

## **Attachment D**

# **Landfill Capacity Documentation**



**Cedar Hills Remaining Capacity**  
As of February 23, 2016

Use 1600 lbs/cy

Assume average tonnage of 988,000 tons per year

| Area 8<br>Alternatives<br>Analysis | Geo Terra<br>Capacity<br>Remaining<br>March 2015 | Geo Terra<br>Volume<br>consumed<br>between<br>March and<br>August 2015 | Geo Terra<br>Capacity<br>Consumed<br>between<br>August 17<br>2015 and<br>February 23,<br>2016 | Volume<br>Surcharge<br>Soils | Cover Soils<br>Recovery | Total (cubic<br>yards) | Total Tons | Estimated<br>Years |
|------------------------------------|--------------------------------------------------|------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|------------------------------|-------------------------|------------------------|------------|--------------------|
|                                    |                                                  |                                                                        |                                                                                               |                              |                         |                        |            |                    |
| Area 5 Remaining Capacity          | 861,344                                          |                                                                        | -                                                                                             | 25,000                       | 50,000                  | 936,344                | 749,075    | 0.8                |
| Area 6 Remaining Capacity          | 845,358                                          |                                                                        | -                                                                                             | 80,000                       | 48,000                  | 973,358                | 778,686    | 0.8                |
| Area 7 Remaining Capacity          | 4,655,763                                        | (672,392)                                                              | (557,046)                                                                                     |                              |                         | 3,426,325              | 2,741,060  | 2.8                |
| Combined 5, 6 and 7                |                                                  |                                                                        |                                                                                               |                              |                         | 5,336,027              | 4,268,822  | 4.3                |
| Area 8 Capacity                    | 7,480,000                                        |                                                                        |                                                                                               |                              |                         | 7,480,000              | 5,984,000  | 6.1                |
| Total Cubic Yards                  |                                                  |                                                                        |                                                                                               |                              |                         | 12,816,027             | 10,252,822 | 10.4               |

## **Volume Report** **Cedar Hills Landfill Areas 5, 6, 7** **King County, WA** **Spring 2015 to Final Design Surface**

*Presented to:*

King County Solid Waste Division  
Department of Natural Resources and Parks  
201 South Jackson Street, Suite 701  
Seattle, WA 98104

*Submitted by:*

# GEOTERRA

3410 West 11st Ave.  
Eugene, OR 97402

June 11, 2015

previously known as:



Aerial Imagery | Mapping | LiDAR | GIS | GPS Surveying

[www.GeoTerra.us](http://www.GeoTerra.us)

King County Solid Waste  
Cedar Hills Landfill (Job # 15-111)  
(Volumes Computed Surface to Surface)

**NOTE:**

In each case the later year was used as the base to which the earlier year was compared. Thus "cut" refers to material in areas where the ground surface of the later year (e.g. 2011) was higher than the earlier year (e.g. 2010). Thus "cut" indicates material which was added to the landfill between the two times indicated.

The "isopach" diagram shows the areas of difference between the 2 times. Green indicates areas of little or no change.

Yellow/red indicates "cut" areas where the ground was higher in the later year (e.g. 2011) than the earlier year (2010).

Cyan/blue indicates "fill" areas where the ground was lower in the later year than the earlier year.

Scale on left shows color coding for height of material. Scale at bottom shows distance.

Approved  
by:



CP #1252

previously known as:

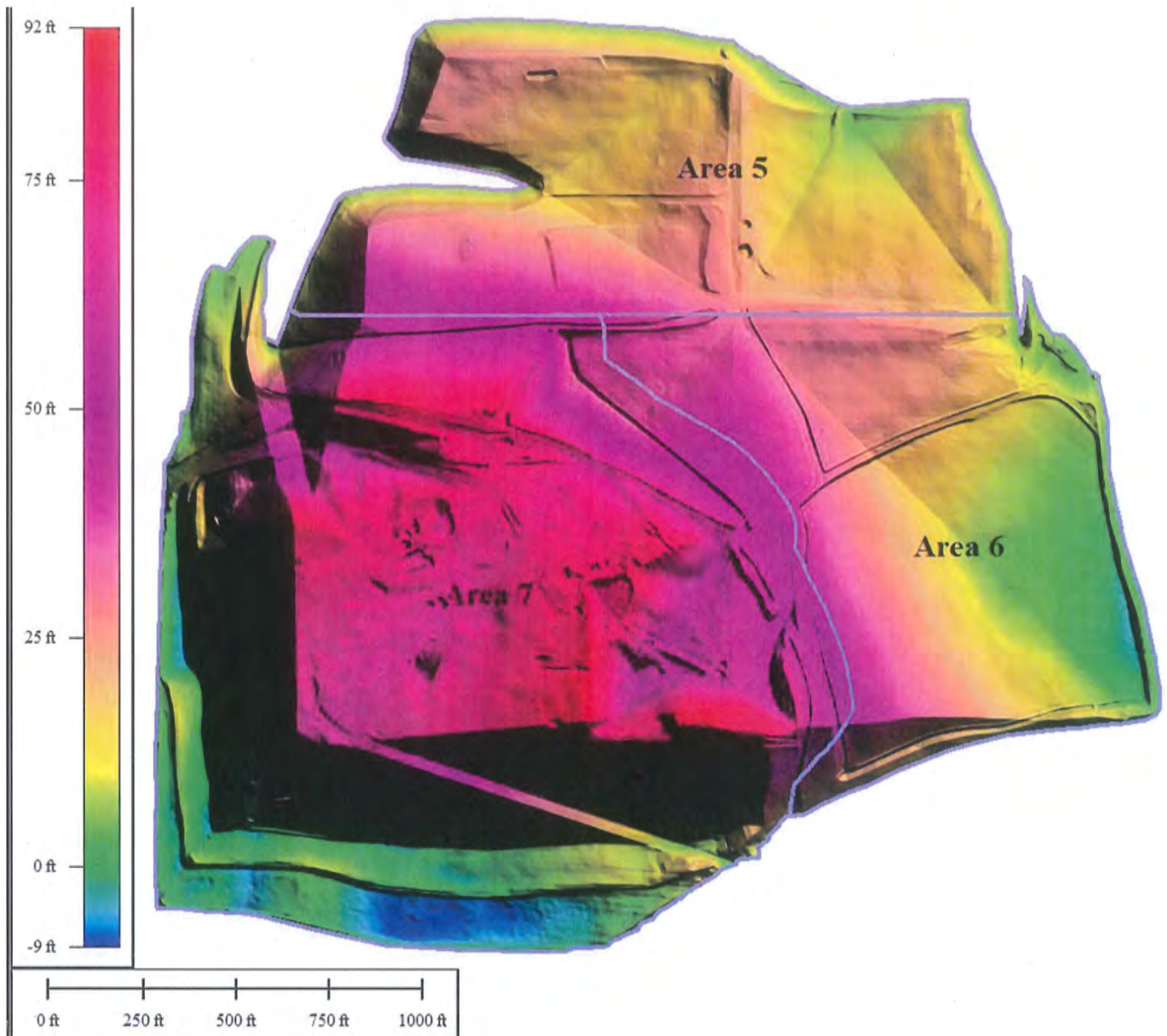


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[www.GeoTerra.us](http://www.GeoTerra.us)

## March 2015 to Projected Design Surface

| TOTAL  | VOLUME (cubic feet) |             |         | AREA (square feet) |           |         |
|--------|---------------------|-------------|---------|--------------------|-----------|---------|
|        | TOTAL               | CUT         | FILL    | TOTAL              | CUT       | FILL    |
| Area 5 | 23,256,292          | 23,256,335  | 44      | 1,194,391          | 1,189,970 | 167     |
| Area 6 | 22,824,675          | 22,877,804  | 53,128  | 1,148,958          | 1,103,868 | 41,086  |
| Area 7 | 125,705,613         | 126,445,244 | 739,631 | 2,711,312          | 2,464,382 | 237,360 |



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3410 W. 11th Avenue  
Eugene, OR 97402  
Ph: 541-343-8877

Cedar Hills Landfill  
King County Department of Natural Resources  
Solid Waste Division  
March 2015 TIN to August 2015 TIN Volume Comparison  
Photo Date: August 17, 2015

