UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

JUN 2 9 2012

MEMORANDUM

SUBJECT: Request for a Time-Critical Removal Action at the Oak Canyon Site, Pueblo of Laguna, Cibola County, New Mexico

FROM: Warren Zehner, On-Scene Coordinator
Removal Team (6SF-PR) for Jon Rinehart
Jon Rinehart, On-Scene Coordinator
Removal Team (6SF-PR) Jon Rinehart

THRU: Ragan Broyles, Associate Director
Prevention and Response Branch (6SF-P) Ragan Broyles

TO: Pam Phillips Acting Director
Superfund Division (6SF) Ragan Broyles for

I. PURPOSE

This memorandum requests approval for a time-critical removal action, pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 U.S.C. § 9601 et seq., at the 27 residential properties that compose the Oak Canyon Site (the "Site") located in the Village of Paguate, Pueblo of Laguna, near Cibola County, New Mexico. The proposed actions for this Site include the excavation, consolidation, and removal of radiologically contaminated soil/debris and/or radon abatement at 27 residential structures located on 27 residential properties within the geographic boundaries of the aforementioned Village.

As described in Section III of this memorandum, the factors described in Section 300.415 of the National Contingency Plan (NCP), 40 CFR § 300.415, have been considered, and, based on those factors, a determination has been made that a removal action at the Site is appropriate. This Removal Action is not expected to exceed the statutory twelve-month time limit, nor is it expected to exceed the statutory $2,000,000 cost ceiling.

II. SITE CONDITIONS AND BACKGROUND

CERCLIS ID:	NMN000606997
Category of Removal:	Time Critical
Site ID:	A6Q4
Latitude:	35 degrees, 8 minutes, 23.5 seconds N
Longitude:	-107 degrees, 22 minutes, 38.1 seconds W

A. Site Description

1. Removal Site Evaluation

As part of the overall environmental assessment of the Grants Mineral Belt area of New Mexico, in March 2009 the Region 6 Prevention and Response Branch (EPA PRB) received a verbal request for assistance from the Laguna Environment Department (LED) in the evaluation of the Villages of Paguate, Laguna, Mesita, Encinal, Paraje, and Seama on the Pueblo of Laguna (POL) for a potential removal action. Documentation provided by the LED indicated that the aforementioned Villages are located adjacent to the three historic uranium mines and one uranium mill that composed the uranium production from the Laguna Sub-District of the Grants Mineral Belt. The St. Anthony (SA) open pit uranium mine and the LBar underground uranium mine and associated uranium mill are located 2 – 3 miles east of the Site, and the Jackpile (JM) uranium mine is located approximately the same distance to the southeast. All of the mines and the associated mill near the Site have been closed for several years. The SA was operated by United Nuclear Company from 1975 to 1981. The LBar mine and mill complex was operated by Sohio Western Mining Company from 1976-1981. The Jackpile mine was operated by Anaconda and its successor ARCO from 1952 – 1982. The villages of the POL were thought to be potentially contaminated with uranium mine/mill waste originating from the uranium mining and milling operations that occurred on the Laguna Sub-District. Based on this request for assistance, the Superfund Technical and Response Team (START) III contractors were tasked by EPA PRB to conduct a Radiation Removal Assessment on the Site. As part of this radiological assessment a quality assurance sampling plan (QASP) was developed for the project documenting standard operating procedures (SOPs), assessment protocols, and data decisions tree consistent with current EPA guidance and other best management practices. Based on the results of the Radiation Removal Assessment, the POL made a written request to the PRB on August 23, 2011 for assistance in conducting a removal action on the affected residential properties on this Site (*See* Attachment 2).

The elevated concentrations of several radio-isotopes and their associated progeny in various uranium mine waste streams are contaminants of concern on this Site primarily from gamma and other forms of ionizing radiation associated with these radio-isotopes. Uranium mine waste streams include, but are not limited to overburden, sub-economic ore, and broken/replaced infrastructure/mechanical elements, and/or soil/debris that have become contaminated with radioactive waste materials ("waste materials"). Principally, contaminants of concern include radium-226 (^{226}Ra, hereafter to mean isotope and progeny) and radon-222 (^{222}Rn, hereafter to mean the isotope and progeny) primarily from the mining operations and/or subsequent mine closure operations conducted in the Laguna Sub-District of the Grants Mineral Belt. In addition to ^{226}Ra and ^{222}Rn contamination, uranium-238 (^{238}U, hereafter to mean, all the isotopes and their progeny) generated from the various uranium mining operations are also contaminants of concern. These radio-isotopes have been potentially dispersed by the aforementioned uranium mining and milling operations in the Laguna Sub-District, during their previous operational history and by various anthropogenic means throughout the Site. The

anthropogenic activities include, but are not limited to the utilization of waste materials in residential landscaping (rock borders, rock gardens, etc.), re-use of contaminated materials (i.e. salvaged piping used in a residential irrigation system) and re-use as construction materials on the residential properties (i.e. foundations). The elevated concentrations of radio-isotopes and associated radioactivity above normal background levels, expressed in counts per minute (CPM) and micro-roentgens per hour (μR/hr) present on the residential properties on this Site appear to be the direct result of the mining operations, and/or the re-utilization of waste materials generated during the uranium mining and/or milling operations conducted in the Laguna Sub-District of the Grants Mineral Belt.

The fine and sandy/dusty texture of the contaminated soils on the Site makes it easy for these waste materials to adhere to humans and animals that come into direct contact with them. For humans and especially children, the wastes may be subsequently ingested during normal hand-to-mouth (or plaything-to-mouth) activity, or may be inhaled. Moreover, the dry climate and sparse vegetative cover in these areas may cause the fine-grained waste materials to become wind-borne. Given the frequent dust storms taking place seasonally on the Site, the potential for exposure is greatly increased. These dust storms can also cause indoor contamination (the dust is so fine that it can blow through small cracks), increasing the likelihood that humans, and especially children, may be exposed. In addition, during the brief wet periods following precipitation events, contaminated mud may be tracked into residences and/or vehicles. When the mud dries and is disturbed during human activities, such as routine cleaning, the airborne fraction of the dust contributes to further inhalation exposure.

2. Physical Location

The Site is located in the Village of Paguate, on the POL, in rural Cibola County, New Mexico (*See* Attachment 3). The Pueblo of Laguna has been settled since the late 1600's. Demographically, the Site is predominantly Native American. Geomorphologically, the Site is in semi-arid grassland with some mixed piñon-juniper stands on the north and west sides of the Villages, grading into rocky outcrops of the foothills of the San Mateo Mountains on the south and east sides. Density of vegetative cover is variable across the Site, with the areas of rocky outcropping having the least amount of cover vegetation. The Site is composed of 27 residential structures located on 27 residential lots within the boundaries of the Village (*See* Attachment 4).

3. Site Characteristics

The EPA PRB has completed investigating the extent of residential radiological contamination on the POL and this Site. Based on the Removal Assessment it appears that the source of the radiological soil/debris contamination on this Site is waste material salvaged from the historic uranium mining and milling operations within the surrounding area. The source of the excess radon-222 levels appears to be directly related to the mining operations altering the porosity and permeability of the uranium-bearing Jackpile sandstone and the overlying Dakota sandstone strata in and around the Site.

The Laguna Sub-District is a small sub-district on the Grants Mineral Belt located in Cibola County in northwest New Mexico. Based on the review of federal and State government regulatory records, there were three uranium mining operations and one uranium mill operating in the sub-district from the early 1950s until 2002, with most active operations ceasing in the 1980s (*See* Attachment 5). These mines and the associated LBar mill were the main source of employment in Cibola County, NM, and the single largest employer for residents of the POL.

Geologically, the Grants Mineral Belt is a reasonably unique uranium mining area as most of the major uranium deposits are tabular as compared to the significantly more prevalent roll-front uranium deposits throughout most of the other uranium mining areas in the United States. In tabular deposits the uranium bearing strata tends to be in horizontal or tabular bands of widths up to 2 -3 miles and of varying thicknesses. The tabular uranium bearing deposits in the Laguna Sub-District are located in the Jackpile Sandstone member of the Morrison Formation. All of the Village of Paguate is underlain by this sandstone (*See* Attachment 6). As discussed in T*he Jackpile Sandstone Member of the Morrison Formation in West-Central New Mexico – A Formal Definition* (Owen et al., New Mexico Geology, Volume 6, No. 3, August 1984), the Jackpile Sandstone is a brittle, cross-bedded sandstone with significant occlusions and fractures. As discussed above uranium mining activities occurred in the Laguna Sub-District from approximately 1952 until approximately 1982. These activities included but were not limited to, surface mining, underground mining, frequent blasting to facilitate ore recovery, geologic borehole installation to define the limits of ore bodies and extent of economic viability. All of these previously described mining and mining related activities are invasive and have a negative effect on the structural integrity of the brittle Jackpile Sandstone primarily in changing the porosity and permeability of the formation through the shafts, tunnels or boreholes and the frequent blasting to facilitate ore removal. It is well documented in the literature that mine shafts, tunnels, and boreholes associated with uranium mines collect and artificially concentrate ^{222}Rn. This artificial concentration becomes exacerbated when the mines are closed due to very limited or no fresh air circulation occurring in the mines. With the historic mining activities altering the porosity and permeability of the Jackpile Sandstone, the artificially concentrated ^{222}Rn has a significantly increased probability of surface discharge at increased concentrations. It appears that this is the source of the elevated ^{222}Rn concentrations on the Site.

In addition, as part of the overall operations at the mines and mills in the Laguna Sub-District, the mines maintained overburden and/or sub-economic ore waste piles and at least one waste/debris area for general infrastructure/ mechanical wastes. It appears based on several conversations with residents and former mine workers throughout the Removal Assessment study areas in the Laguna Sub-District that "salvage" of the aforementioned waste piles and/or waste storage areas for residential re-utilization was common and if not approved by the mine operator(s) it was condoned. Reportedly, no warning signs or potential health impact information about the use of these waste materials were present in these waste areas during the operational history of the mines. Since the various uranium mines in the Laguna Sub-District were the largest employers in the POL for a significant number of years, a disproportionally large

fraction of the adult residents of the POL, including the Site residents, had easy and ready access to the various aforementioned waste storage areas in the Laguna Sub-District. Several examples of residential re-utilization of radioactive waste materials were observed during the Removal Assessment on the Site, including but not limited to building materials, fill, landscaping (rock gardens), and souvenirs.

During the course of the Removal Assessment the EPA OSCs had discussions with various residents on the Site regarding the residential re-utilization of various mine and mine operations wastes streams on their residences. Some residents freely admitted to the various source mines of the contaminated materials, others stated they had no knowledge of the source since it was brought to the residence by a parent or other relative.

As mentioned above, the EPA has completed the surface soil and structural (indoor) Removal Assessment on the Site. Surface radiological surveys were conducted on 143 residences utilizing a 2"x 2" gamma scintillation detector. Gamma radiation levels around and near the residences were as high as 164,624 CPM, as compared to the Village specific background of 12,682 CPM. *See* Interim Status Report, (Attachment 7).

4. Release or Threatened Release into the Environment of a Hazardous Substance, Pollutant or Contaminant

One of the principal contaminants of concern on this Site is ^{222} Rn, which was detected in the residences on 23 properties on the Site at levels up to 15.1 pico curies per liter (pCi/L) using seven day samplers. In order to be consistent with the recommendations of the EPA Region 6, Regional Health Physicist/Radon Coordinator and the substantive requirements of *Protocols for Radon and Radon Decay Product Measurement in Homes* (EPA 402-R-02-003, May 1993), the more definitive 91 day samplers were placed in the nineteen residences that exceeded the acceptable exposure level on the seven day samplers. EPA has previously determined that the acceptable in-home exposure level for ^{222} Rn is $\leq$4 pCi/L as per the 91 day samplers (*EPA Assessment of Risks from Radon in Homes* (EPA 402-R-03-003, June 2003). The 91 day samplers recorded levels of ^{222} Rn above the $\leq$4 pCi/L exposure level at 23 residences, with a maximum level of 14.7 pCi/L at this Site.

Uranium-238 and ^{226} Ra are also principal contaminants of concern on this Site based primarily on the gamma and other forms of ionizing radiation associated with these radio-isotopes. Radiological dose is measured in milli-rem per year (mrem/year). The *Establishment of Cleanup Levels for CERCLA Sites with Radioactive Contamination*, August 22, 1997 (OSWER Directive 9200.4-18) established a general, maximum acceptable radiological dose level of 15 mrem/year above background level for non NRC licensed facilities. Further, this guidance document states that the total effective dose equivalent (TEDE) of 15 mrem/year represents an excess cancer risk of $3x10^{-4}$, and is considered essentially equivalent to the CERCLA presumptively protective excess cancer risk level of $1x10^{-4}$. The referenced risk calculation utilizes a 30-year exposure period per lifetime and a 24 hour/day exposure rate. The risk

calculation is based upon a risk conversion factor of 7% cancer incidence per 100 rem of exposure and comes from the National Academy of Sciences report on *The Biological Effects of Ionizing Radiation (BEIR V), 1990.* The *Protocol for Uranium Home Site Assessment, Grants Mineral Belt Uranium Project; Cibola and McKinley Counties, New Mexico, December 2009,* documents the regulatory consistency with EPA 1997, OSWER 9200.4-18 and the process used for conducting the radiological assessment on this property. The START III Certified Health Physicists (CHPs) have evaluated the radiological data from the Removal Assessment on the Site and have determined that the 23 residences on the Site have exceeded the acceptable radon-222 exposure level of ≤ 4 pCi/L based on 91 day samplers or the TEDE of 15 mrem/year above background levels, and the excess cancer risk level of $3x10^{-4}$ is exceeded by a similar factor.

As previously stated, the primary contaminants of concern at the Site, ^{238}U and ^{226}Ra and their associated progeny, including ^{222}Rn are hazardous substances as defined in Section 101(14) of CERCLA, 42 U.S.C. § 9601(14) and 40 CFR § 302.4. The following are the known health effects associated with exposure to the aforementioned hazardous substances on the Site.

Radon-222

Radon-222 is a colorless and odorless noble gas that is produced in the decay chains of Uranium and Thorium. Radium-226 is the parent of ^{222}Rn. According to the Agency for Toxic Substance and Disease Registry (ATSDR) *ToxFAQs for Radon* (September 2008) document, ^{222}Rn is recognized by the EPA and the Department of Health and Human Services (DHHS) as a human carcinogen. The primary target organ for ^{222}Rn and its alpha ionizing radiation producing progeny are the lungs. Several health organizations have indicated that prolonged exposure to high levels (> 4pCi/L) of ^{222}Rn is the second leading cause of lung cancer in the United States, behind only smoking.

Exposure pathways are the routes that a contaminant can take in order to be assimilated by a human or animal. For example, the inhalation of gases, vapors or contaminated airborne particles (dust) or the incidental ingestion of contaminated soils through direct contact are both exposure pathways. The exposure pathways of concern at the Site for ^{222}Rn are described below:

- Inhalation is the primary exposure pathway at this Site for ^{222}Rn and associated alpha ionizing radiation producing progeny. As discussed above a significant amount of ^{222}Rn is present in 23 of the 27 residences on this Site. Inhalation exposure is not limited only to the gaseous phase of ^{222}Rn; the alpha emitting progeny also readily attach to fine surface soils and related fine particulate matter (dust). Since this Site is in a semi-arid environment and the contaminated soils tend to be fine grained and dusty, they are easily airborne after wind or mechanical disturbance and subject to inhalation by humans or livestock.

Radium-226

Radium-226 is principally a source of alpha and gamma radiation, although some beta radiation is also produced during the decay process. According to the ATSDR *ToxFAQs for Radium* (July 1999) document, exposure to ^{226}Ra can cause adverse effects to the eyes (cataracts) and blood (anemia). Radium-226 has been identified by the EPA and the National Academy of Sciences as a known human carcinogen, being specifically linked to cancers of the bone and breast, and leukemia.

The exposure pathways of concern for radium-226 at this Site are described below:

- The predominant exposure pathway related to ^{226}Ra was determined to be external gamma radiation, contributing over 90% of the total effective dose equivalent (TEDE) in the ResRad modeled scenario with ^{222}Rn removed.

- A significant amount of the surface area of the residences on this Site is contaminated with elevated concentrations of ^{226}Ra at or near the surface. The contaminated soils are fine grained and have a high probability of adherence to skin, clothing and fur as a result of direct contact. For humans, incidental ingestion of the contaminants adhering to skin or clothing can occur through normal hand-to-mouth activities such as play or mealtime.

- Inhalation is another exposure pathway at this Site. As discussed above a significant amount of the surface soils on this Site are contaminated with ^{226}Ra. The contaminated soils tend to be fine grained and dusty, are easily airborne after wind or mechanical disturbances, and subject to inhalation by humans or livestock. Inhalation and ingestion combined for a total of approximately 5% of the TEDE estimate in the ResRad modeled scenario for this Site.

Uranium

Uranium is a widespread mineral forming heavy metal that in nature is composed of three isotopes, ^{238}U, ^{235}U, and ^{234}U, with the ^{238}U isotope generally composing over 98% of the mixture. All of these isotopes are the same chemically, but they have different energy and decay properties. According to the ATSDR *ToxFAQs for Uranium* (October 1999) document, U is an alpha ionizing radiation emitter and in general, weakly radioactive. Exposure to excess levels of U can cause human tissue damage, primarily in the kidneys. Cancer risk from exposure to excess U levels appears to be low to none. The primary risk on this Site from U is cancer caused by exposure to the progeny generated by its decay.

5. NPL Status

This Site is not presently on the NPL. However, should the Site rank on the NPL, the current removal action will be consistent with any subsequent remedial activities that might be taken due to the fact that the proposed actions constitute a source control measure.

6. Maps, Pictures and Other Graphic Presentations

Attachment 1 - Enforcement Addendum (Enforcement Confidential/FOIA Exempt)
Attachment 2 - POL Removal Action Assistance Letter
Attachment 3 - Site Location Map
Attachment 4 - Site Sketch
Attachment 5 - Laguna Sub-District Historic Mine Locations
Attachment 6 – Jackpile Sandstone distribution in Laguna Sub-District
Attachment 7 – Interim Status Report, Paguate Removal Assessment, September 2, 2011

B. Other Actions to Date

1. Previous actions

No previous response actions have occurred on this Site to date.

2. Current Actions

Based on the Removal Assessment data and the health based dose calculations utilizing the ResRad model and a ration of dose to excess cancer risk assumed at the TEDE of 15 mrem/year level per risk of $3x10^{-4}$ and ^{222}Rn levels in excess of 4 pCi/L (based on 91 day samples) as discussed above, in Section II.A.4, the EPA has determined that current conditions on this Site pose an unacceptable health risk to the residents residing on specific properties within the boundaries of the Site.

C. State and Local Authorities' Roles

1. State and Local Actions to Date

The POL, through the LED, has been involved in the historic and current regulatory activities associated with the SA and LBar mines and the LBar mill in the Laguna Sub-District. EPA has coordinated all Removal Assessment activities on this Site with LED.

2. Potential for Continued State/Local Response

Neither the POL nor the LED will be able to provide a response action to physically address the site conditions described in this memorandum.

III. THREAT TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT

A. Threats to Public Health

The factors described in Section 300.415 of the National Contingency Plan (NCP), 40 CFR § 300.415, have been considered, and, based on those factors, a determination has been made that a removal action is appropriate to address the hazardous substances present in the contaminated wastes at the Site. Any or all of these factors may be present at a site yet any one of these factors may determine the appropriateness of a removal action.

1. Actual or Potential Exposure to Nearby Human Populations, Animals, or the Food Chain from Hazardous Substances or Pollutants or Contaminants. 40 CFR § 300.415(b)(2)(i).

As discussed above, in Section II.A.3-4, the Removal Assessment identified levels of ionizing gamma radiation in the soils/debris surrounding or in close proximity to the 7 residential structures and/or excess levels of ^{222}Rn in 23 of the 27 residences on the Site in excess of the referenced EPA acceptable exposure, dose and/or risk limits.

2. High Levels of Hazardous Substances or Pollutants or Contaminants in Soils Largely at or Near the Surface That May Migrate. 40 CFR § 300.415(b)(2)(iv).

As discussed above, and in the results of the Interim Status Report, Paguate Removal Assessment (*See* Attachment 5) indicates high levels of radiological contamination in the surface and near surface soils (< 12 inches) on a significant portion of the residential properties composing this Site.

3. Weather Conditions That May Cause Hazardous Substances or Pollutants or Contaminants to Migrate or be Released. 40 CFR § 300.415(b)(2)(v).

As referenced above, the Site is located on the Pueblo of Laguna, in north-west New Mexico. The Pueblo routinely experiences severe weather of varying degrees of intensity during the Spring and Summer. Given that the referenced radiological contamination is located at or near the surface of the Site, and because the Site is located in a semi-arid area, with limited vegetative cover, there is a high potential for off-site migration of hazardous substances in surface soils from the Site via the flash flooding rains in the Summer and/or strong wind storms

that are associated with strong low pressure systems in the Spring.

4. The Availability of Other Appropriate Federal or State Response Mechanisms to Respond to the Release. 40 CFR § 300.415 (b)(2)(vii).

At this time, there are no other mechanisms available to respond with the actions described in this memorandum in a timely manner so as to effectively reduce the imminent and substantial endangerment to public health posed by the hazardous substances located on the Site. The POL and the LED do not have the resources available to address the current dangerous conditions at the Site. If other mechanisms become available during the conduct of this response action, the EPA will evaluate those mechanisms as appropriate.

B. Threats to the Environment

The actions taken during this response are designed solely to address a public health threat resulting from the hazardous substances present on the Site derived from waste materials that appear to have originated from the historic uranium mining and/or uranium milling in the Laguna Sub-District of the Grants Mineral Belt.

IV. ENDANGERMENT DETERMINATION

Actual or threatened releases of hazardous substances, pollutants or contaminants from the Site, if not addressed by implementing the response action selected in this Action Memorandum, will continue to present an imminent and substantial endangerment to public health or welfare or the environment.

V. PROPOSED ACTIONS AND ESTIMATED COSTS

A. Proposed Actions Taken

1. Action Description

a. Action levels and clean-up levels

EPA uses the term "action level" to mean the contaminant concentration level in soil or groundwater at which a response action in question will be taken. Wastes that meet the definition of a hazardous waste under the RCRA statute not found in a soil or groundwater matrix (such as drummed wastes on a site) are usually not subject to a specific action level. They are simply removed to prevent actual or potential exposures. Action levels should not be confused with "cleanup levels." The cleanup level is the contaminant concentration level which the response action is designed to meet. That is, once EPA has identified a contaminated

medium which contains concentrations of a contaminant which exceed the action level, the removal action calls for continued response until the concentration of the contaminant in the contaminated medium are below the established cleanup level. For this removal action, both the action level and cleanup level is 3.5 pCi/gram of radium-226 in soil, re-purposed materials, and/or debris. This concentration value is the equivalent of a $3x10^{-4}$ excess cancer rate as calculated by the aforementioned ResRad model and EPA's PRG calculator using site specific data where possible. Further, this concentration value is also the equivalent of a 15 mrem/yr dose rate for ionizing gamma radiation generated from the decay of the aforementioned radioisotopes and their associated daughter progeny in the contaminated building materials and soils. Both the action level and the cleanup for ^{222}Rn on this removal action is ≤ 4 pCi/L in indoor air based on 91 day samples.

In developing the action levels and cleanup levels for the Site, EPA Region 6 considered the *Establishment of Cleanup Levels for CERCLA Sites with Radioactive Contamination*, August 22, 1997 (OSWER Directive 9200.4-18), EPA Region 9 Navajo Nation Radiological Structure Assessment data and procedures, and consulted with NMED to determine whether there were potential state Applicable or Relevant and Appropriate Requirements (ARARs) within the meaning of CERCLA Section 121, 42 U.S.C. § 9621. After the action levels and cleanup levels for this Site were reviewed and found to be consistent with historic action levels and cleanup levels used by the EPA on similar sites, the OSC decided to utilize the aforementioned ionizing radiation dose rate as the action level and cleanup level for the radiological contamination on this Site.

b. Oak Canyon Site

The EPA proposes to mitigate the imminent and substantial threats to human health, welfare, or the environment by taking steps to prevent the release of radon-222, radium-226, uranium and external ionizing radiation from the sources on this Site. The removal action will include the following objectives to prevent direct human contact and excessive ionizing radiation exposure from the contaminated soils/debris, contaminated re-purposed materials and excess indoor radon-222 present on the Site:

- Remove the identified surficial residential radiological soil contamination (approximately 1,000 cubic yards) from the Site by excavating to a level below the cleanup level or to a maximum of two feet below ground surface.
- Consolidate, transport and dispose of the radiologically contaminated soil, debris, and any other contaminated materials into an approved off-site facility.
- Replace excavated soils with clean fill and restore to pre-removal grade.
- Install a radon-222 abatement system consistent with BMP for the industry to reduce overall radon-222 levels to below the cleanup level of ≤ 4 pCi/L.
- Conduct confirmation radiological scanning, sampling, and analysis to ensure that the ionizing radiation exposure is below established EPA cleanup levels.

c. Certain contaminated materials will be taken off-site

The contaminated soils excavated during the removal action will be consolidated and taken off-site for disposal. The contamination found at the Site and discussed in this memorandum stems from waste material salvaged from the historic mining operations conducted within the Laguna Sub-District. The contaminated wastes described above are a solid waste, but not a hazardous waste under the Resource Conservation and Recovery Act (RCRA), because they are derived from the extraction, beneficiation, and processing of ores and minerals within the meaning of 40 CFR § 261.4 (b)(7). Since the aforementioned materials are not a hazardous waste under RCRA, EPA does not consider the RCRA hazardous waste management requirements to be applicable or relevant and appropriate (See Section V 4(c) below). Although these wastes are not considered hazardous wastes under RCRA regulations, they are determined to be CERCLA hazardous substances.

The off-site disposal of the CERCLA wastes generated from this removal will be in conformance with EPA's procedures for planning and implementing off-site response action, 40 CFR § 300.440. All off-site transportation of hazardous waste will be performed in conformance with applicable U.S. Department of Transportation (USDOT) requirements. Other requirements under the Occupational Safety and Health Act (OSHA) of 1970, 29 U.S.C. § 651 et. seq., and under the laws of States with plans approved under section 18 of the State's OSHA laws, as well as other applicable safety and health requirements, will be followed. Federal OSHA requirements include, among other things, Hazardous Materials Operation, 29 CFR Part 1910.120, as amended by 54 Fed. Reg. 9317 (March 5, 1989), all OSHA General Industry (29 CFR Part 1910) and Construction (29 CFR Part 1926) standards wherever they are relevant, as well as OSHA recordkeeping and reporting regulations, the EPA regulations set forth in 40 CFR Part 300, and other EPA policies/guidelines relating to the conduct of work at Superfund sites.

After completion of this removal action, the Site will be referred back to the POL for any further needed actions.

2. Contribution to Remedial Performance

The actions described above for the Site will contribute to any presumed remedial cleanup alternative given that the response actions to be taken will constitute contaminant source removal.

3. Description of Alternative Technologies

At this time, there are no other proven alternative technologies that could be feasibly applied at this Site. The appropriate action is to conduct the removal action on the Site as described in this memorandum. If an equally protective and less expensive technology is later identified, it may be considered.

4. Applicable or Relevant and Appropriate Requirements (ARARs)

The proposed removal action will be conducted to eliminate the actual or potential exposure to hazardous substances pursuant to CERCLA, in a manner not inconsistent with the NCP. As per 40 CFR Section 300.415(j), Superfund-financed removal actions under CERCLA § 104 and § 106 shall, to the extent practicable considering the exigencies of the situation, attain the applicable or relevant and appropriate requirements (ARARs) under Federal environmental law.

a. Chemical-specific ARARs - There were no chemical-specific Federal or State ARARs identified that were applicable to this removal action.

b. Location-specific ARARs - There were no location-specific Federal or State ARARs identified that were applicable to this removal action.

c. Action-specific ARARs - The uranium, radium-226 and related daughter progeny contamination in the soil/debris is from the mining of uranium which is a solid waste, but not a hazardous waste under the Resource Conservation and Recovery Act (RCRA), because it is solid waste from the extraction, beneficiation, and processing of ores and minerals within the meaning of 40 CFR § 261.4 (b)(7). Since the materials are not a hazardous waste under RCRA, EPA does not consider RCRA hazardous waste management requirements to be applicable or relevant and appropriate, including without limitation the waste analysis requirements found at 40 CFR §§ 261.20 and 261.30, the RCRA manifesting requirements found at 40 CFR § 262.20, and the RCRA packaging and labeling requirements found at 40 CFR § 262.30. Since the removal action involves no on-site storage of hazardous wastes, storage requirements found at 40 CFR Part 265 are not applicable or relevant and appropriate.

Although the hazardous substances which are the subject of this removal action are solid waste and not hazardous waste under RCRA because they are solid waste from the extraction, beneficiation, and processing of ores and minerals, according to 40 CFR § 261.4(b)(7), it is useful in this Site-specific situation for EPA to use certain RCRA requirements to control and track waste sent off-site. Accordingly, RCRA waste analysis requirements found at 40 CFR §§ 261.20 and 261.30, RCRA manifesting requirements found at 40 CFR § 262.20, and RCRA packaging and labeling requirements found at 40 CFR § 262.30 are deemed to be relevant and appropriate requirements and will be used for off-site disposal of wastes and other contaminated material generated during this removal action. Because on-site storage of repackaged hazardous wastes is not expected to exceed ninety (90) days, specific storage requirements found at 40 CFR Part 265 are neither applicable nor relevant and appropriate *(See* 40 CFR § 262.34).

d. To-be-considered (TBCs) - In addition to ARARs, other advisories, criteria, or guidance that may be useful in developing the remedy were, as appropriate, identified and considered.

5. Project Schedule

The proposed actions for this time critical removal action are expected to be completed in six months.

B. Estimated Costs

Extramural Costs

Removal Contractors.....	$ 830,690
START III Contractors.....	$ 200,000
Subtotal, Extramural Costs	$ 1,030,690
Extramural Costs Contingency (20%)	$ 206,138

TOTAL, EXTRAMURAL COSTS..... $1,236,828

VI. EXPECTED CHANGE IN THE SITUATION SHOULD NO ACTION BE TAKEN OR ACTION BE DELAYED

Should the actions described in this Action Memorandum be delayed or not taken, the elevated gamma radiation dose/excess cancer risk from the Radium-226 and the elevated concentrations of radon-222 in indoor air will continue to pose a significant threat to the residents located in the 27 homes associated with this Site.

VII. OUTSTANDING POLICY ISSUES

There are no outstanding policy issues associated with this removal action.

VIII. ENFORCEMENT

EPA Region 6 has initiated the enforcement process on this Site. (*See* Enforcement Confidential Attachment #1, for additional details). The total cost to EPA for this removal action, consisting of the excavation and disposal of the contaminated soil/debris and the

installation of radon abatement systems, is **$1,764,087**.

(Direct Cost) + (Other Direct) + (42.63% of Total Direct {Indirect Cost}) = Estimated EPA Cost for a Removal Action

$1,236,828 + (42.63% x $1,236,828) = **$1,764,087**

Direct costs include direct extramural costs and direct intramural costs. Indirect costs are calculated based on an estimated indirect cost rate expressed as a percentage of site-specific direct costs, consistent with the full cost accounting methodology effective October 2, 2002. These estimates do not include pre-judgment interest, do not take into account other enforcement costs, including Department of Justice costs, and may be adjusted during the course of a removal action.

IX. RECOMMENDATION

This decision document represents the selected removal action for the Oak Canyon Site, POL, Cibola County, New Mexico, and is developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. § 9601 et seq., and is not inconsistent with the National Contingency Plan (NCP) 40 CFR Part 300. This decision is based on the administrative record for the Site.

Conditions at the Site meet the NCP Section 300.415 (b) (2), 40 CFR § 300.415 (b)(2) criteria for a time-critical removal action. We recommend your approval of the proposed time-critical removal action request. The total estimated EPA cost for the removal is $1,764,087. Of this, an estimated $1,236,828 comes from regional funds.

APPROVED: _____ DATE: 6/29/12

Pam Phillips,
Acting Director
Superfund Division

Attachments

MEMORANDUM

SUBJECT: Request for a Time-Critical Removal Action at the Oak Canyon Site, Pueblo of Laguna, Cibola County, New Mexico

FROM: Warren Zehner, On-Scene Coordinator
Removal Team (6SF-PR)

Jon Rinehart, On-Scene Coordinator
Removal Team (6SF-PR)

THRU: Ragan Broyles, Associate Director
Prevention and Response Branch (6SF-P

TO: Pam Phillips Acting Director
Superfund Division (6SF)

I. PURPOSE

This memorandum requests approval for a time-critical removal action, pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 U.S.C. § 9601 et seq., at the 27 residential properties that compose the Oak Canyon Site (the "Site") located in the Village of Paguate, Pueblo of Laguna, near Cibola County, New Mexico. The proposed actions for this Site include the excavation, consolidation, and removal of radiologically contaminated soil/debris and/or radon abatement at 27 residential structures located on 27 residential properties within the geographic boundaries of the aforementioned Village.

As described in Section III of this memorandum, the factors described in Section 300.415 of the National Contingency Plan (NCP), 40 CFR § 300.415, have been considered, and, based on those factors, a determination has been made that a removal action at the Site is appropriate. This Removal Action is not expected to exceed the statutory twelve-month time limit, nor is it expected to exceed the statutory $2,000,000 cost ceiling.

II. SITE CONDITIONS AND BACKGROUND

CERCLIS ID:	NMN000606997
Category of Removal:	Time Critical
Site ID:	A6Q4
Latitude:	35 degrees, 8 minutes, 23.5 seconds N
Longitude:	-107 degrees, 22 minutes, 38.1 seconds W

Webster	Broyles/Peterson	Capuyan	Johnson	Travis	Peycke
6SF-PR	6SF-P	6SF-TE	6SF-TE	6RC-S	6RC-S
5/10		4/25/12	5/4/12	04/25/12	05/10/12

ATTACHMENT 1

ENFORCEMENT ATTACHMENT TO THE ACTION MEMORANDUM FOR the "Oak Canyon Superfund Site" IS ENFORCEMENT SENSITIVE/FOIA EXEMPT

Note: **This document has been withheld as Enforcement Confidential and is located in Separate "CONFIDENTIALITY FILING" at U.S. EPA, Region 6**

Attachment 2

POL REMOVAL ACTION ASSISTANCE LETTER

ITEM # 2 – EPA JACK PILE URANIUM MINE UPDATE

Presenter(s) Ladonna Turner EPA Region #6, Warren Zehner, EPA Region # 6 & Jon Rinehart, EPA Region #6.

Ms. Turner gave Council a brief overview on the Jackpile Uranium Mine;

Superfund Site Assessment Activities
A formal Tribal Consultation with Laguna Pueblo began October 13, 2009. The EPA conducted a sampling event for the Site Inspection on March 1, 2009. The Pueblo of Laguna submitted a Resolution #10-10 supporting the listing of Jackpile Uranium Mine to the Nation Priorities list (NPL). In the process a Memorandum of Understanding (MOU) was signed on June 22, 2010.

A ground water Conceptual Site Model was developed in January 2011, the EPA conducted a sampling event for the Expanded Site Inspection in April, 2011. The Laguna Environmental Department had several years of surface water data that documented elevated levels of Isotopic Uranium. The EPA documented elevated levels of Isotopic Uranium in the surface and ground water, field and lab data suggested that 3 backfilled pits had a much higher rate.

The next steps that the EPA will take are;
- To review revised ground water Conceptual Site Model;
- To review draft Expanded Site Inspection (ESI) report;
- The aid of a Letter or Resolution from the Pueblo supporting NPL listing in 2012, this is needed by December 1, 2011.
- To submit a package to EPA Headquarters on the Jackpile Uranium Mine site to the National Priorities List (NPL)

The next presentation was presented by Warren Zehner and Jon Rinehart they gave a brief overview on;

EPA Structure Assessment Project Grants Mineral Belt
There have been some over flights made and this established the presence or absence of gross widespread of radiological contamination in residential study areas, there has also been detected elevate radiation in some residential areas as well. Assessments have been conducted in 2 phases:
- **Exterior (Phase I) which consist of Gamma Radiation and Elemental Uranium**
- **Interior (Phase II) which consist of Alpha Radiation, Gamma Radiation (Meter readings and Pressurized Ion Chamber – PIC)**
- **Radon**

The Primary targets were traditionally built houses or those houses incorporating material from the mines in the home structure, no resident was turned down for Phase I, regardless of home type. Established local backgrounds were a wide range of back levels throughout the Pueblo which comprised of 6 backgrounds, 1 for each of the primary villages.

In Phase I: there were 516 residences that were contacted, 355 that agreed and 62 residences that exceeded dose concentration.

In Phase II: there were 82 residences contacted, 61 that agreed and 53 residences that exceeded the total equivalent dose estimate, (which is the general EPA acceptable exposure limit for radiological sites).

Radon Sampling Data: There were 7 day samples; 144 residences sampled, 107 residences were below the acceptable maximum exposure levels for radon and 37 residences were above the acceptable maximum exposure level for radon.

91 day samples: There were 32 residences that were sampled and 23 residences were above the acceptable maximum exposure level for radon.

Final QA/QC check on all data and final report preparation, the estimated time of submittal is the Fall of 2011. The goal of EPA is to notify the residence of Phase II indoor and risk summary results based on Phase I, Phase II and Radon assessments and in addition notify the Pueblo of Laguna Environmental Department and appropriate Staff Officers of results from special interest areas.

In Summary;

- EPA is in the process of developing mitigation options and discuss with Governor, Council and Residents
  - Homes that exceed acceptable exposure rates in soil: (53)
    - **excavation/disposal/backfill/response related damages**
  - Homes that exceed acceptable radon exposure levels: (23)
    - **Installation of radon abatement system**
    - **Resident will be responsible for the cost of electricity to operate (est. $5-7 per month)**
  - Homes that need to be demolished due to contaminated structural materials: (1)
    - **Replace with functionally equivalent modular home that meets applicable building codes**
      OR
    - **Cash out settlement with the structure owner**
  - Repatriation of radiation waste from Pueblo of Laguna back to the Jackpile Mine disposal area
  - Implement the mitigation procedures

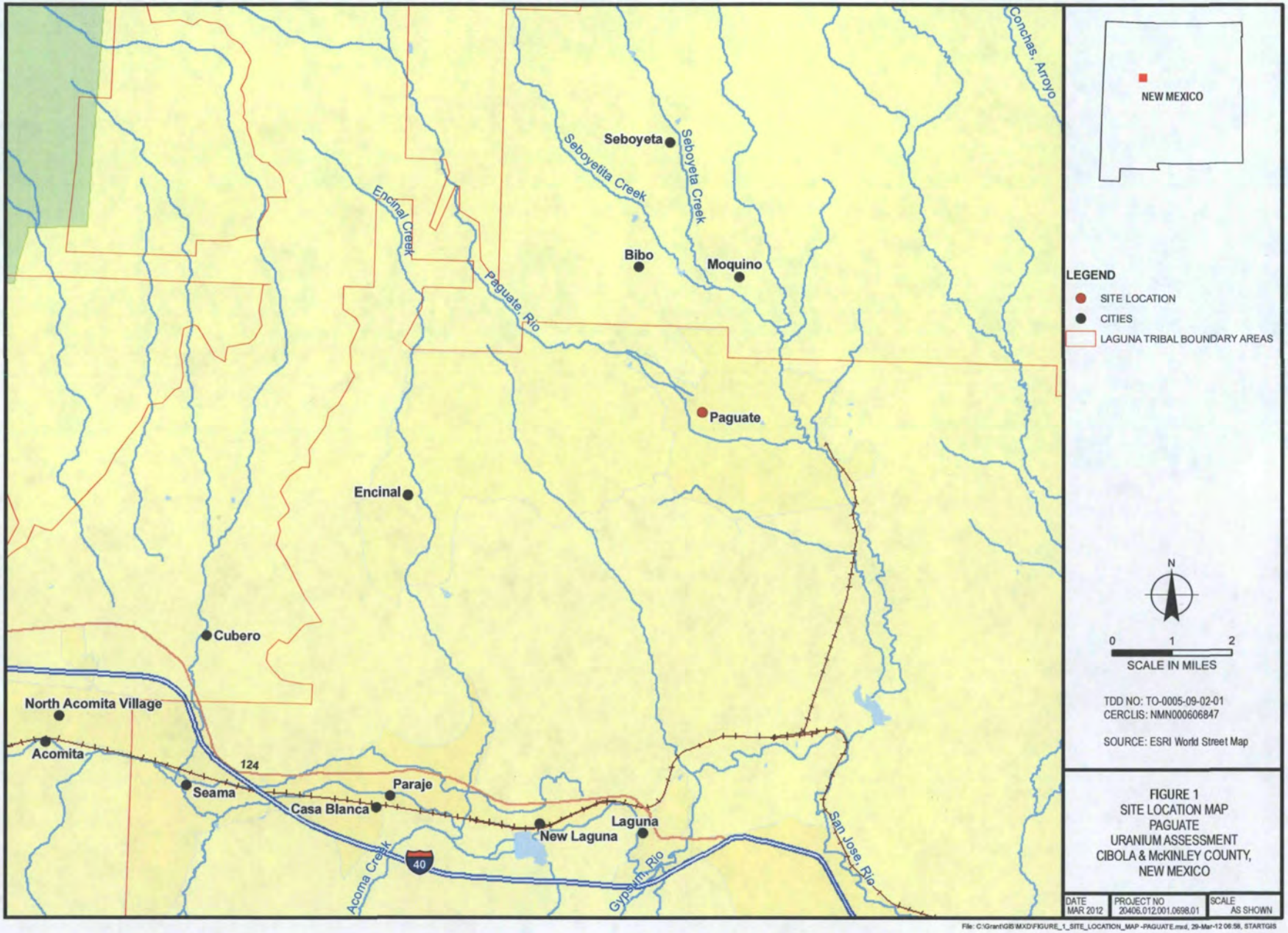
After some discussion the following issues/concerns were raised by Council;

- It was suggested that the Mitigation Plan refer to those particular homes that high exceeded the acceptable exposure rates in soil and radon exposure levels. It was stated that some home owners didn't want to participate in the survey but it was recommended by Council that the community have a second chance to take part.
- Council agreed that more information and education needs to be given to the community, village meetings is one resource of disseminating the information and the local new paper is another means of communication to the general public.
- Some Council members were concerned of how the waste was going to be disposed? Mr. Zehner stated that excavation/disposal/ and backfill.
- The responsible party is the Bureau of Indian Affairs, the Department of Interior doesn't want to pay for the ground water survey.

Council Action:
Council voted 18 in favor 0 opposed to request another survey for the general public who weren't able to participated in the first survey, secondly to repatriate of radiation waste from the Pueblo of Laguna back to the Jackpile mine, **this concluded Item # 2.**

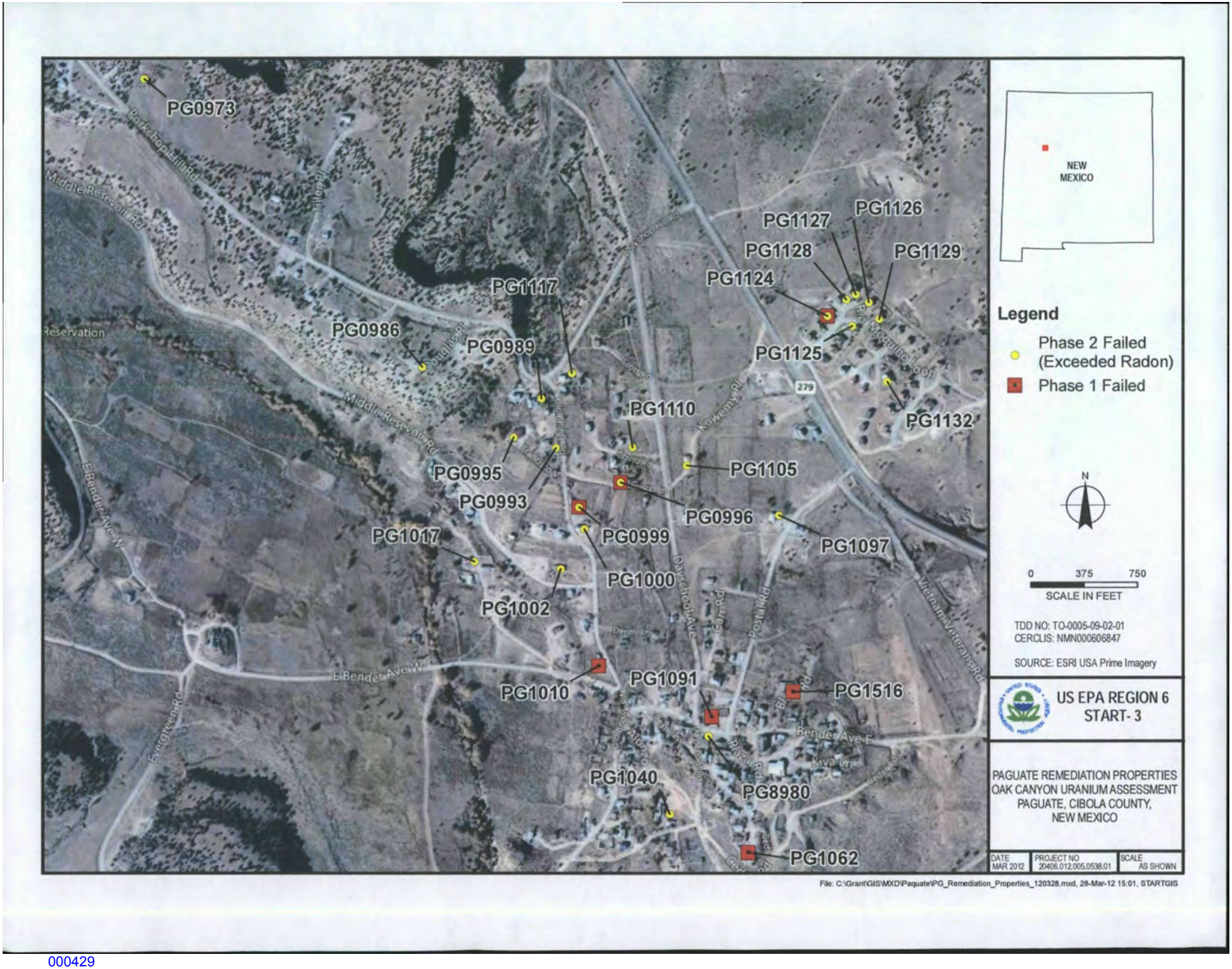
Attachment 3

Site Location Map


Conchas, Arroyo
Seboyeta
Seboyetita Creek
Seboyeta Creek
Encinal Creek
Paguate Rio
Bibo
Moquino
Paguate
Encinal
Cubero
North Acomita Village
Acomita
124
Seama
Paraje
Casa Blanca
New Laguna
Laguna
40
Acoma Creek
Gypsum Rio
San Jose Rio
NEW MEXICO
LEGEND
SITE LOCATION
CITIES
LAGUNA TRIBAL BOUNDARY AREAS
N
0 1 2
SCALE IN MILES
TDD NO: TO-0005-09-02-01
CERCLIS: NMN000606847
SOURCE: ESRI World Street Map
FIGURE 1
SITE LOCATION MAP
PAGUATE
URANIUM ASSESSMENT
CIBOLA & McKINLEY COUNTY,
NEW MEXICO
DATE MAR 2012
PROJECT NO 20406.012.001.0698.01
SCALE AS SHOWN
File: C:\Grant\GIS\MXD\FIGURE_1_SITE_LOCATION_MAP -PAGUATE.mxd, 29-Mar-12 06:58, STARTGIS

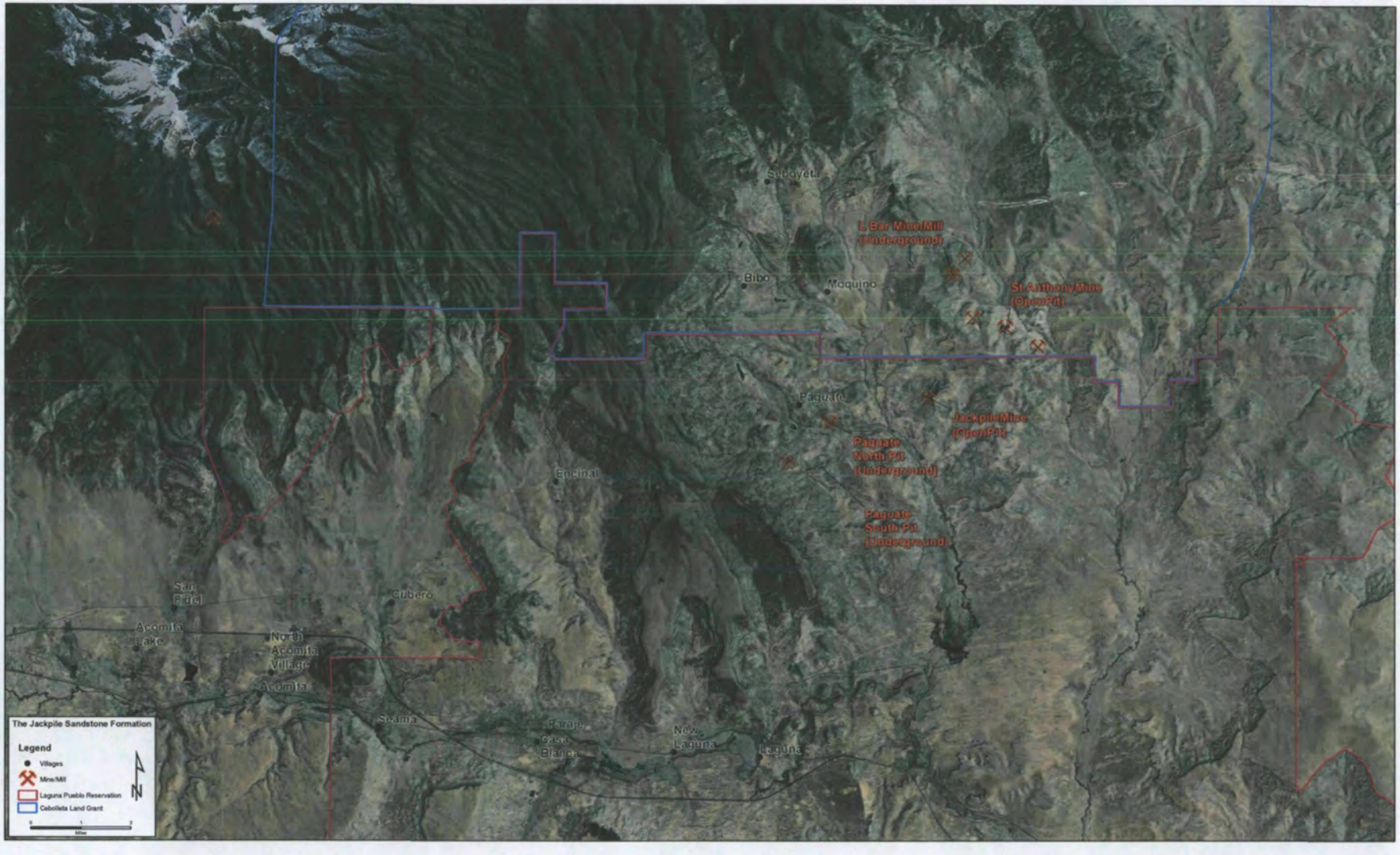
Attachment 4

Site Sketch Map


PG0973
PG1127
PG1126
PG1128
PG1129
PG1124
PG1117
PG0986
PG0989
PG1125
PG1110
PG1132
PG0995
PG1105
PG0993
PG0996
PG0999
PG1097
PG1017
PG1000
PG1002
PG1010
PG1091
PG1516
PG1040
PG8980
PG1062
Middle Reservoir Rd
Porkchop Hill Rd
Douglas Rd
Middle Reservoir Rd
E Bender Ave W
Everglades Rd
Bender Ave E
Portal Rd
Vietnam Veterans Rd
Kowemy Rd
279
NEW MEXICO
Legend
Phase 2 Failed (Exceeded Radon)
Phase 1 Failed
N
0 375 750
SCALE IN FEET
TDD NO: TO-0005-09-02-01
CERCLIS: NMN000606847
SOURCE: ESRI USA Prime Imagery
US EPA REGION 6
START- 3
PAGUATE REMEDIATION PROPERTIES
OAK CANYON URANIUM ASSESSMENT
PAGUATE, CIBOLA COUNTY,
NEW MEXICO
DATE MAR 2012
PROJECT NO 20406.012.005.0538.01
SCALE AS SHOWN
File: C:\Grant\GIS\MXD\Paguate\PG_Remediation_Properties_120328.mxd, 28-Mar-12 15:01, STARTGIS

Attachment 5

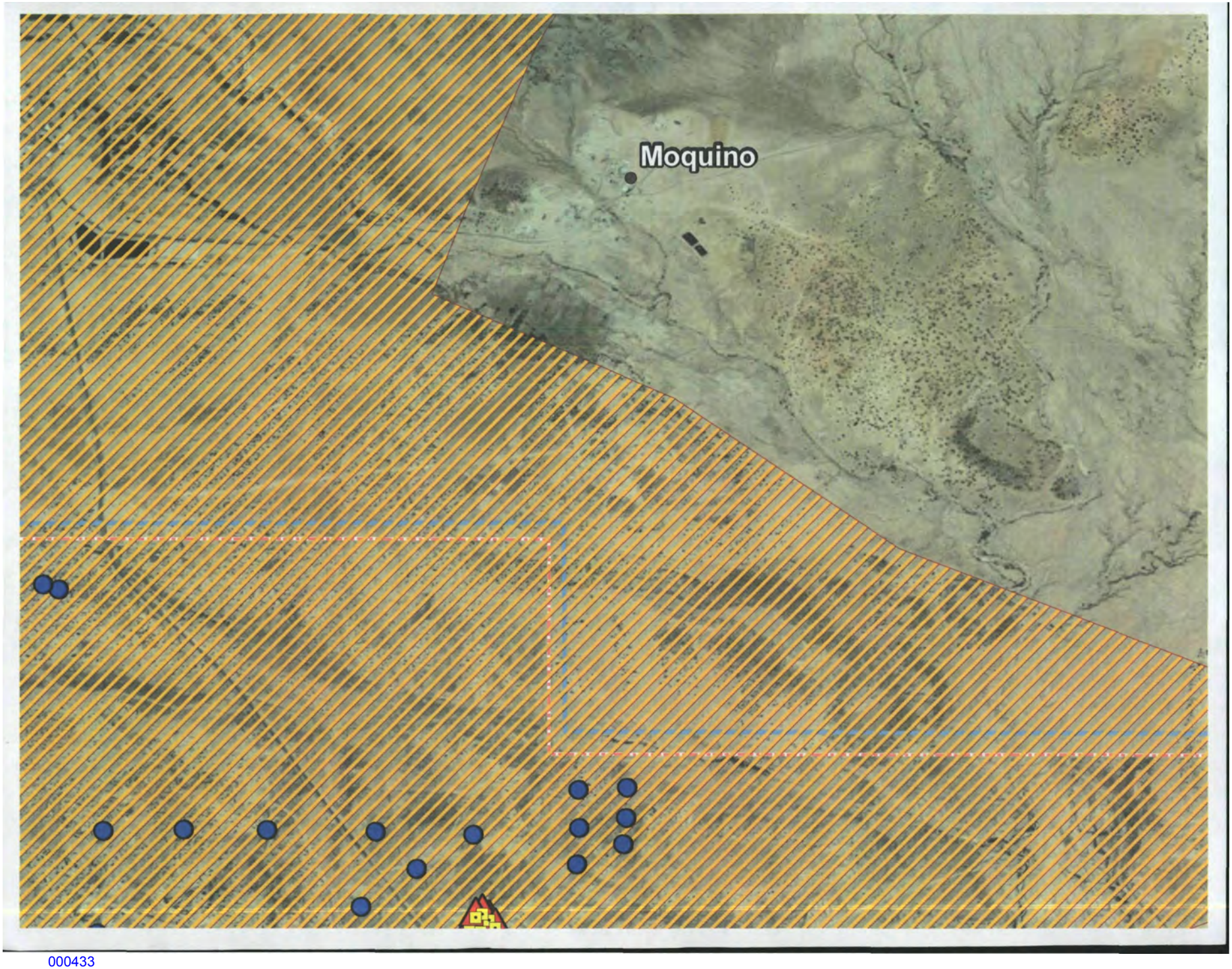
Laguna Sub-District Historic Mine Location



File: C:\Grant\GIS\MXD\JACKPILE SANDSTONE.mxd, 10-Nov-11 12:09, STARTGIS

Attachment 6

Jackpile Sandstone Distribution in Laguna Sub-District


Moquino

Attachment 7

Interim Status Report, Paguate Removal Assessment, September 2, 2011

Weston Solutions, Inc.
4324 S. Sherwood Forest Blvd., Ste. B100
Baton Rouge, LA 70816
225-297-5403 • Fax 225-293-8339
www.WestonSolutions.com

December 14, 2011

Mr. Warren Zehner
On-Scene Coordinator, Region 6
U.S. Environmental Protection Agency
10625 Fallstone Road
Houston, TX 77099

Re: **Interim Status Report for Laguna Pueblo (Paguate Only) Assessment**
TDD: TO-0005-10-03-01
Work Order No.: 20406.012/016.005.0538.01

Mr. Zehner:

Please find attached an Interim Status Report for Phase 1 and Phase 2 Removal Assessment activities conducted at residential, public, agricultural and cultural properties in the village of Paguate on the Laguna Pueblo in 2010-2011. The properties were assessed as part of the Oak Canyon Structures Assessment project near Grants, New Mexico and were performed under the above-referenced TDD. The interim report is a segment of the Final Report under same TDD that will be forthcoming at a later date.

