308 - - - Q200604050003

Scientific Notebook No. 338: Work Performed Under the USFIC Project (09/26/2000 through 08/28/2002)

LABORATORY NOTEBOOK

CNWRA/SwRI

CNWRA
CONTROLLED
COPY 338

David Farrell
210-522-5208

NOTEBOOK NO. 338
ISSUED TO David Farrell
ON 5/20/99
DEPARTMENT Div 20
RETURNED

—SCIENTIFIC NOTEBOOK CO.—
2831 LAWRENCE AVE.
P.O. BOX 238
STEVENSVILLE, MI 49127
616-429-8285

From Page No. ____

Objective

This note book documents field work performed under the USFIC project. As a result the notebook may cover several field ~~campai~~ D.A.J. 9/26/02 excursions. IT IS IMPORTANT TO NOTE THAT THIS NOTEBOOK is ACTUALLY A BACKUP for MY ACTUAL FIELD NOTE BOOK. PAGES FROM MY ACTUAL FIELD NOTE BOOK ARE PHOTOCOPIED AND INSERTED INTO THIS BOOK.

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	

Witnessed & Understood by me.

Date

Invented by

Recorded by

Date

CONTENTS

PAGE	REFERENCE	DATE

From Page No.

1

D.A.J.

5/5/2000

Geophysical field survey western side of 40 line road

Battery of magnetometer died at (553730, 4067107)

5/6/00

Mag. Data File 4

Powerline 1:

① (551173, 4045606)

Powerline 2

② (551344, 4047216)

Project No.

Book No.

TITLE

D.A.J. 9/26/02

2

D.A.J.

5/6/2000

powerline ③

③ (551480, 4048824)

power line 4

④ (553257, 4055074)

5/7/2000

line TEM2 – TEM3

Power line

(547161, 4058423)

TEM 3 elevation 804.2xx. Check from recorded values.

D.A.J. 5/7/2000

Road (550801, 4057076, 814.9m)

(D.A.J. 5/8/2000)

5/8/2000

Need to look for data for *.

NCEWDP – 4x.

TITLE

Project No.

Book No.

D.A.J. 9/25/02

3

Witnessed & Understood by me, | Date | Invented by | Recorded by | Date

4

D.A.J.

5/8/2000

Sample management facility visit:

viewed samples for 19D and 2D.

Samples 19D

Surface material appears to be high K. (start of log 355 ft down)

First appearances tuff appear to be at 820 - 825 ft. No ID for tuff as yet ... no mineralogy.

Yellowey color

Tuff appears to end at approximately 1245 ft - 1250 ft

- - - - -

Back to valley fill material to approximately 1425 - 1430 ft

- - - - - - - - - - - -

Back to tuff again light baige in color.

D.A.J.

5

5/8/2000

Samples 2D

Start of log 0 ft.

0 ↓ sections of very high K ... gravels

(Mixtures of gravels and sands throughout the unit)

1495 ft

transitions into darker more massive grains ... change in texture

No Tuff observed (visually)

Samples 15D

Samples start at 290 ft

Tuff units present.

Overlying unit appears to be a mixture of basalt and maybe tuffs glued together.

(DAJ 8/31/00) (D.A.J. 8/31/00)

Project No. | Book No. | TITLE

D.A.J. 9/26/00

Witnessed & Understood by me, | Date | Invented by | Recorded by | Date

6

D.A.J.

(down to depth 607 ft) 5/8/2000

- next layer flesh colored tuff unit ... biotite grains present.
- next layer basalt ... baige color } + lacustrine clays
  similar to that seen in 19D.

290 ft ↓ dark colored mixture

330 ft? ↓ flesh colored

470 ft? ↓ baige colored

extremely light

D.A.J.

7

5/8/2000

Sample 4PA

0 ft - 570 ft

Mixtures of sands and gravels ... dark colored.

No tuff.

TITLE

D.A.J. 9/26/00

Project No. | Book No.

Witnessed & Understood by me, | Date | Invented by | Recorded by | Date

Project No.

D.A.7 9/26/00

8 RF 9/17/00 wrong dates w/ initials on pages 8-15 RF 9/17/00

Spectral & Water Content
Data in Support of
IKONOS satellite Image

David Farrell - DAF
Randall Fedors - RUF or RF
David Greenevelt - ~~DG~~ or DWG
GPS III 40162489 [011-00316-00]

GPS readings → GPS Garmin III plus
set to UTM NAD27 central (meters)
→ No antenna yet, not working (antenna from DGPS unit of Lafemina game.)

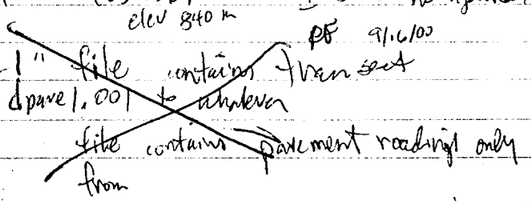
Ocean Optics, Inc
SD1000, fiber optic spectrometer, SPD50
radiometer to get both incoming & outgoing spectrum
Varies over spectrometer
[0.5 nanometer increments, profile DWG ??]

radiometer mounted on telescoping pole ~8 ft long and extended at 45° angle (radiometer still vertical) by use of a level (bubble) on the pole.
Care should be taken to make sure sun is faced so no shadow biases the readings
Plot incoming as a function time of day
angle of radiometer with the sun significantly changes incoming. We want to use a 10-12:00 average for IKONOS image. We also want to use averages of incoming to compensate for slight angle changes during transect.

