     | 1.78399E+22 | 2.1279E-221 | 0     |
| LIPTAUER    | 2.9725E-267 | 4.56326E-90 | 1.2362E-249 | 9.61435E+11 | 0     | 0     | 0     | 0     | 7.66158E+22 | 2.9509E-220 | 0     |
| PYRAMID     | 6.1089E-267 | 6.05344E-90 | 2.4322E-249 | 9.92967E+11 | 0     | 0     | 0     | 0     | 7.70259E+22 | 5.3996E-220 | 0     |
| COLWICK     | 1.045E-266  | 7.47256E-90 | 4.0278E-249 | 1.01714E+12 | 0     | 0     | 0     | 0     | 7.7333E+22  | 8.471E-220  | 0     |
| CANFIELD    | 3.4208E-267 | 2.00143E-90 | 1.2925E-249 | 2.42893E+11 | 0     | 0     | 0     | 0     | 1.82406E+22 | 2.6293E-220 | 0     |
| FLORA       | 1.0015E-266 | 3.05043E-90 | 3.5461E-249 | 2.54868E+11 | 0     | 0     | 0     | 0     | 1.83864E+22 | 6.4739E-220 | 0     |
| KASH        | 1.346E-265  | 2.03658E-89 | 4.4455E-248 | 1.14052E+12 | 0     | 0     | 0     | 0     | 7.88117E+22 | 7.227E-219  | 0     |
| HURON KING  | 6.0523E-266 | 6.17814E-90 | 1.9223E-248 | 2.76259E+11 | 0     | 0     | 0     | 0     | 1.86332E+22 | 2.9275E-219 | 0     |
| TAFI        | 1.3998E-264 | 5.10381E-89 | 4.0134E-247 | 1.26668E+12 | 0     | 0     | 0     | 0     | 8.01915E+22 | 5.1531E-218 | 0     |
| VERDELLO    | 4.5561E-265 | 1.36391E-89 | 1.2809E-247 | 3.02406E+11 | 0     | 0     | 0     | 0     | 1.8914E+22  | 1.5917E-218 | 0     |
| BONARDA     | 4.0332E-263 | 1.90763E-88 | 9.438E-246  | 1.4725E+12  | 0     | 0     | 0     | 0     | 8.2214E+22  | 8.6373E-217 | 0     |
| RIOLA       | 5.085E-265  | 2.40285E-90 | 1.1898E-247 | 18537495938 | 0     | 0     | 0     | 0     | 1.03494E+21 | 1.0887E-218 | 0     |
| DUTCHESS    | 4.6385E-263 | 8.36477E-89 | 9.8622E-246 | 3.71997E+11 | 0     | 0     | 0     | 0     | 1.95733E+22 | 7.6919E-217 | 0     |
| MINERS IRON | 6.7674E-263 | 9.70083E-89 | 1.4064E-245 | 3.78345E+11 | 0     | 0     | 0     | 0     | 1.96282E+22 | 1.0559E-216 | 0     |
| DAUPHIN     | 1.4448E-262 | 1.30627E-88 | 2.8681E-245 | 3.91422E+11 | 0     | 0     | 0     | 0     | 1.97388E+22 | 1.995E-216  | 0     |
| SERPA       | 3.6788E-261 | 1.12057E-87 | 6.5538E-244 | 1.80246E+12 | 0     | 0     | 0     | 0     | 8.50105E+22 | 3.8063E-215 | 0     |
| BASEBALL    | 1.8012E-260 | 2.08967E-87 | 2.9152E-243 | 1.9354E+12  | 0     | 0     | 0     | 0     | 8.60172E+22 | 1.4427E-214 | 0     |
| CLAIRETTE   | 1.3201E-260 | 7.67835E-88 | 1.9948E-243 | 4.79168E+11 | 0     | 0     | 0     | 0     | 2.04105E+22 | 8.804E-215  | 0     |
| SECO        | 3.8892E-260 | 1.17317E-87 | 5.5055E-243 | 5.02933E+11 | 0     | 0     | 0     | 0     | 2.05746E+22 | 2.1792E-214 | 0     |
| VIDE        | 1.2604E-258 | 4.59194E-87 | 1.446E-241  | 5.87742E+11 | 0     | 0     | 0     | 0     | 2.11119E+22 | 4.0313E-213 | 0     |

| Nuclide       | 140Ba       | 141Ce       | 143Pr       | 144Ce       | 147Nd       | 149Pm | 151Pm | 153Sm | 155Eu       | 156Eu       | 157Eu |
|---------------|-------------|-------------|-------------|-------------|-------------|-------|-------|-------|-------------|-------------|-------|
| ALIGOTE       | 6.1178E-258 | 8.53403E-87 | 6.3795E-241 | 6.30846E+11 | 0           | 0     | 0     | 0     | 2.13605E+22 | 1.5169E-212 | 0     |
| HARZER        | 4.0349E-257 | 4.30938E-86 | 4.0972E-240 | 2.7344E+12  | 0           | 0     | 0     | 0     | 9.10784E+22 | 9.3202E-212 | 0     |
| NIZA          | 5.9739E-257 | 2.08644E-86 | 5.4281E-240 | 6.98651E+11 | 0           | 0     | 0     | 0     | 2.17244E+22 | 1.0259E-211 | 0     |
| PINEAU        | 8.2966E-257 | 2.37337E-86 | 7.3904E-240 | 7.09007E+11 | 0           | 0     | 0     | 0     | 2.17773E+22 | 1.3513E-211 | 0     |
| HAVARTI       | 2.4536E-256 | 3.63168E-86 | 2.047E-239  | 7.44298E+11 | 0           | 0     | 0     | 0     | 2.1953E+22  | 3.3555E-211 | 0     |
| ISLAY         | 8.1293E-256 | 5.81036E-86 | 6.3085E-239 | 7.85333E+11 | 0           | 0     | 0     | 0     | 2.21488E+22 | 9.1652E-211 | 0     |
| TREBBIANO     | 1.2572E-255 | 6.89429E-86 | 9.5026E-239 | 8.00824E+11 | 0           | 0     | 0     | 0     | 2.22205E+22 | 1.3212E-210 | 0     |
