Oko Area Mines Data, Sluicebox Data and Calculations

Michael Vieira's Concession Oko   Andrew DeAbreu GM

Airstrip	Location:	06-23.06 N	59-03.19W	WGS 84
		706,503 N	273,042 E	SAM 56

Mass Flow Calculations

The water and pay gravel feed rates were derived from sampler data and time studies. These were compared to recommended values derived from previous research: feed rate of 8 loose cubic yards and a water flow rate of 160 Igpm per foot of sluice width.

One inch angle iron riffles require 320 Igpm and can be fed at a rate of up to 16 loose cubic yards per foot of sluice width.

Note: water flow rates less than 100% or greater than 150% of recommended values usually lower gold recoveries. The width of the sluicebox can be widened if the flow is too high or narrowed if the flow is too low.

Almost all of the sluiceboxes were too wide and should be narrowed to 3 to 4 feet wide for the 6 inch dredges and to 2 feet wide expanded metal riffle section for the 4 inch dredges. This should be followed by a 2 feet wide one inch angle iron riffle section (6 inch dredge) or a 1 foot wide section (4 inch dredges).

Pay gravel feed rates which exceed 100% of recommended values are one of the greatest factors contributing to gold losses. Pay gravel feed rates below 100% of recommended values may improve gold recovery slightly.

Most of the sluiceboxes were operating with solids volume densities of less than 12% due to the inability of the water jets to quickly erode and fluidize the virgin compact clay and pay gravel sections.

Fazal Sheriff's Operations   Right limit of Oko Creek Valley

	Location:	06-22.91 N	59-03.22W	WGS 84
		706,229 N	272,984 E	SAM 56

Deposit: Shallow alluvial gravel deposit on weathered bedrock
The overburden consists of 8 feet of fine red/brown silt with minor pebbles.
The gravels are 3 feet thick with coarse sand with fine quartz pebbles.
The gold also continues into the light gray clay bedrock

Mining: Open pit, hydraulic jetting only.
The pit is about 50 feet wide by 150 feet long by 11 feet deep.

Sheriff's Original Sluicebox dimensions (Imperial)   1 m =   3,2808 feet

Description	Length ft	Width ft	Depth inches	Area ft2	Volume yd3	07-mars
Boil Box	2,0	5,7	6,0	11	0,21	Wood Box 6" deep
Upper Sluice	2,5	5,7	3,0	14	0,13	Dredge Riffles 3" deep
Middle Sectn	8,7	5,7	0,3	49	0,04	Bare Brazilian Carpet
Lower Sluice	10,0	6,8	0,0	68	0,00	Bare Brazilian Carpet
Combined	23,2	6,1		142	0,38	Total Con Vol yd3
Sluice Slope	1,9 in/ft		9 Degrees		16% Percent	

Sheriff's Refitted Sluicebox dimensions (Imperial)   15-mars

Description	Length ft	Width ft	Depth inch	Area ft2	Volume yd3	
Boil Box	1,0	3,8	1,0	0	0,01	Slick Plate
Top Sluice	6,0	3,8	1,0	23		Med Exp/Nomad
	2,5	3,8	0,3	10		Bare Brazilian Carpet
Middle Run	6,0	3,8	1,0	23	0,07	Med Exp/Nomad
	4,0	3,8	0,3	15	0,01	Bare Brazilian Carpet
Bottom Run	8,0	1,9	1,3	15	0,06	one inch angle/Nomad
Combined	27,5	3,1		86	0,09	Total Con Vol yd3
Sluice Slope	1,9	in/ft	9	Degrees	16%	Percent

Gravel Pump	6 by 6 Dambrose Gravel Pump powered by 4 cylinder Perkins diesel	
Pipeline	6 inch PVC 120 ft length 20 ft lift	

Water Supply Pump   6 by 4 Berkeley powered by 4 cylinder diesel engine
Number of Jets   2

Feed Rate   21 yd3/hr @   75% operation   15 yd3/hour net

Daily Feed   8 hours @   75% operation   92 yd3/day

Notes: The original sluicebox used dredge riffles and bare Brazilian carpet for gold recovery. Due to the high clay content, the deep boil box and dredge riffle section was packed.

The sluicebox was narrowed to only 4 feet wide and fitted with medium weight expanded metal riffles over unbacked Nomad matting. The lowest section of the sluicebox was only 2 feet wide and was fitted with one inch angle iron riffles over Nomad matting. This should result in an increase gold recovery of 15 to 25%.

