2004

EPV 015 Charton Field Notes 2004

James Charton

Sunday, July 4th

Up at 3.50 AM to greet the morning with the birds. Beautiful morning with uneventful, 1'10" trip to LAG. AA to Florida / Int'l was busy as I chatted with a woman who came from a poor Honduran port on the Atlantic. "Honduras is not as nice as it was, with safety an issue as crime has increased". So much for an innocent countryside with romanticized "primative" people.

I purchased coffee, bagel + cream cheese and water so I can take my Malaria pill. I'm fortunate I did as neither flight will have on board food. The pleasures of modern day air travel! Was fortunate to get an aisle exit row so I had plenty of leg room while keeping hydrated and reading background papers on Lencan / Mayan culture and the pre historic history of NW Honduras.

Arrived Miami and had lunch. Plane delayed 20 minutes for clean up. Arrived San Pedro Sula and waited for baggage. Customs no problem. Met Ellen Bell, Yan and Charlie, great group. Went shopping at Costco like store + had lunch at a restaurant with a armed guard

outside. BBQ Chicken wasn't bad but Té Fría was very sweet. Weather delightful on outdoor patio at restaurant. Bought Ice Cream + brought back Pizza from Lil Ceasare's to El Paraíso. Also met Jorge project assoc director now working in Copán.

Ride to El Paraíso was amazing. People live in all sorts of cinder block, wood houses / shacks right off of road. No traffic lights outside of city. Due to Sunday + San Pedro festival people outdoors + all along road. Countryside is beautiful hills, mountains and streams. Stopped in La Entrada gas station and advised it was last outpost of civilization to El Paraíso. La Entrada looked like a reasonable city. At Florida made a turn on to a dirt road. At 6:30 everything was dark.

Arrived at HQ in very livable house. I'm barracked at a nice smaller home 3 blocks from HQ. Settled into small

room with Salvador (goes home on w/E) with attached shower (cold) + bath room. Settled down for night a bit tired. Had a great talk w Ellen on drive in about Archaeology. She's read a lot of the same books. Breakfast at 6:30 Am mañana.

Monday, July 5th

Woke early and joined Yon + Charlie for breakfast. HQ was 3 blocks from dorm. Had a good night sleep despite crowing roosters all night long, a fan helped. Woke early 6:00 AM and prepared for the day. The day was sunny and warm upper 70s. Spent the morning at the El Paraíso site (much progress made this year) and late after noon at El Cafetal where we ~~laid out~~ Larry and I laid out a sampling grid.

Children are everywhere following us from site to site helping with surveying by holding stadia and by just having fun and playing providing comic relief. Larry's been teaching

them Karaté and had a fierce cinco contra uno at El Cafetal just before we left for lunch. After lunch we drove to El Paraíso site when rain an lightening soon developed lasting f several hours in the afternoon. Larry a I returned to the dorm to run PO4 analyses.

The evening was relaxing despite me falling off the porch (& also cut my finger jumping off the truck and grabbing barbed wire just as we arrived at El Paraíso). Dinner was by candlelight (Pork chops in Spanish sauce, mashed potatoes, fresh green beans, Tried the local beer El Imperial it was OK. The storm soon intensified and streams started flowing through the cobbled streets. Santiago (my room mate) came in soon after dinner to tell us that a horse had fell into our tarps on the incline of a mound being excavated. Ellen, Roberto, Max

cello, Yon and Santiago all rain out the door in rain gear ~~to~~ and flash lights to rescue the horse and repair the tarps. Power soon returned after they left allowing us to watch inane TV programs and movies. Allison, Irma, Charlie, Larry and I stayed behind as we had no rain gear and only sandals.

After about 1½ hrs the rescue crew returned having repaired the tarps. The horse was not there when they arrived probably being rescued by the owner.

We returned to our rooms at 9:30 after I read a few field reports on PO_4 analyses and by 10:30 settled down. Although it was cooler, my room was still a bit stuffy, so I put on the fan to sleep.

Tuesday July 6th

I awoke at 5:30 and took a cold shower at 5:40. After breakfast I wrote up yesterday's diary. The ~~day~~ morning was overcast

and Larry was having stomach problems. We got to our site and began marking N-S 5m grid. Larry was visibly pained and required rest from time to time. Cheppe made wooden stakes and marked the 5m marks. We completed all but 2-3 rows by lunch and were picked up by 12:40. The morning was comfortable the cloud cover keeping down the heat and the only mosquitos were those around brush piles. I didn't need sun screen or insect repellent all day.

After lunch we completed our grid early and joined the others at El Paraíso at about 3:30PM. Marcello and You were at the 3m offset where interesting artifacts, pottery shards, a foot in ceramic and a burned area were discovered by the local excavators. Marcello was busy expanding the area and found a few additional artifacts. The ceramics were believed

to be a censor that may have been used ritually to consecrate the initiation of a new building. The rock material above the level of the charcoal lens was most likely fill used to build the new structure. A young girl from Houston, Texas visited the site with her cousins who lived locally. The dig is a major attraction for the people of the town.

Larry gained strength in the afternoon enough to play 6-1 score games of soccer with the locals near our dorm. He and Yon are the team to beat. Larry was playing soccer since 5 years old and achieved good success through high school. He decided not to play at Yale in order to concentrate on his studies.

Evening brought rain again, as Marcello outlined the sample labelling protocol for Larry and I. We prepared for the next day, a lot of work ahead. I found my cleaned underwear in a pile of folded ~~clothes~~ clothes much to my relief. I had

visions of running out of clean underw in less than 2 weeks. My jeans from Monday's wash was still not completely dry.

It is difficult to have a room mat one cannot communicate with as Santiago speaks only Spanish and me spanish is non-existant. Hopefully things will improve.

Wednesday, July 7th

A bit overcast this morning after an evening of pounding rain. Our work site must be a field of mud. Larry is feeling somewhat better today so hopefully we'll get things going.

On the way to El Paraíso we came across a truck of Americans, young college age women. It is thought that their from Alabama and are evangelicals. At our work site Larry maps out the new points while I put flags in the

15m points. The mapped site is 135m × 90 or ~400' × 270'. Chapé and I dig the first new sampling point AQ with a post hole digger it soon becomes obvious that the soil is very wet. At about 15-20cm we find a large sherd and several fragments. We continue to about 45cm and take 2 samples.

We call into Ellen to say its too wet and we'll walk back to our dorm. I leave my water bottle (inadvertantly) and we begin our trek through shrubs, fields and over an Indiana Jones type rickety bridge 6' over a stream. Marcello takes us back key truck from El Paraíso stopping to purchase some materials (plastic plates, hair dryer, spray paint) to mark our 15m stakes (I had to pull the flags out as the children will pull them out and play with them), and dry our samples.

Larry + I spend the rest of the morning and afternoon sample coding El Cafetal 15m samples and later I experiment sample

drying while he enters data into l laptop.

At El Calafate in the morning my stomach begins to really bother me and feel a bit piqued and achey. I take 2 ~~Pepto~~ Pepto Bismol tablets and begin to feel better in a while. A lot of gas + burping with stomach cramps. A lunch of ham + cheese sandwiches seems to pick me up.

After dinner of fried chicken, chips and corn I watch the Argentina / Ecuador soccer match with Argentina romps 6-1 After logging in

8/20 Friday Cherry Hill ±3
mi 46
hrs 8-4
Hot & humid

[redacted]

Sept 24, 2004 Holsey Ave

Pit 1

Histosol

A layer thick blk, dk, rich, crumbley
rooty thin top hor
B Changes to light

Green layer
Similar to our pit
2 O horizons
2 C " hit till
2c horizon composed of varve layers
striations
Glacier ~~recdr~~ retreat
Formed a shallow lake, silt + clays
deposited over till, stratified silts
+ clays (varve)
Isolated lake after glacier
retreat
Calcareous
Marl
Triassic basin due to Carbonate
content.
Highly basic
Marsh peat formation - grasses
+ sedges (Green - lake glop, cattails

E+B are inorganic soils

Never spaghum.
Beaver meadow at time of contact (sticks below level with beaver chews)
Good farm land when drained due to high ptt.

Triassic basin - caliche.

Cut off palatable water supply to area.
Farm drained area.
Flooded in 1990 + area drainage improved

Agriculture - abandoned - trees + Spice bush with trees in capapy slowly dying with fallen trees, sapplings couldnt grow in spice bush.
Beaver Meadow → Ag → Red Maple
Swamp → Spice bush

Plow line obliterated by worm activity.
No earth worms

Highly decomposed Peat
~~tract~~

Pit 3

BC – glacial till
2C – thixotropic soil – responds to touch, sandy
A + B layer, peat layer decomposed to mineral layer

A – decomposed peat
A_2/B – mottled layer
2B1 – coarse sand } glaciofluvial
2B2 – coarser "
2C1 } ~~lacustrine silt~~ sand
2C2 }
3C till

Pit 2

Histosol + Inceptsol } somewhere in between.