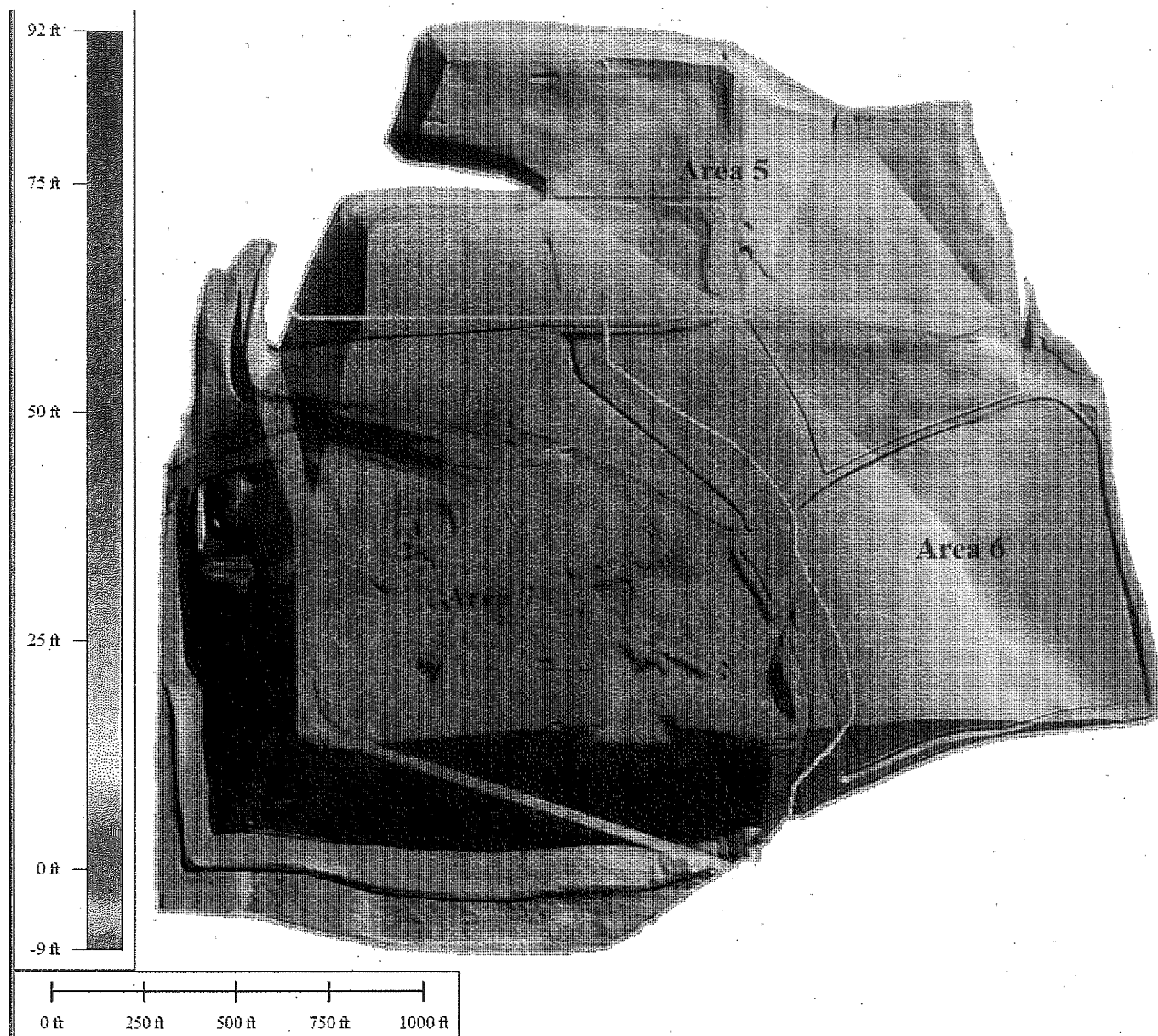
**Cedar Hills Landfill**  
**Volume Change from March 9, 2015 to August 17, 2015**

| Area Name        | Area               | Volume (ft <sup>3</sup> ) |            |            | Volume (yd <sup>3</sup> ) |         |         |
|------------------|--------------------|---------------------------|------------|------------|---------------------------|---------|---------|
|                  | (ft <sup>2</sup> ) | Cut(-)                    | Fill(+)    | Net        | Cut(-)                    | Fill(+) | Net     |
| Stockpile        | 887,446            | 2,159,528                 | 1,516,944  | -642,584   | 79,983                    | 56,183  | -23,799 |
| Area 7 Active    | 2,416,338          | 1,386,119                 | 19,540,704 | 18,154,585 | 51,338                    | 723,730 | 672,392 |
| Top of Area 6    | 1,346,921          | 144,351                   | 2,778,531  | 2,634,180  | 5,346                     | 102,909 | 97,562  |
| Top of Area 5    | 1,366,801          | 148,146                   | 92,169     | -55,977    | 5,487                     | 3,414   | -2,073  |
| Areas 2, 3 and 4 | 3,454,171          | 2,342                     | 5,277      | 2,934      | 87                        | 195     | 109     |



## March 2015 to Projected Design Surface

| TOTAL  | VOLUME (cubic feet) |             |         | AREA (square feet) |           |         |
|--------|---------------------|-------------|---------|--------------------|-----------|---------|
|        | TOTAL               | CUT         | FILL    | TOTAL              | CUT       | FILL    |
| Area 5 | 23,256,292          | 23,256,335  | 44      | 1,194,391          | 1,189,970 | 167     |
| Area 6 | 22,824,675          | 22,877,804  | 53,128  | 1,148,958          | 1,103,868 | 41,086  |
| Area 7 | 125,705,613         | 126,445,244 | 739,631 | 2,711,312          | 2,464,382 | 237,360 |



previously known as:

**BPS 3Di**

Aerial Imagery | Mapping | LIDAR | GIS | GPS Surveying

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## Volume Report

### Cedar Hills Landfill Maple Valley, WA

*Presented to:*

King County Department of Natural Resources  
Solid Waste Division  
201 South Jackson Street #701  
Seattle, WA 98104

*Submitted by:*



3410 West 11st Ave.  
Eugene, OR 97402

March 15, 2016

Cedar Hills Landfill

Job # 160069

(Volumes Computed TIN surface to TIN surface)

Photo Dates: 23 February 2016 – 17 August 2015

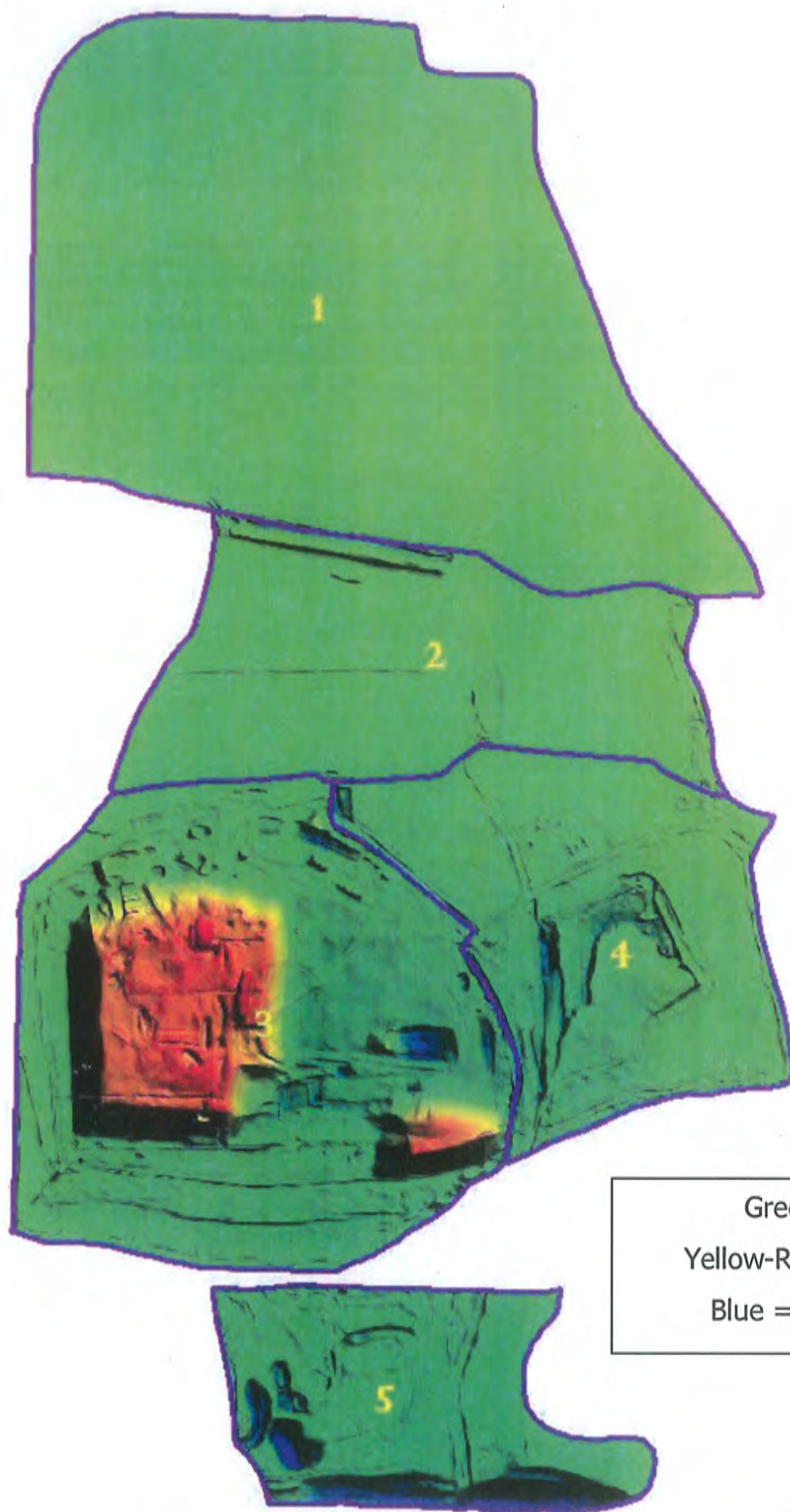
| Area Name         | Area               | Volume (ft <sup>3</sup> ) |            |            | Volume (yd <sup>3</sup> ) |         |         |
|-------------------|--------------------|---------------------------|------------|------------|---------------------------|---------|---------|
|                   | (ft <sup>2</sup> ) | Cut(-)                    | Fill(+)    | Net        | Cut(-)                    | Fill(+) | Net     |
| 1 = Areas 2, 3, 4 | 3,454,171          | 6,929                     | 1,341      | -5,588     | 257                       | 50      | -207    |
| 2 = Top of Area 5 | 1,366,801          | 203,735                   | 117,107    | -86,629    | 7,546                     | 4,337   | -3,208  |
| 3 = Area 7 Active | 2,416,338          | 2,609,785                 | 17,649,995 | 15,040,210 | 96,659                    | 653,704 | 557,045 |
| 4 = Top of Area 6 | 1,346,921          | 1,587,707                 | 51,599     | -1,536,108 | 58,804                    | 1,911   | -56,893 |
| 5 = Stockpile     | 887,446            | 2,548,990                 | 74,159     | -2,474,831 | 94,407                    | 2,747   | -91,660 |

