

# **Navajo Abandoned Uranium Mine**

## **Site Screen Report**

*This form is for use at the site of abandoned uranium mines (AUM) located on Navajo Nation lands. Applicable sites include all mine and mine features that have or have not undergone reclamation by the Navajo Abandoned Mine Lands Reclamation Program, including features, adits, pits and waste piles. Applicable sites also include all AUM sites listed in the USEPA CERCLIS database, all sites listed in the 2008 AUM GIS Report issued by USACOE and USEPA, all AUM sites on allotment lands associated with the Navajo Nation, and any and all AUM sites not listed in any database located on Navajo lands. Reconnaissance of any sites located on lands adjacent to Navajo lands that may be impacting Navajo lands will need to be coordinated with the authorities appropriate to those lands.*

*The purpose of the form is to ascertain the status and location of the identified AUM site, and record all immediate site information associated with the mine site. Decisions and recommendations on what additional steps are needed will be provided on a separate document.*

### **Charles Huskon No. 3 AUM Site**

**Navajo AUM Western Region**

**Prepared by:**

**Weston Solutions, Inc.**

**Contract: W91238-06-F-0083**

**12767.063.599.1111**

**January 2011**

**Part I Site Identification, Location and Status**

**Site Names and ID numbers as applicable**

**Mine ID:** 137; 138; 139; 140

**Map ID:** *137:* W65; *138:* W64; *139:* W63; *140:* W62

**CERCLIS:** NNN000909068

**Navajo Abandoned Mine Land Reclamation Program:** *137:* NA-0149D; *138:* NA-0149C; *139:* NA-0149B; *140:* NA-0149A

**Local name / Aliases:** Charles Huskon #3; Huskon #3; Huskon No. 3

**Chapter and local area:** Cameron Chapter

**County:** Coconino **State:** Arizona

**Lat/Long:** *137:* 35.8215350739 N / -111.366418032 W  
*138:* 35.8179739441 N / -111.374085147 W  
*139:* 35.8199669169 N / -111.373217534 W  
*140:* 35.8211841616 N / -111.377943336 W

**Nearby road and highway:** Highway 89 **Local Post Office:** Cameron, AZ

**Surface Land Status: check one or more and provide ownership and contact information below**

<b>Tribal Trust Land</b>	<input checked="" type="checkbox"/>	<b>Public lands</b>	<input type="checkbox"/>
<b>Private</b>	<input type="checkbox"/>	<b>Tribal Fee Land</b>	<input type="checkbox"/>
<b>Bureau of Land Mgmt</b>	<input type="checkbox"/>	<b>Allotment</b>	<input type="checkbox"/>
<b>State</b>	<input type="checkbox"/>	<b>Fee land</b>	<input type="checkbox"/>

**Subsurface Mineral Rights:**

No information on subsurface mineral rights ownership was found in the EPA/AUM Database.

**Claim and operator information:**

The Charles Huskon No. 3 mine claim consists of 4 separate mine sites (#'s 137, 138, 139, 140). The mine claim surface land status is classified as Tribal Trust Land. Historical documents showed the operator of the mine as the Arrowhead Uranium Corporation from 1953 to 1954, and the Rare Metals Corporation from 1956 to 1961. No additional ownership / lease information was identified in the EPA/AUM database.

**Number of residential structures within 200 feet of mine:** None

**Estimated volume of mine waste onsite:** *137:* 169 yd<sup>3</sup>; *138:* 24 yd<sup>3</sup>; *139:* 37 yd<sup>3</sup>; *140:* 9 yd<sup>3</sup>

**Part II Summary of radiological readings**

**Mine ID:** 137

**Highest gamma radiation measurement:**

493,391 counts per minute (cpm)

**Describe any other radiological measurements:**

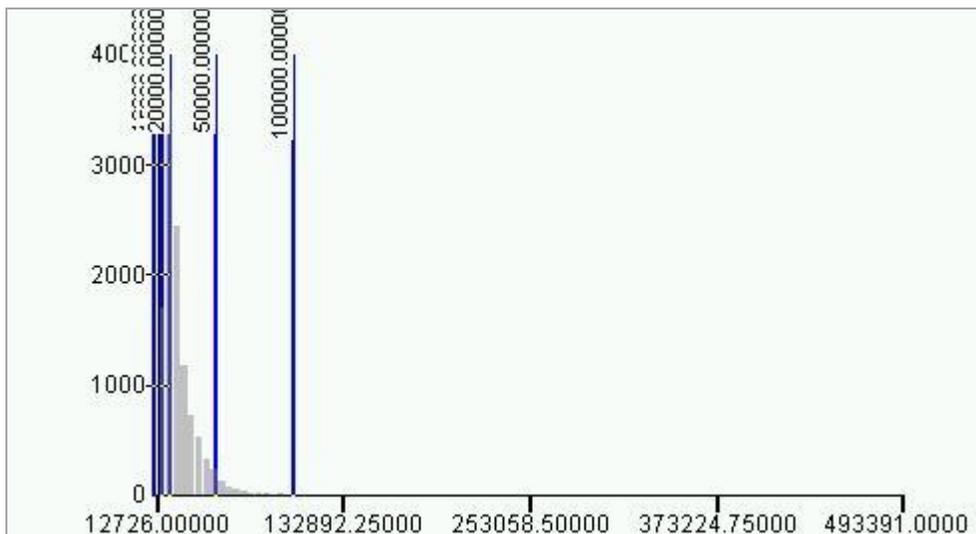
A total of 11,299 gamma radiation measurements were collected from the mine site, ranging from 12,726 cpm to 493,391 cpm. The measurements collected at the waste piles were found at maximum levels ranging from approximately 300,000 cpm to 500,000 cpm, and at the reclamation cap at average levels ranging from approximately 20,000 cpm to 40,000 cpm. The measurements are represented in Figures 1, 2, 3, and 4.

**Background Readings:** 15,376 cpm

**Background Average:** 15,376 cpm (mine claim background average was 12,921 cpm)

**Distribution Chart and Statistics:**

The following chart and statistics were generated by ESRI ArcGIS 9.3.1, and show the general distribution of the site gamma radiation measurements. The horizontal X axis represents the gamma radiation reading levels in cpm (lowest levels to the left). The vertical Y axis represents the frequency of each gamma radiation level.



Count:	11299
Minimum:	12726.00000
Maximum:	493391.00000
Sum:	319689964.00000
Mean:	28293.65112
Median:	22820.00000
Standard Deviation:	25912.81454

**Mine ID:** 138

**Highest gamma radiation measurement:**

311,706 counts per minute (cpm)

**Describe any other radiological measurements:**

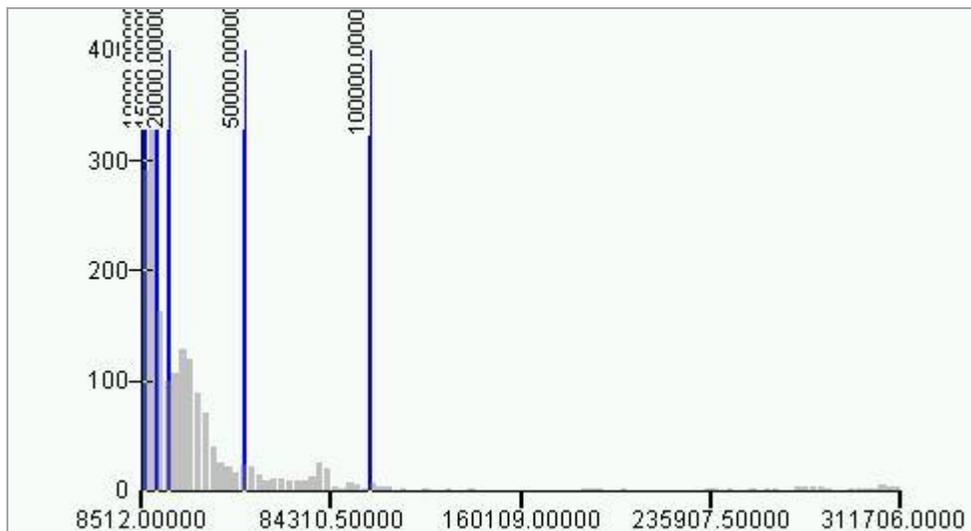
A total of 1,794 gamma radiation measurements were collected from the mine site, ranging from 8,512 cpm to 311,706 cpm. The measurements collected at the waste piles were found at maximum levels ranging from approximately 60,000 cpm to 300,000 cpm. The measurements are represented in Figures 1, 2, 5, and 6.