9/17/00 RF 9

Example
091700-1 Site numbers syntax
mmddyy-#

Near Fortymile wash main channel just north of highway 95 & Lathrop Wells (East west road along electric power lines, this road is also access to alluvial tracer test wells [west of here]).
Parked at 550400 } UTM NAD27 (m)
4058242 } ± 5 m based on drift of readings
* 091700-1 Site [10:30 to 11:00 am]
Sheet flow, non-channel area east of main wash.
Layed out a 100 m transect to avg ~100 readings along
Readings taken by hold sensors on end of pole extended 45°, always facing sun [to avoid shadows (shadows)]
Last readings, from ~10 m to 100 m heading south were done on 1 m spacing
Transect started on north, headed south
550624 to 550676 Garman III plus
4058284 4058367 ± 5 m horizontal
elev 840 m
RF 9/16/00
~~"dpave1" file contains transect dpave1.001 to whatever file contains pavement readings only from~~



Witnessed & Understood by me, | Date | Invented by | Recorded by | Date

Project No.

D.A.7 9/26/00

10 9/17/00 RF

latr1.001 (latr1.001)
creosote bush (single bush/shrub)
RF 9/17/00
dpave1.001 & ~~.00x~~ to dpave19.ssm
pavement only 1 m x 1 m area

091700-1.xxx 0917-1xx.ssm .scm
~100 transect reading profiles

Soil Water Content (Hydro Sense)

~3 cm depth 6% probes parallel to ground

8-10 cm depth max 8% 45° angle

~14-20 cm depth 9% includes probe length
⇒ 19 cm depth ⇒ 9% add 12 cm probe length

Soil Sample 091700-1 (press ⇒ 5.8 cm diameter, 5 cm height)
2 composited samples ~1 m apart from depths of 1 to 6 cm depth
$2 \times [\pi (\frac{5.8\,cm}{2})(2.5\,cm)^2]$
Cobbly top scree brushed away before sampling (top < 1 cm)
Hydrosense at ~5 cm depth ≈ 7%
Get water content & bulk density
550618 } UTM NAD27 (m) Garman III plus
4058277 } eastern hole

Site 091700-1 continued 9/17/00 RF 11

Fluvial sand sheet deposits "Q1s"
on surficial geology map Swadley 1983
(Lathrop Wells Quad)
Misc. Invest. Series Map I-1361

Site 091700-2 General (includes subchannels)
Q1ab of Swadley 1983 (Fluvial Deposits)

Back to 091700-1 site
Veg. Dominated by creosote bush and bursage ca 14-17% crown closure
bursage are senescent for year

back to 091700-2
Veg. near active channel dominated by allscale (Atriplex polycarpa) but with scattered creosote bush and viscid rabbit bush - overall < 15% crown closure; note that

Project No.
Book No.
TITLE

D.A.T. 9/26/00

12 9/17/00 RF

areas (ca 10 to 100 m²) of all scale and creosote bush have been killed by desert dodder (Cuscuta) in vicinity

files (spectra):
0917-2xx.ssm and .sam

Starting at east end, heading ~ westerly
550100 } Garman III no antennae
4058392 }
838 m elev

measurements start at 1 m of tape measure
measurements stations 20 m to 33 m is main channel (no vege) & 2 types of seds, 1 of them has very high reflectance

measurements end at 99 of tape measure
west end of transect 549999 } Garman III
4058392 } no antennae
elev ~837 m

Prominance of boulders & sand at surface (instead of scree/pavement like sheet wash area)
Channel & surrounding areas combined in transect; surrounding area should be different than sheet wash area of 091700-1 site
Readings (spectral) taken at 12:00 to 12:30 pm

9/17/00 RF 13

Soil Samples collected in area of site 091700-2
(1) upstream side of channel (north side of road)
water ponds here, so lots of high reflective fine silt sediments at very surface
bag labeled 550 057, 4058244 UTM NAD27
Garman III plus; no antennae
2 samples composited (each in ring 5.8 cm dia & 5 cm height)
(a) 1-6 cm horizon
(b) 6-11 cm horizon
HydroSense horizontal at 3 cm = 9%
" vertical at 12-24 cm = 7%
vertical 0-12 cm = 18%
The last measurement reflects wetness from recent event (~3 weeks ago?, need to check meteorological data).
(2) Also channel, but more representative
550 068 } Garman III plus; At USGS stream gage site
4058397 } no antennae
HydroSense horizontal at 2.5 cm depth = 7%
vertical 0-12 cm depth = 9%
Coarse sand
2 samples, though difficultly because of rock at depth (stacked)
(3) 2 stacked samples again
550018 HydroSense vertical 0-12 cm = 7%
4058398 " vertical 5-17 cm = 8%
" horizontal at 3 cm = ~~8~~ 7%
RF 9/16/00

Project No.
Book No.
TITLE

D.A.T. 9/26/00

14 9/17/00 RF

Near cinder cone being mined out
(Road to Crater Flat by Horsetooth springs)
RF 9/17/00 2:00 pm readings
~~0917-3xx.sam~~ .ssm file names spectral readings
"basaltxxx.ssm
~3 x 3 meter area 5-10 profiles of basalt blocks
545075 Garman III 838 m
4059835 no antenna

New site welded tuff debris/boulders w
0917-3xx.sam .ssm (no creosote)
colluvial slope transect ~south to north along slope (same elevation)

1	21	41	61	81
2	22	42	62 63	82
3	23	43	64	83
4	24	44	65	84
5	25	45	66	85
6	26	46	67	86
7	27	47	68	87
8	28	48	69	88
9	29	49	70	89
10	30	50	71	90
11	31	51	72	91
12	32	52	73	92
13	33	53	74	93
14	34	54	75	94
15	35	55	76	95
16	36	56	77	96
17	37	57	78	97
18	38	58	79	98
19	39	59	80	99
20	40	60		100

9/17/0 RF 15

southern end of transect
545400 850 m elev } Garman III
4059742 } no antenna

northern end of transect
545446 857 elev, m } Garman III
4059828 }
Readings (spectral) 2:15 to 2:45 pm
Very little visible soil; cobbles to boulders & outcrops of silicic welded tuff; local zones with basaltic rubble mixed w/ silicic tuff (fingering veins of basalt into silicic tuff noted in outcrop).
Veg: 12 to 15% crown closure of the following dominants: ~~[illegible]~~ bursage RF for DWG 9/26/00
& subdominants: shadscale, Nevada ephedra, Encelia, Krameria, creosote bush and galleta grass