| CERNADA       | 3.7292E-255 | 1.05618E-85 | 2.6395E-238 | 8.40798E+11 | 0           | 0     | 0     | 0     | 2.24003E+22 | 3.289E-210  | 0     |
| PALIZA        | 2.34E-254   | 5.23008E-85 | 1.6176E-237 | 3.63631E+12 | 5.4835E-299 | 0     | 0     | 0     | 9.54764E+22 | 1.9382E-209 | 0     |
| TILCI         | 2.1788E-253 | 1.25504E-84 | 1.3162E-236 | 4.01857E+12 | 3.8384E-298 | 0     | 0     | 0     | 9.70684E+22 | 1.2595E-208 | 0     |
| ROUSANNE      | 2.2746E-253 | 1.2764E-84  | 1.3705E-236 | 4.02633E+12 | 3.8384E-298 | 0     | 0     | 0     | 9.70993E+22 | 1.3058E-208 | 0     |
| AKAVI         | 7.1239E-253 | 1.99756E-84 | 4.0063E-236 | 4.23762E+12 | 1.4805E-297 | 0     | 0     | 0     | 9.79244E+22 | 3.4024E-208 | 0     |
| CABOC         | 3.4455E-253 | 6.23549E-85 | 1.8551E-236 | 1.0298E+12  | 7.9994E-298 | 0     | 0     | 0     | 2.31644E+22 | 1.4651E-208 | 0     |
| JORNADA       | 2.4517E-251 | 1.07939E-83 | 1.1469E-234 | 7.94318E+12 | 8.2945E-296 | 0     | 0     | 0     | 1.63792E+23 | 7.1657E-207 | 0     |
| MOLBO         | 3.3803E-251 | 9.08034E-84 | 1.5056E-234 | 5.03752E+12 | 1.3034E-295 | 0     | 0     | 0     | 1.00766E+23 | 8.6664E-207 | 0     |
| HOSTA         | 3.3842E-251 | 9.08438E-84 | 1.5072E-234 | 5.03778E+12 | 1.3051E-295 | 0     | 0     | 0     | 1.00767E+23 | 8.6746E-207 | 0     |
| TENAJA        | 2.5981E-250 | 8.38882E-84 | 9.3735E-234 | 1.38567E+12 | 1.7575E-294 | 0     | 0     | 0     | 2.43303E+22 | 3.7974E-206 | 0     |
| GIBNE         | 1.7061E-249 | 4.22884E-83 | 5.9957E-233 | 6.005E+12   | 1.238E-293  | 0     | 0     | 0     | 1.03738E+23 | 2.3248E-205 | 0     |
| KRYDDOST      | 7.3319E-250 | 1.26026E-83 | 2.4845E-233 | 1.45159E+12 | 5.8626E-294 | 0     | 0     | 0     | 2.4518E+22  | 9.0662E-206 | 0     |
| BOUSCHET      | 3.2774E-249 | 5.46322E-83 | 1.1072E-232 | 6.18322E+12 | 2.642E-293  | 0     | 0     | 0     | 1.04241E+23 | 4.0198E-205 | 0     |
| KESTI         | 6.7194E-249 | 3.00542E-83 | 1.9917E-232 | 1.60305E+12 | 7.679E-293  | 0     | 0     | 0     | 2.49239E+22 | 5.8139E-205 | 0     |
| NEBBIOLO      | 4.4142E-248 | 1.51527E-82 | 1.2744E-231 | 6.94717E+12 | 5.4114E-292 | 0     | 0     | 0     | 1.06269E+23 | 3.5604E-204 | 0     |
| MONTEREY      | 2.9988E-247 | 3.21312E-82 | 7.7111E-231 | 7.56982E+12 | 5.0065E-291 | 0     | 0     | 0     | 1.07789E+23 | 1.7761E-203 | 0     |
| ATRISCO       | 7.0257E-247 | 6.02389E-82 | 1.767E-230  | 1.24934E+13 | 1.2444E-290 | 0     | 0     | 0     | 1.75475E+23 | 3.9223E-203 | 0     |
| QUESO         | 1.4141E-247 | 9.9309E-83  | 3.4867E-231 | 1.83748E+12 | 2.6409E-291 | 0     | 0     | 0     | 2.54931E+22 | 7.4877E-204 | 0     |
| CERRO         | 4.6658E-247 | 1.58627E-82 | 1.0704E-230 | 1.93842E+12 | 1.0563E-290 | 0     | 0     | 0     | 2.57197E+22 | 2.0381E-203 | 0     |
| HURON LANDING | 1.4679E-246 | 2.48691E-82 | 3.1422E-230 | 2.04056E+12 | 3.9975E-290 | 0     | 0     | 0     | 2.59391E+22 | 5.3305E-203 | 0     |
| DIAMOND ACE   | 1.4679E-246 | 2.48691E-82 | 3.1422E-230 | 2.04056E+12 | 3.9975E-290 | 0     | 0     | 0     | 2.59391E+22 | 5.3305E-203 | 0     |
| FRISCO        | 6.2529E-246 | 1.05788E-81 | 1.3383E-229 | 8.67326E+12 | 1.7034E-289 | 0     | 0     | 0     | 1.10243E+23 | 2.2698E-202 | 0     |
| BORREGO       | 1.517E-245  | 2.1151E-81  | 3.1848E-229 | 1.55255E+13 | 4.3501E-289 | 0     | 0     | 0     | 1.95006E+23 | 5.2311E-202 | 0     |
| SEYVAL        | 2.241E-245  | 7.2452E-82  | 4.0685E-229 | 2.30558E+12 | 9.4701E-289 | 0     | 0     | 0     | 2.64684E+22 | 5.2446E-202 | 0     |
| MANTECA       | 4.3255E-244 | 5.57525E-81 | 7.1666E-228 | 1.04861E+13 | 2.3328E-287 | 0     | 0     | 0     | 1.13759E+23 | 7.9317E-201 | 0     |
| COALORA       | 3.1315E-243 | 5.03115E-81 | 4.218E-227  | 2.87667E+12 | 2.9341E-286 | 0     | 0     | 0     | 2.74554E+22 | 3.3054E-200 | 0     |
| CHEEDAM       | 4.349E-243  | 5.72306E-81 | 5.7428E-227 | 2.91931E+12 | 4.2965E-286 | 0     | 0     | 0     | 2.75223E+22 | 4.3538E-200 | 0     |
| CABRA         | 1.392E-241  | 5.3705E-80  | 1.627E-225  | 1.35816E+13 | 1.9042E-284 | 0     | 0     | 0     | 1.18733E+23 | 1.0064E-198 | 0     |