RI Field Trip

October 2, 2004

	0-2 Oi	no O_2
	2-6 Oe	
	6-11	redish thin layer below
Ap	11-18	last plowing incorporated
	18-22	some B horizon
	22-27	
BW1	27-76	Silty
BW2 C1	76-89	Loess
~~2C2~~	89-101	Red - Fe
Augered		
	171	Water table

Since plowing } E - grey lense
Bh - redish Soil forming
reforming of soil processes
incipient E + incipient Bh

Kettle Depression

Pit 1 25m E of Pit 2

S of 1706 40m

(low canopy)

White Pine, mt laurel, ~~with~~ with hazel

Indian pipe, hair cap

1980 Gypsy moth infestation destroyed White Oak + ~~Pine~~ Pin Oak

Pine leaf litter

Sandy loam / loamy sandy

~~Anti~~ Inceptisols
(Windsor or Huckley

Pit 1

Spotisol - spotic horizon with cemented Fe oxide

pH
4.0 Oi
| Oe
| Oa — black
6.0 E acid, coarse, wet — leaching
Bhs - acc of illuviation of Fe oxide
Bs
C — outwash plane

Water at 1.7 m

Pit 3
Oi
Oe
Ap
BW1
BW2
C1
C2
2C

Textural / Geologic / Water Related Processes

Qf silt – air bourne process
Q sand – water bourne process

Outwash plane with loess cap

Kettles – melting, collapse

Granite, gneiss bedrock

LAB NOTES PEABODY/ITS BASEMENT

February 1, 2007

1 Sorted El Cafetal samples into zip lock bags in groups of 10 for 07/05/ series.
2. Generated Random numbers (file P04 Random Sampling. MTW) for 10% data check numbers were (some repeated):

95	271	202	78	212	61*	101
168	67	34	308	55	49	
178	61	276	36	5	52	
4	143	113	318	64	263*	
263	7	204	204*	76	40	

* Duplicate numbers

February 8, 2005 J. Charten

I Realized that I forgot to order phospate standard solution. Need to run standard in order to ~~conform~~ assure results.

⟹ Will order ~~solution~~ PO_4 standard solution

Did a test run

1. Prepared stock sol'n 20ml Mehlich 2 ~~plus~~ w/s distilled water to top of ~~bottle~~ bottle.
2. Sifted and weighed samples 07/05

Blank	0.00	0.00	Blank	0.00		
61	0.22	0.40	202	0.01?	0.76	0.73
143	0.98?	0.34	034	1.42	0.96	1.39
007	0.98	0.90	276*	0.20	0.11	0.68
Recheck Blank		0		0.00	0.00	0.27

*Note sample extracted had root matter

Let color develop 3.30-4 minutes

Note 143 light color recheck reasonable
202 slight/med color recheck "

2/2/05 — Larry Levan

Samples: 07/05/004, 067, 095, 168, 178, 263, 277

Measure: /004 : 2.00g ; /067 : 2.00g ; /095 : 2.00g ; /168 : 2.00g ; /178 : 2.00g ; /263 : 2.00g
/277 : 2.00g

- Placed 2.00g sample in respective 50mL test tubes
- Measured 20mL Mehlich 2 soil extractant using 50mL graduated cylinder. Placed 20mL in flip-top dispensing bottle (200mL). Brought up w/ distilled water
- Added 25mL solution to each soil sample & shook for 5 min.
- Placed shook solution into respective Funnel w/ 125mm filter paper & collected extract in different set of 50mL test tubes.

/004 : 0.32 mg/L
/067 : 0.00 mg/L
/095 : 0.00 mg/L
/168 : 0.09 mg/L
/178 : 0.00 mg/L
/263 : 0.37 mg/L

* Something wrong : will have to redo. Significantly different from Honduras readings.

- we also need a waste bin in here

February 10, 2005 J. Clanton

Set up laptop to network with Marcello Canuto's server, Canutolab.

Called Melody White on variation in HACH readings (970 669 3050 or 800 227 4224 $23

Melody suggests we check instrument wavelength. There are 2 wavelengths: 520 and 610. Would need to purchase D/R check kit, Item # 2763900 $ 1

Some other points:
- Zero will change from reagent + PhosVer to reagent + phosVer 3 sample
- Can wait up to 10 minutes to take reading, recommends at 5 minute
- Some reading variation can be expl by "settling" of undissolved phos crystals.
- Will talk further on D/R check kit and running calibration curves.

March 2 2005

Phosphate Standard : 50.0 mg/l ratio = 1:49 ⇒ 1 mg/l ; 0.1 ml → 10 mL = 0.5 mg/l

Reading : 0.5 mg/l : 0.46 mg/l

Samples : 07/05/004 ; 07/05/277 ; 07/05/067

004 : 0.13 mg/l ?

067 : 0.70 mg/l vs. Honduras 1.18 mg/l

0.277 : 0.34 mg/l 0.83 mg/l

Something not right. Readings somewhat high but no blue color. Redo phosphate standard

Ratio :	Predicted	Result :	No blue color
1mL/10mL	= 5 mg/L	.88 mg/L	
0.4mL/10mL	= 2 mg/L →	.54 mg/L	
0.2mL/10mL	= 1 mg/l	.34 mg/L	

OK Trouble Shooting ; 2 possibilities : Phosver 3 batch = no good

Mehlich 2 Soil extractant = no good

Also note : Colorimeter seems to be reading off too...

March 3, 2005

Raw standard calibration test.
1 ml PO_4 std to 49 ml distilled water

Readings	5 min Set	N 7 min good	good	Plug back	Plug front	Cu
Blank *	0.00	0.00	0.00	0.63	0.52	
Vial 1	0.22	0.29	0.21	0.63	0.52	
" 2	0.24	0.63	0.75			
" 3	1.05	0.48	0.18			
	0.0	0.00	0.00			

* 10 ml distilled water + phosver indicator
Shook sample 30 sec w indicator

Note: Bubbles + powder visible in sample vials

Plug front 0.41, 0.42, 0.42
back 0.56, 0.56, 0.56

Need to talk with Hach
1) Sample ~~is rape~~ value is repeatable when left in colorimeter
2) Zero is consistant
3) Individual sample values d

up and down.

March 22, 2005

pH Test (with pocket pH Tester)

CVS Distilled Water	5.8	5.7
Buffered Sol'n (4.0)	4.3	4.2

March 29, 2005

pH reading 5.9

1. Replaced DR-850 batteries
2. Cleaned out sample well with Windex on Q-Tips
3. Using Ultra pure Distilled Water (GIBCO from stock room) I prepared a calibration solution 1:49, 50.0 mg/l PO_4 Std Soln : Distilled Water*
4. Fill 4 glass sample vials with 10ml** of diluted std solution
5. Ran Zero. Set first vial to zero and then ran all vials 3 times See Results A (pg 7). Note ◇ diamond facing keypad
6. Added PhosVer 3 pwd to vials 2-4 (keeping 1 as zero std) and shook for 1 minute (per Wells).

* Stirred with glass rod. ** Measured w 10ml graduate

7 Allowed vials to "rest" 3 minutes be
taking readings* see Results B below.

Results A

Reading \ Vial	1 (Set)	2	3	4
Zero	0.00	0.00	0.03	0.04
	0.06	0.05	0.08	0.06
	0.08	0.06	0.08	0.07
Reset Zero	0.00	0.00	0.01	0.0
	0.00	0.00	0.02	0.0
	0.00	0.00	0.02	0.0

Results B

Reading \ Vial	1	2	3	
4B min	0.00	1.23	1.23	1
5A min	0.01	1.23	1.24	1
6B min	0.01	1.23	1.25	1
7B min	0.01	1.24	1.26	1
8 min	0.01	1.24	1.24	1
9 min	0.02	1.24	1.25	1
10 min	0.02	1.25	1.24	1

* Note Solutions are clear (no bubbles or ov
and a bit blue than earlier weeks).

Conclusions:

Zero drifted a bit at first 0.00 - 0.08
When rezroed drift reduced to 0.00 - 0.02

Calibration sample consistant from 4 to 10 minutes.

Rerun series using CVS distilled water.
Note: Rinsed out graduated cylinders and sample vials w CVS distilled water.

Reseults A1 Vial / Reading	Ultra pure 1	CVS 2	3	4
Zero	0.00	0.00	0.06	0.00
	0.00	0.00	0.06	0.00
	0.01	0.00	0.06	0.00

Results B1	1	2	3	4
4 min	0.00	1.26	1.22	1.13
5 min	0.00	1.26	1.21	1.13
6 min	0.00	1.26	1.22	1.12
7 min	0.00	1.26	1.22	1.12
8 min	0.00	1.26	1.22	1.12
9 min	0.00	1.26	1.22	1.12
10 min	0.00	1.26	1.23	1.12

Conclusions:

- CVS distilled water is OK for testing
- ~~Std~~ = Calibration test readings consistant, slightly more variable than Ultra Pure

Rerun Samples 61, 143 and 007

1 Prepared Mehlich 2 Stock solution 20 ml conc + CVS distilled water to neck of bottle.

2 Extracted and filtered 2g of each sample with 25ml of diluted stock solution.

3 Pipetted 1 ml into sample vial, add 9 ml of CVS distilled water from grad cylinder (10 ml).

4 Prepared previously used blank, 1 ml diluted stock solution plus 9 ml distil water.

Zero Test

Reading / Vial	Ultra Pure * 1	Old blank ** 2	(007) 3	(61) 4	(143) 5
Set Zero	000	0.00	0.00	0.00	0.04
	0.01	0.00	0.00	0.00	0.04
	0.00	0.01	0.00	0.00	0.04

5 Added PhosVer 3 and shook for 1 minute.

Reading / Vial	1	2	3	4	5
4 minutes	0.00	0.29	1.05	0.61	0.54
5 "	0.01	0.31	1.05	0.61	0.54
6 "	0.00	0.31	1.05	0.61	0.54
7	0.00	0.32	1.05	0.61	0.54
8	0.00	0.32	1.04	0.61	0.54
9	0.00	0.32	1.05	0.62	0.54
10	0.00	0.33	1.05	0.62	0.55

Conclusions:

1) Results consistant over time, zero is consistant

2) Old blank has reading

Results	Sample	Reading	Honduras Reading
	007	1.05	0.38
	61	0.61	0.36
	143	~~4.40~~ 0.54	0.35

* Sample from page 7. ** Step 3 prep.