Approved by:



CP #1252

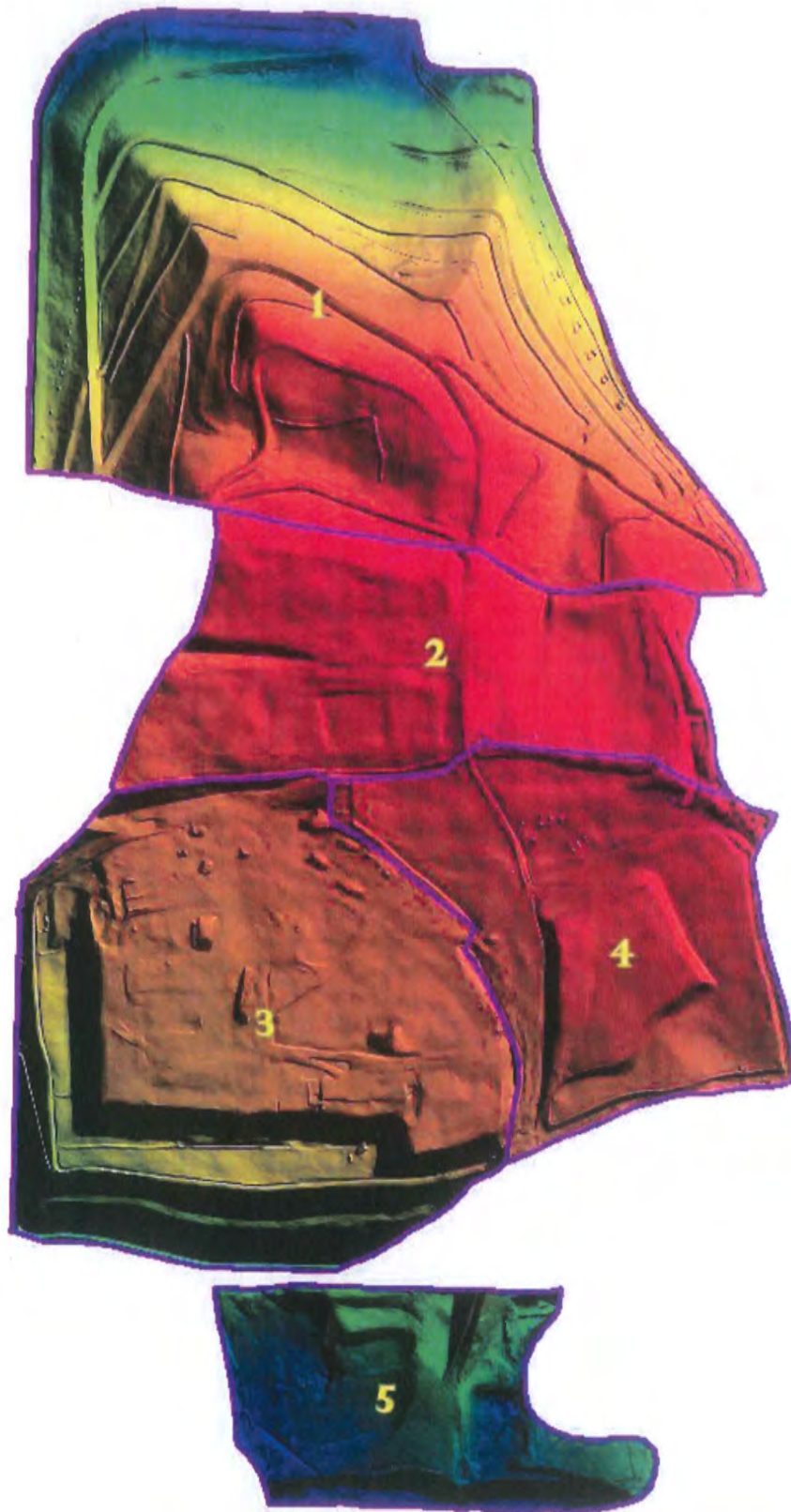
Cedar Hills Landfill  
Volume Comparison From Spring 2016 to Fall 2015  
Isopach Surface



Green = no change  
Yellow-Red = material added  
Blue = material removed



Perspective view (Hill shade): Spring 2016 surface



Perspective view (Hill shade): Fall 2015 surface





## Cedar Hills Area 7 Air Space Utilization

|                                  | tons (from<br>tonnage<br>reports) | CY (from<br>Geoterra<br>Survey) | tons/cy | lbs/cy |
|----------------------------------|-----------------------------------|---------------------------------|---------|--------|
| Aug 2010 to Dec 31, 2010         | 347,308                           |                                 |         |        |
| Jan1 2011 to Mar 31 2011         | 191,145                           |                                 |         |        |
| Apr1 2011 to April 11 2011       | 24,217                            |                                 |         |        |
| Aug 2010 to April 11, 2011       | 562,670                           | 696,903                         | 0.81    | 1,615  |
| April 11 2011 to April 30, 2011  | 41,829                            |                                 |         |        |
| April 30, 2011 to July 31, 2011  | 215,246                           |                                 |         |        |
| Aug 1, 2011 to Aug 25, 2011      | 60,513                            |                                 |         |        |
| Aug 2010 to August 25, 2011      | 880,258                           | 1,153,756                       | 0.76    | 1,526  |
| Aug 25, 2011 to Aug 31, 2011     | 14,523                            |                                 |         |        |
| Sept 1, 2011 to Dec 31, 2011     | 265,212                           |                                 |         |        |
| Jan 1, 2012 to July 31, 2012     | 467,021                           |                                 |         |        |
| Aug 1, 2012 to Aug 14, 2012      | 34,247                            |                                 |         |        |
| Aug 2010 to August 14, 2012      | 1,661,261                         | 2,116,531                       | 0.78    | 1,570  |
| Aug 14, 2012 to Aug 31, 2012     | 41,586                            |                                 |         |        |
| Sept 1, 2012 to Dec 31, 2012     | 264,060                           |                                 |         |        |
| Jan 1, 2013 to August 31, 2013   | 540,749                           |                                 |         |        |
| Sept 1, 2013 to Sept 10, 2013    | 23,197                            |                                 |         |        |
| Aug 2010 to Sept 10, 2013        | 2,530,853                         | 3,095,828                       | 0.82    | 1,635  |
| Sept 10, 2013 to Sept 30, 2013   | 46,393                            |                                 |         |        |
| Oct 1, 2013 to Dec 31, 2013      | 198,826                           |                                 |         |        |
| Jan 1, 2014 to Feb 28, 2014      | 125,006                           |                                 |         |        |
| March 1, 2014 to March 22, 2014  | 49,306                            |                                 |         |        |
| Aug 2010 to March 22, 2014       | 2,950,384                         | 3,575,200                       | 0.83    | 1,650  |
| March 22, 2014 to March 31, 2014 | 20,171                            |                                 |         |        |
| April 1, 2014 to Aug 31, 2014    | 366,350                           |                                 |         |        |
| Sept 1, 2014 to Sept 14, 2014    | 33,982                            |                                 |         |        |
| Aug 2010 to Sept 14, 2014        | 3,370,887                         | 4,088,800                       | 0.82    | 1,649  |
| Sept 14, 2014 to Sept 31, 2014   | 38,837                            |                                 |         |        |
| Oct 1, 2014 to Dec 31, 2014      | 209,968                           |                                 |         |        |
| Jan 1, 2015 to March 9, 2015     | 151,495                           |                                 |         |        |
| Aug 2010 to March 9, 2015        | 3,771,187                         | 4,506,448                       | 0.84    | 1,674  |
| March 9, 2015 to March 31, 2015  | 50,520                            |                                 |         |        |
| March 31, 2015 to July 31, 2015  | 298,129                           |                                 |         |        |
| Aug 1, 2015 to August 17, 2015   | 41,372                            |                                 |         |        |
| Aug 2010 to August 17, 2015      | 4,161,208                         | 5,178,840                       | 0.80    | 1,607  |





**Volume Report**  
**Cedar Hills Landfill Area 7**  
**King County, WA**  
**Fall 2010 to Spring 2015 and Final Design Surface**

*Presented to:*

King County Solid Waste Division  
Department of Natural Resources and Parks  
201 South Jackson Street, Suite 701  
Seattle, WA 98104

*Submitted by:*

**GEOTERRA**

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June 10, 2015

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King County Solid Waste  
Cedar Hills Landfill (Job # 15-111)  
(Volumes Computed Surface to Surface)

**NOTE:**

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The "isopach" diagram shows the areas of difference between the 2 times. Green indicates areas of little or no change.