Pistachio trees Amargosa Farms area
west side 534542
4048317

Hazy morning (smoke from regional fires ??)
cleared up more or less by end of day,
No clouds, light breezes, temperatures up to 104°F

Project No.
Book No.
TITLE

D.A.T. 9/26/00

Witnessed & Understood by me, | Date | Invented by | Recorded by | Date

16 9/18/00 RF Groenevelt, Farrell, Fedors

Solitario Canyon 10:00am

545738 m } Garmin III UTM
4078026 m } no antenna NAD27

On Jet Ridge, eastward flanking valley
(analogs to YM eastflanking ridge/valley)
Up the valley from H-6 borehole platform

Remnant bromus between shrubs
Creosote bushes down in Solitario Canyon
appear much healthier than those in Amargosa
Desert (even those in Crater Flat were healthier
than in Amargosa Desert). Sparse
creosote on hillside
Lithophysal unit in talus piles, tubes on cooling joints
Talus piles vary in color, fresh stuff very light
RF 9/18/00 North facing slope
→ talus3xx.ssm darkest talus at location
noted above

→ talus2xx.ssm medium colored talus
10 reading along length of pile (upslope) long talus pile at 545727 4078021

→ talus1xx.ssm At tops of talus piles, fresher
talus (no varnish) readings are from
4 different piles (at top)

9/18/00 17

South facing slope across valley
10:30 am – 10:55 am, sunny, no clouds
Transect ~ along slope west to east
West start point { 545696 m RF 9/18/00
zero point of transect ⇒ { 4078105 m UTM NAD27
first spectral measurement at 1 m on tape
elev ~1385 m
lithophysal unit, debris & sparse outcrop
caliche presence noted (roughly 1% surface) ↳ surface exposure

middle slope transect above colluvial lobes
at base of slopes; no distinct talus piles
but some variation in varnish extent on
distributed rubble/outcrop.
Eastern end of transect nears top of ridge
and goes through some smaller talus piles. The
western extent had talus piles upslope of transect
eastern 100 m point { 545796 m Garmin III
readings stop at { 4078099 m no antenna
drift on Garmin readings over 5 minute period
was ± 1 m with 1 instance of a change by 2 m
Garmin III files
elev. 1378 ± 3 easily 0918-1xx.ssm

$$NDVI = \frac{\text{Infrared} - \text{Red}}{\text{Infrared} + \text{Red}}$$
normalized index

TITLE

D.A.T. 9/26/00

Project No.
Book No.

Recorded by

18 9/18/00

DWG 9/18/00 Vegetation: 15-18% crown closure
of Ephedra viridis, shadscale, spiny
hopsage, needle & threadgrass, Eriogonum
facikulatum, bursage, needle-leaved
rabbitbrush and Ephedra nevadensis
bursage is dominant followed by
the Eriogonum

Caprock boulders (ledge-former)
Two categories:
→ fresh faces cap1xx.ssm files
→ varnished surface cap2xx.ssm files
(virtually as dark as talus 2 or 3)

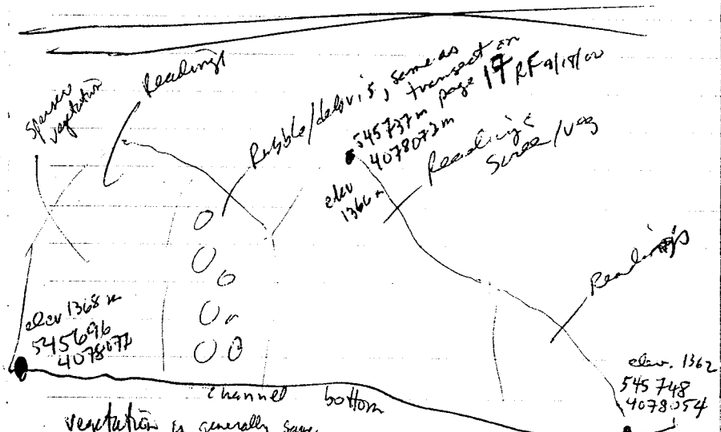
545783 } above this point & east-west
4078227 } ± 25 meters
(20 meters upslope extent of ledge)

Soil Sample # Jet-1, mid-slope
hillslope, rx fragments
Hydro Sense 6 to 9% vary top
4" diameter, 3 inches depth
cylindrical shaped sample volume
coordinates on sample bag

9/18/00 RF 19

Lithophysal unit
(0545800, 4078145) elev ≈ 1370 m

lith #1 (fresh face)
bedrock only, 3 outcrop locations
w/in 3 meters of location above



vegetation is generally same
as noted page 18, top of page

12:15 pm colluvial lobes at bottom of slope

(lobe1xx.ssm file)
Random measurements coving only the area
of scree (as opposed to boulder/talus as
was taken for site 0918-1xx.* page 17)

Project No.
Book No.
TITLE

D.A.T. 9/26/00

Witnessed & Understood by me,
Date
Invented by
Recorded by
Date

20 9/18/00 RF

Talus pile on north facing slope
tal2xx.ssm 545895 Garmin III
elev 1334 m 4077928 no antenna
talus pile has medium varnish color
(scale of 1 to 3, this is a 2)
similar to talus2xx.ssm page 16

1:45 pm start

Alluvial in channel midway between crest & Solitario Canyon (slightly closer to bottom)
allu1xx.ssm files
546039 m } Garmin III no antenna ± 2 m
4077956 m } zero location on tape drift
elev. 1325 m ; 1331 drift ; 1327 m
1st spectral reading is at 1 m, ΔX = 1 m
(as usual Δx = 1 for yesterday and today on transects, this the spacing between spectral readings)
This appears to be an alluvial terrace, the dissecting channel begins ~5 meters to south and is 8 or 9 meters wide
end reading at elev 1333 m
545955 m
4077975 m
Stopped at reading at 85 m on tape