**Background Readings:** 11,930 cpm

**Background Average:** 11,930 cpm (mine claim background average was 12,921 cpm)

**Distribution Chart and Statistics:**

The following chart and statistics were generated by ESRI ArcGIS 9.3.1, and show the general distribution of the site gamma radiation measurements. The horizontal X axis represents the gamma radiation reading levels in cpm (lowest levels to the left). The vertical Y axis represents the frequency of each gamma radiation level.



Count:	1794
Minimum:	8512.00000
Maximum:	311706.00000
Sum:	57805714.00000
Mean:	32221.69119
Median:	19720.00000
Standard Deviation:	43861.35267

**Mine ID:** 139

**Highest gamma radiation measurement:**

135,423 counts per minute (cpm)

**Describe any other radiological measurements:**

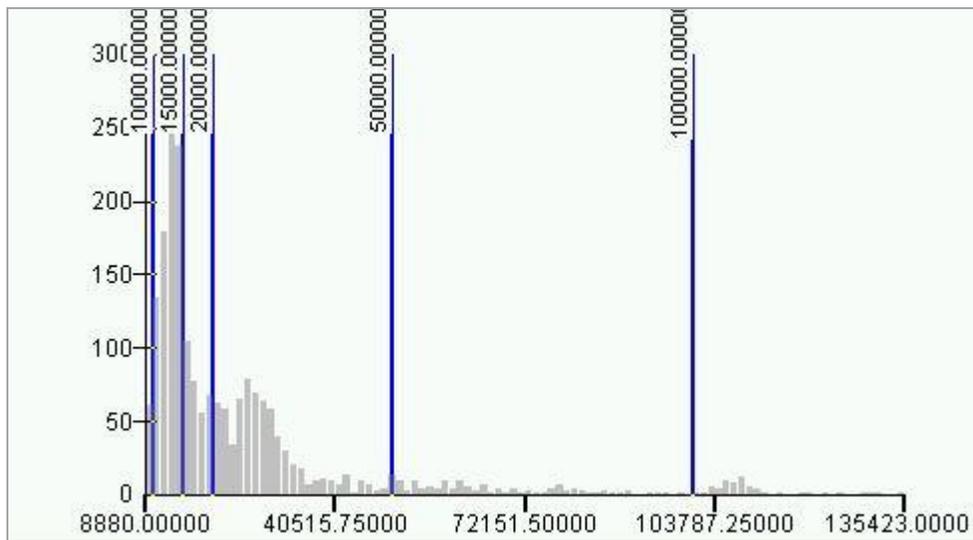
A total of 2,051 gamma radiation measurements were collected from the mine site, ranging from 8,880 cpm to 135,423 cpm. The measurements collected at the waste piles were found at maximum levels ranging from approximately 70,000 cpm to 130,000 cpm. The measurements are represented in Figures 1, 2, 5, and 6.

**Background Readings:** 11,930 cpm

**Background Average:** 11,930 cpm (mine claim background average was 12,921 cpm)

**Distribution Chart and Statistics:**

The following chart and statistics were generated by ESRI ArcGIS 9.3.1, and show the general distribution of the site gamma radiation measurements. The horizontal X axis represents the gamma radiation reading levels in cpm (lowest levels to the left). The vertical Y axis represents the frequency of each gamma radiation level.



Count:	2051
Minimum:	8880.00000
Maximum:	135423.00000
Sum:	51433448.00000
Mean:	25077.25402
Median:	17291.00000
Standard Deviation:	20592.71496

**Mine ID:** 140

**Highest gamma radiation measurement:**

163,816 counts per minute (cpm)

**Describe any other radiological measurements:**

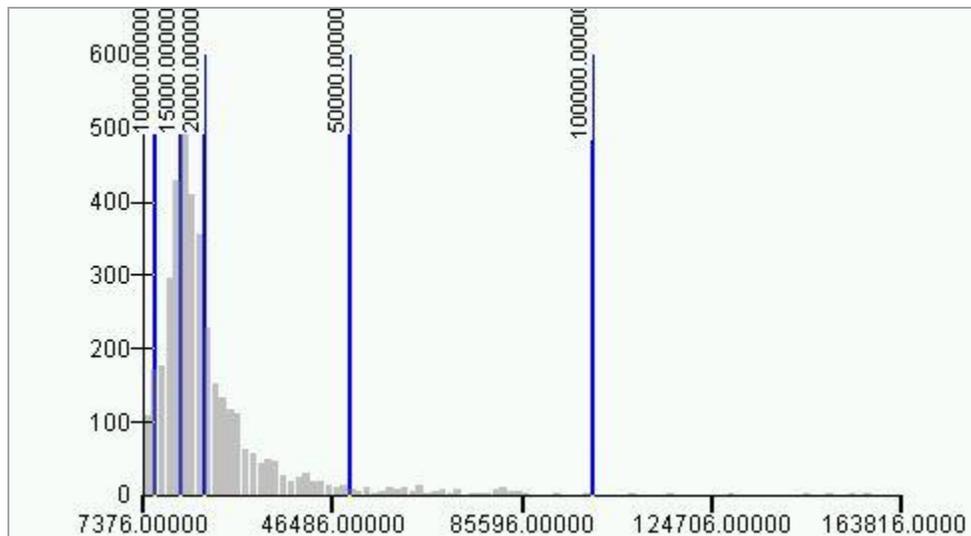
A total of 3,822 gamma radiation measurements were collected from the mine site, ranging from 7,376 cpm to 163,816 cpm. The measurements collected at the waste pile were found at a maximum level of approximately 160,000 cpm, and at the reclamation area at average levels ranging from approximately 15,000 cpm to 20,000 cpm. The measurements are represented in Figures 1, 2, 7, and 8.

**Background Readings:** 12,448 cpm

**Background Average:** 12,448 cpm (mine claim background average was 12,921 cpm)

**Distribution Chart and Statistics:**

The following chart and statistics were generated by ESRI ArcGIS 9.3.1, and show the general distribution of the site gamma radiation measurements. The horizontal X axis represents the gamma radiation reading levels in cpm (lowest levels to the left). The vertical Y axis represents the frequency of each gamma radiation level.



Count:	3822
Minimum:	7376.00000
Maximum:	163816.00000
Sum:	84278252.00000
Mean:	22050.82470
Median:	17564.50000
Standard Deviation:	16264.42453

### **Part III Status of Reclamation and Mine Waste**

**Mine ID:** 137

**The following information was obtained from the Navajo Abandoned Mine Land Reclamation Program (NAMLRP) Point Features Database:**

**NAMLRP Status of the mine site: Reclaimed:** Yes                      **Waste Pile onsite:** No

**NAMLRP Project Number:** NA-0149D

**NAMLRP Mine features:** 1 Rim Strip/Pit

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**The following information was obtained from field observations collected during the 2010 site screening:**

**Provide description and status of all mine sites and features at site. Include all waste piles, adits, pits and other features, and indicate whether they are open, closed, covered, capped, buried or unreclaimed. Indicate approximate size, shape and extent, including description of any reclamation caps. Note condition of all caps.**

#### **Observed reclamation work and status:**

##### **Adits**

None

##### **Waste Piles**

3 Waste piles: 1 - 15' x 10' x 5' oval yellow-brown fine soil with larger rocks; 2 - 20' x 10' x 4' oval yellow-brown fine soil with larger rocks; 3 - 4 interconnected mounds, 60' x 10' x 5 yellow-brown fine soil with larger rocks

