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Title:	Proposal for Open Air Handling and Transfer of Contaminated Soil at LANL MDA-B
Author(s):	Fuehne, David P.
Intended for:	DOE Environmental Permit Notification; to LASO then EPA US EPA Air quality Environmental monitoring and surveillance Reading Room Radionuclide NESHAP

To: Hai Shen, LASO

Proposal for Open Air Handling and Transfer of Contaminated Soil at LANL MDA-B

This memo is intended to transmit a request for approval of minor changes to the operational scope of remediation operations at Materials Disposal Area B (MDA-B) at Los Alamos National Laboratory (LANL). As this change represents a deviation from the approved work scope in our January 2010 updated Pre-Construction application, notification to Region 6 of the Environmental Protection Agency is required. Please forward the attached proposal to Mr. George Brozowski, Regional Health Physicist for EPA Region 6.

In short, the attached proposal requests approval for the open air handling and transfer of contaminated soil between waste transport containers. Some of these waste transport containers exceed Department of Transportation (DOT) limits for either the mass of soil in the container or the total amount of radioactive material in the container. Such containers will be moved to a remote section of the TA-21 mesa, and a small amount of soil moved from these bins to new containers. The amount of soil to be moved is minimal; just enough to bring these bins within DOT limits.

We have evaluated the off-site dose from this operation, and the maximally exposed individual from this operation is expected to receive less than 0.2 millirem from this soil transfer activity. Air monitoring stations are located in each downwind compass sector from this operation.

The overall MDA-B remediation operation had an estimated off-site dose of 7.7 millirem. To date, air measurements indicate the maximally exposed individual on DP Road has received about 3.1 millirem. The project is anticipated to end in calendar year 2011.

In the February 18, 2010 memo from EPA Region 6 approving the MDA-B work scope, Conditions 2 and 3 state:

2. Any change in the information of this approved Application, shall be provided in writing to EPA-Region 6 within 30 days after the change.

3. Any revision of the plans and specifications of this approved Application, which may affect the radiation emissions to the outside air from the new construction, shall require prior written approval by Region 6 of EPA.

This memo constitutes notification of the planned operational change, per Condition 2. As this change may slightly increase the off-site dose from MDA-B remediation operations, please request that Mr. Brozowski reply with his concurrence to this proposal via either electronic mail or formal memo. Such written communication will meet the requirement of Condition 3.

The attachment contains more details on the general proposal and the specific case encountered to date. If you have further questions, please contact David Fuehne of my staff at davef@lanl.gov or 505-665-3850. Thank you for your time.

Sincerely,

Patricia Gallagher
Group Leader, Environmental Stewardship Group

Attachment: LA-UR-yy-xxxx, "Proposal for Open Air Handling and Transfer of Contaminated Soil at LANL MDA-B"

Cy:
David Janecky, ENV-ES, J978
David Fuehne, ENV-ES, J978
Dennis Hjeresen, ENV-DO, K404
Chris Cantwell, ADESHQ, K491
Isaac Richardson, DIR, A100
Carl Beard, PADOPS, A102
IRM-RMMSO, A150
Allan Chaloupka, ADEP, C348
Mitch Goldberg, PMFS-DO, C349
Hai Shen, LASO, E550
Cindy Blackwell, LC-LESH
ENV-ES Rad-NESHAP Records, 2011 Section 1.6, EPA Correspondence
ENV-ES Memo File

Proposal for Open Air Handling and Transfer of Contaminated Soil at LANL MDA-B

David Fuehne, CHP
Aug 31, 2011
LA-UR-xx-xxxxx

The updated Pre-Construction Application[1] of January 2010 and follow-up status update memo[2] of May 2010 describe the planned methods for remediation of Materials Disposal Area B (MDA-B) at Los Alamos National Laboratory (LANL). In these documents, we describe how the majority of excavation work at MDA-B will be conducted under enclosures. Only specific areas with very low levels of radiological contamination were excavated in the open air. A previous request to expand open-air operations to include specific follow-up excavations removing residual contamination was approved in October 2010.[3]

With this memo, we request an extension of the philosophy put forth in these three prior documents, allowing the handling of excavated soil and transfer of soil between waste storage containers to be performed in the open air, when anticipated off-site dose consequences are very small.