21

TWG
9/18/00 Vegetation; Dominated by bursage: creosote bush with patchy Ericameria cooperi, Grayia spinosa, Indian ricegrass Eriogonum fasciculatum, winter fat
20-25% crown closure

Solitario Canyon bottom
east of USW-UZ-N90 & N89
RF 9/18/00 approx 20 m east of wells
files allu2xx.ssm
Start tape → 546655
4077006
elev. 1253 m
1st reading at 1 m, Δx = 1 spacing; starting at north end and heading south (S 10° East)
end tape ⇒ 546682
4076910
elev. 1263 m
Vegetation: Creosote bush; bursage are dominant, also present are Indian ricegrass cheesebush, cooper goldenbush, Menodora spinescens ca 30% crown closure

TITLE

D.A.T. 9/26/00

Project No.
Book No.

Recorded by

22 9/18/00

Pavement averages (only) in vicinity of transect on page 21 [allu2xx.]
scre1xx.ssm files
~4 m x 4 m area
Creosote only bushes in vicinity of transect allu2xx.
latr2xx.ssm files

Both at south end of transect

Water content elev 1255 m 546653
4076922
vertical probes 1-10 cm depth = 12%
horizontal probes ~2½ cm depth = 9%
rx frag ≥ 50%
fine sandy loam approx

multiple locations Varied to 13%

9/18/00 RF 23

Crater Flats
2 transects, areas look different on landsat image
soil map is not particularly consistent w/ landsat.
First Transect started 3:45 pm, ended 4:10 pm
Site 0918-2xx. files
start tape 534966 m UTM NAD27
4074740 m
elev. 1008 m
1st spectral reading at 1 m on tape
starting at north end of transect
prominent limestone component in desert pavement
debris → dark gray
some marble (light gray), some siltstone (red brown)
transect does not include any small channels
end of 100 m transect 535029 m
elev 1003 m 4074660 m
UTM NAD27

Sun angle estimated at 35° by siting shadow with Brunton; this is rule-of-a-thumb from Pat Chavez USGS Flagstaff

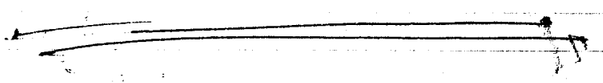
Water Contents at southern end of transect
range of 10 measurements
8 to 10% HydroSense horizontal at 3-4 cm depth; and 10-12% angled probe (1-9 cm depth)
soil < 2 mm grain size looks like eolian-derived fine sandy loam; 50% rx frag

Project No.
Book No.
TITLE
D.A.F. 9/26/00

24 Desert Pavement south end of transect (page 23)
9/18/00 RF
dpave3xx.ssm RF 9/18/00
files, pavement only
cobbles, no boulders, limestone, marble siltstone

Did not get to second transect because ~4:15 pm & sun angle was getting to be less than 35°

Vegetation: creosote bush, bursage dominated with shadscale, Opuntia basilaris, cholla cactus Krameria parvifolia
patches of bioturbation have seedlings that include Sphaeralcea ambigua Ca 10-12% cover



Ocean Optics spectrometer, SD1000
fiber optic spectrometer
with incoming & outgoing sensor connected to spectrometer; size of cable (optic fiber) changes resolution of readings (get fiber optic cable size from Groeneveld)
Hook up spectrometer to laptop using a PCMCI card
Need to get copies of DWG's (invoice info) info

9/19/00 RF 25
More Spectral Readings
DWG, DAF, RF
Sun angle okay (>35°) ~ 9:30 am
Thin sparse clouds, breezy; system moving in that is forecasting to lower temperatures to low 90's °F

Crater Flat (to get other transect, completing yesterday's work)
Waiting for sun angle threshold, got spectral readings on SE facing slope (reducing shadowing effect) of cinder cone pavement & outcrop

Outcrop, scoria/cobbly ejecta tuff in outcrop near base of ledge near top
9:40 am 537626 } Garmin III
elev. 1013 m 1012 m 4071788 } no antenna
avoided faces with desert varnish
⇒ cind1xx.ssm files

Pavement on cone (Red Cone)
dpav4xx.ssm file
rubble w/ some varnish, eolian dust (buff) interstitial to rubble (rubble cover >80%)
Broad pavement area 4 x 4 m²
4071781 elev 1012 m
537623

TITLE
D.A.F. 9/26/00
Project No.
Book No.

26 09/18/00 RF
Crater Flat Alluvial sheet wash (older surface) 975 m elev / 974 m
535341 m UTM NAD 87
4073640 m Garmin III
files = 0919-1xx.ssm
Pavement includes a wider variety of cobbles as compared to transect described on page 23
limestone, basalt, siltstone in about equal amounts; also some quartzite & silicic volcanic/intrusive
As usual start point is a creosote plant (zero on tape), 1st reading at one meter. Generally if creosote plants are present, we tied measuring tape to them (later location of these transects should look for closest creosote for starting point).