WATER FLOW RATES — **Fazal Sheriff**

Description	Original Sluicebox 07-mars	Original Sluicebox 09-mars	New Box Expanded 15-mars	New Box Angle Iron 15-mars
Slurry Velocity m/s	1,9	1,8	1,6	1,6
Slurry Velocity Factor	6,2	5,9	5,3	5,3
% Recommended	124%	119%	106%	107%
Depth of Water cm	1,8	1,7	2,9	5,1
Depth in inches	0,7	0,7	1,1	2,0
Width of Sluice Run m	1,5	2,0	1,2	0,6
Width in feet	5,0	6,6	3,8	1,9
Slurry cms	0,042	0,051	0,044	0,039
Slurry Flowrate Igpm	549	670	579	509
Slurry Flowrate USgpm	660	805	695	612
0,800				
% Recommend by Width	69%	64%	94%	
For Angle Iron Riffles	34%	32%		83%
Recommended Width ft	3,4	4,2		

The new narrower sluicebox has water flows close to recommended values.

PAY GRAVEL FEED RATES — **Fazal Sheriff**

Description		Original "-1/4 inch 07-mars	Original "-2 inch 07-mars	Original "-1/4 inch 09-mars	New Box Expanded	New Box Angle Iron
	Factor					
Solids %		7%	10%	9%	9%	9%
Solids cms	1,00	0,0029	0,0042	0,0046	0,0038	0,0033
Sluice Solids Lyd3/hr		14	20	22	18	16
% Recommend by Feed		34%	49%	41%	58%	
For Angle Iron Riffles		17%	24%	20%		51%

All sluices are operating at low solids densities because it is difficult to erode the
catch-cow pay gravels with hand held water jets.

Peter Thompson's Operation   Right limit of Oko Creek Valley   Ainton Vieira GM

Deposit: Shallow (8-10 feet) alluvial deposit, 1.5 ft of gravel
Material is very clay-rich with irregular quartz gravels.
Bedrock clays appear to have been squeezed into and through gravels.

Mining: Open Pit, Jetting only

Original Three Piece Sluicebox dimensions (Imperial)   07-mars

Location: 06-22.87 N   59-03.43 W   WGS 84
              706,162 N   272,605 E   SAM 56

Description	Length ft	Width ft	Depth inch	Area ft2	Volume	
Boil Box	1,5	2,9	4,0	4	0,05	Wood Box 4 deep
						packed
Top Run	2,2	2,9	2,0	6		Swollen Unbacked
						Bare Nomad Mat
	2,9	2,9	1,0	9	0,03	Fine Plastic Mesh/
						Rib Brazilian Carpet
Center Run	3,0	4,0	1,0	12		Fine Plastic Mesh/
	4,7	4,0	0,5	19	0,03	Bare Ribbed Carpet
Bottom Run	3,0	2,5	0,3	8		Bare Ribbed Carpet
	3,0	2,5	0,3	8	0,01	Bare Braz Carpet
Combined	20,3	3,2		65	0,11	Total Con Vol yd3
Sluice Slope	2,3 in/ft		11 Degrees		19%	Percent

Peter Thompson's Newly Constructed & Refitted Sluice   15-mars

Description	Length ft	Width ft	Depth inch	Area ft2	Volume yd3	
Boil Box	N/A			0	0,00	
Top Sluice	6,0	1,9	1,0	11	0,03	Coarse Exp/Nomad
Transition	2,5	1,9	0,0	5	0,00	Bare wood
Middle Sluice	1,0	1,9		2	0,00	Wood slick plate
	6,0	1,9	1,0	11	0,04	Coarse Exp/Nomad
Transition	3,0	1,9	0,0	6	0,00	Bare wood
Bottom Run	8,0	1,3	1,8	11	0,06	One inch Angle/Nom
Combined	26,5	1,7		46	0,13	Total Con Vol yd3

Sluice Slope	1,8	in/ft	9	Degrees	15%	Percent

Gravel Pump   4 by 4 Dambrose Gravel Pump powered by 1 cylinder Yanmar diesel
Pipeline   4 1 inch Poly   120   ft length   15   ft lift

Water Supply Pump   3 by 3 inch centrifugal powered by 3 cylinder Isuzu diesel engine
Number of Jets   1   Total recycle

Feed Rate   6 yd3/hr @   75% operation   4 yd3/hour net

Daily Feed   10 hours @   75% operation   31 yd3/day

Notes: The original sluicdbox was 3 and 4 feet wide and was fitted with boil boxes, bare unbacked Nomad mattng, light plastic mesh and bare ribbed Brazilian carpet. The bare unbacked Nomad matting was swollen up into a high mound shape.
Small round wood was nail across the sluice at intervals to hold the matting down.
A new sluicebox was built with a 2 feet wide top section fitted with coarse expanded metal over unbacked Nomad matting and a lower 1.3 feet wide section fitted with one inch angle iron riffles over Nomad matting. This new sluicebox should increase gross gold recovery by about 15 to 25%.