| TURQUOISE     | 6.8814E-241 | 1.41968E-79 | 7.5577E-225 | 2.50995E+13 | 1.1114E-283 | 0     | 0     | 0     | 2.11135E+23 | 4.2142E-198 | 0     |
| ARMADA        | 1.4008E-241 | 2.23472E-80 | 1.4996E-225 | 3.41065E+12 | 2.4221E-284 | 0     | 0     | 0     | 2.82397E+22 | 8.013E-199  | 0     |
| CROWDIE       | 2.8493E-241 | 2.95253E-80 | 2.9222E-225 | 3.52088E+12 | 5.5241E-284 | 0     | 0     | 0     | 2.83887E+22 | 1.4536E-198 | 0     |

| Nuclide               | 140Ba       | 141Ce       | 143Pr       | 144Ce       | 147Nd       | 149Pm | 151Pm | 153Sm | 155Eu       | 156Eu       | 157Eu |
|-----------------------|-------------|-------------|-------------|-------------|-------------|-------|-------|-------|-------------|-------------|-------|
| MINI JADE             | 8.907E-241  | 4.61726E-80 | 8.527E-225  | 3.70533E+12 | 2.0752E-283 | 0     | 0     | 0     | 2.86296E+22 | 3.7815E-198 | 0     |
| FAHADA                | 8.9171E-241 | 4.61931E-80 | 8.5361E-225 | 3.70552E+12 | 2.0779E-283 | 0     | 0     | 0     | 2.86298E+22 | 3.7851E-198 | 0     |
| DANABLU               | 1.9182E-240 | 6.23861E-80 | 1.7532E-224 | 3.83489E+12 | 5.0574E-283 | 0     | 0     | 0     | 2.87928E+22 | 7.1966E-198 | 0     |
| LABAN                 | 3.7836E-239 | 2.00968E-79 | 2.8879E-223 | 4.38297E+12 | 1.6132E-281 | 0     | 0     | 0     | 2.94362E+22 | 8.778E-197  | 0     |
| SABADO                | 5.8509E-239 | 2.38452E-79 | 4.3498E-223 | 4.46941E+12 | 2.6763E-281 | 0     | 0     | 0     | 2.95315E+22 | 1.2653E-196 | 0     |
| JARLSBERG             | 1.3963E-238 | 3.35429E-79 | 9.8492E-223 | 4.64701E+12 | 7.3483E-281 | 0     | 0     | 0     | 2.97224E+22 | 2.6247E-196 | 0     |
| CHANCELLOR            | 1.8325E-238 | 3.73175E-79 | 1.2715E-222 | 4.70395E+12 | 1.0076E-280 | 0     | 0     | 0     | 2.97824E+22 | 3.2969E-196 | 0     |
| TOMME/MIDNIGHT ZEPHYR | 5.4479E-238 | 5.722E-79   | 3.5393E-222 | 4.93925E+12 | 3.5705E-280 | 0     | 0     | 0     | 3.00239E+22 | 8.2228E-196 | 0     |
| BRANCO                | 5.4654E-238 | 5.72921E-79 | 3.55E-222   | 4.93996E+12 | 3.5839E-280 | 0     | 0     | 0     | 3.00246E+22 | 8.2449E-196 | 0     |
| BRANCO HERKIMER       | 5.4654E-238 | 5.72921E-79 | 3.55E-222   | 4.93996E+12 | 3.5839E-280 | 0     | 0     | 0     | 3.00246E+22 | 8.2449E-196 | 0     |
| TECHADO               | 4.3142E-237 | 4.38401E-78 | 2.7936E-221 | 3.71347E+13 | 2.8524E-279 | 0     | 0     | 0     | 2.2527E+23  | 6.4548E-195 | 0     |
| NAVATA                | 8.4161E-238 | 6.78653E-79 | 5.3258E-222 | 5.03644E+12 | 5.9165E-280 | 0     | 0     | 0     | 3.01208E+22 | 1.1843E-195 | 0     |
| MUGGINS               | 4.0033E-236 | 3.08794E-78 | 2.006E-220  | 5.98778E+12 | 5.2451E-278 | 0     | 0     | 0     | 3.09954E+22 | 3.0228E-194 | 0     |
| ROMANO                | 2.5034E-235 | 1.52707E-77 | 1.2255E-219 | 2.58922E+13 | 3.4907E-277 | 0     | 0     | 0     | 1.32108E+23 | 1.7762E-193 | 0     |
| GORBEA                | 3.0315E-234 | 4.06233E-77 | 1.2764E-218 | 2.89529E+13 | 6.3188E-276 | 0     | 0     | 0     | 1.34573E+23 | 1.4389E-192 | 0     |
| MIDAS MYTH/MILAGRO    | 1.6177E-234 | 1.31796E-77 | 6.4824E-219 | 7.06701E+12 | 3.8477E-276 | 0     | 0     | 0     | 3.18569E+22 | 6.7289E-193 | 0     |
| TORTUGAS              | 1.5566E-233 | 7.71822E-77 | 5.937E-218  | 3.11547E+13 | 4.2237E-275 | 0     | 0     | 0     | 1.36214E+23 | 5.6757E-192 | 0     |
| AGRINI                | 1.8573E-233 | 3.43358E-77 | 6.4222E-218 | 7.88358E+12 | 6.5475E-275 | 0     | 0     | 0     | 3.24384E+22 | 5.213E-192  | 0     |
| MUNDO                 | 4.3024E-232 | 2.83819E-76 | 1.3427E-216 | 3.61497E+13 | 1.9934E-273 | 0     | 0     | 0     | 1.39607E+23 | 9.1876E-191 | 0     |
| ORKNEY                | 1.0562E-232 | 6.7903E-77  | 3.288E-217  | 8.522E+12   | 4.9276E-274 | 0     | 0     | 0     | 3.2859E+22  | 2.2402E-191 | 0     |
| BELLOW                | 2.2722E-232 | 9.17064E-77 | 6.7532E-217 | 8.81953E+12 | 1.1993E-273 | 0     | 0     | 0     | 3.30461E+22 | 4.2593E-191 | 0     |