(1) Samples in lab with cylinder sample cell read higher than Honduras using cell based on these samples

(2) Sample 61 + 143 were similar in Honduras and sample 7 significantly different.

(3) Noted some floating specs (undissolved PhosVer 3) that settled to bottom of cell.

March 31, 2005

Discussion with Heather:

1) Run calibration std every 10 samples. Can use change listed to ca
2) Compare results to blank.
3) Run distilled water for zero check.
4) Purchase Agate mortar + pestle reducing "clumps". Porcelain will be pitted by soil.
5) Absorption = $1 - \log(\%T/100)$ per Heather

Spoke to Marcello:

1) Select 50 samples: 40 El Cafetal, 10 El Paraíso for element analysis
2) Run ~~DS~~ DR-850 on same samples
3) Contacted Univ of Wis, they will run samples at $20/sample.
4) Need to run:

- Step calibration test
- Glass vs Plastic
- Feedback from HACH on
  a. 0.30 value for blank
  b. 1.20 vs 1.00 reading for calibration sample
- Multiple std preparations

April 4, 2009

Calibration Test

1 mL 50 mg/L PO_4 std soln : 49 mL H_2O

		5 min	6 min
	Zero	0.00	0.00
Vial	1	1.22	1.22
"	2	1.31	1.31
"	3	1.32	1.32

(w PhosVer3)

			Zero	4 min	5 min	Adjusted Reading
	Zero	Blank	0.00	0.21	0.22	
Vial	1	#21	0.02	0.86	0.85	0.6
	2	22	0.05	0.58	0.61	0.3
	3	24	0.01	2.06	2.06	1.8
	4	44	0.04	0.61	0.62	0.2
	5	49	0.01	0.69	0.69	0

OK

Note all samples 2 gms

* Adj Reading = Reading − (blank + zero)

April 6th

Calibration Test

1 ml 50 mg/l PO_4 std solution : 49 ml H_2O

Zero.	0.00
Reading 1:	0.93
Reading 2:	0.95

			Zero :	PhosVer 3	Adjusted Reading
	Zero | Blank		0.00	0.23	
V.d	1	#52	0.01	0.85	0.61
	2	54	0.01	0.60	0.36
	3	77	0.03	1.15	0.89
	4	79	0.04	1.51	1.24

Mass Sample: 2.0 g.

April 7, 2005

Calibration Test / Curve

1 ml 50 mg/L PO_4 Std Soln : 49 ml H_2O (Ultra Pure)

Phosver 3

Conc	Vial		Zero (Set Zero)	4 min	5 min	Zero Blank
	1	UltraPure	0.00	0.29	0.29	0.00
	2	CVS	0.00	0.19	0.18	0.00
0.05	3	0.5ml + 9.5 UP	0.00	0.21	0.21	0.00
0.10	4	1.0 ml + 9.0 UP	0.00	0.32	0.31	0.03
0.15	5	1.5ml + 8.5 UP	0.00	0.28	0.28	0.00
0.20	6	2.0 ml + 8.0 UP	0.00	0.31	0.31	0.02

OK

Std solution: 2ml 50 mg/L PO_4 Std Soln : 48 ml H_2O Ultra P

Calibration Test / Curve

Conc	Vial		Zero	4 min	5 min	Blank
	1	UltraPure	~~Set~~ 0.00	0.22	0.22	0.00/0
	2	Tap Water	~~0.01~~	1.02	1.01	0.79/0
0.50	3	~~0.25ml~~ 2.5ml	0.01	0.84	0.83	0.61/0
1.00	4	~~0.5ml~~ 5ml	~~0.02~~ 0.02	1.36	1.36	1.13/1
~~0.75~~ 1.50	5	~~0.75ml~~ 7.5ml	0.02	1.84	1.84	1.62/1
2.00	6	~~1.0ml~~ 10ml	0.00	2.30	2.30	2.06/2

Using Ultra Pure w PhosVer as "blank"

		(subtract 0.22)	set to zero
Vial 2	Tap Water	0.80	0.79
3	0.5 STD	0.61	0.61
4	1.0 STD	1.14	1.13
5	1.5 STD	1.62	1.62
6	2.0 STD	2.08	2.05

Basically no difference between subtracting PhosVer3 in Ultra Pure reading and setting instrument to zero.

April 11, 2005

Prepared 1 mg/L solution using 50 ml flat bottom flask, 1 ml 50 mg/L standard solution to 49 ml CVS distilled water.

Prepared 2 bottles of Mehlich 2 diluted Stock solution 20 ml of Mehlich 2 to CVS distilled water to ring on neck of bottle.

Run 1.0% Calibration Test

		Zero	4 min	5 min	Blank
Vial 1	Distilled Water Set	0.00	0.12	0.11	0.00
2	1% std soln	0.01	1.22	1.22	1.11

Adj Reading = 1.10

Soil Analysis

		Wgt	Zero	4 minute 5	5 minute	Blank	Adj Reading
Blank*			set 0.01	0.12	0.11	0.00	
deep blue	07/05/064	1.85	0.03	2.69	2.69	2.57	2.54
	07/05/081	1.93	0.01	0.68	0.68	0.57	0.57
deep blue	07/05/088	1.80	~~0.05~~ 0.04	1.99	1.99	1.88	1.84
	07/05/103	1.80	0.01	0.57	0.56	0.45	0.44
	07/05/105	1.81	0.02	0.51	0.52	0.40	0.38

/ OK

		Wgt	Zero	4 min	5 min	Blank
Blank*		set	0.00	0.00	0.00	
blue	07/05/107	1.80		1.19	1.19	Forgot to take Zero readings.
blue	07/05/109	1.80		0.82	0.82	
	07/05/135	1.81		0.20	0.20	
	07/05/137	1.84		0.21	0.21	
	07/05/139	1.80		0.15	0.14	/ OK

* Blank 1 ml Mehlich 2 dilute to 9 ml

Melody discussion

Phosver Correction

1) Run 5 Phosver 3 packets per bag with distilled water and average readings. label bag and subtract average from each soil extraction reading.
2) PO4 standard soln is ± 5%

Re-run previous set

		Wgt Set	Zero	4 min	5 min	Blank	Adj Read
	Blank	~~1.80~~	0.00	0.11	0.10	0.00	
blue	07/05/107	1.80	0.00	1.35	1.34	1.26	1.24
blue	07/05/109	1.80	0.00	0.89	0.88	0.78	0.78
	07/05/135	1.81	0.00	0.45	044	0.35	0.34
	07/05/137	1.84	0.00	0.41	0.40	0.30	0.30
	07/05/139	1.80	0.00	0.38	0.37	0.27	0.27 OK

		Wgt Set	Zero	4 min	Blank	Adj Reading
	Blank		0.00	0.19	Set 0.00	
blue	07/05/158	1.84	0.02	1.09	0.91	0.88
blue	07/05/163	1.86	~~0.04~~ 0.03	1.54	1.36	1.32
~~blue~~	07/05/167	1.89	0.00	0.65	0.48	0.46
blue	07/05/172	1.91	0.02	1.21	1.05	0.99
	07/05/184	1.90	0.01	0.53	0.35	0.33

OK

		Wgt	Zero	4 min		Blank	Adj Read
	Blank	Set	0.00	0.17	0.15	0.00	Set
blue	07/05/186	1.94	0.01	0.94	0.93	0.79	0.77
blue	07/05/189	1.80	0.05	1.13	1.14	1.00	0.93
	07/05/215	1.89	0.03	0.68	0.68	0.54	0.49
	1% STD	—	0.03	1.20	1.20	1.05	1.01
DUPLICATE	07/05/189	1.80	0.03	0.96	0.96	0.82 / OK	0.79

Note: Std 1% is reading within ±0.05
earlier read 1.11%

Duplicate of 07/05/189 was ~~0.00~~ 0.18 different in reading, 0.14 in adj reading.

Avg of 07/05/189 = 0.86

April 14, 2005

Calibration Test:

Prepared 1% std soln using 1 ml pipette of 50mg/L PO4 standard : 49 ml CVS distilled water

Vial		W/o PhosVer 3	W PhosVer 3 4 min	W PhosVer 3 5 min	Blank
Vial 1	CVS Zero	0.00	0.06	0.05	set 0.00
✗ 2	1% STD Soln	0.02	1.23	1.23	1.19
✗ 3	1% STD Soln	0.03	1.26	1.26	1.20
3					

1% STD Soln = 1.17 (1.16+1.18) Note: Zero PhosVer 3 was very low (0.06).

New batch of PhosVer 3 used for samples below

Prepared 2 bottles of dilute Mehlich 2 Soil Extractant Reagent 20 ml conc Mehlich 2 to CVS distilled water to line.