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CP #1252

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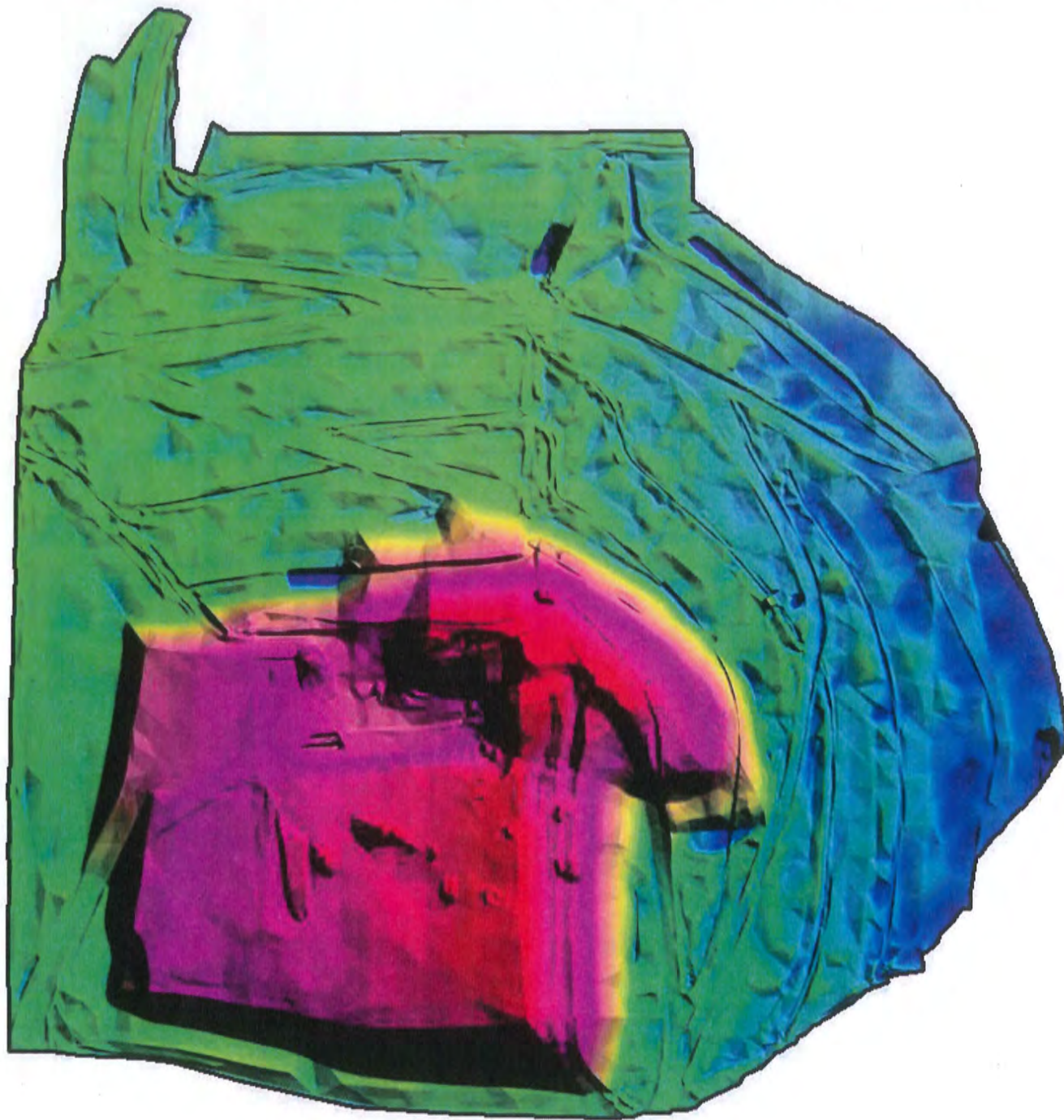


Aerial Imagery | Mapping | LiDAR | GIS | GPS Surveying

[www.GeoTerra.us](http://www.GeoTerra.us)

## August 2010 to April 2011

| VOLUME (cubic feet) |            |           | AREA (square feet) |           |           |
|---------------------|------------|-----------|--------------------|-----------|-----------|
| TOTAL               | CUT        | FILL      | TOTAL              | CUT       | FILL      |
| 18,816,376          | 20,473,283 | 1,656,906 | 2,711,307          | 1,287,039 | 1,414,686 |



previously known as:



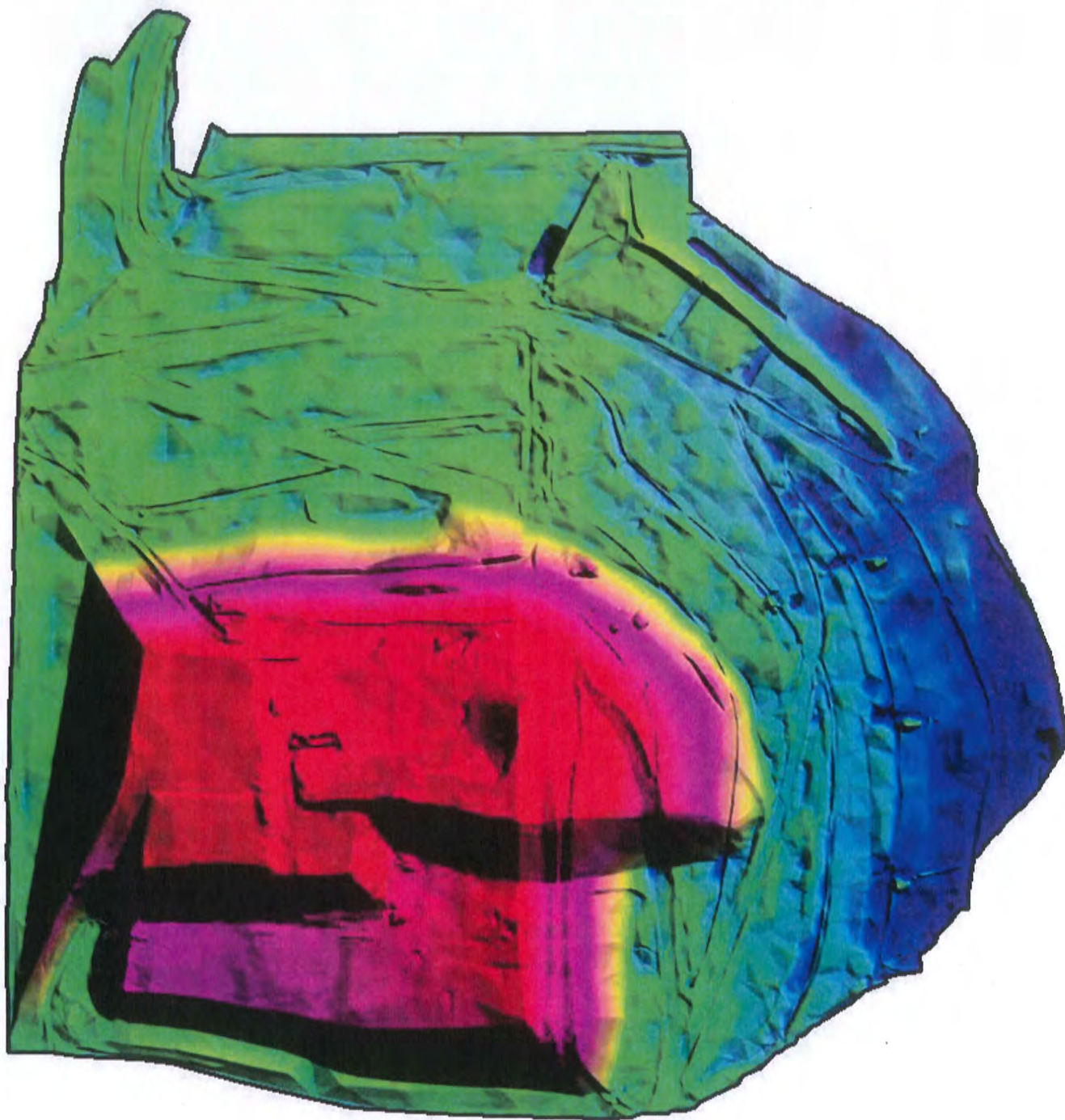
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## August 2010 to August 2011

| VOLUME (cubic feet) |            |           | AREA (square feet) |           |           |
|---------------------|------------|-----------|--------------------|-----------|-----------|
| TOTAL               | CUT        | FILL      | TOTAL              | CUT       | FILL      |
| 31,151,412          | 33,028,089 | 1,876,678 | 2,711,307          | 1,429,765 | 1,271,952 |



previously known as:

**BPS 3Di**

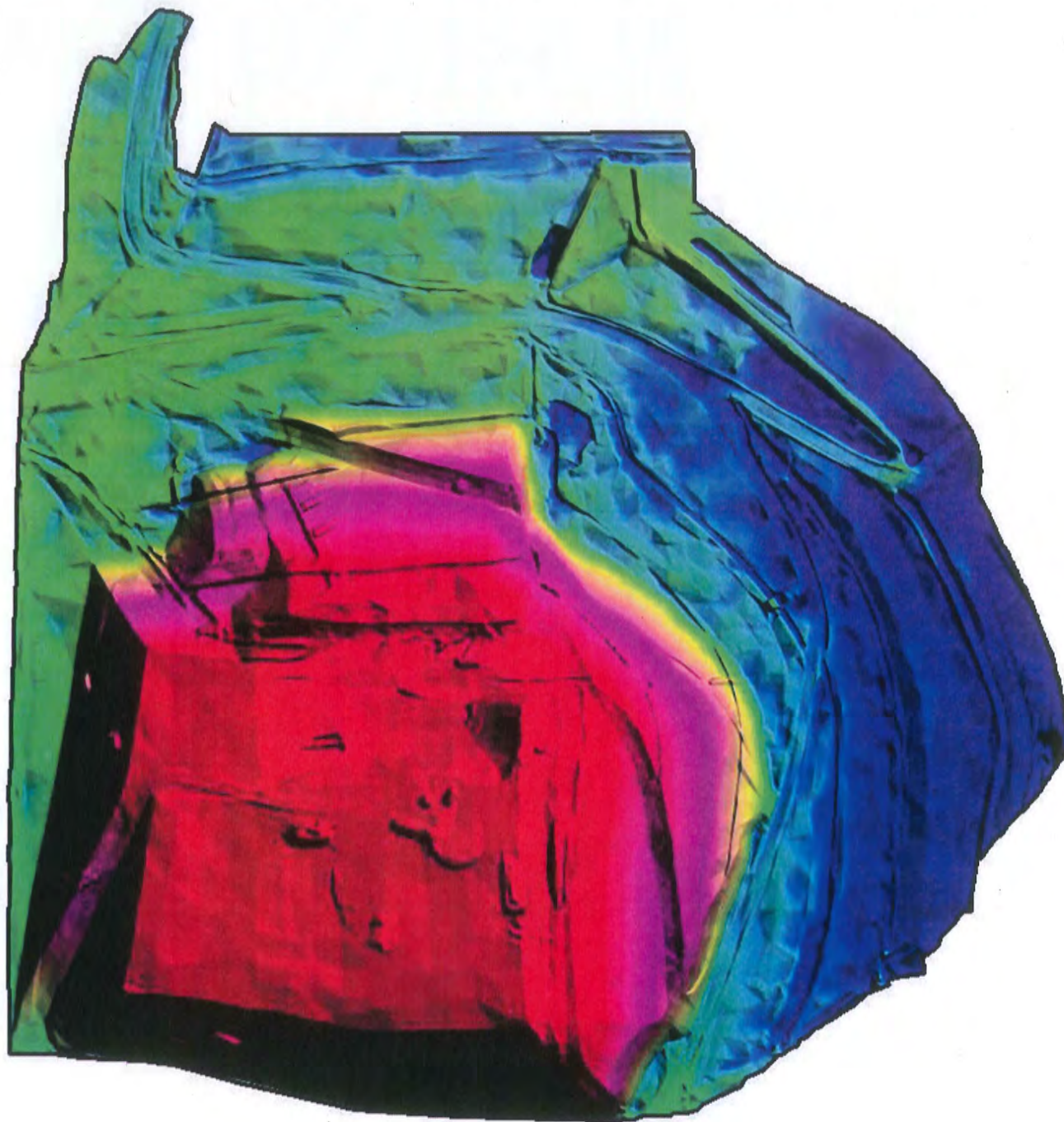
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## August 2010 to March 2012

| VOLUME (cubic feet) |            |           | AREA (square feet) |           |           |
|---------------------|------------|-----------|--------------------|-----------|-----------|
| TOTAL               | CUT        | FILL      | TOTAL              | CUT       | FILL      |
| 44,252,065          | 47,381,399 | 3,129,334 | 2,711,307          | 1,410,721 | 1,291,000 |



previously known as:

**BPS 3Di**

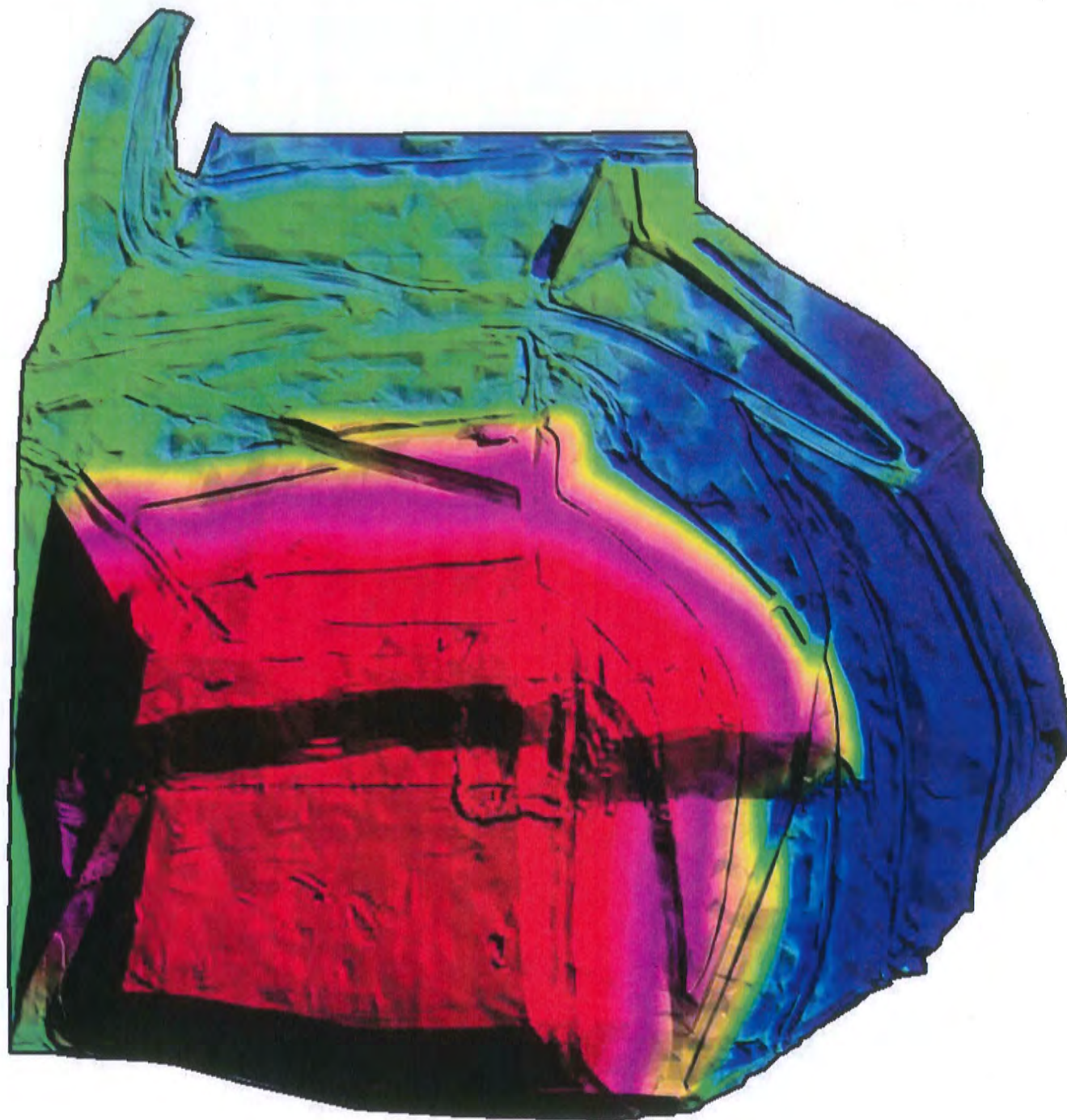
Aerial Imagery | Mapping | LiDAR | GIS | GPS Surveying