General process description:

All excavation of contaminated soil and waste is performed under excavation enclosures at MDA-B, except for those situations previously discussed and authorized for open-air excavation. Once excavated, the soil is placed into waste storage containers and the process for characterization and shipment of the bins is initiated.

The Department of Transportation (DOT) has established limits on the quantity (mass) of soil can be in an individual container and also on the total amount of radioactive material that can be in a single container. As containers from MDA-B are processed for shipment, there are some which exceed either the mass limit or the radiological content limit for shipping, and these bins must be addressed.

[1] Update to Pre-Construction Application for the MDA-B Project, LA-UR-10-0015. Application submitted to EPA Region 6 on January 13, 2010. Approval from EPA Region 6 received February 18, 2010.

[2] Rad-NESHAP Status Update and Changes to Work Scope Implementation at Materials Disposal Area B, memo ENV-ES:10-089, May 17, 2010. LA-UR-10-03297.

[3] Proposal for Limited Open-Air Remediation at LANL MDA-B, memo ENV-ES: 10-188. LA-UR-10-06543. Submitted to EPA Region 6 on Oct 7, 2010; approval received via email Oct 8, 2010.

Proposal for Open-Air Soil Handling:

The proposed solution to address this issue is to move the bins to a remote section of the site at Technical Area 21 (TA-21), at a location furthest from public receptors. At this location, the bins will be opened up and dirt moved from the loaded bin to a secondary container. A minimum amount of soil will be moved; just enough to bring the initial container to within DOT limits.

The proposed soil transfer location at the east end of TA-21 is indicated on the attached maps. Airnet stations are in place in all compass sectors in the area. The location of the maximally exposed individual, specific to this operation, is the cluster of buildings designated the "Airport Hangars." These buildings are monitored by Airnet station 347.

Summary of containers requiring soil transfer, and associated off-site dose consequence:

- Total number of waste bins affected: 125
- Total amount of soil to be moved: 1,040,000 lbs 520 cubic yards[4]
- Average soil mass to be moved: 8,320 lbs per bin 4.2 cubic yards per bin
- Total amount of rad material to be moved: 0.982 Ci of plutonium-239 or equivalent[5]
- Average rad content to be moved: 0.0079 Ci of Pu-239 or equivalent per bin

CAP88 version 3 analysis of emissions:

- Total amount of radioactive material: 0.982 Ci of Pu-239
- Airborne release fraction (Appendix D): 0.001
- CAP88 dose factor 166 millirem per curie emitted (N sector)
- **Estimated off-site dose** **0.16 millirem**

Benefits of Open Air Soil Transfer:

Performing this soil transfer in open air will allow the project to maintain current schedule estimates. Final remediation of MDA-B, including backfilling excavation pits and application of clean overburden, will take place after waste is segregated and shipped out of TA-21. The enclosures are currently working at capacity completing excavation activities and preparing newly filled containers for shipment. A delay in processing the containers described in this

[4] This mass and volume relationship represents a typical soil density of 1.2 grams per cubic centimeter. Our assumed density for the pre-construction planning process was 1.6 g/cm3, appropriate for "dry packed earth." The lower density now assumes excavated dirt, loaded into a transport container, and not packed in any fashion.

[5] Plutonium "equivalency" is a DOE term that quantifies the inhalation toxicity of a given radionuclide relative to the amount of Pu-239 which has an equivalent level of risk. This allows streamlined analysis of nuclide mixtures and flexibility in analyses. At MDA-B, the primary pollutant of concern is Pu-239.

memo would push back the project schedule. In turn, this will extend the duration of diffuse emissions from the site before the remediation is complete.

Summary of Year-to-Date Emissions:

The initial dose estimates predictions were over seven millirem for the complete scope of the MDA-B remediation project. The LANL Rad-NESHAP team has established an administrative limit of 5 millirem per year for MDA-B; current data show the maximum dose at any receptor location is 3.1 millirem. The project is expected to complete excavations this fall, and complete remediation activities in calendar year 2011.

The latest summary of off-site dose measurements is included with this memo, and further updates will be posted to the LANL external web site when they become available; usually every two weeks.

The addition of less than 0.2 millirem of dose from the proposed action will not add significant dose to the levels already encountered by Airnet stations north of MDA-B.