HydroSense at start of transect (north end)
horizontal probe placement = 9% (2-3 cm depth)
definitely looks wetter below ~7 cm depth
Hydrosense angled (~6-15 cm depth) = 15%
RF 9/19/00 Files Sample 0919-1xx.ssm 535336 m 4073644 m
thin scree cover brushed away 2 2x[5 cm height 5.8 cm diameter]
⇒ Soil Sample 0919-1 2 composited samples both from 1-6 cm depth
End transect 535339 m elev = 974 m
of 100 m tape 4073538 m

9/19/00 RF 27
dpav5xx.ssm
desert pavement only spectral readings at south end of transect 3x5 m area
Vegetation: dominant plants are shadscale and bursage also present but not dominant are creosote bush Lycium andersonii, Krameria parvifolia at ca 15% cover
RF for DWG 9/26/00
Soil sample described on previous page
fine sandy loam, carbonate present (by appearance) appears to be the typical eolian

Horsetook Deposits (Spring deposits north of highway 95
536834
4062393 } single pt on eastern edge of deposit at outcrop edge
File: spgdp*.ssm elev. 798 m
RF 10/17/00 11:00 am readings, clouds continuing to thin out

Green will send literature support
I.D.: USRS-99-010
Lab sphere Date: 5-30-96 By: PW 16328-E
White disk standard (Halon standard)
hal1xx.ssm 11:10 am
Calibration, certified reflectance standard

Witnessed & Understood by me, Date Invented by Recorded by Date

Project No.
Book No.
TITLE

D.A.F. 9/26/00

28 9/19/00 RF

Amargosa Desert / Farms Area (north of)

Transect in distributed channel, sheetwash area of Forty mile Wash. Transect heads ~west from telephone line (north/south) starting from Big Dune road and heading SE, the creosote's dominated (<5% bursage) once we got east of main wash near road. Once in the distributed Forty mile wash, ~equal amounts (or more bursage) and creosote

no dash — sheet wash no distinct small runoff channels

⇒ Transect 0919-2xx.ssm
Facing south to avoid shadow,
544114 m } elev 767 m / 766 m / 765
4052907 m }
544110 } drift
4052906 }
Loose scree, small cobbles & few boulders prominent aeolian soil visible through the scree
~~dpav6~~ RF 9/19/00
End of transect (100 m tape pt.) elev. 768 m
544041, 4052976
12:00 pm – 12:20 pm
Soil sample #0919-2 2 composited from 1-6 cm depth

9/19/00 RF 29

Hydro Sense

Soil Sample ½ cm to 5½ cm depth
2 x [5.8 cm diam x 5 cm height]
0919-2a, extremely dry
marginal bulk density estimate use
Soil Sample → 14-19 cm depth sampled
0919-2b, noticeably moist

Hydro Sense 2 cm depth horizon probe = 7%
" angled 5-12 cm depth = 9%
vertical 1-12 cm depth = 8%

⇒ dpav6xx.ssm
pavement readings ~3 meters west of end of transect, ~4x4 m² area

⇒ Halon standard ⇒ hal2xx.ssm
12:25 pm
Vegetation: only two perennial species
Creosote; bursage; bursage 2x coverage of creosote; ca. 17% cover

Project No.
Book No.
TITLE

D.A.F. 9/26/00

30 9/19/00

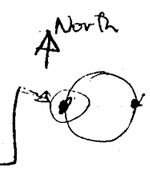
Pavement only Readings
mixed zone pavement, redistributed (eolian) in patches w/ pavement of cobble scree
[Last site, transect only had cobbly covered (scree); this site has fine sand in patches particularly around shrubs but also in between shrubs]
Vegetation is ~ same mix of creosote & bursage
Parked at: 545919 m 545920
[at 13:00 time] 4051270 m 4051268
elev 764 m elev 766 m
and did representative mix of pavement patches
⇒ File = "dsmix"xx.ssm
⇒ File = sandxx (sand patches only)
Also more boulders here; Sand is coarser than fine sandy loam eolian deposits in areas surrounding Amargosa Desert. Likely that occasional runoff events move the sands but that eolian re-distributes

Did not include runoff channels that direct this area. They should be prominent in VCONDS because of fine silts in channel bottoms (high reflectance)

⇒ dpav7xx.ssm pavement only (scree with top thin layer comprised of ~50% cobbles & boulders

9/19/00 RF 31

Alfalfa field
center pivot
central, western edge
edge of field



elev 735 m 540983 m
Measurements taken: 739 m 4044145 m
~20 meters into field; soil has dry crust.
Files alfa1xx.ssm
alfalfa 2-8" tall not just watered
(pivot to north ~100-125 meters) → and moving towards the area we just measured
photos (2) of setup
Readings at 2:00 pm

Halon Reading (control std)
hal3xx.ssm at 2:05 pm

Playa/marl area (silt, little clay)
Location along road given but measurements are from a broad area 20 to 30 meters
south of road { 549460 m elev 695 m
4033510 m
scld1xx.ssm = File @ 3:10 pm
no vegetation; ~~clay~~/silt predominant RF 9/19/00
scattered small cobbles; otherwise sand/gravel on surface

Project No.
Book No.
TITLE

D.A.J. 9/26/00

32

9/19/00 RF

hal 4xx.ssm @ 3:10 pm
Halon standard readings

Sudan Grass 3 to 4 ft tall, dense
flooding for irrigation
top is wet.
northside of field is measurement location
550963 m
4038782 m
elev 708 m
On Mecca Rd

File: suda1xx.ssm

hal 5xx.ssm @ 3:35 pm
Halon Standard

Alfalfa @ 3:50 - 4:00 pm
center pivot
alfa 2xx.ssm
Cut to 2-3 inch height
elev. 710 m Garmin III
543755 m UTM NAD27
4039025 m
eastern edge of field
fine silt loam field looks dry, not recently
watered Hydrosense horizontal @ 3 cm depth = 7%

9/19/00
RF 33

Halon Standard @ 3:58 pm RF 9/19/00
hal 6xx.ssm → saved as hal 7xx.ssm
As usual for Halon spectral readings,
files also saved as reference spectrum

Thin wispy clouds stayed around most
of the day, though basically it was
a blue sky. Haze still remains.
101°F at 4:30 p in Amargosa Desert.

Qualitative observation that shrubs, particularly
creosote looked healthier near Big Dune and
westward to Beatty than in the farm area

Observations written on map/landsat image
Estimates of locations & comments transcribed
here (crop, active/inactive, area [pivot etc...]):

Witnessed & Understood by me, Date Invented by Recorded by Date

TITLE

From Page No.