Sincerely,

Robert Sherman

Robert Sherman
EPA Region 6, START-3 Project Manager

INTERIM STATUS REPORT
OAK CANYON REMOVAL ASSESSMENT
(VILLAGE OF PAGUATE)
SSID: A6AH

December 14, 2011

Weston Work Order No.: 20406.012/016.005.0538.01

I. General Information

EPA Contract No.	EP-W-06-042
Task Order	0005
TDD No.	TO-0005-10-03-01
Project Location	Cibola County, near Grants, NM
Work Activity	Removal Assessment (RA)
EPA Work Assignment Manager	Warren Zehner/ Jon Rinehart
WESTON Site Manager	David Bordelon

II. Interim Status

The Pueblo of Laguna, located in Cibola County, consists of the villages of Encinal, Laguna, Mesita, Paguate, Paraje, and Seama. Only the village of Paguate will be addressed in this interim status report; the villages of Encinal, Laguna, Mesita, Paraje and Seama were addressed together in a separate interim status report. The village of Paguate (Latitude 35° 08' 17.54" N, Longitude 107° 23' 38.52" W) is located on State Highway 279 approximately 6.9 miles north of Interstate Highway 40 exit 114 (see Figure 1). Due to results of the EPA Airborne Spectral Photometric Environmental Collection Technology (ASPECT) survey flown in October 2009, which revealed elevated gamma readings from the Jackpile Uranium Mine located nearby on the Laguna Pueblo, EPA conducted 143 Phase 1 outdoor assessments of residential properties, one public park, two cultural properties, one public elementary school and one agricultural field in Paguate as part of the Oak Canyon Uranium assessment project. Also, short-term (7-day) radon sampling was conducted as part of a Phase 2 indoor assessment on all the above properties (excluding the public elementary school) where a structure was present and access was provided. Based on Phase 1 outdoor assessment and radon sampling results, EPA then conducted 42 complete Phase 2 indoor assessments of residential properties in Paguate. EPA obtained a signed Access Agreement from each property owner prior to commencement of work on the subject properties.

Phase 1 Outdoor Assessments

The Phase 1 Outdoor Assessments consisted of:

a) a walking, ground-level gamma scan (2-3 feet per second; 15 inches above ground surface) of residential soils utilizing a Model 44-10 2"x2" NaI probe attached to a Model 2210 count- meter, a laptop computer and a global positioning system (together referred to as the Rapid Assessment Tool [RAT] system) all mounted in a modified baby buggy,

b) the collection of 20 stationary, 1-minute gamma measurements uniformly spaced throughout the assessment area utilizing the RAT system,

c) the collection of grab, 'hot spot,' surface, soil samples (including 10 percent duplicate samples) for laboratory analysis of Radium-226 where gamma scan readings exceeded the screening level (the derived concentration guideline level [DCGL]) of 3,648 counts per minute (cpm) above background,

d) the collection of stationary, 1-minute gamma measurements at the 'hot spot' surface soil sample locations utilizing the RAT system,

e) the procurement of a residential information sheet detailing residents' work relationship with local uranium mines and mills, structural elements of the residence and other buildings, and consumption of home-grown produce, and

f) the collection of two 10-point, composite, surface soil samples (from the 20 stationary, 1-minute gamma measurement locations) for analysis of elemental Uranium (non-radiological/ non-carcinogenic).

Only those parts of yards that were used by residents or public users on a regular basis, up to a maximum 40,000 sq. ft. area, were assessed.

EPA calculated property-specific DCGLs for three residential properties in Paguate (PG0949, PG0952, PG1034 [see Table 1 footnotes for specifics]) due to higher consumption of home-grown produce than the project default value. See Appendix A for the DCGL re-calculations.

EPA calculated an agricultural field-specific DCGL of 1.44 pCi/g for property PG9999, assuming the consumption by one person of 160 kilograms per year (kg/yr) of produce, direct exposure to the agricultural field soils for 40 hours per week for 7 months per year on a 0.9 hectare (2.22 acres) plot, and irrigation. See Appendix B for the Residual Radiation (RESRAD)-calculated output for PG9999.

After initial Phase 1 Outdoor Assessments, the Pueblo of Laguna removed petrified wood artifacts from 5 properties (PG0996, PG1010, PG1020, PG1034, and PG1516). These pieces of petrified wood appeared to be the cause of or contributors to the elevated gamma measurements as detected by the RAT system. Subsequently, EPA conducted a second Phase 1 Outdoor Assessment at each of the properties. The results of the second Phase 1 Assessment are presented in this report.

Additionally, EPA conducted an extended Phase 1 Assessment on property PG1516 subsequent to the original assessment that included additional soil sampling at six-inch depths.

Each assessed property was subjected subsequently to up to four statistical tests, in general accordance with Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) guidelines (EPA is not required to adhere strictly to MARSSIM), to determine if the property exceeded the DCGL (3,648 cpm or 2.5 pico Curies per gram (pCi/g) above background) and warranted a Phase 2 Indoor Assessment. One background location in Paguate was chosen for comparison to individual property results. The background assessment included the collection of 20 stationary, 1-minute gamma measurements uniformly spaced throughout the assessment area utilizing the RAT system; and the collection of 20 five-minute, gamma measurements utilizing a Pressurized Ionization Chamber (PIC) and 20 grab, surface soil samples for laboratory analysis of Radium-226 at the same 20 locations. See Table 1 for a summary of all Phase 1 Assessment and statistical results, including background results. Graphic illustrations of walking, gamma

scan results (RAT Maps) for each property are presented in Appendix C.

Seven properties, all residential, in Paguate (shaded in Table 1) exhibited Phase 1 Assessment results that **exceeded** the DCGL. The seven properties had the following results:

- The Paguate walking, gamma scan averages ranged from 7,238 – 10,852 cpm (0 – 1,818 cpm above background). The highest standard deviation measured 7,278 cpm.

- The Paguate stationary, 1-minute gamma measurement averages ranged from 7,654 – 10,887 cpm (0 – 1,853 cpm above background). The highest standard deviation measured 8,299 cpm.

- The Paguate 'hot spot,' surface, soil sample laboratory results for Radium-226 ranged from 0.50-147.00 pCi/g (0.00 - 146.13 pCi/g above background).

  The associated stationary, 1-minute gamma measurements taken at 'hot spot' sample locations ranged from 6,947 – 68,777 cpm (0 – 59,743 cpm above background).

- MARSSIM Test 1 (the difference between the lowest background, stationary, 1-minute gamma measurement and the highest property gamma scan reading must be less than the DCGL for a property to PASS and negate a need for additional MARSSIM Tests 2-4):
  All 7 properties FAILed.

  MARSSIM Test 2 (the difference between the property gamma scan average and the background; and the property's 20 stationary, 1-minute gamma measurements average and the background must both be less than the DCGL for a property to PASS. Only a FAIL result negates a need for additional MARSSIM Tests 3-4):
  All 7 properties PASSed.

  MARSSIM Test 3 (Wilcoxon Rank Sum; a definition is supplied as Appendix D) Only a FAIL result negates a need for additional MARSSIM Test 4:
  All 7 properties PASSed.

  MARSSIM Test 4 (Elevated Measurement Comparison/ Unity Rule; conducted only if concentrated, elevated 'hot spot(s)' are present on a property. The Unity ratio represents the fraction of the DCGL above background that a property's contamination exhibits, and must be less than 1.0 for a property to PASS. Note that in cases where the Unity ratio is greater than 1.0, this may not reflect all 'hot spot' contamination present on a property. Additional 'hot spot' areas were not included once the Unity ratio reached 1.0 or higher):
  All 7 properties FAILed.

One-hundred thirty-six residential properties, one public park, one public school, two cultural properties, and one agricultural field in Paguate (all non-shaded in Table 1) exhibited Phase 1 Assessment results that **did not exceed** the DCGL. These properties had the following results:

- Paguate walking, gamma scan results ranged from 6,147 – 11,038 cpm (0 – 2,004 cpm above background). The highest standard deviation measured 1,303 cpm.

- Paguate stationary, 1-minute gamma measurements ranged from 4,492 – 11,260 cpm (0 – 2,226 cpm above background). The highest standard deviation measured 2010 cpm.

- Paguate 'hot spot,' surface, soil sample laboratory results for Radium-226 ranged from 0.50 – 1.67 pCi/g (0.00 – 0.80 pCi/g above background). One-hundred twenty-six properties did not require collection of 'hot spot' soil samples.

  Associated, stationary 1-minute gamma measurements taken at 'hot spot' sample locations ranged from 6,759 – 23,241 cpm (0 – 14,207 cpm above background).

- MARSSIM Test 1 (the difference between the lowest background, stationary, 1-minute gamma measurement and the highest property gamma scan reading must be less than the DCGL for a property to PASS and negate a need for additional MARSSIM Tests 2-4): *101 properties PASSed.*

  MARSSIM Test 2 (the difference between the property gamma scan average and the background; and the property's 20 stationary, 1-minute gamma measurements average and the background must both be less than the DCGL for property to PASS): *All properties requiring the test PASSed.*

  MARSSIM Test 3 (Wilcoxon Rank Sum; a definition is supplied as Appendix D): *All properties requiring the test PASSed.*

  MARSSIM Test 4 (Elevated Measurement Comparison/ Unity Rule; Test 4 was conducted only if concentrated, elevated 'hot spot(s)' were present on a property. The Unity ratio represents the fraction of the DCGL above background that a property's contamination exhibits): *118 Paguate properties did not require Test 4; the remaining 23 properties PASSed.* The Unity Rule ratio on these 23 properties ranged from 0.02-0.97.

All 148 properties in the village of Paguate exhibited elemental Uranium results significantly less than the EPA removal action-level of 230 mg/kg (parts per million (ppm)). Prior to September 2010, the composite surface samples were analyzed using a hand-held x-ray fluorescence (XRF) analyzer, with 10 percent of these sent for laboratory analysis. Subsequently, all samples were sent for laboratory analysis in lieu of XRF analysis. Ten percent of samples sent for laboratory analysis had a duplicate sample collected and also sent for laboratory analysis. Laboratory results are listed in red in Table 1.

Eleven property owners in the village of Paguate stated on a residential information sheet that material from local uranium mines and mills was used or possibly used to construct their home or that they stored or possibly stored such materials inside their home. EPA was unable to collect this information from 35 owners or from the stakeholders of the two cultural properties.

Phase 2 Indoor Assessments

EPA conducted Phase 2 Indoor Assessments according to three qualifications. First, a partial Phase 2 Indoor Assessment (short-term radon sampling only (see next paragraph)) was conducted on all properties, excluding the public park (PG8975) and the agricultural field (PG9999) where no inhabitable structures exist and the public elementary school (PG8960). A complete Phase 2 Indoor Assessment was then conducted on properties where:

a) Phase I Assessment results exhibited residual gamma radioactivity in surface soils

greater than the DCGL above background, and/or

b) where short-term radon results equaled or exceeded the EPA and Center for Disease Control (CDC)-acceptable exposure level of 4.0 pico Curies per liter (pCi/l), and/or

c) where material from local uranium mines and mills was either used to construct a home or was stored in the home.

Forty-two complete Phase 2 Assessments were conducted.

One homeowner (PG1062), whose Phase 1 Assessment results exceeded the DCGL, declined an offer by the EPA to have both short-term radon and a complete Phase 2 Indoor Assessment conducted. Two homeowners whose short-term radon results equaled or exceeded 4.0 pCi/L either declined an offer by EPA (PG1059) or were unable to be scheduled (PG8961) for long-term radon sampling and a complete Phase 2 Indoor Assessment. Three properties whose short-term radon results equaled or exceeded 4.0 pCi/L either declined an offer by EPA or were unable to be scheduled for long-term radon sampling but received the additional aspects of a Phase 2 Indoor Assessment (see below). Eight homeowners (in addition to PG1062) declined an offer by EPA to have any radon sampling conducted, while five homeowners (including one property [PG1144] whose original short-term radon results were invalid) and one cultural property stakeholder (PG9001) were unable to be scheduled by EPA for any radon sampling. Two homeowners (PG1138, PG1504) who stated that material from a local uranium mine or mill was either used or possibly used to construct their home or that they stored or possibly stored such material inside their home were unable to be scheduled by EPA for a complete Phase 2 Indoor Assessment.

Two properties (PG1138, PG1504), whose owners stated that uranium mine material may have been used to partially construct their homes and who were otherwise ineligible for a complete Phase 2 Indoor Assessment, were unable to be scheduled for a complete Phase 2 Indoor Assessment by EPA. EPA conducted a complete Phase 2 Indoor Assessment at one property (PG8982) at the request of the homeowner, who was otherwise ineligible.

The complete Phase 2 Indoor Assessments consisted of:

a) the collection of two short-term (6-day minimum; 7-day maximum) radon gas samples, utilizing activated charcoal adsorbent canisters, in two separate locations of each residence for laboratory analysis of Radon-222 (10 percent of sample canister locations had a third, duplicate canister placed in the home),

b) the collection of two long-term (91-day minimum; no maximum) radon gas samples for laboratory analysis of Radon-222, utilizing track etch detectors in the two short-term detector locations of each residence where short-term Radon-222 results exceeded 4 pCi/l (10 percent of the sample detector locations had a third, duplicate detector placed in the home),

c) the collection of 5-minute, stationary gamma measurements utilizing a PIC in the center of a minimum of the 2 most-often occupied rooms of a residence,

d) a walking, gamma scan of the floor and walls of each room in a residence utilizing a Model 44-10 2"x2" NaI probe attached to a Model 2210 count- meter,

e) the collection of wipe samples for 'alpha tray counter' analysis in locations where gamma scan readings exceeded a residence-specific screening level (quick, 'whole-house' scan average plus 1,900 cpm) (no wipe-sample duplicates were collected), and

f) the collection of additional 5-minute stationary gamma measurements utilizing a PIC in the center of each room where wipe sample(s) were collected.

EPA conducted an extended Phase 2 Assessment on property PG1516 (utilizing the Model 44-10 2"x2" NaI probe attached to a Model 2210 count- meter) subsequent to the original Phase 2 Assessment. EPA determined that elevated readings were emanating from a material located between the home's ceiling planks and the sheet-metal roof.

Each assessed property then had an annual *indoor gamma dose above background* calculated (conservatively using the highest room average as the entire residential average) assuming default values of 12 hours per day and 365 days per year spent indoors. The annual indoor gamma dose was converted from milli-Roentgens per year (mR/yr) to milli-Roentgens equivalent-in-man per year (mrem/yr) [1.5 R = 1 rem, determined by MicroShield Analysis provided as Appendix E] to determine if the indoor assessment results exceeded the EPA action-level Total Effective Dose Equivalent (TEDE) above background of 15 mrem/yr. The same background location in Paguate that was utilized for Phase 1 assessment results was used for comparison to the Phase 2 results. See Table 2 for a summary of all Phase 2 Assessment results.

Thirty-five properties (shaded in Table 2) exhibited short-term radon results from at least one of the two canisters placed in each home that **met or exceeded** 4.0 pCi/l. The 35 properties had the following results:

- Short-term radon concentrations ranged from 4.0 – 15.7 pCi/l.

Twenty-three properties (shaded in Table 2) exhibited subsequent long-term radon results from at least one of the two detectors placed in each home that **met or exceeded** 4.0 pCi/l. Five properties that exhibited short-term radon results from at least one of the two canisters placed in each home that **met or exceeded** 4.0 pCi/l were either unable to be scheduled for long-term radon sampling, or had property owners who declined EPA's offer.

- Long-term radon concentrations ranged from 4.1 – 14.7 pCi/l.

Zero properties exhibited an annual indoor TEDE above background that **met or exceeded** 15mrem/yr.

- TEDEs ranged from 0.0 – 8.8 mrem/yr.

Seventeen properties exhibited walking gamma scan results that **exceeded** the residence-specific screening level and required surface wipe samples to be obtained. The 17 properties had the following results:

- Walking gamma scans of all floors and walls ranged from 4,400 – 30,000 cpm.

Zero properties exhibited subsequent wipe sample results that **met or exceeded** the EPA action-level of 20 disintegrations per minute (dpm).

One property, PG1516 (shaded in Table 2), exhibited walking-scan gamma results (maximum 30,000 cpm) that **exceeded** a second EPA action-level of 3 times the corresponding background average.

Maps illustrating the locations of all assessed properties, color-coded to reflect exceedances of Phase 1, Phase 2 and long-term radon action-levels, are provided as Appendix F.

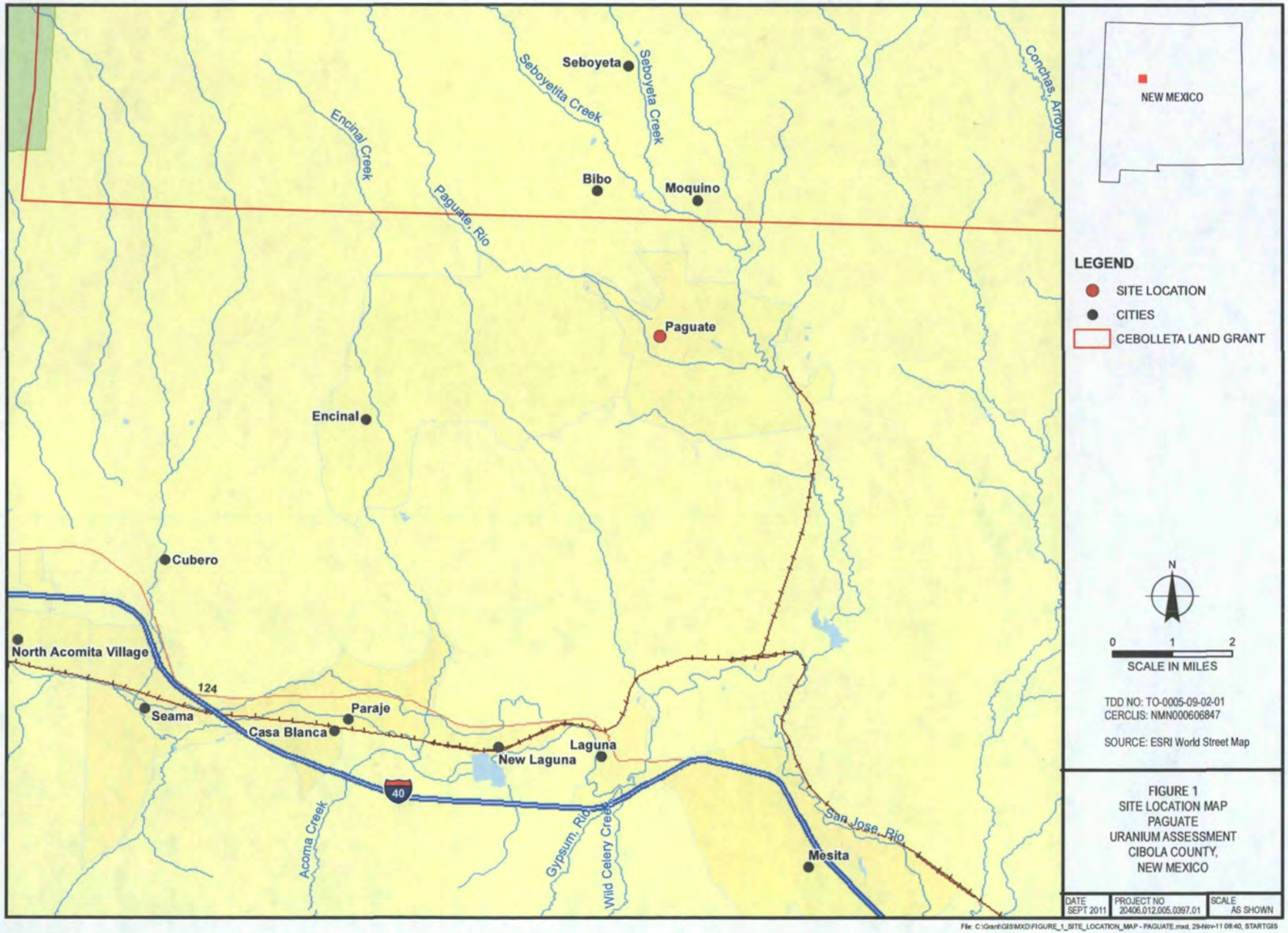

Seboyeta
Seboyetita Creek
Seboyeta Creek
Conchas Arroyo
Encinal Creek
Paguate, Rio
Bibo
Moquino
Paguate
Encinal
Cubero
North Acomita Village
124
Seama
Paraje
Casa Blanca
New Laguna
Laguna
40
Acoma Creek
Gypsum, Rio
Wild Celery Creek
San Jose, Rio
Mesita
NEW MEXICO
LEGEND
SITE LOCATION
CITIES
CEBOLLETA LAND GRANT
N
0 1 2
SCALE IN MILES
TDD NO: TO-0005-09-02-01
CERCLIS: NMN000606847
SOURCE: ESRI World Street Map
FIGURE 1
SITE LOCATION MAP
PAGUATE
URANIUM ASSESSMENT
CIBOLA COUNTY,
NEW MEXICO
DATE SEPT 2011
PROJECT NO 20406.012.005.0397.01
SCALE AS SHOWN
File: C:\Grant\GIS\MXD\FIGURE_1_SITE_LOCATION_MAP - PAGUATE.mxd, 29-Nov-11 08:40, STARTGIS

TABLE 1
Summary of Phase 1 Field Screening, Laboratory Analytical Results and MARSSIM Statistical Tests for Paguate Village
Grants Mineral Belt Structures Assessment
Cibola County, New Mexico
May 2010 - October 2011

Property ID[1]	Residential Info. Sheet: Mine/Mill Mat'l Used to Build House or Is Present Indoors?[2]	Gamma Scan Avg. (CPM)	Highest Gamma Scan Measurement (CPM)	Standard Deviation: Gamma Scan (CPM)	20 One-Minute Stationary Measurements Avg. (CPM)	Highest One-Minute Stationary Measurement (CPM)	Standard Deviation: 20 One-Minute Stationary Measurements (CPM)	"Hot Spot' Surface Soil Sample Results [Radium-226] (pCi/g)[3]	'Hot Spot' Surface Soil Sample Location One-Minute Stationary Measurement (CPM)	MARSSIM Test 1	MARSSIM Test 2	MARSSIM Test 3	MARSSIM Test 4	Elemental Uranium (mg/kg)[5]
PG-BKGD	n/a	n/a	n/a	n/a	9,034 Avg. + DCGL = 12,682	8,606 (lowest)	126	0.87 (non-'hot') (Avg. of 20)	n/a	n/a	n/a	n/a	n/a	1.02 U/0.358 0.23
PG0234	No	6,147	9,692	731	6,197	7,353	156	n/a	n/a	PASS	n/a	n/a	n/a	9.4 9.0
PG0692	No	8,244	9,670	368	8,360	8,754	194	n/a	n/a	PASS	n/a	n/a	n/a	10.0 9.4
PG0945	No	8,166	10,701	667	8,277	8,753	199	n/a	n/a	PASS	n/a	n/a	n/a	9.0 9.8
PG0947	Possible	8,957	11,687	644	9,064	9,588	204	n/a	n/a	PASS	n/a	n/a	n/a	9.4 11.0
PG0948	No	8,437	11,404	736	8,280	9,037	217	n/a	n/a	PASS	n/a	n/a	n/a	9.0 9.8
PG0949[6]	No	9,619	13,163	626	9,028	10,002	220	0.98-1.36 (1 sample + 1 duplicate)	13,833	FAIL	PASS	PASS	0.22[4] (PASS)	9.8 0.408 9.2
PG0950	No	9,319	15,290	1,303	9,197	12,648	220	1.09-1.14 (1 sample + 1 duplicate)	13,523	FAIL	PASS	PASS	0.57 (PASS)	10.4 10.0
PG0951	No	9,113	12,691	671	9,031	10,154	222	n/a	n/a	FAIL	PASS	PASS	n/a	10.4 10.0
PG0952[6]	No	9,600	11,847	573	9,298	9,883	224	n/a	n/a	PASS	n/a	n/a	n/a	9.2 9.8
PG0953	No	8,608	11,437	682	9,780	10,346	235	n/a	n/a	PASS	n/a	n/a	n/a	9.6 8.8
PG0958	No	11,038	13,976	735	11,192	12,371	247	0.78-1.67 (4 samples)	10,673-11,501	FAIL	PASS	PASS	0.79 (PASS)	12.2 10.8
PG0959	Unable to procure information	10,043	12,979	734	10,219	11,127	253	0.97 (1 sample)	9,937	FAIL	PASS	PASS	n/a	13.8 0.264 11.2
PG0960	No	11,023	14,238	843	11,260	11,959	258	n/a	n/a	FAIL	PASS	PASS	0.92 (PASS)	10.4 10.2
PG0961	No	10,686	14,018	938	10,264	11,342	260	n/a	n/a	FAIL	PASS	PASS	0.97 (PASS)	10.4 11.0
PG0962	No	9,798	15,605	1,034	9,499	10,170	261	n/a	n/a	FAIL	PASS	PASS	0.73 (PASS)	10.4 10.0
PG0964	Possible	9,332	11,952	585	9,397	10,562	292	n/a	n/a	PASS	n/a	n/a	n/a	11.0 11.6
PG0968	No	7,500	10,301	801	7,464	8,302	292	n/a	n/a	PASS	n/a	n/a	n/a	9.8 10.4
PG0971	No	7,629	13,024	1,020	7,455	8,214	299	n/a	n/a	FAIL	PASS	PASS	0.02 (PASS)	9.8 9.2
PG0973	No	9,173	11,113	547	9,027	10,144	302	n/a	n/a	PASS	n/a	n/a	n/a	10.2 9.6
PG0974	No	8,851	11,639	771	8,989	10,073	306	n/a	n/a	PASS	n/a	n/a	n/a	10.0 10.8
PG0975	No	8,528	12,695	955	8,640	9,604	306	n/a	n/a	FAIL	PASS	PASS	n/a	9.2 9.2

TABLE 1
Summary of Phase 1 Field Screening, Laboratory Analytical Results and MARSSIM Statistical Tests for Paguate Village
Grants Mineral Belt Structures Assessment
Cibola County, New Mexico
May 2010 - October 2011
(Continued)

Property ID[1]	Residential Info. Sheet: Mine/Mill Mat'l Used to Build House or Is Present Indoors?[2]	Gamma Scan Avg. (CPM)	Highest Gamma Scan Measurement (CPM)	Standard Deviation: Gamma Scan (CPM)	20 One-Minute Stationary Measurements Avg. (CPM)	Highest One-Minute Stationary Measurement (CPM)	Standard Deviation: 20 One-Minute Stationary Measurements (CPM)	"Hot Spot" Surface Soil Sample Results [Radium-226] (pCi/g)[3]	'Hot Spot' Surface Soil Sample Location One-Minute Stationary Measurement (CPM)	MARSSIM Test 1	MARSSIM Test 2	MARSSIM Test 3	MARSSIM Test 4	Elemental Uranium (mg/kg)[5]
PG0976	No	7,449	13,325	1,090	7,297	8,337	316	n/a	n/a	FAIL	PASS	PASS	n/a	9.6 10.0
PG0977	No	8,218	12,498	951	8,489	9,335	318	n/a	n/a	FAIL	PASS	PASS	n/a	9.0 0.338 9.4
PG0978	Unable to procure information	7,704	14,253	1,095	7,467	9,093	318	0.5 (1 sample)	6,759	FAIL	PASS	PASS	0.20[4] (PASS)	9.4 9.6
PG0980	No	8,785	11,338	574	8,958	9,663	319	n/a	n/a	PASS	n/a	n/a	n/a	10.6 9.8
PG0981	No	7,515	11,929	999	7,512	8,577	323	n/a	n/a	PASS	n/a	n/a	n/a	9.4 9.0
PG0982	Unable to procure information	6,441	10,938	854	6,544	7,435	327	n/a	n/a	PASS	n/a	n/a	n/a	8.8 8.6
PG0983	No	7,821	12,389	931	7,743	8,165	330	n/a	n/a	FAIL	PASS	PASS	n/a	9.4 8.2
PG0985	Unable to procure information	7,768	12,281	985	7,693	8,632	331	n/a	n/a	FAIL	PASS	PASS	n/a	9.4 8.4
PG0986	No	7,745	12,536	1,080	7,401	8,399	341	n/a	n/a	FAIL	PASS	PASS	n/a	9.4 8.8 0.282
PG0987	No	7,921	10,760	627	7,982	8,481	343	n/a	n/a	PASS	n/a	n/a	n/a	9.0 8.8
PG0988	No	7,085	10,494	764	7,136	8,393	346	n/a	n/a	PASS	n/a	n/a	n/a	8.2 8.4
PG0989	Yes	7,223	11,181	724	7,178	7,628	347	n/a	n/a	PASS	n/a	n/a	n/a	8.8 8.4
PG0990	Unable to procure information	7,359	10,053	696	7,312	7,901	352	n/a	n/a	PASS	n/a	n/a	n/a	9.0 0.356 9.0
PG0991	No	7,548	11,738	679	7,930	9,346	357	n/a	n/a	PASS	n/a	n/a	n/a	9.0 9.4
PG0992	No	7,477	9,841	687	7,278	8,226	359	n/a	n/a	PASS	n/a	n/a	n/a	9.6 9.0
PG0993	Yes	7,428	11,365	674	7,305	7,637	365	n/a	n/a	PASS	n/a	n/a	n/a	10.2 0.383 8.8
PG0995	No	7,671	10,230	717	7,539	8,353	367	n/a	n/a	PASS	n/a	n/a	n/a	8.8 9.4
PG0996[7]	Unable to procure information	10,852	164,624	7,278	9,491	24,299	371	51.0-57.9 (2 samples)	39,779-42,099	FAIL	PASS	PASS	15.37 (FAIL)	9.6 9.2
PG0998	No	9,043	15,579	883	9,086	9,576	371	n/a	n/a	FAIL	PASS	PASS	0.17 (PASS)	10.2 9.6
PG0999	No	8,722	42,266	2,347	8,371	9,169	377	0.67-8.15 (5 samples + 1 duplicate)	8,107-31,690	FAIL	PASS	PASS	1.38[4] (FAIL)	9.0 9.0

TABLE 1
Summary of Phase 1 Field Screening, Laboratory Analytical Results and MARSSIM Statistical Tests for Paguate Village
Grants Mineral Belt Structures Assessment
Cibola County, New Mexico
May 2010 - October 2011
(Continued)

Property ID[1]	Residential Info. Sheet: Mine/Mill Mat'l Used to Build House or Is Present Indoors?[2]	Gamma Scan Avg. (CPM)	Highest Gamma Scan Measurement (CPM)	Standard Deviation: Gamma Scan (CPM)	20 One-Minute Stationary Measurements Avg. (CPM)	Highest One-Minute Stationary Measurement (CPM)	Standard Deviation: 20 One-Minute Stationary Measurements (CPM)	"Hot Spot' Surface Soil Sample Results [Radium-226] (pCi/g)[3]	'Hot Spot' Surface Soil Sample Location One-Minute Stationary Measurement (CPM)	MARSSIM Test 1	MARSSIM Test 2	MARSSIM Test 3	MARSSIM Test 4	Elemental Uranium (mg/kg)[5]
PG1000	No	8,352	10,578	522	8,328	8,855	384	n/a	n/a	PASS	n/a	n/a	n/a	9.2 9.0
PG1002	Unable to procure information	8,171	10,791	656	7,783	8,587	384	n/a	n/a	PASS	n/a	n/a	n/a	9.4 10.8
PG1007	No	9,222	11,531	577	9,195	10,148	385	n/a	n/a	PASS	n/a	n/a	n/a	9.4 9.4
PG1008	No	8,581	11,617	794	8,388	9,360	386	n/a	n/a	PASS	n/a	n/a	n/a	10.4 10.0
PG1010[7]	No	10,452	71,748	6,092	10,781	44,988	389	18.8-147.00 (4 samples)	17,054-49,673	FAIL	PASS	PASS	27.66 (FAIL)	9.4 9.4 2.96
PG1013	No	8,522	11,087	773	8,433	9,485	391	no information	no information	PASS	n/a	n/a	n/a	10.8 10.4
PG1014	No	8,574	11,410	871	8,460	9,226	399	n/a	n/a	PASS	n/a	n/a	n/a	9.6 9.4
PG1015	No	8,584	11,697	715	8,587	9,466	399	n/a	n/a	PASS	n/a	n/a	n/a	9.2 9.6
PG1016	No	8,546	11,137	658	8,858	9,916	405	n/a	n/a	PASS	n/a	n/a	n/a	15.4 0.328 10.2
PG1017	No	8,937	13,069	811	8,813	9,555	407	1.07 (1 sample)	12,802	FAIL	PASS	PASS	0.07[4] (PASS)	9.2 9.4
PG1018	Unable to procure information	8,343	13,276	644	8,285	8,646	410	n/a	n/a	FAIL	PASS	PASS	0.02[4] (PASS)	10.0 0.412 9.2
PG1019	Unable to procure information	8,809	12,001	830	8,909	9,456	412	n/a	n/a	PASS	n/a	n/a	n/a	9.6 9.6
PG1020[7]	Unable to procure information	8,879	12,090	699	8,806	9,765	412	n/a	n/a	PASS	n/a	n/a	n/a	9.2, 9.4 (Apr 8, 10) 9.4, 10.2 (June 16, 10)
PG1025	No	7,540	10,960	1,030	7,715	9,621	421	n/a	n/a	PASS	n/a	n/a	n/a	9.0 9.2
PG1028	Yes (doorstep)	8,720	11,459	783	8,312	9,034	425	n/a	n/a	PASS	n/a	n/a	n/a	10.4 10.4
PG1029	No	8,482	12,332	839	8,461	9,762	428	n/a	n/a	FAIL	PASS	PASS	n/a	9.6 10.2
PG1030	No	9,083	14,083	903	9,057	10,356	428	0.71-1.09 (6 samples)	8,573-13,317	FAIL	PASS	PASS	0.05 (PASS)	9.0 9.0 0.484
PG1031	Unable to procure information	8,969	11,992	953	8,916	9,846	430	n/a	n/a	PASS	n/a	n/a	n/a	9.6 10.2
PG1034[6,7]	Possible	9,424	14,801	1,120	9,262	10,494	431	0.79 (1 sample)	9,982	FAIL	PASS	PASS	0.42 (PASS)	9.2 0.741, 9.4 (March 23, 10) 9.2, 9.6 (June 16,10)

TABLE 1
Summary of Phase 1 Field Screening, Laboratory Analytical Results and MARSSIM Statistical Tests for Paguate Village
Grants Mineral Belt Structures Assessment
Cibola County, New Mexico
May 2010 - October 2011
(Continued)

Property ID[1]	Residential Info. Sheet: Mine/Mill Mat'l Used to Build House or Is Present Indoors?[2]	Gamma Scan Avg. (CPM)	Highest Gamma Scan Measurement (CPM)	Standard Deviation: Gamma Scan (CPM)	20 One-Minute Stationary Measurements Avg. (CPM)	Highest One-Minute Stationary Measurement (CPM)	Standard Deviation: 20 One-Minute Stationary Measurements (CPM)	"Hot Spot' Surface Soil Sample Results [Radium-226] (pCi/g)[3]	'Hot Spot' Surface Soil Sample Location One-Minute Stationary Measurement (CPM)	MARSSIM Test 1	MARSSIM Test 2	MARSSIM Test 3	MARSSIM Test 4	Elemental Uranium (mg/kg)[5]
PG1038	No	8,606	11,621	655	8,564	9,236	433	n/a	n/a	PASS	n/a	n/a	n/a	9.2 9.6
PG1040	No	7,951	11,001	812	7,955	9,370	434	n/a	n/a	PASS	n/a	n/a	n/a	9.0 9.2
PG1041	No	8,080	10,458	768	8,101	8,629	435	n/a	n/a	PASS	n/a	n/a	n/a	9.0 8.6
PG1042	Unable to procure information	7,882	9,994	674	7,987	8,589	437	n/a	n/a	PASS	n/a	n/a	n/a	9.6 10.0
PG1044	No	7,323	10,917	936	7,370	8,964	442	n/a	n/a	PASS	n/a	n/a	n/a	9.8 0.364 8.8
PG1045	No	7,250	9,677	796	7,277	8,013	442	n/a	n/a	PASS	n/a	n/a	n/a	9.2 0.643 10.4
PG1053	No	7,148	10,696	835	7,102	8,283	443	n/a	n/a	PASS	n/a	n/a	n/a	9.0 9.4
PG1054	No	8,873	11,825	861	8,862	10,353	456	n/a	n/a	PASS	n/a	n/a	n/a	9.6 10.6
PG1056	No	8,384	11,047	721	8,271	9,123	458	n/a	n/a	PASS	n/a	n/a	n/a	14.2 0.401 9.6
PG1058	No	8,653	12,486	958	8,576	11,614	458	n/a	n/a	FAIL	PASS	PASS	n/a	9.6 9.0
PG1059	No	8,303	11,077	797	8,254	9,283	460	n/a	n/a	PASS	n/a	n/a	n/a	10.4 11.6
PG1060	No	8,047	10,806	801	8,361	9,750	461	n/a	n/a	PASS	n/a	n/a	n/a	9.0 11.4
PG1061	No	7,052	10,520	890	7,121	9,015	463	n/a	n/a	PASS	n/a	n/a	n/a	10.0 10.4 0.347
PG1062	Unable to procure information	7,238	49,048	2,049	7,654	8,633	463	0.50-14.1 (5 samples + 1 duplicate)	6,947-68,777	FAIL	PASS	PASS	1.39 (FAIL)	9.4 0.408 9.8
PG1063	No	6,843	10,771	845	7,115	8,390	469	n/a	n/a	PASS	n/a	n/a	n/a	9.0 10.2
PG1069	No	7,222	12,856	937	7,982	10,281	471	n/a	n/a	FAIL	PASS	PASS	0.03[4] (PASS)	11.4 8.4
PG1070	No	6,472	8,880	599	6,558	7,359	473	n/a	n/a	PASS	n/a	n/a	n/a	9.6 12.4
PG1071	No	7,070	10,339	662	7,213	8,243	473	n/a	n/a	PASS	n/a	n/a	n/a	9.0 9.0 0.459
PG1073	No	7,273	9,479	662	7,416	8,864	482	n/a	n/a	PASS	n/a	n/a	n/a	11.0 10.0
PG1079	No	7,174	11,996	766	7,225	8,274	484	n/a	n/a	PASS	n/a	n/a	n/a	9.0 0.461/0.443 9.0
PG1091	Unable to procure information	8,208	26,341	909	8,185	9,164	495	0.53-0.90 (5 samples)	7,844-41,126	FAIL	PASS	PASS	1.67 (FAIL)	9.4 9.6 0.489

TABLE 1
Summary of Phase 1 Field Screening, Laboratory Analytical Results and MARSSIM Statistical Tests for Paguate Village
Grants Mineral Belt Structures Assessment
Cibola County, New Mexico
May 2010 - October 2011
(Continued)

Property ID[1]	Residential Info. Sheet: Mine/Mill Mat'l Used to Build House or Is Present Indoors?[2]	Gamma Scan Avg. (CPM)	Highest Gamma Scan Measurement (CPM)	Standard Deviation: Gamma Scan (CPM)	20 One-Minute Stationary Measurements Avg. (CPM)	Highest One-Minute Stationary Measurement (CPM)	Standard Deviation: 20 One-Minute Stationary Measurements (CPM)	"Hot Spot' Surface Soil Sample Results [Radium-226] (pCi/g)[3]	'Hot Spot' Surface Soil Sample Location One-Minute Stationary Measurement (CPM)	MARSSIM Test 1	MARSSIM Test 2	MARSSIM Test 3	MARSSIM Test 4	Elemental Uranium (mg/kg)[5]
PG1093	No	7,972	10,802	673	7,859	8,837	498	n/a	n/a	PASS	n/a	n/a	n/a	90 0.367 84.4 .398/.493
PG1094	No	8,191	11,706	778	8,188	8,871	500	n/a	n/a	PASS	n/a	n/a	n/a	9.6 9.4
PG1096	No	8,581	10,965	686	8,508	9,228	507	n/a	n/a	PASS	n/a	n/a	n/a	9.4 0.45 10.2
PG1097	No	9,220	12,179	772	10,051	11,416	510	n/a	n/a	PASS	n/a	n/a	n/a	9.6 10.0
PG1102	No	8,347	11,857	706	8,484	9,075	511	n/a	n/a	PASS	n/a	n/a	n/a	9.2 9.2
PG1104	Unable to procure information	8,486	11,054	699	8,543	9,137	514	n/a	n/a	PASS	n/a	n/a	n/a	8.8 9.6
PG1105	No	9,098	11,647	842	8,963	10,378	523	n/a	n/a	PASS	n/a	n/a	n/a	10.4 9.2
PG1107	No	8,380	11,551	775	8,353	9,530	526	n/a	n/a	PASS	n/a	n/a	n/a	9.2 10.0
PG1110	No	8,374	25,400	830	8,145	9,053	531	0.62-0.95 (5 samples)	8,022-22,960	FAIL	PASS	PASS	0.47[4] (PASS)	9.4 0.457 10.0
PG1111	Unable to procure information	7,734	10,243	651	8,130	8,815	532	n/a	n/a	PASS	n/a	n/a	n/a	9.6 9.4
PG1113	No	7,687	10,416	670	7,807	8,548	539	n/a	n/a	PASS	n/a	n/a	n/a	9.8 9.4
PG1114	Unable to procure information	7,171	9,774	609	6,942	7,352	543	n/a	n/a	PASS	n/a	n/a	n/a	8.2 7.8
PG1117	No	7,511	9,216	543	7,668	8,309	556	n/a	n/a	PASS	n/a	n/a	n/a	9.8 8.8
PG1118	No	9,995	12,668	597	9,869	10,693	563	n/a	n/a	FAIL	PASS	PASS	n/a	9.4 10.0 0.392
PG1119	Unable to procure information	8,681	11,284	799	8,882	9,813	572	n/a	n/a	PASS	n/a	n/a	n/a	9.8 9.6
PG1120	Unable to procure information	7,784	10,292	687	7,789	8,522	573	n/a	n/a	PASS	n/a	n/a	n/a	10.0 9.4
PG1121	Unable to procure information	8,009	10,395	661	8,098	8,618	583	n/a	n/a	PASS	n/a	n/a	n/a	9.6 9.6
PG1124	No	9,410	24,409	2,636	9,718	19,435	584	0.62-3.45 (6 samples)	8,128-22,228	FAIL	PASS	PASS	1.07 (FAIL)	9.2 .325/.479 9.0
PG1125	No	7,552	10,744	924	7,711	9,098	589	n/a	n/a	PASS	n/a	n/a	n/a	9.4 9.6
PG1126	No	9,148	11,383	636	8,842	9,789	593	n/a	n/a	PASS	n/a	n/a	n/a	9.4 12.4

TABLE 1
Summary of Phase 1 Field Screening, Laboratory Analytical Results and MARSSIM Statistical Tests for Paguate Village
Grants Mineral Belt Structures Assessment
Cibola County, New Mexico
May 2010 - October 2011
(Continued)

Property ID[1]	Residential Info. Sheet: Mine/Mill Mat'l Used to Build House or Is Present Indoors?[2]	Gamma Scan Avg. (CPM)	Highest Gamma Scan Measurement (CPM)	Standard Deviation: Gamma Scan (CPM)	20 One-Minute Stationary Measurements Avg. (CPM)	Highest One-Minute Stationary Measurement (CPM)	Standard Deviation: 20 One-Minute Stationary Measurements (CPM)	"Hot Spot" Surface Soil Sample Results [Radium-226] (pCi/g)[3]	'Hot Spot' Surface Soil Sample Location One-Minute Stationary Measurement (CPM)	MARSSIM Test 1	MARSSIM Test 2	MARSSIM Test 3	MARSSIM Test 4	Elemental Uranium (mg/kg)[5]
PG1127	Unable to procure information	8,169	12,529	771	8,205	8,790	601	n/a	n/a	FAIL	PASS	PASS	n/a	11.0 9.2
PG1128	Possible	8,807	10,991	639	8,820	9,694	603	n/a	n/a	PASS	n/a	n/a	n/a	9.4 9.2
PG1129	No	7,913	10,972	656	8,066	8,629	609	n/a	n/a	PASS	n/a	n/a	n/a	9.0 9.2
PG1130	No	8,850	11,031	567	4,492	4,858	610	n/a	n/a	PASS	n/a	n/a	n/a	8.8 9.0
PG1131	No	9,230	14,545	897	9,440	10,486	623	0.74 (1 sample)	8,957	FAIL	PASS	PASS	n/a	8.8 8.6
PG1132	No	7,960	15,103	660	8,070	10,891	623	0.58 (1 sample)	8,173	FAIL	PASS	PASS	0.13[4] (PASS)	9.0 0.309 8.6
PG1133	No	8,099	10,315	548	8,252	9,193	635	n/a	n/a	PASS	n/a	n/a	n/a	10.0 9.8
PG1134	No	8,384	14,495	581	8,307	9,173	644	0.58-0.64 (1 sample + 1 duplicate)	23,241	FAIL	PASS	PASS	0.34[4] (PASS)	9.0 10.6
PG1135	Unable to procure information	7,964	11,148	422	7,830	8,367	650	n/a	n/a	PASS	n/a	n/a	n/a	10.0 9.2
PG1136	No	7,880	9,976	466	7,995	8,408	653	n/a	n/a	PASS	n/a	n/a	n/a	9.0 8.8
PG1138	Possible	7,787	9,801	677	7,680	8,358	661	n/a	n/a	PASS	n/a	n/a	n/a	9.8 9.8
PG1139	No	7,817	9,628	460	8,130	9,151	661	n/a	n/a	PASS	n/a	n/a	n/a	9.4 9.6
PG1141	No	6,975	9,685	770	6,887	7,680	662	n/a	n/a	PASS	n/a	n/a	n/a	8.8 9.4
PG1142	Unable to procure information	8,222	10,289	585	8,307	9,105	663	n/a	n/a	PASS	n/a	n/a	n/a	9.4 9.4
PG1143	No	7,054	9,501	650	6,792	7,853	674	n/a	n/a	PASS	n/a	n/a	n/a	9.0 9.6
PG1144	No	6,917	10,433	883	7,404	8,220	674	n/a	n/a	PASS	n/a	n/a	n/a	9.0 8.6
PG1145	No	7,877	12,745	1,002	6,948	7,791	676	n/a	n/a	FAIL	PASS	PASS	n/a	8.8 8.4 0.295
PG1146	No	7,672	19,033	775	7,301	7,484	677	0.56 (1 sample)	7,210	FAIL	PASS	PASS	0.31[4] (PASS)	9.8 9.1
PG1366	No	8,428	10,182	598	8,414	9,467	680	n/a	n/a	PASS	n/a	n/a	n/a	9.2 10.2
PG1380	No	9,083	12,706	755	9,029	9,871	682	n/a	n/a	FAIL	PASS	PASS	n/a	10.0 11.6
PG1471	Unable to procure information	8,408	11,040	712	8,450	9,287	685	n/a	n/a	PASS	n/a	n/a	n/a	10.2 9.4