| CAPROCK               | 2.1682E-231 | 5.35295E-76 | 6.1368E-216 | 3.88661E+13 | 1.3038E-272 | 0     | 0     | 0     | 1.4129E+23  | 3.5676E-190 | 0     |
| DUORO                 | 6.4632E-231 | 8.21647E-76 | 1.7125E-215 | 4.08152E+13 | 4.6348E-272 | 0     | 0     | 0     | 1.42439E+23 | 8.918E-190  | 0     |
| NORMANNA              | 5.0148E-231 | 3.08737E-76 | 1.2363E-215 | 1.01309E+13 | 4.3589E-272 | 0     | 0     | 0     | 3.38127E+22 | 5.7089E-190 | 0     |
| KAPPELI               | 4.3356E-230 | 1.73368E-75 | 1.024E-214  | 4.44481E+13 | 4.2256E-271 | 0     | 0     | 0     | 1.44462E+23 | 4.4019E-189 | 0     |
| CORREO                | 1.5742E-230 | 4.83599E-76 | 3.6216E-215 | 1.06636E+13 | 1.6453E-271 | 0     | 0     | 0     | 3.41006E+22 | 1.4903E-189 | 0     |
| WEXFORD               | 7.2092E-230 | 8.78493E-76 | 1.5129E-214 | 1.14159E+13 | 9.63E-271   | 0     | 0     | 0     | 3.44873E+22 | 5.3407E-189 | 0     |
| DOLCETTO              | 7.2092E-230 | 8.78493E-76 | 1.5129E-214 | 1.14159E+13 | 9.63E-271   | 0     | 0     | 0     | 3.44873E+22 | 5.3407E-189 | 0     |
| BRETON                | 6.5476E-229 | 5.02935E-75 | 1.3124E-213 | 5.01965E+13 | 9.8852E-270 | 0     | 0     | 0     | 1.47398E+23 | 4.2917E-188 | 0     |
| VERMEJO               | 4.3697E-229 | 1.78133E-75 | 8.2239E-214 | 1.23757E+13 | 7.8044E-270 | 0     | 0     | 0     | 3.4951E+22  | 2.4211E-188 | 0     |
| VILLITA               | 3.6283E-228 | 4.08672E-75 | 6.0088E-213 | 1.36066E+13 | 9.1155E-269 | 0     | 0     | 0     | 3.55036E+22 | 1.4293E-187 | 0     |
| EGMONT                | 7.5118E-227 | 3.23246E-74 | 1.1305E-211 | 6.20792E+13 | 2.4359E-267 | 0     | 0     | 0     | 1.52671E+23 | 2.2925E-186 | 0     |
| TIERRA                | 1.0294E-226 | 3.65772E-74 | 1.5199E-211 | 6.29616E+13 | 3.512E-267  | 0     | 0     | 0     | 1.53028E+23 | 2.9859E-186 | 0     |
| MINERO                | 3.19E-227   | 9.58837E-75 | 4.6325E-212 | 1.49984E+13 | 1.1378E-267 | 0     | 0     | 0     | 3.60802E+22 | 8.8515E-187 | 0     |
| VAUGHN                | 1.3779E-224 | 2.49755E-73 | 1.5135E-209 | 7.8406E+13  | 1.0352E-264 | 0     | 0     | 0     | 1.58684E+23 | 1.8153E-184 | 0     |
| COTTAGE               | 2.1382E-224 | 2.96742E-73 | 2.287E-209  | 7.99647E+13 | 1.7243E-264 | 0     | 0     | 0     | 1.59202E+23 | 2.6244E-184 | 0     |
| HERMOSA               | 3.6952E-224 | 3.67775E-73 | 3.8238E-209 | 8.19487E+13 | 3.2546E-264 | 0     | 0     | 0     | 1.59848E+23 | 4.1525E-184 | 0     |
| MISTY RAIN            | 1.0886E-224 | 9.45143E-74 | 1.1113E-209 | 1.94772E+13 | 9.9423E-265 | 0     | 0     | 0     | 3.76741E+22 | 1.1798E-184 | 0     |

| Nuclide                       | 140Ba       | 141Ce       | 143Pr       | 144Ce       | 147Nd       | 149Pm | 151Pm | 153Sm | 155Eu       | 156Eu       | 157Eu |
|-------------------------------|-------------|-------------|-------------|-------------|-------------|-------|-------|-------|-------------|-------------|-------|
| TOWANDA                       | 1.8679E-223 | 6.94473E-73 | 1.7526E-208 | 8.81187E+13 | 2.1363E-263 | 0     | 0     | 0     | 1.61779E+23 | 1.6166E-183 | 0     |
| SALUT                         | 1.7349E-222 | 1.66488E-72 | 1.4228E-207 | 9.73714E+13 | 2.842E-262  | 0     | 0     | 0     | 1.64474E+23 | 1.0484E-182 | 0     |
| VILLE                         | 4.1031E-223 | 3.92522E-73 | 3.3638E-208 | 2.29161E+13 | 6.7267E-263 | 0     | 0     | 0     | 3.87012E+22 | 2.4773E-183 | 0     |
| MARIBO                        | 8.7942E-223 | 5.29359E-73 | 6.885E-208  | 2.37123E+13 | 1.6303E-262 | 0     | 0     | 0     | 3.89205E+22 | 4.6957E-183 | 0     |
| SERENA                        | 1.7918E-221 | 4.1609E-72  | 1.2761E-206 | 1.08108E+14 | 4.2765E-261 | 0     | 0     | 0     | 1.67345E+23 | 7.4316E-182 | 0     |
| CEBRERO                       | 1.2477E-221 | 1.49852E-72 | 8.3219E-207 | 2.67042E+13 | 3.5472E-261 | 0     | 0     | 0     | 3.96932E+22 | 4.3447E-182 | 0     |
| CHAMITA                       | 1.4802E-221 | 1.60239E-72 | 9.7709E-207 | 2.69094E+13 | 4.3255E-261 | 0     | 0     | 0     | 3.97435E+22 | 5.0141E-182 | 0     |