Project No.
Book No.

D.A.J. 01/10/02

9/19/00
RF 33

Halon Standard @ 3:58 pm RF 9/19/00
hal 6xx.ssm → saved as hal 7xx.ssm
As usual for Halon spectral readings,
files also saved as reference spectrum

Thin wispy clouds stayed around most
of the day, though basically it was
a blue sky. Haze still remains.
101°F at 4:30 p in Amargosa Desert.

Qualitative observation that shrubs, particularly
creosote looked healthier near Big Dune and
westward to Beatty than in the farm area

Observations written on map/landsat image
Estimates of locations & comments transcribed
here (crop, active/inactive, area [pivot etc...]):

(see next page) RF 10/2/00

UTM NAD 27 readings on following pages
are taken from landsat image (rk lar. tif)
and are based on notes written on printed-out
copy of image used in the field. Actual
coordinates are not important; only general locations
are needed.

D.A.J. 01/10/02

D.A.J. 01/10/02

Witnessed & Understood by me, Date Invented by Recorded by Date

To Page No.

RF 10/2/00

(1) Pistachio Trees (no spectral profile obtained) [See page 15 note]. The trees are spaced 5 to 10 meters apart; they occupy the northwest corner of the square mile agricultural area that is the furthest northwest of any agricultural areas on the rklan landsat image (date of Landsat unknown).

Field location: 534542 m UTM NAD27
4048317 m

NW corner per Landsat (roads): 534528 m
4048495 m

RF 10/2/00 ~~guessing~~ guessing that area is ~ 400 m x 400 m though it could be larger.

(2) Vegetation along small dirt road running northwest from the northernmost farms in Amargosa Farms [see old landsat image, rklan.tif]. Halfway between Horsetooth Deposits and Forty-mile Wash, along Highway 95, there is a wash heading SSW that the dirt road crosses. The road intersects the wash at approx: 541277 m UTM NAD27
4055837 m

RF 10/2/00

General vegetation changes over this stretch of the road (east from the wash) are:

(a) creosote dominant UTM NAD27
541611 4055523 to 542684 4054368

(b) equal parts burrsage and creosote
543056 4054006 to 544088 4053005
by the eastern edge of this area (near transect 0919-2xx. * [page 28]) the burrsage is becoming more abundant.

(c) creosote & burrsage
546308 4050868 to 546968 4050239

(d) creosote only
547350 4049960 to 548733 4048618 RF 10/2/00

(e) creosote only, north-south road going into farming area ["School Lane"]
548155 4048639 to 548165 4047885

(f) Along School Lane, on west side of road RF 10/2/00 are Athel trees along same stretch as for (e); Athel (Tamarix aphylla) (~~Tamarisk~~ introduced)

(g) school & soccer/football field
approx 548379 4047163 as read from Landsat

DAF 01/10/02

10/2/00 RF

(h) Since part (d) was the last location actually on the NW trending dirt road, I'll go back to numbering items.

(3) Going along paved "Amargosa Farms Rd" from the school, westward towards Valley View Rd (slightly greater than 4 miles west of school). Another line of Athel Trees bordering the north side of the road from 548176 4046977 to 547381 4046987

(4) Mixed creosote, burrsage, plus other shrubs
RF 10/2/00 544635 4046987 to 545450 4046904 to 546531 4046977

(5) Swale on Valley View; mixed burrsage/creosote on east side of road: 541000 4046460 to 541157 4045883

(6) Large (2-3 m diameter) creosote on west side of road: 540910 4045171 to 540899 4044727

(7) 1/4 mi² center pivot (1/2 mile on a side) centered at 541341 4044906 UTM NAD27 Sparse shrubs only

(8) 1/4 mi² center pivot; Abandoned
542126 m
4044918 m

10/4/00 RF

(9) 1/4 mi² center pivot; tilled but no vegetation
542914 4044933 m

(10) Silt & runoff pool of water leading into center pivot area (runoff would be non-agricultural); in triangular area on south side of road between center pivots & athels on north side of road
541749 m and 405417 m
541745 m 405234 m

(11) Center Pivots 1/4 mi²
544593 4044920 } Sudan grass NW quarter alfalfa SW quarter
543754
543754 4044178 } abandoned
542980 4043307 } active alfalfa
542162 4043317 } active alfalfa
541366 4043317 } active alfalfa
542958 4042518 } active alfalfa
541356 4044135 } active alfalfa

(12) mixed burrsage and creosote
creosote > burrsage

DAF 01/10/02

Project No.
Book No.
TITLE

D.A.J. 01/10/02

10/3/00 RF

(13) Two areas of mixed bursage and creosote
(a) 540882 / 4043683 to 540925 / 4043027 west side of road
(b) 542119 / 4042081 to 542485 / 4041725

(14) 1/4 mi² center pivots in southern Amargosa Farms area
543378 / 4039907 } north half active south half is inactive
543356 / 4039036 } alfalfa
544228 / 4039047 } inactive sparse shrubs, no grasses
545013 / 4037562 } north half abandoned creosote/bursage south half

(15) Old alfalfa in NW quarter of 1/4 mi² plot
544540 / 4041715 }

(16) More Athel trees (Tamarix aphylla) lining the west side of road. These are often next to roads and near houses (wind breaks)
544658 / 4037864 to 544668 / 4037509

10/3/00 RF

(17) 1/4 mi² center pivots on straightline sprinklers
548208 / 4038326 } converted, no longer center pivot but it is active
548993 / 4038369 } active
549864 / 4038390 } 1/2" fall alfalfa / or sudan grass

(18) Sudan grass; flooded irrigation
550294 / 4038724 to 550996 / 4038746 } south side of road

(19) Mixed creosote & bursage
550370 / 4038885 north side of road

The last 3 points (17, 18, 19) were along Mecca Rd

Project No.
Book No.
TITLE Yucca Mt. Region Spectral Data Collection: Vegetation & pavement Spectra.
From Page No.