TABLE 1
Summary of Phase 1 Field Screening, Laboratory Analytical Results and MARSSIM Statistical Tests for Paguate Village
Grants Mineral Belt Structures Assessment
Cibola County, New Mexico
May 2010 - October 2011
(Continued)

Property ID[1]	Residential Info. Sheet: Mine/Mill Mat'l Used to Build House or Is Present Indoors?[2]	Gamma Scan Avg. (CPM)	Highest Gamma Scan Measurement (CPM)	Standard Deviation: Gamma Scan (CPM)	20 One-Minute Stationary Measurements Avg. (CPM)	Highest One-Minute Stationary Measurement (CPM)	Standard Deviation: 20 One-Minute Stationary Measurements (CPM)	"Hot Spot" Surface Soil Sample Results [Radium-226] (pCi/g)[3]	'Hot Spot' Surface Soil Sample Location One-Minute Stationary Measurement (CPM)	MARSSIM Test 1	MARSSIM Test 2	MARSSIM Test 3	MARSSIM Test 4	Elemental Uranium (mg/kg)[5]
PG1473	Unable to procure information	8,629	11,519	824	8,587	9,857	690	n/a	n/a	PASS	n/a	n/a	n/a	10.2 9.8
PG1504	Possible	7,463	10,415	713	7,604	8,737	709	n/a	n/a	PASS	n/a	n/a	n/a	9.0 9.4
PG1516[7]	Possible	10,651	60,251	4,264	10,887	19,063	716	4.44-35.0 (7 samples) 0.66-357.0[8] (2 six-inch depth samples)	17,402-36,941	FAIL	PASS	PASS	4.93 (FAIL)	11.0 2.48 12.0 0.545
PG1540	Unable to procure information	7,638	10,584	785	7,540	8,544	727	n/a	n/a	PASS	n/a	n/a	n/a	8.2 9.0
PG2871	No	9,537	15,627	1,136	9,986	11,794	732	1.07 (1 sample)	12,331	FAIL	PASS	PASS	0.58 (PASS)	10.6 11.6
PG8954	n/a (2011 construction; unoccupied)	7,976	9,788	515	8,083	8,776	747	n/a	n/a	PASS	n/a	n/a	n/a	1.02 U 0.944 U
PG8955	n/a (2011 construction; unoccupied)	7,472	10,591	544	7,410	7,981	755	n/a	n/a	PASS	n/a	n/a	n/a	1.01 U 0.945 U
PG8956	n/a (2011 construction; unoccupied)	8,201	10,283	591	8,104	8,805	771	n/a	n/a	PASS	n/a	n/a	n/a	1.01 U 0.993 U
PG8957	No	10,024	13,897	921	9,923	10,527	783	n/a	n/a	FAIL	PASS	PASS	0.54 (PASS)	9.6 9.2
PG8959	Unable to procure information	6,896	9,215	614	6,861	7,493	797	n/a	n/a	PASS	n/a	n/a	n/a	9.2 9.6
PG8960 (Public Elementary School)	No	7,331	13,207	964	7,689	9,035	806	n/a	n/a	FAIL	PASS	PASS	0.08[4] (PASS)	8.2 11.8
PG8961	No	8,459	10,800	794	8,354	9,313	811	n/a	n/a	PASS	n/a	n/a	n/a	8.8 8.8
PG8962	Unable to procure information	9,339	11,267	657	9,291	10,165	843	n/a	n/a	PASS	n/a	n/a	n/a	8.8 8.8
PG8963	Unable to procure information	9,336	11,301	587	9,490	10,016	855	n/a	n/a	PASS	n/a	n/a	n/a	11.4 10.2
PG8964	No	8,278	10,710	606	8,025	8,401	863	n/a	n/a	PASS	n/a	n/a	n/a	9.0 0.319 9.0
PG8975 (Public Park)	n/a	7,177	9,518	617	7,233	8,116	864	n/a	n/a	PASS	n/a	n/a	n/a	9.2 8.8

TABLE 1
Summary of Phase 1 Field Screening, Laboratory Analytical Results and MARSSIM Statistical Tests for Paguate Village
Grants Mineral Belt Structures Assessment
Cibola County, New Mexico
May 2010 - October 2011
(Continued)

Property ID[1]	Residential Info. Sheet: Mine/Mill Mat'l Used to Build House or Is Present Indoors?[2]	Gamma Scan Avg. (CPM)	Highest Gamma Scan Measurement (CPM)	Standard Deviation: Gamma Scan (CPM)	20 One-Minute Stationary Measurements Avg. (CPM)	Highest One-Minute Stationary Measurement (CPM)	Standard Deviation: 20 One-Minute Stationary Measurements (CPM)	"Hot Spot' Surface Soil Sample Results [Radium-226] (pCi/g)[3]	'Hot Spot' Surface Soil Sample Location One-Minute Stationary Measurement (CPM)	MARSSIM Test 1	MARSSIM Test 2	MARSSIM Test 3	MARSSIM Test 4	Elemental Uranium (mg/kg)[5]
PG8976	Unable to procure information	7,939	11,201	881	7,947	8,927	933	n/a	n/a	PASS	n/a	n/a	n/a	10.2 9.0
PG8980	Unable to procure information	8,367	18,578	1,156	8,852	10,407	988	0.52-0.55 (1 sample)	21,365	FAIL	PASS	PASS	0.51[4] (PASS)	10.2 10.6
PG8981	Unable to procure information	7,993	10,839	724	8,040	8,596	1,017	n/a	n/a	PASS	n/a	n/a	n/a	9.8 9.4
PG8982	Unable to procure information	7,228	11,153	913	7,336	9,185	1,155	n/a	n/a	PASS	n/a	n/a	n/a	0.955 U 0.954 U
PG8986	Possible	8,149	13,064	883	8,439	9,955	1,416	n/a	n/a	FAIL	PASS	PASS	0.04[4] (PASS)	8.8 9.4
PG8998	No	7,835	9,131	450	7,781	8,401	2,010	n/a	n/a	PASS	n/a	n/a	n/a	9.2 10.4
PG8999	No	8,510	9,937	537	8,576	9,184	2,387	n/a	n/a	PASS	n/a	n/a	n/a	7.8 9.2
PG9001 (Cultural Property)	Unable to procure information	9,210	14,085	912	9,098	10,629	899	n/a	n/a	FAIL	PASS	PASS	n/a	0.992 U 1.01 U
PG9002 (Cultural Property)	Unable to procure information	7,952	12,004	1,109	8,201	10,738	8,299	n/a	n/a	PASS	n/a	n/a	n/a	1.01 U 0.99 U
PG9999 (Agricultural Field)	n/a	9,152	11,397	466	9,188	10,633	na	n/a	n/a	FAIL	PASS	PASS	n/a	10.0 10.6 0.983 U

[1]Properties shaded in red exhibit Phase 1 Assessment results that make the property eligible for a Phase 2 Indoor Assessment.

[2]Residents who stated that materials from mines or mills were used or possibly used in the construction of their houses, thus making them eligible for a Phase 2 Indoor Assessment, are shaded in gray.

[3]'Hot Spot' Surface Samples were obtained if any walking, gamma scan measurements were greater than Background average of 20 one-minute, stationary measurements + DCGL (3,648 cpm or property-specific).

[4]The calculation utilized the property avg. of 20 one-minute stationary measurements or of soil samples taken from uncontaminated area as background, as this figure was less than the actual background average.

[5]Results from XRF analysis are in black; results from laboratory analysis are in red. U = undetected - in that case the detection limit is shown.

[6]RESRAD model calculated a property-specific DCGL due to higher property-grown vegetable and fruit consumption than default value: PG0949 = 3,233 cpm, PG0952 = 3,653 cpm and PG1034 = 3,286 cpm.

[7]Results are from a second Phase 1 Assessment conductd after removal of petrified wood from the property by Laguna Pueblo officials.

[8]PG1516: The 2 six-inch depth samples were collected prior to petrified-wood removal and subsequent follow-up Phase 1 assessment; they are reported here as they were not collected from the petrified wood

TABLE 2
Summary of Phase 2 Laboratory Analytical Results and Field Measurements for Oak Canyon Settlement
Grants Mineral Belt Structures Assessment
Cibola County, New Mexico
May 2010 - October 2011

Property ID	Short-term (7-day) Indoor Radon $(pCi/l)_{1,2}$	Long-term (90-day) Indoor Radon $(pCi/l)_{1,2}$	PIC Indoor: Annual Dose Above Bkgd. - (Assumes 12 hrs. /day; 365 days/yr) (mrem/yr.)	Walking Gamma Indoor Scan: All Rooms (CPM)	Highest Gamma Scan Measurement Greater Than 3 X Background Average?	Alpha Wipe Sample Results (DPM)
PG-BKGD	n/a	n/a	n/a	n/a	9,034 CPM	n/a
PG0234	<0.4 0.5	n/a	n/a	n/a	n/a	n/a
PG0692	<0.5 <0.5	n/a	n/a	n/a	n/a	n/a
PG0945	1.8 1.8	n/a	n/a	n/a	n/a	n/a
PG0947	Homeowner Declined EPA Offer	n/a	n/a	n/a	n/a	n/a
PG0948	3.0 4.0	3.0 3.5	0.0	5,700-10,400	No	0.00 (1 sample)
PG0949	1.4 1.6	n/a	n/a	n/a	n/a	n/a
PG0950	3.1 4.2	2.8 3.3	0.0	5,400-7,800	No	n/a
PG0951	0.5 0.9	n/a	n/a	n/a	n/a	n/a
PG0952	1.4 8.1 1.8	Homeowner Declined EPA Offer	0.0	5,500-10,000	No	n/a
PG0953	1.0 0.9	n/a	n/a	n/a	n/a	n/a
PG0958	2.6 2.3	n/a	n/a	n/a	n/a	n/a
PG0959	<0.5 0.9	n/a	n/a	n/a	n/a	n/a
PG0960	2.0 1.8	n/a	n/a	n/a	n/a	n/a
PG0961	<0.5 <0.5	n/a	n/a	n/a	n/a	n/a
PG0962	3.1 3.2	n/a	n/a	n/a	n/a	n/a
PG0964	3.3 2.9	n/a	0.0	7,000-15,000	No	0.00-0.00 (2 samples)
PG0968	<0.5 <0.5	n/a	n/a	n/a	n/a	n/a
PG0971	<0.5 <0.5	n/a	n/a	n/a	n/a	n/a
PG0973	5.5 8.8	4.1 6.3	0.0	6,100-10,000	No	n/a
PG0974	Homeowner Declined EPA Offer	n/a	n/a	n/a	n/a	n/a
PG0975	2.9 3.4	n/a	n/a	n/a	n/a	n/a
PG0976	1.0 0.8	n/a	n/a	n/a	n/a	n/a

TABLE 2
Summary of Phase 2 Laboratory Analytical Results and Field Measurements for Paguate Village
Grants Mineral Belt Structures Assessment
Cibola County, New Mexico
May 2010 - October 2011
(Continued)

Property ID	Short-term (7-day) Indoor Radon $(pCi/l)_{1,2}$	Long-term (90-day) Indoor Radon $(pCi/l)_{1,2}$	PIC Indoor: Annual Dose Above Bkgd. - (Assumes 12 hrs. /day; 365 days/yr) (mrem/yr.)	Walking Gamma Indoor Scan: All Rooms (CPM)	Highest Gamma Scan Measurement Greater Than 3 X Background Average?	Alpha Wipe Sample Results (DPM)
PG0977	1.3 1.3	n/a	n/a	n/a	n/a	n/a
PG0978	0.5 0.9	n/a	n/a	n/a	n/a	n/a
PG0980	1.3 1.2	n/a	n/a	n/a	n/a	n/a
PG0981	11.0 0.6	<0.4 1.5	4.8	6,700-13,100	No	n/a
PG0982	0.4 0.5	n/a	n/a	n/a	n/a	n/a
PG0983	0.7 0.7	n/a	n/a	n/a	n/a	n/a
PG0985	1.9 1.7	n/a	n/a	n/a	n/a	n/a
PG0986	4.1 3.6	3.4 4.3	0.0	4,600-10,000	No	n/a
PG0987	0.7 0.5	n/a	n/a	n/a	n/a	n/a
PG0988	3.5 4.8	3.1 3.2	0.0	6,100-9,900	No	n/a
PG0989	5.1 5.0	4.7 5.2	0.0	5,000-8,600	No	n/a
PG0990	EPA unable to schedule	n/a	n/a	n/a	n/a	n/a
PG0991	2.1 1.9	n/a	n/a	n/a	n/a	n/a
PG0992	2.3 2.3	n/a	n/a	n/a	n/a	n/a
PG0993	7.3 7.7	7.2 7.1	0.0	7,500-11,300	No	0.00-0.00 (2 samples)
PG0995	4.4 4.6	4.0 4.2	0.0	5,900-13,000	No	0.00-0.00 (5 samples)
PG0996	15.7 15.5	12.4 14.7	0.0	8,500-10,500	No	n/a
PG0998	1.9 1.7	n/a	n/a	n/a	n/a	n/a
PG0999	4.3 5.5	5.7 6.4	0.0	6,900-15,000	No	3.23 (1 sample)
PG1000	8.6 9.2	6.6 6.9	0.0	8,000-13,300	No	0.00 (1 sample)
PG1002	6.3 4.6	9.2 9.3	0.0	8,000-13,200	No	n/a
PG1007	0.9 1.0	n/a	n/a	n/a	n/a	n/a
PG1008	2.1 1.5	n/a	n/a	n/a	n/a	n/a
PG1010	1.5 1.6	n/a	0.0	7,800-12,200	No	0.00-3.23 (2 samples)

TABLE 2
Summary of Phase 2 Laboratory Analytical Results and Field Measurements for Paguate Village
Grants Mineral Belt Structures Assessment
Cibola County, New Mexico
May 2010 - October 2011
(Continued)

Property ID	Short-term (7-day) Indoor Radon $(pCi/l)_{1,2}$	Long-term (90-day) Indoor Radon $(pCi/l)_{1,2}$	PIC Indoor: Annual Dose Above Bkgd. - (Assumes 12 hrs. /day; 365 days/yr) (mrem/yr.)	Walking Gamma Indoor Scan: All Rooms (CPM)	Highest Gamma Scan Measurement Greater Than 3 X Background Average?	Alpha Wipe Sample Results (DPM)
PG1013	1.6 1.9	n/a	n/a	n/a	n/a	n/a
PG1014	2.5 3.2	n/a	n/a	n/a	n/a	n/a
PG1015	2.7 2.6	n/a	n/a	n/a	n/a	n/a
PG1016	<0.5 0.6	n/a	n/a	n/a	n/a	n/a
PG1017	7.0 5.7	5.8 5.0	0.0	6,500-10,000	No	n/a
PG1018	Homeowner Declined EPA Offer	n/a	n/a	n/a	n/a	n/a
PG1019	0.8 <0.5	n/a	n/a	n/a	n/a	n/a
PG1020	1.0 1.5	n/a	0.0	5,400-10,000	No	n/a
PG1025	4.3 5.0	EPA unable to schedule	1.1	6,600-14,000	No	0.00 (1 sample)
PG1028	2.6 2.8	n/a	0.0	5,600-10,500	No	n/a
PG1029	4.4 4.1	3.4 3.6	0.9	7,600-12,000	No	n/a
PG1030	1.1 1.8	n/a	n/a	n/a	n/a	n/a
PG1031	2.6 3.3	n/a	n/a	n/a	n/a	n/a
PG1034	3.3 3.2 2.3	n/a	0.7	8,600-15,500	No	0.00-6.25 (21 samples)
PG1038	Homeowner Declined EPA Offer	n/a	n/a	n/a	n/a	n/a
$PG1040_3$	4.2 4.5 4.5 5.6 6.8	4.4 5.3	1.8	8,200-12,600	No	0.00-3.23 (5 samples)
PG1041	3.0 3.1	n/a	n/a	n/a	n/a	n/a
PG1042	3.5 3.0	n/a	n/a	n/a	n/a	n/a
PG1044	3.1 3.2	n/a	n/a	n/a	n/a	n/a
PG1045	2.9 3.8	n/a	n/a	n/a	n/a	n/a
PG1053	EPA unable to schedule	n/a	n/a	n/a	n/a	n/a

TABLE 2
Summary of Phase 2 Laboratory Analytical Results and Field Measurements for Paguate Village
Grants Mineral Belt Structures Assessment
Cibola County, New Mexico
May 2010 - October 2011
(Continued)

Property ID	Short-term (7-day) Indoor Radon $(pCi/l)_{1,2}$	Long-term (90-day) Indoor Radon $(pCi/l)_{1,2}$	PIC Indoor: Annual Dose Above Bkgd. - (Assumes 12 hrs. /day; 365 days/yr) (mrem/yr.)	Walking Gamma Indoor Scan: All Rooms (CPM)	Highest Gamma Scan Measurement Greater Than 3 X Background Average?	Alpha Wipe Sample Results (DPM)
PG1054	2.9 3.4	n/a	n/a	n/a	n/a	n/a
PG1056	1.9 1.8	n/a	n/a	n/a	n/a	n/a
PG1058	Homeowner Declined EPA Offer	n/a	n/a	n/a	n/a	n/a
PG1059	9.1 9.9	Homeowner Declined EPA Offer	Homeowner Declined EPA Offer	Homeowner Declined EPA Offer	Homeowner Declined EPA Offer	Homeowner Declined EPA Offer
PG1060	1.6 1.5	n/a	n/a	n/a	n/a	n/a
PG1061	1.2 1.9	n/a	n/a	n/a	n/a	n/a
PG1062	Homeowner Declined EPA Offer	n/a	Homeowner Declined EPA Offer	Homeowner Declined EPA Offer	Homeowner Declined EPA Offer	Homeowner Declined EPA Offer
PG1063	Homeowner Declined EPA Offer	n/a	n/a	n/a	n/a	n/a
PG1069	0.7 <0.5	n/a	n/a	n/a	n/a	n/a
PG1070	Homeowner Declined EPA Offer	n/a	n/a	n/a	n/a	n/a
PG1071	1.2 1.2	n/a	n/a	n/a	n/a	n/a
PG1073	1.7 2.8	n/a	n/a	n/a	n/a	n/a
PG1079	2.0 2.2	n/a	n/a	n/a	n/a	n/a
PG1091	<0.5 0.6	n/a	0.0	6,300-8,800	No	n/a
PG1093	1.9 1.5	n/a	n/a	n/a	n/a	n/a
PG1094	2.1 2.2	n/a	n/a	n/a	n/a	n/a
PG1096	0.9 1.6	n/a	n/a	n/a	n/a	n/a
PG1097	6.1 6.0	8.0 6.1	2.4	10,500-16,000	No	0.00 (1 sample)
PG1102	4.8 4.4	EPA unable to schedule	0.0	7,000-12,400	No	3.33 (1 sample)
PG1104	2.1 2.1	n/a	n/a	n/a	n/a	n/a
PG1105	9.7 12.3	6.3 9.9	8.3	8,800-14,600	No	0.00 (1 sample)

TABLE 2
Summary of Phase 2 Laboratory Analytical Results and Field Measurements for Paguate Village
Grants Mineral Belt Structures Assessment
Cibola County, New Mexico
May 2010 - October 2011
(Continued)

Property ID	Short-term (7-day) Indoor Radon $(pCi/l)_{1,2}$	Long-term (90-day) Indoor Radon $(pCi/l)_{1,2}$	PIC Indoor: Annual Dose Above Bkgd. - (Assumes 12 hrs. /day; 365 days/yr) (mrem/yr.)	Walking Gamma Indoor Scan: All Rooms (CPM)	Highest Gamma Scan Measurement Greater Than 3 X Background Average?	Alpha Wipe Sample Results (DPM)
PG1107	2.6 1.1	n/a	n/a	n/a	n/a	n/a
PG1110	10.7 7.4	6.5 6.3	0.0	5,100-9,100	No	n/a
PG1111	<0.5 0.7	n/a	n/a	n/a	n/a	n/a
PG1113	3.1 3.6	n/a	n/a	n/a	n/a	n/a
PG1114	<0.5 <0.5	n/a	n/a	n/a	n/a	n/a
PG1117	5.3 2.2	5.1 2.0	0.0	4,400-10,800	No	0.00 (1 sample)
PG1118	<0.5 0.6	n/a	n/a	n/a	n/a	n/a
PG1119	2.8 3.3	n/a	n/a	n/a	n/a	n/a
PG1120	4.1 4.4	3.4 2.7	0.0	5,300-9,500	No	n/a
PG1121	2.4 2.1	n/a	n/a	n/a	n/a	n/a
PG1124	7.1 5.7	6.2 5.5	0.0	6,500-13,000	No	3.23 (1 sample)
PG1125	6.0 6.3	4.6 4.5	0.0	5,400-8,900	No	n/a
PG1126	6.5 4.7	4.8 3.5	0.0	5,500-8,500	No	n/a
PG1127	8.6 7.2	9.6 8.3	0.0	6,500-11,100	No	n/a
PG1128	10.6 9.4	5.9 4.8	0.0	5,500-9,400	No	n/a
PG1129	5.3 4.7	4.3 4.5	0.0	6,100-10,000	No	n/a
PG1130	1.9 1.9	n/a	n/a	n/a	n/a	n/a
PG1131	1.8 1.9	n/a	n/a	n/a	n/a	n/a
PG1132	6.6 7.4	5.0 3.7	0.0	5,500-8,800	No	n/a
PG1133	1.9 1.7	n/a	n/a	n/a	n/a	n/a
PG1134	<0.5 2.1	n/a	n/a	n/a	n/a	n/a
PG1135	2.4 1.6	n/a	n/a	n/a	n/a	n/a
PG1136	1.6 1.3	n/a	n/a	n/a	n/a	n/a
PG1138	2.3 1.6	n/a	EPA unable to schedule	EPA unable to schedule	EPA unable to schedule	EPA unable to schedule

TABLE 2
Summary of Phase 2 Laboratory Analytical Results and Field Measurements for Paguate Village
Grants Mineral Belt Structures Assessment
Cibola County, New Mexico
May 2010 - October 2011
(Continued)

Property ID	Short-term (7-day) Indoor Radon $(pCi/l)_{1,2}$	Long-term (90-day) Indoor Radon $(pCi/l)_{1,2}$	PIC Indoor: Annual Dose Above Bkgd. - (Assumes 12 hrs. /day; 365 days/yr) (mrem/yr.)	Walking Gamma Indoor Scan: All Rooms (CPM)	Highest Gamma Scan Measurement Greater Than 3 X Background Average?	Alpha Wipe Sample Results (DPM)
PG1139	1.9 0.9	n/a	n/a	n/a	n/a	n/a
PG1141	1.0 12.1	1.5 1.5	0.0	4,800-8,300	No	n/a
PG1142	1.5 1.6	n/a	n/a	n/a	n/a	n/a
PG1143	0.9 1.3	n/a	n/a	n/a	n/a	n/a
$PG1144_4$	EPA unable to schedule	n/a	n/a	n/a	n/a	n/a
PG1145	0.6 <0.5	n/a	n/a	n/a	n/a	n/a
PG1146	<0.5 <0.5	n/a	n/a	n/a	n/a	n/a
PG1366	2.4	n/a	n/a	n/a	n/a	n/a
PG1380	Homeowner Declined EPA Offer	n/a	n/a	n/a	n/a	n/a
PG1471	2.1 2.3	n/a	n/a	n/a	n/a	n/a
PG1473	EPA unable to schedule	n/a	n/a	n/a	n/a	n/a
$PG1504_3$	1.8 1.4 0.6 1.0	n/a	EPA unable to schedule	EPA unable to schedule	EPA unable to schedule	EPA unable to schedule
PG1516	3.7 2.5	n/a	8.8	8,000-30,000	Yes	0.00-3.33 (9 samples)
PG1540	1.7 1.6	n/a	n/a	n/a	n/a	n/a
PG2871	2.8 2.2	n/a	n/a	n/a	n/a	n/a
PG8954	0.7 1.0	n/a	n/a	n/a	n/a	n/a
PG8955	0.9 0.8	n/a	n/a	n/a	n/a	n/a
PG8956	1.2 1.2	n/a	n/a	n/a	n/a	n/a
PG8957	1.0 1.1	n/a	n/a	n/a	n/a	n/a
PG8959	0.5 0.6	n/a	n/a	n/a	n/a	n/a
PG8960 (Public Elementary School)	n/a	n/a	n/a	n/a	n/a	n/a
PG8961	5.1 5.8	EPA unable to schedule	EPA unable to schedule	EPA unable to schedule	EPA unable to schedule	EPA unable to schedule

TABLE 2
Summary of Phase 2 Laboratory Analytical Results and Field Measurements for Paguate Village
Grants Mineral Belt Structures Assessment
Cibola County, New Mexico
May 2010 - October 2011
(Continued)

Property ID	Short-term (7-day) Indoor Radon $(pCi/l)_{1,2}$	Long-term (90-day) Indoor Radon $(pCi/l)_{1,2}$	PIC Indoor: Annual Dose Above Bkgd. - (Assumes 12 hrs. /day; 365 days/yr) (mrem/yr.)	Walking Gamma Indoor Scan: All Rooms (CPM)	Highest Gamma Scan Measurement Greater Than 3 X Background Average?	Alpha Wipe Sample Results (DPM)
PG8962	0.7 1.2	n/a	n/a	n/a	n/a	n/a
PG8963	1.3 1.4	n/a	n/a	n/a	n/a	n/a
PG8964	<0.5 <0.5	n/a	n/a	n/a	n/a	n/a
PG8975 (Public Park)	n/a	n/a	n/a	n/a	n/a	n/a
PG8976 (Vacant Property)	n/a	n/a	n/a	n/a	n/a	n/a
PG8980	4.8 4.9	4.3 4.5	0.0	8,400-12,200	No	n/a
PG8981	EPA unable to schedule	n/a	n/a	n/a	n/a	n/a
PG8982[5]	2.8 2.5	n/a	3.0	7,300-10,800	No	n/a
PG8986	2.4 1.9	n/a	1.9	7,500-19,200	No	0.00-0.00 (7 samples)
PG8998	0.5 0.5	n/a	n/a	n/a	n/a	n/a
PG8999	2.1 1.9	n/a	n/a	n/a	n/a	n/a
PG9001 (Cultural Property)	EPA unable to schedule	n/a	n/a	n/a	n/a	n/a
PG9002 (Cultural Property)	2.0 2.0 1.5	n/a	n/a	n/a	n/a	n/a
PG9999 (Agricultural field)	n/a	n/a	n/a	n/a	n/a	n/a

[1]Properties with 3 results had a duplicate canister or detector placed in the home.

[2]Properties that exceeded the 4.0 pCi/l guideline are highlighted.

[3]PG1040, PG1504: Properties had 2 separate living spaces; therefore, each received 2 short-term radon canisters (plus 1 duplicate in 1 space at PG1040). EPA condcuted long-term radon sampling at PG1040 in only 1 living space inadvertently.

[4]PG1144: Intial short-term radon results were invalid; EPA was unable to schedule a second sampling event.

[5]PG8982: Property was not eligible for a complete Phase 2 Assessment as determined by the Phase 1 Assessment and 7-day radon sample results; however, the homeowner requested one.

APPPENDIX A

PROPERTY-SPECIFIC DCGL CALCULATIONS FOR HOUSEHOLDS
WITH HIGH CONSUMPTION OF HOME-GROWN PRODUCE

The **PG0949** property homeowner stated on the Residential Information Sheet that he/she grows/ consumes apricots, peaches, beans, chile, squash and corn from a vegetable garden and fruit trees. A conservative estimate concludes that these vegetables and fruits could add up to 65 kg/year, the lowest amount that would contribute a minimum of 10% towards the property DCGL, as demonstrated by RESRAD calculations detailed in the Site Assessment Protocol.

Therefore, a new property-specific DCGL will be calculated to assess the property as follows:

To be conservative, it will be assumed that the garden is part of the 'hot spot' area described above. (**4,805** cpm above bkgd. proxy (property avg.))

Committed dose from ingestion of 65 kg/yr = $\frac{\text{Hot Spot Reading}}{\text{1459 cpm/ pCi/g}}$ x .009 mrem / pCi/g / 1kg/yr of plant ingestion x 65 kg of plants/ yr

Committed dose = $\frac{4{,}805}{1459}$ x 0.009 x 65 = 1.926611 mrem

The EPA TEDE = 15 mrem/year
Therefore, all other pathways cannot contribute more than 15 - 1.926611 = 13.07339 mrem

RESRAD demonstrates that the dose from all pathways except plant ingestion is 5.9 mrem/yr per 1 pCi/g of Ra-226; therefore,

Revised DCGL = $\frac{13.07339}{5.9}$ x 1459 cpm per pCi/g = **3232.894** cpm

The **PG0952** property homeowner stated on the Residential Information Sheet that he/she grows/ consumes grapes, peaches, apples, corn, chiles and beans from a vegetable garden and fruit trees. A conservative estimate concludes that these vegetables and fruits could add up to 65 kg/year, the lowest amount that would contribute a minimum of 10% towards the property DCGL, as demonstrated by RESRAD calculations detailed in the Site Assessment Protocol.

Therefore, a new property-specific DCGL will be calculated to assess the property as follows:

As noted in the PA-Z score and Background SP tabs, the property's Scan average is 9,600 cpm (**566 cpm** above bkgd.)

Committed dose from ingestion of 65 kg/yr = $\frac{\text{Property Scan Avg.}}{\text{1459 cpm/ pCi/g}}$ x .009 mrem / pCi/g / 1kg/yr of plant ingestion x 65 kg of plants/ yr

Committed dose = $\frac{566}{1459}$ x 0.009 x 65 = 0.226943 mrem

The EPA TEDE = 15 mrem/year
Therefore, all other pathways can 15 - 0.226943 = 14.77306 mrem

RESRAD demonstrates that the dose from all pathways except plant ingestion is 5.9 mrem/yr per 1 pCi/g of Ra-226; therefore,

Revised DCGL = $\frac{14.77306}{5.9}$ x 1459 cpm per pCi/g = **3653.202** cpm

The **PG1034** property homeowner stated on the Residential Information Sheet that he/she grows/ consumes corn, carrots, onions, peaches and apples from a vegetable garden and fruit trees. A conservative estimate concludes that these vegetables and fruits could add up to 65 kg/year, the lowest amount that would contribute a minimum of 10% towards the property DCGL, as demonstrated by RESRAD calculations detailed in the Site Assessment Protocol.

Therefore, a new property-specific DCGL will be calculated to assess the property as follows:

As a conservative stance, the 'hot spot' (avg. of all 23 elevated Scan readings = 13,199 cpm) will be assumed to be the gamma level in the garden/ fruit tree area.
13,199 cpm is **4,165** cpm above background.

Committed dose from ingestion of 65 kg/yr = $\frac{\text{Hot Spot Reading}}{\text{1459 cpm/ pCi/g}}$ x .009 mrem / pCi/g / 1kg/yr of plant ingestion x 65 kg of plants/ yr

Committed dose = $\frac{4{,}265}{1459}$ x 0.009 x 65 = 1.710093 mrem

The EPA TEDE = 15 mrem/year
Therefore, all other pathways cannot contribute more than 15 - 1.710093 = 13.28991 mrem

RESRAD demonstrates that the dose from all pathways except plant ingestion is 5.9 mrem/yr per 1 pCi/g of Ra-226; therefore,

Revised DCGL = $\frac{13.28991}{5.9}$ x 1459 cpm per pCi/g = **3286.436** cpm

APPENDIX B

OUTPUT of RESRAD ANALYSIS FOR AGRICULTURAL FIELD

Table of Contents

Part I: Mixture Sums and Single Radionuclide Guidelines

Dose Conversion Factor (and Related) Parameter Summary
Dose Library: FGR 12 & FGR 11

Menu	Parameter	Current Value#	Base Case*	Parameter Name
A-1	DCF's for external ground radiation, (mrem/yr)/(pCi/g)			
A-1	At-218 (Source: FGR 12)	5.847E-03	5.847E-03	DCF1(1)
A-1	Bi-210 (Source: FGR 12)	3.606E-03	3.606E-03	DCF1(2)
A-1	Bi-214 (Source: FGR 12)	9.808E+00	9.808E+00	DCF1(3)
A-1	Pa-234 (Source: FGR 12)	1.155E+01	1.155E+01	DCF1(4)
A-1	Pa-234m (Source: FGR 12)	8.967E-02	8.967E-02	DCF1(5)
A-1	Pb-210 (Source: FGR 12)	2.447E-03	2.447E-03	DCF1(6)
A-1	Pb-214 (Source: FGR 12)	1.341E+00	1.341E+00	DCF1(7)
A-1	Po-210 (Source: FGR 12)	5.231E-05	5.231E-05	DCF1(8)
A-1	Po-214 (Source: FGR 12)	5.138E-04	5.138E-04	DCF1(9)
A-1	Po-218 (Source: FGR 12)	5.642E-05	5.642E-05	DCF1(10)
A-1	Ra-226 (Source: FGR 12)	3.176E-02	3.176E-02	DCF1(11)
A-1	Rn-222 (Source: FGR 12)	2.354E-03	2.354E-03	DCF1(12)
A-1	Th-230 (Source: FGR 12)	1.209E-03	1.209E-03	DCF1(13)
A-1	Th-234 (Source: FGR 12)	2.410E-02	2.410E-02	DCF1(14)
A-1	Tl-210 (Source: no data)	0.000E+00	-2.000E+00	DCF1(15)
A-1	U-234 (Source: FGR 12)	4.017E-04	4.017E-04	DCF1(16)
A-1	U-238 (Source: FGR 12)	1.031E-04	1.031E-04	DCF1(17)
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Pb-210+D	1.380E-02	1.360E-02	DCF2(1)
B-1	Po-210	9.400E-03	9.400E-03	DCF2(2)
B-1	Ra-226+D	8.594E-03	8.580E-03	DCF2(3)
B-1	Th-230	3.260E-01	3.260E-01	DCF2(4)
B-1	U-234	1.320E-01	1.320E-01	DCF2(5)
B-1	U-238	1.180E-01	1.180E-01	DCF2(6)
B-1	U-238+D	1.180E-01	1.180E-01	DCF2(7)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Pb-210+D	5.376E-03	5.370E-03	DCF3(1)
D-1	Po-210	1.900E-03	1.900E-03	DCF3(2)
D-1	Ra-226+D	1.321E-03	1.320E-03	DCF3(3)

D-1	Th-230	5.480E-04	5.480E-04	DCF3(4)
D-1	U-234	2.830E-04	2.830E-04	DCF3(5)
D-1	U-238	2.550E-04	2.550E-04	DCF3(6)
D-1	U-238+D	2.687E-04	2.550E-04	DCF3(7)
D-34	Food transfer factors:			
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(1,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(1,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(1,3)
D-34				
D-34	Po-210 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(2,1)
D-34	Po-210 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(2,2)
D-34	Po-210 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.400E-04	3.400E-04	RTF(2,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(3,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(3,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(3,3)
D-34				

Dose Conversion Factor (and Related) Parameter Summary (continued)
Dose Library: FGR 12 & FGR 11

0 Menu	Parameter	Current Value#	Base Case*	Parameter Name
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(4,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(4,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(4,3)
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(5,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(5,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(5,3)
D-34				
D-34	U-238 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(6,1)
D-34	U-238 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(6,2)
D-34	U-238 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(6,3)
D-34				
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(7,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(7,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(7,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(1,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(1,2)
D-5				
D-5	Po-210 , fish	1.000E+02	1.000E+02	BIOFAC(2,1)
D-5	Po-210 , crustacea and mollusks	2.000E+04	2.000E+04	BIOFAC(2,2)
D-5				
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(3,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(3,2)
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(4,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(4,2)
D-5				
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(5,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(5,2)
D-5				
D-5	U-238 , fish	1.000E+01	1.000E+01	BIOFAC(6,1)
D-5	U-238 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(6,2)
D-5				

D-5	U-238+D , fish	1.000E+01	1.000E+01	BIOFAC(7,1)
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(7,2)

#For DCF1(xxx) only, factors are for infinite depth & area. See ETFG table in Ground Pathway of Detailed Report.
*Base Case means Default.Lib w/o Associate Nuclide contributions.

Summary : U_chain0_9HA_160 kg crop
File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\NONNUC_UCHAIN+CROPS.RAD

Site-Specific Parameter Summary

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	9.000E+03	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	9.000E-01	2.000E+00	---	THICK0
R011	Fraction of contamination that is submerged	0.000E+00	0.000E+00	---	SUBMFRACT
R011	Length parallel to aquifer flow (m)	1.000E+02	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	not used	1.000E+01	---	T(4)
R011	Times for calculations (yr)	not used	3.000E+01	---	T(5)
R011	Times for calculations (yr)	not used	1.000E+02	---	T(6)
R011	Times for calculations (yr)	not used	3.000E+02	---	T(7)
R011	Times for calculations (yr)	not used	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Pb-210	1.000E+00	0.000E+00	---	S1(1)
R012	Initial principal radionuclide (pCi/g): Po-210	1.000E+00	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): Ra-226	1.000E+00	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g): Th-230	1.000E+00	0.000E+00	---	S1(4)
R012	Initial principal radionuclide (pCi/g): U-234	1.000E+00	0.000E+00	---	S1(5)
R012	Initial principal radionuclide (pCi/g): U-238	1.000E+00	0.000E+00	---	S1(6)
R012	Concentration in groundwater (pCi/L): Pb-210	not used	0.000E+00	---	W1(1)
R012	Concentration in groundwater (pCi/L): Po-210	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	W1(3)
R012	Concentration in groundwater (pCi/L): Th-230	not used	0.000E+00	---	W1(4)
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	---	W1(5)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(6)
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	0.000E+00	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	2.000E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.000E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	2.000E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	1.000E+06	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	---	EPS

R014	Density of saturated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	4.000E-01	4.000E-01	---	TPSZ

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R014	Saturated zone effective porosity	2.000E-01	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	2.000E-01	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	1.000E+02	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	---	HGWT
R014	Saturated zone b parameter	5.300E+00	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	1.000E-03	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	1.000E+01	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	2.500E+02	2.500E+02	---	UW
R015	Number of unsaturated zone strata	1	1	---	NS
R015	Unsat. zone 1, thickness (m)	4.000E+00	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	1.500E+00	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	4.000E-01	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	2.000E-01	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	2.000E-01	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	5.300E+00	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.696E-03	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for Po-210				
R016	Contaminated zone (cm**3/g)	1.000E+01	1.000E+01	---	DCNUCC(2)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+01	1.000E+01	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	1.000E+01	1.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.626E-02	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(3)
R016	Unsaturated zone 1 (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.275E-03	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for Th-230				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(4)
R016	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	6.173E-06	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)

Site-Specific Parameter Summary (continued)

0		User		Used by RESRAD	Parameter

Menu	Parameter	Input	Default	(If different from user input)	Name
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(5)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(5,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.376E-03	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(6)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(6,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.376E-03	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
R017	Inhalation rate (m**3/yr)	8.400E+03	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	1.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	3.000E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	0.000E+00	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	1.385E-01	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE(9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R018	Fruits, vegetables and grain consumption (kg/yr)	1.600E+02	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	0.000E+00	1.400E+01	---	DIET(2)

R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	not used	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	not used	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	not used	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	not used	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	0.000E+00	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	-1	-1	0.500E+00	FPLANT
R018	Contamination fraction of meat	not used	-1	---	FMEAT
R018	Contamination fraction of milk	not used	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	not used	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	not used	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	not used	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	not used	5.000E-01	---	LSI
R019	Mass loading for foliar deposition (g/m**3)	1.000E-04	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	9.000E-01	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	not used	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	not used	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	0.000E+00	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	7.000E-01	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	1.500E+00	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	1.700E-01	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	2.500E-01	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	not used	8.000E-02	---	TE(3)
R19B	Translocation Factor for Non-Leafy	1.000E-01	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	1.000E+00	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	not used	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	2.000E+01	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4

C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR1
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	1	---	---	KYMAX

Summary of Pathway Selections

Pathway	User Selection
1 -- external gamma	active
2 -- inhalation (w/o radon)	active
3 -- plant ingestion	active
4 -- meat ingestion	suppressed
5 -- milk ingestion	suppressed
6 -- aquatic foods	suppressed
7 -- drinking water	suppressed
8 -- soil ingestion	active
9 -- radon	suppressed
Find peak pathway doses	suppressed

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	9000.00 square meters	Pb-210	1.000E+00
Thickness:	0.90 meters	Po-210	1.000E+00
Cover Depth:	0.00 meters	Ra-226	1.000E+00
		Th-230	1.000E+00
		U-234	1.000E+00
		U-238	1.000E+00

0

Total Dose TDOSE(t), mrem/yr
Basic Radiation Dose Limit = 2.500E+01 mrem/yr
Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E+00	3.000E+00
TDOSE(t):	1.044E+01	1.041E+01	1.031E+01
M(t):	4.175E-01	4.162E-01	4.124E-01

0Maximum TDOSE(t): 1.045E+01 mrem/yr at t = 0.1807 ▒ 0.0004 years

0

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.807E-01 years

0 Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	7.882E-04	0.0001	3.821E-04	0.0000	0.000E+00	0.0000	4.392E+00	0.4204	0.000E+00	0.0000	0.000E+00	0.0000	3.281E-02	0.0031
Po-210	2.195E-06	0.0000	5.923E-05	0.0000	0.000E+00	0.0000	4.929E-02	0.0047	0.000E+00	0.0000	0.000E+00	0.0000	3.106E-03	0.0003
Ra-226	1.448E+00	0.1386	1.742E-04	0.0000	0.000E+00	0.0000	4.320E+00	0.4136	0.000E+00	0.0000	0.000E+00	0.0000	7.309E-03	0.0007
Th-230	5.878E-04	0.0001	6.352E-03	0.0006	0.000E+00	0.0000	4.508E-02	0.0043	0.000E+00	0.0000	0.000E+00	0.0000	2.772E-03	0.0003
U-234	5.327E-05	0.0000	2.559E-03	0.0002	0.000E+00	0.0000	5.635E-02	0.0054	0.000E+00	0.0000	0.000E+00	0.0000	1.423E-03	0.0001
U-238	1.967E-02	0.0019	2.288E-03	0.0002	0.000E+00	0.0000	5.351E-02	0.0051	0.000E+00	0.0000	0.000E+00	0.0000	1.352E-03	0.0001
Total	1.469E+00	0.1406	1.181E-02	0.0011	0.000E+00	0.0000	8.916E+00	0.8536	0.000E+00	0.0000	0.000E+00	0.0000	4.878E-02	0.0047

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.807E-01 years

0 Water Dependent Pathways

Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.426E+00	0.4237
Po-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.245E-02	0.0050
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.775E+00	0.5529
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.479E-02	0.0052
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.039E-02	0.0058
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.682E-02	0.0074
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.045E+01	1.0000

0*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

0 Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	7.923E-04	0.0001	3.611E-04	0.0000	0.000E+00	0.0000	4.386E+00	0.4202	0.000E+00	0.0000	0.000E+00	0.0000	3.180E-02	0.0030
Po-210	3.074E-06	0.0000	8.297E-05	0.0000	0.000E+00	0.0000	6.901E-02	0.0066	0.000E+00	0.0000	0.000E+00	0.0000	4.351E-03	0.0004
Ra-226	1.449E+00	0.1389	1.722E-04	0.0000	0.000E+00	0.0000	4.297E+00	0.4117	0.000E+00	0.0000	0.000E+00	0.0000	7.135E-03	0.0007
Th-230	4.744E-04	0.0000	6.352E-03	0.0006	0.000E+00	0.0000	4.475E-02	0.0043	0.000E+00	0.0000	0.000E+00	0.0000	2.772E-03	0.0003
U-234	5.334E-05	0.0000	2.563E-03	0.0002	0.000E+00	0.0000	5.643E-02	0.0054	0.000E+00	0.0000	0.000E+00	0.0000	1.425E-03	0.0001
U-238	1.970E-02	0.0019	2.291E-03	0.0002	0.000E+00	0.0000	5.358E-02	0.0051	0.000E+00	0.0000	0.000E+00	0.0000	1.353E-03	0.0001
Total	1.470E+00	0.1409	1.182E-02	0.0011	0.000E+00	0.0000	8.907E+00	0.8533	0.000E+00	0.0000	0.000E+00	0.0000	4.883E-02	0.0047

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years
Water Dependent Pathways

Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.419E+00	0.4234
Po-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.345E-02	0.0070
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.754E+00	0.5512
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.435E-02	0.0052
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.047E-02	0.0058
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.692E-02	0.0074
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.044E+01	1.0000

0*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years
Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	7.677E-04	0.0001	4.160E-04	0.0000	0.000E+00	0.0000	4.305E+00	0.4138	0.000E+00	0.0000	0.000E+00	0.0000	3.424E-02	0.0033
Po-210	4.759E-07	0.0000	1.284E-05	0.0000	0.000E+00	0.0000	1.069E-02	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	6.736E-04	0.0001
Ra-226	1.441E+00	0.1385	1.836E-04	0.0000	0.000E+00	0.0000	4.410E+00	0.4238	0.000E+00	0.0000	0.000E+00	0.0000	8.135E-03	0.0008
Th-230	1.101E-03	0.0001	6.352E-03	0.0006	0.000E+00	0.0000	4.662E-02	0.0045	0.000E+00	0.0000	0.000E+00	0.0000	2.775E-03	0.0003
U-234	5.296E-05	0.0000	2.544E-03	0.0002	0.000E+00	0.0000	5.601E-02	0.0054	0.000E+00	0.0000	0.000E+00	0.0000	1.415E-03	0.0001
U-238	1.956E-02	0.0019	2.275E-03	0.0002	0.000E+00	0.0000	5.318E-02	0.0051	0.000E+00	0.0000	0.000E+00	0.0000	1.343E-03	0.0001
Total	1.463E+00	0.1406	1.178E-02	0.0011	0.000E+00	0.0000	8.882E+00	0.8536	0.000E+00	0.0000	0.000E+00	0.0000	4.858E-02	0.0047

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years
Water Dependent Pathways

Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.341E+00	0.4172
Po-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.138E-02	0.0011
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.860E+00	0.5632
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.685E-02	0.0055
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.003E-02	0.0058
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.636E-02	0.0073

Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.041E+01	1.0000

0*Sum of all water independent and dependent pathways.

Summary : U_chain0_9HA_160 kg crop

File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\NONNUC_UCHAIN+CROPS.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years
Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
Pb-210	7.166E-04	0.0001	3.997E-04	0.0000	0.000E+00	0.0000	4.026E+00	0.3905	0.000E+00	0.0000	0.000E+00	0.0000	3.255E-02	0.0032
Po-210	1.140E-08	0.0000	3.077E-07	0.0000	0.000E+00	0.0000	2.561E-04	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.614E-05	0.0000
Ra-226	1.425E+00	0.1382	2.069E-04	0.0000	0.000E+00	0.0000	4.618E+00	0.4479	0.000E+00	0.0000	0.000E+00	0.0000	1.012E-02	0.0010
Th-230	2.342E-03	0.0002	6.352E-03	0.0006	0.000E+00	0.0000	5.054E-02	0.0049	0.000E+00	0.0000	0.000E+00	0.0000	2.783E-03	0.0003
U-234	5.221E-05	0.0000	2.507E-03	0.0002	0.000E+00	0.0000	5.519E-02	0.0054	0.000E+00	0.0000	0.000E+00	0.0000	1.394E-03	0.0001
U-238	1.927E-02	0.0019	2.241E-03	0.0002	0.000E+00	0.0000	5.241E-02	0.0051	0.000E+00	0.0000	0.000E+00	0.0000	1.324E-03	0.0001
Total	1.447E+00	0.1404	1.171E-02	0.0011	0.000E+00	0.0000	8.802E+00	0.8538	0.000E+00	0.0000	0.000E+00	0.0000	4.818E-02	0.0047

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years
Water Dependent Pathways

Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.060E+00	0.3938
Po-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.725E-04	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.053E+00	0.5871
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.201E-02	0.0060
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.915E-02	0.0057
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.524E-02	0.0073
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.031E+01	1.0000

0*Sum of all water independent and dependent pathways.

Summary : U_chain0_9HA_160 kg crop

File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\NONNUC_UCHAIN+CROPS.RAD

Dose/Source Ratios Summed Over All Pathways
Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,t) At Time in Years 0.000E+00	1.000E+00	3.000E+00
Pb-210+D	Pb-210+D	1.000E+00	4.256E+00	4.110E+00	3.834E+00
Pb-210+D	Po-210	1.000E+00	1.634E-01	2.304E-01	2.253E-01
Pb-210+D	ªDSR(j)		4.419E+00	4.341E+00	4.060E+00
0Po-210	Po-210	1.000E+00	7.345E-02	1.138E-02	2.725E-04
0Ra-226+D	Ra-226+D	1.000E+00	5.672E+00	5.640E+00	5.576E+00
Ra-226+D	Pb-210+D	1.000E+00	7.948E-02	2.109E-01	4.539E-01
Ra-226+D	Po-210	1.000E+00	2.515E-03	9.145E-03	2.329E-02
Ra-226+D	ªDSR(j)		5.754E+00	5.860E+00	6.053E+00
0Th-230	Th-230	1.000E+00	5.316E-02	5.316E-02	5.316E-02
Th-230	Ra-226+D	1.000E+00	1.171E-03	3.612E-03	8.470E-03
Th-230	Pb-210+D	1.000E+00	1.263E-05	7.623E-05	3.657E-04
Th-230	Po-210	1.000E+00	3.493E-07	2.831E-06	1.693E-05
Th-230	ªDSR(j)		5.435E-02	5.685E-02	6.201E-02
0U-234	U-234	1.000E+00	6.047E-02	6.002E-02	5.915E-02

U-234	Th-230	1.000E+00	2.580E-07	7.362E-07	1.675E-06
U-234	Ra-226+D	1.000E+00	3.396E-09	2.479E-08	1.326E-07
U-234	Pb-210+D	1.000E+00	3.038E-11	3.873E-10	4.023E-09
U-234	Po-210	1.000E+00	7.613E-13	1.289E-11	1.713E-10
U-234	ªDSR(j)		6.047E-02	6.003E-02	5.915E-02
0U-238	U-238	5.400E-05	2.939E-06	2.918E-06	2.875E-06
0U-238+D	U-238+D	9.999E-01	7.692E-02	7.636E-02	7.524E-02
U-238+D	U-234	9.999E-01	8.560E-08	2.551E-07	5.867E-07
U-238+D	Th-230	9.999E-01	2.557E-13	1.665E-12	8.440E-12
U-238+D	Ra-226+D	9.999E-01	2.340E-15	3.701E-14	4.398E-13
U-238+D	Pb-210+D	9.999E-01	1.821E-17	4.744E-16	1.048E-14
U-238+D	Po-210	9.999E-01	4.224E-19	1.450E-17	4.156E-16
U-238+D	ªDSR(j)		7.692E-02	7.636E-02	7.524E-02

ª is used to indicate summation; the Greek sigma is not included in this font.
The DSR includes contributions from associated (half-life <= 30 days) daughters.

