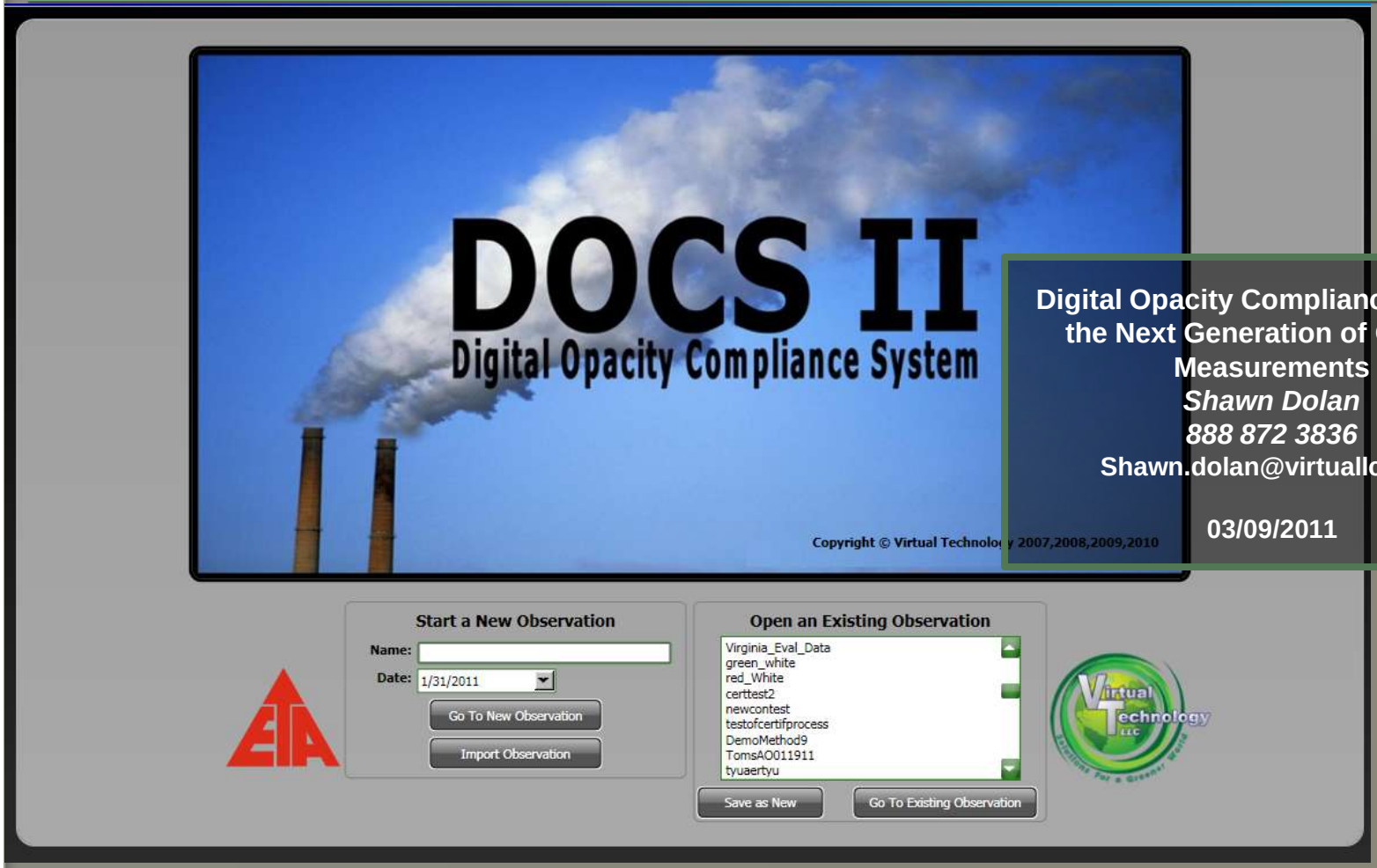
Visible Emission Measurement



Digital Opacity Compliance System the Next Generation of Opacity Measurements

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03/09/2011

Agenda

- ASTM D7520 Update
- DOCSII Walk Through and Discussion

ASTM D7520 vs Method 9

ASTM D7520-09

- Device (Camera, Computer, Software) 300 reading (6 runs) certification
- Operator Training
  - 8 hour course
  - 50 plume certification
  - +/- 7.5% overall and 15%
- Certification Duration 3.5 yrs
- Operational Conditions
  - Unlimited backgrounds
  - Unlimited weather conditions

EPA METHOD 9

- Person only devices not applicable
- Operations
  - 8 hour course
  - 50 plume certification
  - +/- 7.5% overall and 15%
- Certification Duration 6mo
- Operational Conditions
  - Unlimited backgrounds
  - Unlimited weather conditions

Standards are essentially the same performance criteria

ASTM D7520 Update

- Work Group for Standard Maintenance (Shawn Dolan, Chairman)
- Proposed a change to the released version in support of Bias section Update

- Will be proposing additional modifications in the upcoming meeting (April, 2011)
  - RGB Qualification Testing
  - Certification testing background variation

ASTM D7520 is constructed with forensic credibility in mind!

DOCSII Update

DOCSII Certified According to D7520

- Camera Model - Canon Powershot G11 (6 runs, 300 images, Double Blind process, all attempts tracked)
- Analysis Module - DOCSII Versioned Analysis Module
- Reporting Module - DOCSII Versioned Reporting Module
- Self Test on-board to ensure changes in hardware or OS do not impact configured modules.