##### **Pits**

None

##### **Shafts**

None

##### **Other Debris and Mine Features**

4 large reclamation caps, series of berms created for erosion control, minor erosional cuts but relatively good condition

**Mine ID:** 138

**The following information was obtained from the Navajo Abandoned Mine Land Reclamation Program (NAMLRP) Point Features Database:**

**NAMLRP Status of the mine site: Reclaimed:** Yes

**Waste Pile onsite:** No

**NAMLRP Project Number:** NA-0149C

**NAMLRP Mine features:** 1 Rim Strip/Pit

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**The following information was obtained from field observations collected during the 2010 site screening:**

**Provide description and status of all mine sites and features at site. Include all waste piles, adits, pits and other features, and indicate whether they are open, closed, covered, capped, buried or unreclaimed. Indicate approximate size, shape and extent, including description of any reclamation caps. Note condition of all caps.**

**Observed reclamation work and status:**

**Adits**

None

**Waste Piles**

3 waste piles: 1 - 10' diameter x 4' h; 2 - 10' diameter x 4' h; 3 - 20' diameter x 4' h exposed material

**Pits**

None

**Shafts**

None

**Other Debris and Mine Features**

None

**Mine ID:** 139

**The following information was obtained from the Navajo Abandoned Mine Land Reclamation Program (NAMLRP) Point Features Database:**

**NAMLRP Status of the mine site: Reclaimed:** Yes

**Waste Pile onsite:** No

**NAMLRP Project Number:** NA-0149B

**NAMLRP Mine features:** 1 Rim Strip/Pit

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**The following information was obtained from field observations collected during the 2010 site screening:**

**Provide description and status of all mine sites and features at site. Include all waste piles, adits, pits and other features, and indicate whether they are open, closed, covered, capped, buried or unreclaimed. Indicate approximate size, shape and extent, including description of any reclamation caps. Note condition of all caps.**

**Observed reclamation work and status:**

**Adits**

None

**Waste Piles**

3 Waste piles: 1 - exposed yellow-brown material, 6' x 4' x 3'; 2 - larger pile of fine yellow-brown material, 20' diameter x 8' h; 3 - series of 3 small piles of yellow-brown material and petrified wood chips 8' diameter x 2.5' h

**Pits**

None

**Shafts**

None

**Other Debris and Mine Features**

None

**Mine ID:** 140

**The following information was obtained from the Navajo Abandoned Mine Land Reclamation Program (NAMLRP) Point Features Database:**

**NAMLRP Status of the mine site: Reclaimed:** Yes

**Waste Pile onsite:** No

**NAMLRP Project Number:** NA-0149A

**NAMLRP Mine features:** 1 Rim Strip/Pit

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**The following information was obtained from field observations collected during the 2010 site screening:**

**Provide description and status of all mine sites and features at site. Include all waste piles, adits, pits and other features, and indicate whether they are open, closed, covered, capped, buried or unreclaimed. Indicate approximate size, shape and extent, including description of any reclamation caps. Note condition of all caps.**

**Observed reclamation work and status:**

**Adits**

None

**Waste Piles**

Collection of approximately 10 small waste pile mounds, each 6' diameter x 2.5' h, fine yellow-brown material

**Pits**

None

**Shafts**

None

**Other Debris and Mine Features**

2 reclamation areas: 1 - 200' x 400' tiered with berms in southern portion of site; 2 - 150' x 750' tiered with berms, drainage below, in northern portion of site

## Part IV

### Site observations and Environs

**Observed Structures: list number of and describe human habitation status of structures at the following distances from mine:**

**0 to 200 feet:** None

**200 feet to 0.25 mile:** None

**Observed Public or commercial structure: list and describe all schools, clinics, Chapter Houses, places of business and any other structure used by members of the community at the following distances:**

**0 to 200 feet:** None

**200 feet to 0.25 mile:** None

**Levels measured around the perimeter(s) of the identified structure(s):**

None

**Observed water sources: list the number and type of wells and surface water sources that are potentially used for human consumption at the following distances from the mine:**

**0 to 0.25 miles:** None

**0.25 miles to 4 miles:** Little Colorado River Basin approximately 0.5 mi E of the site 137; approximately 1 mi E of sites 138 and 139; approximately 1.5 mi E of site 140

**Sensitive environments: note and describe all sensitive environments located within visible range of the mine site, including: wetlands, endangered species, habitats and approximate locations of sites that may be under protection of the government of the Navajo Nation.**

None

**Known Site History: include information from interviews with Chapter officials and residents. Note information on mine ownership, type of mining operation, period of operation, known amount of production, and any other information as provided.**

Charles Huskon No. 3 mine claim consists of 4 separate mine sites (#'s 137, 138, 139, 140) with a total combined area of 461,836.98 m<sup>2</sup>. The mine claim was identified as being operational from 1953 to 1961. Historical documents showed the operator of the mine as the Arrowhead Uranium Corporation from 1953 to 1954, and the Rare Metals Corporation from 1956 to 1961. While operational, the mine had a total reported production volume of 27,249 tons. No other historical information or any additional ownership / lease information was identified in the EPA/AUM database.

**Part V Response Action Summary**

**Summary of Evaluation Factors:**

***Accessibility:***

**Was the mine easily accessible to potential human activity?**

Yes

***Radiological Measurements:***

**Were any gamma radiation measurements collected at the mine greater than two times the site-specific background levels?**

Yes

***Waste Piles:***

**Were any unreclaimed waste piles observed at the mine with gamma radiation measurements greater than two times the site-specific background levels?**

Yes

***Structures:***

**Were any structures observed within 200 feet of the mine?**

No

***Potential Drinking Water Sources:***

**Were any potential drinking water sources observed within 4 miles of the mine?**

Yes

***Reclamation:***

**Was the mine reported to be previously reclaimed, or did the mine appear to be reclaimed?**

Yes (reclamation caps at sites 137 and 140)