D.A.J. 8/26/02

Field notes transferred into field note book on 8/26/02. Description of equipment is provided at the end of this report.

D.A.J

09/29/01

Southern Solitario Canyon / Jet Ridge
Nevada

Vegetation Spectral Data Collection
Michael Smith & David Farrell
GPS coordinates recorded with Garmin GPS III Plus

(1) Standard (Std-1)
546391 / 4076590 ⇐ GPS location
Data points (coordinates are in NAD27) (D.A.J. 2/26/03)

(2) 100-m transect (trans-1 & trans-1u)
start - 546399 / 4076597
end - 546445 / 4076675
description: east facing slope on Southern Jet Ridge. Transect crossed a gully.
Vegetation: bursage, ephedra, yellow grasses, some other, dead desert trumpet, minimal creosote, except more present within the gully (middle section of transect).
Photo 7 ⇒ facing south along transect
(P9290115.jpg 8/26/02 D.A.J)

(3) Creosote (creo-1) near transect

(4) burrsage (bsage-1) photo 8 & 9
P9290116.jpg } D.A.J
P9290117.jpg } 8/26/02

D.A.J

09/29/01

(5) Unknown (unknown-1) photo 10
possibilities: { - ephedra / - nevada ephedra }
P9290118.jpg D.A.J. 8/26/02
P9290119.jpg

(6) Yellow grasses (grass-1) photo 11
low density (<5%)
occurs in isolated clumps
P9290120.jpg D.A.J. 8/26/02
possibly: desert needle grass

(7) Smaller wide spread grasses with wheat like appearance (grass-2)
photo 12
possibly: cheat grass
P9290121.jpg D.A.J. 8/26/02

(8) Unknown thorny plant photo 13-15
(dry thorny-1)
P9290122.jpg D.A.J. 8/26/02
possibly: spiny hopsage
P9290123.jpg
P9290124.jpg

(9) pavement photo 16-17
pave-1 546424/4076636
P9290125.jpg
P9290126.jpg
D.A.J. 8/26/02

From Page No.

Project No.
Book No.
TITLE

D.A.J. 8/26/02

09/29/01 (D.A.J 2/1/06)
~~09/29/02~~

D.A.J

(10) ephedra (eph-1) photo 18 { darker / green ephedra
isolated - darker color

P9290127.jpg D.A.J. 8/26/02

photo 19 { lighter / nevada ephedra

P9290128.jpg D.A.J. 8/26/02

(11) darker boulders (bould-1) reddish color with dark stain
(some lighter boulders also present)

photos 20-22 → P9290129.jpg, P9290130.jpg, P9290131.jpg D.A.J 8/26/02

photos 25-28 taken downslope of transect area → P9290132.jpg, P9290133.jpg, P9290134.jpg, P9290135.jpg D.A.J 8/26/02

photos 29-30 Solitario Canyon from eastern slope of Jet Ridge → P9290136.jpg, P9290137.jpg D.A.J 8/26/02

photos 31-32 Eastern slope of Jet Ridge with gully crossed by transect → P9290138.jpg, P9290139.jpg D.A.J 8/26/02

photos downloaded

(12) Std-2 & Std-2u time ≈ 10:40 am

New location

D.A.J

9/29/01

(13) Std-3 & Std-3u
location 536319/4068125
time: 11:42 am

(14) 100m transect ≈ E-W across wash area. trans-2
start: 536321/4068124
end: 536222/4068101

photos 1-2 → P9290140.jpg, P9290141.jpg D.A.J 8/26/02

Vegetation along Transect:
- Younger burrsage and creosote (mostly sage)
- some small grasses
- pavement is sand with small cobbles (mixed composition rounded & angular)

(15) pave-2 photos 3-4 → P9290142.jpg, P9290143.jpg D.A.J 8/26/02

(16) coarse-pave-1 photo 5
coarse pavement → P9290144.jpg D.A.J 8/26/02

(17) Sandchan-1 transect → P9290145.jpg D.A.J 8/26/02 photo 6
start 536257/4068109
end 536267/4068039

From Page No.

TITLE

Project No.
Book No.

D.A.J 8/26/02

9/29/01

(D.A.J 2/1/6)
~~9/29/02~~ 9/29/01
D.A.J

(18) Std-4 & Std-4u time: 12:30 pm
location: 536343/4067948

(19) Unknown-2 photos 7, 8, 10 → P9290146.jpg, P9290148.jpg, P9290150.jpg D.A.J 8/26/02

photo 9 taken for general interest → P9290149.jpg D.A.J 8/26/02

location 536029/4067970
- cedar like shrub in/near dry stream channel composed of a mixture of sands & pebbles
- stream channel ~ 50m wide.

(20) Unknown-3
- Small shrub seen at edge of stream channel

photos 11-14 → P9290151.jpg, P9290152.jpg, P9290154.jpg, P9290155.jpg D.A.J 8/26/02

(21) trans-3 area dominated by creosote & reddish desert trumpet photo 16 → P9290157.jpg D.A.J 8/26/02
location: 535849/4067990 → just east of wide channel
spectral readings taken of pavement / trumpet mix
start: 535882/4067957
end: 535834/4067985

9/29/01
~~9/29/02~~
(D.A.J 2/1/6) D.A.J

(22) pave-trumpet-1 near 535836/4067986
photos 15, 17 time ≈ 1:23 pm

P9290156.jpg, P9290158.jpg D.A.J 8/26/02

(23) Std-5 & Std-5u time ≈ 2:10 pm
location: 535800/4068123

(24) trans-4 200m transect (transition between desert pavement & wash)
start: 535800/4068123
50m: 535853/4068119 —
100m: 535900/4068122 —
200m: 535999/4068121 —

photo 18 To ~~east~~ Base/ft
photo 19 To ~~east~~ east
photo 21 across Crater Flat
photo 22 To ~~east~~ east