Single Radionuclide Soil Guidelines G(i,t) in pCi/g
Basic Radiation Dose Limit = 2.500E+01 mrem/yr

0Nuclide (i)	t= 0.000E+00	1.000E+00	3.000E+00
Pb-210	5.657E+00	5.759E+00	6.158E+00
Po-210	3.404E+02	2.198E+03	9.174E+04
Ra-226	4.345E+00	4.266E+00	4.130E+00
Th-230	4.600E+02	4.397E+02	4.031E+02
U-234	4.134E+02	4.165E+02	4.227E+02
U-238	3.250E+02	3.274E+02	3.323E+02

0

Summed Dose/Source Ratios DSR(i,t) in (mrem/yr)/(pCi/g)
and Single Radionuclide Soil Guidelines G(i,t) in pCi/g
at tmin = time of minimum single radionuclide soil guideline
and at tmax = time of maximum total dose = 0.1807 ± 0.0004 years

0Nuclide (i)	Initial (pCi/g)	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Pb-210	1.000E+00	0.1183 ± 0.0002	4.427E+00	5.647E+00	4.426E+00	5.649E+00
Po-210	1.000E+00	0.000E+00	7.345E-02	3.404E+02	5.245E-02	4.766E+02
Ra-226	1.000E+00	3.000E+00	6.053E+00	4.130E+00	5.775E+00	4.329E+00
Th-230	1.000E+00	3.000E+00	6.201E-02	4.031E+02	5.479E-02	4.563E+02
U-234	1.000E+00	0.000E+00	6.047E-02	4.134E+02	6.039E-02	4.140E+02
U-238	1.000E+00	0.000E+00	7.692E-02	3.250E+02	7.682E-02	3.254E+02

Individual Nuclide Dose Summed Over All Pathways
Parent Nuclide and Branch Fraction Indicated

0Nuclide (j)	Parent (i)	THF(i)	DOSE(j,t), mrem/yr t= 0.000E+00	1.000E+00	3.000E+00
Pb-210	Pb-210	1.000E+00	4.256E+00	4.110E+00	3.834E+00
Pb-210	Ra-226	1.000E+00	7.948E-02	2.109E-01	4.539E-01
Pb-210	Th-230	1.000E+00	1.263E-05	7.623E-05	3.657E-04
Pb-210	U-234	1.000E+00	3.038E-11	3.873E-10	4.023E-09
Pb-210	U-238	9.999E-01	1.821E-17	4.744E-16	1.048E-14

Pb-210	ºDOSE(j)		4.335E+00	4.321E+00	4.289E+00
0Po-210	Pb-210	1.000E+00	1.634E-01	2.304E-01	2.253E-01
Po-210	Po-210	1.000E+00	7.345E-02	1.138E-02	2.725E-04
Po-210	Ra-226	1.000E+00	2.515E-03	9.145E-03	2.329E-02
Po-210	Th-230	1.000E+00	3.493E-07	2.831E-06	1.693E-05
Po-210	U-234	1.000E+00	7.613E-13	1.289E-11	1.713E-10
Po-210	U-238	9.999E-01	4.224E-19	1.450E-17	4.156E-16
Po-210	ºDOSE(j)		2.394E-01	2.509E-01	2.489E-01
0Ra-226	Ra-226	1.000E+00	5.672E+00	5.640E+00	5.576E+00
Ra-226	Th-230	1.000E+00	1.171E-03	3.612E-03	8.470E-03
Ra-226	U-234	1.000E+00	3.396E-09	2.479E-08	1.326E-07
Ra-226	U-238	9.999E-01	2.340E-15	3.701E-14	4.398E-13
Ra-226	ºDOSE(j)		5.673E+00	5.643E+00	5.584E+00
0Th-230	Th-230	1.000E+00	5.316E-02	5.316E-02	5.316E-02
Th-230	U-234	1.000E+00	2.580E-07	7.362E-07	1.675E-06
Th-230	U-238	9.999E-01	2.557E-13	1.665E-12	8.440E-12
Th-230	ºDOSE(j)		5.316E-02	5.316E-02	5.316E-02
0U-234	U-234	1.000E+00	6.047E-02	6.002E-02	5.915E-02
U-234	U-238	9.999E-01	8.560E-08	2.551E-07	5.867E-07
U-234	ºDOSE(j)		6.047E-02	6.003E-02	5.915E-02
0U-238	U-238	5.400E-05	2.939E-06	2.918E-06	2.875E-06
U-238	U-238	9.999E-01	7.692E-02	7.636E-02	7.524E-02
U-238	ºDOSE(j)		7.692E-02	7.636E-02	7.524E-02

THF(i) is the thread fraction of the parent nuclide.
º is used to indicate summation; the Greek sigma is not included in this font.

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

0Nuclide (j)	Parent (i)	THF(i)	t=	S(j,t), pCi/g 0.000E+00	1.000E+00	3.000E+00
Pb-210	Pb-210	1.000E+00		1.000E+00	9.658E-01	9.009E-01
Pb-210	Ra-226	1.000E+00		0.000E+00	3.046E-02	8.778E-02
Pb-210	Th-230	1.000E+00		0.000E+00	6.643E-06	5.821E-05
Pb-210	U-234	1.000E+00		0.000E+00	1.996E-11	5.263E-10
Pb-210	U-238	9.999E-01		0.000E+00	1.416E-17	1.122E-15
Pb-210	ºS(j):			1.000E+00	9.963E-01	9.888E-01
0Po-210	Pb-210	1.000E+00		0.000E+00	8.104E-01	8.965E-01
Po-210	Po-210	1.000E+00		1.000E+00	1.548E-01	3.707E-03
Po-210	Ra-226	1.000E+00		0.000E+00	1.642E-02	7.136E-02
Po-210	Th-230	1.000E+00		0.000E+00	2.701E-06	4.051E-05
Po-210	U-234	1.000E+00		0.000E+00	6.567E-12	3.219E-10
Po-210	U-238	9.999E-01		0.000E+00	3.923E-18	6.135E-16
Po-210	ºS(j):			1.000E+00	9.816E-01	9.716E-01
0Ra-226	Ra-226	1.000E+00		1.000E+00	9.943E-01	9.830E-01
Ra-226	Th-230	1.000E+00		0.000E+00	4.320E-04	1.289E-03
Ra-226	U-234	1.000E+00		0.000E+00	1.941E-09	1.732E-08
Ra-226	U-238	9.999E-01		0.000E+00	1.833E-15	4.899E-14
Ra-226	ºS(j):			1.000E+00	9.947E-01	9.843E-01
0Th-230	Th-230	1.000E+00		1.000E+00	1.000E+00	1.000E+00
Th-230	U-234	1.000E+00		0.000E+00	8.969E-06	2.671E-05
Th-230	U-238	9.999E-01		0.000E+00	1.270E-11	1.132E-10
Th-230	ºS(j):			1.000E+00	1.000E+00	1.000E+00
0U-234	U-234	1.000E+00		1.000E+00	9.926E-01	9.781E-01
U-234	U-238	9.999E-01		0.000E+00	2.814E-06	8.318E-06
U-234	ºS(j):			1.000E+00	9.927E-01	9.781E-01
0U-238	U-238	5.400E-05		5.400E-05	5.360E-05	5.282E-05
U-238	U-238	9.999E-01		9.999E-01	9.926E-01	9.781E-01

```
 U-238   ºS(j):              1.000E+00 9.927E-01 9.781E-01
 ======= ======= =========    ========== ========= =========
 THF(i) is the thread fraction of the parent nuclide.
 º is used to indicate summation; the Greek sigma is not included in this font.
0RESCALC.EXE execution time =    1.48 seconds
=
```

APPENDIX C

RAT MAPS

APPENDIX D

MARSSIM TEST 3
WILCOXON RANK SUM TEST

From MARSSIM Manual, Section 8.4.1

Two-Sample Statistical Test

The comparison of measurements from the reference area and survey unit is made using the Wilcoxon Rank Sum (WRS) test (also called the Mann-Whitney test). The WRS test should be conducted for each survey unit. In addition, the EMC is performed against each measurement to ensure that it does not exceed a specified investigation level. If any measurement in the remediated survey unit exceeds the specified investigation level, then additional investigation is recommended, at least locally, regardless of the outcome of the WRS test.

The WRS test is most effective when residual radioactivity is uniformly present throughout a survey unit. The test is designed to detect whether or not this activity exceeds the $DCGL_W$. The advantage of the nonparametric WRS test is that it does not assume that the data are normally or log-normally distributed. The WRS test also allows for "less than" measurements to be present in the reference area and the survey units. As a general rule, the WRS test can be used with up to 40 percent "less than" measurements in either the reference area or the survey unit. However, the use of "less than" values in data reporting is not recommended as discussed in Section 2.3.5. When possible, report the actual result of a measurement together with its uncertainty.

The hypothesis tested by the WRS test is

> Null Hypothesis H_0: The median concentration in the survey unit exceeds that in the reference area by more than the $DCGL_W$
>
> versus
>
> Alternative Hypothesis H_a: The median concentration in the survey unit exceeds that in the reference area by less than the $DCGL_W$

The null hypothesis is assumed to be true unless the statistical test indicates that it should be rejected in favor of the alternative. One assumes that any difference between the reference area and survey unit concentration distributions is due to a shift in the survey unit concentrations to higher values (*i.e.*, due to the presence of residual radioactivity in addition to background). Note that some or all of the survey unit measurements may be larger than some reference area measurements, while still meeting the release criterion. Indeed, some survey unit measurements may exceed some reference area measurements by more than the $DCGL_W$. The result of the hypothesis test determines whether or not the survey unit as a whole is deemed to meet the release criterion. The EMC is used to screen individual measurements.

Two assumptions underlying this test are: 1) samples from the reference area and survey unit are independent, identically distributed random samples, and 2) each measurement is independent of every other measurement, regardless of the set of samples from which it came.

8.4.2 Applying the Wilcoxon Rank Sum Test

The WRS test is applied as outlined in the following six steps....

1. Obtain the adjusted reference area measurements, Z_i, by adding the $DCGL_W$ to each reference area measurement, X_i. $Z_i = X_i + DCGL_W$

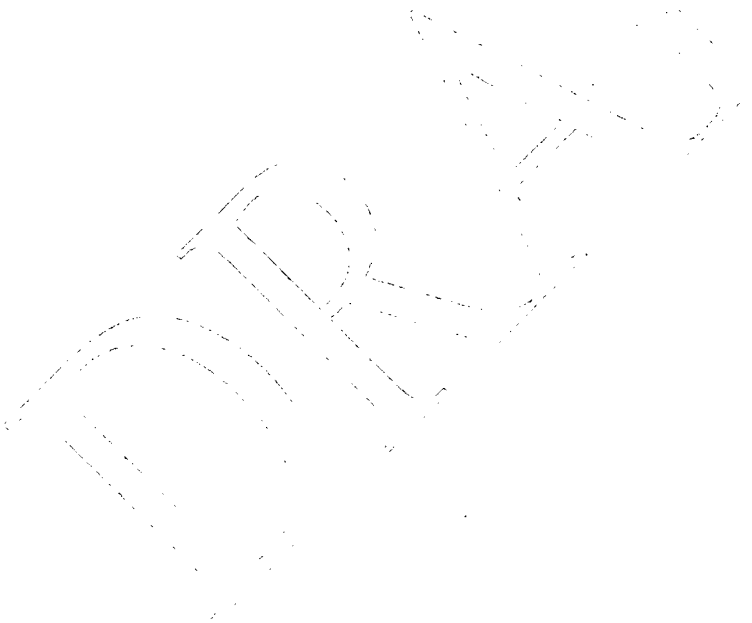
2. The m adjusted reference sample measurements, Z_i, from the reference area and the n sample measurements, Y_i, from the survey unit are pooled and ranked in order of increasing size from 1 to N, where $N = m+n$.

3. If several measurements are tied (*i.e.*, have the same value), they are all assigned the average rank of that group of tied measurements.

4. If there are t "less than" values, they are all given the average of the ranks from 1 to t. Therefore, they are all assigned the rank $t(t+1)/(2t) = (t+1)/2$, which is the average of the first t integers. If there is more than one detection limit, all observations below the largest detection limit should be treated as "less than" values.[3]

5. Sum the ranks of the adjusted measurements from the reference area, W_r. Note that since the sum of the first N integers is $N(N+1)/2$, one can equivalently sum the ranks of the measurements from the survey unit, W_s, and compute $W_r = N(N+1)/2 - W_s$.

6. Compare W_r with the critical value given in Table I.4 for the appropriate values of n, m, and α. If W_r is greater than the tabulated value, reject the hypothesis that the survey unit exceeds the release criterion.



[3] If more than 40 percent of the data from either the reference area or survey unit are "less than," the WRS test *cannot* be used. Such a large proportion of non-detects suggest that the DQO process be re-visited for this survey to determine if the survey unit was properly classified or the appropriate measurement method was used. As stated previously, the use of "less than" values in data reporting is not recommended. Wherever possible, the actual result of a measurement, together with its uncertainty, should be reported.

APPENDIX E

MICROSHIELD ANALYSIS

(Roentgen (R) to Roentgen-Equivalent-in-Man (rem) Conversion)

Print

MicroShield v6.02 (6.02-00039)
AQ_Safety,_Inc.

:1
File :U-238soilSlab.ms6
Date : May 25, 2011
Time : 11:26:33 AM
tion : 00:00:00

File Ref :
Date :
By :
Checked :

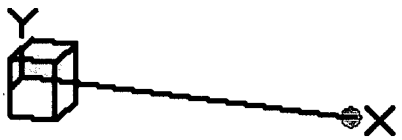
Case Title: U+chainSlab
Description: U-238 + chain slab
Geometry: 16 - Infinite Slab

Source Dimensions:

Thickness	15.0 cm	(5.9 in)

Dose Points

A	X	Y	Z
# 1	115 cm	0 cm	0 cm
	3 ft 9.3 in	0.0 in	0.0 in



Shields

Shield N	Dimension	Material	Density
Source	Infinite	ANS soil 2011	1.5
Air Gap		Air	0.00122

Source Input : Grouping Method - Standard Indices
Number of Groups : 25
Lower Energy Cutoff : 0.015
Photons < 0.015 : Included
Library : Grove

Nuclide	_Ci/cm_	Bq/cm_
Bi-210	1.4990e-006	5.5464e-002
Bi-214	1.4993e-006	5.5476e-002
Pa-234	2.3993e-009	8.8772e-005
Pa-234m	1.4995e-006	5.5483e-002
Pb-210	1.4990e-006	5.5464e-002
Pb-214	1.4993e-006	5.5476e-002
Po-210	1.4990e-006	5.5464e-002
Po-214	1.4990e-006	5.5464e-002
Po-218	1.4996e-006	5.5487e-002
Ra-226	1.4996e-006	5.5487e-002
Rn-222	1.4996e-006	5.5487e-002
Th-230	1.4996e-006	5.5487e-002
Th-234	1.4995e-006	5.5483e-002
U-234	1.4996e-006	5.5486e-002

U-238 1.4995e-006 5.5483e-002

Buildup : The material reference is - Source
Integration Parameters

Energy MeV	Activity Photons/sec	Results Fluence Rate MeV/cm_/sec No Buildup	Fluence Rate MeV/cm_/sec With Buildup	Exposure Rate mR/hr No Buildup	Exposure Rate mR/hr With Buildup
0.015	4.281e-02	2.034e-05	2.102e-05	1.745e-06	1.803e-06
0.04	1.087e-07	2.822e-09	4.722e-09	1.248e-11	2.088e-11
0.05	2.925e-03	1.432e-04	3.334e-04	3.815e-07	8.882e-07
0.06	2.379e-03	1.794e-04	4.971e-04	3.563e-07	9.873e-07
0.08	1.287e-02	1.689e-03	6.226e-03	2.672e-06	9.853e-06
0.1	3.503e-03	6.578e-04	2.943e-03	1.006e-06	4.503e-06
0.15	6.623e-05	2.220e-05	1.137e-04	3.655e-08	1.872e-07
0.2	5.995e-03	2.976e-03	1.474e-02	5.252e-06	2.602e-05
0.3	1.145e-02	9.877e-03	4.263e-02	1.874e-05	8.087e-05
0.4	2.123e-02	2.721e-02	1.057e-01	5.302e-05	2.059e-04
0.5	9.991e-04	1.746e-03	6.028e-03	3.427e-06	1.183e-05
0.6	2.678e-02	6.037e-02	1.901e-01	1.178e-04	3.710e-04
0.8	5.427e-03	1.834e-02	4.905e-02	3.488e-05	9.329e-05
1.0	1.796e-02	8.322e-02	1.987e-01	1.534e-04	3.662e-04
1.5	1.057e-02	8.715e-02	1.696e-01	1.466e-04	2.853e-04
2.0	1.485e-02	1.833e-01	3.162e-01	2.835e-04	4.889e-04
Totals	**1.798e-01**	**4.769e-01**	**1.103e+00**	**8.228e-04**	**1.948e-03**

MicroShield v6.02 (6.02-00039)
AQ_Safety,_Inc.
Conversion of calculated exposure in air to dose
FILE: C:\Program Files\MicroShield\Examples\casefiles\U-238soilSlab.ms6
Case Title: U+chainSlab
This case was run on Wednesday, May 25, 2011 at 11:26:33 AM
Dose Point # 1 - (115,0,0) cm

Results (Summed over energies)	Units	Without Buildup	With Buildup
Photon Fluence Rate (flux)	Photons/cm2/sec	5.109e-001	1.464e+000
Photon Energy Fluence Rate	MeV/cm2/sec	4.769e-001	1.103e+000
Exposure and Dose Rates:			
Exposure Rate in Air	mR/hr	8.228e-004	1.948e-003
Absorbed Dose Rate in Air	mGy/hr	7.183e-006	1.700e-005
"	mrad/hr	7.183e-004	1.700e-003
Deep Dose Equivalent Rate	(ICRP 51 - 1987)		
o Parallel Geometry	mSv/hr	8.333e-006	2.001e-005
o Opposed	"	7.014e-006	1.647e-005
o Rotational	"	7.013e-006	1.646e-005
o Isotropic	"	6.274e-006	1.471e-005
Shallow Dose Equivalent Rate	(ICRP 51 - 1987)		
o Parallel Geometry	mSv/hr	8.781e-006	2.105e-005
o Opposed	"	8.416e-006	2.008e-005
o Rotational	"	8.415e-006	2.008e-005
o Isotropic	"	6.621e-006	1.556e-005
Effective Dose Equivalent Rate	(ICRP 51 - 1987)		
o Anterior/Posterior Geometry	mSv/hr	7.442e-006	1.779e-005
o Posterior/Anterior	"	6.777e-006	1.601e-005
o Lateral	"	5.335e-006	1.237e-005
o Rotational	"	6.099e-006	1.436e-005
o Isotropic	"	5.363e-006	1.252e-005

Print

MicroShield v6.02 (6.02-00039)
AQ_Safety,_Inc.

	:1
File	:Ra-226SoilSlab.ms6
Date	: May 25, 2011
Time	: 11:20:52 AM
tion	: 00:00:00

File Ref	:
Date	:
By	:
Checked	:

Case Title: Ra-226SoilSlab
Description: Ra226 infinite soil 15 cm slab
Geometry: 16 - Infinite Slab

Source Dimensions:

Thickness	15.0 cm	(5.9 in)

Dose Points

A	X	Y	Z
# 1	115 cm	0 cm	0 cm
	3 ft 9.3 in	0.0 in	0.0 in

Shields

Shield N	Dimension	Material	Density
Source	Infinite	ANS soil 2011	1.5
Air Gap		Air	0.00122

Source Input : Grouping Method - Standard Indices
Number of Groups : 25
Lower Energy Cutoff : 0.015
Photons < 0.015 : Included
Library : Grove

Nuclide	_Ci/cm_	Bq/cm_
Bi-210	1.5206e-006	5.6261e-002
Bi-214	1.4997e-006	5.5489e-002
Pb-210	1.5205e-006	5.6260e-002
Pb-214	1.4997e-006	5.5489e-002
Po-210	1.5209e-006	5.6274e-002
Po-214	1.4994e-006	5.5478e-002
Po-218	1.5000e-006	5.5500e-002
Ra-226	1.5000e-006	5.5500e-002
Rn-222	1.5000e-006	5.5500e-002

Buildup : The material reference is - Source
Integration Parameters

Results

Energy MeV	Activity Photons/sec	Fluence Rate MeV/cm_/sec No Buildup	Fluence Rate MeV/cm_/sec With Buildup	Exposure Rate mR/hr No Buildup	Exposure Rate mR/hr With Buildup
0.015	2.191e-02	1.041e-05	1.076e-05	8.931e-07	9.230e-07
0.05	2.892e-03	1.416e-04	3.297e-04	3.772e-07	8.782e-07
0.08	1.279e-02	1.679e-03	6.190e-03	2.657e-06	9.795e-06
0.1	7.532e-05	1.414e-05	6.328e-05	2.164e-08	9.682e-08
0.2	5.977e-03	2.967e-03	1.470e-02	5.237e-06	2.594e-05
0.3	1.145e-02	9.874e-03	4.262e-02	1.873e-05	8.084e-05
0.4	2.123e-02	2.721e-02	1.057e-01	5.302e-05	2.059e-04
0.5	9.912e-04	1.732e-03	5.981e-03	3.400e-06	1.174e-05
0.6	2.675e-02	6.031e-02	1.899e-01	1.177e-04	3.706e-04
0.8	5.244e-03	1.772e-02	4.740e-02	3.370e-05	9.015e-05
1.0	1.737e-02	8.051e-02	1.922e-01	1.484e-04	3.543e-04
1.5	1.056e-02	8.707e-02	1.694e-01	1.465e-04	2.851e-04
2.0	1.485e-02	1.833e-01	3.162e-01	2.835e-04	4.890e-04
Totals	**1.521e-01**	**4.726e-01**	**1.091e+00**	**8.141e-04**	**1.925e-03**

MicroShield v6.02 (6.02-00039)
AQ_Safety,_Inc.
Conversion of calculated exposure in air to dose
FILE: Case1
Case Title: Ra-226SoilSlab
This case was run on Wednesday, May 25, 2011 at 11:20:52 AM
Dose Point # 1 - (115,0,0) cm

Results (Summed over energies)	Units	Without Buildup	With Buildup
Photon Fluence Rate (flux)	Photons/cm2/sec	4.968e-001	1.416e+000
Photon Energy Fluence Rate	MeV/cm2/sec	4.726e-001	1.091e+000
Exposure and Dose Rates:			
Exposure Rate in Air	mR/hr	8.141e-004	1.925e-003
Absorbed Dose Rate in Air	mGy/hr	7.107e-006	1.681e-005
"	mrad/hr	7.107e-004	1.681e-003
Deep Dose Equivalent Rate	(ICRP 51 - 1987)		
o Parallel Geometry	mSv/hr	8.246e-006	1.976e-005
o Opposed	"	6.948e-006	1.629e-005
o Rotational	"	6.947e-006	1.628e-005
o Isotropic	"	6.215e-006	1.454e-005
Shallow Dose Equivalent Rate	(ICRP 51 - 1987)		
o Parallel Geometry	mSv/hr	8.684e-006	2.079e-005
o Opposed	"	8.330e-006	1.985e-005
o Rotational	"	8.330e-006	1.985e-005
o Isotropic	"	6.555e-006	1.539e-005
Effective Dose Equivalent Rate	(ICRP 51 - 1987)		
o Anterior/Posterior Geometry	mSv/hr	7.367e-006	1.758e-005
o Posterior/Anterior	"	6.711e-006	1.583e-005
o Lateral	"	5.286e-006	1.224e-005
o Rotational	"	6.041e-006	1.420e-005
o Isotropic	"	5.313e-006	1.238e-005

Print

MicroShield v6.02 (6.02-00039)
AQ_Safety,_Inc.

	:1
File	:Ra-226SoilConcrete.ms6
Date	: May 25, 2011
Time	: 2:40:34 PM
tion	: 00:00:00

File Ref	:
Date	:
By	:
Checked	:

Case Title: Ra-226+found
Description: Ra-226 chain plus 15 cm foundation
Geometry: 16 - Infinite Slab

Source Dimensions:

Thickness	15.0 cm	(5.9 in)

Dose Points

A	X	Y	Z
# 1	130 cm	0 cm	0 cm
	4 ft 3.2 in	0.0 in	0.0 in

Shields

Shield N	Dimension	Material	Density
Source	Infinite	ANS soil 2011	1.5
Shield 1	15.0 cm	Concrete	2.1
Air Gap		Air	0.00122

Source Input : Grouping Method - Standard Indices
Number of Groups : 25
Lower Energy Cutoff : 0.015
Photons < 0.015 : Included
Library : Grove

Nuclide	_Ci/cm_	Bq/cm_
Bi-210	1.5206e-006	5.6261e-002
Bi-214	1.4997e-006	5.5489e-002
Pb-210	1.5205e-006	5.6260e-002
Pb-214	1.4997e-006	5.5489e-002
Po-210	1.5209e-006	5.6274e-002
Po-214	1.4994e-006	5.5478e-002
Po-218	1.5000e-006	5.5500e-002
Ra-226	1.5000e-006	5.5500e-002
Rn-222	1.5000e-006	5.5500e-002

Buildup : The material reference is - Shield 1
Integration Parameters

Energy MeV	Activity Photons/sec	Results Fluence Rate MeV/cm_/sec No Buildup	Fluence Rate MeV/cm_/sec With Buildup	Exposure Rate mR/hr No Buildup	Exposure Rate mR/hr With Buildup
0.015	2.191e-02	0.000e+00	0.000e+00	0.000e+00	0.000e+00
0.05	2.892e-03	1.168e-10	6.039e-10	3.112e-13	1.609e-12
0.08	1.279e-02	4.030e-07	5.306e-06	6.377e-10	8.396e-09
0.1	7.532e-05	9.805e-09	1.760e-07	1.500e-11	2.693e-10
0.2	5.977e-03	1.053e-05	2.366e-04	1.859e-08	4.177e-07
0.3	1.145e-02	6.703e-05	1.252e-03	1.272e-07	2.375e-06
0.4	2.123e-02	2.825e-04	4.237e-03	5.505e-07	8.256e-06
0.5	9.912e-04	2.464e-05	3.058e-04	4.836e-08	6.002e-07
0.6	2.675e-02	1.099e-03	1.153e-02	2.144e-06	2.251e-05
0.8	5.244e-03	4.689e-04	3.685e-03	8.919e-07	7.008e-06
1.0	1.737e-02	2.804e-03	1.775e-02	5.170e-06	3.272e-05
1.5	1.056e-02	4.801e-03	2.050e-02	8.078e-06	3.450e-05
2.0	1.485e-02	1.342e-02	4.597e-02	2.075e-05	7.108e-05
Totals	**1.521e-01**	**2.298e-02**	**1.055e-01**	**3.778e-05**	**1.795e-04**

MicroShield v6.02 (6.02-00039)
AQ_Safety,_Inc.
Conversion of calculated exposure in air to dose
FILE: C:\Program Files\MicroShield\Examples\casefiles\Ra-226SoilConcrete.ms6
Case Title: Ra-226+found
This case was run on Wednesday, May 25, 2011 at 2:40:34 PM
Dose Point # 1 - (130,0,0) cm

Results (Summed over energies)	Units	Without Buildup	With Buildup
Photon Fluence Rate (flux)	Photons/cm2/sec	1.617e-002	9.486e-002
Photon Energy Fluence Rate	MeV/cm2/sec	2.298e-002	1.055e-001
Exposure and Dose Rates:			
Exposure Rate in Air	mR/hr	3.778e-005	1.795e-004
Absorbed Dose Rate in Air	mGy/hr	3.299e-007	1.567e-006
"	mrad/hr	3.299e-005	1.567e-004
Deep Dose Equivalent Rate	(ICRP 51 - 1987)		
o Parallel Geometry	mSv/hr	3.761e-007	1.805e-006
o Opposed	"	3.278e-007	1.540e-006
o Rotational	"	3.278e-007	1.540e-006
o Isotropic	"	2.943e-007	1.378e-006
Shallow Dose Equivalent Rate	(ICRP 51 - 1987)		
o Parallel Geometry	mSv/hr	3.955e-007	1.901e-006
o Opposed	"	3.826e-007	1.831e-006
o Rotational	"	3.826e-007	1.831e-006
o Isotropic	"	3.083e-007	1.451e-006
Effective Dose Equivalent Rate	(ICRP 51 - 1987)		
o Anterior/Posterior Geometry	mSv/hr	3.383e-007	1.617e-006
o Posterior/Anterior	"	3.138e-007	1.482e-006
o Lateral	"	2.547e-007	1.179e-006
o Rotational	"	2.840e-007	1.337e-006
o Isotropic	"	2.533e-007	1.181e-006

Date: 5-25-2011

To: Nels Johnson

From: Rick Haaker

Subject Microsohield Calculations of Exposure rate and dose equivalent rate

---

On May 10 , 2009 I provided a technical memo entitled *Response Estimates for a 2"x2" NaI Detector to Ra-226 That is Distributed in Soil.* The last paragraph of that memo was a discussion of conversion factors between soil concentration, exposure rate, and effective dose equivalent rate for the U-238 decay chain. This memo elaborates on that final paragraph. In determining the conversion factors, the geometry assumed was an infinite slab of soil having a thickness of 15 cm and a density of 1.5. A simplified soil composition derived from ANSI/ANS 6.6.1-19971 was used in the Microshield® 6.02 modeling2, see Table 1.

Table 1 Simplified Soil Composition from ANSI/ANS 6.6.1.

Element	Weight Percent
Hydrogen	0.954
Oxygen	54.4
Aluminum	12.9
Silicon	31.8

Three cases were considered for the Microshield calculations:

- an infinite slab of soil 15 cm thick containing U-238 plus progeny through Po-210 in decay equilibrium, and
- an infinite slab of soil 15 cm thick containing Ra-226 plus progeny through Po-210 in decay equilibrium.
- an infinite slab of soil 15 cm thick containing Ra-226 plus progeny through Po-210 in decay equilibrium covered by a 15-cm thick concrete foundation.
-

A circular slab of uniformly contaminated soil that is 20 meters in diameter is approximately "infinite" with respect to the Microshield calculations. Microshield also will also model other, non-infinite geometries.

Each time a Microshield calculation was performed, the corresponding "Conversion of Calculated Exposure in Air to Dose" report was generated via the Microshield software package.

Results for a U-238 at 1 pCi/g Plus Progeny

---

1 ANSI/ANS-6.6.1-1987, Calculation and Measurement of Direct and Scattered Gamma Radiation from LWR Nuclear Power Plants. American Nuclear Society, La Grange Park, Il, 1987.

2 Microshield 6.02, Grove Engineering, Framatone ANP, Rockville, MD, 2003.

Table 2 provides results for the U-238 decay chain

Table 2. Results for 1 pCi/g U-238 with decay chain in equilibrium

Exposure rate	1.948 μR/h
EDE rate in isotropic field	1.252 μREM/hr
Ratio	1.56 μR/μREM

Results for a Ra-226 at 1 pCi/g Plus Progeny

Table 3 provides results for the Ra-226 decay chain

Table 3. Results for 1 pCi/g Ra-226 with decay chain in equilibrium

Exposure rate	1.925 μR/h
EDE rate in isotropic field	1.238 μREM/hr
Ratio	1.55 μR/μREM

Results for a Ra-226 at 1 pCi/g Plus Progeny and 15 cm Foundation

Table 4 provides results for the Ra-226 decay chain assuming a 15 cm thick concrete foundation covers the entire site.

Table 4. Results for 1 pCi/g Ra-226 with decay chain in equilibrium plus concrete foundation.

Exposure rate	0.1795 μR/h
EDE rate in isotropic field	0.1181 μREM/hr
Ratio	1.52 μR/μREM

Use of estimates indoors

A house is a complicated object, it is constructed of materials that serve to shield the occupant to some degree from the terrestrial gamma radiation field. The degree of shielding that a structure provides an occupant will depend on the materials of construction, their thickness and radiation attenuating properties and other factors.

The RESRAD software package3 accounts for external radiation attenuation by a structure via an external radiation transmission factor, and the RESRAD default value of 0.7 was used for all RESRAD calculations we have performed; this is probably a reasonable value for frame houses. Another source, NCRP Report 94 suggests an external gamma transmission factor of 0.8.4

As a limiting case, a Microshield calculation was performed assuming a 15-cm thick concrete foundation covers the infinite slab of contaminated soil. The μR/μREM ratio decreased insignificantly to 1.52 μR/μREM; see Table 4. Thus it is concluded that any attenuation of external gamma radiation, which is caused by the structure will affect EDE and exposure to a similar degree.

In addition, the materials of construction will contain Ra-226, Ra-228, and K-40, and these will contribute to the external dose of an occupant to some degree. NCRP Report 94 reports that in Europe where masonry houses are prevalent, the structural materials increase indoor gamma radiation exposures by about 20% relative to terrestrial background.

Limitations of estimates

These estimates utilize Microshield 6.02, and so they inherit all of its limitations. Microshield quickly does simple radiation attenuation and build-up calculations, which otherwise would be tedious to do in a spreadsheet. It does not account for:

- surface roughness,
- bremstrahlung arising from beta emitters,
- more than one radiation source at a time,
- complicated radiation behaviors like backscatter or skyshine, or
- dose buildup in more than one model element at a time.

Equilibrium in the decay chain has been assumed, comparison of table 2 and table 3 shows that the amount of U-238 through U-234 in the chain is unimportant. Some radon (Rn-222) is usually lost from near surface soil and this may cause both the external EDE rate and exposure rates to be lower per pCi/g of Ra-226 than have been estimated.

---

3 C. Yu et al. ,User's Manual for RESRAD Version 6, ANL/EAD-4, Argonne National Laboratory, Argonne, IL, 2001.

4 Exposure of the Population of the United States and Canada from Natural Background Radiation, NCRP Report 94, National Council on Radiation Protection and Measurements. Bethesda, MD, 1992.

Date: 5-25-2011

To: Nels Johnson

From: Rick Haaker

Subject Microsohield Calculations of Exposure rate and dose equivalent rate

---

On May 10 , 2009 I provided a technical memo entitled *Response Estimates for a 2"x2" NaI Detector to Ra-226 That is Distributed in Soil.* The last paragraph of that memo was a discussion of conversion factors between soil concentration, exposure rate, and effective dose equivalent rate for the U-238 decay chain. This memo elaborates on that final paragraph. In determining the conversion factors, the geometry assumed was an infinite slab of soil having a thickness of 15 cm and a density of 1.5. A simplified soil composition derived from ANSI/ANS 6.6.1-19971 was used in the Microshield® 6.02 modeling2, see Table 1.

Table 1 Simplified Soil Composition from ANSI/ANS 6.6.1.

Element	Weight Percent
Hydrogen	0.954
Oxygen	54.4
Aluminum	12.9
Silicon	31.8

Three cases were considered for the Microshield calculations:

- an infinite slab of soil 15 cm thick containing U-238 plus progeny through Po-210 in decay equilibrium; and
- an infinite slab of soil 15 cm thick containing Ra-226 plus progeny through Po-210 in decay equilibrium.
- an infinite slab of soil 15 cm thick containing Ra-226 plus progeny through Po-210 in decay equilibrium covered by a 15-cm thick concrete foundation.
-

A circular slab of uniformly contaminated soil that is 20 meters in diameter is approximately "infinite" with respect to the Microshield calculations. Microshield also will also model other, non-infinite geometries.

Each time a Microshield calculation was performed, the corresponding "Conversion of Calculated Exposure in Air to Dose" report was generated via the Microshield software package.

Results for a U-238 at 1 pCi/g Plus Progeny

Table 2 provides results for the U-238 decay chain

Table 2. Results for 1 pCi/g U-238 with decay chain in equilibrium

---

1 ANSI/ANS-6.6.1-1987, Calculation and Measurement of Direct and Scattered Gamma Radiation from LWR Nuclear Power Plants. American Nuclear Society, La Grange Park, Il, 1987.

2 Microshield 6.02, Grove Engineering, Framatone ANP, Rockville, MD, 2003.

Exposure rate	1.948 μR/h
EDE rate in isotropic field	1.252 μREM/hr
Ratio	1.56 μR/μREM

Results for a Ra-226 at 1 pCi/g Plus Progeny

Table 3 provides results for the Ra-226 decay chain

Table 3. Results for 1 pCi/g Ra-226 with decay chain in equilibrium

Exposure rate	1.925 μR/h
EDE rate in isotropic field	1.238 μREM/hr
Ratio	1.55 μR/μREM

Results for a Ra-226 at 1 pCi/g Plus Progeny and 15 cm Foundation

Table 4 provides results for the Ra-226 decay chain assuming a 15 cm thick concrete foundation covers the entire site.

Table 4. Results for 1 pCi/g Ra-226 with decay chain in equilibrium plus concrete foundation.

Exposure rate	0.1795 μR/h
EDE rate in isotropic field	0.1181 μREM/hr
Ratio	1.52 μR/μREM

Use of estimates indoors

A house is a complicated object, it is constructed of materials that serve to shield the occupant to some degree from the terrestrial gamma radiation field. The degree of shielding that a structure provides an occupant will depend on the materials of construction, their thickness and radiation attenuating properties and other factors.

The RESRAD software package3 accounts for external radiation attenuation by a structure via an external radiation transmission factor, and the RESRAD default value of 0.7 was used for all RESRAD calculations we have performed; this is probably a reasonable value for frame houses.

3 C. Yu et al. ,User's Manual for RESRAD Version 6, ANL/EAD-4, Argonne National Laboratory, Argonne, IL, 2001.

Another source, NCRP Report 94 suggests an external gamma transmission factor of 0.8.4

As a limiting case, a Microshield calculation was performed assuming a 15-cm thick concrete foundation covers the infinite slab of contaminated soil. The μR/μREM ratio decreased insignificantly to 1.52 μR/μREM; see Table 4. Thus it is concluded that any attenuation of external gamma radiation, which is caused by the structure will affect EDE and exposure to a similar degree.

In addition, the materials of construction will contain Ra-226, Ra-228, and K-40, and these will contribute to the external dose of an occupant to some degree. NCRP Report 94 reports that in Europe where masonry houses are prevalent, the structural materials increase indoor gamma radiation exposures by about 20% relative to terrestrial background.

Limitations of estimates

These estimates utilize Microshield 6.02, and so they inherit all of its limitations. Microshield quickly does simple radiation attenuation and build-up calculations, which otherwise would be tedious to do in a spreadsheet. It does not account for:

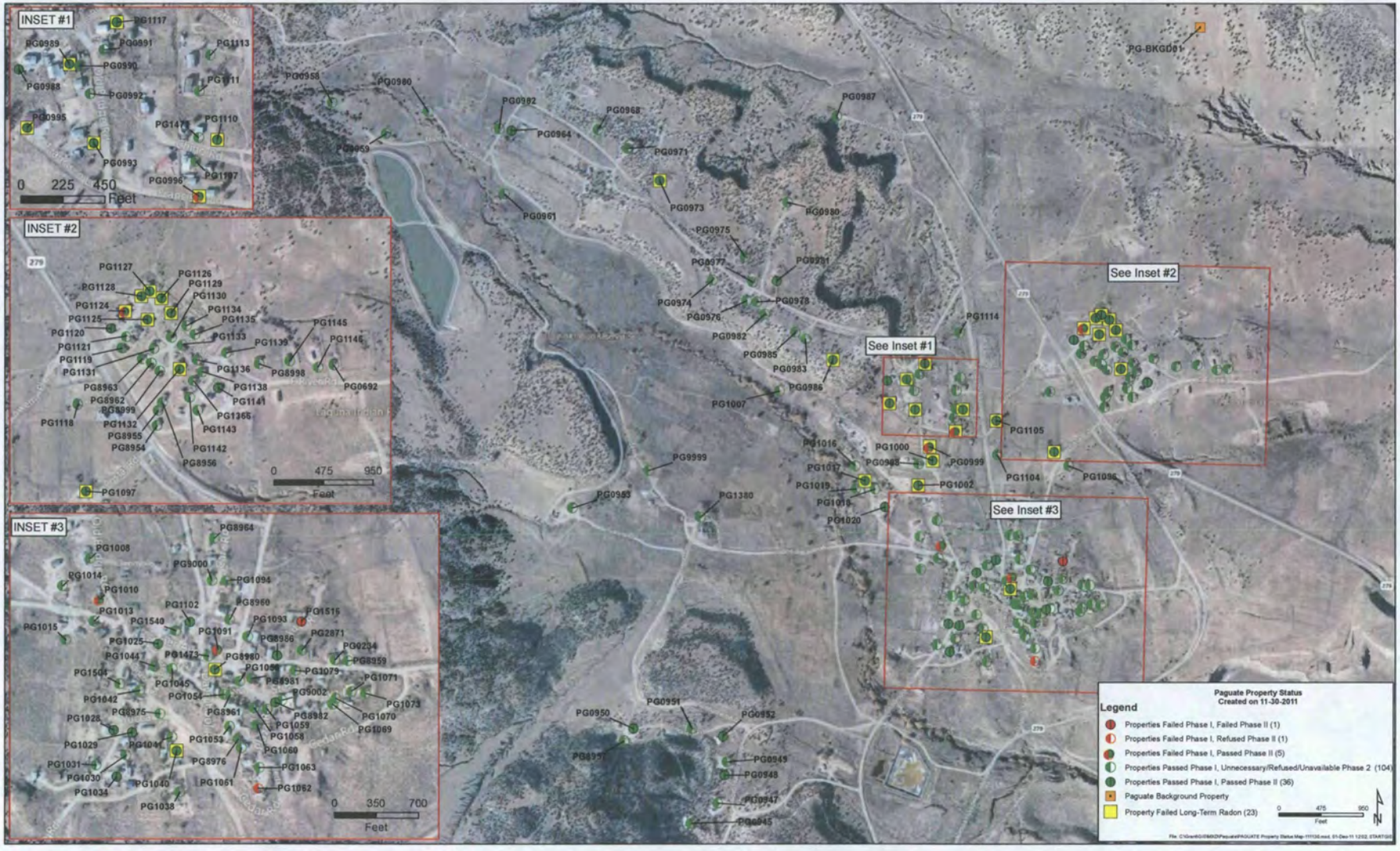
- surface roughness,
- bremstrahlung arising from beta emitters,
- more than one radiation source at a time,
- complicated radiation behaviors like backscatter or skyshine, or
- dose buildup in more than one model element at a time.

Equilibrium in the decay chain has been assumed, comparison of table 2 and table 3 shows that the amount of U-238 through U-234 in the chain is unimportant. Some radon (Rn-222) is usually lost from near surface soil and this may cause both the external EDE rate and exposure rates to be lower per pCi/g of Ra-226 than have been estimated.

4 Exposure of the Population of the United States and Canada from Natural Background Radiation, NCRP Report 94, National Council on Radiation Protection and Measurements. Bethesda, MD, 1992.

APPENDIX F

GRAPHIC, SPATIAL REPRESENTATION OF PHASE 1 AND PHASE 2 RESULTS

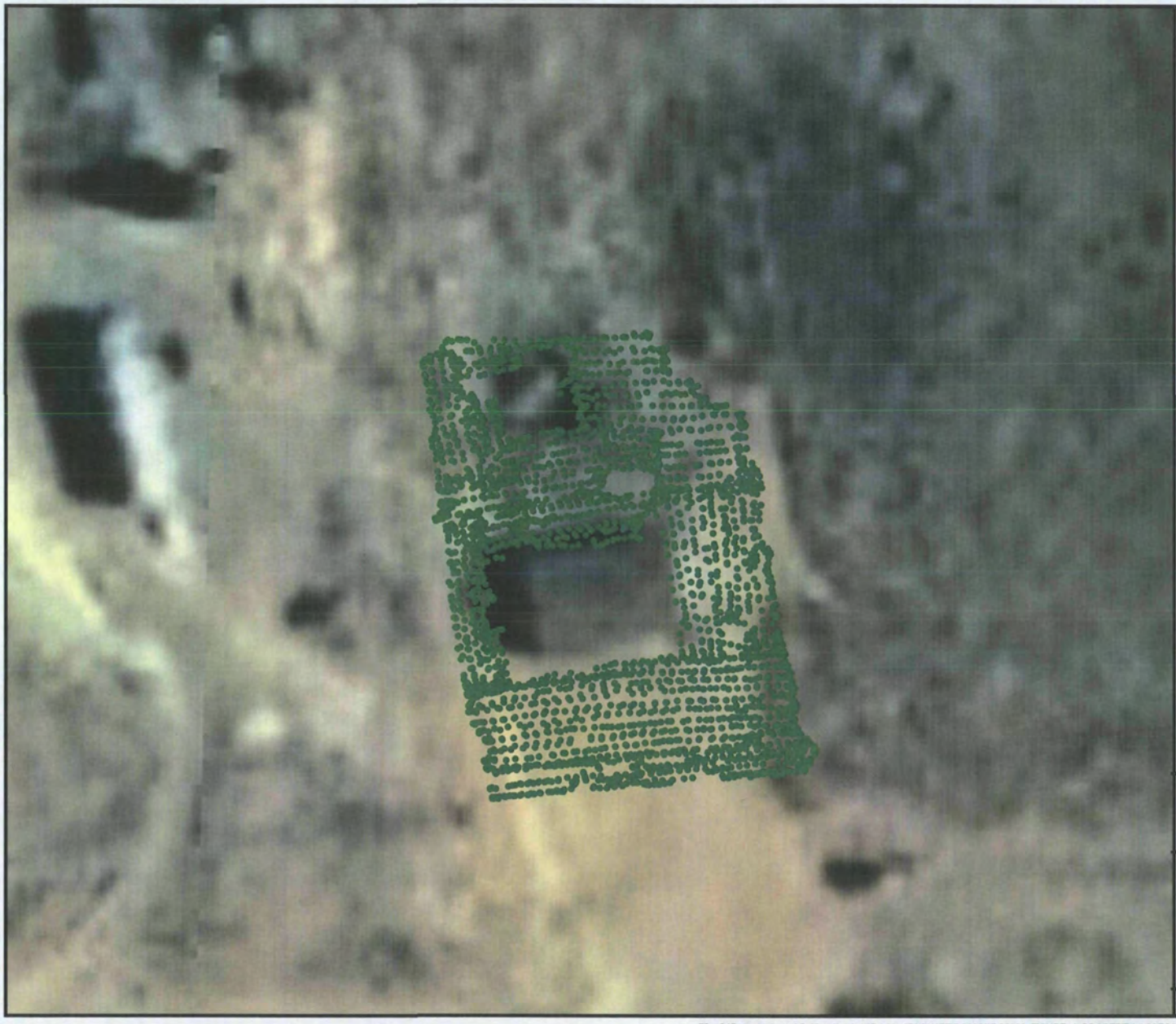

INSET #1
0 225 450 Feet
INSET #2
0 475 950 Feet
INSET #3
0 350 700 Feet
See Inset #1
See Inset #2
See Inset #3
Paguate Property Status
Created on 11-30-2011
Legend
Properties Failed Phase I, Failed Phase II (1)
Properties Failed Phase I, Refused Phase II (1)
Properties Failed Phase I, Passed Phase II (5)
Properties Passed Phase I, Unnecessary/Refused/Unavailable Phase 2 (104)
Properties Passed Phase I, Passed Phase II (36)
Paguate Background Property
Property Failed Long-Term Radon (23)
0 475 950 Feet
N

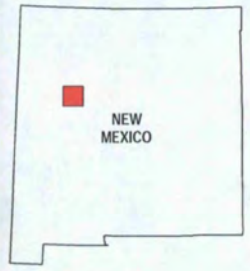
Rapid Assessment Tool Maps
Part 1

PG0234

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG0234\PG0234_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 28-Sep-10 08:24, busterp

PG0692





Legend

PG0692

Results

- 0 - 9670

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG0692
ASSESSMENT DATE: 03/30/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
SEPT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG0692\PG0692_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 28-Sep-10 09:02, busterp

PG0945

Legend

PG0945

Results

- 0 - 10701

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG0945
ASSESSMENT DATE: 04/27/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
SEPT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG0945\PG0945_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 28-Sep-10 09:32, busterp

PG0947

Legend

PG0947

Results

- 0 - 11680
- 11687

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG0947
ASSESSMENT DATE: 05/10/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
SEPT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG0947\PG0947_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 28-Sep-10 10:39, busterp

PG0948

Legend

PG0948

Results

- 0 - 11404

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG0948
ASSESSMENT DATE: 04/27/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
SEPT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG0948\PG0948_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 28-Sep-10 11:11, busterp

PG0949

Legend

PG0949

Results

- 0 - 11680
- 11681 - 12681
- 12682 - 12999
- 13134; 13163

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA (OAK CANYON)
URANIUM ASSESSMENT
PROPERTY - PG0949
ASSESSMENT DATE: 4/30/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
NOV 2010	20406.012.005.0538.01	AS SHOWN

File: \\fsnm01\Operations\Field Data\TDD-OAK CANYON\PAGUATE\PG0949\PG0949_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 08-Nov-10 15:25, STARTGIS

PG0950

File: \\fsnm01\Operations\Field Data\TDD-OAK CANYON\PAGUATE\PG0950\PG0950_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 08-Nov-10 15:49, STARTGIS

PG0951

Legend

PG0951

Results

- 0 - 11680
- 11681 - 12681
- 12691

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG0951
ASSESSMENT DATE: 04/26/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
SEPT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG0951\PG0951_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 28-Sep-10 12:32, busterp

PG0952

Legend

PG0952

Results

- 0 - 11680
- 11681 - 12681

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG0952
ASSESSMENT DATE: 04/26/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
SEPT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG0952\PG0952_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 29-Sep-10 08:26, busterp

PG0953

Legend

PG0953

Results

- 0 - 11437

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

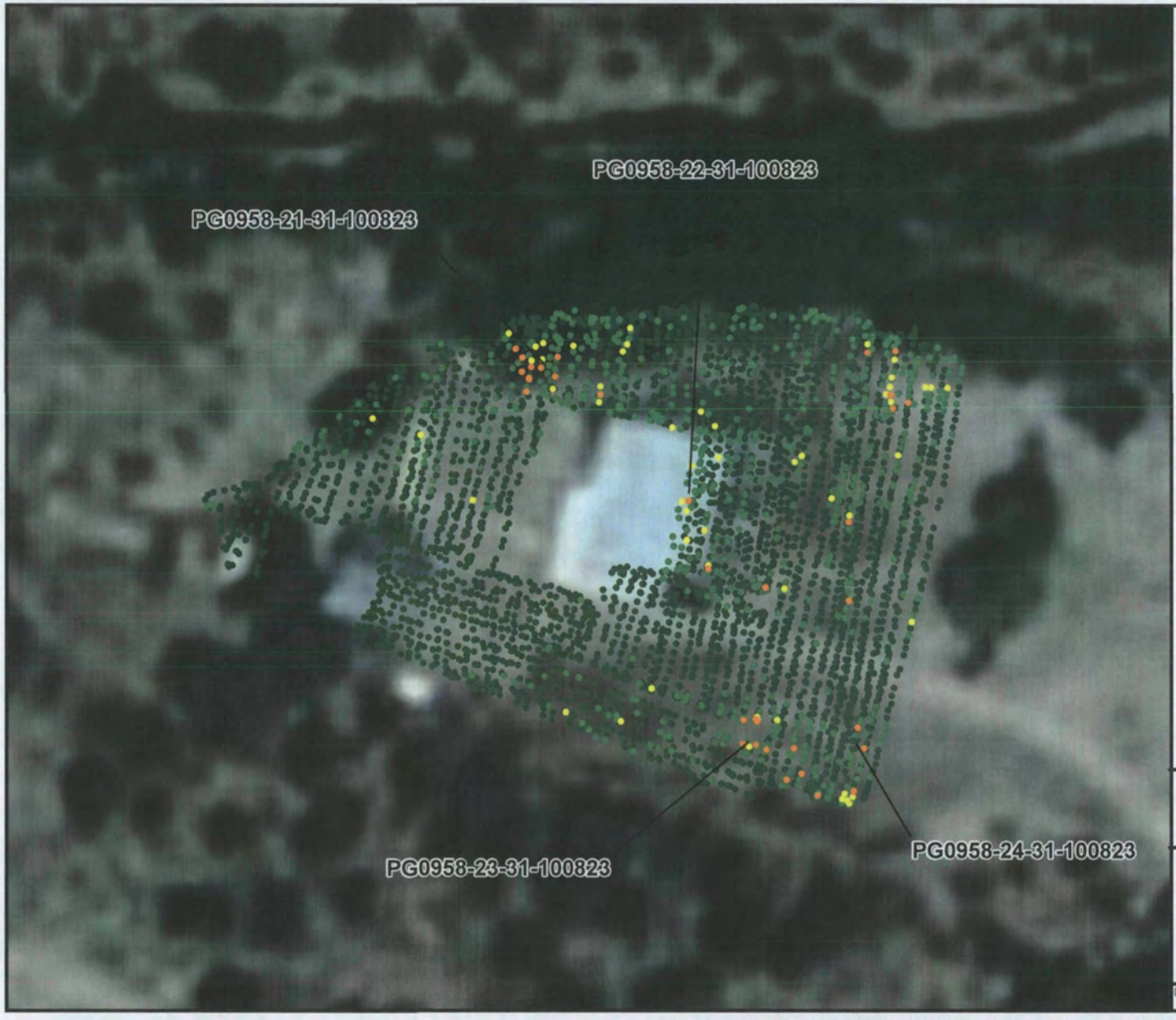
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG0953
ASSESSMENT DATE: 04/22/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
SEPT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG0953\PG0953_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 29-Sep-10 09:03, busterp