DOCSII sold into multiple (nuisance) Environments

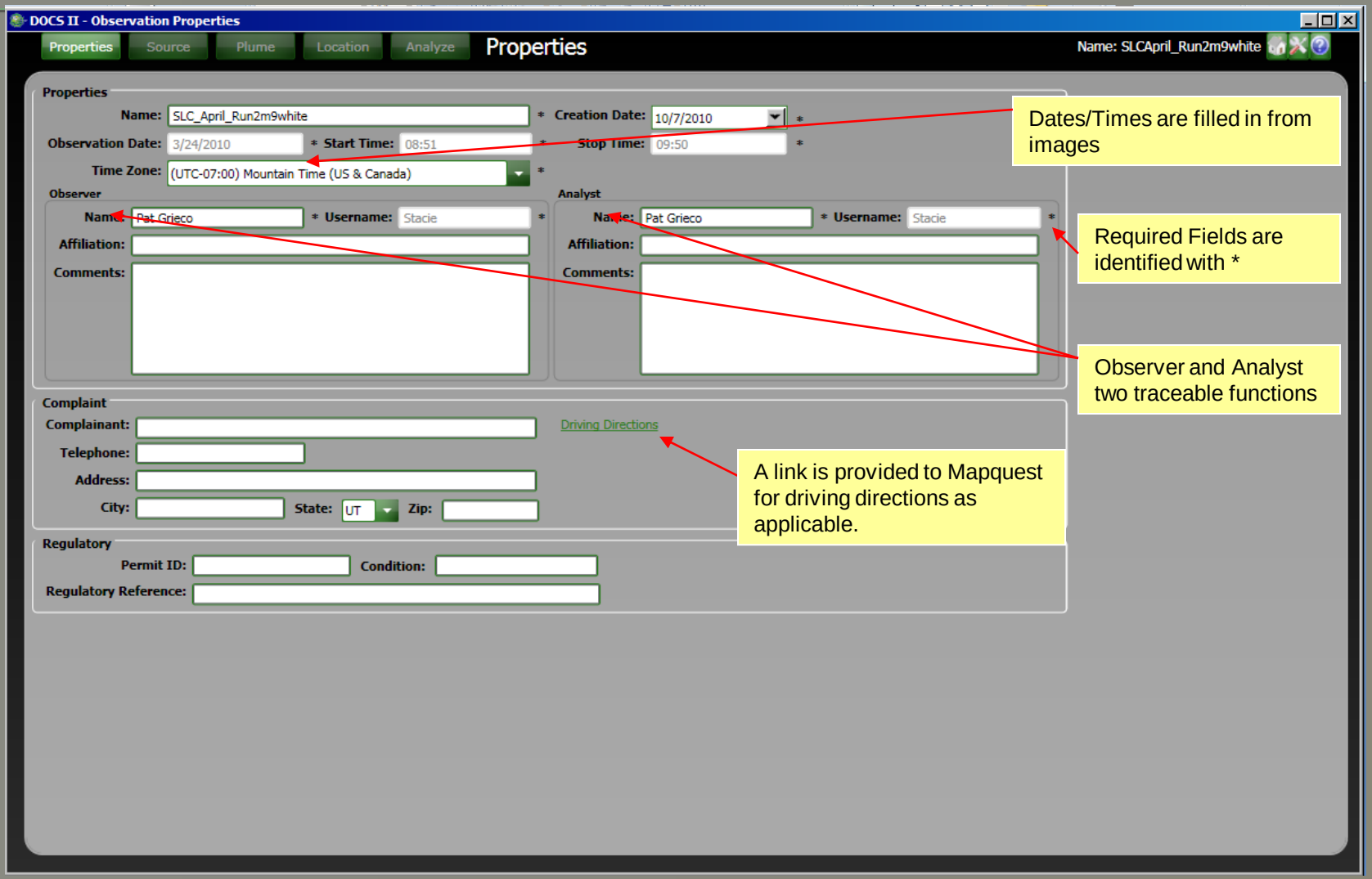
Hill Air Force Base approved by the EPA for site use of DOCSII as equivalent alternative to Method 9 for all visible emissions.

EPA had limited hands-on with DOCSII, and is working the adoption of ASTM D7520, with broad applicability