Request for Concurrence:

Los Alamos National Security (LANS) seeks EPA Region 6 concurrence with the proposal for limited open air soil handling and transfer as described in this memo. Off-site dose from these open-air operations are estimated to be less than 0.2 millirem from this proposed project. An email indicating such concurrence would suffice for our records.

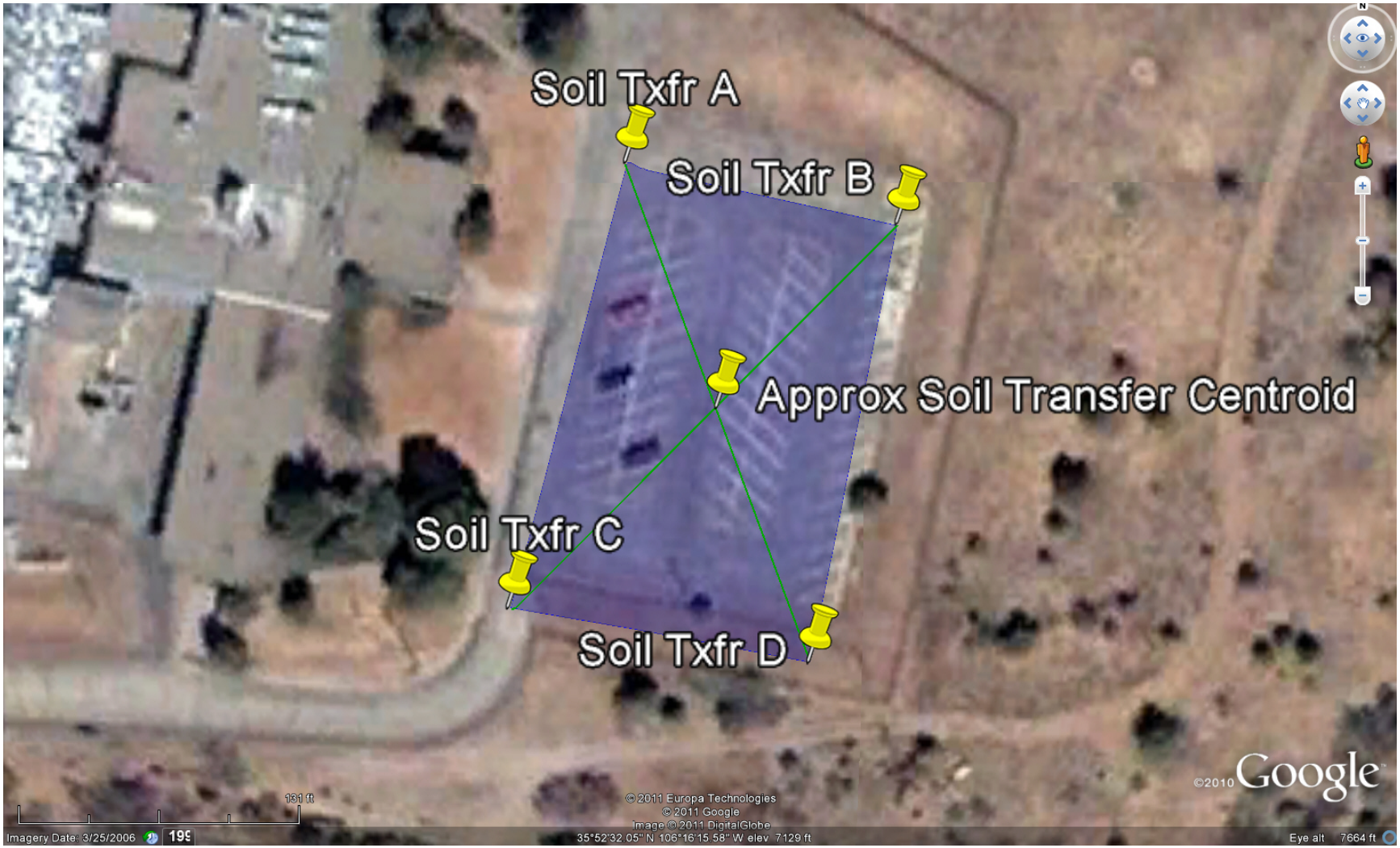
If we can be of further assistance, please contact David Fuehne of the LANS Environmental Stewardship Group by electronic mail at davef@lanl.gov or by phone at (505) 665-3850.