PG0958



Legend

PG0958

Results

- 0 - 11680
- 11681 - 12681
- 12682 - 12999
- 13000 - 13976

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA (OAK CANYON)
URANIUM ASSESSMENT
PROPERTY - PG0958
ASSESSMENT DATE: 4/13/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
NOV 2010	20406.012.005.0538.01	AS SHOWN

File: \\fsnm01\Operations\Field Data\TDD-OAK CANYON\PAGUATE\PG0958\PG0958_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 09-Nov-10 10:30, STARTGIS

PG0959

Legend

PG0959

Results

- 0 - 11680
- 11681 - 12681
- 12682 - 12999

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA (OAK CANYON)
URANIUM ASSESSMENT
PROPERTY - PG0959
ASSESSMENT DATE: 4/08/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
NOV 2010	20406.012.005.0538.01	AS SHOWN

File: \\fsnm01\Operations\Field Data\TDD-OAK CANYON\PAGUATE\PG0959\PG0959_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 09-Nov-10 11:43, STARTGIS

PG0960

Legend

PG0960

Results

- 0 - 11680
- 11681 - 12681
- 12682 - 12999
- 13000 - 14999

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG0960
ASSESSMENT DATE: 04/12/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
SEPT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG0960\PG0960_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 29-Sep-10 10:07, busterp

PG0961

Legend

PG0961

Results

- 0 - 11680
- 11681 - 12681
- 12682 - 12999
- 13000 - 14018

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG0961
ASSESSMENT DATE: 04/10/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
SEPT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG0961\PG0961_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 29-Sep-10 10:52, busterp

PG0962

Legend

PG0962

Results

- 0 - 11680
- 11681 - 12681
- 12682 - 12999
- 13000 - 14999
- 15605

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG0962
ASSESSMENT DATE: 03/25/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
SEPT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG0962\PG0962_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 29-Sep-10 11:58, busterp

PG0964

Legend

PG0964

Results

- 0 - 11680
- 11952

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG0964
ASSESSMENT DATE: 04/21/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
SEPT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG0964\PG0964_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 29-Sep-10 12:59, busterp

PG0968

Legend

PG0968

Results

- 0 - 10301

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

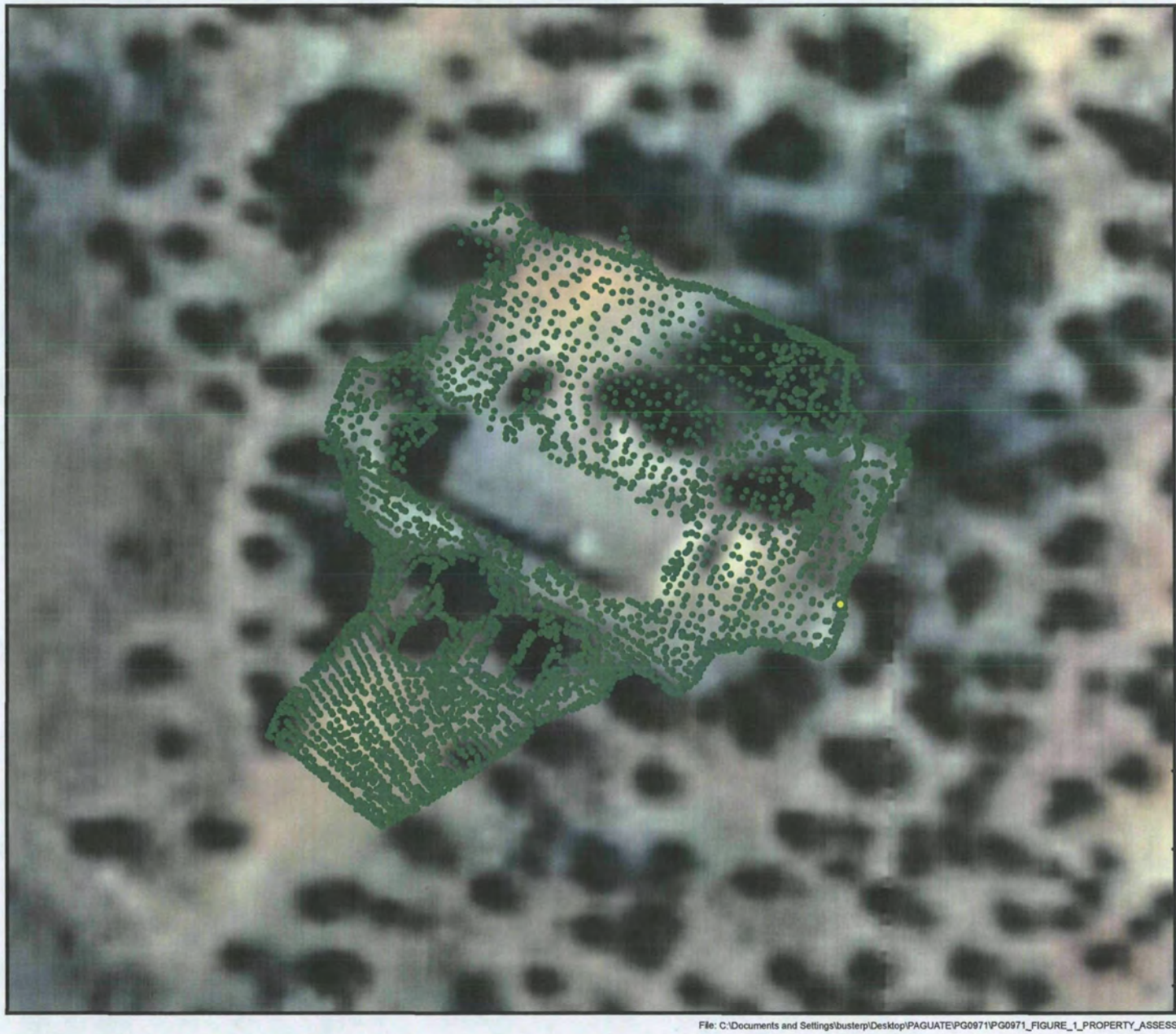
US EPA REGION 6
START- 3

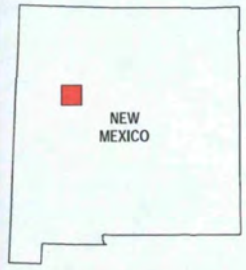
FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG0968
ASSESSMENT DATE: 09/30/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG0968\PG0968_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 01-Oct-10 07:59, busterp

PG0971





Legend

PG0971

Results

- 0 - 11680
- 11681 - 12681
- 13024

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG0971
ASSESSMENT DATE: 04/3/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
SEPT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG0971\PG0971_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 29-Sep-10 13:49, busterp

PG0973

Legend

PG0973

Results

- 0 - 11113

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG0973
ASSESSMENT DATE: 04/14/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
SEPT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG0973\PG0973_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 29-Sep-10 14:27, busterp

PG0974

Legend

PG0974

Results

- 0 - 11639

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG0974
ASSESSMENT DATE: 04/16/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG0974\PG0974_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 01-Oct-10 09:02, busterp

PG0975

Legend

PG0975

Results

- 0 - 11680
- 11681 - 12681
- 12695

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

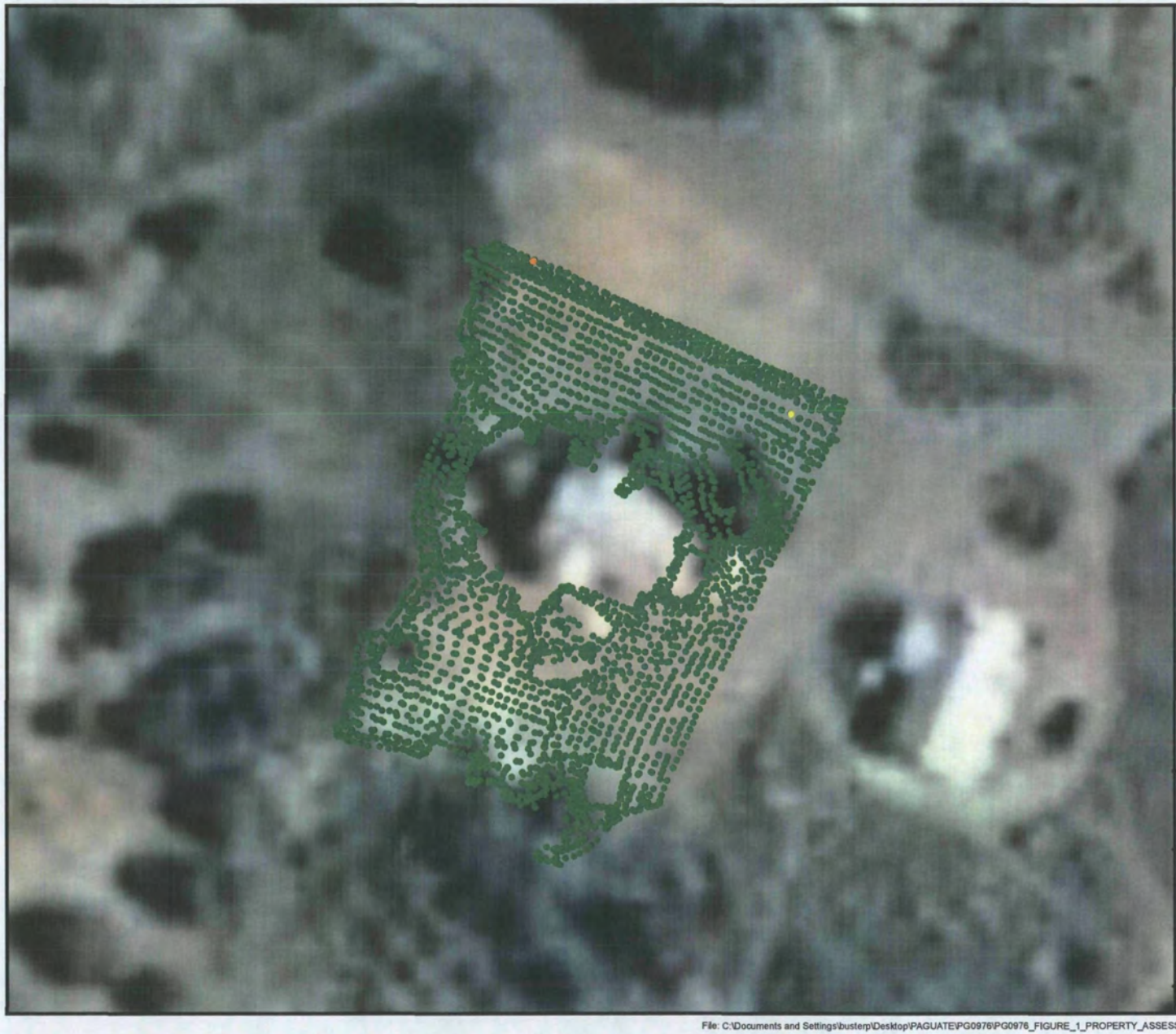
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG0975
ASSESSMENT DATE: 03/31/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG0975\PG0975_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 01-Oct-10 10:15, busterp

PG0976



Legend

PG0976

Results

- 0 - 11680
- 11681 - 12681
- 12682 - 12999
- 13325

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG0976
ASSESSMENT DATE: 04/1/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\buserp\Desktop\PAGUATE\PG0976\PG0976_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 01-Oct-10 11:07, buserp

PG0977

Legend

PG0977

Results

- 0 - 11680
- 11681 - 12681

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG0977
ASSESSMENT DATE: 03/29/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG0977\PG0977_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 04-Oct-10 07:56, busterp

PG0978

Legend

PG0978

Results

- 0 - 11680
- 11681 - 12681
- 12682 - 12999
- 13000 - 14253

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA (OAK CANYON)
URANIUM ASSESSMENT
PROPERTY - PG0978
ASSESSMENT DATE: 11/01/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
DEC 2010	20406.012.005.0538.01	AS SHOWN

File: \\fsnm01\Operations\Field Data\TDD-OAK CANYON\PAGUATE\PG0978\PG0978_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 08-Dec-11 10:21, STARTGIS

PG0980

Legend

PG0980

Results

- 0 -11338

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG0980
ASSESSMENT DATE: 04/14/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG0980\PG0980_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 04-Oct-10 09:48, busterp

PG0981

Legend

PG0981

Results

- 0 - 11680
- 11681 - 12681

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG0981
ASSESSMENT DATE: 03/30/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG0981\PG0981_FIGURE_1_PROPERTY_ASSESSMENT_ASSESSMENT_MAP.mxd, 04-Oct-10 11:03, busterp

PG0982

Legend

PG0982

Results

- 0 - 10938

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

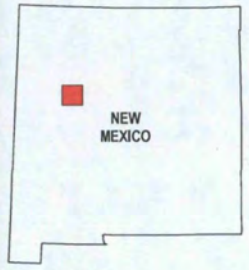
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG0982
ASSESSMENT DATE: 04/05/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG0982\PG0982_FIGURE_1_PROPERTY_ASSESSMENT_ASSESSMENT_MAP.mxd, 04-Oct-10 13:16, busterp

PG0983



Legend

PG0983

Results

- 0 - 11680
- 11681 - 12681

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

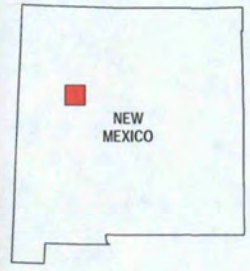
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG0983
ASSESSMENT DATE: 03/25/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG0983\PG0983_FIGURE_1_PROPERTY_ASSESSMENT_ASSESSMENT_MAP.mxd, 04-Oct-10 13:42, busterp

PG0985



Legend

PG0985

Results

- 0 - 11680
- 11681 - 11681 - 12681

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

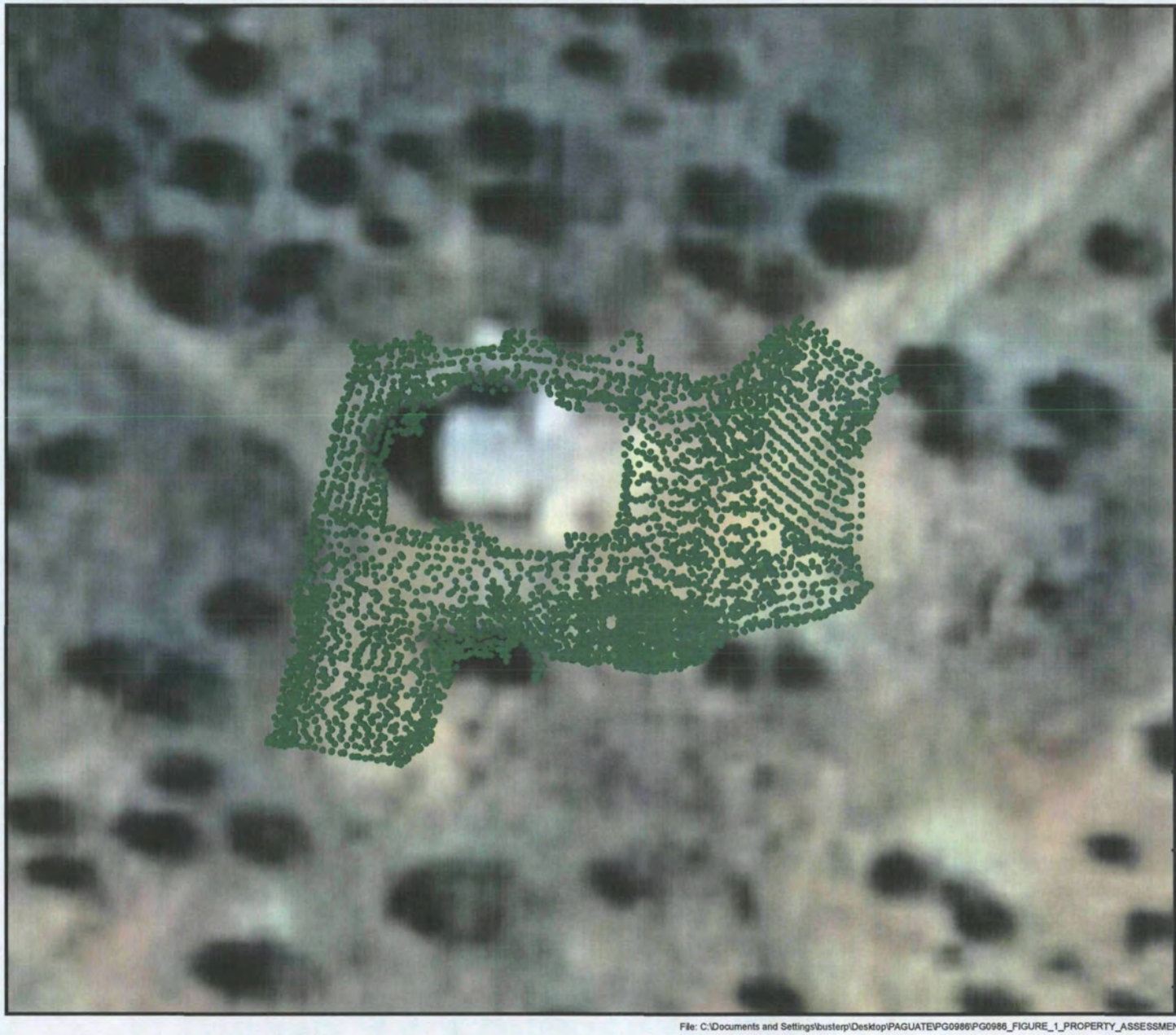
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG0985
ASSESSMENT DATE: 03/26/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG0985\PG0985_FIGURE_1_PROPERTY_ASSESSMENT_ASSESSMENT_MAP.mxd, 04-Oct-10 15:53, busterp

PG0986



Legend

PG0986

Results

- 0 - 11680
- 11681 - 12681

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG0986
ASSESSMENT DATE: 03/27/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG0986\PG0986_FIGURE_1_PROPERTY_ASSESSMENT_ASSESSMENT_MAP.mxd, 05-Oct-10 06:44, busterp

PG0987

Legend

PG0987

Results

- 0 - 10760

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

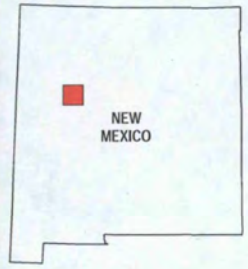
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG0987
ASSESSMENT DATE: 05/11/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG0987\PG0987_FIGURE_1_PROPERTY_ASSESSMENT_ASSESSMENT_MAP.mxd, 05-Oct-10 07:16, busterp

PG0988



Legend

PG0988

Results

- 0 - 10494

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG0988
ASSESSMENT DATE: 04/28/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG0988\PG0988_FIGURE_1_PROPERTY_ASSESSMENT_ASSESSMENT_MAP.mxd, 05-Oct-10 07:37, busterp

PG0989

Legend

PG0989

Results

- 0 - 11181

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG0989
ASSESSMENT DATE: 05/05/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO.	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG0989\PG0989_FIGURE_1_PROPERTY_ASSESSMENT_ASSESSMENT_MAP.mxd, 05-Oct-10 09:56, busterp

PG0990

Legend

PG0990

Results

- 0 - 10053

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG0990
ASSESSMENT DATE: 05/03/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG0990\PG0990_FIGURE_1_PROPERTY_ASSESSMENT_ASSESSMENT_MAP.mxd, 05-Oct-10 12:26, busterp

PG0991

Legend

PG0991

Results

- 0 - 11680
- 11681 - 12681

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG0991
ASSESSMENT DATE: 04/10/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG0991\PG0991_FIGURE_1_PROPERTY_ASSESSMENT_ASSESSMENT_MAP.mxd, 05-Oct-10 13:12, busterp

PG0992

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG0992\PG0992_FIGURE_1_PROPERTY_ASSESSMENT_ASSESSMENT_MAP.mxd, 05-Oct-10 14:32, busterp

PG0993

Legend

PG0993

Results

- 0 - 11365

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

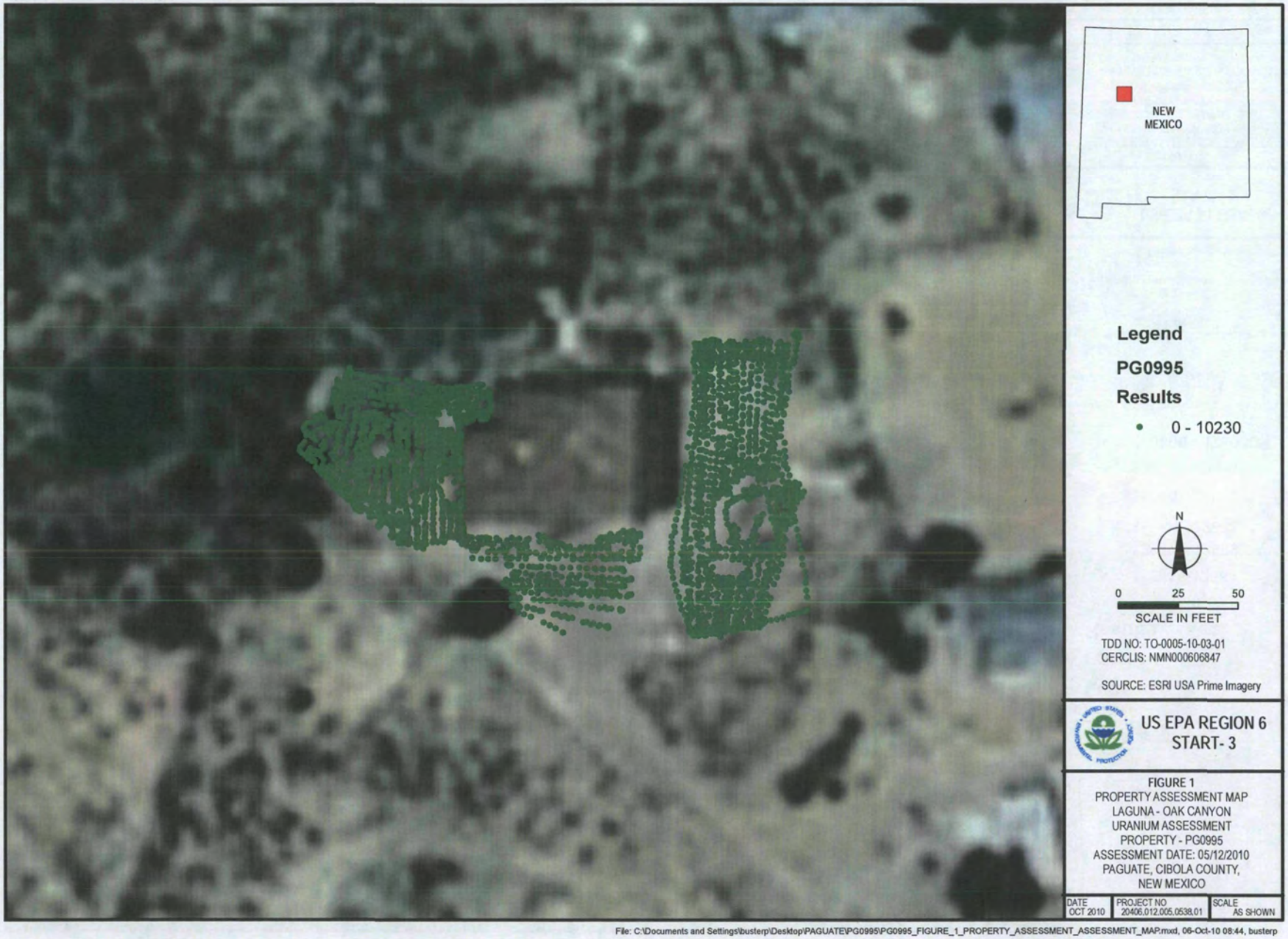
FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA (OAK CANYON)
URANIUM ASSESSMENT
PROPERTY - P0993
ASSESSMENT DATE: 4/24/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
DEC 2010	20406.012.005.0538.01	AS SHOWN

File: \\fsnm01\Operations\Field Data\TDD-OAK CANYON\PAGUATE\PG0993\PG0993_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 01-Dec-10 09:49, STARTGIS

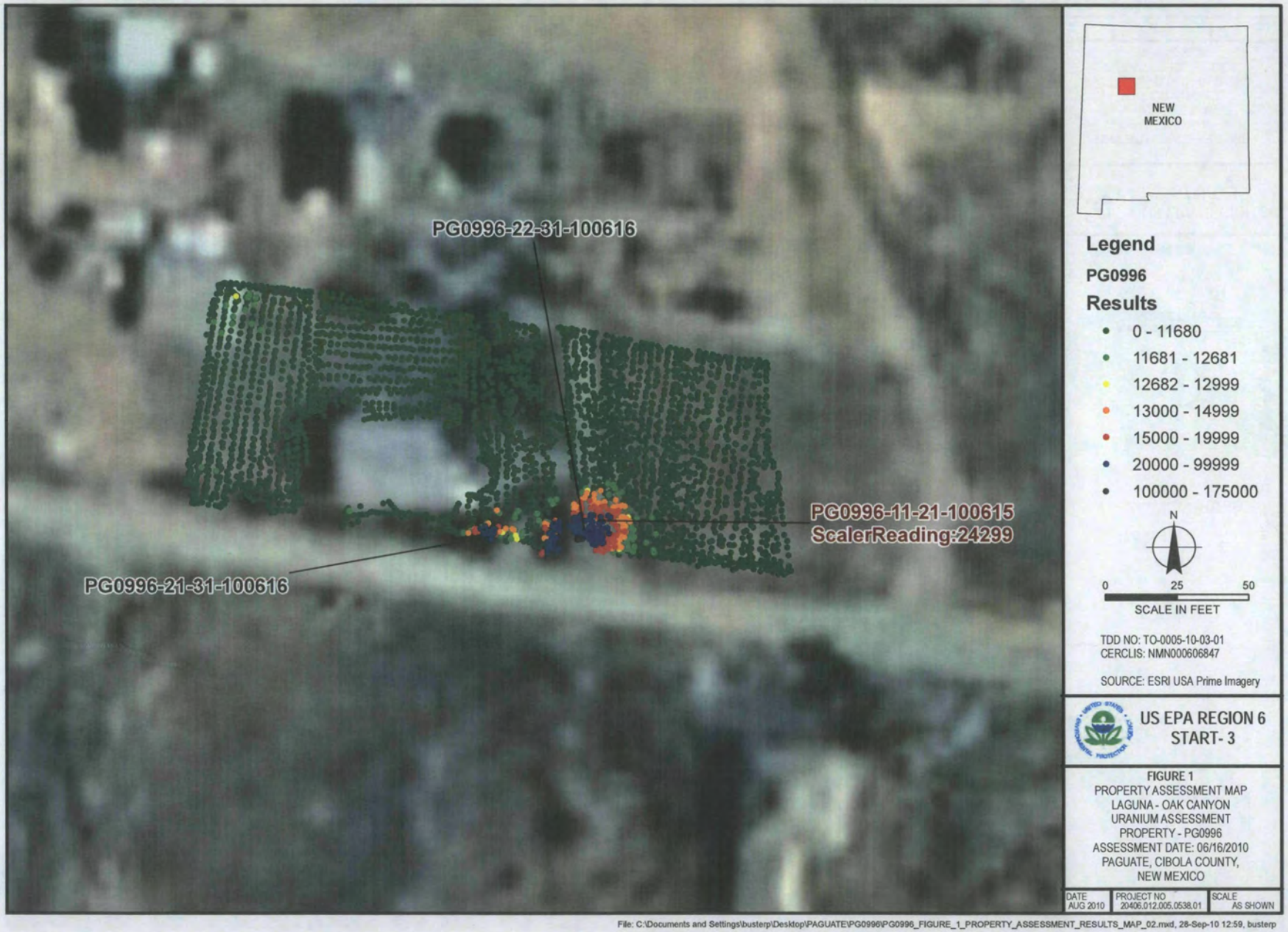
Rapid Assessment Tool Maps
Part 2

PG0995



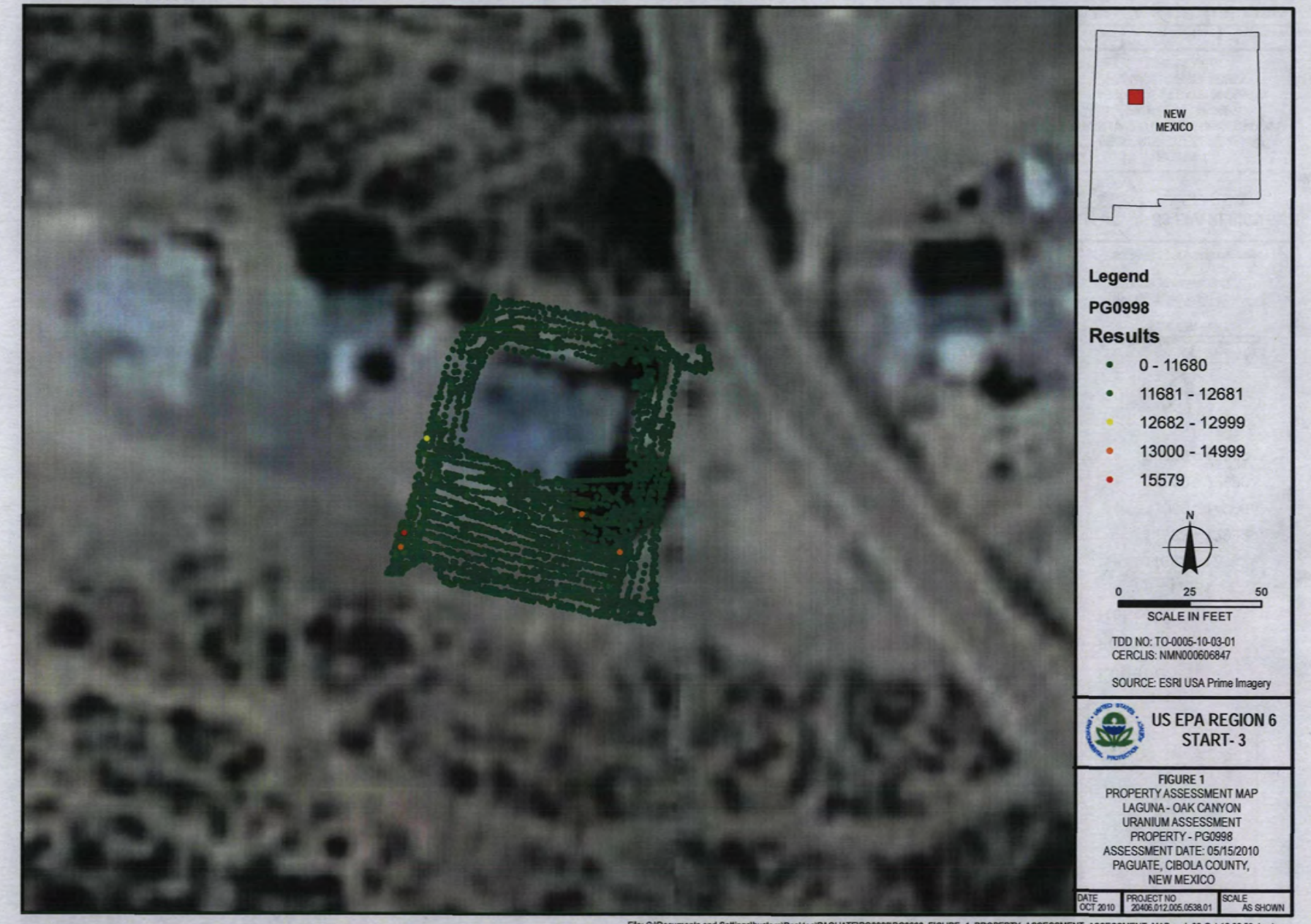
File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG0995\PG0995_FIGURE_1_PROPERTY_ASSESSMENT_ASSESSMENT_MAP.mxd, 06-Oct-10 08:44, busterp

PG0996



File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG0996\PG0996_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP_02.mxd, 28-Sep-10 12:59, busterp

PG0998



File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG0998\PG0998_FIGURE_1_PROPERTY_ASSESSMENT_ASSESSMENT_MAP.mxd, 06-Oct-10 08:56, busterp

PG0999

Legend

PG0999

Results

- 0 - 11681
- 11682 - 12682
- 12683 - 12999
- 13000 - 14999
- 15000 - 29999
- 30000 - 49999

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

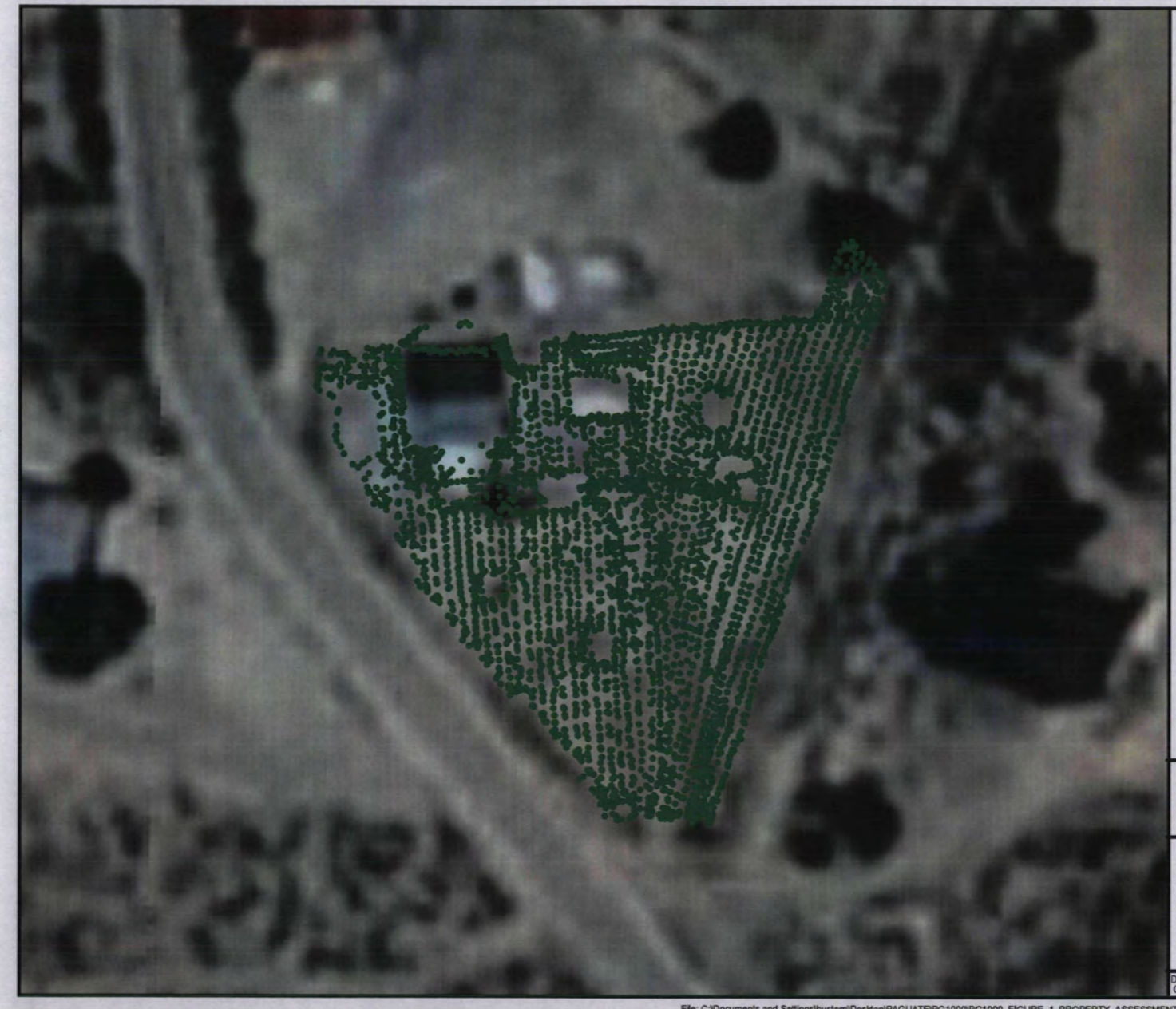
US EPA REGION 6
START- 3

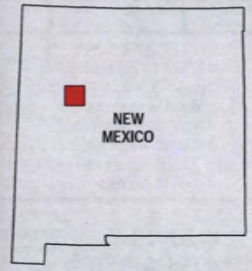
FIGURE 1
PROPERTY ASSESSMENT MAP
SAN MATEO URANIUM ASSESSMENT
PROPERTY - PG0999
ASSESSMENT DATE: 04/28/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
AUG 2010	20406.012.005.0538.01	AS SHOWN

File: \\snm01\Operations\Field Data\TDD-OAK CANYON\PAGUATE\PG0999\PG0999_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 20-Aug-10 15:00, STARTGIS

PG1000





Legend

PG1000

Results

- 0 - 10578

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1000
ASSESSMENT DATE: 04/28/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1000\PG1000_FIGURE_1_PROPERTY_ASSESSMENT_ASSESSMENT_MAP.mxd, 06-Oct-10 09:01, busterp

PG1002

Legend

PG1002

Results

- 0 - 10791

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

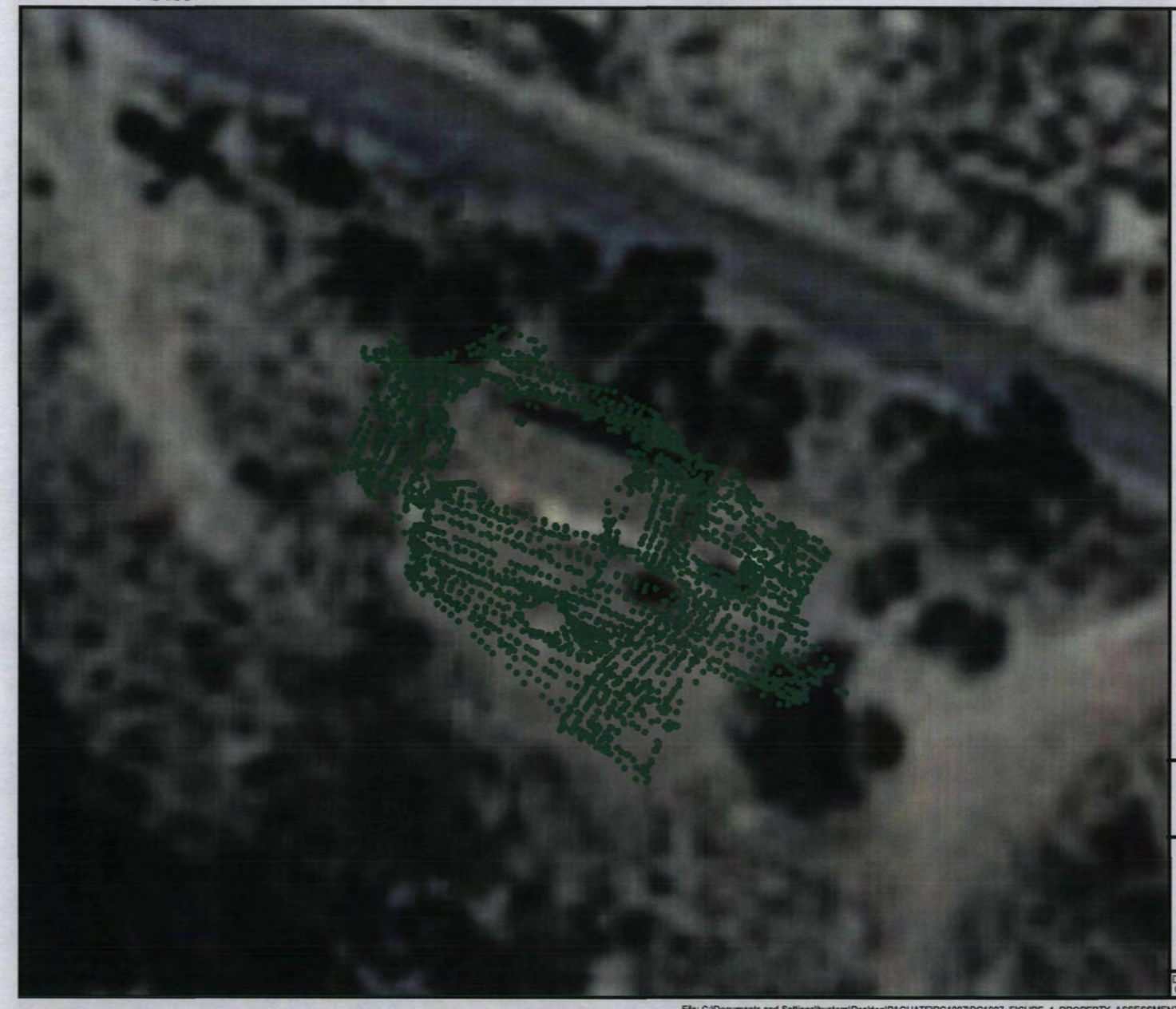
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1002
ASSESSMENT DATE: 05/07/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1002\PG1002_FIGURE_1_PROPERTY_ASSESSMENT_ASSESSMENT_MAP.mxd, 06-Oct-10 09:15, busterp

PG1007



Legend

PG1007

Results

- 0 - 11531

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1007
ASSESSMENT DATE: 04/07/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1007\PG1007_FIGURE_1_PROPERTY_ASSESSMENT_ASSESSMENT_MAP.mxd, 06-Oct-10 09:30, busterp

PG1008

Legend

PG1008

Results

- 0 - 11617

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

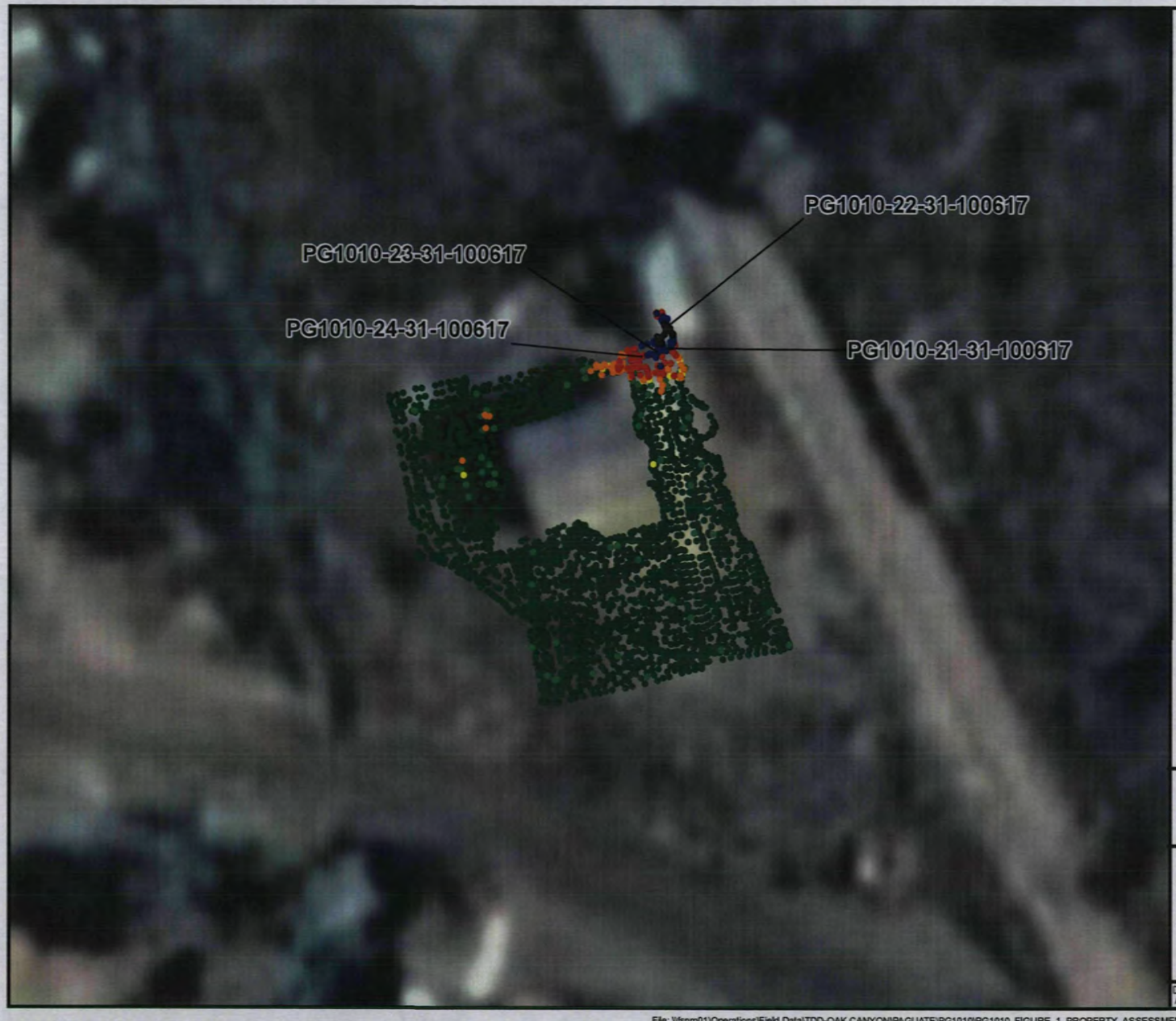
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1008
ASSESSMENT DATE: 04/14/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1008\PG1008_FIGURE_1_PROPERTY_ASSESSMENT_ASSESSMENT_MAP.mxd, 06-Oct-10 10:36, busterp

PG1010



Legend

PG1010

Results

- 0 - 11680
- 11681 - 12681
- 12682 - 12999
- 13000 - 14999
- 15000 - 29999
- 30000 - 49999
- 50000 - 75000

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
SAN MATEO URANIUM ASSESSMENT
PROPERTY - PG1010
ASSESSMENT DATE: 06/17/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
AUG 2010	20406.012.005.0538.01	AS SHOWN

File: \\fsnm01\Operations\Field Data\TDD-OAK CANYON\PAGUATE\PG1010\PG1010_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 02-Oct-10 11:42, STARTGIS

PG1013

Legend

PG1013

Results

- 0 - 11087

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

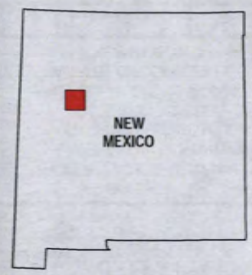
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1013
ASSESSMENT DATE: 04/09/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1013\PG1013_FIGURE_1_PROPERTY_ASSESSMENT_ASSESSMENT_MAP.mxd, 06-Oct-10 11:22, busterp

PG1014



Legend

PG1014

Results

- 0 - 11410

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1014
ASSESSMENT DATE: 04/12/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1014\PG1014_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 06-Oct-10 13:02, busterp

PG1015

Legend

PG1015

Results

- 0 - 11680
- 11681 - 12681

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

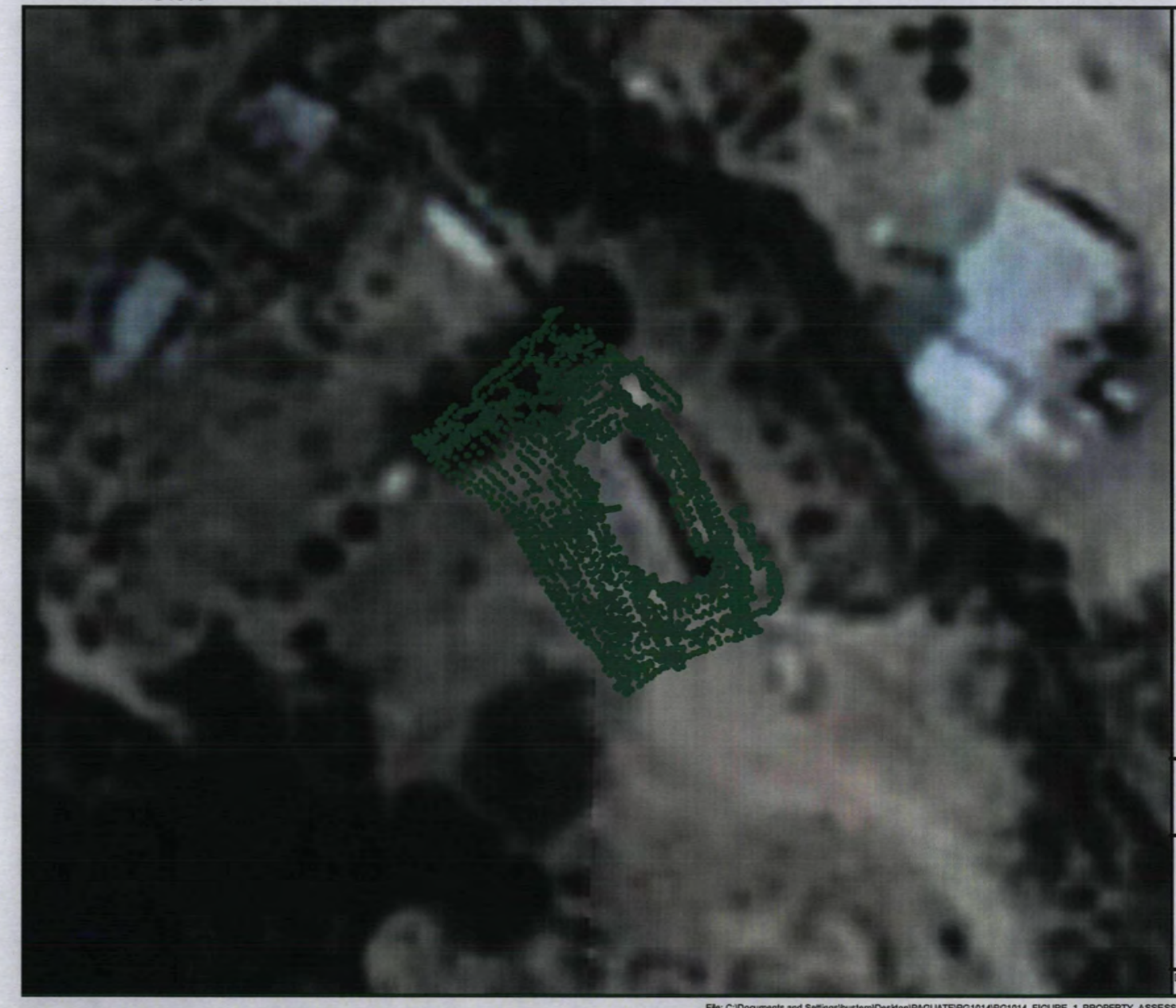
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1015
ASSESSMENT DATE: 04/12/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\buster\Desktop\PAGUATE\PG1015\PG1015_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 06-Oct-10 14:00, buster