**Part VI      Photos**



Photo 1. Charles Huskon No. 3, Site #137



Photo 2. Charles Huskon No. 3, Site #137



Photo 3. Charles Huskon No. 3, Site #137, reclamation berms



Photo 4. Charles Huskon No. 3, Site #137, reclamation berms



Photo 5. Charles Huskon No. 3, Site #137, gully with waste rock

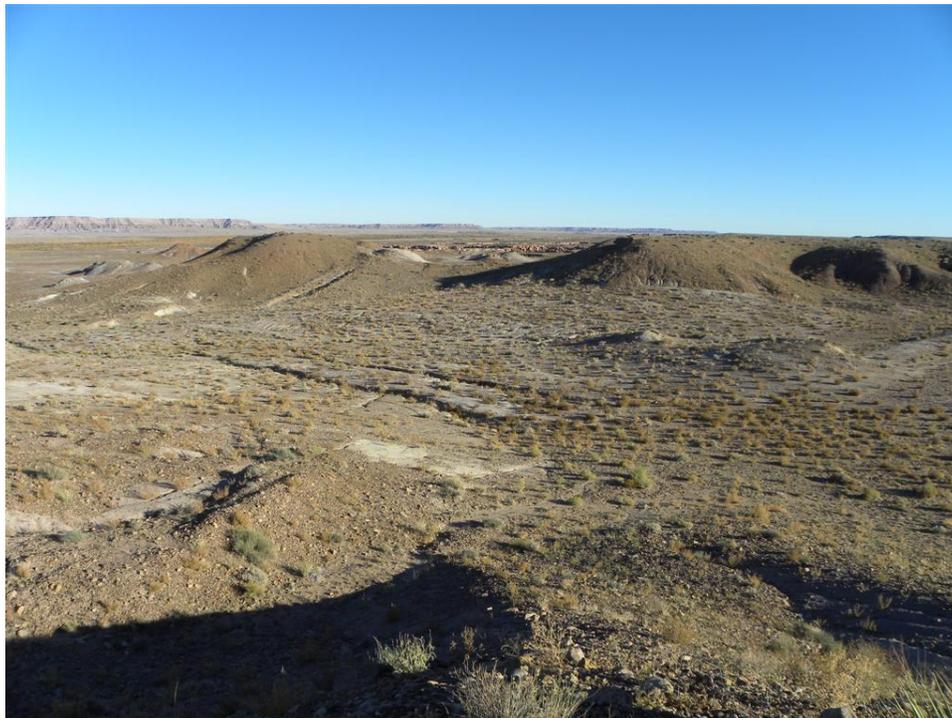


Photo 6. Charles Huskon No. 3, Site #138

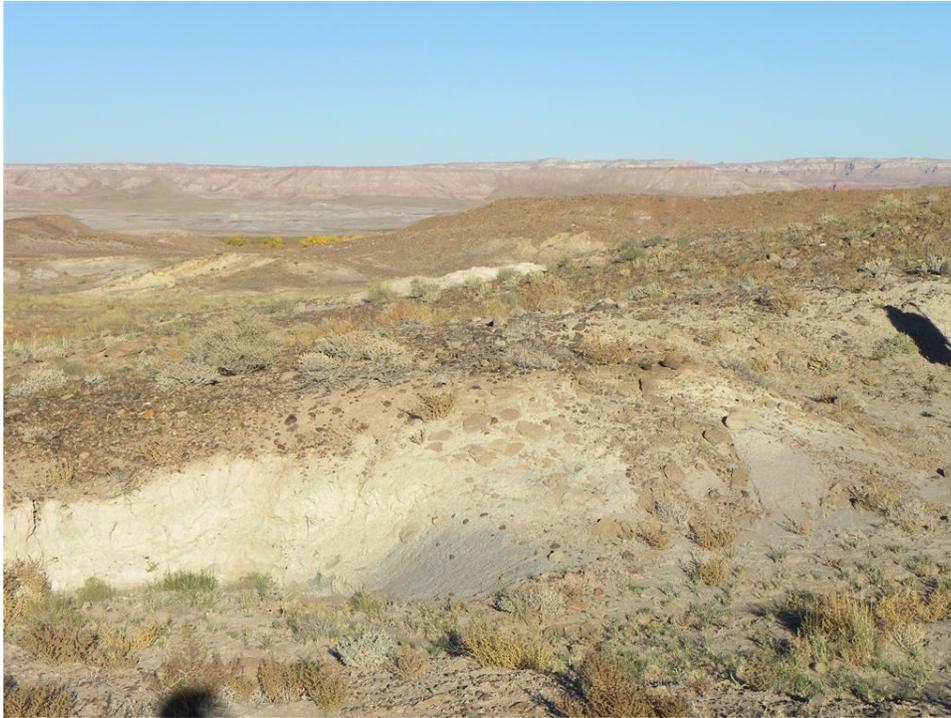


Photo 7. Charles Huskon No. 3, Site #138, waste piles and exposed material



Photo 8. Charles Huskon No. 3, Site #138



Photo 9. Charles Huskon No. 3, Site #139



Photo 10. Charles Huskon No. 3, Site #139, waste pile



Photo 11. Charles Huskon No. 3, Site #139, waste pile



Photo 12. Charles Huskon No. 3, Site #140



Photo 13. Charles Huskon No. 3, Site #140, reclamation berms



Photo 14. Charles Huskon No. 3, Site #140, reclamation berms

**Part VII      Contacts Reports and Information**

Name:      Stanley Edison (928) 871-6861

Eugene Esplain (928) 871-7331

Title or official role (if any): Navajo EPA Superfund Program

Address:    PO Box 2946, Window Rock, AZ 86515

Information provided: Lead Regulatory Agency

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Name: \_\_\_\_\_

Title or official role (if any): \_\_\_\_\_

Address: \_\_\_\_\_

Telephone number: \_\_\_\_\_

Information provided: \_\_\_\_\_

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Name: \_\_\_\_\_

Title or official role (if any): \_\_\_\_\_

Telephone number: \_\_\_\_\_

Information provided: \_\_\_\_\_

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Name: \_\_\_\_\_

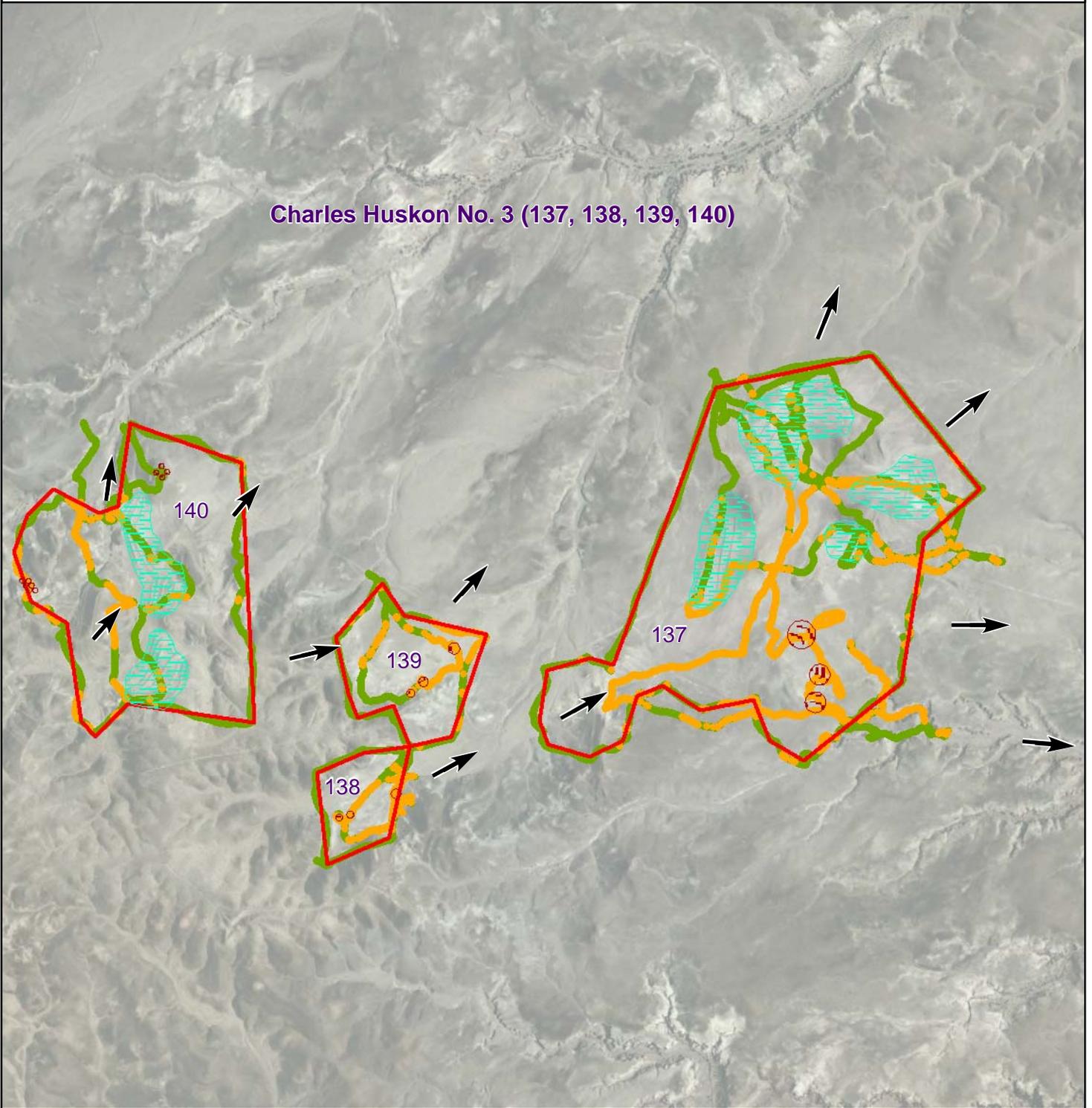
Title or official role (if any): \_\_\_\_\_