Attachments:

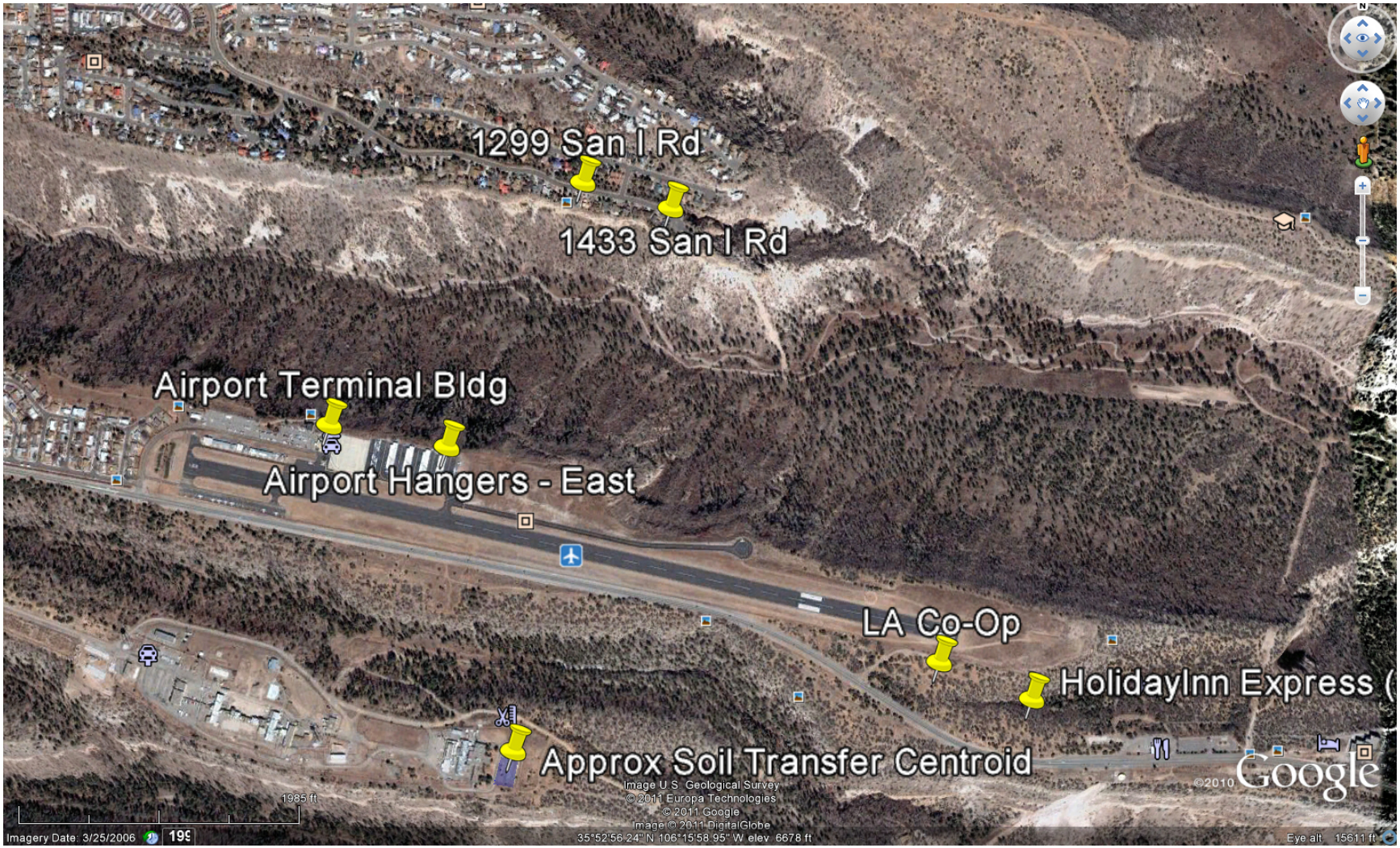
a) Maps showing overview of TA-21 mesa, indicating MDA-B and the proposed soil transfer work area.
b) "Dose map" showing rolling 12-month doses through August 1, 2011, for MDA-B.
c) Calculation table showing the methods used to determine off-site dose consequence.
d) Summary of CAP88 input parameters, distances to receptors, etc.