Vial	Sample	Wt (gms)	Phos V3 Zero	4 min	5 min	Blank	Adj Reading
1	Distilled CVS	—	set 0.00	0.09	0.09	set 0.00	—
2	07/05/257	1.96	0.00	0.63	0.62	0.54	0.54
3	07/05/219	1.98	0.00	0.91	0.90	0.82	0.82
blue 4	07/05/~~222~~ 221	1.95	0.00	1.56	1.56	1.47	1.47
5	07/05/223	1.97	0.00	0.89	0.90	0.81	0.81
6	07/05/254	1.97	0.00	0.35	0.35	0.30	0.26 OK

1	Distilled CVS		Set 0.00	0.13	0.00	0.00	Set 0.00	
2	07/05/256	1.93	Set 0.04	(0.82)	0.23	0.23	0.71	
3	07/05/258	1.96	0.03	0.00	0.00	(0.48)		
blue 4	07/05/260	1.88	0.03	1.18	1.19	(1.60)		
5	07/05/262	1.94	0.02	0.17	0.45	(0.63)		
6	07/05/290	1.92	0.03	0.00	0.00	(0.37)		not OK

Results are inconsistent need to re-run set

1	Distilled CVS		Set 0.00	0.12	0.12	Set 0.00		
2	07/05/256		0.01 0.03	1.00	1.02	0.90	0.90	
3	07/05/258		0.00 0.02	1.06	1.06	0.95	0.94	
blue #4	07/05/260		0.02 0.03	1.82	1.81	1.71	—	
5	07/05/262		0.00 0.02	0.85	0.84	0.73	0.73	
6	07/05/290		0.01 0.02	0.46	0.46	0.36	0.34	

Vial	
1	
2	
blue 3	
4	
5	
6	
1	
2	
3	
4	
5	

* Set reread after ~7 minutes (walk to car)
** Put 2 packets of PhosVer 3 by mistake (re-run)

Vial	Sample	Wait (secs)	Zero	PhosVer 3 Amin	PhosVer 3 5min	Blank	Adj. Reading
1	CVS Distilled		set 0.00	0.20	0.19	set 0.00	
2	07/05/307	1.93	0.01	0.33	032	0.13	0.12
blue 3	Re-Run 07/05/260	1.88	0.03	1.90	1.89	1.70	1.67
4	07/05/309	1.95	0.01	0.28	0.27	0.08	0.07
5	1% Std Soln		6.00	1.26	1.24	1.05	1.05
6	07/05/292	1.95	0.00	1.23	1.23	1.03	1.03

OK

	Sample						
1	CVS Distilled		set 0.00	0.11	0.08	set 0.01	
2	07/05/311	1.99	0.00	0.21	0.18	0.11	0.10
3	07/05/312	1.99	0.00	0.19	0.17	0.10	0.09
4	Dup 07/05/311	1.99	0.00	0.19	0.19	0.09	0.10
5	Dup 07/05/312	1.99	0.00	024	0.23	0.14	0.14

OK

Avg 311 $\frac{0.10 + 0.10}{2} = 0.10$

312 $\frac{0.09 + 0.14}{2} = 0.11$

TC

20 DB2TT-995-780 Wchester T/2	784	788
781	785	789
782	786	
783	787	
50 HA583-879-150 Wchster T/2	154	158
151	155	159
152	156	
153	157	
50 HA583-879-140	144	148
141	145	149
142	146	
143	147	

Expenses

Date	Item	Amount
6/10	3 Trowels (F-S, Inc)	$45.15
6/11	" "	45.15
5/29	AA Air Fare	614.00
7/4	Car Rental to Air Port	62.13
	Tolls	4.00
	Air Port Breakfast	5.94

July 5, Monday — El Paraíso

Weather: Slightly warm morning, slight humidity, partly cloudy. Roosters crowing all around town.

Today's objective: Become familiar with sites, shadow Larry to learn techniques/procedures. Hope to increase sample output and efficiency. Survey of El Paraíso complete with focus on El Cafétal.

AM

Visited El Paraíso site, saw progress on high mound and smaller structures, building of levee along cut bank that has cut into site partial building. Marcello set a new trench 3m south on high mound. Ellen demonstrated Total Station with data collector.

Visited El Cafétal much more spread out than El Paraíso. Courtyards in El Paraíso were paved in plaster (yellow) while El Cafétal has cobble courtyards.

Larry and I laid out new grid at 5m intervals from 15m original stakes along

E-W line beginning at A thru V on structure 9 (see map pg) except for Q, S + W. Stopped at noon.

After lunch rain + thunder at site. Decided to focus on sample analysis back at house.

1) Evaluated samples for dryness and took 12 or so driest samples
2) Discarded diluted solution from testing last week.
~~3) Measure 2g from each sample + record on analysis sheet (pad)~~
3) ~~Take adequate sample in sifter~~ Clean sifter with Chem wipes
4) Add adequate amount of sample (handful from bottom of middle of sample bag) and screen.
5) Weigh out 2g and fold + label weighing paper
6) Clean off benchtop
7) Hang in samples 1-7 on data sheet

	Test #	Lorry Sample #	Lot No	Test #	Sample #
Batch 1	1	591	11	5	5131 17
	2	592	12	6	5191 23
	3	5102	14	7	5192 24
	4	5111	15		
Batch 2	8	5251	31		
	9	5301	36		
	10	5401	45		

8. Put 2gm in sequential array of plastic test tubes.
9. Test phosphate meter.
   a. Take 2 test vials
      vial 1 – distilled water (zero)
      " 2 – diluted std 1:49 (1 mg/l)
   b. Turn on meter (push Exit)
   c. Pour distilled water into squeeze water bottle (fill)
   d. Using 10ml graduate cylinder measure 10 ml distilled water and place in vial 1
   e. Dose 1 ml (using syringe) of Phosphate std soln into 50 ml graduate cylinder. Fill graduate cylinder to 50 ml mark with distilled water.

f. Using 10 ml syringe, pipette 10mls of diluted PO_4 standard into vial 2.

g. Add phosver 3 packet to both vials shake 15 seconds and let stand 2 minutes Diluted PO_4 standard will turn blue

h. Turn on machine* and wipe face of vial being analyzed
- Vial one — push zero
- " two — 1.22 (reading)

*Program 79 PO_4

Note: Took several readings
Vial one — 0.00, 0.08, 0.22, 0.33
" two — 0.94, 1.22, 1.24

Re zeroed instrument and instrument stabilized.

i. Instrument calibrated. Wash vials dump + rinse w distilled water

Begin Test Procedure

Stock solu prep.

a. Measure 2oml in graduate cylinder of Mahlich 2 solu and pour into smaller squeeze bottle with spout

b. Rinse graduate cylinder with distilled water and fill squeeze bottle to line near

neck.

c. Set up funnels + test tubes in separate rack. Add filter paper to funnel.

Extract Soil Samples

a. Measure in 50ml graduate cylinder 25ml of diluted Mehlich 2 sol'n and add to 1st test tube. Repeat with remaining 6 test tubes. Screw on caps. ~~Shake for 5 minutes.~~

b. Shake for 30 seconds and vent cap. Tighten cap and shake for additional 4½ minutes.

c. Pour into funnel and wash extraction test tubes with drinking water and destilled water

Analyzed extract solution

a. 8 sample vials (one control)

Note make new control every time

b. Control 1 ml of diluted Mehlich 2 sol'n to 9 ml distilled water. Add phosVer 3 pwd.

c. Dilute each extract solution using syringe 1 ml to 9 ml distilled water and add phosphor 3 pwd.
d. Zero the control solution
e. Read extract solns

1	~~0.70~~	~~0.10~~ 0.69	5	~~0.85~~	0.84
2	~~0.78~~	~~0.38~~ 0.92	6	~~0.90~~	0.93
3	~~0.69~~	~~0.60~~ 0.80	7	~~1.53~~	1.51
4	1.02				

July 6th, Tuesday

Weather: Rain most of night near disaster at El Paraíso site as horse fell in tarp covered trench of tallest mound. Sky overcast most of morning

Observations: I felt better than yesterday, unfortunately Lary was dragging most of morning, he accepted some Pepto Bismo tablets and felt better after lunch.

Cheppe' helped us lay out 5 m points on the

original 15m grid. All points are identified by wooden stakes, made by Chepper by scrap wood. Some 5 m locations are off by up to 0.5 m. Ellen will site points in later.

After lunch we finished the site and plan to begin taking samples tomorrow.

Thoughts: Site is spread out with several structures around big flat area, central plaza? The site is not as near to contemporar activity as El Paraíso and appears to be more pristine.

Original analysis of El Cafetal appears much higher than El Paraíso results. Concerned about analytical error as sample values changed (see previous page).

Plan for tomorrow:

- Establish lot # and EU system

requested by Marcello:

1) Since this is a sub lot use consecutive lot numbers

2) Use alphabetical system for EU* ie A-Z, AA-AZ, BA-BZ, etc. Include N+E to help correlate EU to grid.

Sample tag

Date Sample Taker

Op 07/05/ Lot# ___ E.U. ___

(N, E)

Depth ___ in cm

Harry notice black marker rubbed off bag, need to put tags in bags.

Things to be done:

1. Begin 5m grid sampling with new coding system

First Lot No. 49

" E.U. ~~AO~~ ~~AP~~ AQ

2. Take 100 gm sample bag from each El Paraíso sample and discard remainder

* Excavation Unit

3. Set out A—AP EU samples on paper to dry.
4. Investigate test method uncertainties

July 6, 2004 Wednesday El Cafetal

Weather humid and overcast from a lot of rain last night. Harry appears in better shape and I'm OK with some minor stomach pains.

1. Flagged A B C D E F G H EUs.
2. Larry Mapping points, will need to establish EU designations. Will use NE location as well, datum set at (0,0)
3. Flagged sampled located (15m grid) with red or 2 yellow flags. Single yellow we added. Took flags down, will use spray paint.
4. Descrepancy in mapped sample points with samples taken 38 vs 41. Also I+R 15m grid samples points not used
5. Added 2-5m points between H and an unlabelled sampled point we labelled I
6. Began digging AP, found bits of shard and one

large shard 15-25cm depth. Soil dk brn and moist. Color change at about 45cm. Took 2 samples 20-30cm (#49) 30-40cm (#50). Soil very wet. Decided to suspend taking further samples and work at lab instead.