Telephone number: \_\_\_\_\_

Information provided: \_\_\_\_\_

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**Figure 1 - Gamma Radiation Measurements, Above Two Times Background  
Charles Huskon No. 3 (137, 138, 139, 140)  
Cameron Chapter, Navajo Nation**



Charles Huskon No. 3 (137, 138, 139, 140)

**Legend**

**Gamma Radiation Measurements**

- < 2X Background
- > 2X Background

Gamma survey conducted 11/2010  
Measured as counts per minute (cpm)

Average background 12,921 cpm

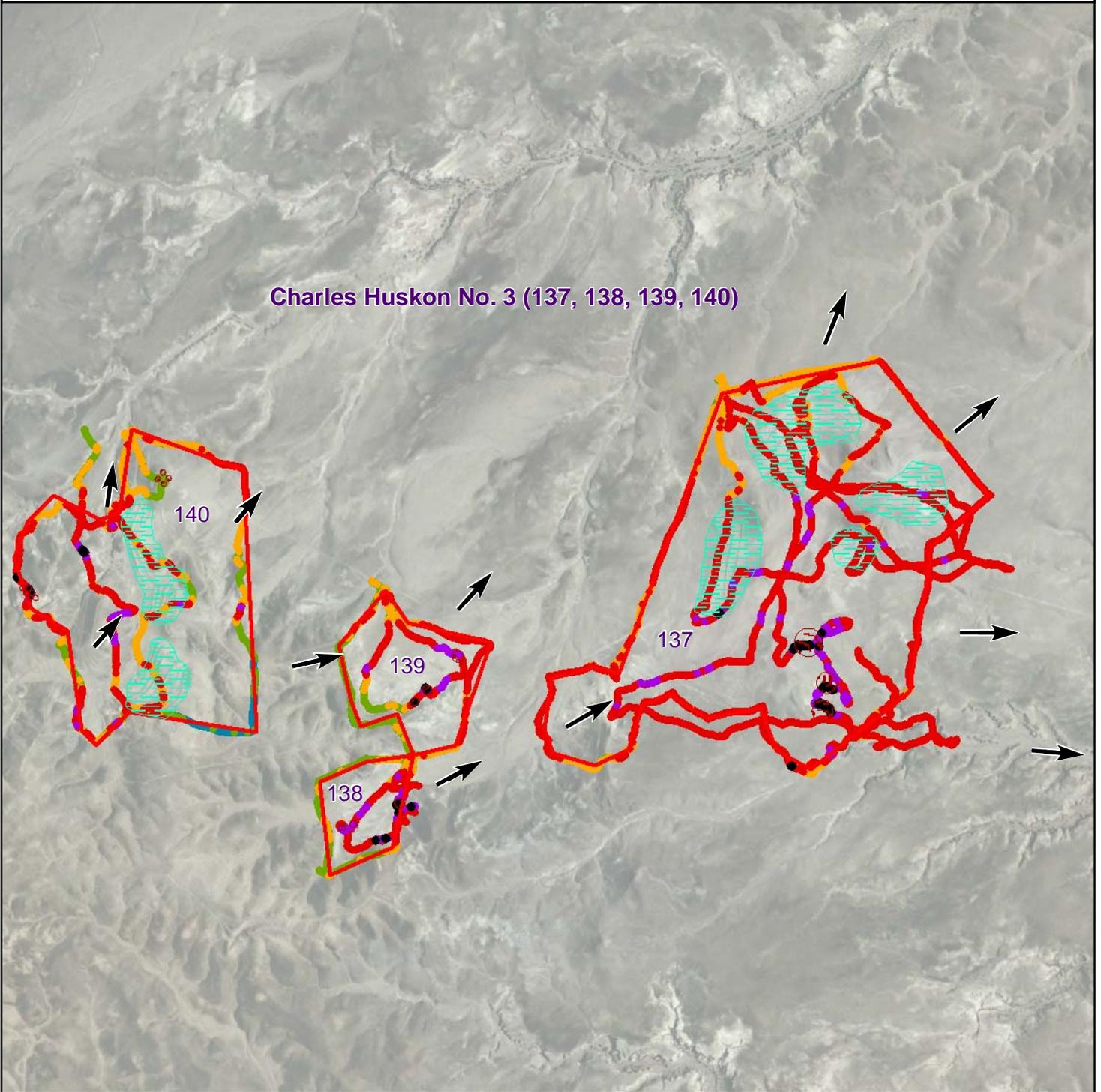
- General Slope Direction
- ▨ Observed Waste Pile
- ▨ Observed Reclamation Area
- ▭ Mine Site Boundary

N

0 1,000 Feet

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**Figure 2 - Gamma Radiation Measurements  
Charles Huskon No. 3 (137, 138, 139, 140)  
Cameron Chapter, Navajo Nation**



**Legend**

**Gamma Radiation Measurements**

- 0 - 10,000
- 10,000 - 15,000
- 15,000 - 20,000
- 20,000 - 50,000
- 50,000 - 100,000
- > 100,000

Average background 12,921 cpm

→ General Slope Direction



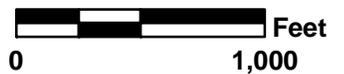
Observed Waste Pile



Observed Reclamation Area

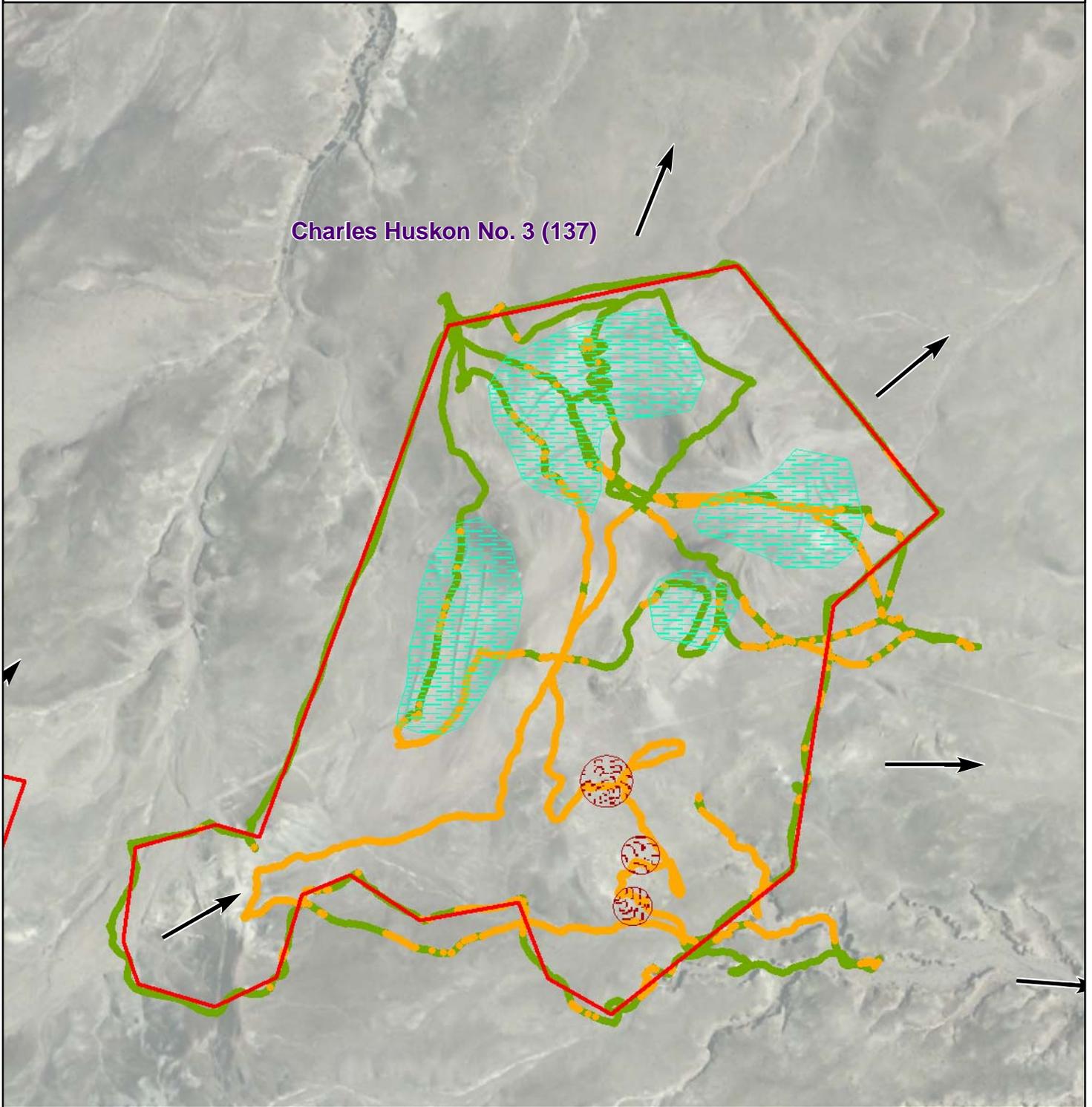


Mine Site Boundary



Gamma survey conducted 11/2010  
Measured as counts per minute (cpm)