P9290159.jpg D.A.J 8/26/02
P9290160.jpg, P9290161.jpg, P9290162.jpg

1st channel at 117m of transect 535915/4068124
photo 20 north from 117m point ... shows transition ... more sage in wash area
→ P9290162.jpg, P9290163.jpg (D.A.J. 8/26/02)

(25) Std-6 & Std-6u approximately 2:00 pm
535999/4068121

D.A.J.
8/26/02

From Page No.____

Summary of Equipment Used:

- 2 Spectrometers used: one uplooking and the other downlooking ~~Spectrometers manufactured by~~ (D.AF 8/28/02)

Field Equipment:
DELL Inspiron 5000 laptop (CNWRA ID#2592)
Garmin III Plus global positioning system (GPS) [SN#92138807, David Farrell's CNWRA unit]
Ocean Optics USB2000 spectrometers (serial numbers USB2E739 and USB2E740)
OOIBase32 version 1.00.8 [Driver version 3.04.07]
Standards: WS-2 reflectance standard (Labsphere certified reflectance standard, AS-01158-060, USRS-99-010, BT55C)
HG-1 Mercury-Argon Lamp [008-00000-STD, only marked on box, not actually on lamp]
Upward facing cosine corrector probe connected to USB2E739 using the 600 µm optic fiber cable.
Downward facing cosine corrector probe connected to USB2E740 using the 200 µm optic fiber cable.
Integration time is adjusted for each series of profiles to ensure that the profile peak registers between 1000 and 4000, but does not go over 4000 (intensity units).

D.AF 2/1/06
No new entries will be made to this scientific notebook.

David A Farrell 2/1/06

I have reviewed this SN and determined that it complies with QAP-001

Gordon Wittmeyer
2/7/2006

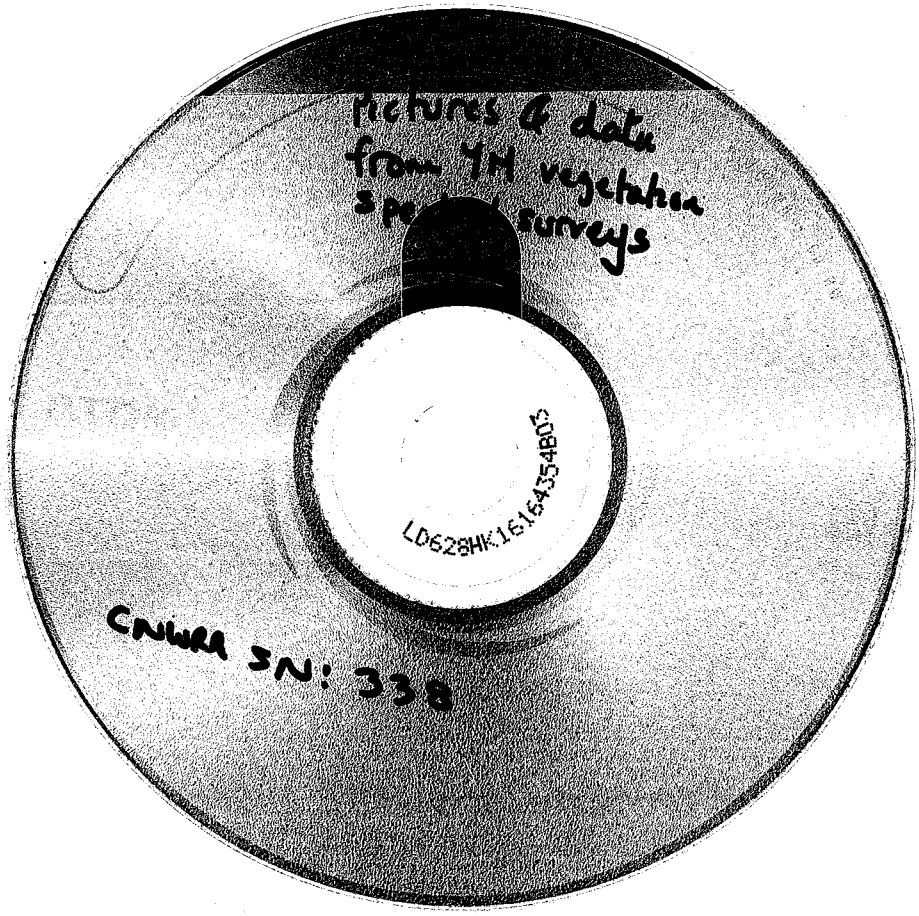
To Page No.____

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	

From Page No.____

To Page No.____

Witnessed & Understood by me,	Date	Invented by	Date
		Recorded by	


Pictures & data
from YH vegetation
surveys
LD628HK.1616435480
CNWRA SN: 338

ADDITIONAL INFORMATION FOR SCIENTIFIC NOTEBOOK NO. 338

Document Date:	09/26/2000
Availability:	Southwest Research Institute® Center for Nuclear Waste Regulatory Analyses 6220 Culebra Road San Antonio, Texas 78228
Contact:	Southwest Research Institute® Center for Nuclear Waste Regulatory Analyses 6220 Culebra Road San Antonio, TX 78228-5166 Attn.: Director of Administration 210.522.5054
Data Sensitivity:	■"Non-Sensitive" □ Sensitive □"Non-Sensitive - Copyright" □ Sensitive - Copyright
Date Generated:	02/08/2006
Operating System: (including version number)	Windows
Application Used: (including version number)	applications unknown
Media Type: (CDs, 3 1/2, 5 1/4 disks, etc.)	1 - CD
File Types: (.exe, .bat, .zip, etc.)	scope, jpg
Remarks: (computer runs, etc.)	Media contains: data files and photos from Yucca Mountain vegetation spectral surveys