PG1016



Legend

PG1016

Results

- 0 - 11137

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1016
ASSESSMENT DATE: 04/09/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1014\PG1014_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 06-Oct-10 13:02, busterp

PG1017

Legend

PG1017

Results

- 0 - 11680
- 11681 - 12681
- 12682 - 12999
- 13054; 13069

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

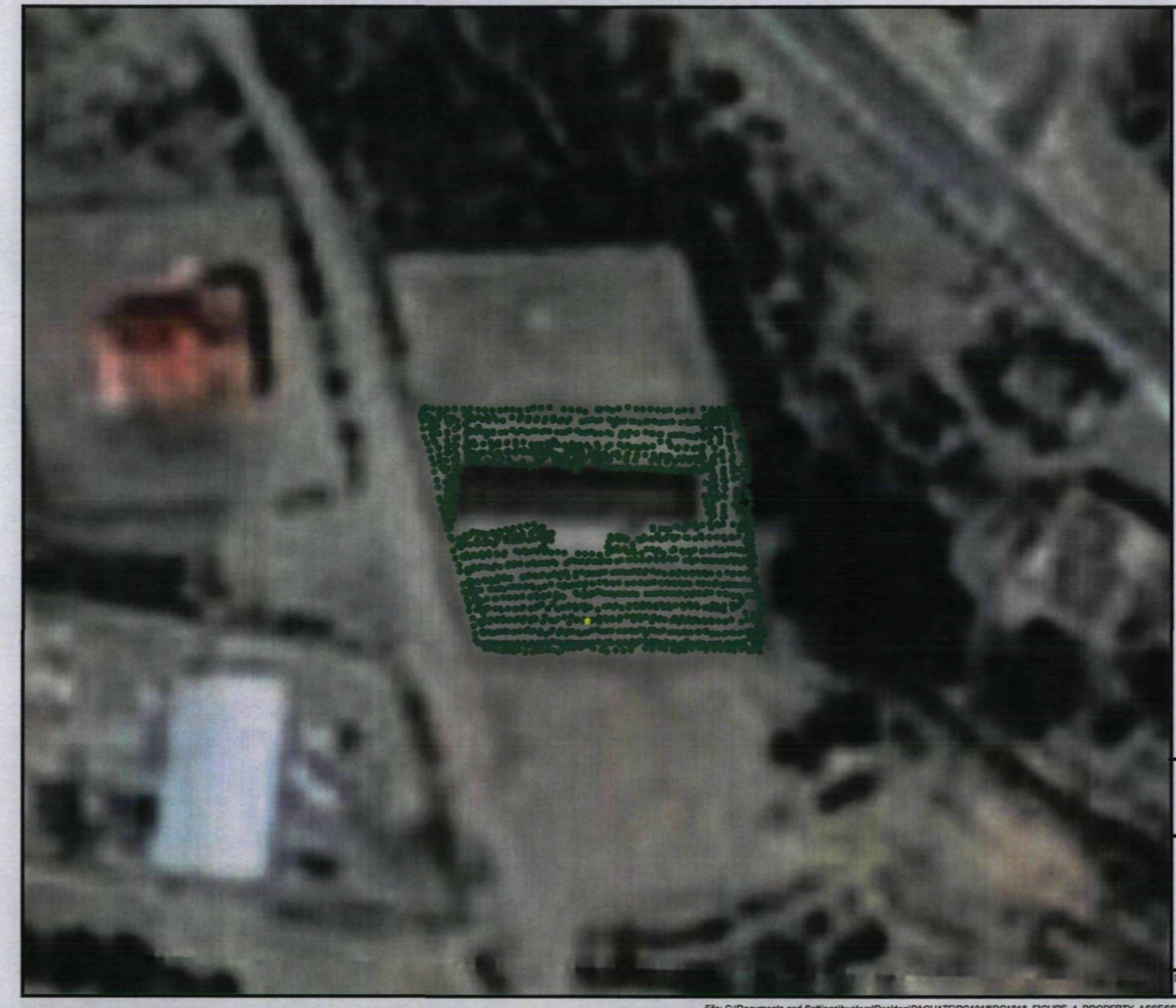
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA (OAK CANYON)
URANIUM ASSESSMENT
PROPERTY - PG1017
ASSESSMENT DATE: 4/7/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
DEC 2010	20406.012.005.0538.01	AS SHOWN

File: \\fsnm01\Operations\Field Data\TDD-OAK CANYON\PAGUATE\PG1017\PG1017_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 17-Dec-10 11:27, STARTGIS

PG1018



Legend

PG1018

Results

- 0 - 11680
- 11681 - 12681
- 13276

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1018
ASSESSMENT DATE: 04/08/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1018\PG1018_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 07-Oct-10 07:23, busterp

PG1019

Legend

PG1019

Results

- 0 - 11680
- 11681 - 11681

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

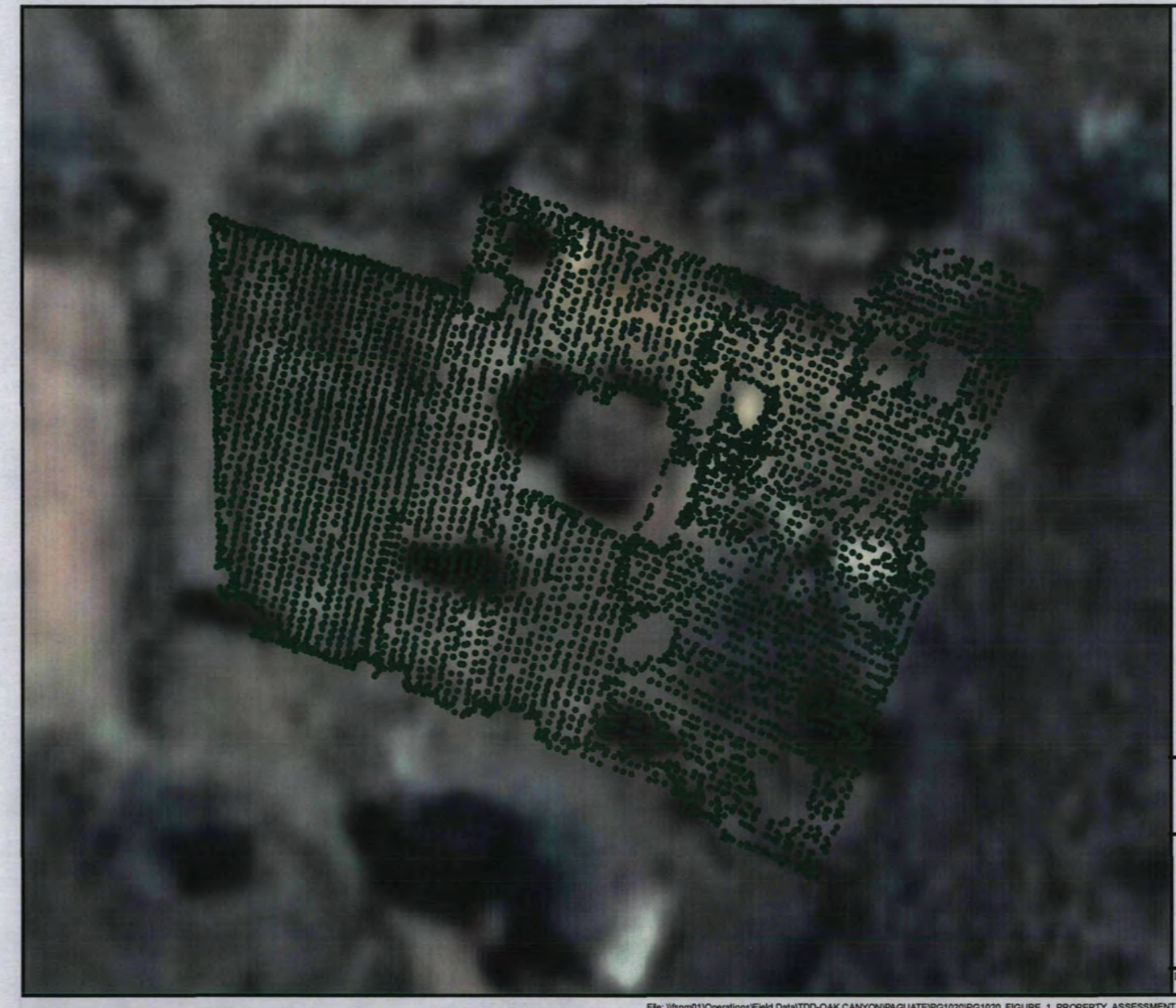
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1019
ASSESSMENT DATE: 04/08/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\buserp\Desktop\PAGUATE\PG1019\PG1019_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 07-Oct-10 08:07, buserp

PG1020



Legend

PG1020

Results

- 0 - 11680
- 11681 - 12681

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
SAN MATEO URANIUM ASSESSMENT
PROPERTY - PG1020
ASSESSMENT DATE: 06/16/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
AUG 2010	20406.012.005.0538.01	AS SHOWN

File: \\fsnm01\Operations\Field Data\TDD-OAK CANYON\PAGUATE\PG1020\PG1020_FIGURE_1_PROPERTY_ASSESSMENT_2_RESULTS_MAP.mxd, 21-Aug-10 14:42, STARTGIS

PG1025

Legend

PG1025

Results

- 0 - 10960

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1025
ASSESSMENT DATE: 04/13/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1025\PG1025_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 07-Oct-10 09:21, busterp

PG1028

Legend

PG1028

Results

- 0 - 11459

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1028
ASSESSMENT DATE: 03/27/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1028\PG1028_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 07-Oct-10 09:41, busterp

PG1029

Legend

PG1029

Results

- 0 - 11680
- 11681 - 12681

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1029
ASSESSMENT DATE: 05/06/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PG1029\PG1029_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 08-Oct-10 00:13, busterp

PG1030

Legend

PG1030

Results

- 0 - 11680
- 11681 - 12681
- 12682 - 12999
- 13000 - 13999
- 14083

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

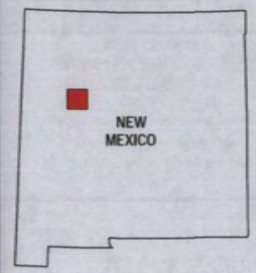
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA (OAK CANYON)
URANIUM ASSESSMENT
PROPERTY - PG1030
ASSESSMENT DATE: 5/03/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
NOV 2010	20406.012.005.0538.01	AS SHOWN

File: \\fsnm01\Operations\Field Data\TDD-OAK CANYON\PAGUATE\PG1030\PG1030_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 09-Nov-10 12:30, STARTGIS

PG1031



Legend

PG1031

Results

- 0 - 11680
- 11681 - 12681

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

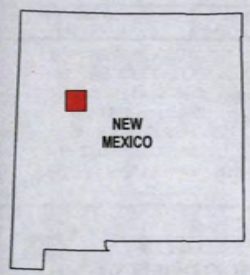
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1031
ASSESSMENT DATE: 05/08/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PG1031\PG1031_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 08-Oct-10 01:08, busterp

PG1034



Legend

PG1034

Results

- 0 - 11680
- 11681 - 12681
- 12682 - 12999
- 13000 - 13999
- 14000 - 14801

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

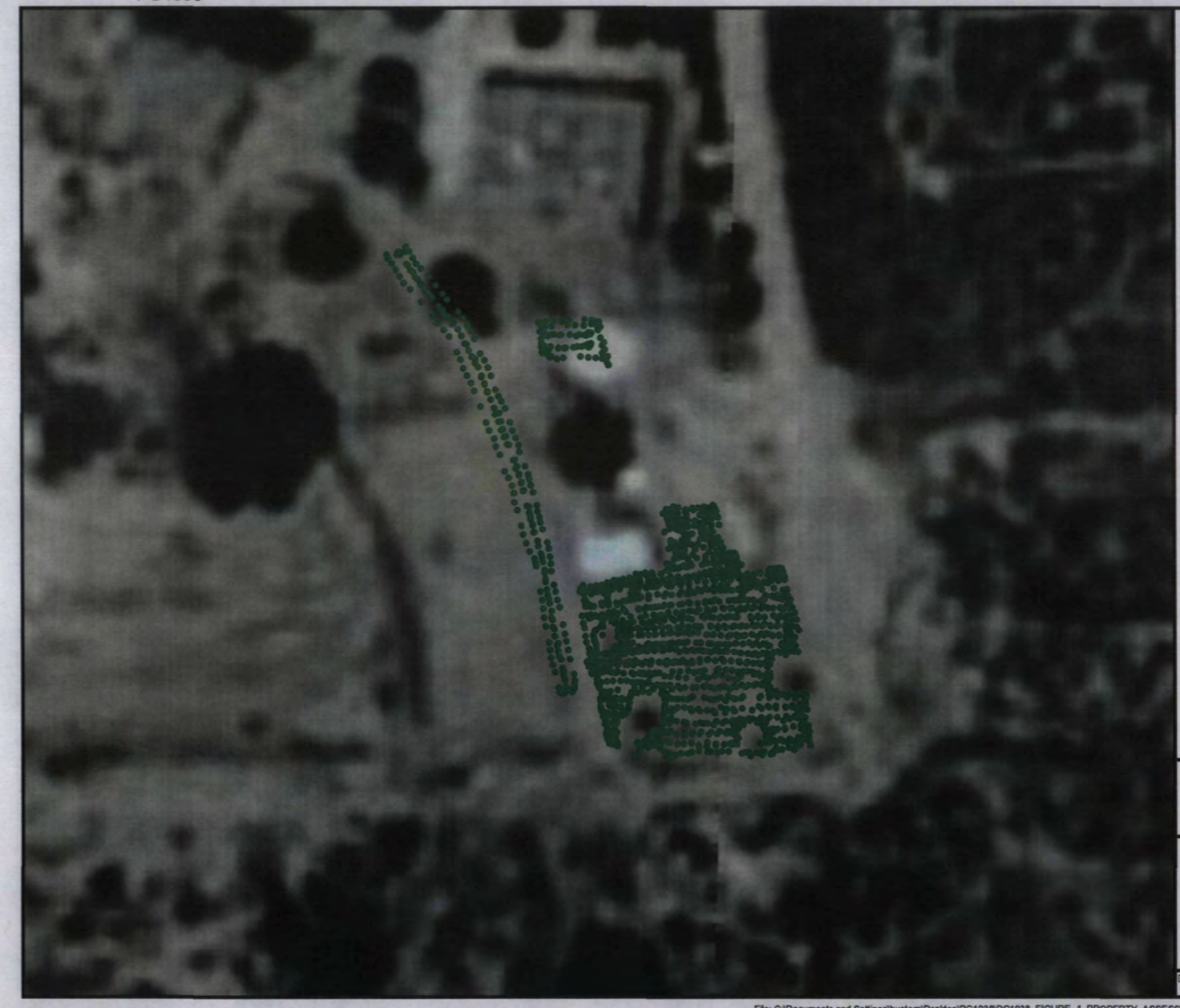
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1034
ASSESSMENT DATE: 06/17/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
AUG 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1034\PG1034_FIGURE_1_PROPERTY_ASSESSMENT_2_RESULTS_MAP.mxd, 27-Sep-10 10:43, busterp

PG1038



Legend

PG1038

Results

- 0 - 11621

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

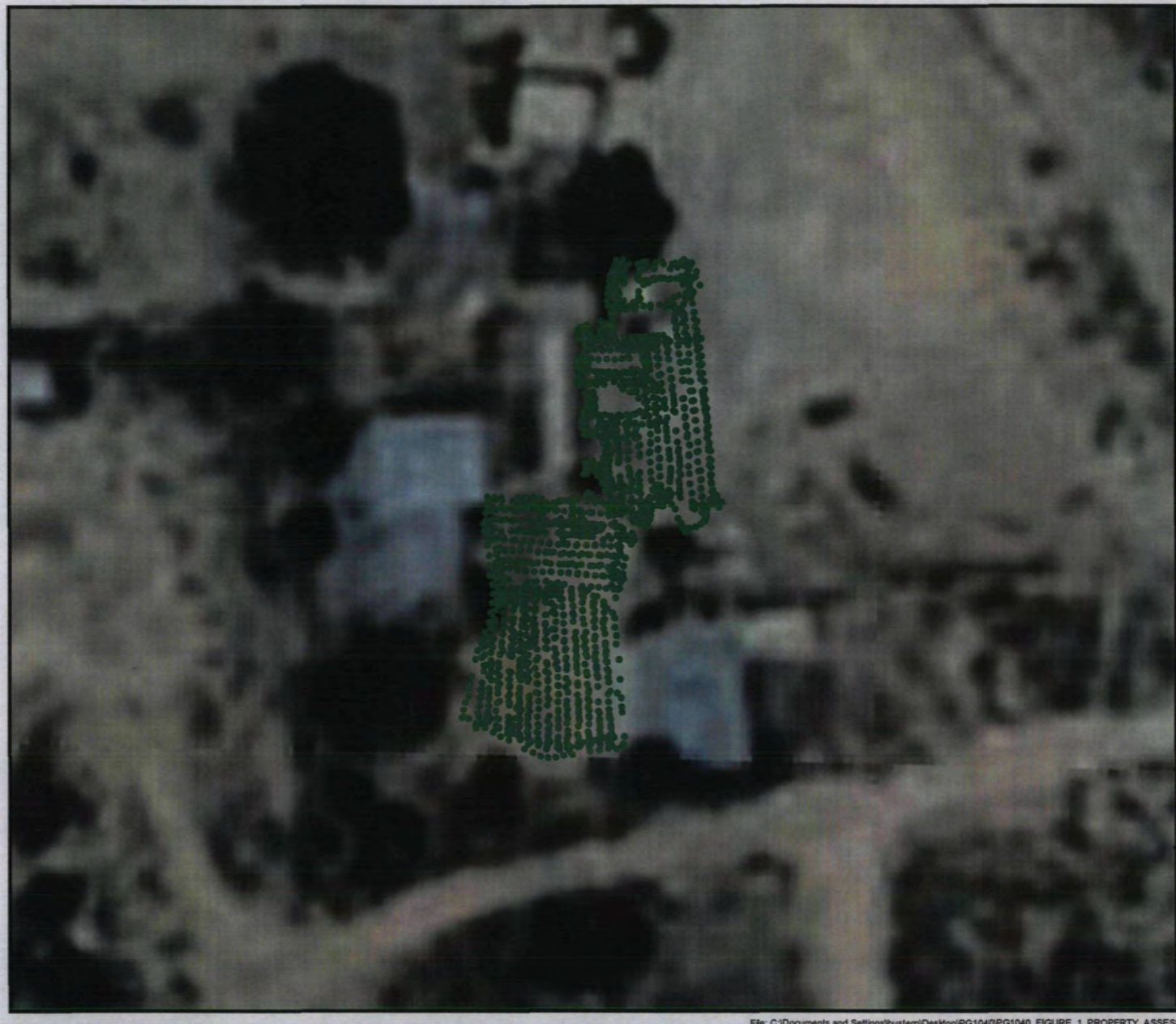
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1038
ASSESSMENT DATE: 05/08/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PG1038\PG1038_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 08-Oct-10 02:18, busterp

PG1040



Legend

PG1040

Results

- 0 - 11001

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

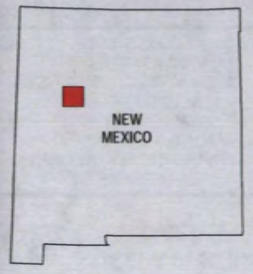
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1040
ASSESSMENT DATE: 04/15/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PG1040\PG1040_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 08-Oct-10 03:03, busterp

PG1041



Legend

PG1041

Results

- 0 - 10458

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1041
ASSESSMENT DATE: 04/16/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1041\PG1041_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 11-Oct-10 08:07, busterp

PG1042

Legend

PG1042

Results

- 0 - 9994

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1042
ASSESSMENT DATE: 05/04/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1042\PG1042_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 11-Oct-10 08:39, busterp

PG1044

Legend

PG1044

Results

- 0 - 10917

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

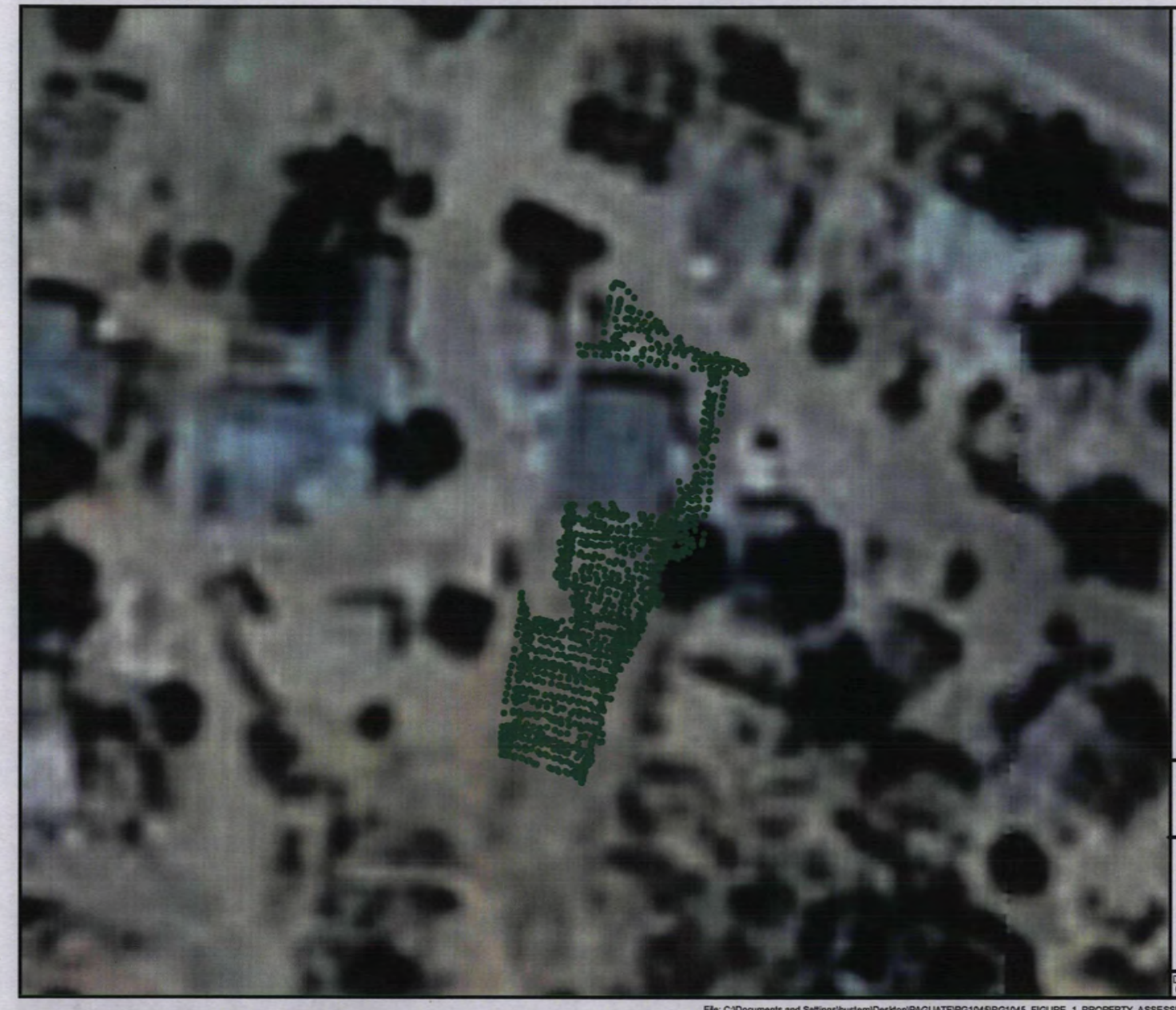
US EPA REGION 6
START- 3

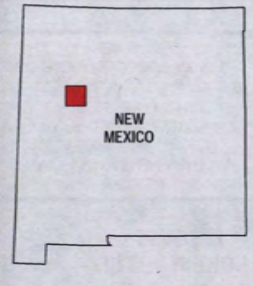
FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1044
ASSESSMENT DATE: 04/16/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1044\PG1044_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 11-Oct-10 09:17, busterp

PG1045





Legend

PG1045

Results

- 0 - 9677

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1045
ASSESSMENT DATE: 05/07/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1045\PG1045_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 11-Oct-10 10:05, busterp

PG1053

Legend

PG1053

Results

- 0 - 10696

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

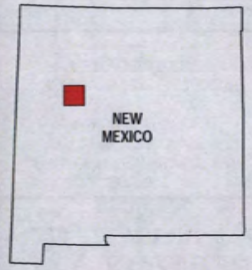
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1053
ASSESSMENT DATE: 04/21/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1053\PG1053_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 11-Oct-10 11:13, busterp

PG1054



Legend

PG1054

Results

- 0 - 11680
- 11681 - 12681

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

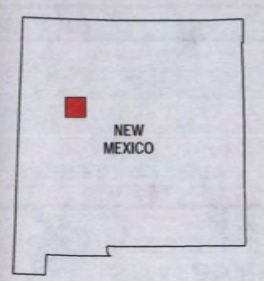
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1054
ASSESSMENT DATE: 04/21/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1054\PG1054_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 11-Oct-10 11:52, busterp

PG1056



Legend

PG1056

Results

- 0 - 11047

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

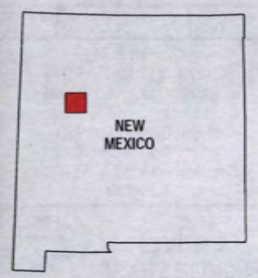
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1056
ASSESSMENT DATE: 03/30/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1056\PG1056_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 11-Oct-10 12:52, busterp

PG1058



Legend

PG1058

Results

- 0 - 11680
- 11681 - 12681

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

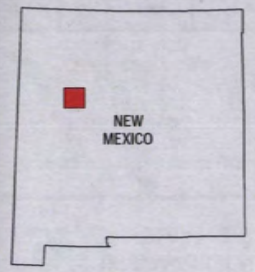
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1058
ASSESSMENT DATE: 04/01/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1058\PG1058_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 11-Oct-10 13:52, busterp

PG1059



Legend

PG1059

Results

- 0 - 11077

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

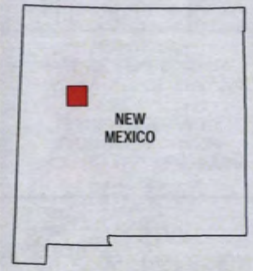
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1059
ASSESSMENT DATE: 04/14/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1059\PG1059_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 11-Oct-10 14:36, busterp

PG1060



Legend

PG1060

Results

- 0 - 10806

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

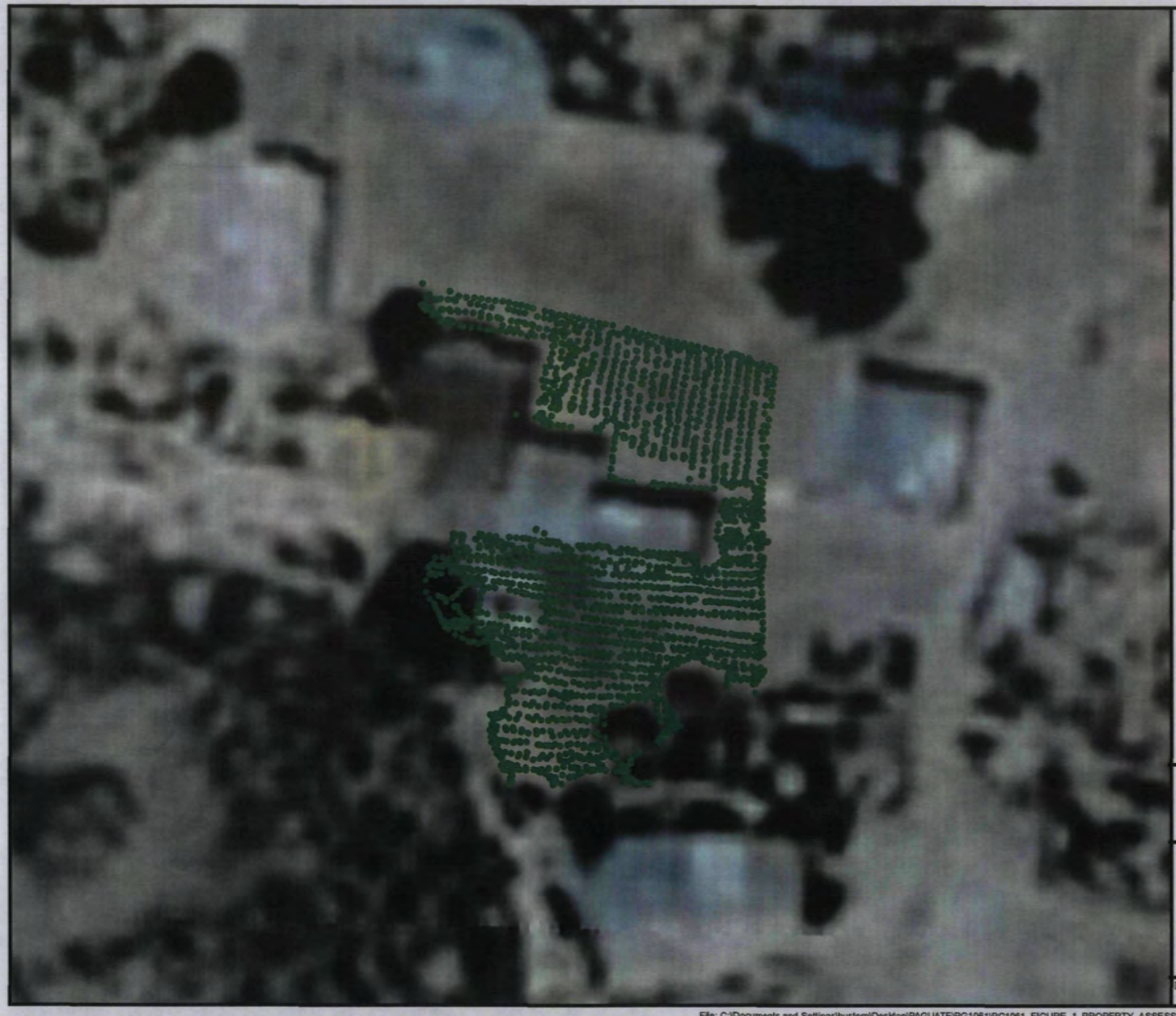
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1060
ASSESSMENT DATE: 03/29/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1060\PG1060_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 12-Oct-10 08:09, busterp

PG1061



Legend

PG1061

Results

- 0 - 10520

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

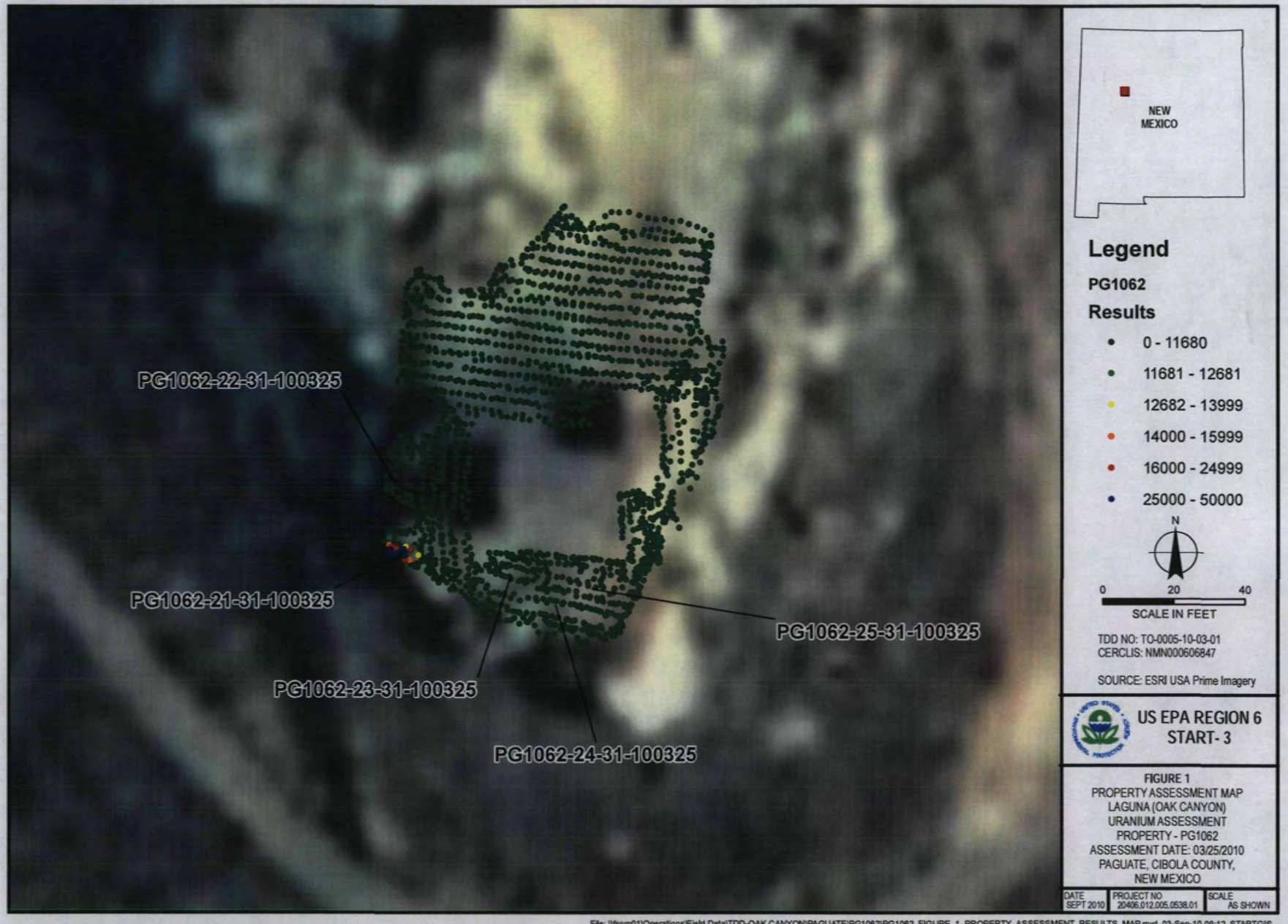
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1061
ASSESSMENT DATE: 03/29/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\buserp\Desktop\PAGUATE\PG1061\PG1061_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 12-Oct-10 08:26, buserp

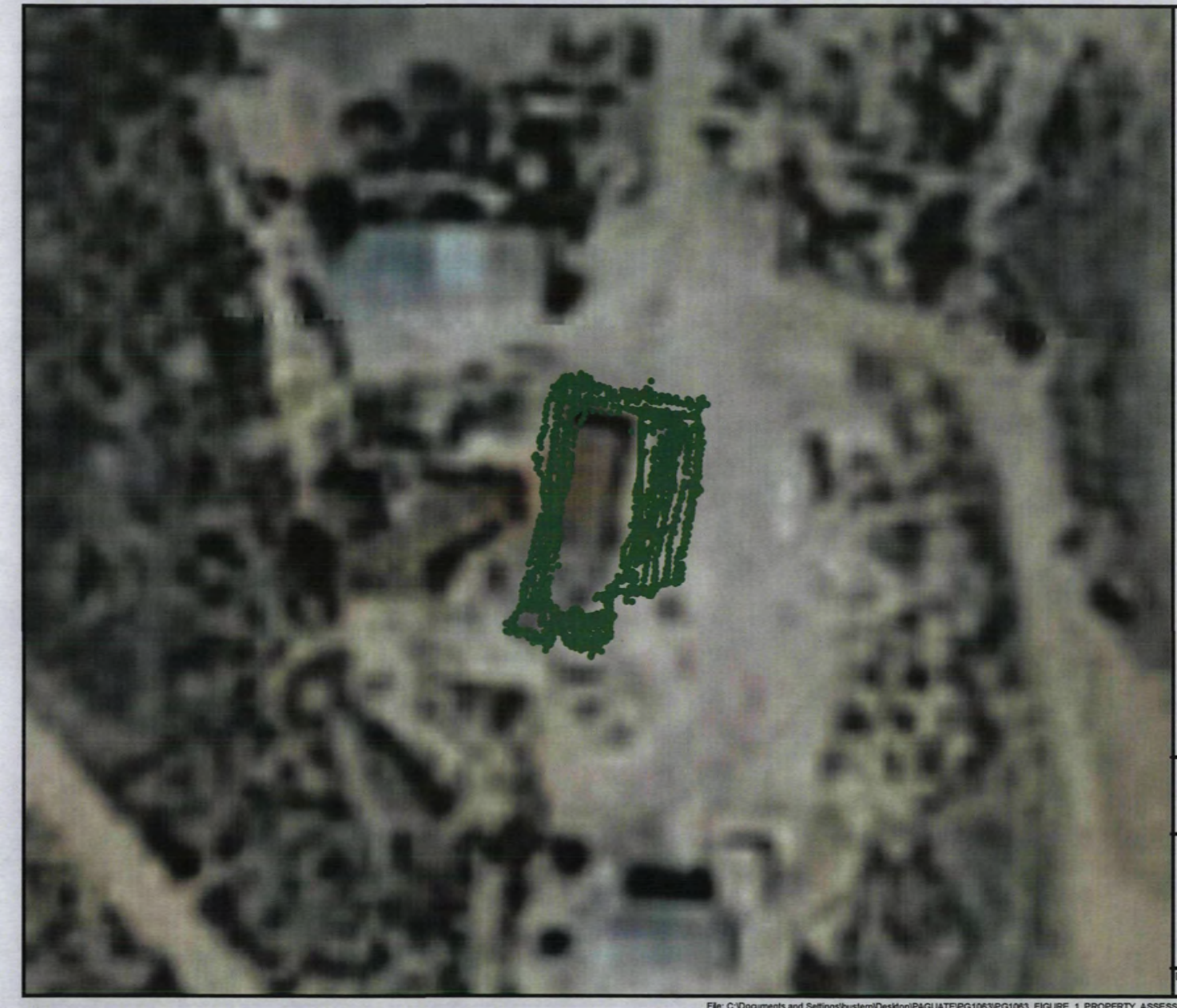
PG1062



File: \\fsnm01\Operations\Field Data\TDD-OAK CANYON\PAGUATE\PG1062\PG1062_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 03-Sep-10 09:12, STARTGIS

Rapid Assessment Tool Maps
Part 3

PG1063



Legend

PG1063

Results

- 0 - 10771

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

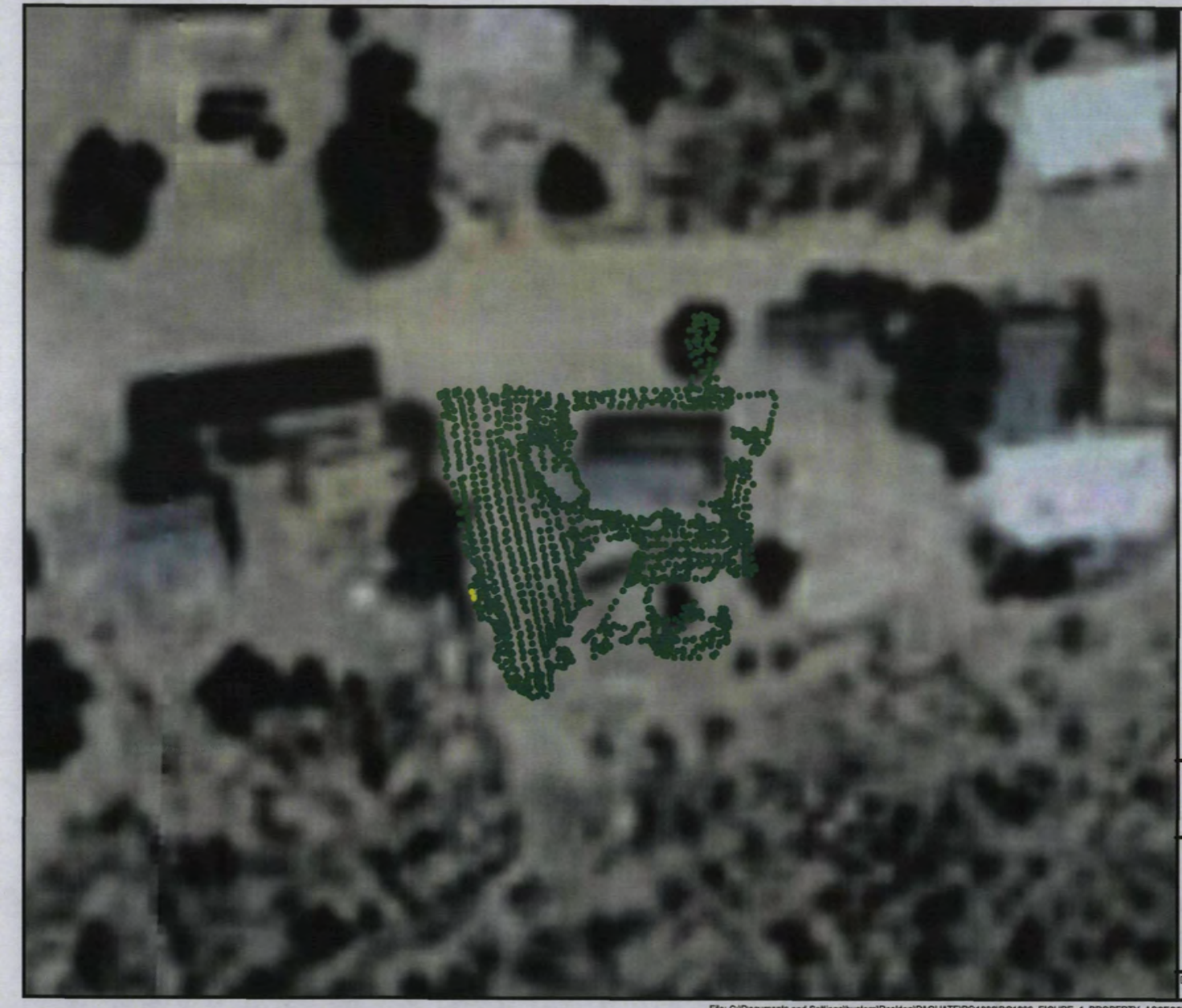
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1063
ASSESSMENT DATE: 03/29/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1063\PG1063_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 12-Oct-10 09:12, busterp

PG1069



Legend

PG1069

Results

- 0 - 11680
- 11681 - 12681
- 12682 - 12999

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1069
ASSESSMENT DATE: 04/01/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1069\PG1069_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 12-Oct-10 09:44, busterp

PG1070

Legend

PG1070

Results

- 0 - 8880

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1070
ASSESSMENT DATE: 04/01/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1070\PG1070_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 12-Oct-10 10:45, busterp

PG1071

Legend

PG1071

Results

- 0 - 10339

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1071
ASSESSMENT DATE: 03/31/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1071\PG1071_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 12-Oct-10 11:09, busterp

PG1073

Legend

PG1073

Results

- 0 - 9479

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1073
ASSESSMENT DATE: 03/31/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1073\PG1073_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 12-Oct-10 12:04, busterp

PG1079

Legend

PG1079

Results

- 0 - 11680
- 11681 - 12681

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

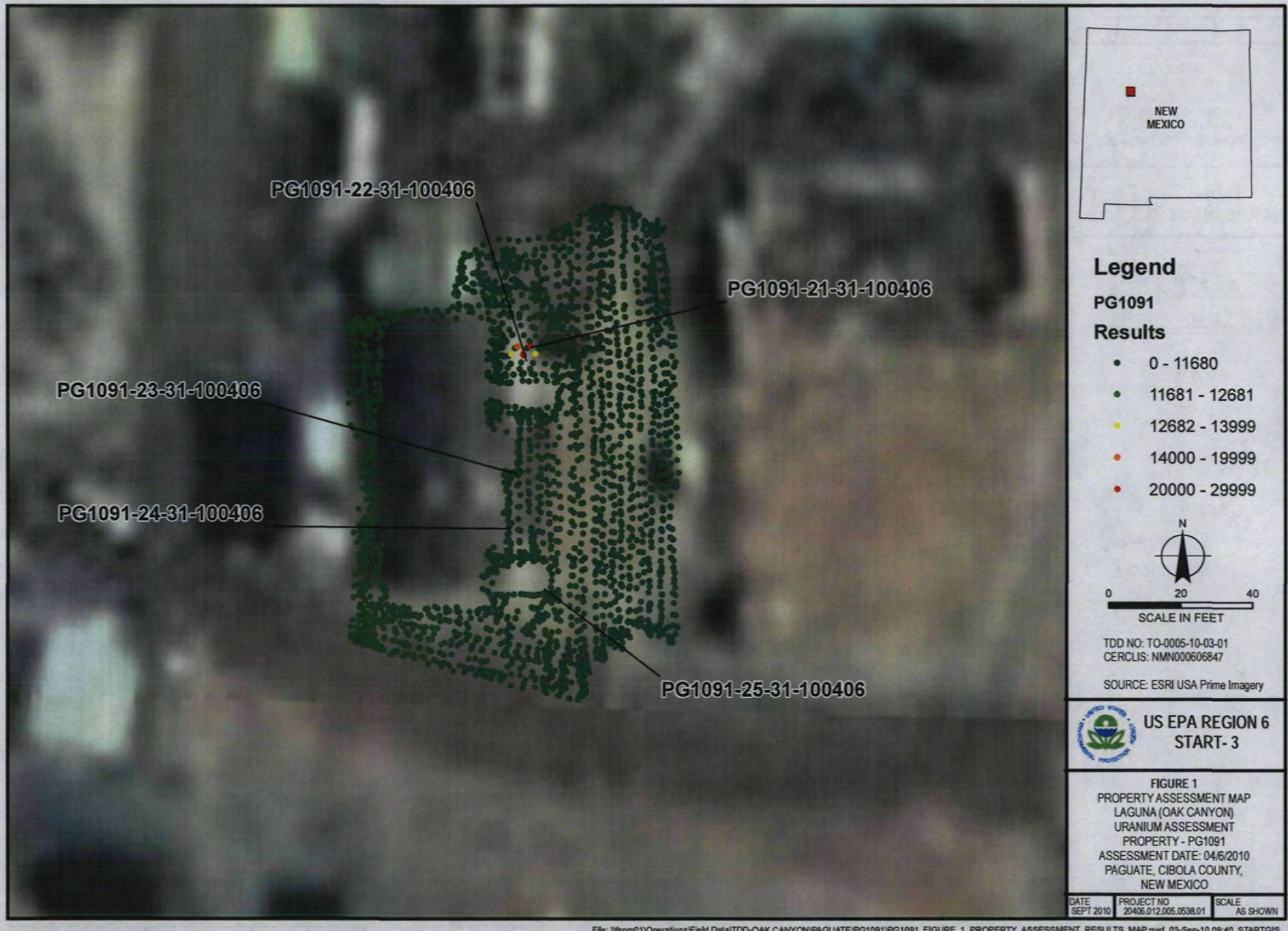
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1079
ASSESSMENT DATE: 05/03/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1079\PG1079_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 12-Oct-10 12:49, busterp

PG1091



File: \\fsnm01\Operations\Field Data\TDD-OAK CANYON\PAGUATE\PG1091\PG1091_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 03-Sep-10 09:40, STARTGIS

PG1093

Legend

PG1093

Results

- 0 - 10802

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1093
ASSESSMENT DATE: 04/07/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1093\PG1093_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 12-Oct-10 13:25, busterp

PG1094

Legend

PG1094

Results

- 0 - 11680
- 11681 - 12681

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

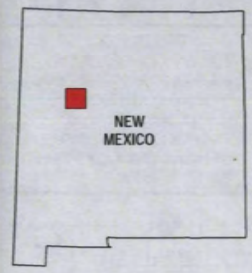
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1094
ASSESSMENT DATE: 05/07/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1094\PG1094_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 12-Oct-10 14:49, busterp

PG1096



Legend

PG1096

Results

- 0 - 10965

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1096
ASSESSMENT DATE: 05/11/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1096\PG1096_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 13-Oct-10 07:53, busterp

PG1097

Legend

PG1097

Results

- 0 - 11680
- 11681 - 12681

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1097
ASSESSMENT DATE: 04/07/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1097\PG1097_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 13-Oct-10 08:14, busterp

PG1102

Legend

PG1102

Results

- 0 - 11680
- 11681 - 12681

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

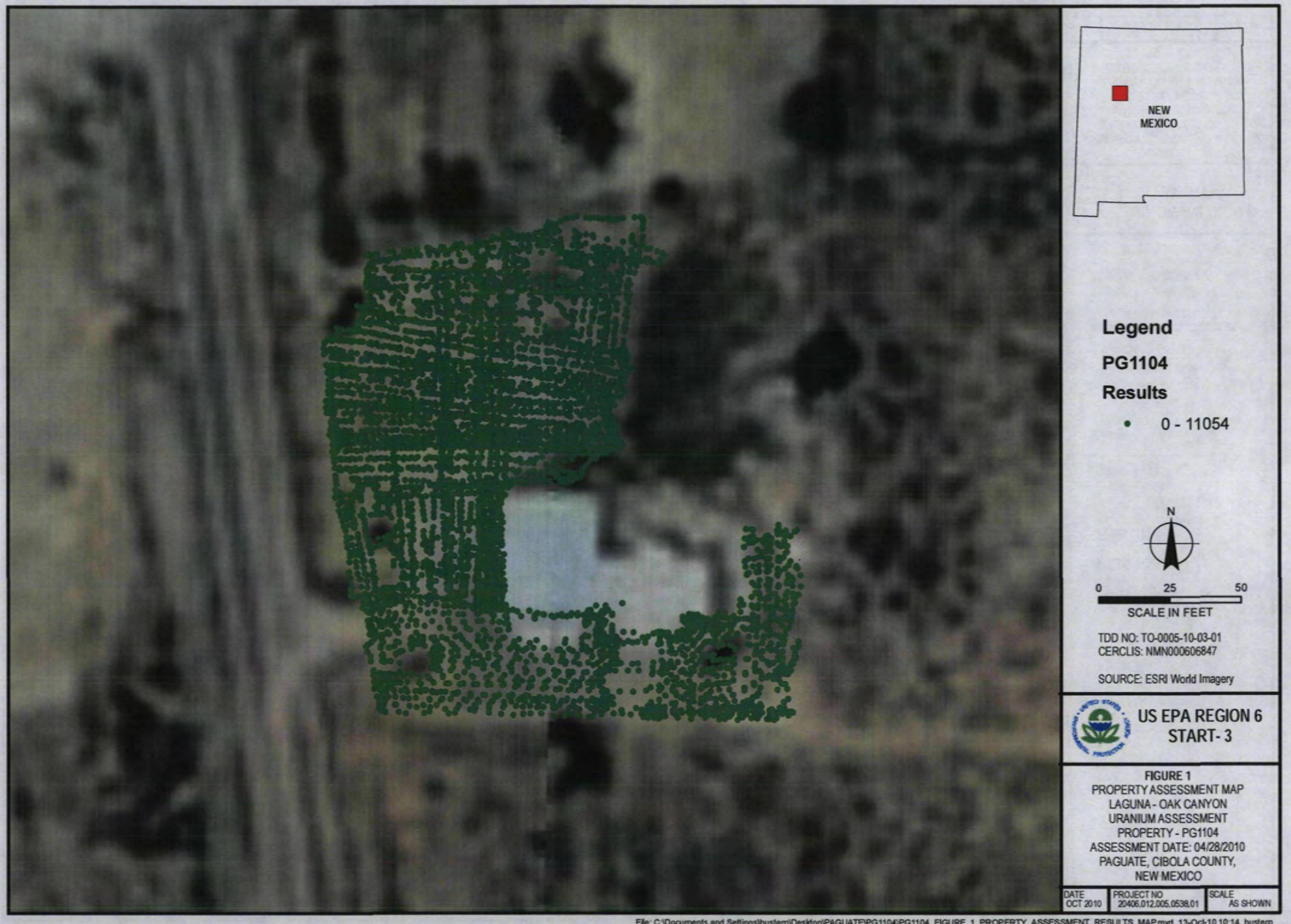
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1102
ASSESSMENT DATE: 04/30/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\buster\Desktop\PAGUATE\PG1102\PG1102_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 13-Oct-10 09:13, buster