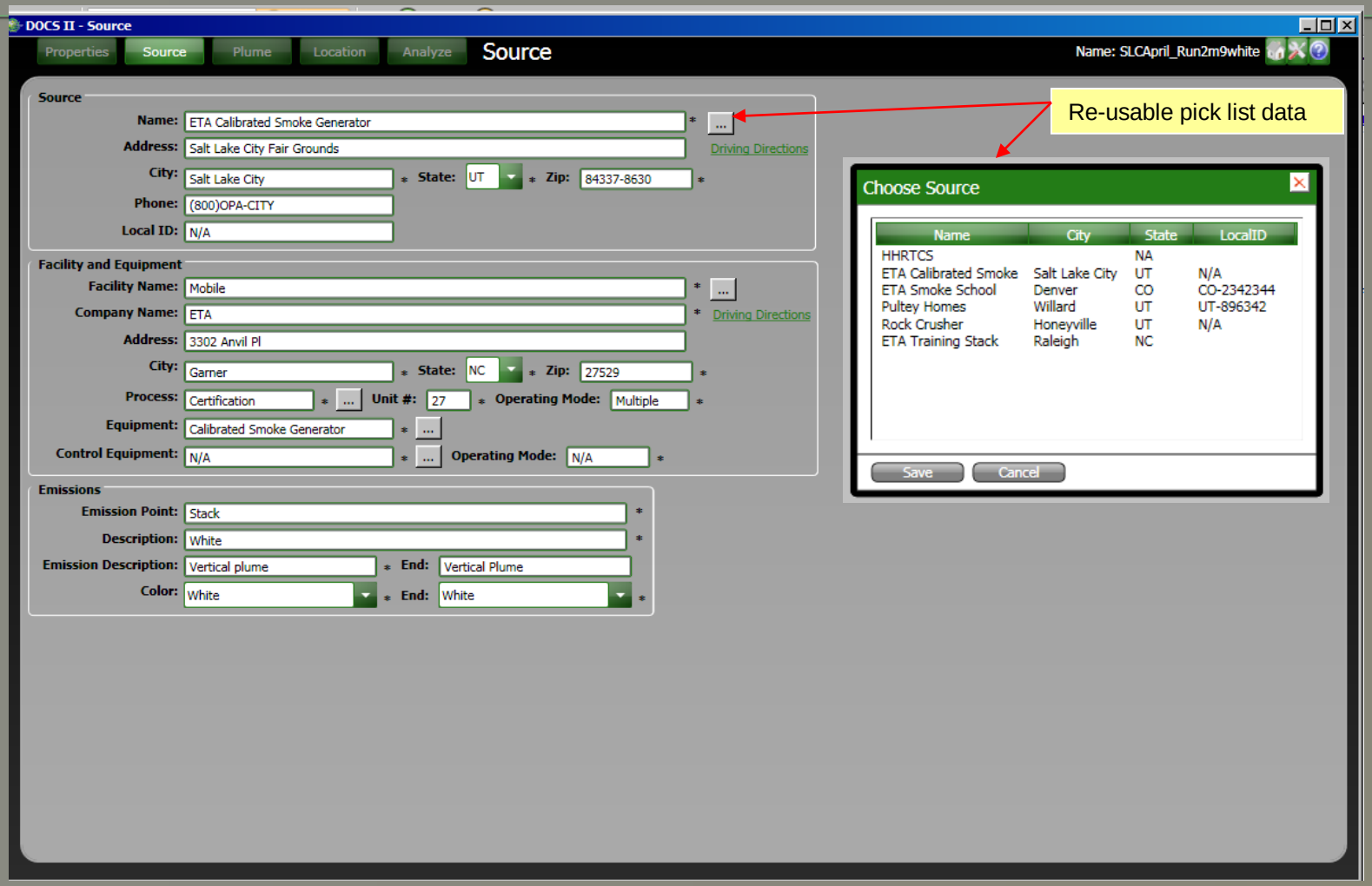
With Pre-certified camera and software…One run and DONE is the Goal!