| PONIL                         | 1.3684E-220 | 3.83436E-72 | 7.8968E-206 | 2.97287E+13 | 5.723E-260  | 0     | 0     | 0     | 4.0404E+22  | 3.2389E-181 | 0     |
| MILL YARD                     | 2.6719E-220 | 4.98545E-72 | 1.4808E-205 | 3.06334E+13 | 1.2448E-259 | 0     | 0     | 0     | 4.06049E+22 | 5.6776E-181 | 0     |
| DIAMOND BEECH                 | 2.682E-220  | 4.99284E-72 | 1.4861E-205 | 3.06386E+13 | 1.2502E-259 | 0     | 0     | 0     | 4.0606E+22  | 5.6956E-181 | 0     |
| ROQUEFORT                     | 1.6611E-219 | 2.45979E-71 | 8.9972E-205 | 1.32429E+14 | 8.2281E-259 | 0     | 0     | 0     | 1.73058E+23 | 3.3199E-180 | 0     |
| ABO                           | 8.2616E-220 | 7.76299E-72 | 4.2769E-205 | 3.22224E+13 | 4.617E-259  | 0     | 0     | 0     | 4.0946E+22  | 1.4635E-180 | 0     |
| KINIBITO                      | 2.4799E-218 | 7.10364E-71 | 1.1408E-203 | 1.49479E+14 | 1.8993E-257 | 0     | 0     | 0     | 1.7656E+23  | 3.2057E-179 | 0     |
| GOLDSTONE                     | 8.7382E-218 | 1.16431E-70 | 3.725E-203  | 1.58156E+14 | 8.1988E-257 | 0     | 0     | 0     | 1.78216E+23 | 9.2202E-179 | 0     |
| GLENCOE                       | 2.8506E-216 | 2.37698E-70 | 9.225E-202  | 6.619E+13   | 5.5787E-255 | 0     | 0     | 0     | 6.28933E+22 | 1.4422E-177 | 0     |
| MIGHTY OAK                    | 5.4965E-216 | 2.45375E-70 | 1.6716E-201 | 4.78E+13    | 1.2696E-254 | 0     | 0     | 0     | 4.37064E+22 | 2.3561E-177 | 0     |
| MOGOLLON                      | 9.4894E-216 | 3.03995E-70 | 2.7923E-201 | 4.89838E+13 | 2.3936E-254 | 0     | 0     | 0     | 4.38837E+22 | 3.725E-177  | 0     |
| JEFFERSON                     | 4.489E-215  | 1.34743E-69 | 1.3124E-200 | 2.09183E+14 | 1.152E-253  | 0     | 0     | 0     | 1.86654E+23 | 1.732E-176  | 0     |
| PANAMINT                      | 0           | 0           | 0           | 0           | 0           | 0     | 0     | 0     | 0           | 0           | 0     |
| TAJO                          | 4.9154E-214 | 3.44568E-69 | 1.2435E-199 | 2.32858E+14 | 1.8553E-252 | 0     | 0     | 0     | 1.89994E+23 | 1.2895E-175 | 0     |
| DARWIN                        | 1.4759E-213 | 5.30403E-69 | 3.4939E-199 | 2.44615E+14 | 6.6513E-252 | 0     | 0     | 0     | 1.91549E+23 | 3.2431E-175 | 0     |
| CYBAR                         | 6.8415E-213 | 1.18772E-68 | 1.5065E-198 | 3.61331E+14 | 3.7394E-251 | 0     | 0     | 0     | 2.70558E+23 | 1.2394E-174 | 0     |
| CORNUCOPIA                    | 1.6599E-213 | 2.30543E-69 | 3.575E-199  | 6.1735E+13  | 9.6259E-252 | 0     | 0     | 0     | 4.55959E+22 | 2.8344E-175 | 0     |
| GALVESTON                     | 1.6322E-212 | 5.65181E-69 | 3.0617E-198 | 6.83916E+13 | 1.3682E-250 | 0     | 0     | 0     | 4.63749E+22 | 1.9281E-174 | 0     |
| ALEMAN                        | 2.3815E-212 | 6.55483E-69 | 4.3666E-198 | 6.95591E+13 | 2.1217E-250 | 0     | 0     | 0     | 4.65049E+22 | 2.6471E-174 | 0     |
| LABQUARK                      | 2.8924E-211 | 4.20583E-68 | 4.9773E-197 | 3.09865E+14 | 3.0521E-249 | 0     | 0     | 0     | 1.9919E+23  | 2.7145E-173 | 0     |
| BELMONT                       | 6.8547E-211 | 5.90012E-68 | 1.1196E-196 | 3.22078E+14 | 8.3127E-249 | 0     | 0     | 0     | 2.00468E+23 | 5.5977E-173 | 0     |
| GASCON                        | 3.291E-210  | 1.09183E-67 | 4.8893E-196 | 3.45529E+14 | 5.1394E-248 | 0     | 0     | 0     | 2.02812E+23 | 2.087E-172  | 0     |
| BODIE                         | 1.5989E-209 | 2.02989E-67 | 2.159E-195  | 3.70885E+14 | 3.2216E-247 | 0     | 0     | 0     | 2.05202E+23 | 7.8591E-172 | 0     |
| HAZEBROOK CHECKER BERRY (RED) | 6.3199E-209 | 1.44466E-67 | 7.1962E-195 | 9.90243E+13 | 2.0066E-246 | 0     | 0     | 0     | 4.93031E+22 | 1.9713E-171 | 0     |
| HAZEBROOK APRICOT (ORANGE)    | 6.3199E-209 | 1.44466E-67 | 7.1962E-195 | 9.90243E+13 | 2.0066E-246 | 0     | 0     | 0     | 4.93031E+22 | 1.9713E-171 | 0     |
| HAZEBROOK EMERALD (GREEN)     | 6.3199E-209 | 1.44466E-67 | 7.1962E-195 | 9.90243E+13 | 2.0066E-246 | 0     | 0     | 0     | 4.93031E+22 | 1.9713E-171 | 0     |