7. Walked back to El Paraíso site over a rickety bridge and three fields. Marcello brought us back to the house, stopping to buy spray paint, plastic plates and a hair dryer.

8. Organized 15m grid samples sequentially and coded all samples using Alphabetic EU code and sequential Lot Nos (see next page).

9. Tested hair dryer to dry samples

Sample	EU	
07/05/09	AQ	~~Depth: 20-30 Dryed 10min layer~~

Note broke samples between time intervals

Time 3:44—47 3 min
:48—50 2 "
:51—54 3 " lt brn appearing
:56—58 2 "
10 min

Sample moist dk brn, damp clumpy but friable
79.5g dryed

(Continued pg 14)

EI Cafetal ~~Subs~~ Sub Op 5 Op 7 15m Grid

Larry Code	EU	Lot No	Comment
	A	1	
	A	2	
	B	3	
	B	2	
	C		
	C		

Operation 7 Sub Op 5 15m Grid

Larry Code	Lot No	EU	Depth	Comments	location
—	—	A	—	Datum	(0,0)
U2 Lot 1*	001	B	30cm		(0,-15)
U3 Lot 1	002	C	58cm		(0,-30)
U4 Lot 1	003	D	52cm		(0,-45)
U4 Lot 2	004	D	30cm		
U5 Lot 1	005	E	70cm		(15,-45)
U6 Lot 1	006	F	62cm		(15,-30)
U6 Lot 2	007	F	30cm		
U7 Lot 1	008	G	50cm		(15,-15)
U7 Lot 2	009	G	30cm		
U8 Lot 1	010	H	50cm		(15,0)
U9 Lot 1	011	I	49cm		(30,15)
U9 Lot 2	012	I	30cm		

* Relabelled from originally 2

	Lot No	EU	Depth	Comments	Location	Lam Code
t1	013	J	49cm		(30,0)	U29
t2	014		30cm			U30
t1	015	K	39cm		(30,-15)	U31
t1	016	L	36cm		(30,-30)	U32
t1	017	M	42cm		(30,-45)	U33
t1	018	N	32cm		(45,-45)	U34
t1	019	O	40cm		(45,-30)	U35
t1	020	P	30cm		(45,-15)	U36
t1	021	Q	30cm		(45,15)	U37
t1	022	W	35cm	Many Sherds	(60,30)	U38
t2	023	S	72cm	Many Sherds Charcoal	(60,15)	U40
t2	024		30cm			U39
t1	025	T	40cm		(60,-15)	U39
t1*	026	U	39cm		(75,-30)	U41
t1*	027	V	30cm		(75,-15)	
t1	028	X	40cm		(90,30)	
t1**	029	Y	30cm		(90,15)	
t2**	030		No Sample		(90,15)	
t1	031	Z	40cm		(90,0)	
t1	032	AA	49cm		(90,-15)	
t1	033	AB	40cm		(90,-30)	
t1	034	AC	49cm	MANY SHERDS	(90,-45)	

* Both samples ID'd as U21, one is U22

Larry Code	Lot No	EU	Depth	Comments	Location
U29 Lot1	035	AD	40cm		(105, -45)
U30 Lot1	036	AE	25cm	Stone Floor	(105, -30)
U31 Lot1	037	AF	25cm	Test Pit " "	(105, -15)
U32 Lot1	038	AG	45cm		(105, 0)
U33 Lot1	039	AH	No Sample	No Sample	(105, 15)
U34 Lot1	040	AI	50cm	charcoal sherds	(105, 30)
U35 Lot1	041	AM	32cm	Stone Floor	(120, -45)
U36 Lot1	042	AL	42cm	" "	(120, -30)
U37 Lot1	043	AK	31cm	" "	(120, -15)
U38 Lot1	044	AJ	34cm	" "	(120, 15)
U40 Lot1	045	AN	42cm	" "	(135, 30)
U39 Lot1	046	AO	57cm	" "	(135, 15)
U39 Lot2	047		30cm		
U41 Lot1	048	AP	36cm	Stone Floor	(135, 45)

Sample: 07/05/50 EU AQ Depth

Time 4:08-11 3 min Note broke samples between time intervals
:13-15 2 "
:17-20 3 " Lt tan appearing
:21-23 2 "

10 min.

78.9g dryed in ~~plastic~~ Plate.
Damp pasty clay, not friable.

It appears after about 10 minutes of drying at low, ~40 cm above sample, samples dry well enough to analyze.

10. Overnight drying test; previously untested samples were weighed and crumbled in plastic plates. All samples are from 07/05 opt sub opt

	7/7 4:47	7/8 8:04
Lot No	Tared wgt (g)	
001	112.1	106.9
002	119.0	116.3
003	111.5	106.7
004	113.6	108.5
005	112.3	107.6
006	117.7	112.8
007	120.8	115.5
	7/7 6:04	
49A	117.4	112.4
50A	123.1	118.1

Note Ch – Charcoal, Sh – Sherds

	7/7 5:00	7/8 8:04
Lot No	Tared Wgt (g)	
008	120.3	115.4
009	119.7	115.10
010	117.7	113.5
013	119.2	115.3
016	112.2	107.9
sh 018	115.7	111.1
ch 019	119.6	115.2
	7/7 5:23	7/8 8:04
020	121.6	117.0
021	120.8	116.3
022	124.4	120.0
025	122.9	119.0
026	116.8	112.3
027	117.6	113.9
028	120.1*	116.6
	7/7 5:40	7/8 8:04
029	121.3	117.5
032	126.0	122.2
033	116.4	112.7
Ch Sh 034	123.1	119.3
035	123.5	119.2
037	128.7	124.3
038	126.6	122.5

Note Sh – Sherds
Ch – Charcoal

* Erroneous Tare

July 8, 2004 El Paraíso Dorm

No rain last night! Feeling better after Pepto Bismo yesterday AM. Decided (Marcello) to split Larry + I, I will do analysis today, Larry will do field samples.

1) Weighed samples left out yesterday, weight reduction 4-5 gms
2) Dried Marcello El Paraíso special sample from charcoal lens in 3m offset on mount (MC.1) and weighed out 2gms for analysis.
3) Weighed out 2gms of each sample to a total of 21 weighed samples. Takes about 15 min to weigh out 3 samples and collect remainder in whirl pack.
4) Calibrated machine
   Vial One – Dist H_2O – Read Zero – Set Zero
   " " – 1.0 me/l std – 0.73 me/l

	0.61
	0.86
	0.61
Σ	0.82
	1.04
	1.05
	0.69

Set Vial one for zero
Std Reading 0.90
Set Vial one for zero
Std Reading 0.91

left machine on with blank set at zero

A	Sample Control	wgt (g)	Reading (30sec shake + >2min 0.0
1	HCl*	1.9	0.09
2	31	1.8	1.44 (0.78)
3	36	1.5	1.82 (0.33)
4	42	1.7	1.16 (0.00)
5	45	1.7	0.83 (0.68)
6	49	1.8	0.42 (0.24)
7	50	1.9	1.13 (0.26)

() = Rezero reading
* El Paraíso charcoal lens sample.

Rec Prepared a new dilution of all samples for analysis

	Sample	Reading		
1	Blank	0.00	0.01 (Rezeroed)	0.03 (Rezeroed)
2	MC1*	0.00	0.02	0.00
3	31	0.60	0.37	0.27
4	36	~~0.00~~ 0.17	0.60	0.18
5	42	0.12	0.06	0.00
6	45	0.00	0.00	0.00
7	49	0.00	0.44	0.28
8	50	0.31	0.06	0.48

* El Paraíso charcoal new sample

2:35

Distilled water Blank — Set 0.00

Std ~~of~~ 1.0ml soln — 0.57, 0.00

Raw second set of new samples

Blank	0.00	0.59R	0.01
1% std	0.49	0.00	0.00

Made fresh batch of 1% std soln.

New dilute water

Blank	Set 0	~~Blank~~ 0.25	0.00
1%	0.22	0.19	0.00

Can't get 1% std solution to read.
Tried different vials, best reading was 0.26.
Decided to contact HACH helpcenter.
techhelp@hach.com
DR/850 Prog 79 POA
Could not get on internet, café was busy.

& Finished weighing out 2gm samples from 15 m intervals and set out 32 new 5 m samples to dry.

July 9th, 2004 El Paraíso Lab

Larry stayed in this AM due to diarrhea and sore throat. Marcello has the Minister of Tourism visiting today so both Larry and I will do lab work.

Prepared 1mg std soln
1) ~~Pepped~~ Pipetted 1 ml from 50mg std soln into 50 ml graduate
2) Add distilled water to 50ml mark.

3) Pipetted 10 ml of 1% solⁿ into test vial 2
4) Measured with graduate cylinder 10 ml of distilled water in blank
5) Added PhosVer 3 to both samples shook 30 seconds and set 2 min +
6) Readings

	Blank	1% solⁿ	
	Set to 0.00	0.60	
	0.00	0.73	
Reverse vial	0.00	0.83	
	0.00	0.91	~5 min
	0.00	0.58	~6 min
	0.00	0.91	~7 min

Machine reading OK!