Overview of TA-21 Mesa, showing MDA-B remediation project on the left (west) and proposed soil transfer area on the right (east). Note that almost all of the buildings depicted in the center of TA-21 have been demolished under the American Reinvestment and Recovery Act (ARRA, “Stimulus” Act).

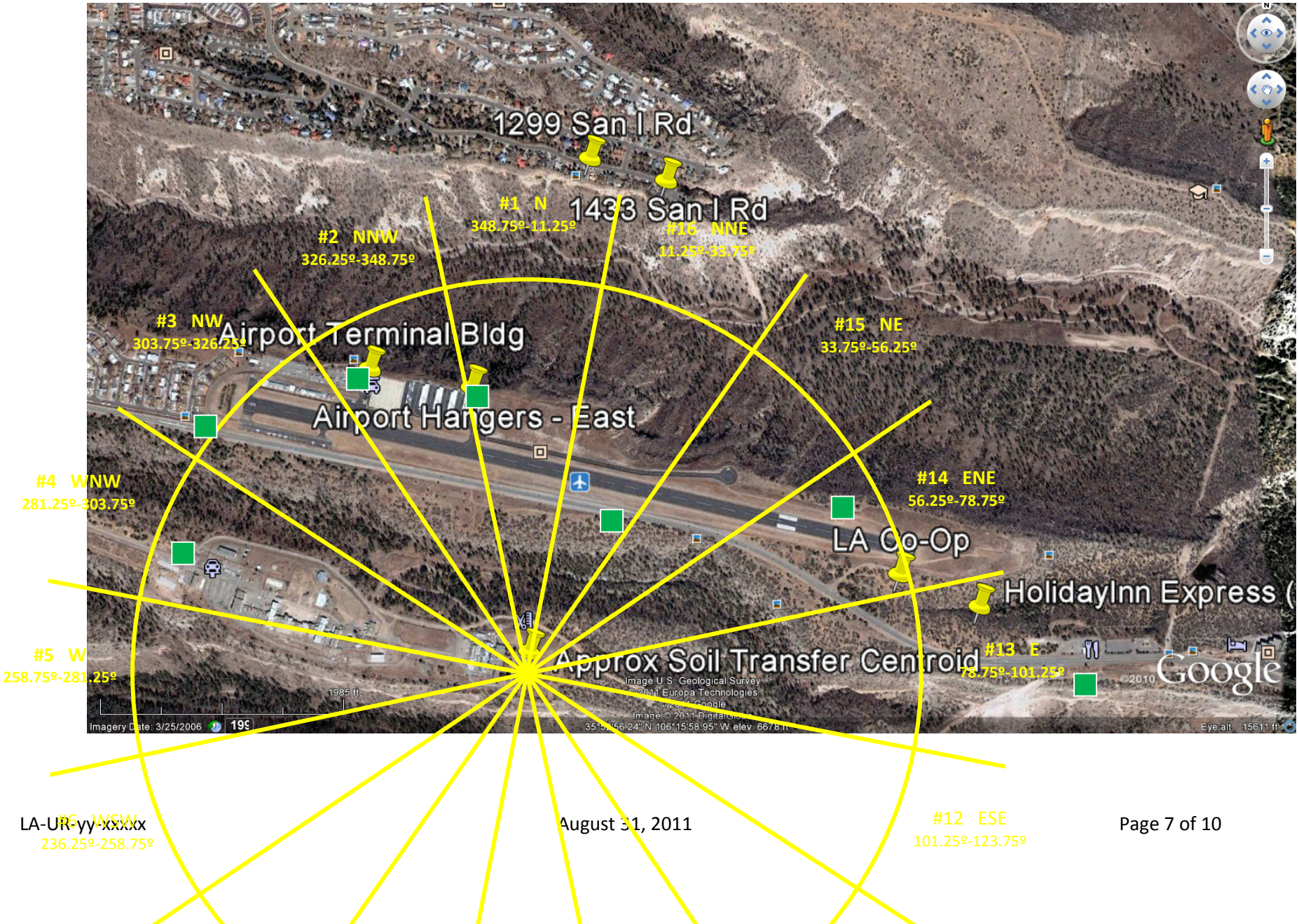
A close up of the soil transfer area at the east end of the TA-21 mesa. Points A, B, C, and D were provided by project personnel. All emissions are modeled as an area source centered on the indicated point. Source area was calculated based on provided points.