| TORNERO                       | 9.7945E-209 | 1.71559E-67 | 1.0861E-194 | 1.00987E+14 | 3.3375E-246 | 0     | 0     | 0     | 4.94635E+22 | 2.8469E-171 | 0     |
| MIDDLE NOTE                   | 6.5922E-208 | 3.62461E-67 | 6.5146E-194 | 1.09992E+14 | 3.0546E-245 | 0     | 0     | 0     | 5.01674E+22 | 1.4091E-170 | 0     |
| DELAMAR                       | 1.4949E-206 | 2.97122E-66 | 1.3351E-192 | 5.03883E+14 | 9.0731E-244 | 0     | 0     | 0     | 2.15874E+23 | 2.4396E-169 | 0     |
| PRESIDIO                      | 4.385E-207  | 7.62272E-67 | 3.8646E-193 | 1.19737E+14 | 2.7577E-244 | 0     | 0     | 0     | 5.08769E+22 | 6.9063E-170 | 0     |
| HARDIN                        | 2.8693E-206 | 3.83725E-66 | 2.4636E-192 | 5.18818E+14 | 1.9345E-243 | 0     | 0     | 0     | 2.16919E+23 | 4.2153E-169 | 0     |
| BRIE                          | 9.7293E-206 | 2.57157E-66 | 7.11E-192   | 1.37574E+14 | 1.0085E-242 | 0     | 0     | 0     | 5.20592E+22 | 9.2979E-169 | 0     |



| Nuclide       | 140Ba       | 141Ce       | 143Pr       | 144Ce       | 147Nd       | 149Pm | 151Pm | 153Sm | 155Eu       | 156Eu       | 157Eu |
|---------------|-------------|-------------|-------------|-------------|-------------|-------|-------|-------|-------------|-------------|-------|
| MISSION GHOST | 1.0863E-205 | 2.68523E-66 | 7.886E-192  | 1.38255E+14 | 1.1462E-242 | 0     | 0     | 0     | 5.21017E+22 | 1.0199E-168 | 0     |
| PANCHUELA     | 1.8713E-205 | 3.32382E-66 | 1.3145E-191 | 1.41665E+14 | 2.1553E-242 | 0     | 0     | 0     | 5.23121E+22 | 1.6094E-168 | 0     |
| MIDLAND       | 1.9106E-204 | 1.99229E-65 | 1.2729E-190 | 6.26185E+14 | 2.5345E-241 | 0     | 0     | 0     | 2.23775E+23 | 1.4267E-167 | 0     |
| TAHOKA        | 8.6563E-204 | 3.60389E-65 | 5.2639E-190 | 6.70037E+14 | 1.465E-240  | 0     | 0     | 0     | 2.26295E+23 | 5.0667E-167 | 0     |
| LOCKNEY       | 8.5103E-203 | 8.83447E-65 | 4.5075E-189 | 7.42279E+14 | 2.0819E-239 | 0     | 0     | 0     | 2.30161E+23 | 3.4463E-166 | 0     |
| BORATE        | 4.1269E-202 | 1.64126E-64 | 1.9869E-188 | 7.96683E+14 | 1.3022E-238 | 0     | 0     | 0     | 2.3287E+23  | 1.2957E-165 | 0     |
| WACO          | 8.1007E-202 | 8.87601E-65 | 3.4309E-188 | 2.06144E+14 | 3.5982E-238 | 0     | 0     | 0     | 5.56613E+22 | 1.8068E-165 | 0     |
| MISSION CYBER | 8.5533E-202 | 9.06735E-65 | 3.6107E-188 | 2.06646E+14 | 3.8327E-238 | 0     | 0     | 0     | 5.56837E+22 | 1.8911E-165 | 0     |
| KERNVILLE     | 2.1524E-199 | 1.91072E-63 | 7.1004E-186 | 1.05444E+15 | 1.8621E-235 | 0     | 0     | 0     | 2.43923E+23 | 2.465E-163  | 0     |
| ABILENE       | 8.5382E-199 | 1.36177E-63 | 2.3746E-185 | 2.81574E+14 | 1.1647E-234 | 0     | 0     | 0     | 5.86079E+22 | 6.2018E-163 | 0     |
| SCHELLBOURNE  | 4.516E-197  | 2.1977E-62  | 1.1161E-183 | 2.30493E+15 | 8.4403E-233 | 0     | 0     | 0     | 4.45969E+23 | 2.3943E-161 | 0     |
| LAREDO        | 7.0866E-197 | 2.62264E-62 | 1.7044E-183 | 2.35194E+15 | 1.4243E-232 | 0     | 0     | 0     | 4.47461E+23 | 3.4939E-161 | 0     |
| COMSTOCK      | 1.3317E-196 | 3.35909E-62 | 3.0832E-183 | 2.41935E+15 | 2.963E-232  | 0     | 0     | 0     | 4.49558E+23 | 5.931E-161  | 0     |
| RHYOLITE      | 3.9592E-196 | 5.15058E-62 | 8.5821E-183 | 2.54038E+15 | 1.05E-231   | 0     | 0     | 0     | 4.53203E+23 | 1.4793E-160 | 0     |
| NIGHTINGALE   | 3.9592E-196 | 5.15058E-62 | 8.5821E-183 | 2.54038E+15 | 1.05E-231   | 0     | 0     | 0     | 4.53203E+23 | 1.4793E-160 | 0     |
| ALAMO         | 8.9708E-196 | 7.09928E-62 | 1.8508E-182 | 2.63519E+15 | 2.7145E-231 | 0     | 0     | 0     | 4.55959E+23 | 2.9378E-160 | 0     |
| KEARSARGE     | 6.975E-195  | 1.42079E-61 | 1.2574E-181 | 2.42707E+15 | 3.0252E-230 | 0     | 0     | 0     | 3.86307E+23 | 1.5937E-159 | 0     |
| HARLINGEN A   | 1.5517E-195 | 2.58705E-62 | 2.742E-182  | 3.94107E+14 | 7.0971E-231 | 0     | 0     | 0     | 6.19603E+22 | 3.3619E-160 | 0     |
| HARLINGEN B   | 1.5517E-195 | 2.58705E-62 | 2.742E-182  | 3.94107E+14 | 7.0971E-231 | 0     | 0     | 0     | 6.19603E+22 | 3.3619E-160 | 0     |