**Figure 3 - Gamma Radiation Measurements, Above Two Times Background  
Charles Huskon No. 3 (137)  
Cameron Chapter, Navajo Nation**



**Legend**

**Gamma Radiation Measurements**

- < 2X Background
- > 2X Background

Gamma survey conducted 11/2010  
Measured as counts per minute (cpm)

Average background 12,921 cpm

- General Slope Direction
- ▨ Observed Waste Pile
- ▨ Observed Reclamation Area
- ▭ Mine Site Boundary

N

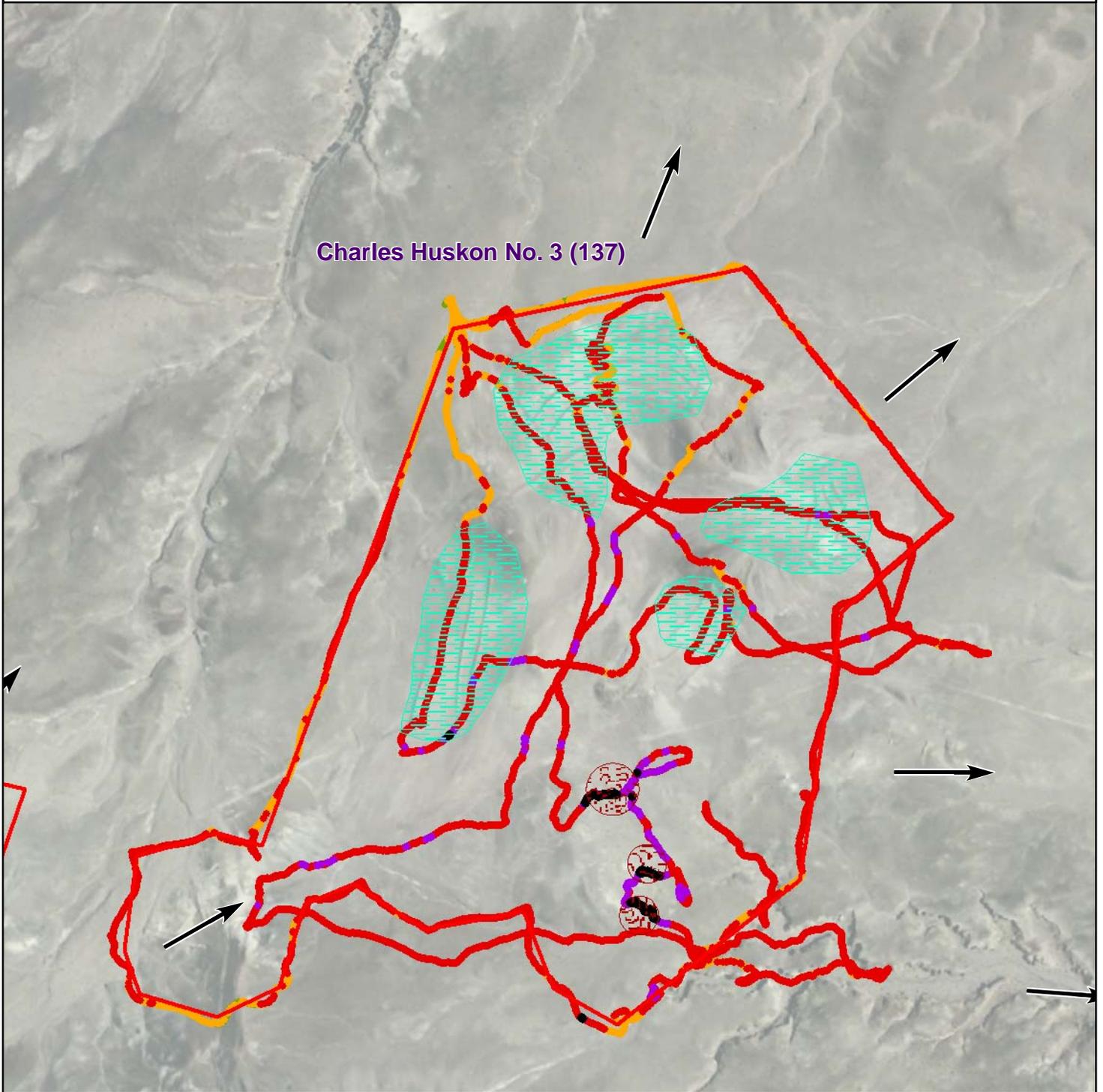
0 500 Feet





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**Figure 4 - Gamma Radiation Measurements  
Charles Huskon No. 3 (137)  
Cameron Chapter, Navajo Nation**



**Legend**

**Gamma Radiation Measurements**

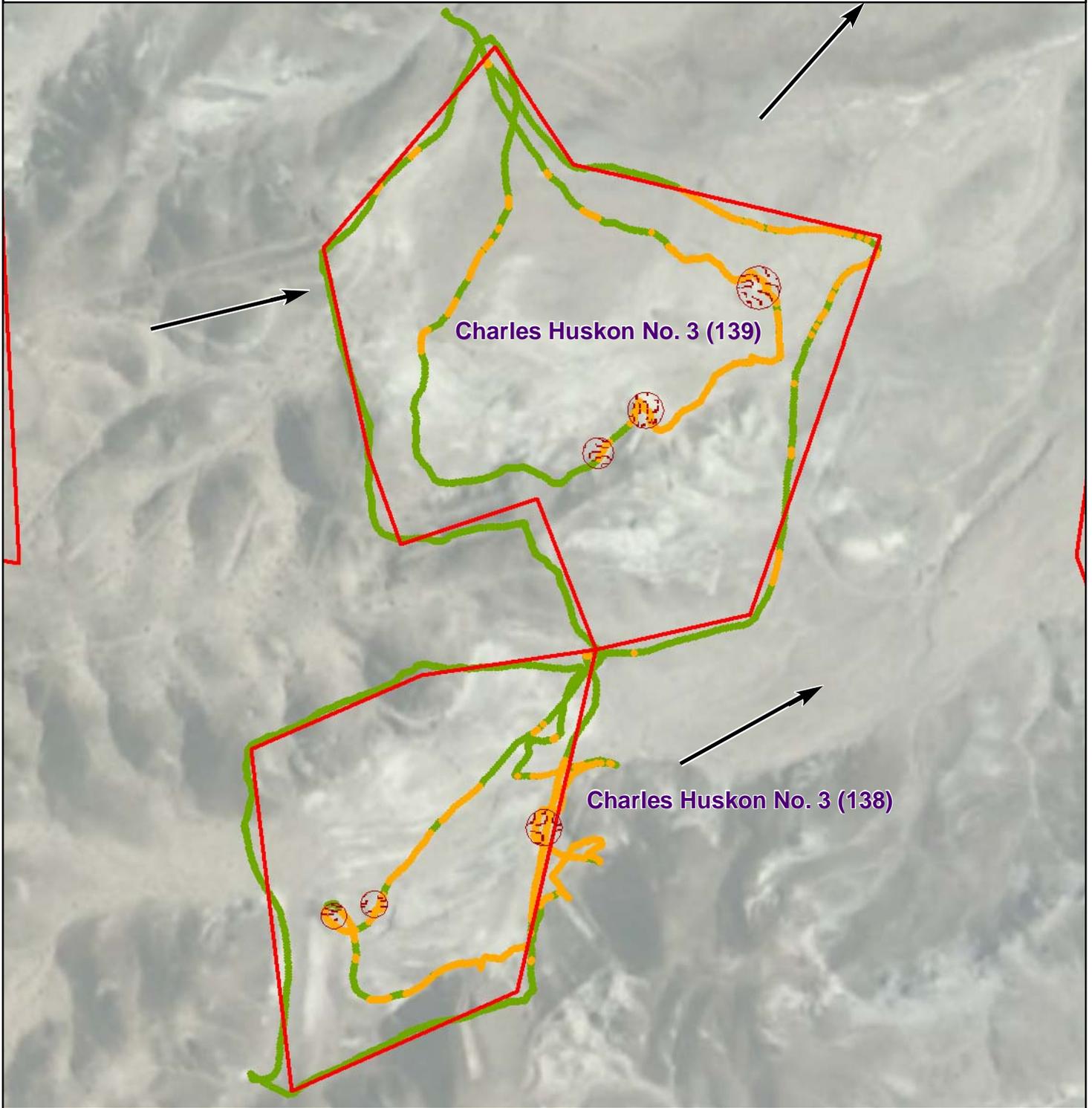
- 0 - 10,000
- 10,000 - 15,000
- 15,000 - 20,000
- 20,000 - 50,000
- 50,000 - 100,000
- > 100,000