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## August 2010 to August 2012

| VOLUME (cubic feet) |            |           | AREA (square feet) |           |           |
|---------------------|------------|-----------|--------------------|-----------|-----------|
| TOTAL               | CUT        | FILL      | TOTAL              | CUT       | FILL      |
| 57,146,487          | 60,090,413 | 2,943,926 | 2,711,307          | 1,617,367 | 1,084,358 |



previously known as:

**BPS 3Di**

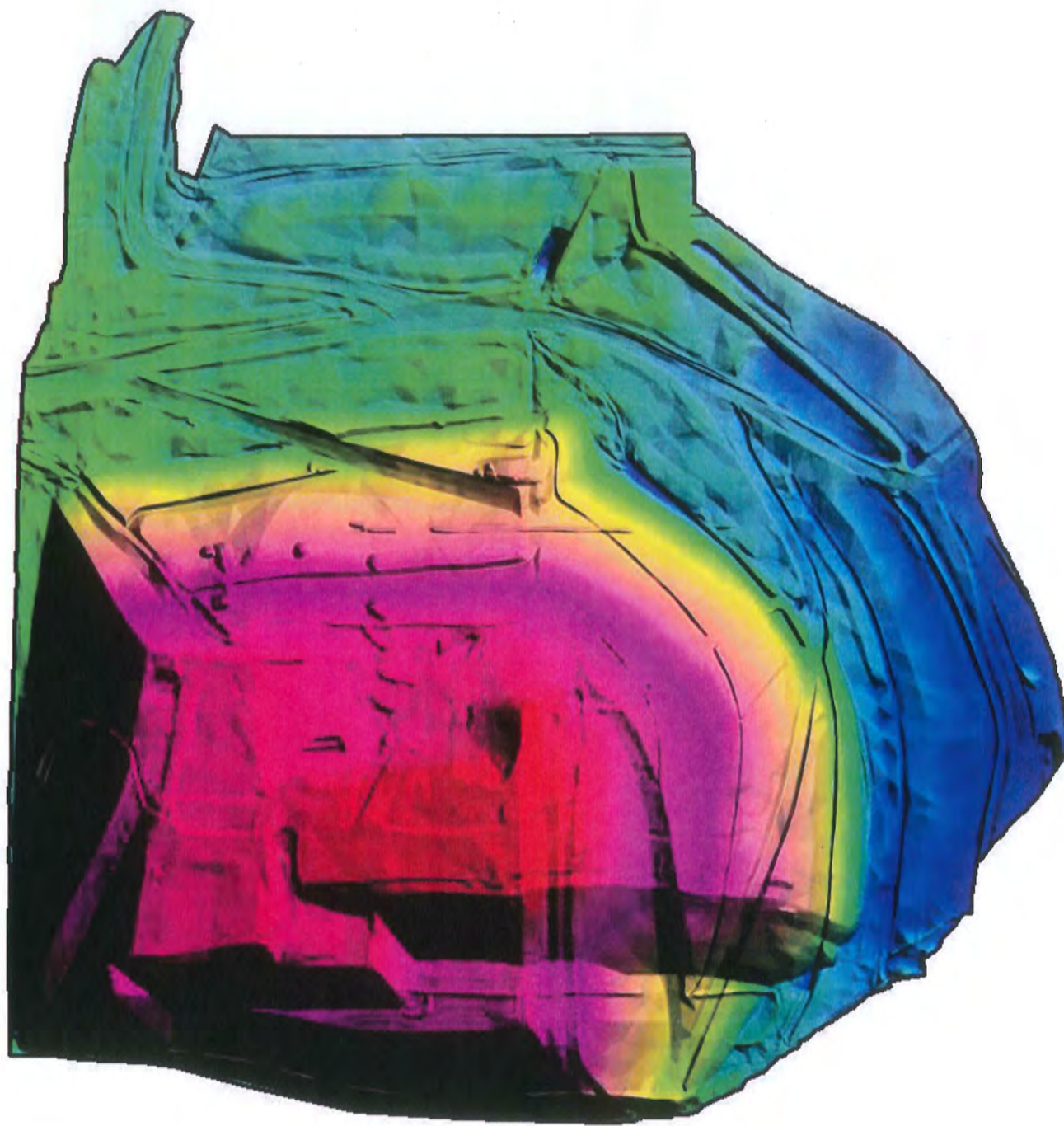
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## August 2010 to March 2013

| VOLUME (cubic feet) |            |           | AREA (square feet) |           |           |
|---------------------|------------|-----------|--------------------|-----------|-----------|
| TOTAL               | CUT        | FILL      | TOTAL              | CUT       | FILL      |
| 69,890,827          | 74,290,802 | 1,118,735 | 2,711,307          | 1,582,998 | 1,118,735 |



previously known as:

**BPS 3Di**

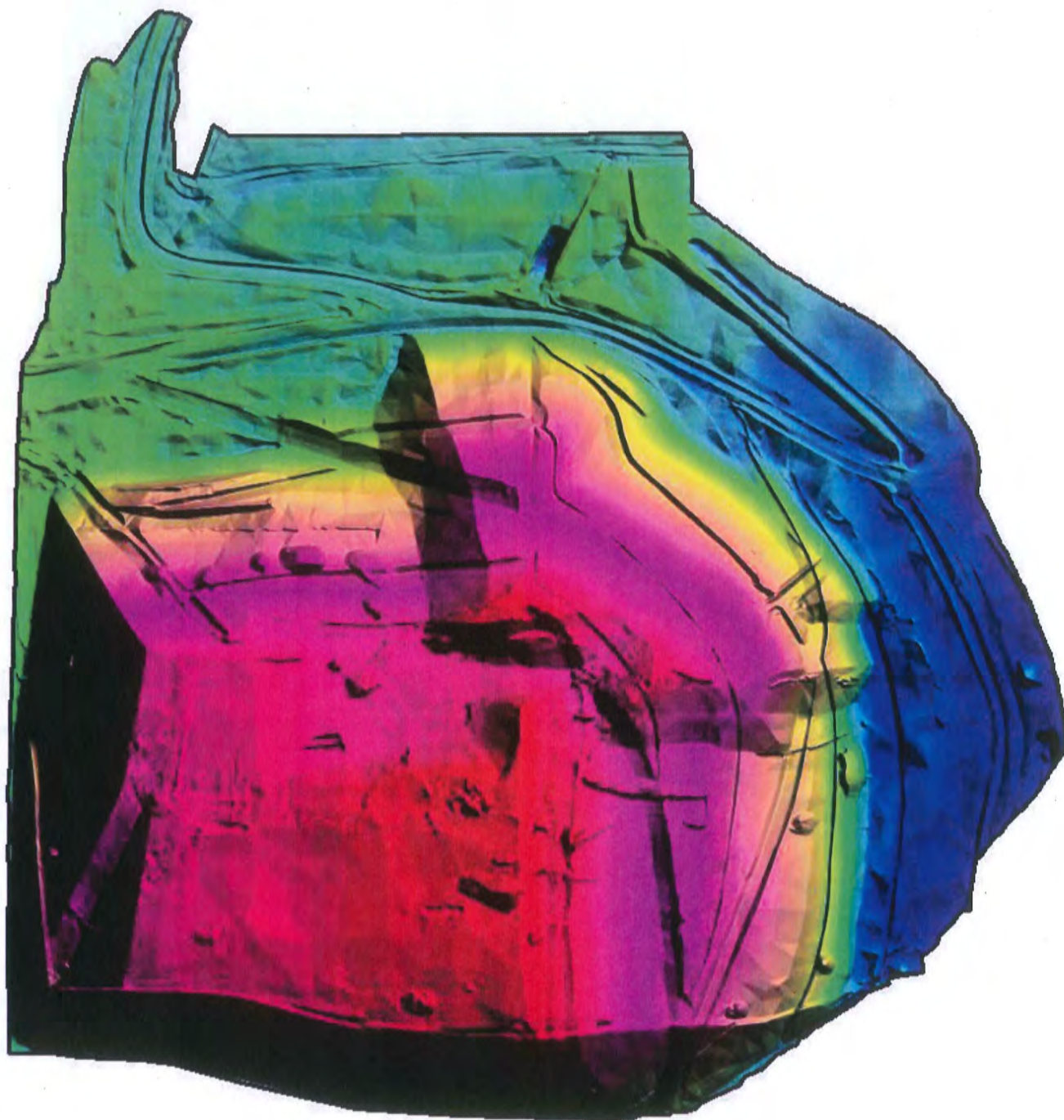
Aerial Imagery | Mapping | LiDAR | GIS | GPS Surveying