DOCSII Walkthrough

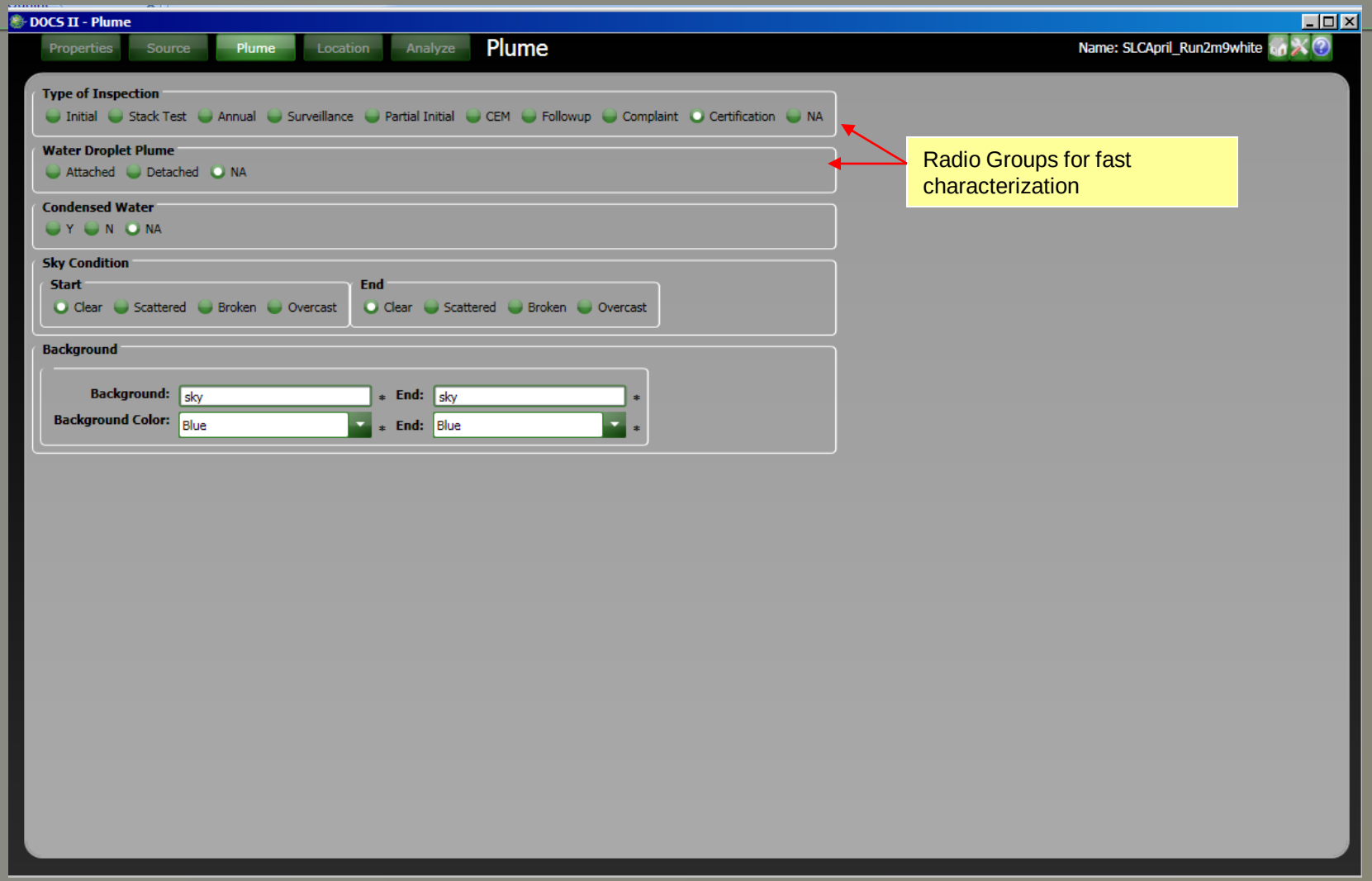
Properties


DOCS II - Observation Properties
Properties
Source
Plume
Location
Analyze
Properties
Name: SLCApril_Run2m9white
Properties
Name: SLC_April_Run2m9white
Creation Date: 10/7/2010
Observation Date: 3/24/2010
Start Time: 08:51
Stop Time: 09:50
Time Zone: (UTC-07:00) Mountain Time (US & Canada)
Observer
Name: Pat Grieco
Username: Stacie
Affiliation:
Comments:
Analyst
Name: Pat Grieco
Username: Stacie
Affiliation:
Comments:
Complaint
Complainant:
Telephone:
Address:
City:
State: UT
Zip:
Driving Directions
Regulatory
Permit ID:
Condition:
Regulatory Reference:
Dates/Times are filled in from images
Required Fields are identified with *
Observer and Analyst two traceable functions
A link is provided to Mapquest for driving directions as applicable.