Water Flow Rates

Water Flow Rates	Peter Thompson				
	Original Top	Original Bottom		Refitted Top	Refitted Bottom
	Average flow				
	07-mars	07-mars		15-mars	15-mars
Slurry Velocity m/s	1,0	1,8		1,5	1,5
Slurry Velocity ft/s	3,3	6,1		5,0	5,0
% Recommended	67%	121%		100%	100%
Depth of Water cm	2,3	2,1		2,9	4,3
Depth in inches	0,9	0,8		1,1	1,7
Width of Sluice Run m	0,9	0,7		0,6	0,4
Width in feet	2,9	2,3		1,9	1,3
Slurry cms 0,800	0,017	0,022		0,020	0,021
Slurry Flowrate Igpm	222	296		266	280
Slurry Flowrate USgpm	267	356		319	337
% Recommend by Width	48%	79%		88%	
For Angle Iron Riffles	24%	40%			66%

The new narrower sluicebox has water flows close to recommended values, the lower sluice run with angle iron riffles was operating well despite low water flows.

Pay Gravel Feed Rates continued

Description	Peter Thompson	Peter Thompson	
	Original	New Box	New Box
	07-mars	Expanded	Angle Iron
Solids %	6%	6%	6%
Solids cms	0,0012	0,0008	0,0013
Sluice Solids Lyd3/hr	6	4	6
% Recommend by Feed	24%	15%	
For Angle Iron Riffles	12%		17%

The solids volume densities are low due to the inability of the hand-held water jets to erode the soils. This results in low throughput of gravels through the sluicebox.

Fazil Rahama ' Operations   Atonone Chico GM

	Location:	06-23.04 N	59-03.37 W	WGS 84
		706,479 N	272,708 E	SAM 56

Deposit: Shallow (10 feet deep) alluvial deposit.
8 feet of silt, 2 feet of gravel

Mining: Shallow (10 feet) open pit, mined with hydraulic jetting only.
Pit is approximately 60 feet in diameter

Rahama Original Sluicebox dimensions (Imperial)   07-mars Not Refitted

Description	Length ft	Width ft	Depth inch	Area ft2	Volume yd3	
Head Box	2,3	4,4	8,0	10	0,25	Wood Box 8" deep
						full/packed
Top Sluice	4,5	4,4	1,0	20	0,06	MExp/Unbacked Nomad
	1,3	4,4	1,0	6	0,02	Unbacked Nomad
Bottom Run	3,5		0,3	0	0,00	MExp/Brazilian
	4,5		1,0	0	0,00	Bare Brazilian carpet
Combined	16,2	2,2		36	0,33	Total Con Vol yd3
Sluice Slope	2,1	in/ft	10	Degrees	17%	Percent

Gravel Pump	5 by 5	Dambrose Gravel Pump powered by 3 cylinder MWM				
Pipeline		5 inch Poly	140 ft length		15	ft lift
Water Supply Pump		4 by 4 centrifugal powered by 3 cylinder MWM				
Number of Jets		N/A	150 ft length		10	ft lift
Feed Rate	13 yd3/hr @		50% operation		6	yd3/hour net
Daily Feed	10 hours @		75% operation		49	yd3/day

Notes: The sluicebox was narrower than most others with a 5 by 5 inch gravel pump.
The sluice runs were also slightly wider than the sheets of medium thickness expanded
metal. The overall layout and operation of the sluicebox was good.

Ivan Goditte   Right Limit of Oko Creek Valley   Not refitted
                                                                   09-mars

	Location	06-22.99 N	59-02.93 E	WGS 84
		706,369 N	273,530 E	SAM 56

Deposit: Cutting down through overburden silts.

Mining: Open pit, hydraulic jetting with two or three jets.