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## August 2010 to September 2013

| VOLUME (cubic feet) |            |           | AREA (square feet) |           |         |
|---------------------|------------|-----------|--------------------|-----------|---------|
| TOTAL               | CUT        | FILL      | TOTAL              | CUT       | FILL    |
| 83,587,357          | 88,041,987 | 4,454,629 | 2,711,307          | 1,732,020 | 969,709 |



previously known as:

**BPS 3Di**

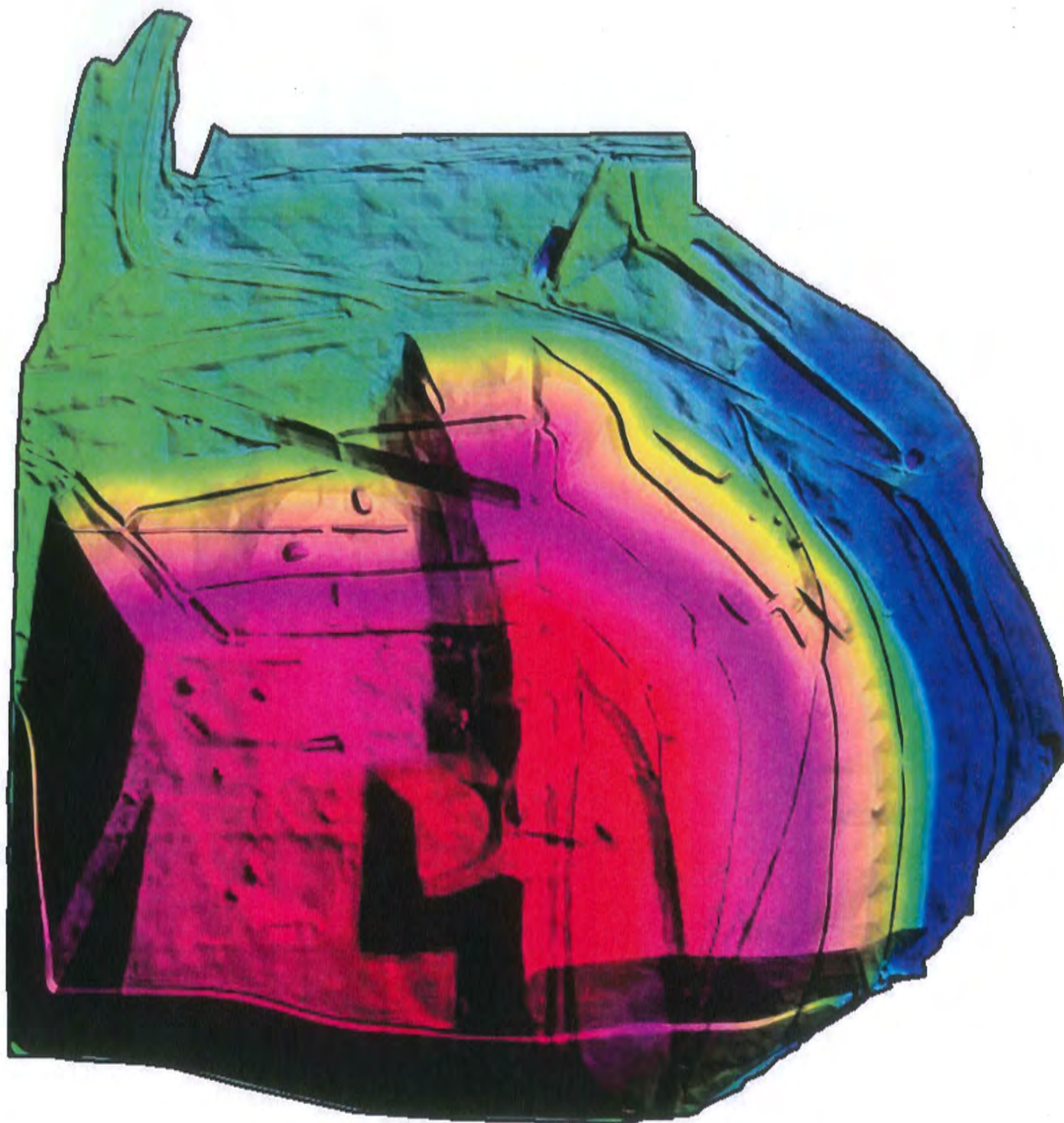
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## August 2010 to March 2014

| VOLUME (cubic feet) |             |           | AREA (square feet) |           |         |
|---------------------|-------------|-----------|--------------------|-----------|---------|
| TOTAL               | CUT         | FILL      | TOTAL              | CUT       | FILL    |
| 96,530,404          | 100,657,208 | 4,126,804 | 2,711,307          | 1,783,033 | 918,692 |



previously known as:

**BPS 3Di**

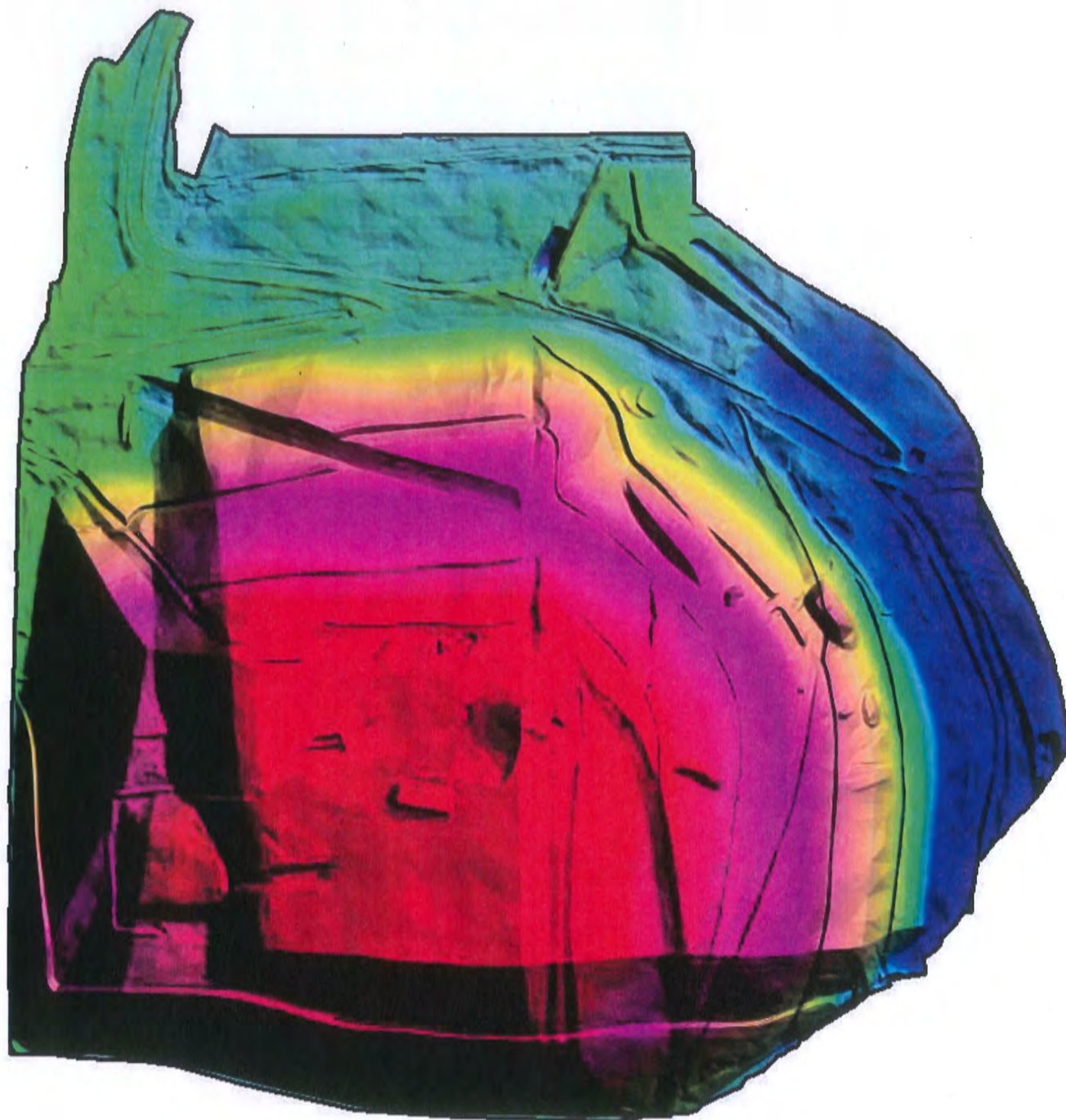
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## August 2010 to September 2014

| VOLUME (cubic feet) |             |           | AREA (square feet) |           |         |
|---------------------|-------------|-----------|--------------------|-----------|---------|
| TOTAL               | CUT         | FILL      | TOTAL              | CUT       | FILL    |
| 110,397,613         | 114,537,044 | 4,139,431 | 2,711,307          | 1,840,991 | 860,738 |



previously known as:

**BPS 3Di**

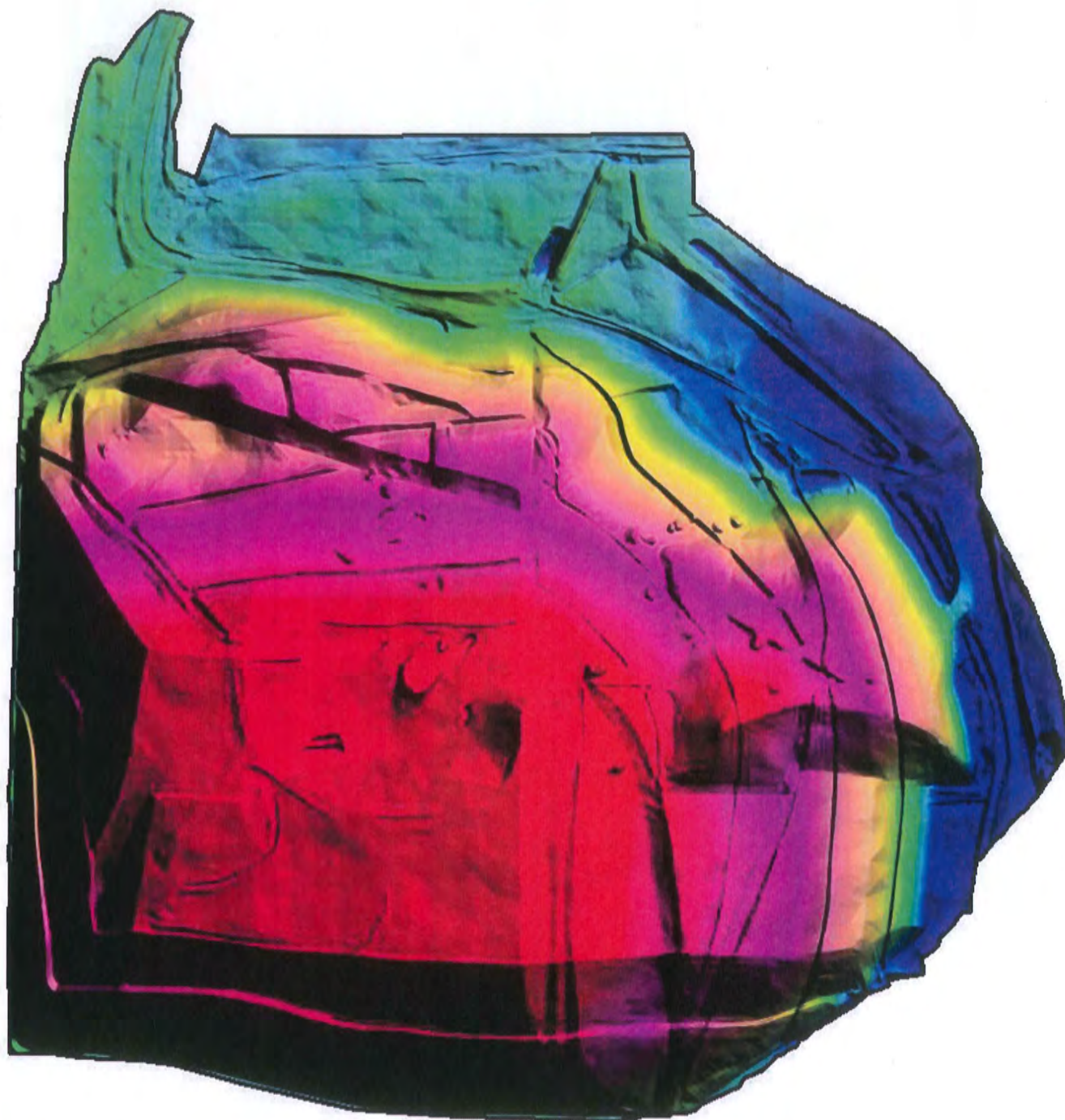
Aerial Imagery | Mapping | LiDAR | GIS | GPS Surveying

[www.GeoTerra.us](http://www.GeoTerra.us)



## August 2010 to March 2015

| VOLUME (cubic feet) |             |           | AREA (square feet) |           |         |
|---------------------|-------------|-----------|--------------------|-----------|---------|
| TOTAL               | CUT         | FILL      | TOTAL              | CUT       | FILL    |
| 121,674,190         | 125,804,557 | 4,130,367 | 2,711,307          | 1,990,284 | 711,445 |



previously known as:

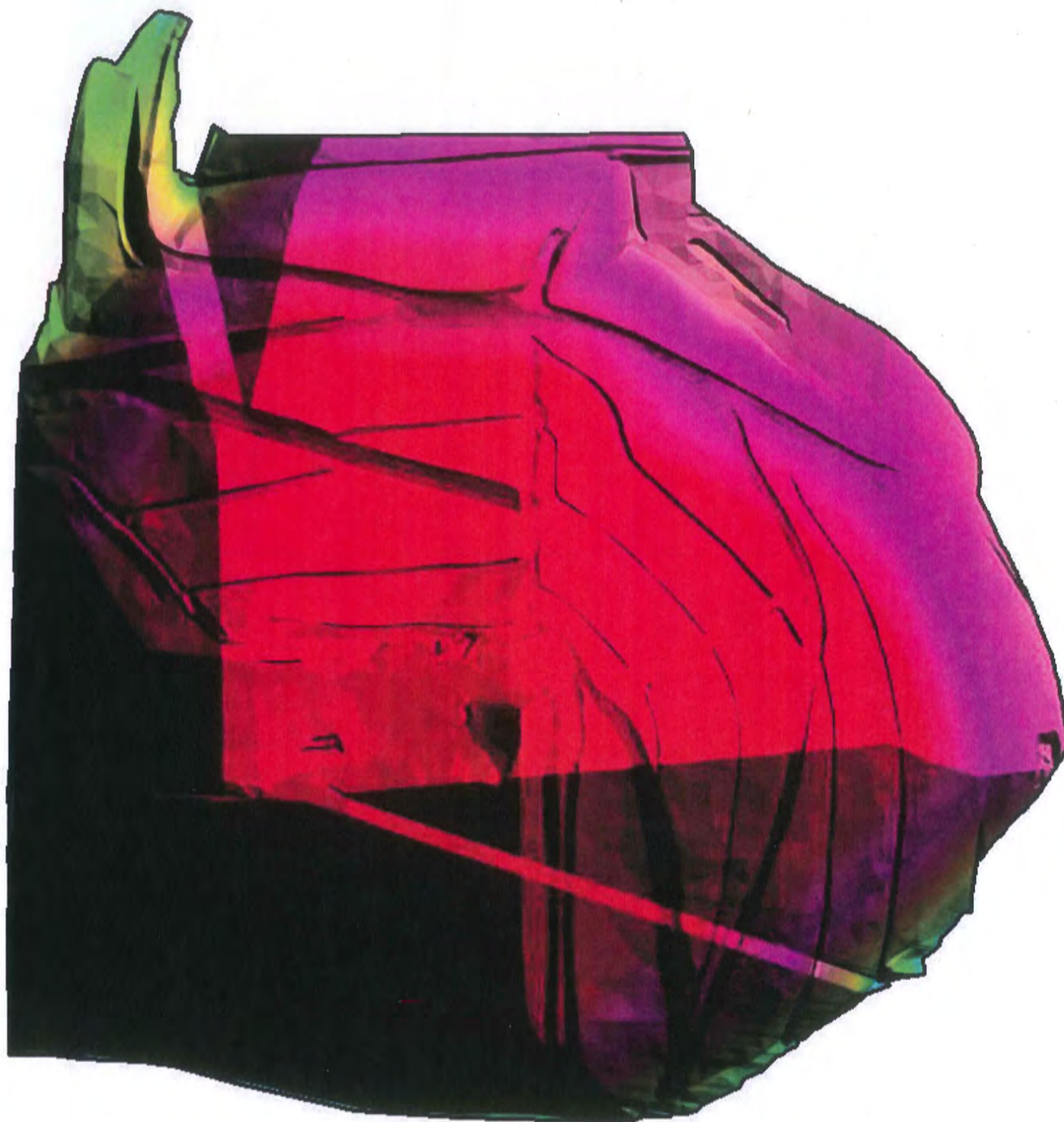
**BPS 3Di**

Aerial Imagery | Mapping | LiDAR | GIS | GPS Surveying

[www.GeoTerra.us](http://www.GeoTerra.us)

## August 2010 to Projected Design Surface

| VOLUME (cubic feet) |             |        | AREA (square feet) |           |        |
|---------------------|-------------|--------|--------------------|-----------|--------|
| TOTAL               | CUT         | FILL   | TOTAL              | CUT       | FILL   |
| 247,382,432         | 247,396,764 | 14,333 | 2,711,307          | 2,691,197 | 10,536 |



previously known as:

**BPS 3Di**

Aerial Imagery | Mapping | LiDAR | GIS | GPS Surveying

[www.GeoTerra.us](http://www.GeoTerra.us)