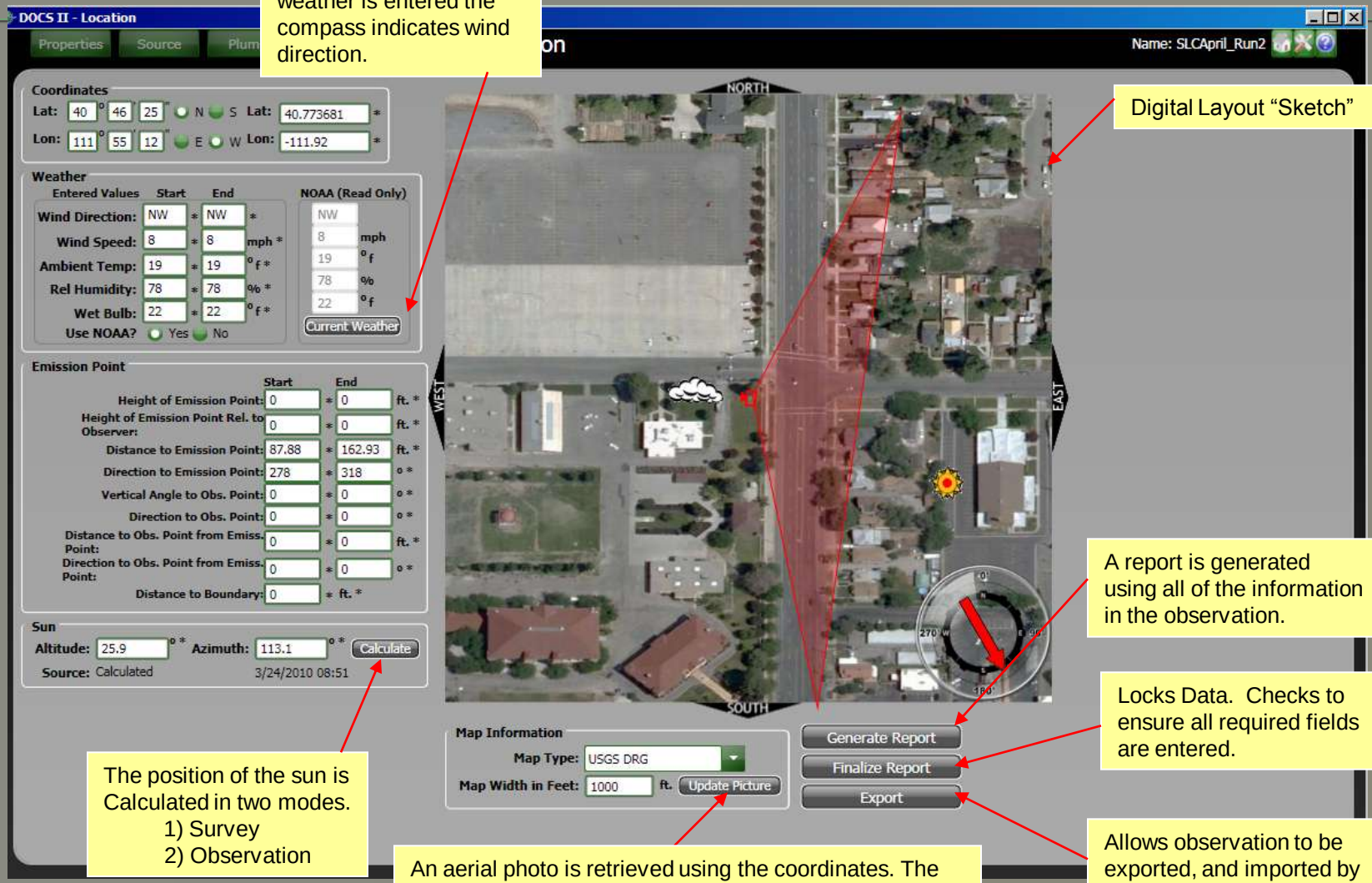
Source


DOCS II - Source
Properties
Source
Plume
Location
Analyze
Source
Name: SLCApril_Run2m9white
Source
Name: ETA Calibrated Smoke Generator
Address: Salt Lake City Fair Grounds
Driving Directions
City: Salt Lake City
State: UT
Zip: 84337-8630
Phone: (800)OPA-CITY
Local ID: N/A
Facility and Equipment
Facility Name: Mobile
Company Name: ETA
Driving Directions
Address: 3302 Anvil Pl
City: Garner
State: NC
Zip: 27529
Process: Certification
Unit #: 27
Operating Mode: Multiple
Equipment: Calibrated Smoke Generator
Control Equipment: N/A
Operating Mode: N/A
Emissions
Emission Point: Stack
Description: White
Emission Description: Vertical plume
End: Vertical Plume
Color: White
End: White
Re-usable pick list data
Choose Source
Name
City
State
LocalID
HHRTCS
NA
ETA Calibrated Smoke
Salt Lake City
UT
N/A
ETA Smoke School
Denver
CO
CO-2342344
Pultey Homes
Willard
UT
UT-896342
Rock Crusher
Honeyville
UT
N/A
ETA Training Stack
Raleigh
NC
Save
Cancel

Plume


DOCS II - Plume
Properties
Source
Plume
Location
Analyze
Plume
Name: SLCApril_Run2m9white
Type of Inspection
Initial
Stack Test
Annual
Surveillance
Partial Initial
CEM
Followup
Complaint
Certification
NA
Water Droplet Plume
Attached
Detached
NA
Condensed Water
Y
N
NA
Sky Condition
Start
Clear
Scattered
Broken
Overcast
End
Clear
Scattered
Broken
Overcast
Background
Background:
sky
End:
sky
Background Color:
Blue
End:
Blue
Radio Groups for fast characterization

Location



The current weather for the lon/lat coordinates is retrieved when pushing this button. Once the weather is entered the compass indicates wind direction.

Digital Layout "Sketch"

A report is generated using all of the information in the observation.

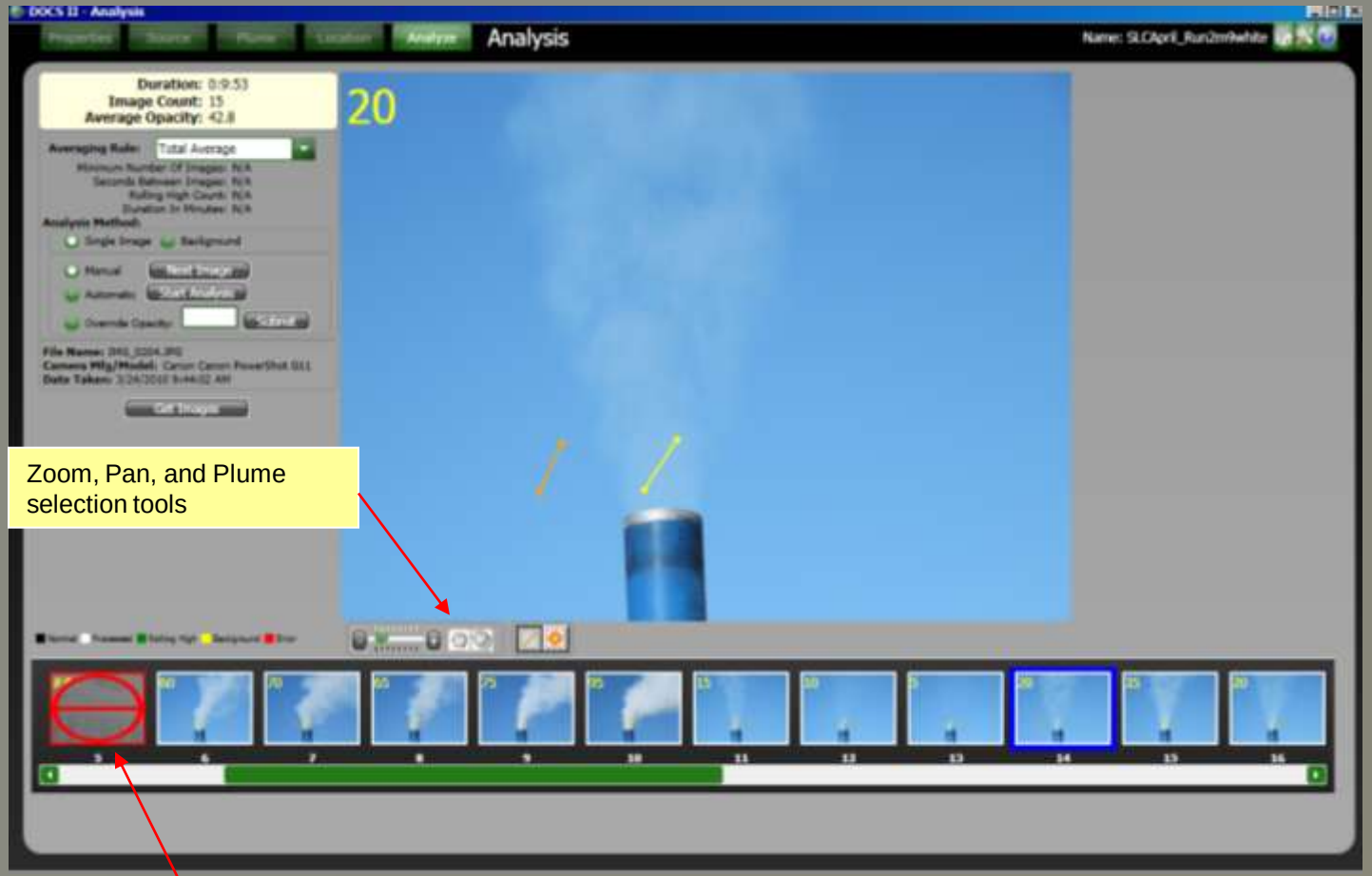
Locks Data. Checks to ensure all required fields are entered.