- General Slope Direction
- Observed Waste Pile
- Observed Reclamation Area
- Mine Site Boundary

**Gamma survey conducted 11/2010  
Measured as counts per minute (cpm)**

**Average background 12,921 cpm**

**Figure 5 - Gamma Radiation Measurements, Above Two Times Background  
Charles Huskon No. 3 (138, 139)  
Cameron Chapter, Navajo Nation**



**Legend**

**Gamma Radiation Measurements**

- < 2X Background
- > 2X Background

Gamma survey conducted 11/2010  
Measured as counts per minute (cpm)

Average background 12,921 cpm

- General Slope Direction
-  Observed Waste Pile
-  Observed Reclamation Area
-  Mine Site Boundary

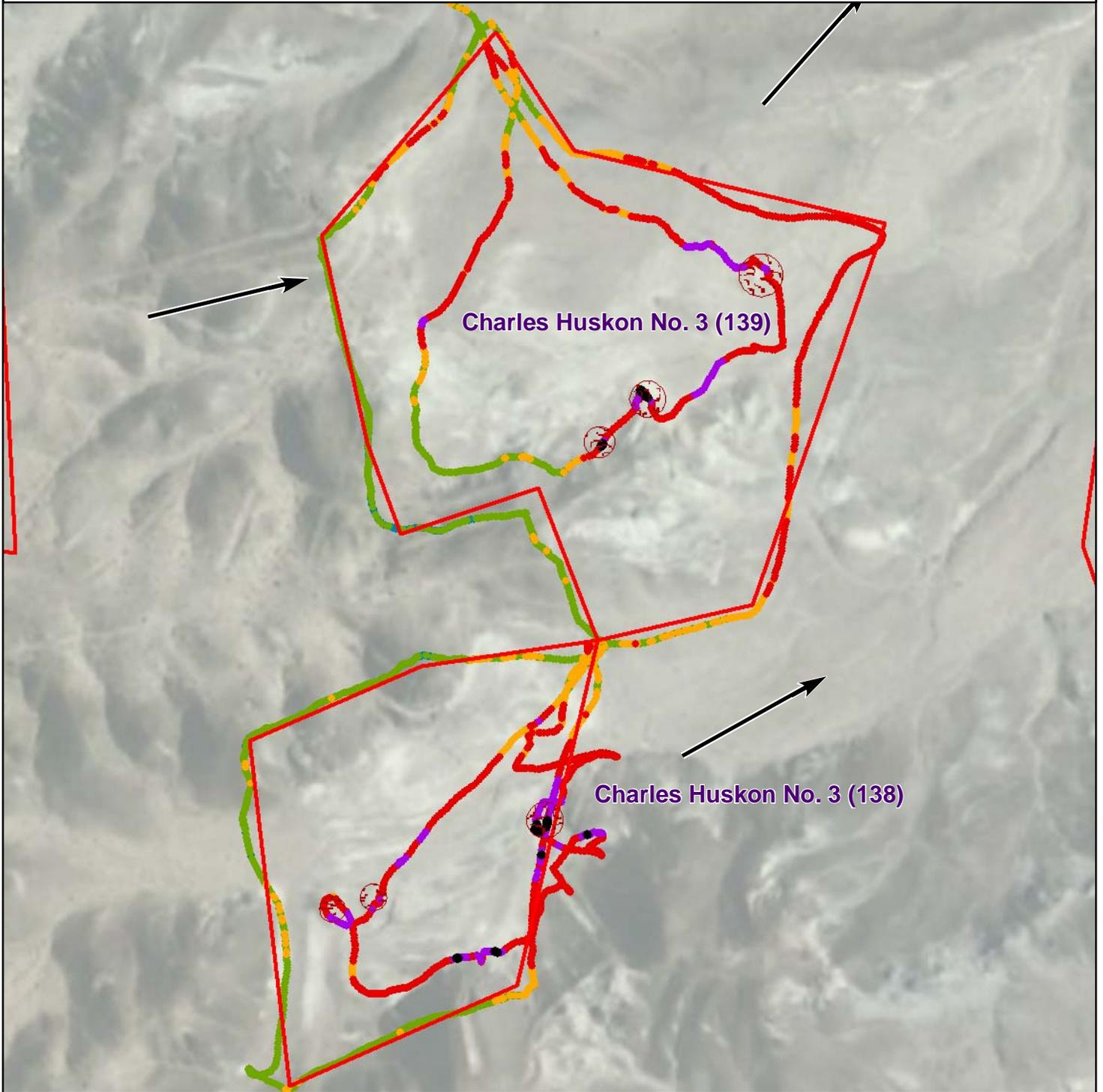
  
  
 0 250 Feet





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**Figure 6 - Gamma Radiation Measurements  
Charles Huskon No. 3 (138, 139)  
Cameron Chapter, Navajo Nation**



**Legend**

**Gamma Radiation Measurements**

- 0 - 10,000
- 10,000 - 15,000
- 15,000 - 20,000
- 20,000 - 50,000
- 50,000 - 100,000
- > 100,000