PG1104



File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1104\PG1104_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 13-Oct-10 10:14, busterp

PG1105

Legend

PG1105

Results

- 0 - 11647

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1105
ASSESSMENT DATE: 05/01/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1105\PG1105_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 13-Oct-10 11:35, busterp

PG1107

Legend

PG1107

Results

- 0 -11551

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1107
ASSESSMENT DATE: 04/09/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

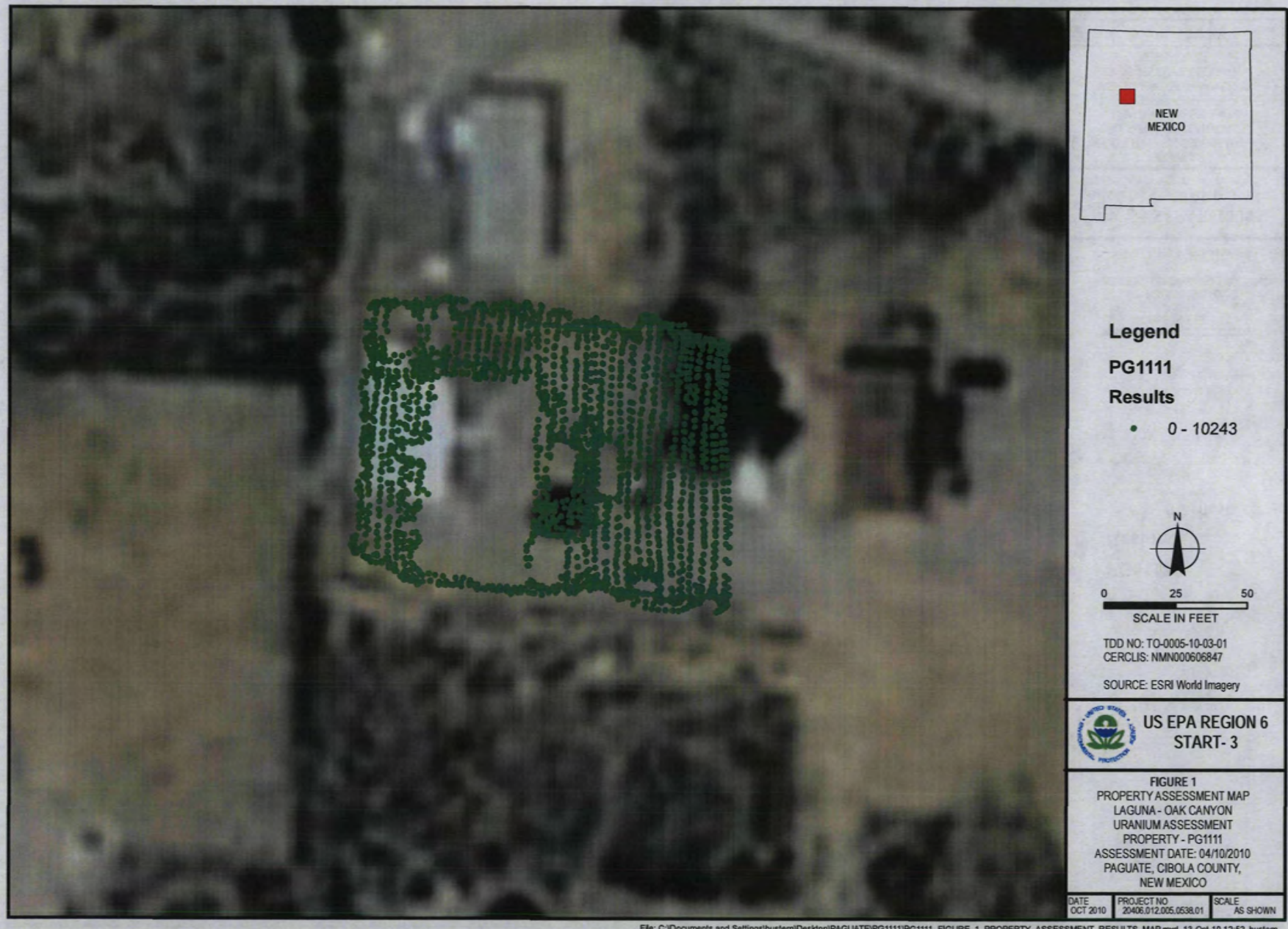
DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1107\PG1107_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 13-Oct-10 12:17, busterp

PG1110

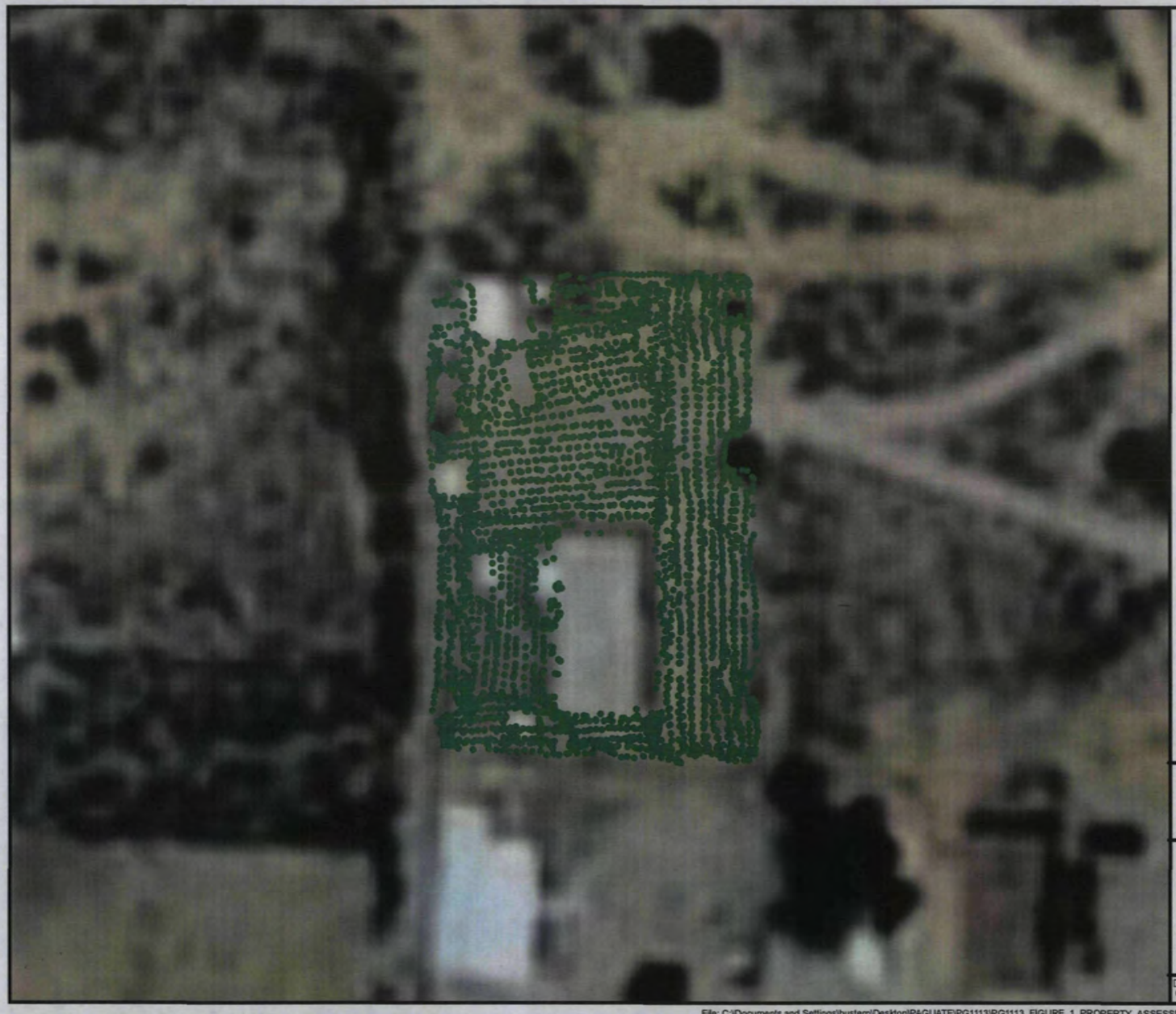
File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1110\PG1110_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 27-Sep-10 13:14, busterp

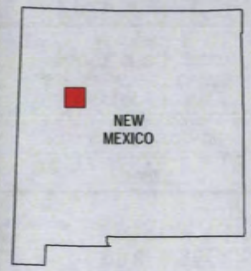
PG1111



File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1111\PG1111_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 13-Oct-10 12:52, busterp

PG1113





Legend

PG1113

Results

- 0 - 10416

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1113
ASSESSMENT DATE: 04/10/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1113\PG1113_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 13-Oct-10 13:18, busterp

PG1114

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1114\PG1114_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 13-Oct-10 14:28, busterp

PG1117

Legend

PG1117

Results

- 0 - 9216

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

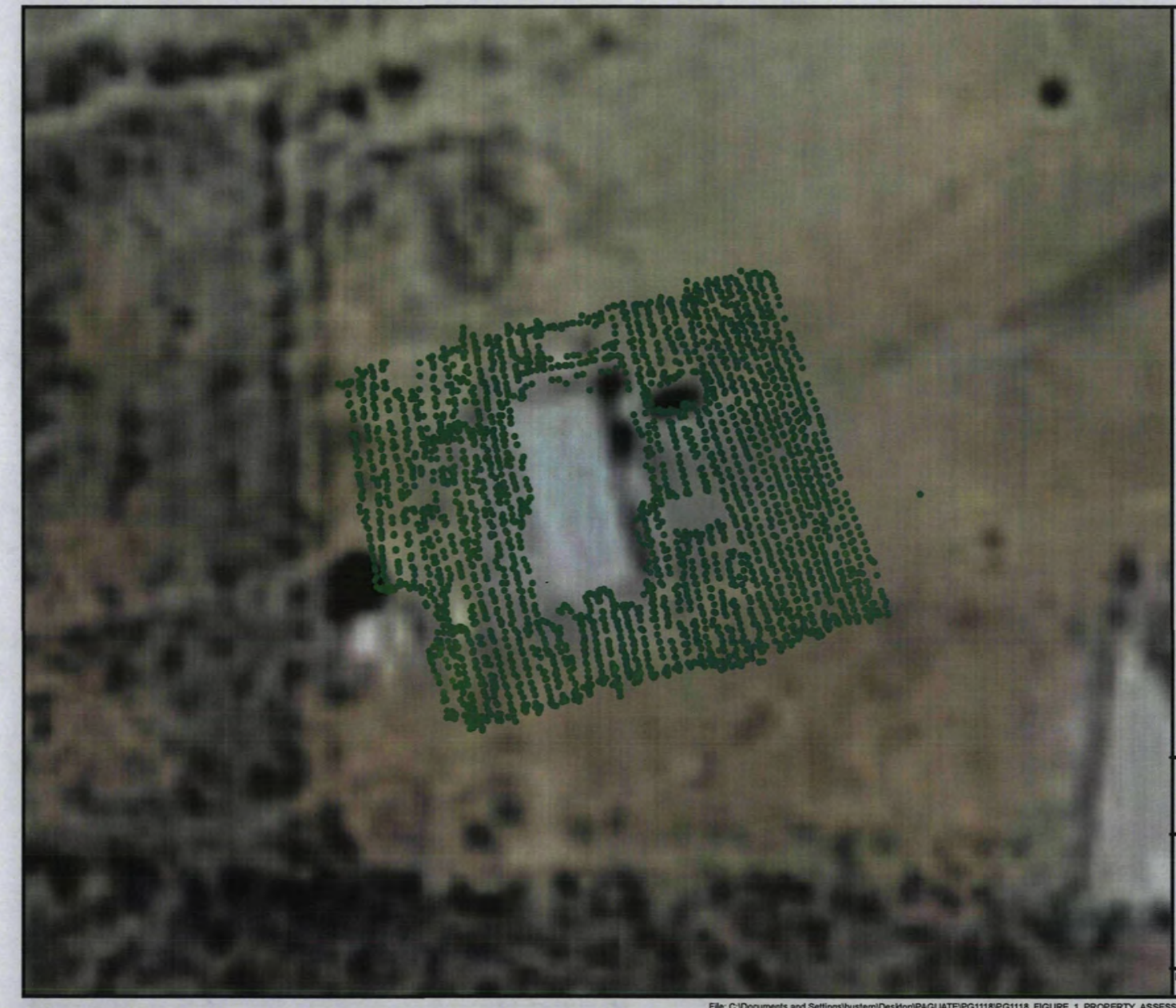
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA (OAK CANYON)
URANIUM ASSESSMENT
PROPERTY - PG1117
ASSESSMENT DATE: 10/23/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: \\fsnm01\Operations\Field Data\TDD-OAK CANYON\PAGUATE\PG1117\PG1117_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 27-Oct-10 11:40, STARTGIS

PG1118



Legend

PG1118

Results

- 0 - 11680
- 11681 - 12681

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1118
ASSESSMENT DATE: 04/13/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1118\PG1118_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 13-Oct-10 15:35, busterp

PG1119

Legend

PG1119

Results

- 0 - 11284

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

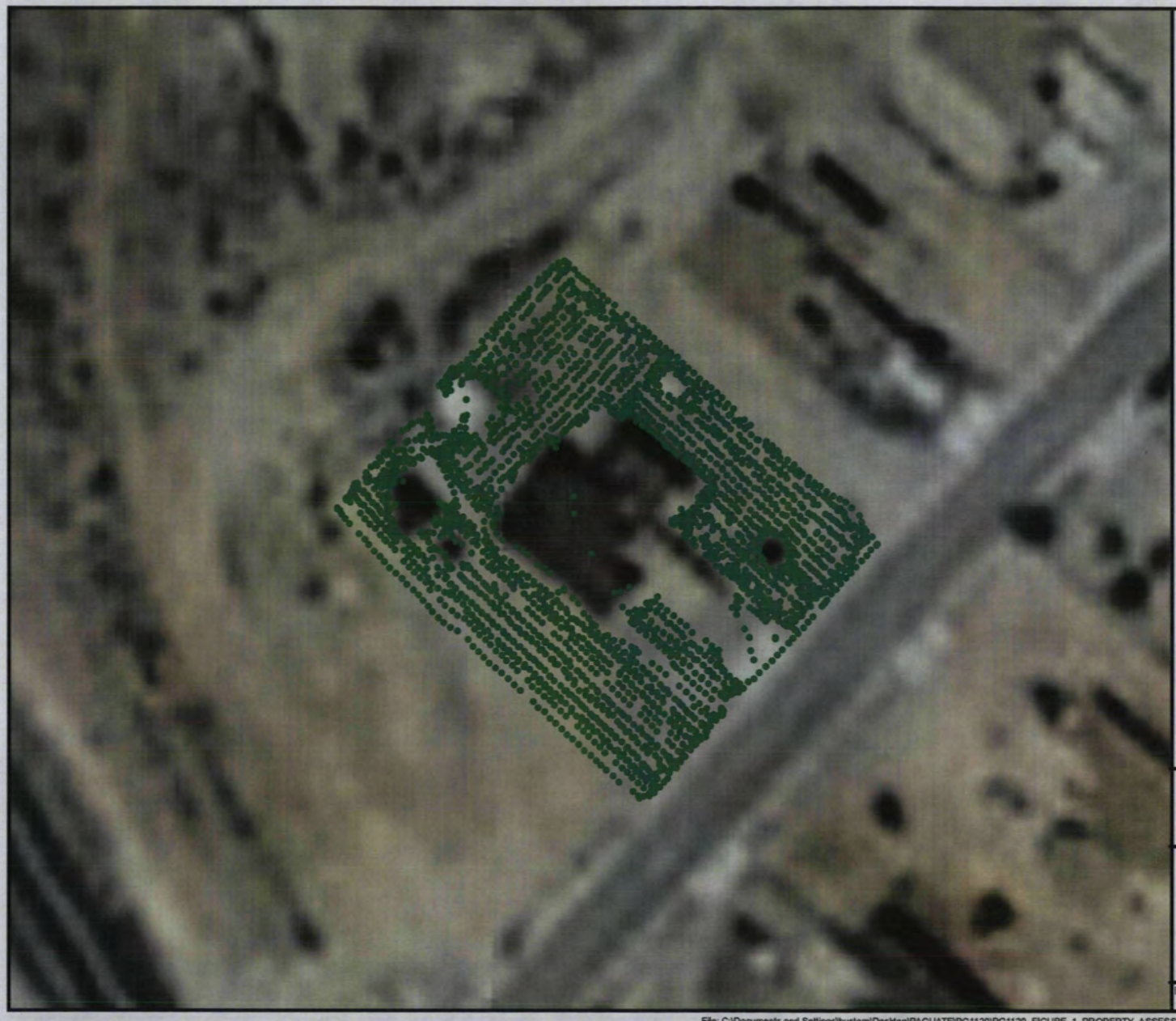
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1119
ASSESSMENT DATE: 04/14/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1119\PG1119_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 14-Oct-10 08:01, busterp

PG1120



Legend

PG1120

Results

- 0 - 10292

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

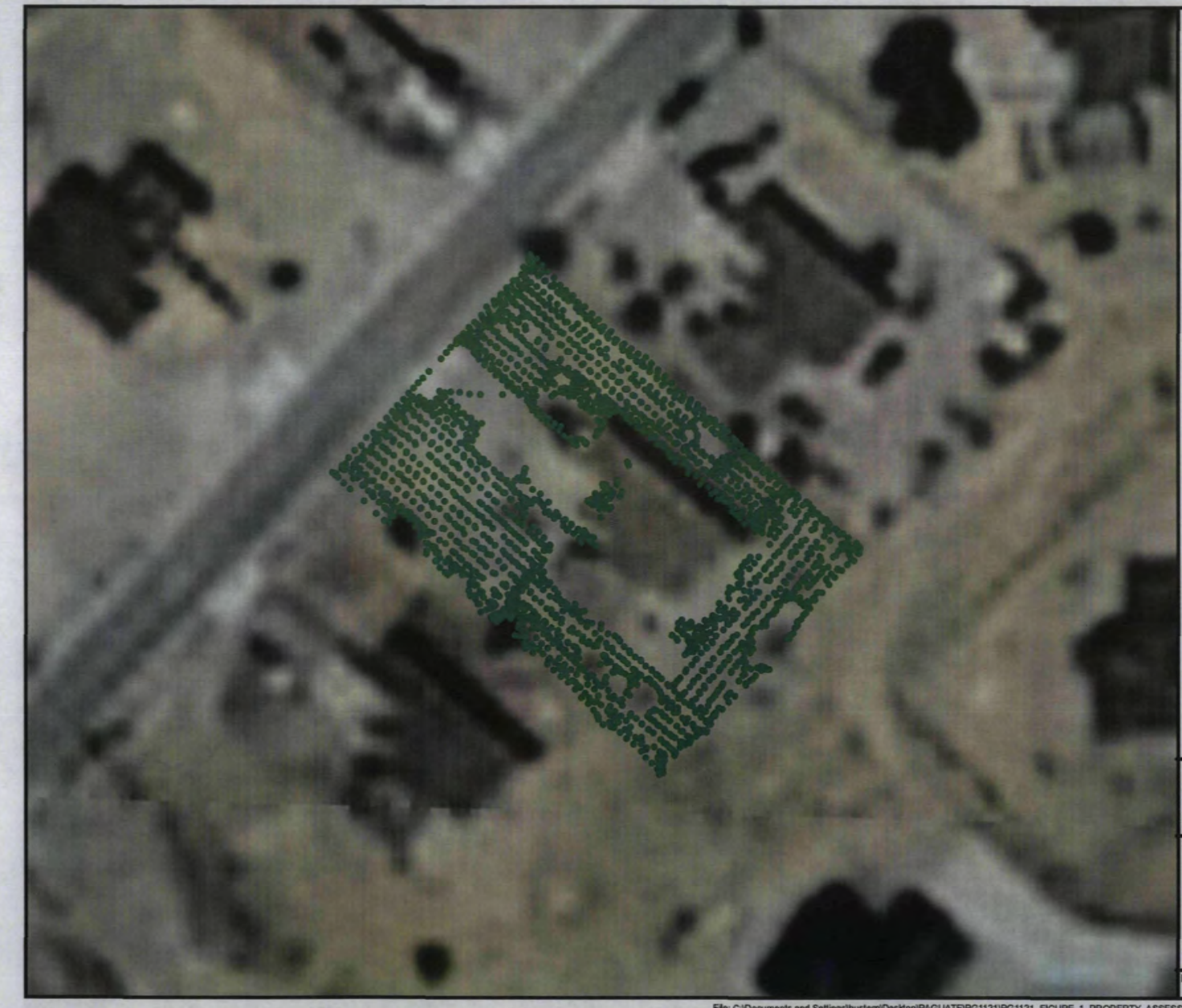
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1120
ASSESSMENT DATE: 04/15/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1120\PG1120_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 14-Oct-10 08:38, busterp

PG1121



Legend

PG1121

Results

- 0 - 10395

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1121
ASSESSMENT DATE: 04/13/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1121\PG1121_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 14-Oct-10 09:16, busterp

PG1124

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1124\PG1124_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 27-Sep-10 13:49, busterp

PG1125

Legend

PG1125

Results

- 0 - 10744

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

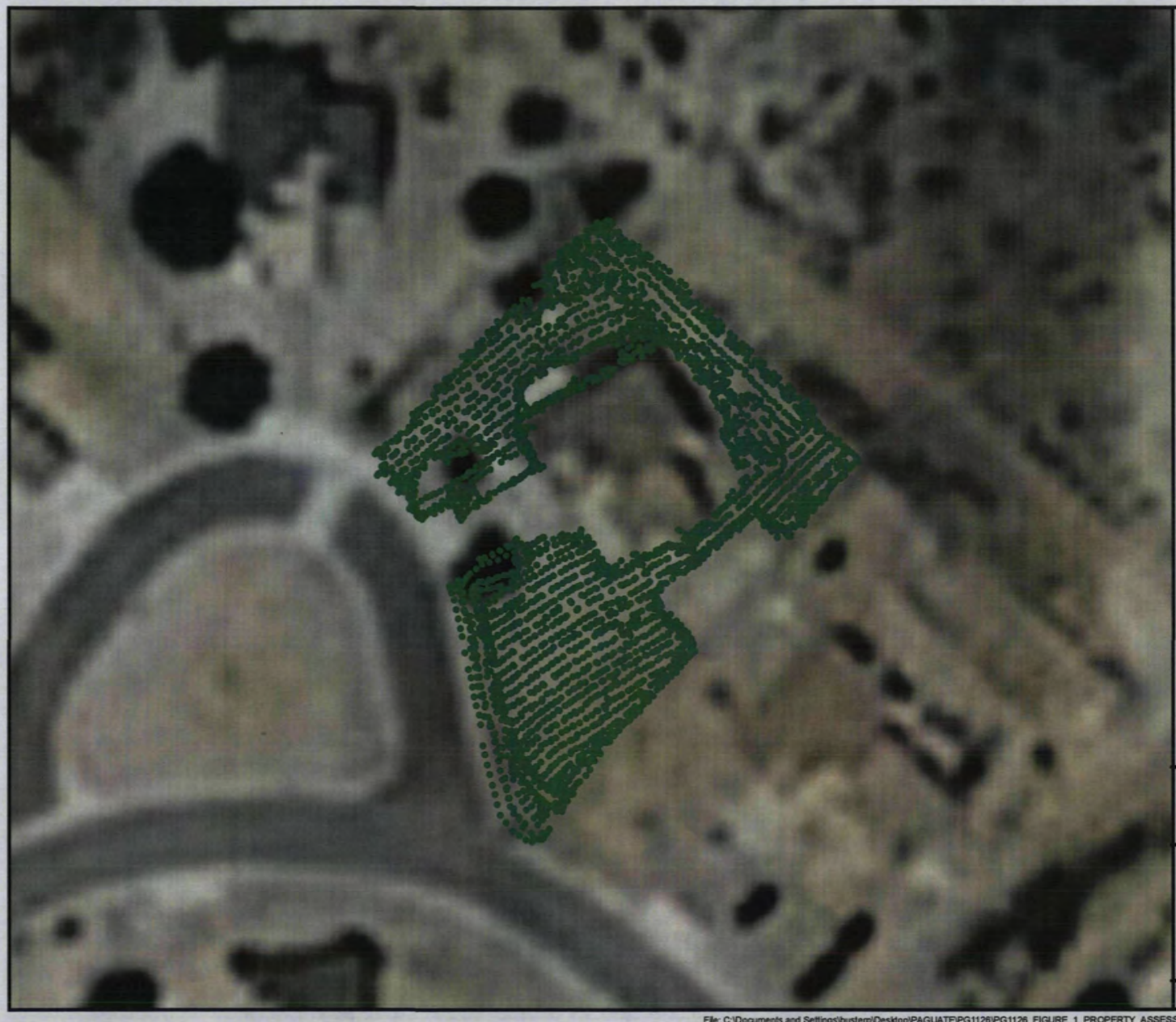
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1125
ASSESSMENT DATE: 04/16/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1125\PG1125_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 14-Oct-10 10:13, busterp

PG1126



Legend

PG1126

Results

- 0 - 11383

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1126
ASSESSMENT DATE: 04/09/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1126\PG1126_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 14-Oct-10 11:12, busterp

PG1127

Legend

PG1127

Results

- 0 - 11680
- 11681 - 12681

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

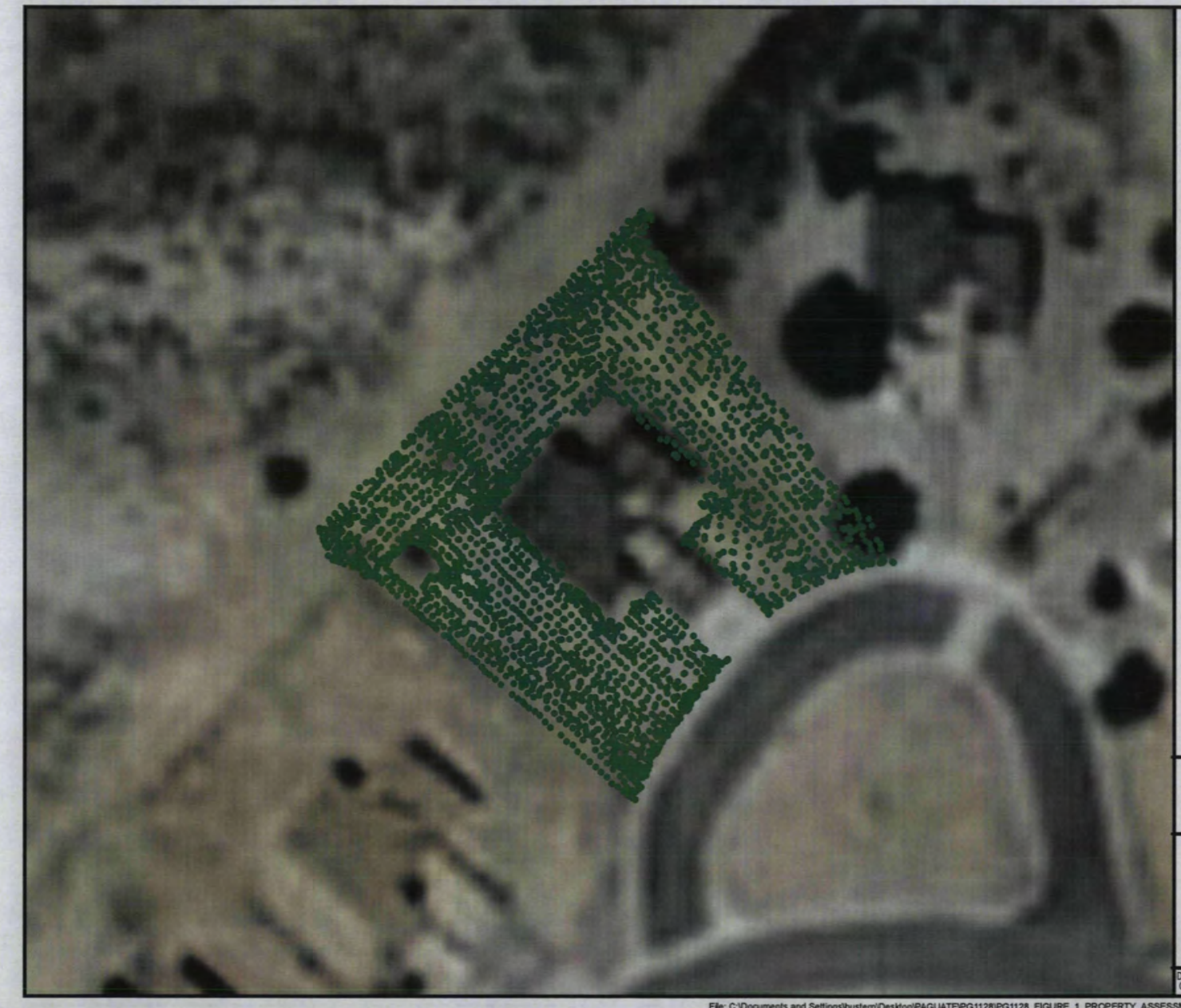
US EPA REGION 6
START- 3

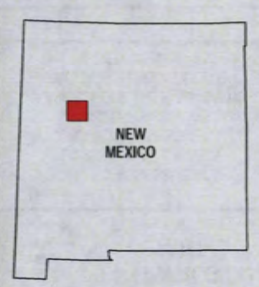
FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1127
ASSESSMENT DATE: 04/15/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1127\PG1127_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 14-Oct-10 12:11, busterp

PG1128





Legend

PG1128

Results

- 0 - 10991

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1128
ASSESSMENT DATE: 04/15/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1128\PG1128_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 14-Oct-10 13:08, busterp

PG1129

Legend

PG1129

Results

- 0 - 10972

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1129
ASSESSMENT DATE: 04/16/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1129\PG1129_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 14-Oct-10 13:59, busterp

PG1130

Legend

PG1130

Results

- 0 - 11031

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

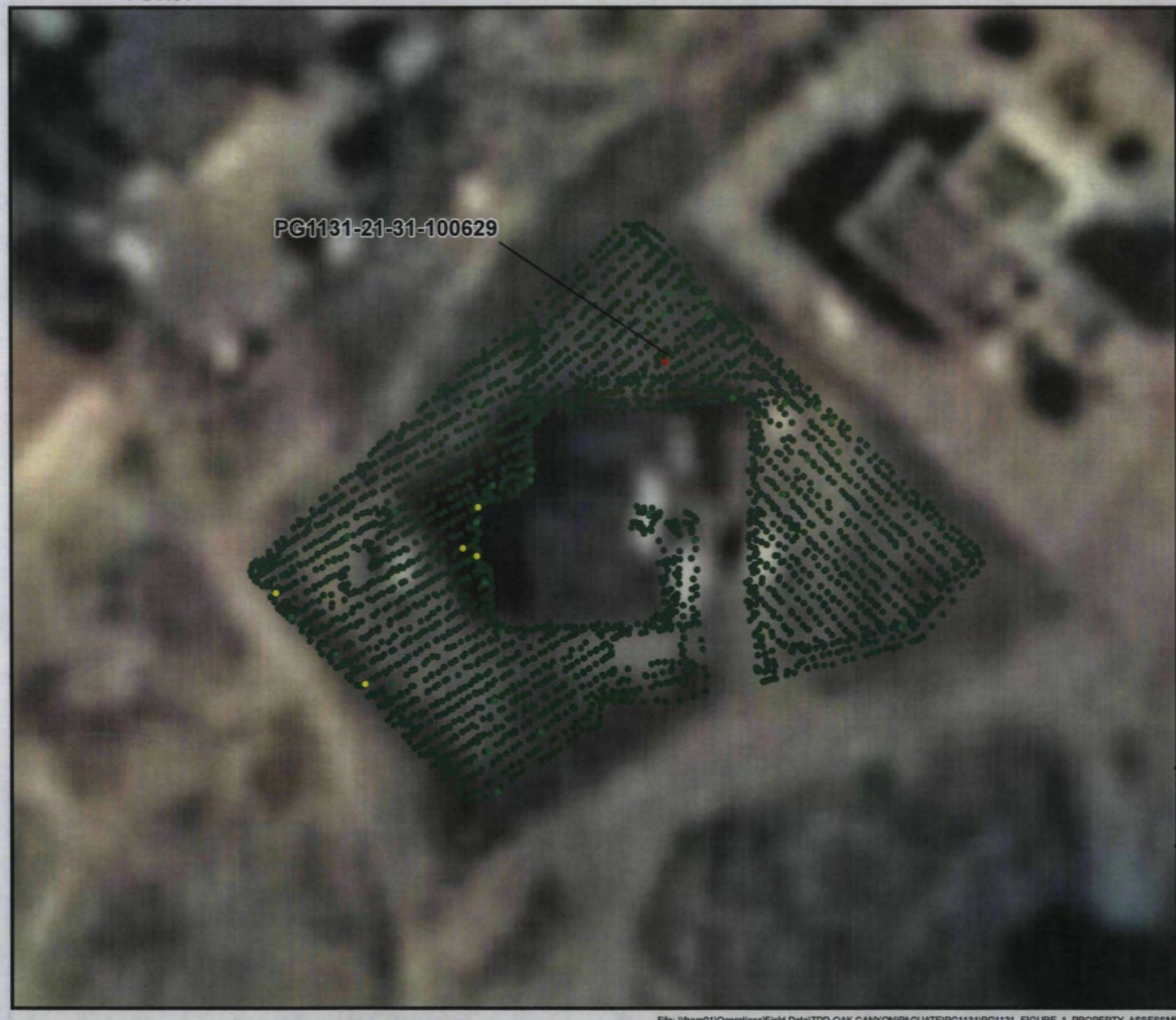
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1130
ASSESSMENT DATE: 04/06/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\buserp\Desktop\PAGUATE\PG1130\PG1130_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 14-Oct-10 14:55, buserp

PG1131



Legend

PG1131

Results

- 0 - 11680
- 11681 - 12681
- 12682 - 12999
- 14545

N

0 20 40

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

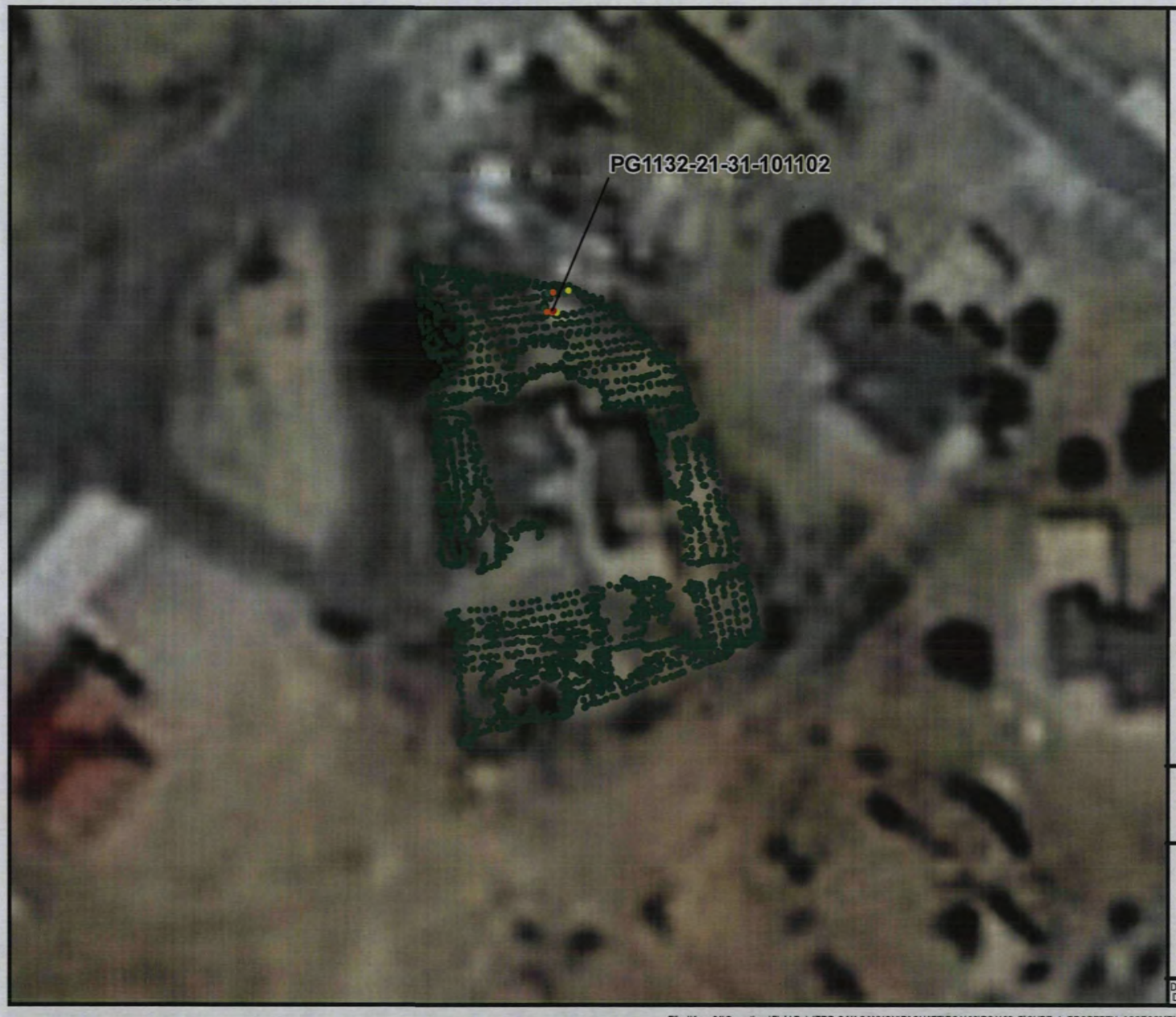
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA (OAK CANYON)
URANIUM ASSESSMENT
PROPERTY - PG1131
ASSESSMENT DATE: 6/29/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO.	SCALE
SEPT 2010	20406.012.005.0538.01	AS SHOWN

File: \\fsnm01\Operations\Field Data\TDD-OAK CANYON\PAGUATE\PG1131\PG1131_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 03-Sep-10 12:04, STARTGIS

PG1132



Legend

PG1132

Results

- 0 - 11680
- 11681 - 12681
- 12682 - 12999
- 13000 - 14999
- 15103

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA (OAK CANYON)
URANIUM ASSESSMENT
PROPERTY - LG1132
ASSESSMENT DATE: 3/26/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
DEC 2010	20406.012.005.0538.01	AS SHOWN

File: \\tsnm01\Operations\Field Data\TDD-OAK CANYON\PAGUATE\PG1132\PG1132_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 16-Dec-10 13:42, STARTGIS

PG1133

Legend

PG1133

Results

- 0 - 10315

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1133
ASSESSMENT DATE: 04/21/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\buster\Desktop\PAGUATE\PG1133\PG1133_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 15-Oct-10 10:54, buster

PG1134

Legend

PG1134

Results

- 0 - 11680
- 11681 - 12681
- 12682 - 12999
- 13000 - 13999
- 14428; 14495

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1134
ASSESSMENT DATE: 04/01/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

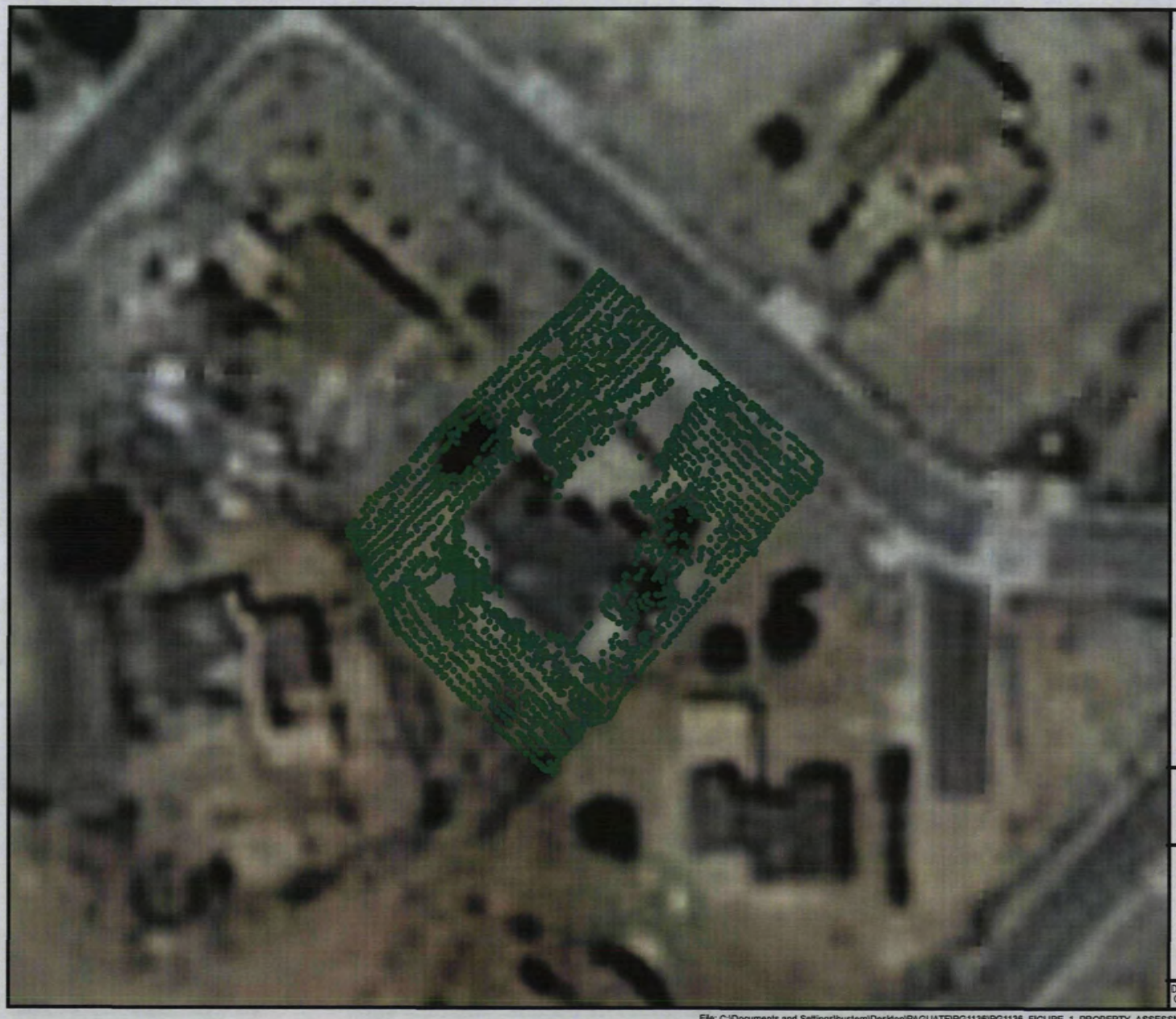
DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1134\PG1134_FIGURE_1_PROPERTY_ASSESSMENT_ASSESSMENT_MAP.mxd, 05-Oct-10 10:35, busterp

PG1135

File: C:\Documents and Settings\buserp\Desktop\PAGUATE\PG1135\PG1135_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 15-Oct-10 11:39, buserp

PG1136



Legend

PG1136

Results

- 0 - 9976

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

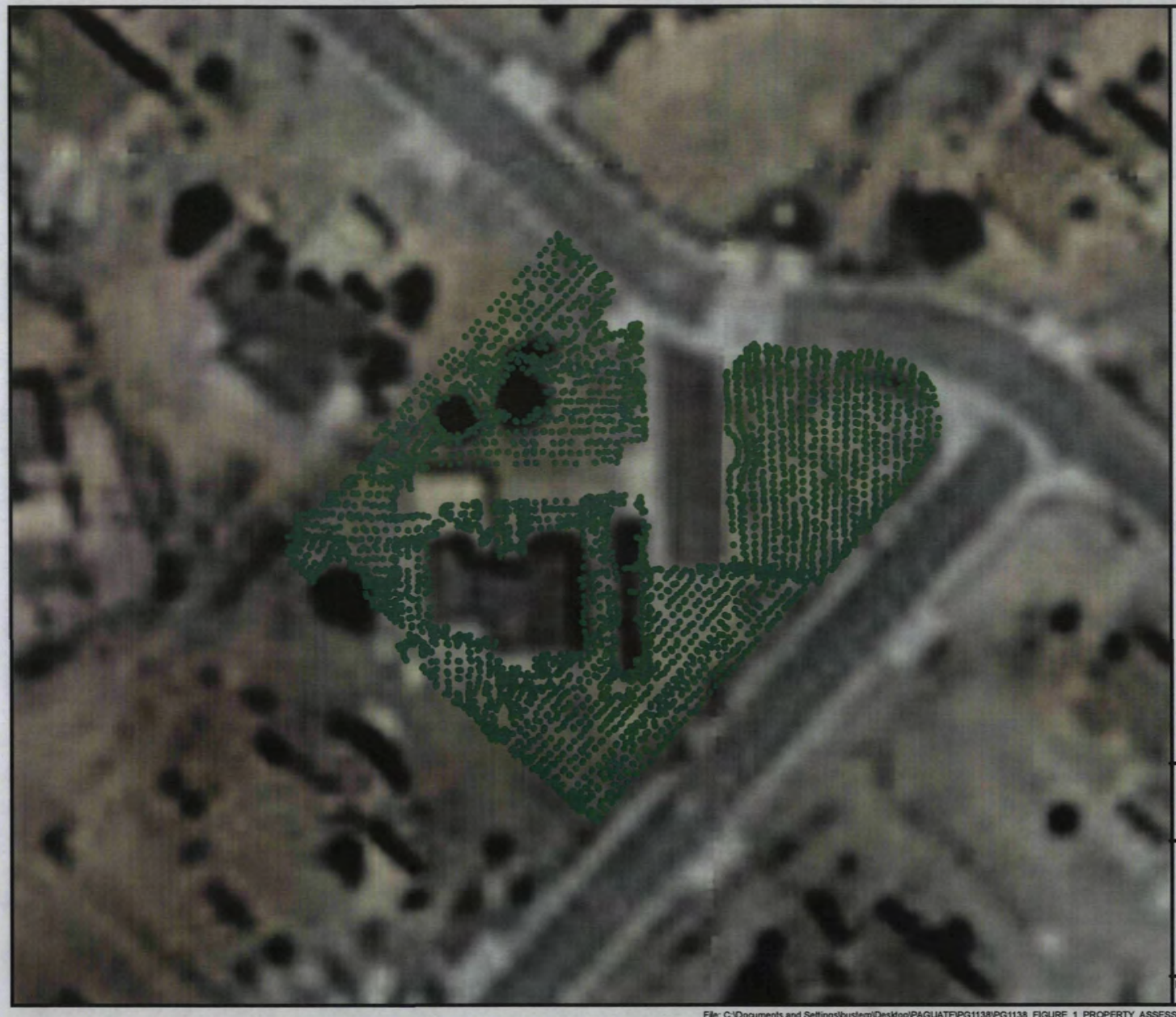
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1136
ASSESSMENT DATE: 03/23/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\buster\Desktop\PAGUATE\PG1136\PG1136_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 15-Oct-10 12:23, buster

PG1138



Legend

PG1138

Results

- 0 - 9801

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1138
ASSESSMENT DATE: 03/26/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1138\PG1138_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 18-Oct-10 06:01, busterp

PG1139

Legend

PG1139

Results

- 0 - 9628

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

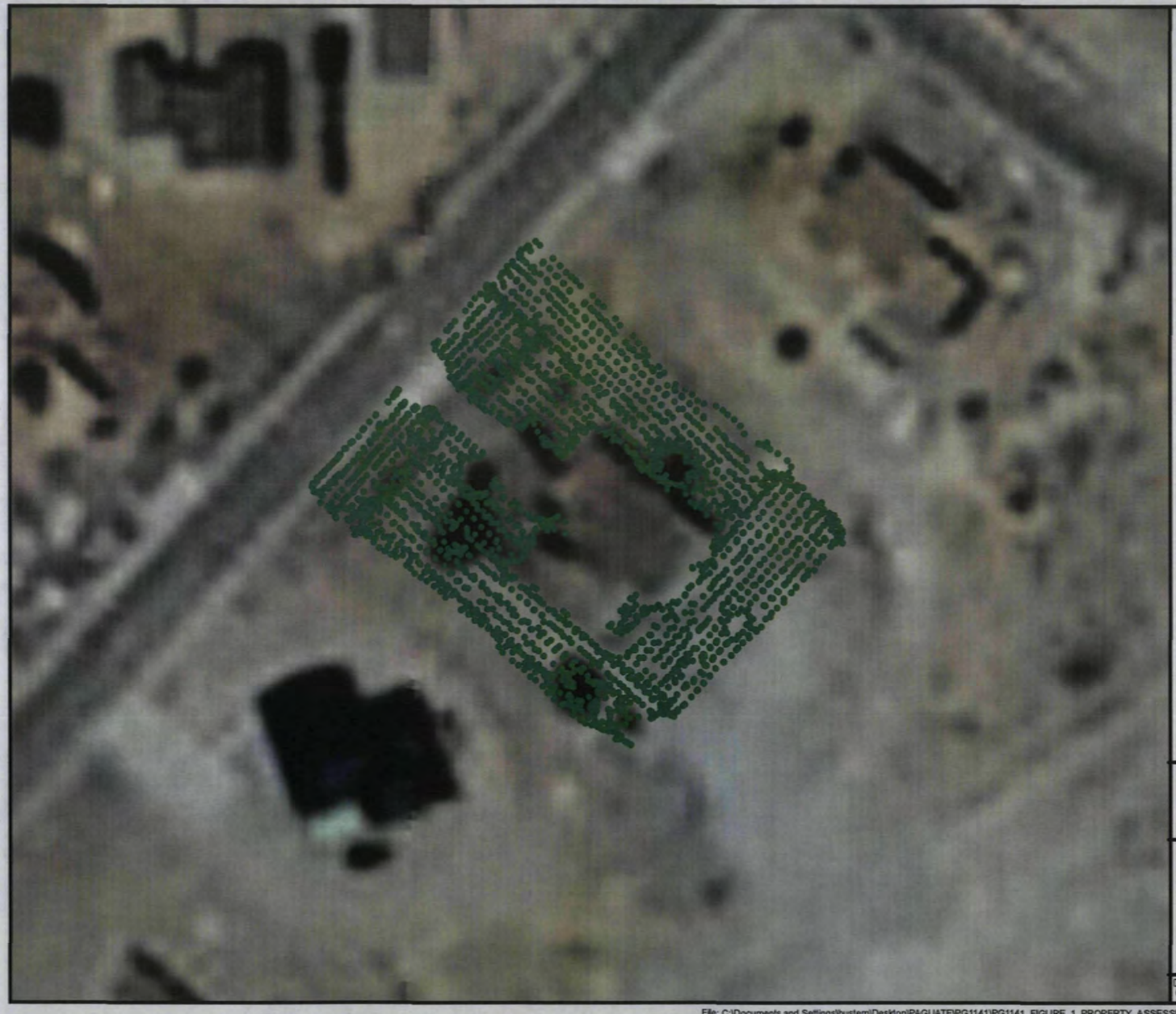
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1139
ASSESSMENT DATE: 03/25/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1139\PG1139_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 18-Oct-10 06:27, busterp