Allows observation to be exported, and imported by another DOCSII certified user.

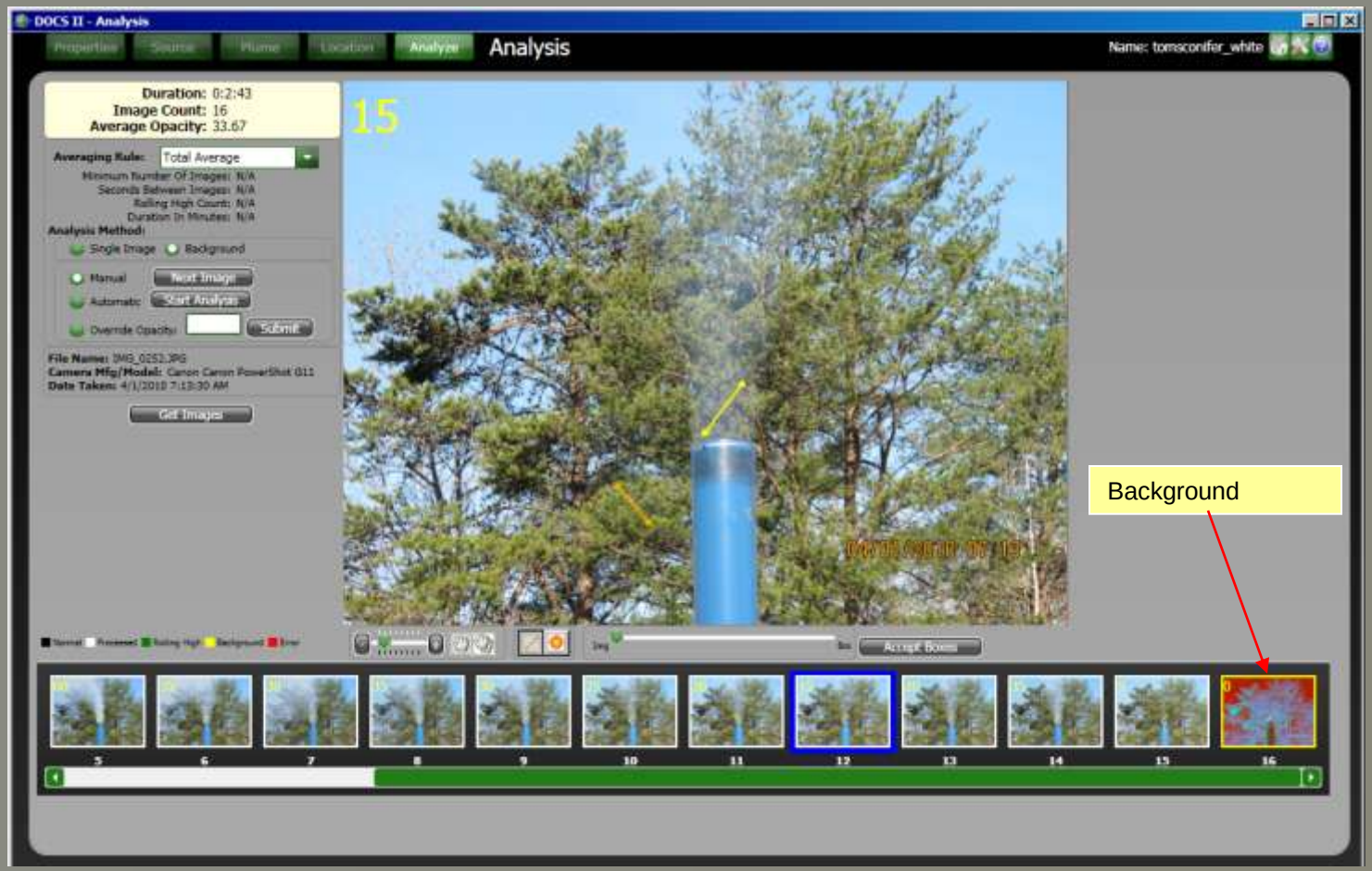
The position of the sun is Calculated in two modes.
1) Survey
2) Observation

An aerial photo is retrieved using the coordinates. The Map width can be entered to zoom in or out on the observer's position.