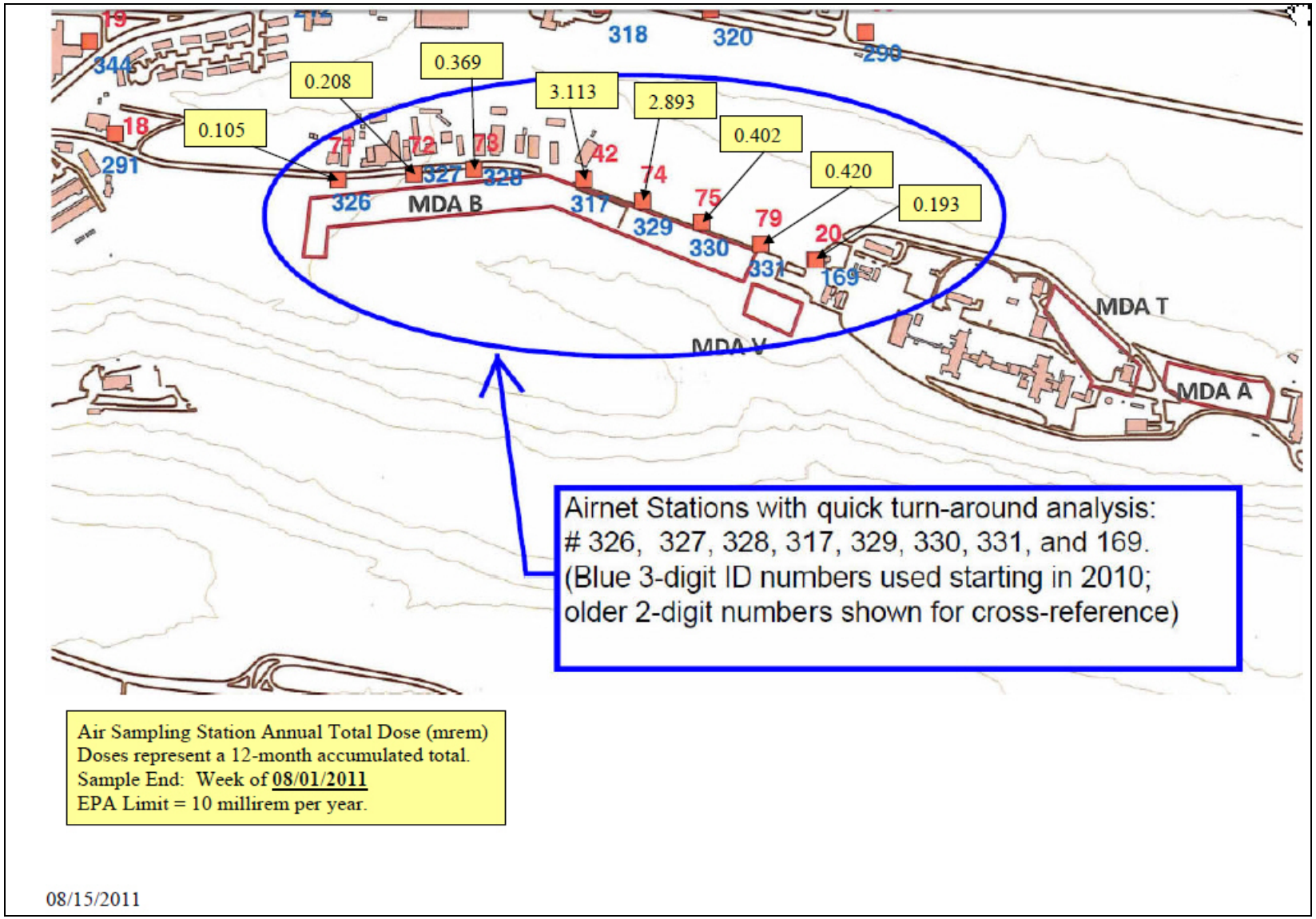
Map of the soil transfer area and potential receptor locations.