Prepare N2 Stock solⁿ
1 20 ml N2 solⁿ from 50 ml graduate
2 Filled to line with distilled H_2O
3. Prepared 2 batches

Prepare sample extraction

1. Pour sample into 50 ml test vial
2. Add 25 ml diluted M2 soln
3. Shook 30 seconds, vented and shook another 4:30 minutes.

	Samples	wgt	Reading 5 min 10:45
1	1	1.8	0.26
2	2	1.8	0.37
3	3		0.48
4	4		0.53
5	5		0.00
6	6		1.01
7	7*	1.7	~~Set 0.00~~ 0.38
Blank	A		Set 0.00 000

4 Filtered samples into new 50ml sample vials

5. Pipette 1ml extract into 10 ml cylinder + fill with distilled water to 10 ml.
6. Blank 1ml dilute M2 stock soln to 9 ml distilled water.

* Spilled some sample

Samples	wgt	reading
8	1.9	0.15
9	1.8	0.15
10	1.8	0.46
13	1.9	0.23
16	1.8	0.81
18	1.8	0.08
19	1.8	0.26
Blank	Set	0.00

Samples	Wgt	Reading
20	1.8	0.23
21	1.9	0.34
22	1.9	0.11
25	1.9	0.58
26	1.8	0.30
27	1.9	0.30
28	1.9	0.12
Blank	Set 0.00	0.19 0.00 Recheck

Sample	wgt	reading	Sample	wgt	Reading
29	1.8	0.84	58		0.57
32	1.8	0.68	59		0.27
33	1.8	0.75	60		0.50
34	1.8	1.44	61		0.36
35	1.8	1.05	62		0.91
37	1.8	1.09	63		0.94
38	1.8	0.36	64		2.26
			Blank		
51	2.0	0.30			
52	2.0	0.39			
53	2.0	0.73			
54	2.0	0.29			
55	2.0	0.00			
56	2.0	0.46			
57	2.0	0.34			
Blank	Set 0.00	0.00 Recheck			

7. Set out samples 79-98 for on plates for overnight drying.

July 10, 2004 El Paraíso Lab
Saturday

Overcast morning, a little cool, everyone a bit slow - this AM after a few drinks last night.

1. Weighed out and sample bagged samples left out last night.
2. Analyzed samples

Std Soln Blank — 0 Std Rechck 0.0
1% — 0.78 1.2

Samples	Wgt	Reading
65	20g	1.14
66	20g	0.28
67	20	1.18
68	20	0.00
69	20	0.00
70	20	0.00
71	20	0.44
Zero Recheck		0.27

{ Note reagents and readings came out relat the same

Note: Larry left at ~ 10AM with Ellen, Charlie and Ellen for San Pedro Sula. Larry will do analysis tomorrow.

3. Left out previously missed or first analyses samples to day 40-48, 11, 12, 14, 15, 17, 23, 31 and 36.

4. Bagged and labelled all artifact sample

5 Organized area and swept floor, will run 3 sets of analyses this afternoon, Harry will finish tomorrow.

Note: Large fast spider in sample bag case for soil samples. Left box on porch.

Samples	Wgt	Reading	
72	1.9	0.38	~~0.61~~
73	1.9	0.63	1.05
74	1.8	0.24	
75	1.8	0.28	
76	1.9	0.00	
77	1.9	~~0.27~~ 0.51	
78	1.9	0.00	
Blank		0.03	

Standards Test

1) Vial one – distilled water } plus Ver
" two – 1% std solin } 30 sec shake

Time	Vial 1	Vial 2	
3:50 45 2:00	1.03	1.03	
8'15 2:30	0.21 R	0.96	R – Reset to zero
8'45 3:00	0.00	0.69	
9'15 3:30	0.09 R	0.93	
9'45" 4:00	0.00	0.79	
4:00'15" 4:30	0.00	0.21	
0'45 5:00	0.00	0.58	
1 15 5:30	0.00	0.72	
1 45 6:00	0.00	0.59	
2 15 6:30	0.00	0.71	
2 45 7:00	0.00	0.71	
3 15 7:30	0.00	0.72	
3 45 8:00	0.00	~~0.72~~ 0.75	
4 15 8:30	0:00	0.60	
4 45 9:00	0:00	0.45	
5 15 9:30	0:00	0.20	
5 45 10:00	0.00	0.52	

Correct reading is at 2 minutes after which readings decrease, level at 0.7 for a few minutes then decrease again.

Zero standard stays zero except for one minor blip at 2:30.

July 11, 2004 El Paraiso lab

Larry ran the following analyses:

Sample	Wgt	Reading
79	2.0	0.65
80		1.07
81		1.08
82		1.66
83		0.9
84		0.41
85	2.0	0.40

Sample	Wgt	Reading
86	1.7	1.56
87	1.8	1.78
88	1.8	1.95
89	1.8	1.33
90	1.8	0.53
91	1.9	0.65
92	1.8	0.99
93	1.8	0.37
94	1.8	0.83
95	1.8	0.47
96	1.8	1.02
97	1.8	0.10
98	1.8	0.43
40	2.0	0.00

Weighed out samples 41–50, 11, 12, 14, 15, 17, 23, 24, 31 and 36 for tomorrow's analysis.

Marcella plotted PO4 concentration map of El Cafetal using surfer 9W.

July 12, 2004 El Gafetal

1) Sprayed orange paint on 15m grid points
2) Look for color change in units
   CY - 44 m many sherds below flat rock
3) Laid out new coordinates CZ, DA, DB and DC plus 3 in next row north
4) Found baby coral snake in DC.
5) Sited 5m sample pts with total station 10cm W of point
   BE - 35cm S offset
   BF - 80cm N "
   BY - 12cm N "
   I - 25cm W "
   DM - 26cm W "
   DW - 20cm W "
   EG - Refused (1.4m west)
6) Good day, sampled up to 192, total of 94 lots for the day
7) Set out to dry samples 99-130

July 12, 2004 El Cafetal

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EQ - Refused (1.4m west)
6) Good day, sampled up to 192, total of 94 lots for the day
7) Set out to dry samples 99-130

July 13, 2004 El Cafetal

1) Sampled in the Am from 193 → 2
2) PM worked in lab
I weighed samples, Larry ran analyses.
3) Set out to air dry 131 – 155
4) Larry analysis:

Sample	Wgt	Reading
41	1.9	0.77
42	1.8	0.48
43	1.8	0.31
44	1.9	0.25
45	2.0	0.44
46	1.9	0.05
47	1.9	0.21
23	1.9	0.51
48	1.9	0.00
11	2.0	0.60
12	1.8	0.35
14	1.9	0.15
15	1.9	0.33
17	1.9	0.03

Sample	Wgt	Reading	
24	1.9	1.42	
31	2.0	0.84	
36	1.7	0.00	
49	2.0	0.31	
50		0.47	
MC1*		0.31	* El Paraíso charcoal lens sample
99	2.0	0.26	
100	2.0	0.80	
101		0.48	
102		0.84	
103		0.57	
104		0.79	
105		0.60	
106	2.0	0.67	

July 14, 2004

1) Finished 5m grid sampling, last sample KW Lot 318, missed assigning Lot 265.
2) Left bags in field to assist in shooting locations.
3) Began shooting with point EQ15A.

July 15, 2004 El Paraíso lab

1) Put out sample bags 1–98
2) Brought in and organized last 2 days samples
3) Marcello asked that Larry run 7 samples from Paraíso and repeat a sample he ran previously
4) Larry ran the following samples

Sample	Wgt	Reading	Rezero
107		1.38	1.68
108	No	1.06	1.07
109	Electric	0.54	0.85
110		0.76	0.51
111	Power	0.55	0.27
112		0.92	0.57
113		0.75	0.42
Blank		0.25 0.31	0.00

Sample	Wgt	Reading
114	No	0.79
115	Power	0.54
116		0.60
117		0.47
118		0.74
119		0.08
120		0.00

5) At 11 pm went to HQ to help set up El Paraiso worker party. I felt weak with a sore throat and began taking Penicillin from Ellen. The party was great took lots of pictures played with children and felt better although a bit washed out.

July 16 2004 El Paraiso Lab

Overcast morning, today's the day to get things done before the weekend. Throat is feeling 100% better.

1) Weighed samples 121 – 127.
2) Prepared bottles of diluted MeZ solv.
3) Ran extractions of 1st set.