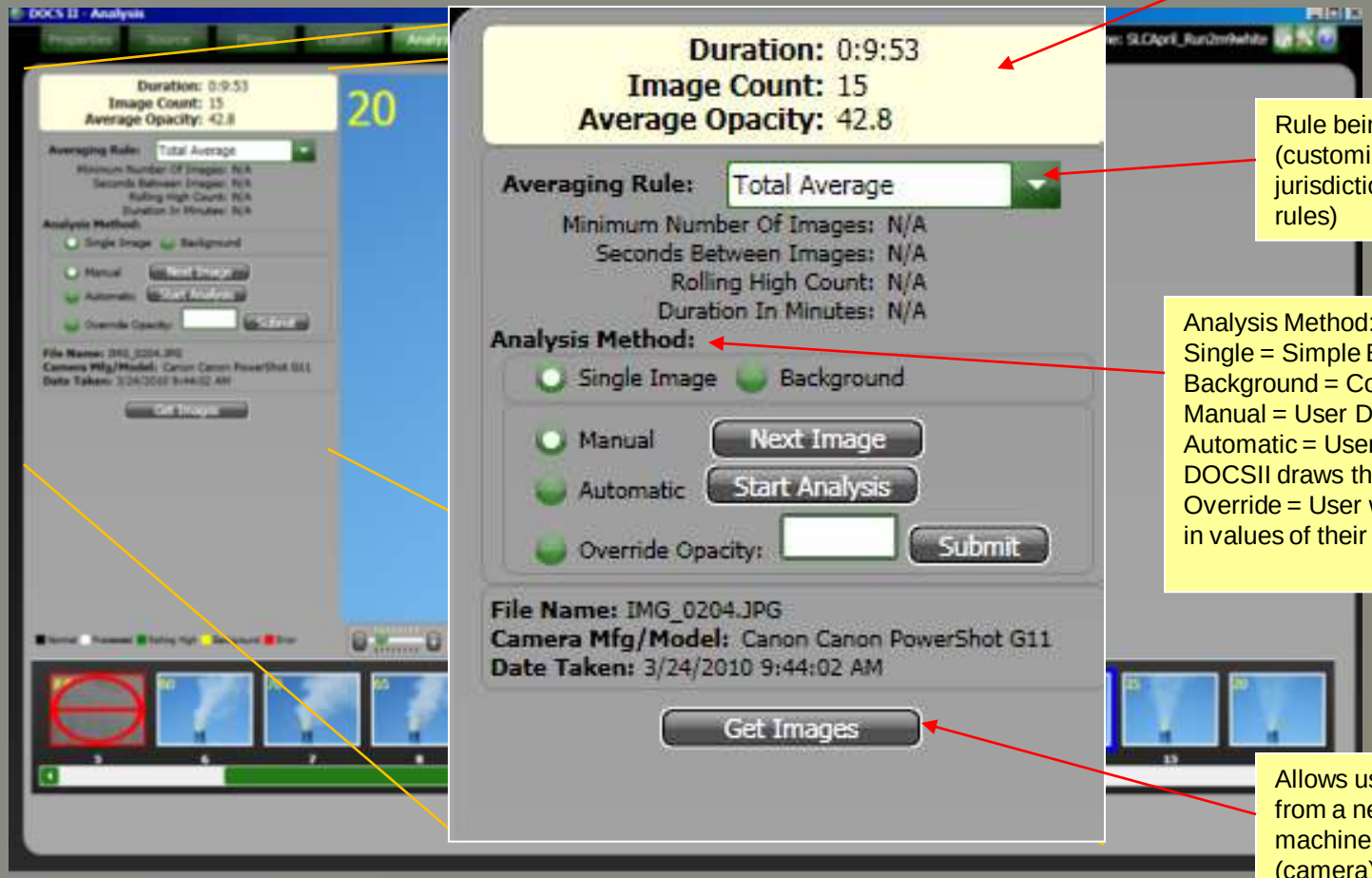
Analysis (Simple Background)



Analysis (Complex Background)



Analysis Tools



Statistics about the images being analyzed

Rule being applied (customizable to meet any jurisdictional specific rules)

Analysis Method:
Single = Simple Background
Background = Complex Background
Manual = User Draws
Automatic = User Draws Once, DOCSII draws the rest
Override = User who chooses to put in values of their own

Allows user to pull images from a network, local machine, or device (camera)

Analysis Tools

The colors on the filmstrip are represented in a legend.

1. Normal (Not processed)
2. Processed (Opacity calculated)
3. Part of Rule average
4. Background Image
5. There is an error with the seconds between images part of the rule.

Zoom, Pan, and area selection tools (bar bell or circle)

The slider allows the user to view the background image in comparison to the current image. Sliding back and forth between them.

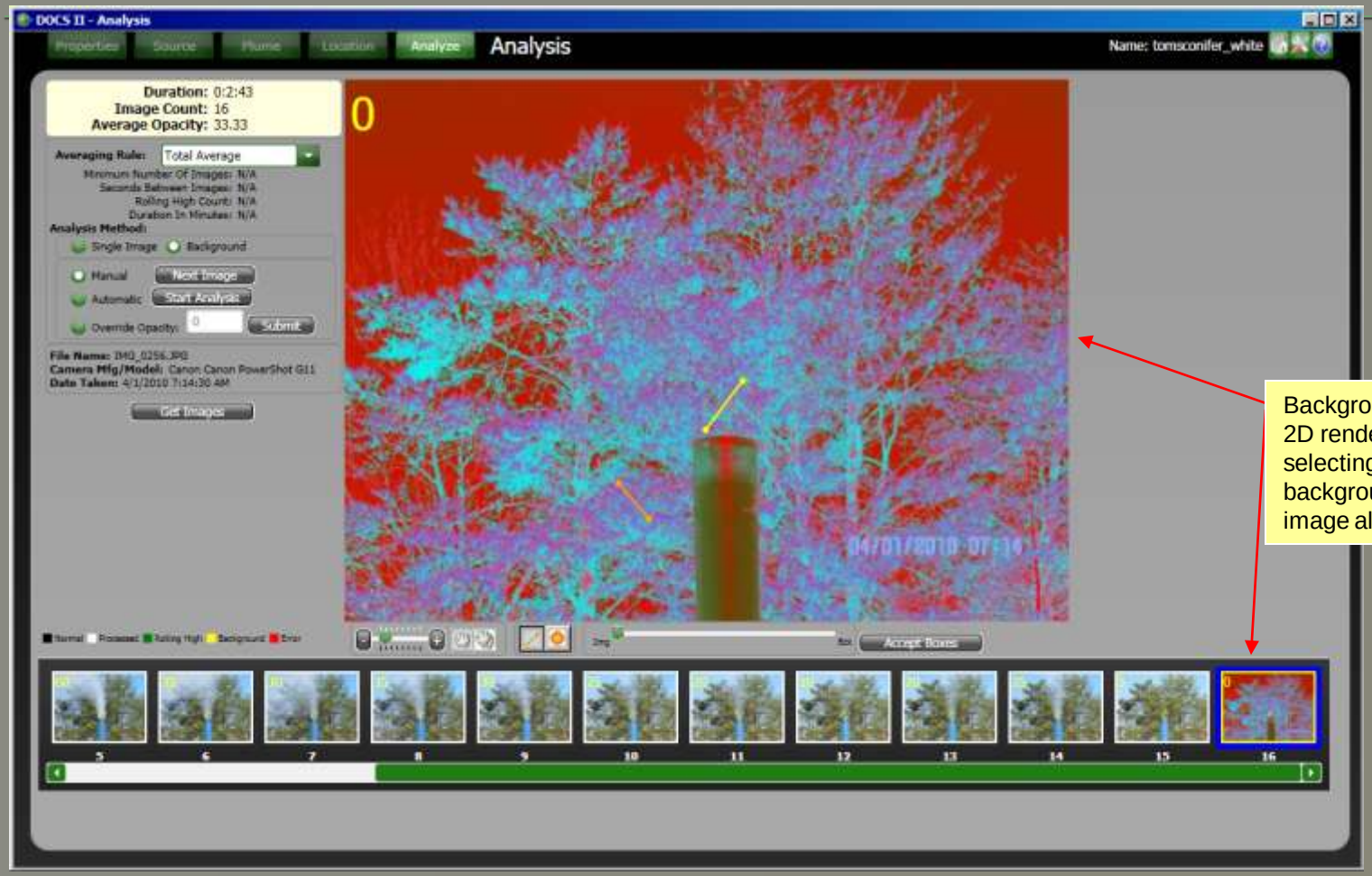
This image is excluded from analysis.