| BULLFROG      | 1.7008E-194 | 2.2517E-61  | 2.9373E-181 | 3.00648E+15 | 8.2696E-230 | 0     | 0     | 0     | 4.66011E+23 | 3.4663E-159 | 0     |
| DALHART       | 1.8431E-193 | 5.73475E-61 | 2.7563E-180 | 3.3452E+15  | 1.3159E-228 | 0     | 0     | 0     | 4.74314E+23 | 2.5584E-158 | 0     |
| MONAHANS B    | 1.0817E-193 | 1.36758E-61 | 1.4791E-180 | 4.76644E+14 | 9.8072E-229 | 0     | 0     | 0     | 6.39403E+22 | 1.1825E-158 | 0     |
| MONAHANS A    | 1.0817E-193 | 1.36758E-61 | 1.4791E-180 | 4.76644E+14 | 9.8072E-229 | 0     | 0     | 0     | 6.39403E+22 | 1.1825E-158 | 0     |
| KAWICH BLUE   | 5.464E-193  | 2.58164E-61 | 6.7746E-180 | 5.12514E+14 | 6.4316E-228 | 0     | 0     | 0     | 6.47125E+22 | 4.6005E-158 | 0     |
| KAWICH WHITE  | 5.464E-193  | 2.58164E-61 | 6.7746E-180 | 5.12514E+14 | 6.4316E-228 | 0     | 0     | 0     | 6.47125E+22 | 4.6005E-158 | 0     |
| MISTY ECHO    | 4.3787E-192 | 1.98722E-60 | 5.4073E-179 | 3.85528E+15 | 5.2095E-227 | 0     | 0     | 0     | 4.85582E+23 | 3.6475E-157 | 0     |
| TEXARKANA     | 7.2129E-191 | 4.22369E-60 | 7.2663E-178 | 2.54066E+15 | 1.4773E-225 | 0     | 0     | 0     | 2.82122E+23 | 3.4905E-156 | 0     |
| KAWICH BLACK  | 3.6014E-191 | 1.33503E-60 | 3.4668E-178 | 6.18294E+14 | 8.3274E-226 | 0     | 0     | 0     | 6.67527E+22 | 1.5438E-156 | 0     |
| KAWICH RED    | 3.6014E-191 | 1.33503E-60 | 3.4668E-178 | 6.18294E+14 | 8.3274E-226 | 0     | 0     | 0     | 6.67527E+22 | 1.5438E-156 | 0     |
| INGOT         | 3.0879E-190 | 7.47233E-60 | 2.8491E-177 | 2.71169E+15 | 7.9953E-225 | 0     | 0     | 0     | 2.85179E+23 | 1.1821E-155 | 0     |
| PALISADE 3    | 2.7686E-189 | 7.33328E-60 | 2.05E-176   | 7.51066E+14 | 1.2891E-223 | 0     | 0     | 0     | 6.89359E+22 | 5.8939E-155 | 0     |
| PALISADE 2    | 2.7686E-189 | 7.33328E-60 | 2.05E-176   | 7.51066E+14 | 1.2891E-223 | 0     | 0     | 0     | 6.89359E+22 | 5.8939E-155 | 0     |
| PALISADE I    | 2.7686E-189 | 7.33328E-60 | 2.05E-176   | 7.51066E+14 | 1.2891E-223 | 0     | 0     | 0     | 6.89359E+22 | 5.8939E-155 | 0     |
| TULIA         | 5.0914E-189 | 9.31313E-60 | 3.6338E-176 | 7.71847E+14 | 2.6153E-223 | 0     | 0     | 0     | 6.92478E+22 | 9.8252E-155 | 0     |
| CONTACT       | 9.4577E-188 | 7.0596E-59  | 6.1744E-175 | 3.50443E+15 | 6.162E-222  | 0     | 0     | 0     | 2.97538E+23 | 1.4389E-153 | 0     |
| AMARILLO      | 1.2251E-187 | 7.814E-59   | 7.8741E-175 | 3.54529E+15 | 8.3221E-222 | 0     | 0     | 0     | 2.98109E+23 | 1.7878E-153 | 0     |
| DISKO ELM     | 2.1111E-186 | 9.90891E-59 | 1.0468E-173 | 1.01112E+15 | 2.8652E-220 | 0     | 0     | 0     | 7.24114E+22 | 1.542E-152  | 0     |
| HORNITOS      | 1.1563E-184 | 1.148E-57   | 4.9127E-172 | 4.81866E+15 | 2.3696E-218 | 0     | 0     | 0     | 3.13634E+23 | 5.5937E-151 | 0     |

| Nuclide         | 140Ba       | 141Ce       | 143Pr       | 144Ce       | 147Nd       | 149Pm | 151Pm | 153Sm | 155Eu       | 156Eu       | 157Eu |
|-----------------|-------------|-------------|-------------|-------------|-------------|-------|-------|-------|-------------|-------------|-------|
| MULESHOE        | 6.2171E-185 | 3.73557E-58 | 2.5128E-172 | 1.17657E+15 | 1.4556E-218 | 0     | 0     | 0     | 7.42497E+22 | 2.6325E-151 | 0     |
| BARNWELL        | 9.1151E-184 | 2.58062E-57 | 3.4185E-171 | 5.28564E+15 | 2.6057E-217 | 0     | 0     | 0     | 3.18471E+23 | 3.1613E-150 | 0     |
| WHITEFACE B     | 4.1839E-184 | 7.89199E-58 | 1.507E-171  | 1.28147E+15 | 1.3321E-217 | 0     | 0     | 0     | 7.53063E+22 | 1.3029E-150 | 0     |
| WHITEFACE A     | 4.1839E-184 | 7.89199E-58 | 1.507E-171  | 1.28147E+15 | 1.3321E-217 | 0     | 0     | 0     | 7.53063E+22 | 1.3029E-150 | 0     |
| METROPOLIS      | 1.3579E-181 | 1.83762E-56 | 3.7639E-169 | 6.61383E+15 | 8.6967E-215 | 0     | 0     | 0     | 3.30503E+23 | 2.1024E-148 | 0     |
| BOWIE           | 1.3898E-181 | 7.69733E-57 | 3.5247E-169 | 1.66214E+15 | 1.1281E-214 | 0     | 0     | 0     | 7.86173E+22 | 1.6977E-148 | 0     |