Map of soil transfer area and receptor locations. Same as previous map, but with the standard compass sector grid as an overlay.
GREEN SQUARES ■ indicate the location of air monitoring stations in the vicinity. All compass sectors are covered.



Map of rolling 12-month dose at eight Airnet stations along DP Road, north of MDA-B.



Dose Calcs

Request from MDA-B Project.

Remove soil from Roll-Off Bins, transfer to second bin.
Primary bins contain either excess weight (too heavy) or excess rad material (too "hot").
A small amount of soil is to be removed from each affected bin, in order to lower bin inventory amounts to within DOT requirements for mass loading or radiological content of bins on open road.

Information provided by Joe Kanzleiter of the MDA-B project. 8/23/2011, email

125	bins need to have soil removed from them		
520	yd3 total are being removed from these bins	1,040,000	lbs total
0.982	curies of Pu-239 or equivalent in soil to be transferred		
Avg, each bin:	4.2 yd3 to be moved on average	8,320	lbs per bin
	0.0079 PE-Ci (plutonium-equivalent Ci) per bin to be transferred		

Emissions estimate from soil transfer activities:

	0.982	PE-Ci TOTAL amount of rad material being moved.
x	1.00E-03	airborne release fraction for particulates (EPA release fraction; 40CFR61 App D)
=	9.82E-04	PE-Ci released during entire soil handling operation.

Off-site dose consequence from this operation:

x	166	mrem/Ci from DP-East area to max off-site receptor for Pu-239, from DP-East area.
	1.63E-01 mrem	off-site dose consequence from soil handling operation.

This level is in excess of our typical 0.1 mrem threshold level. Regardless, this is a scope change from EPA-approved operations; it also potentially increases emissions. We will need approval from EPA Region 6 prior to proceeding with this activity.

David Fuehne, CHP, Aug 26, 2011.

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CAP88 parameters

Soil Transfer Location
Centroid of old parking lot east of TA-21-209
[Project provided GIS data bounding area; I approximated center]
Lat 35 deg 52 min 32.11 sec N
Long 106 deg 16 min 15.5 sec W

Compare w/ R. Lattin CAP88 runs in similar area

Possible Receptors	Dist (m)	Sector	Azimuth	2009 calc Dose Factor mrem/Ci	2011 calc verify dose factor mrem/Ci
Airport Terminal Bldg	793	NNW	331	118	n/a Hangars closer
Airport Hangars - East	660	NNW	347.8	n/a	166 new max!
1299 San I Rd	1219	N	6.9	89.8	88.8
1433 San I Rd	1204	NNE	16	123	n/a same as 1449
1449 San I Rd	1206	NNE	19.6	123	124
1795 Los Pueblos	2653	NE	34	26.0	26.6
LA Food Co-Op	925	ENE	78.3	n/a	130
Holiday Inn Express (approx)	1100	E	85	n/a	95.7

Distances are from the work area centroid (above) to centroid of each structure

Difference in Lattin runs (2009) and 2011 analyses due to minor differences in distance; the evaluation site in 2009 was not exactly the same as what was used for 2011 runs.

Other CAP88 Input Parameters:

Source area:	2356	m2 (calc from work area boundaries)
Source height:	0	meters
Plume rise:	0	m/s
Met File:	530408	TA-53, 2004-2008 average data
Temperature:	9	deg C
Precipitation:	45	cm/year
Avg Humidity:	5.5	g/m3
Mixing Height:	1600	meters
Agricultural Data:	Local	
CAP88 dataset name:	SoilTxfr	

CAP88 results files are maintained on the Rad-NESHAP / ENV-ES file server at:
\\Cleanair\Projects\RAD-NESHAPS\CAP88 v3 Work\Results by Project\TA-21\Soil Txfr 2011

NNW_Hangars_SoilTxfr.SYN and .SUM
N_SanIRd_SoilTxfr.SYN and .SUM
NNE_SanIRd_SoilTxfr.SYN and .SUM
NE_LosPueb_SoilTxfr.SYN and .SUM
ENE_CoOp_SoilTxfr.SYN and .SUM
E_HolInn_SoilTxfr.SYN and .SUM

D. Fuehne, CHP, 8/26/2011

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