Images can be:

1. Excluded from Analysis
2. Used as Background
3. Deleted

If any of these are chosen the image will not be included in the average opacity rating.

Whats New This Year



Background displays as a 2D rendering which aids in selecting a suitable background, and for image alignment.

Averaging Rules

Rule Name	Minimum Number of Images	Rolling High Count	Seconds Between Images	Comments
Method 9	24	24	15	
Dust	4	4	5	
Continuous Fugitive	240	12	15	
ODR	2	2	5	
Total Average	N/A	All	N/A	

Report

VISIBLE EMISSION OBSERVATION FORM

Facility User: Dust
Company Name: Hill AFB
Facility Name: Hill AFB
Street Address: 7274 Wardleigh Road
City: Hill AFB | State: UT | Zip: 84050
Process: Grading Land | Unit: | Operating Mode:
Effluent Equipment: Electrostatic Precipitator | Operating Mode:

Observation Date: 5/3/2007 | Time Zone: MST | Start Time: 10:05 | End Time: 10:09

	0	5	10	15	20	25	30	35	40	45	50	55
1	87	74	65	62	35	15	5	0	0	0	0	0
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												

Plume Background: Green trees and shrubs / Grassy hill
Background Color: Green trees and shrubs / green
Sky Conditions: Clear / Same
Wind Speed: 4 / Same
Wind Direction: 130 / Same
Ambient Temp: 81 / Same
Wet Bulb Temp: 60 deg
RH Percent: 28

Longitude: -112.06642
Latitude: 41.32762
Declination: 2 deg W

Observer Name (Print): John Smith
Observer Signature: | Date:
Organization:
Certified By: | Date:

Additional Information: No interference from other emissions.

Source

Name:	Weelurd Dust
Address:	1044 W 7850th S
City:	Willard
State:	UT
Zip:	84340-6702
Phone:	(435)555-2222
Local ID:	UT-RT2342344

Regulatory

Permit ID:	UT-1F299938
Condition:	UT-ZZAB222
Regulatory Reference:	FR-1239992

Process

Process:	Grading Land
Unit:	
Operating Mode:	

Complaint

Name:	Jose Martinez
Address:	1080 N 255th E
City:	Willard
State:	UT
Zip:	84340

Equipment

Name:	Grader

Type of Inspection

Type of Inspection:	Initial

Sun

Altitude:	50.2
Azimuth:	120.2
Data Source:	Calculated

Map Information

Map Type:	USGSDRG
Scale:	Item1m
Map Width:	1000

Analysis

Averaging Type:	Automatic
Averaging Rule:	Dust
Number of Images:	4
Rolling High Count:	4
Rolling High Count:	5
Who Created:	DOCSII
Creation Date:	5/24/2008
Map Width:	1000

Background Image

Report

Background.JPG

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Image	Opacity	T	L	B	R	Date Taken	Camera Information
Background.JPG	0	84	15	240	519	5/3/2007 12:05:36 AM	NIKON COOLPIX P3
DSCN2307.JPG	82	84	15	240	519	5/3/2007 12:08:10 AM	NIKON COOLPIX P3
DSCN2308.JPG	74	84	15	240	519	5/3/2007 12:08:15 AM	NIKON COOLPIX P3
DSCN2309.JPG	85	84	15	240	519	5/3/2007 12:08:20 AM	NIKON COOLPIX P3
DSCN2310.JPG	92	84	15	240	519	5/3/2007 12:08:25 AM	NIKON COOLPIX P3
DSCN2311.JPG	35	84	15	240	519	5/3/2007 12:08:30 AM	NIKON COOLPIX P3
DSCN2312.JPG	15	84	15	240	519	5/3/2007 12:08:35 AM	NIKON COOLPIX P3
DSCN2313.JPG	6	84	15	240	519	5/3/2007 12:08:40 AM	NIKON COOLPIX P3

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Questions ?

Digital Opacity Compliance System
the Next Generation of Opacity Measurements

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