| BULLION         | 2.376E-179  | 1.39377E-55 | 4.8202E-167 | 8.33561E+15 | 3.4986E-212 | 0     | 0     | 0     | 3.43399E+23 | 1.6001E-146 | 0     |
| AUSTIN          | 8.6808E-180 | 3.89735E-56 | 1.7149E-167 | 2.00037E+15 | 1.3722E-212 | 0     | 0     | 0     | 8.10636E+22 | 5.4457E-147 | 0     |
| RANDBURG        | 5.4715E-179 | 8.02489E-56 | 9.6708E-167 | 2.17235E+15 | 1.1637E-211 | 0     | 0     | 0     | 8.21773E+22 | 2.5511E-146 | 0     |
| MINERAL QUARRY  | 5.4715E-179 | 8.02489E-56 | 9.6708E-167 | 2.17235E+15 | 1.1637E-211 | 0     | 0     | 0     | 8.21773E+22 | 2.5511E-146 | 0     |
| SUNDOWN A       | 1.2165E-177 | 2.70945E-55 | 1.7827E-165 | 2.49617E+15 | 4.2658E-210 | 0     | 0     | 0     | 8.40882E+22 | 3.4405E-145 | 0     |
| SUNDOWN B       | 1.2165E-177 | 2.70945E-55 | 1.7827E-165 | 2.49617E+15 | 4.2658E-210 | 0     | 0     | 0     | 8.40882E+22 | 3.4405E-145 | 0     |
| LEDOUX          | 1.7871E-177 | 3.15074E-55 | 2.5587E-165 | 2.53956E+15 | 6.6675E-210 | 0     | 0     | 0     | 8.43282E+22 | 4.7504E-145 | 0     |
| TENABO          | 1.7146E-176 | 1.84301E-54 | 2.337E-164  | 1.11941E+16 | 7.2941E-209 | 0     | 0     | 0     | 3.60564E+23 | 3.9971E-144 | 0     |
| HOUSTON         | 1.0353E-175 | 3.73144E-54 | 1.2658E-163 | 1.21331E+16 | 5.885E-208  | 0     | 0     | 0     | 3.65401E+23 | 1.8062E-143 | 0     |
| COSO GRAY       | 1.2022E-173 | 1.0002E-53  | 1.0105E-161 | 3.76914E+15 | 1.857E-205  | 0     | 0     | 0     | 9.00207E+22 | 7.7189E-142 | 0     |
| COSO SILVER     | 1.2022E-173 | 1.0002E-53  | 1.0105E-161 | 3.76914E+15 | 1.857E-205  | 0     | 0     | 0     | 9.00207E+22 | 7.7189E-142 | 0     |
| COSO BRONZE     | 1.2022E-173 | 1.0002E-53  | 1.0105E-161 | 3.76914E+15 | 1.857E-205  | 0     | 0     | 0     | 9.00207E+22 | 7.7189E-142 | 0     |
| BEXAR           | 2.207E-172  | 7.547E-53   | 1.6981E-160 | 1.71041E+16 | 4.3162E-204 | 0     | 0     | 0     | 3.86759E+23 | 1.1194E-140 | 0     |
| MONTELLO        | 4.2043E-172 | 9.71792E-53 | 3.1113E-160 | 1.76051E+16 | 9.1222E-204 | 0     | 0     | 0     | 3.88611E+23 | 1.922E-140  | 0     |
| FLOYDADA        | 7.1224E-170 | 3.02089E-52 | 3.5417E-158 | 5.56233E+15 | 4.4632E-201 | 0     | 0     | 0     | 9.6007E+22  | 1.1275E-138 | 0     |
| HOYA            | 1.5569E-168 | 2.44093E-51 | 7.0126E-157 | 2.54396E+16 | 1.2704E-199 | 0     | 0     | 0     | 4.13013E+23 | 1.8929E-137 | 0     |
| DISTANT ZENITH  | 4.7805E-169 | 6.3755E-52  | 2.1188E-157 | 6.05758E+15 | 4.0718E-200 | 0     | 0     | 0     | 9.73713E+22 | 5.568E-138  | 0     |
| LUBBOCK         | 9.8904E-168 | 5.04146E-51 | 3.9839E-156 | 2.76364E+16 | 1.0872E-198 | 0     | 0     | 0     | 4.18711E+23 | 8.9259E-137 | 0     |
| BRISTOL         | 1.9365E-167 | 2.72374E-51 | 6.8628E-156 | 7.15018E+15 | 2.9955E-198 | 0     | 0     | 0     | 1.0008E+23  | 1.242E-136  | 0     |
| JUNCTION        | 5.891E-164  | 1.52584E-49 | 1.4034E-152 | 4.07943E+16 | 2.6293E-194 | 0     | 0     | 0     | 4.46572E+23 | 1.3097E-133 | 0     |
| DIAMOND FORTUNE | 9.2931E-164 | 7.57365E-50 | 1.9733E-152 | 1.04528E+16 | 5.6366E-194 | 0     | 0     | 0     | 1.06568E+23 | 1.5203E-133 | 0     |
| VICTORIA        | 1.409E-162  | 2.20052E-49 | 2.5387E-151 | 1.18067E+16 | 1.3247E-192 | 0     | 0     | 0     | 1.08737E+23 | 1.4872E-132 | 0     |
| GALENA YELLOW   | 1.7444E-162 | 2.39276E-49 | 3.1026E-151 | 1.19202E+16 | 1.6974E-192 | 0     | 0     | 0     | 1.08909E+23 | 1.7789E-132 | 0     |
| GALENA GREEN    | 1.7444E-162 | 2.39276E-49 | 3.1026E-151 | 1.19202E+16 | 1.6974E-192 | 0     | 0     | 0     | 1.08909E+23 | 1.7789E-132 | 0     |
| GALENA ORANGE   | 1.7444E-162 | 2.39276E-49 | 3.1026E-151 | 1.19202E+16 | 1.6974E-192 | 0     | 0     | 0     | 1.08909E+23 | 1.7789E-132 | 0     |
| HUNTERS TROPHY  | 1.9847E-160 | 1.53287E-48 | 2.6518E-149 | 1.47365E+16 | 4.1426E-190 | 0     | 0     | 0     | 1.12799E+23 | 9.4362E-131 | 0     |
| DIVIDER         | 2.5932E-160 | 1.70244E-48 | 3.4093E-149 | 1.49141E+16 | 5.6513E-190 | 0     | 0     | 0     | 1.13022E+23 | 1.1809E-130 | 0     |

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