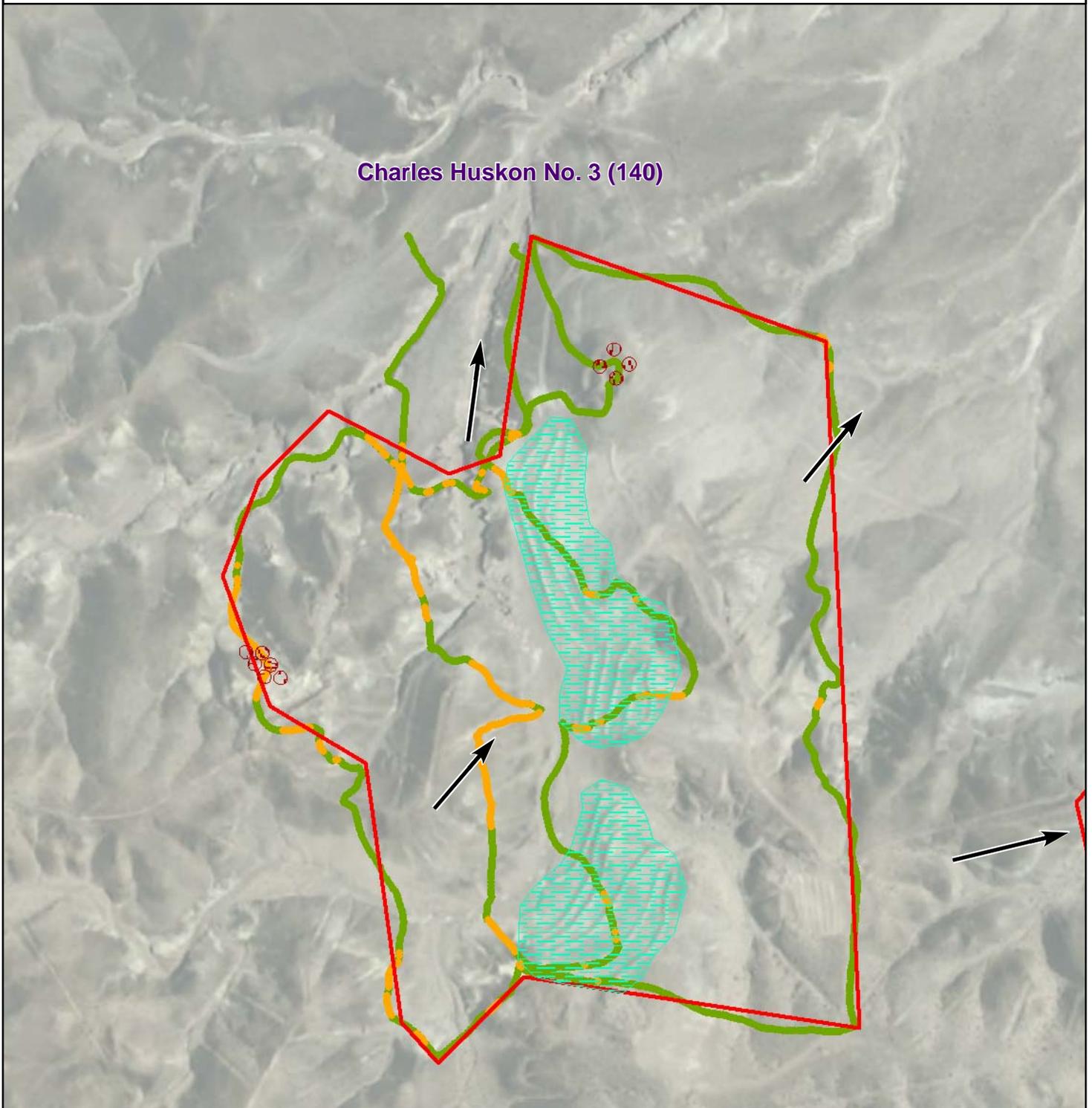
- General Slope Direction
-  Observed Waste Pile
-  Observed Reclamation Area
-  Mine Site Boundary

**Gamma survey conducted 11/2010  
Measured as counts per minute (cpm)**

**Average background 12,921 cpm**



**Figure 7 - Gamma Radiation Measurements, Above Two Times Background  
Charles Huskon No. 3 (140)  
Cameron Chapter, Navajo Nation**



**Legend**

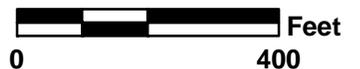
**Gamma Radiation Measurements**

- < 2X Background
- > 2X Background

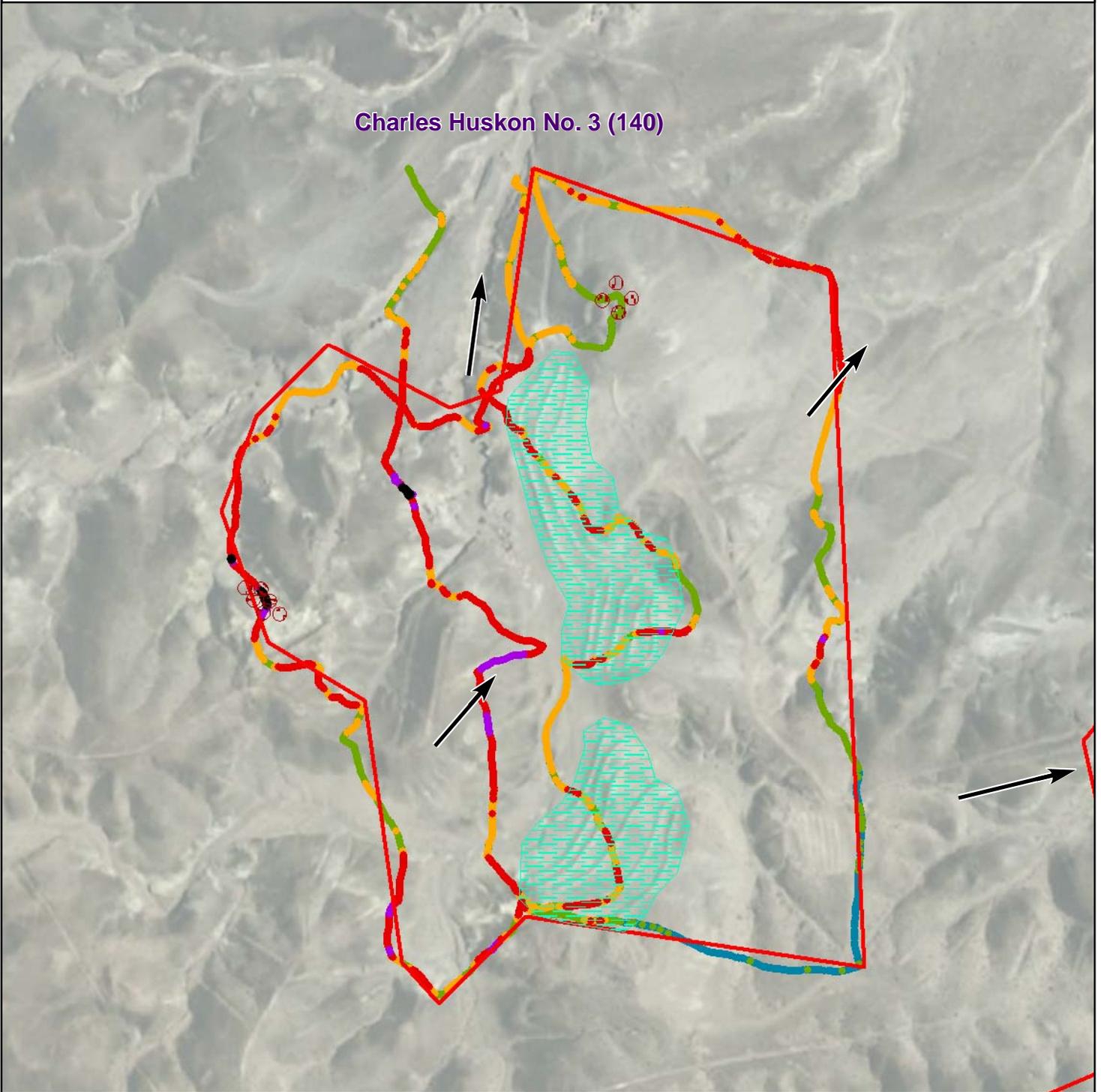
Gamma survey conducted 11/2010  
Measured as counts per minute (cpm)

Average background 12,921 cpm

- General Slope Direction
-  Observed Waste Pile
-  Observed Reclamation Area
-  Mine Site Boundary



**Figure 8 - Gamma Radiation Measurements  
Charles Huskon No. 3 (140)  
Cameron Chapter, Navajo Nation**



**Legend**

**Gamma Radiation Measurements**

- 0 - 10,000
- 10,000 - 15,000
- 15,000 - 20,000
- 20,000 - 50,000
- 50,000 - 100,000
- > 100,000

- General Slope Direction
- ▨ Observed Waste Pile
- ▨ Observed Reclamation Area
- ▭ Mine Site Boundary

**Gamma survey conducted 11/2010  
Measured as counts per minute (cpm)**

**Average background 12,921 cpm**