Two Piece Sluicebox for Processing Pit-Run Material dimensions (Imperial)

Description	Length ft	Width ft	Depth inch	Area ft2	Volume yd3	
Boil Box	2,1	5,7	5,0	12	0,18	Wood Box 5" deep full/packed
Top Sluice	3,0	5,7	3,0	17	0,16	Dredge Riffles
	4,7	5,7	3,0	26	0,24	Bare Brazilian Carpet
Bottom Run	9,5	6,2	0,25	59	0,05	Bare Brazilian Carpet
Combined	19,3	5,9		114	0,63	Total Con Vol yd3

Sluice Slope	2,0 in/ft	9 Degrees	17% Percent

Gravel Pump   6 by 6 Dambrose Gravel Pump powered by 6 cylinder Perkins
Pipeline   6 inch PVC   100 ft length   10 ft lift

Water Supply Pump   6 by 4 centrifugal Berkeley pump powered by 6 cylinder Nissan
Number of Jets   2 Normally 3

Feed Rate	23 yd3/hr @	60% operation	14 yd3/hour net
Daily Feed	10 hours @	75% operation	102 yd3/day

> Notes: This operation was not refitted.
> The boil box and dredge riffles were hard packed.
> The pump was jetting down through the overburden silts.
> Wooden checks located every two feet, and were hung up with rocks.

Muhamed Kadir's Operation   Not Refitted   Sherland Williams

Pit   Location: 06-23.22 N   59-02.53 W   WGS 84
                              706,804 N   274,266 E   SAM 56

Deposit: The deposit consists of 4 feet of silty mud, 2 feet of Pegas, a further
                 2 feet of silt, 2 feet of sand and 1 foot of gravel
                 Pit is approximately 300 by 150 feet and 11 feet deep.
                 Material is extremely clay/silty overburden, thixotropic.

Mining: Open pit with hydraulic jets only

Original Sluicebox dimensions (Imperial)   08-mars

Description	Length ft	Width ft	Depth inch	Area ft2	Volume yd3	
Boil Box	2,0	6,0	7,0	12	0,26	Wooden Boil Box
Top Sluice	2,8	6,0	3,0	17	0,15	Dredge Riffles
	5,0	6,0	0,3	30	0,03	Bare Braz Carpet
Bottom Sluice	10,2	5,5	0,3	56	0,05	Bare Braz Carpet
Combined	19,9	5,7		114	0,49	Total Con Vol yd3

Sluice Slope   2,3 in/ft   11 Degrees   19% Percent

Gravel Pump   6 by 6 Dambrose Gravel Pump powered by 4 cylinder Ford
Pipeline   6 inch PVC   120 ft length   20   ft lift

Water Supply Pump   6 by 4 Berkeley centrifugal powered by 6 cylinder Bedford
Number of Jets   3   ft length   N/A   ft lift
          4 inch diameter pipe

Feed Rate   23 yd3/hr @   75% operation   17 yd3/hour net

Daily Feed   10 hours @   75% operation   127 yd3/day

The sluicebox had high flow rates, especially on the outside edges.
The dredge riffles were packed in the center section of the sluicebox with little flow.

WATER FLOW RATES (continued)

Description	Factor	**Rahama** Original 07-mars	**Ivan Goditte** Original 09-mars	**Kadir** Original 08-mars
Slurry Velocity m/s		1,4	1,3	1,6
Slurry Velocity ft/s		4,7	4,1	5,2
% Recommended		94%	83%	103%
Depth of Water cm		2,5	1,9	2,7
Depth in inches		1,0	0,8	1,1
Width of Sluice Run m		1,3	1,7	1,7
Width in feet		4,4	5,7	5,5
Slurry cms	0,800	0,039	0,033	0,057
Slurry Flowrate Igpm		519	437	752
Slurry Flowrate USgpm		623	525	904
% Recommend by Width		73%	48%	86%
For Angle Iron Riffles		37%	24%	43%

Ivan Goditte's sluicebox was too wide for the volume of water pumped.
The other two sluiceboxes were closer to the recommended width.

Pay Gravel Feed Rates continued

Description	Factor	**Rahama** Original 07-mars	**Ivan Goditte** Original 09-mars	**Kadir** Original 08-mars
Solids %		7%	15%	14%
Solids cms	1,00	0,0028	0,0048	0,0077
Sluice Solids Lyd3/hr		13	23	36
% Recommend by Feed		37%	50%	82%
For Angle Iron Riffles		18%	25%	41%

The solids volume densities at Goditte and Kadir's operations were too high.

Fazil Rahaman's Operation   GM   Reinoldo Rein Farian

Pit	Location:	06-23.34 N	59-02.47 W	WGS 84
		707,030 N	274,371 E	SAM 56

Deposit: Shallow (12 feet) alluvial deposits being worked by operator.
Gravel seam is about 1 foot thick.
Pit is approximately 350 by 100 feet wide and 12 feet deep.

Mining: Shallow (12 feet) open pit, mined with hydraulic jetting only.