Sample	Wgt	Reading	
121	1.8	0.57	
122	1.8	0.53	
123	1.7	0.46	
~~124~~	1.8	1.04	
125	1.7	~~0.04~~ 0.60	
126	1.8	0.94	OK
127	1.8	0.04	
Blank		0.00	

Sample	Wgt	Reading
128	1.9	0.34
129	1.9	0.33
130	1.8	0.17
131	1.9	0.21
132	1.8	0.35
133	1.9	0.69
134	1.8	0.90
Blank		0.00
135	1.9	0.44
136	1.8	0.26
137	1.4	0.35
138	1.9	0.43
139	1.5	0.17
140	1.9	0.04
141	1.8	0.17

El Paraiso Samples		Reading	Reset	Description
1	20	0.57	0.15	N841 E450 05/01/09
2	20	0.39	0.00	06/01 N828 EVA E464 Lot 16
3	20	1.23	0.23	06/03 N816 EVK EA72 Lot 28
4	20	0.48	0.16	06/02/22 EU H Piso Estuco
5	20	0.34	0.28	06/02/021 EU G
6	20	1.97	2.15	06/03/06 A RM 4 Floor
7	20 Blank	0.32 0.30	0.19	06/02 EU A Lot 9

Sample	Wgt	Reading
142	1.9	0.56
143	1.8	0.35
144 W	1.8	0.79
145	1.8	0.00
146	1.8	0.00
147	1.8	0.00
148	2.0	0.74
Blank		0.00

W – Weight out of wood in sample

149	2.0	1.16
150		0.74
151		0.90
152		0.84
153		0.33
154		1.20
155		1.04
Blank		0.00

	Sample	Wgt	Reading	Description
El Paraiso Samples	8	2.0	0.30	05/01 Feature 5 Lot 20 Floor
	9		0.06	05/01 N841 Yde E458 Floor Sample
	10		0.11	07/03 N800 EU AD E473 Lot 58
	11		0.17	07/03 N805 EU AE E483 Lot 59
	12		0.00	07/03 N780 EU AC E473 Lot 57
	156		0.29	
	157		0.49	
	158	2.0	0.17	
	159	1.9	1.20	
	160	1.9	0.67	
	161	1.8	0.20	
	162	1.8	0.54	
	163	1.8	1.22	
	164	1.9	0.78	AOS RC
	Blank		0.00	
	165	2.0	0.88*	Note: Filter paper broke, ferrum
	166	2.0	0.38	
	167	1.9	0.00	
	168	2.0	0.23	
	169	1.9	0.53	
	170	1.9	0.08	
	171	1.9	0.22	
	Blank		0.06	

July 20, 2004 Paraíso Lab

Morning is cloudy, some sun and a touch humid. Cat stretches last night cut into dream time.

Began lab at about 7:40, weighed samples 190-260 ~~last~~ yesterday and left out first samples to dry. Sample 317 EW KV is missing, will need to look further. Flying Solo this week, a bit quiet.

1) Made 4 batches M2 stock soln
2) Calibrate HACH instrument DR/850 Colorimeter
3) Vial 1 — 10 ml distilled water + phosVer
   Vial 2 — 1% ~~Pos~~ soln + PhosVer (1:49)

	Vial 1	Vial 2
2 min	0.00	0.26
3 min	0.00	0.49
4 min	0.04	0.61 ~~0.16~~
5 min	0.00	0.51

Instrument appears to be reading low.

Sample	Wgt	Reading	Sample	Wgt	Reading
172	1.9	0.95	179	1.9	0.38
173	1.8	0.13	180	1.9	1.17
174	1.9	0.22	181	1.8	0.62
175	1.8	0.16	182	~~1.9~~ 2.0	2.66
176	1.9	1.22	183	1.9	0.45
177	1.8	0.49	184	1.9	0.00
178	1.8	0.83	185	1.9	0.00
Blank		0.00 ok	Blank		0.00 ok
186	1.9	0.57 0.38	191	2.0	0.84
187	1.8	0.79 1.17	192	2.0	0.32
188	1.8	0.55 0.62	193	2.0	0.87
~~165~~ 139	1.8	0.54 2.66	194	2.0	0.78
~~184~~ 190	2.0	0.83 0.45	195	1.9	0.72
39	2.0	0.46 0.00	196	1.9	0.72
165	1.8	1.01 ~~1.01~~ 0.46 0.00	197	2.0	0.58
Blank		~~0.31~~ 0.07 ok 0.00 ok	Blank		0.00 ok

- Lost identity of samples 186 + 187 (fell out of holder during shaking). Difference in value not great enough to re-run

Sample	Wgt	Reading	Sample	Wgt	Reading
198	2.1	0.46	205	1.9	0.96
199	2.1	0.59	206	2.0	0.95
200	2.1	0.52	207	2.0	~~0.94~~
201	2.1	0.27	208	2.0	0.74
202	2.1	0.69	209	2.0	0.42
203	2.0	~~1.04~~ 0.18	210	2.0	0.00
204	2.0	0.36	211	1.9	0.41
Blank		0.00 OK	Blank		0.00
212	1.9	0.84	219	2.0	0.00
213	1.9	0.95	220	2.0	0.53
214	1.9	0.22	221	2.0	0.92
215	1.9	0.32	222	2.1	0.71
216	2.0	0.16	223	2.0	0.58
217	1.9	0.25	224	2.0	0.29
218	1.9	0.41	225	2.0	0.30
Blank		0.06 OK	Blank		0.00 OK

Concerned about instrument reading 1% std soln. Could it be that temperature is too hot? Need to talk to Hoch + Hestler when I return home.

Sample	Wgt	Reading	Sample	Wgt	Reading
226	2.1	0.82	233	1.9	0.58
227	2.0	0.28	234	1.9	1.52
228	2.1	0.36	235	2.0	0.90
229	2.0	0.48	236	2.0	0.96
230	2.0	0.54	237	1.9	0.62
231	2.0	~~0.84~~ ~~0.46~~ 0.56	238	1.9	0.86
232	2.0	~~1.53~~ ~~0.85~~ 1.81	239	2.0	1.46
Blank		0.29 ~~0.00~~ OK	Blank		0.00 ok

240	2.0	0.17
241	1.9	0.00
242	2.0	0.42
243	2.0	0.31
244	2.0	0.19
245	2.0	0.44
246	1.9	0.62
Blank		~~0.20~~ 0.00 ok

July 21, 2004 El Paraíso lab

Another warm sunny day, little rain in last 2 days. Charlie left this AM, the group is getting smaller ...
This morning weighed all the remaining samples + set up to run analysis this afternoon. 10 more sets to run, should finish by lunch tomorrow.
Sample 317 is missing, need to search.

1) Made 4 vials dilute M2 ~~Solo~~ stock Sol
2) Calibration test for HACH DR/850
Vial 1 - 10 ml distilled water + phosphe
" 2 - 10 ml 1% PO_4 std solⁿ* (1÷49) "

Time	Vial 1	Vial 2
2:00	Set 0	0.45
3:00	0.06	0.89
4:00	0.05	0.87
5:00	0.08	1.06

OK

* Note: 1st time I thoroughly shaked sam

Sample	Wgt	Reading	Sample	Wgt	Reading
247	2.0	0.88	254	2.0	0.00
248	2.0	1.24	255	2.1	0.01
249	1.8	0.30	256	2.0	0.29
250	2.0	1.73	257	2.0	0.32
251	1.9	0.45	258	1.9	0.28
252	1.9	0.17	259	2.0	0.66
253	2.0	0.40	260	1.8	1.20
Blank		0.00 ok	Blank		0.00 ok
261	1.9	0.83	269	2.0	0.00
262	1.9	0.10	270	2.0	0.68
263	1.8	1.38	271	1.9	0.84
264	1.9	0.17	272	1.9	0.33
~~265~~			273	1.9	0.46
266	2.0	0.16	274	1.9	036
267	2.0	0.00	275	1.9	0.18
268	2.0	0.15	276		
Blank		0.00 ok	Blank		0 ok

Sample	Wgt	Reading
276	2.0	0.87
277	2.0	0.83
278	2.0	0.32
279	2.0	0.53
280	1.9	0.26
281	1.9	0.01
282	1.9	0.26
Blank		0.00 OK

July 22, 2004 El Paraíso Lab

Cooler clear morning after torrential downpour last evening (took photos). Cooler, good sleeping evening.

You will be over at 8AM to sort artifacts from bags. Later today will take site "background" and SW corner samples from El Cafetal.

1) Made 4 bottles of dilute ME stock soln
2) Prepared standard (1:49), 1% PO_4

Calibration Test Vial 1 - Distilled Water
" 2 - 1% PO_4

Time	Vial 1	Vial 2
2:00	Set 0	0.92
3:00	0.00	~~0.85~~ 1.13
4:00	0.08	1.06
5:00	0.00	1.15

OK

Sample	Wgt	Reading	Sample	Wgt	Reading
283	2.0	0.40	290	1.9	0.56
284	1.9	~~0.09~~ 0.01	291	2.0	0.37
285	1.9	~~0.01~~ 0.17	292	1.9	~~0.54~~ 1.25
286	2.0	0.14	293	2.0	0.63
287	2.0	0.51	294	2.0	0.22
288	1.9	0.23	295	2.0	0.64
289	2.0	0.16	296	2.0	0.51
Blank		0.00 OK	Blank		0.00
		0.02			
297	2.0	~~0.55~~	304	2.0	0.00
298	1.9	0.33	305	1.8	0.00
299	2.0	0.64	306	1.8	0.00
300	2.0	0.50	307	1.9	0.00
301	2.0	0.30	308	1.9	0.00
302	2.0	0.34	309	2.0	0.00
303	1.9	0.24	310	1.9	0.00
Blank		0.00 OK	Blank		0.00 OK

Sample	Wgt	Reading
311	2.0	0.00
312	1.9	0.00
313	2.0	0.21
314	1.9	0.09
315	2.0	0.23
316	2.0	0.87
318	2.0	0.20
Blank		0.03 OK

PM Visited El Cafetal to orient readings with landscape. Could not find sample 317. NW small structure misrepresented on Map sample 253 is to the West of the structure not on it. Marcello noted that outer boundary of plaza as delineated by topography is not a right angle in the NE but rather an obtuse angle shortening the patio

Two samples for El Paraíso to run tomorrow AM.