PG1141



Legend

PG1141

Results

- 0 - 9685

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

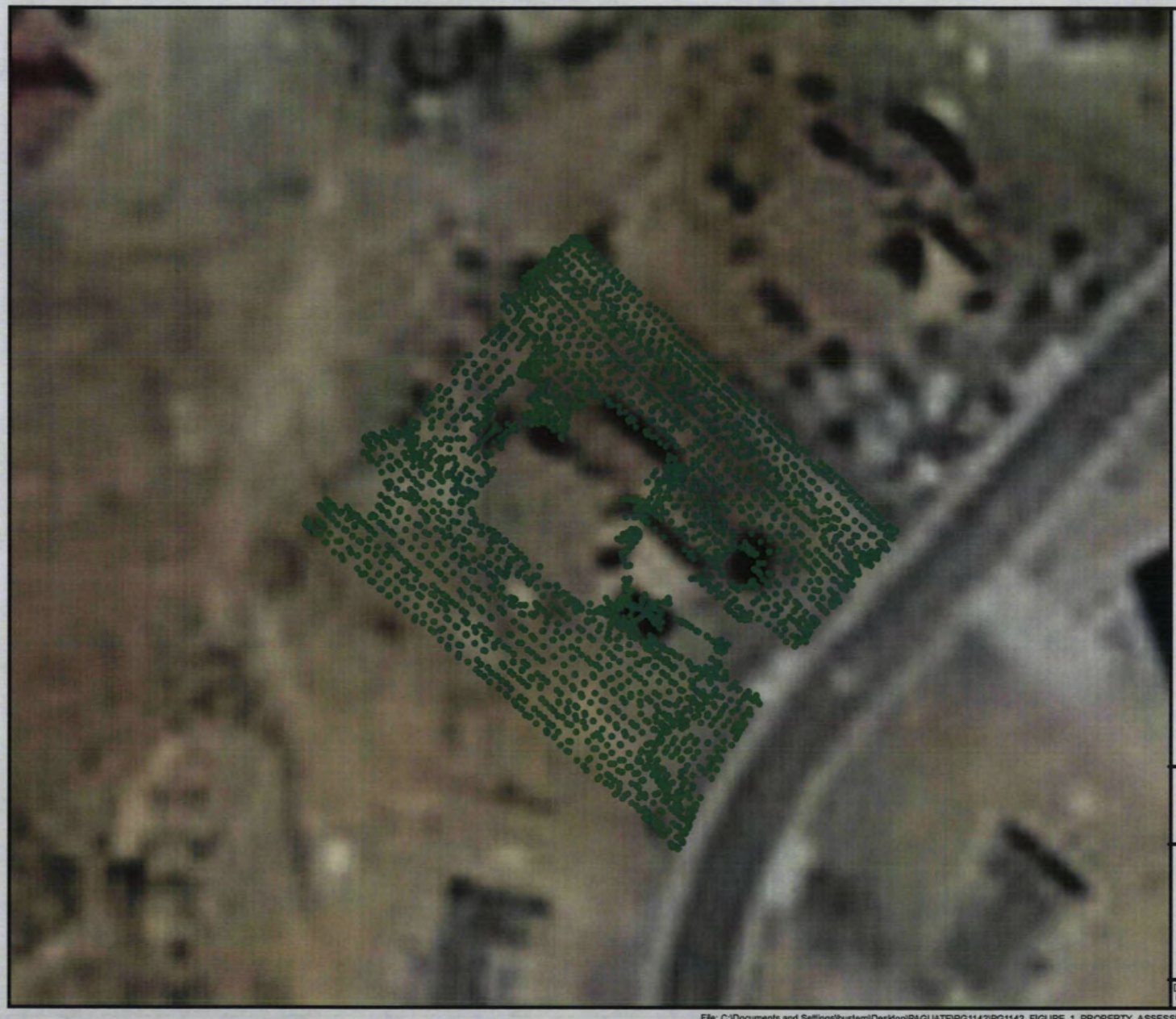
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1141
ASSESSMENT DATE: 03/31/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1141\PG1141_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 18-Oct-10 07:20, busterp

PG1142



Legend

PG1142

Results

- 0 - 10289

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1142
ASSESSMENT DATE: 03/29/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1142\PG1142_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 18-Oct-10 07:47, busterp

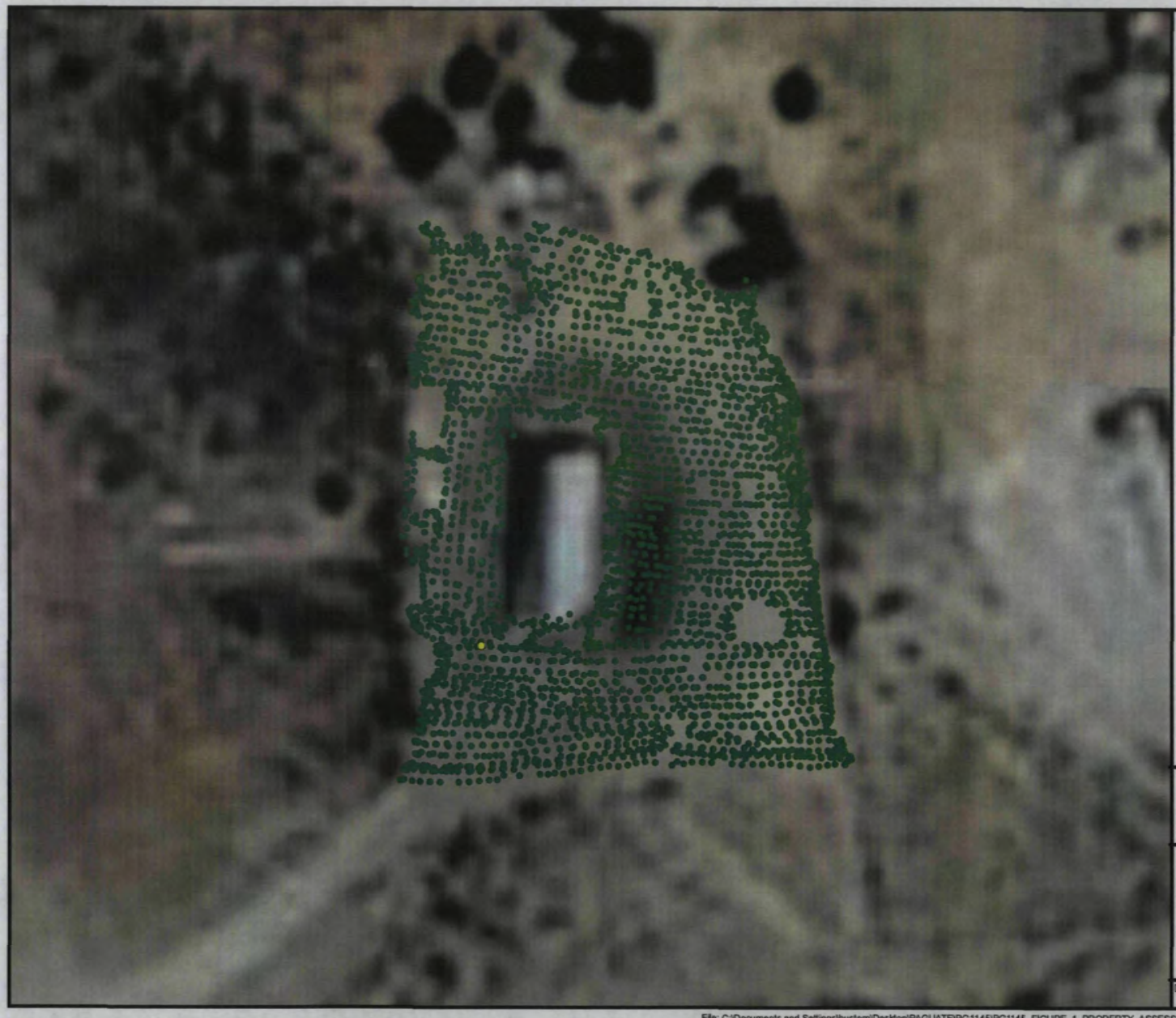
PG1143

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1143\PG1143_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 18-Oct-10 08:28, busterp

PG1144

File: C:\Documents and Settings\buserp\Desktop\PAGUATE\PG1144\PG1144_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 18-Oct-10 09:15, buserp

PG1145



Legend

PG1145

Results

- 0 - 11680
- 11681 - 12681
- 12745

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1145
ASSESSMENT DATE: 04/03/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1145\PG1145_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 18-Oct-10 10:08, busterp

PG1146

Legend

PG1146

Results

- 0 - 11680
- 11681 - 12681
- 12682 - 12999
- 13000 - 14999
- 15000 - 17999
- 19033

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA (OAK CANYON)
URANIUM ASSESSMENT
PROPERTY - PG1146
ASSESSMENT DATE: 3/26/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
DEC 2010	20406.012.005.0538.01	AS SHOWN

File: \\fsnm01\Operations\Field Data\TDD-OAK CANYON\PAGUATE\PG1146\PG1146_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 16-Dec-10 14:09, STARTGIS

PG1366

Legend

PG1366

Results

- 0 - 10182

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

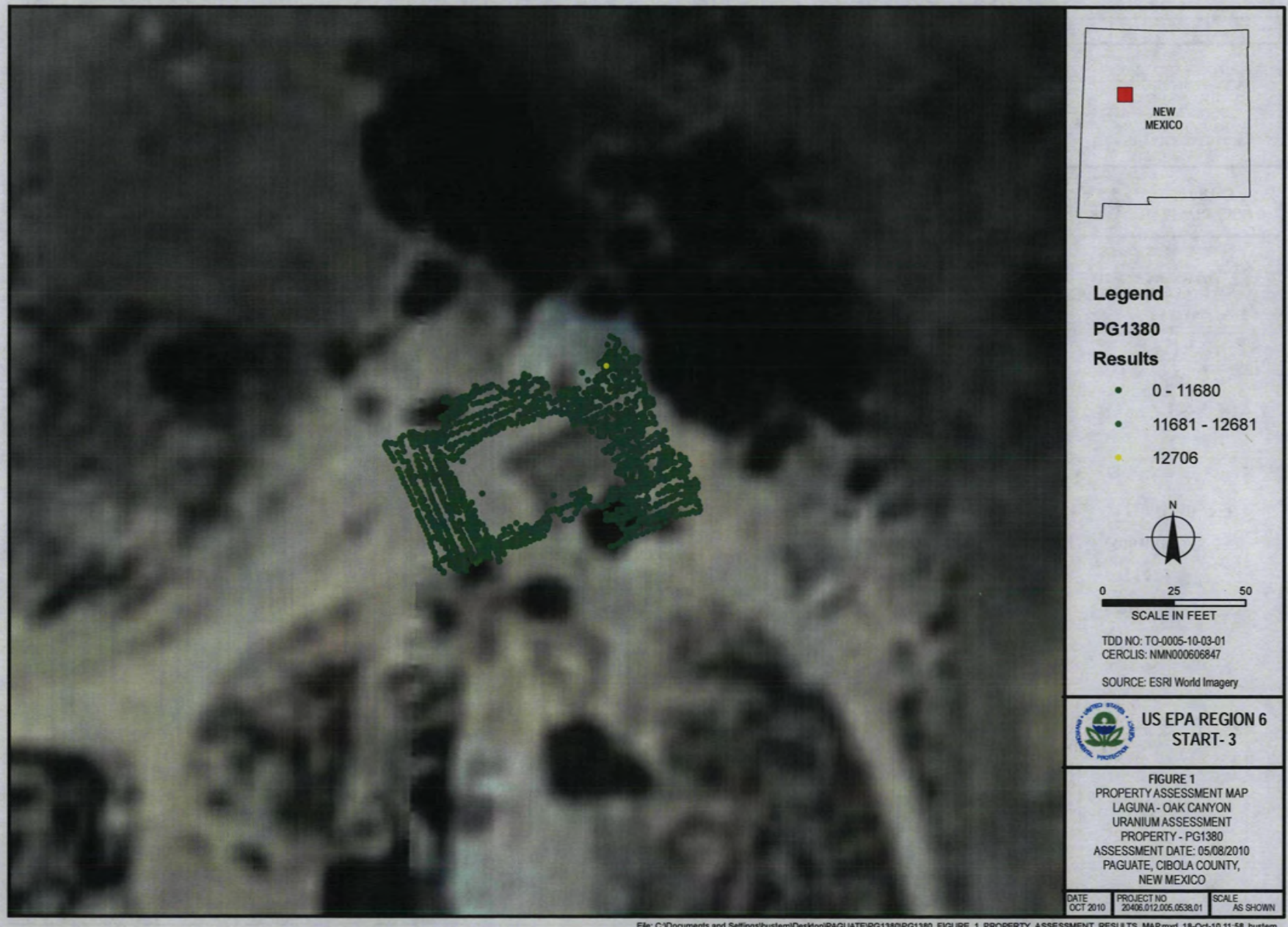
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1366
ASSESSMENT DATE: 03/29/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

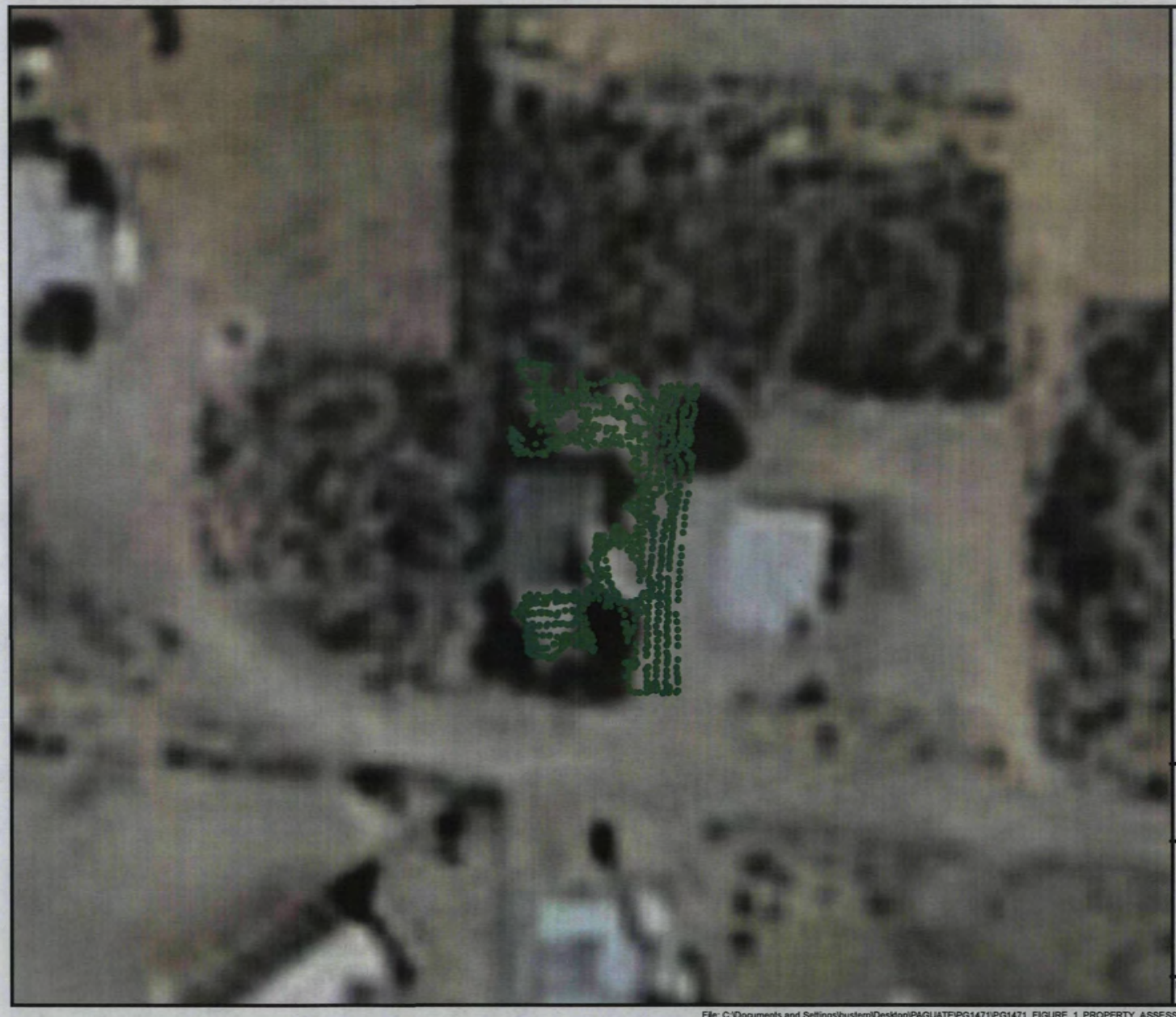
File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1366\PG1366_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 18-Oct-10 11:28, busterp

PG1380



File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1380\PG1380_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 18-Oct-10 11:58, busterp

PG1471



Legend

PG1471

Results

- 0 - 11040

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1471
ASSESSMENT DATE: 04/13/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

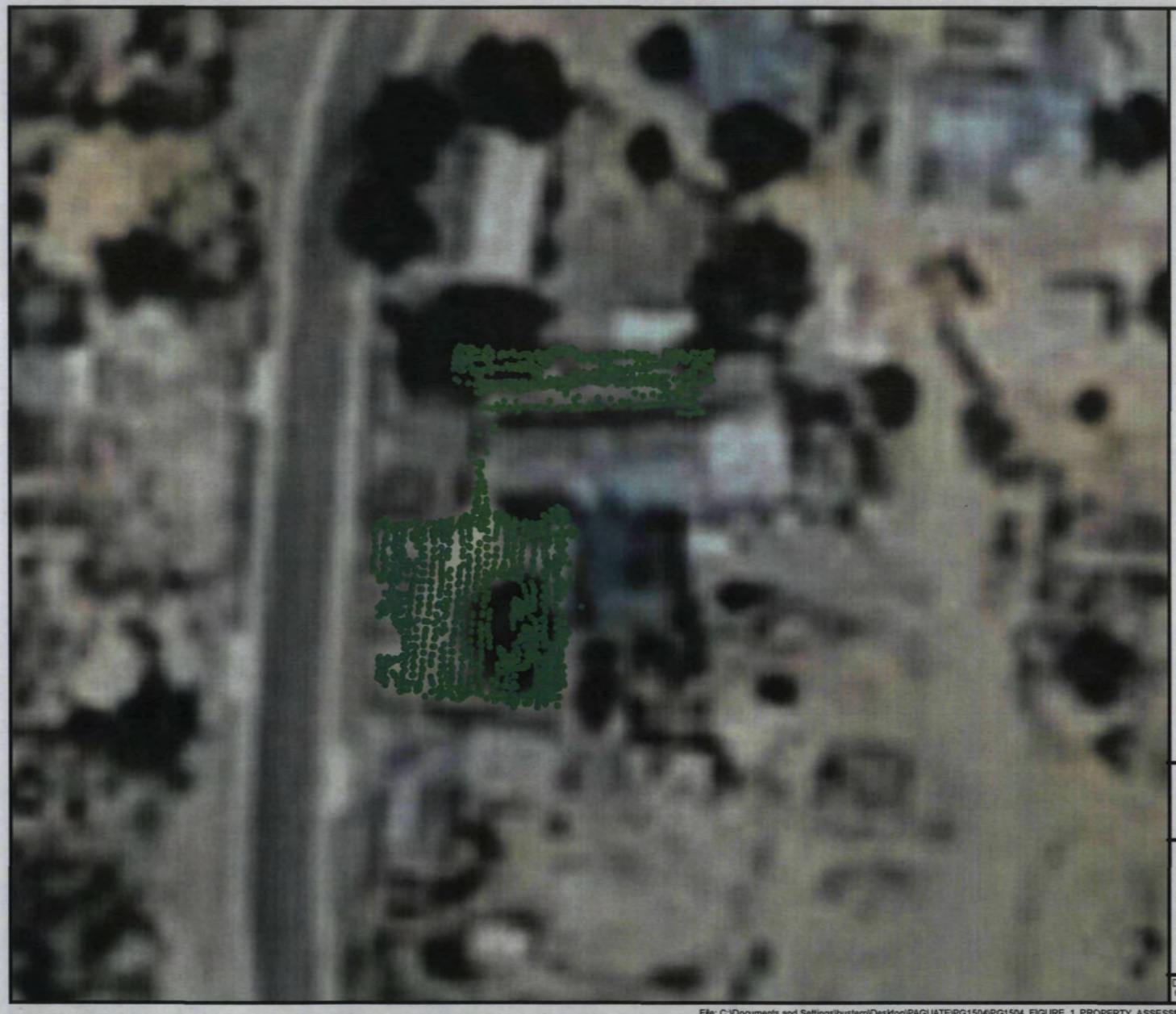
DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1471\PG1471_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 18-Oct-10 13:02, busterp

PG1473

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1473\PG1473_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 19-Oct-10 06:56, busterp

PG1504



Legend

PG1504

Results

- 0 - 10415

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1504
ASSESSMENT DATE: 04/10/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

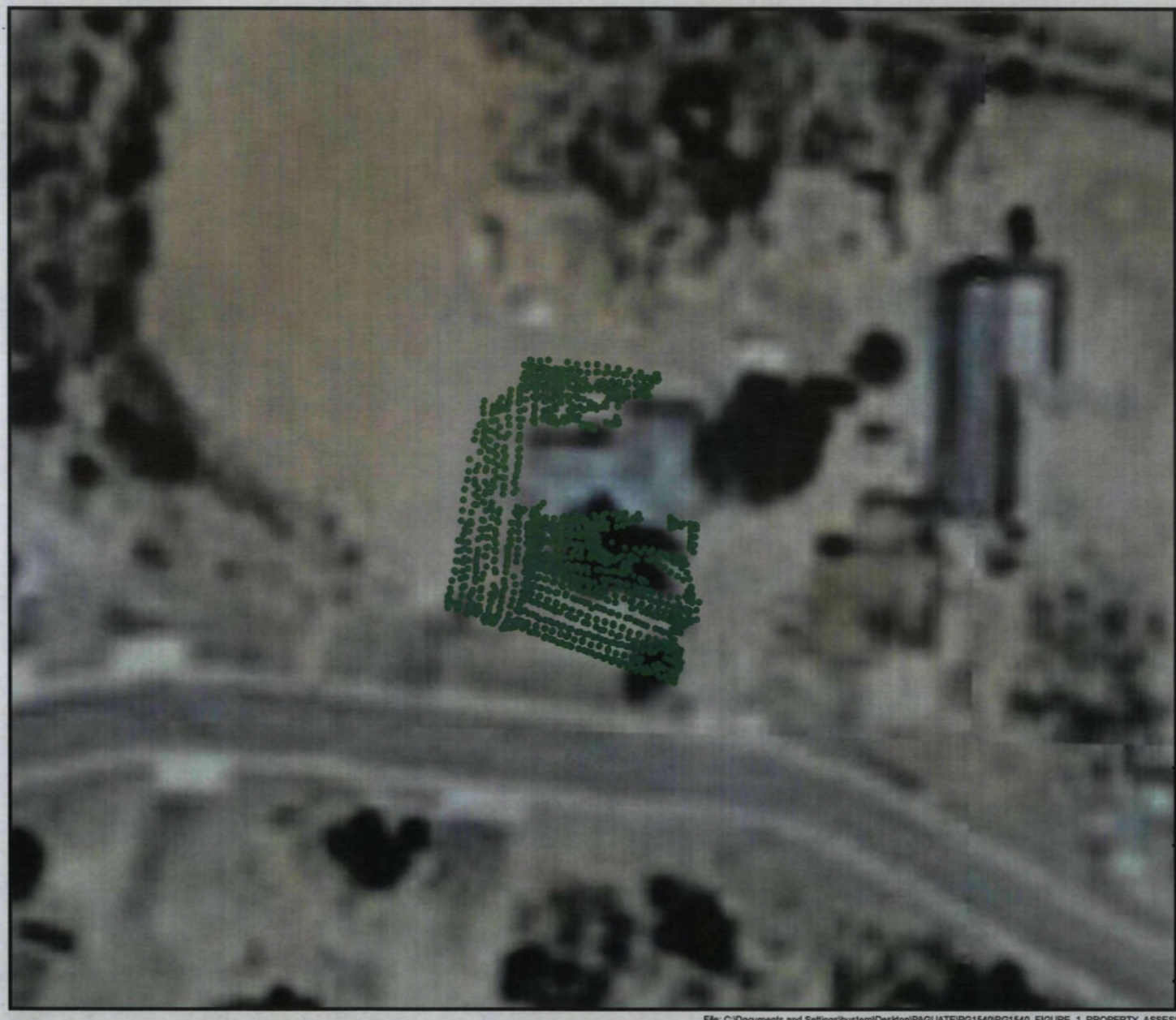
DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1504\PG1504_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 19-Oct-10 07:51, busterp

PG1516

File: \\fsnm01\Operations\Field Data\TDD-OAK CANYON\PAGUATE\PG1516\PG1516_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 02-Oct-10 10:35, STARTGIS

PG1540



Legend

PG1540

Results

- 0 - 10584

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

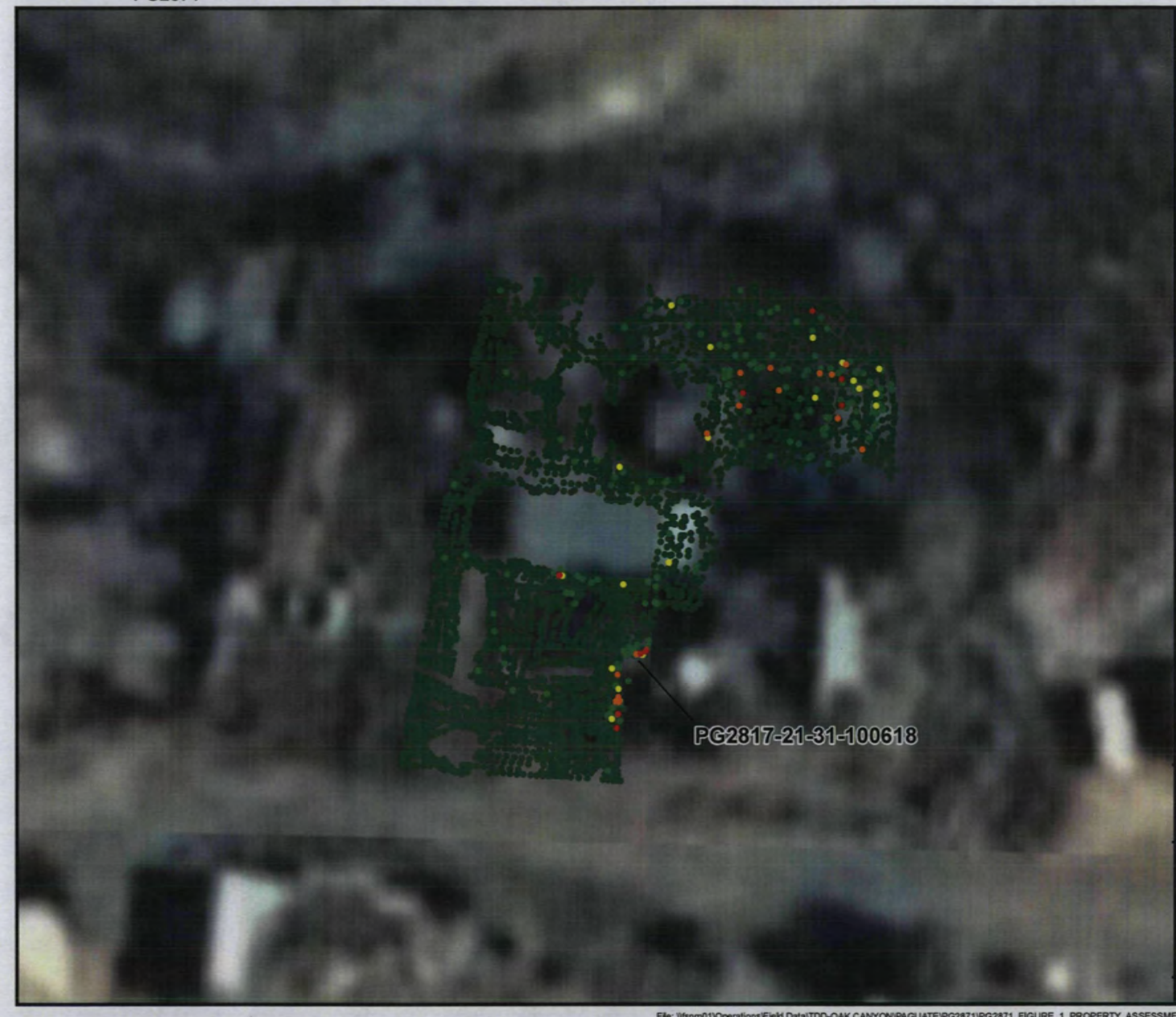
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG1540
ASSESSMENT DATE: 05/04/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG1540\PG1540_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 19-Oct-10 08:24, busterp

PG2871



Legend

PG2871

Results

- 0 - 11680
- 11681 - 12681
- 12682 - 12999
- 13000 - 13999
- 14000 - 15999

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI USA Prime Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA (OAK CANYON)
URANIUM ASSESSMENT
PROPERTY - PG2871
ASSESSMENT DATE: 06/18/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
SEPT 2010	20406.012.005.0538.01	AS SHOWN

File: \\fsnm01\Operations\Field Data\TDD-OAK CANYON\PAGUATE\PG2871\PG2871_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 03-Sep-10 12:19, STARTGIS

PG8954

Legend

PG8954

Results

- 0 - 9788

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

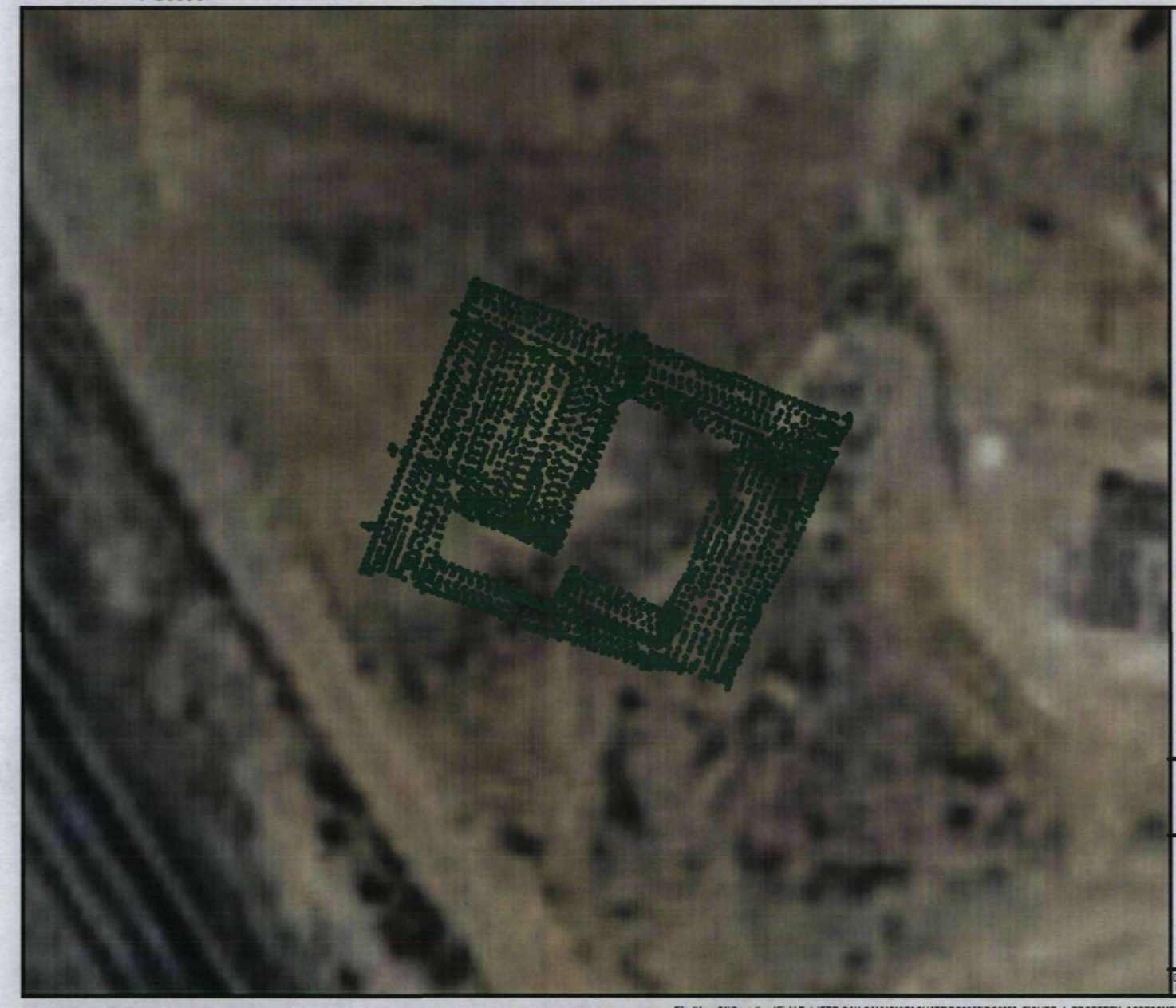
US EPA REGION 6
START- 3

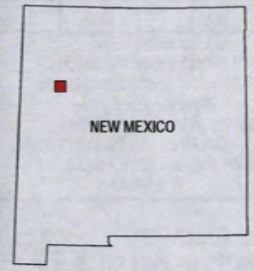
FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA (OAK CANYON)
URANIUM ASSESSMENT
PROPERTY - PG8954
ASSESSMENT DATE: 11/05/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
NOV 2010	20406.012.005.0538.01	AS SHOWN

File: \\fsnm01\Operations\Field Data\TDD-OAK CANYON\PAGUATE\PG8954\PG8954_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 30-Nov-10 14:23, STARTGIS

PG8955





Legend

PG8955

Results

- 0 - 10591

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA (OAK CANYON)
URANIUM ASSESSMENT
PROPERTY - PG8955
ASSESSMENT DATE: 11/04/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
NOV 2010	20406.012.005.0538.01	AS SHOWN

File: \\fsnm01\Operations\Field Data\TDD-OAK CANYON\PAGUATE\PG8955\PG8955_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 30-Nov-10 14:54, STARTGIS

PG8956

Legend

PG8956

Results

- 0 - 10283

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

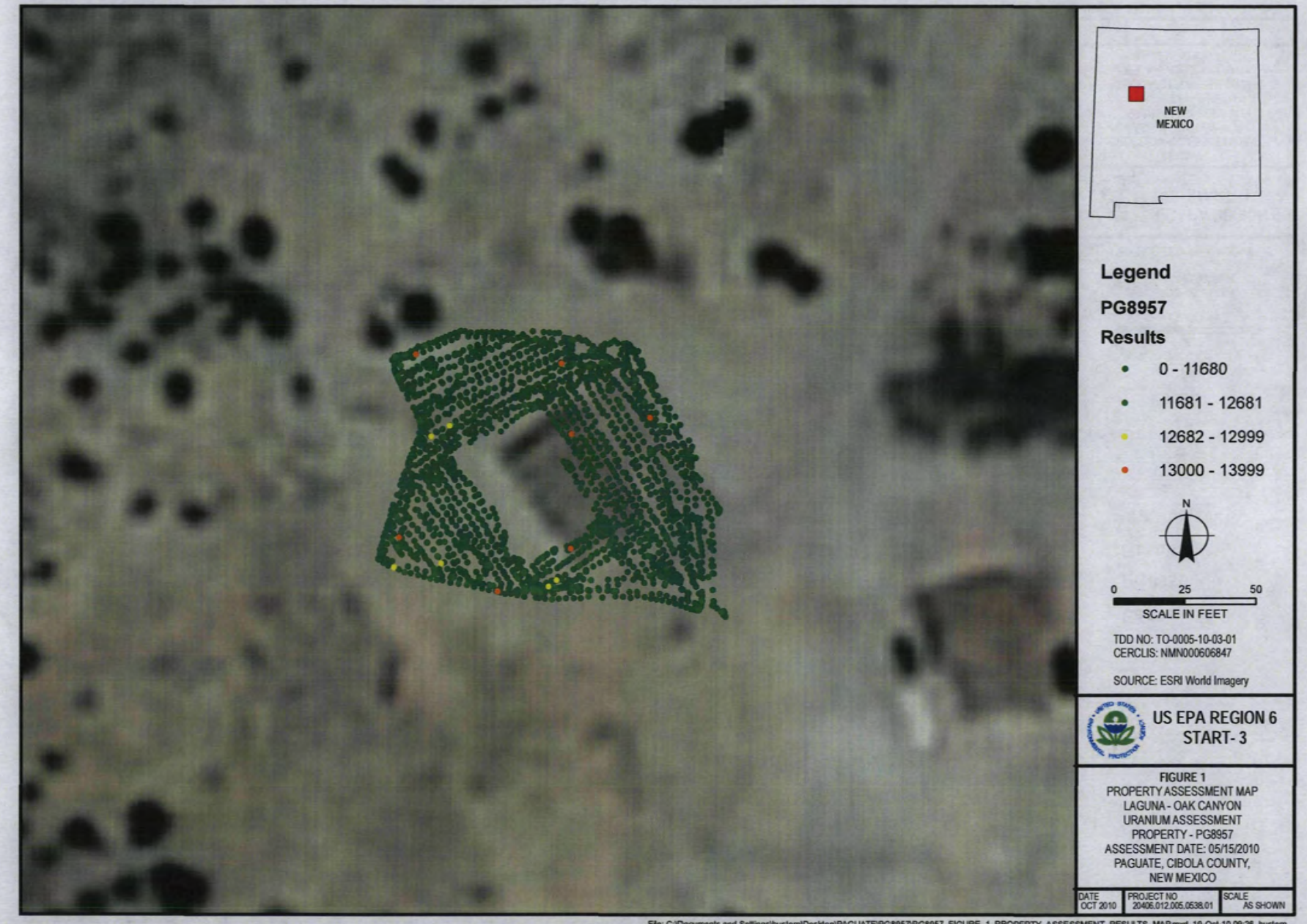
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA (OAK CANYON)
URANIUM ASSESSMENT
PROPERTY - PG8956
ASSESSMENT DATE: 11/04/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
NOV 2010	20406.012.005.0538.01	AS SHOWN

File: \\fsnm01\Operations\Field Data\TDD-OAK CANYON\PAGUATE\PG8956\PG8956_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 30-Nov-10 15:29, STARTGIS

PG8957



File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG8957\PG8957_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 19-Oct-10 09:26, busterp

PG8959

Legend

PG8959

Results

- 0 - 9215

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG8959
ASSESSMENT DATE: 05/06/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG8959\PG8959_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 19-Oct-10 10:12, busterp

PG8960

Legend

PG8960

Results

- 0 - 11680
- 11681 - 12681
- 12682 - 12999
- 13000 - 13207

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG8960
ASSESSMENT DATE: 05/05/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG8960\PG8960_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 19-Oct-10 10:44, busterp

PG8961

Legend

PG8961

Results

- 0 - 10800

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

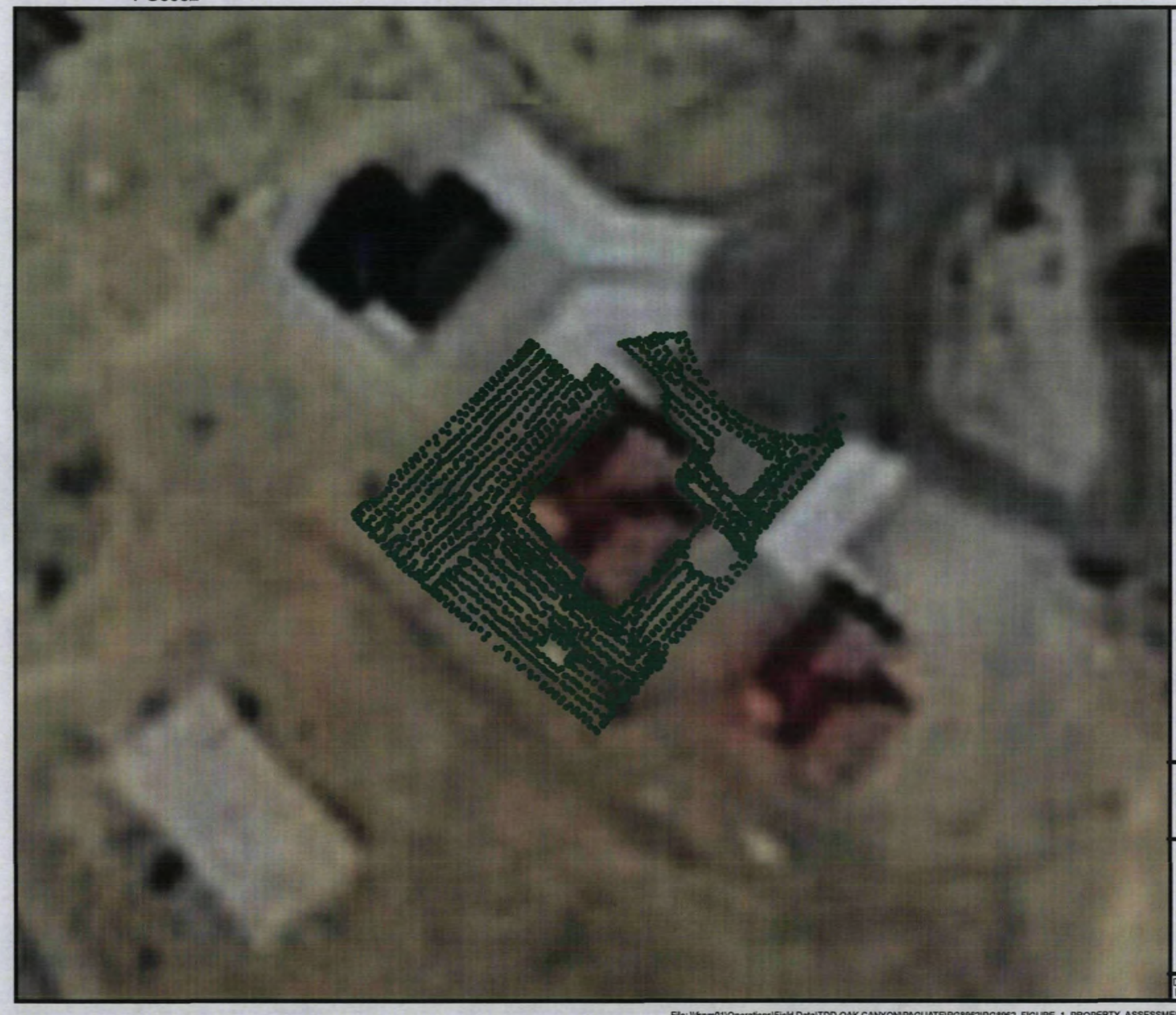
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG8961
ASSESSMENT DATE: 04/20/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG8961\PG8961_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 19-Oct-10 12:04, busterp

PG8962



Legend

PG8962

Results

- 0 - 11267

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA (OAK CANYON)
URANIUM ASSESSMENT
PROPERTY - PG8962
ASSESSMENT DATE: 4/10/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
DEC 2010	20406.012.005.0538.01	AS SHOWN

File: \\fsnm01\Operations\Field Data\TDD-OAK CANYON\PAGUATE\PG8962\PG8962_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 01-Dec-10 09:19, STARTGIS

PG8963

Legend

PG8963

Results

- 0 - 11301

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG8963
ASSESSMENT DATE: 04/10/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG8963\PG8963_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 19-Oct-10 13:08, busterp

PG8964

Legend

PG8964

Results

- 0 - 10710

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

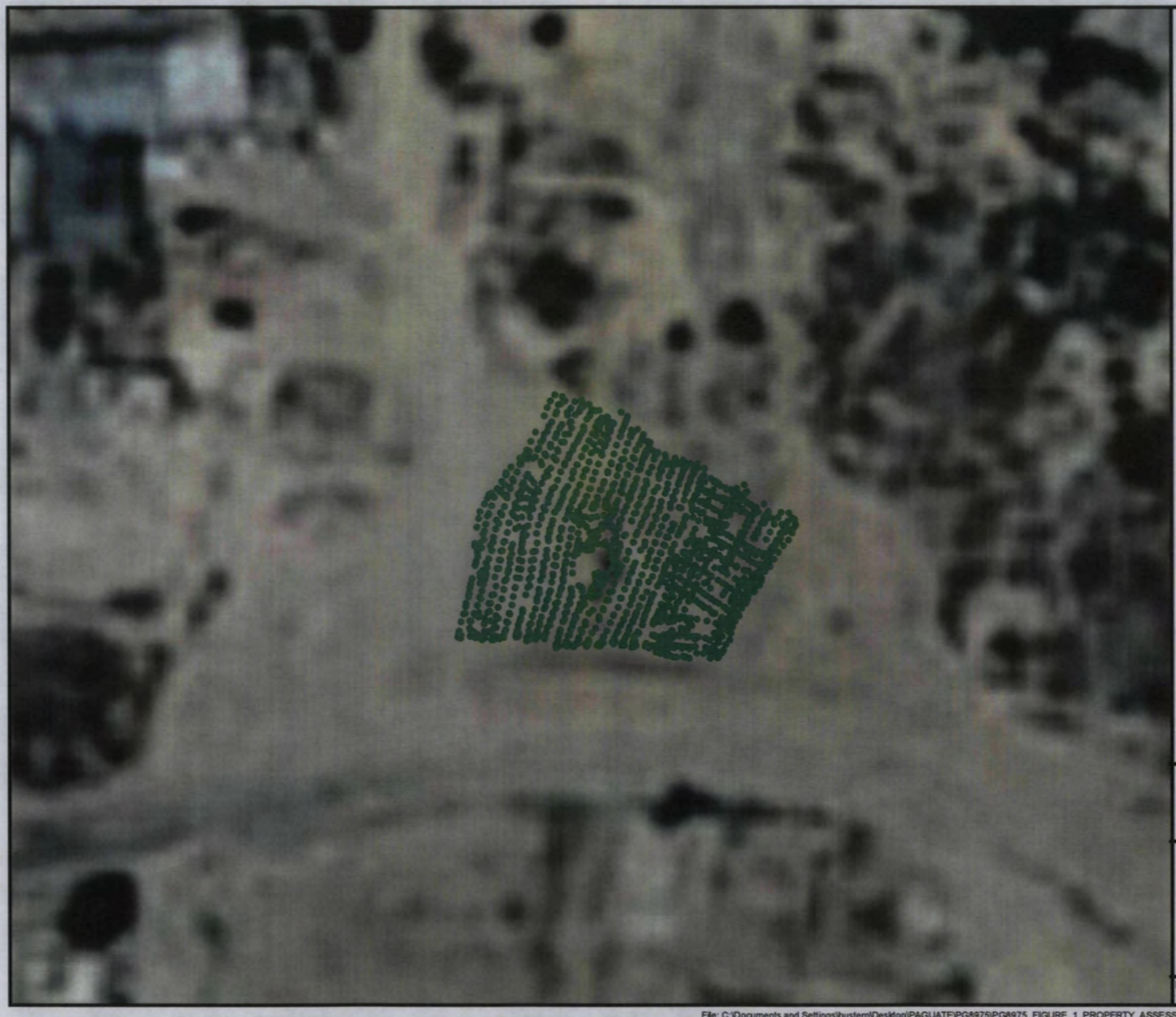
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG8964
ASSESSMENT DATE: 04/30/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG8964\PG8964_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 19-Oct-10 13:54, busterp

PG8975



Legend

PG8975

Results

- 0 - 9518

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG8975
ASSESSMENT DATE: 05/03/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG8975\PG8975_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 19-Oct-10 14:28, busterp

PG8976

Legend

PG8976

Results

- 0 - 11201

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG8976
ASSESSMENT DATE: 05/08/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG8976\PG8976_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 20-Oct-10 06:40, busterp

PG8980

Legend

PG8980

Results

- 0 - 11680
- 11681 - 12681
- 12682 - 12999
- 13000 - 13999
- 16404; 18578

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG8980
ASSESSMENT DATE: 04/02/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG8980\PG8980_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 20-Oct-10 14:22, busterp

PG8981

Legend

PG8981

Results

- 0 - 10839

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG8981
ASSESSMENT DATE: 05/04/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG8981\PG8981_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 20-Oct-10 07:21, busterp

PG8982

Legend

PG8982

Results

- 0 - 11153

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

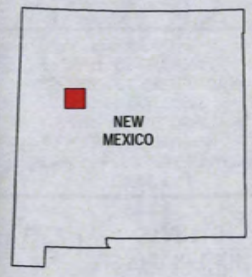
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA (OAK CANYON)
URANIUM ASSESSMENT
PROPERTY - PG8982
ASSESSMENT DATE: 9/29/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
DEC 2010	20406.012.005.0538.01	AS SHOWN

File: \\fsnm01\Operations\Field Data\TDD-OAK CANYON\PAGUATE\PG8982\PG8982_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 01-Dec-10 08:19, STARTGIS

PG8986



Legend

PG8986

Results

- 0 - 11680
- 11681 - 12681
- 12682 - 13064

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG8986
ASSESSMENT DATE: 05/08/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG8986\PG8986_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 20-Oct-10 08:06, busterp

PG8998

Legend

PG8998

Results

- 0 - 9131

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG8998
ASSESSMENT DATE: 03/27/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG8998\PG8998_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 20-Oct-10 09:15, busterp

PG8999

Legend

PG8999

Results

- 0 - 9937

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA - OAK CANYON
URANIUM ASSESSMENT
PROPERTY - PG8999
ASSESSMENT DATE: 03/31/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
OCT 2010	20406.012.005.0538.01	AS SHOWN

File: C:\Documents and Settings\busterp\Desktop\PAGUATE\PG8999\PG8999_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 20-Oct-10 09:52, busterp

PG9001

Legend

PG9001

RESULTS

- 0 - 11680
- 11681 - 12681
- 12682 - 12999
- 13102; 14085

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: BING MAPS

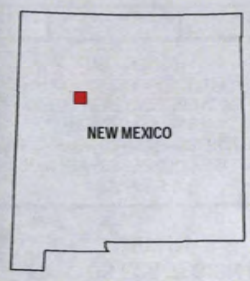
US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA (OAK CANYON)
URANIUM ASSESSMENT
PG9001
ASSESSMENT DATE: 12/9/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
DEC 2011	20406.012.005.0538.01	AS SHOWN

File: \\fsnm01\Operations\Field Data\TDD-OAK CANYON\PAGUATE\PG9001 (church)\PG9001_FIGURE_1.mxd, 07-Dec-11 16:13, STARTGIS

PG9002



Legend

PG9002

Results

- 0 - 11680
- 11681 - 12681

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: ESRI World Imagery

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT MAP
LAGUNA (OAK CANYON)
URANIUM ASSESSMENT
PG9002-COMMUNITY CENTER
ASSESSMENT DATE: 3/17/2011
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
APR 2011	20406.012.005.0538.01	AS SHOWN

File: \\fsnm01\Operations\Field Data\TDD-OAK CANYON\PAGUATE\PG9002 (Community Center)\PG9002_FIGURE_1_PROPERTY_ASSESSMENT_RESULTS_MAP.mxd, 06-Apr-11 15:36, STARTGIS

PG9999

Legend

PG9999

RESULTS

- 0 - 11135
- 11397

N

0 25 50

SCALE IN FEET

TDD NO: TO-0005-10-03-01
CERCLIS: NMN000606847

SOURCE: BING MAPS

US EPA REGION 6
START- 3

FIGURE 1
PROPERTY ASSESSMENT RESULTS
OAK CANYON URANIUM ASSESSMENT
PROPERTY - PG9999
ASSESSMENT DATE: 08/31/2010
PAGUATE, CIBOLA COUNTY,
NEW MEXICO

DATE	PROJECT NO	SCALE
NOV 2011	20406.012.001.0538.01	AS SHOWN

File: \\fsnm01\Operations\Field Data\TDD-OAK CANYON\PAGUATE\PG9999 (fields)\PG9999_FIGURE_1.mxd, 15-Nov-11 15:55, STARTGIS