~~July 23, 2004~~ ~~El Paraiso Lab~~

Colorimeter Calibration Tests

1% std ~~stock~~ solution run 4 times

Time	Vial 1	Vial 2	Vial 3	Vial 4	V
	Distilled H_2O	—	1% std soln	—	
2:00	Set 0	1.40	1.50	1.72	0.
3:00	~~0.79~~	~~0.44~~	~~0.94~~	~~0.37~~	~~0.~~
4:00	0.00		0.78		
5:00	~~0.14~~	1.14	~~0.58~~	0.83	0.
	0.00 ok				

Using morning reading, 5 readings are

1.15	0.22
1.14	0.21
0.79	0.14
0.83	0.10
0.77	0.16
4.68	0.83

$\bar{X} = 0.93 \pm 0.17$

From morning samples, took extract of 0.00, 0.23 and 0.87 and re-ran with blank 3 times

From early morning readings

0.0 Original

Re run — ~~0.37~~ 0.22

— 0.16

— 0.00

Blank ~~Zero~~ ~~0.14~~ 0.11

0.38

~~X = 0.13~~

OK $\bar{X} = 0.13 \pm$

0.23 Original

Re run — 0.00

— 0.00

— 0.00

Blank 0.00 OK

0.87 Original

−0.62 0.03

−0.50 0.15

−0.84 0.19

Blank 0.00 OK

196

$\bar{X} = 0.65 \pm 0.12$

July 23, 2004 El Paraíso Lab

Final day! Although an overcast morning, looking with anticipation to wrap + pack up and leave tomorrow.

Calibration Test

Vial 1	Dilute H_2O	—	Set 0	
Vial 2	1% soln	—	1.58	0.90
" 3	"	—	1.54	1.06
" 4	"	—	1.47	~~0.00~~ 0.95
	Dilute H_2O		0.47	0.00 OK

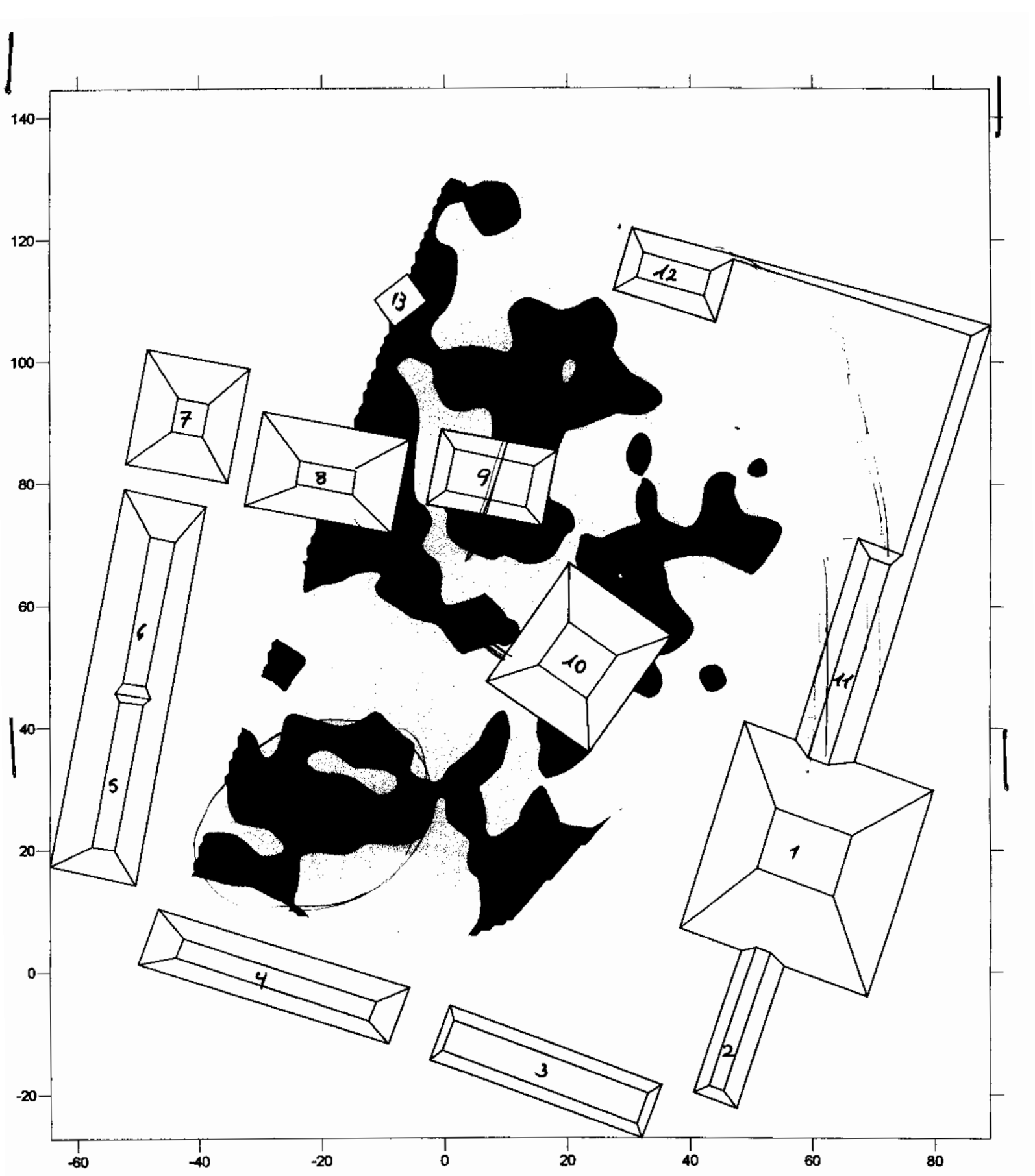
	Sample Wgt	Reading	
*06/02/29L	2.0	0.68	0.35
*06/02/32N	2.0	72.75	>2.75 Darkest blue yet
Blank		0.10 OK	0.00

* El Paraíso samples

Wrapped up mat'ls in boxes.

Wrote brief report

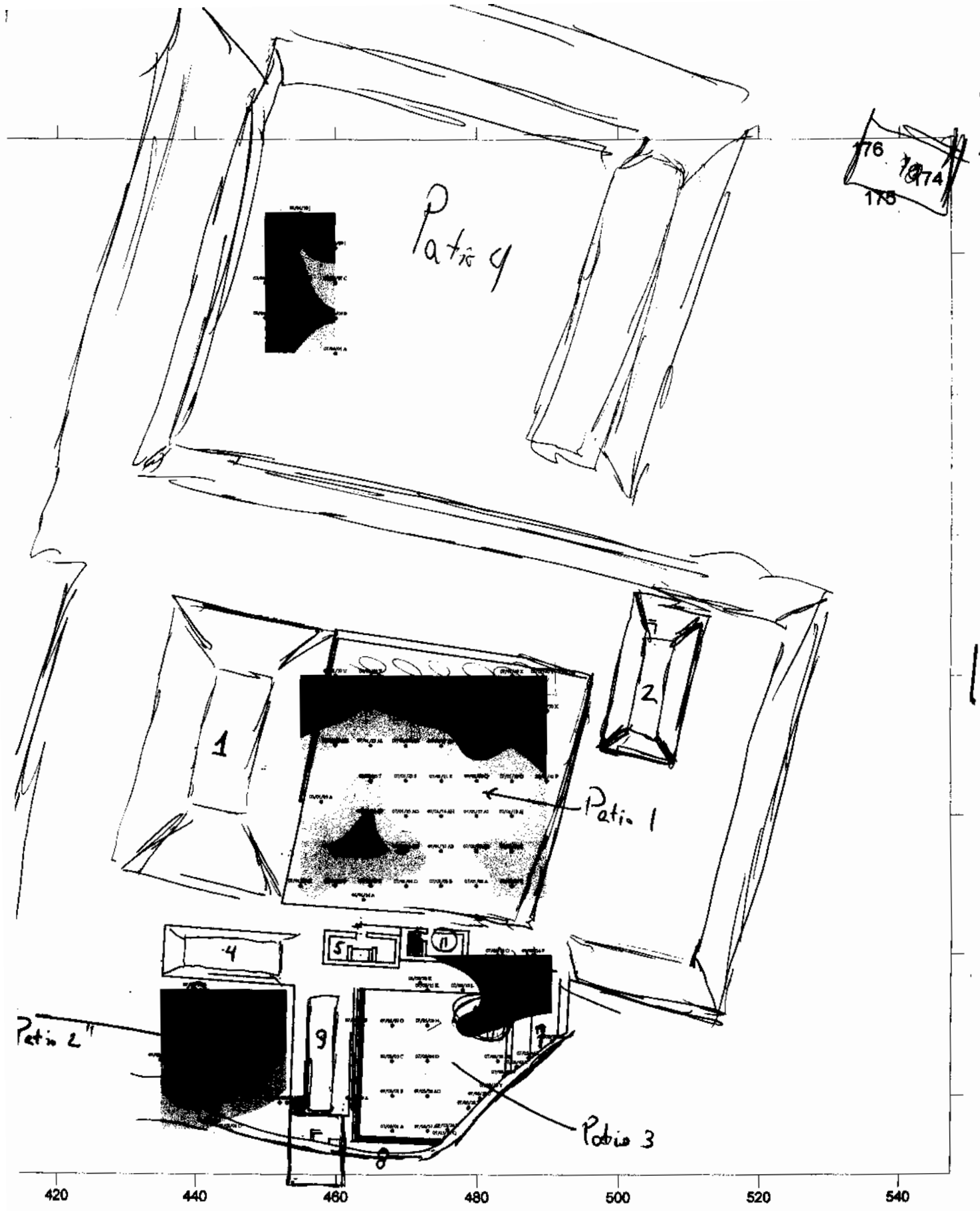
"Phosphate analysis of El Cafetal + El Paraíso" on Marcello's hard drive.



El Cafetal Phosphate concentration contour

Yellow – 0-25

DK Blue – highest



El Paraíso Phosphate concentration contour map
DK Blue - highest values

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