Original Sluicebox dimensions (Imperial)

Description	Length ft	Width ft	Depth inch	Area ft2	Volume yd3	
Top Sluice	3,0	4,5	1,0	14	0,04	Med Exp/Nomad
Middle Sluice	9,2	4,3	1,0	40	0,12	Med Exp/Braz
	9,7	5,0	1,0	48	0,15	Plastic Mesh/ Brazilian Carpet
Bottom Sluice	5,0	2,1	1,0	10	0,15	Plastic mesh/Braz
Combined	26,8	4,2		112	0,46	Total Con Vol yd3
Sluice Slope	3,2	in/ft	15	Degrees	26%	Percent
Lower	2,0	in/ft	9	Degrees	17%	Percent

Gravel Pump   6 by 6 Dambrose Gravel Pump powered by 4 cylinder Deutz
Pipeline   6 inch PVC   ft length   ft lift

Water Supply Pump   6 by 4 centrifugal powered by 4 cylinder Deutz   4 inch
Number of Jets   N/A ft length   N/A ft lift

Feed Rate   33 yd3/hr @   75% operation   25 yd3/hour net

Daily Feed   10 hours @   75% operation   188 yd3/day

This sluicebox has already been fitted with medium expanded metal riffles and
nomad matting. Some sections of Brazilian carpet are covered with plastic mesh.
The expanded mesh is alternating forward and reverse and is raised above carpet.
Otherwise the sluicebox is operating very well and close to optimum water and
maximum pay gravel feed rates.

Capishava's Operation The Crack near Oko Paulo Not Refitted

Pit Location: 06-22.76 N 59-05.24 W WGS 84
  705,969 N 269,258 E SAM 56

Deposit: Narrow Gulch alluvial deposit known as the Crack.
  Only 4 to 6 feet deep including about 1 foot of gravels.
  There is a high percentage of cobble size rock in this material.
  Area was extensively worked earlier by Porknockers.

Mining: Open pit with one hydraulic jet only.

Original Sluicebox dimensions (Imperial) Two Identical 08-mars

Description	Length ft	Width ft	Depth inch	Area ft2	Volume yd3	
Boil Box	1,8	3,0	7,0	5	0,11	Wooden Boil Box
Top Sluice	5,7	3,0	1,0	17	0,05	Plastic Screen/ Braz Carpet
Bottom Sluice	6,5	3,3	1,0	21	0,07	Plastic Screen/ Braz Carpet
Combined	13,9	3,1		43	0,23	Total Con Vol yd3
Sluice Slope	1,9	in/ft	9	Degrees	16%	Percent

Gravel Pump 4 by 4 Dambrose Gravel Pump powered by 1 cylinder Agrale
Pipeline 4 inch PVC 120 ft length 10 ft lift

Water Supply Pump 3x3 centrifugal powered by 2 cylinder Agrale for both.
Number of Jets 1 200 ft length 5 ft lift
  3 inch diameter pipe

Feed Rate 14 yd3/hr @ 80% operation 11 yd3/hour net

Daily Feed 10 hours @ 80% operation 89 yd3/day

This sluicebox is processing a very thick gravel/tailings slurry with very little water.
The gold recovery consists of Brazilian carpet covered with plastic mesh.
The wooden boil box is packed hard with solids.
Wooden check boards have been installed every 2 feet and material hangs up.
The gold losses would be extremely high.

James Gomes   Not Refitted

Pit   Location: 06-22.75 N   59-05.70 W   WGS 84
                               705,970 N   268,419 E   SAM 56

Deposit: Narrow Gulch alluvial deposit known as the Crack.
                 Only 4 to 6 feet deep including 3 feet of red silt, about 1/2 foot of gravel
                 overlying 6 inches of clay and a further 1 foot of gravels above bedrock.
                 There is a high percentage of cobble size rock in this material.
                 Area was extensively worked earlier by Porknockers.

Mining: Open pit with hydraulic jet only

Original Sluicebox dimensions (Imperial)   08-mars

Description	Length	Width	Depth	Area	Volume	
	ft	ft	inch	ft2	yd3	
Boil Box	1,5	3,3	6,0	5	0,09	Wooden Boil Box
Top Sluice	5,7	3,3	1,0	18	0,06	Med Exp/Nomad
Bottom Sluice	7,0	3,4	1,0	24	0,07	Med Exp/Braz
Combined	14,2	3,3		47	0,22	Total Con Vol yd3
Sluice Slope	2,5	in/ft	12	Degrees	21%	Percent
Bottom	3,3	in/ft	16	Degrees	28%	Percent

Gravel Pump   4 by 4 Dambrose Gravel Pump powered by a 1 cylinder Agrale
Pipeline   4 inch PVC   200 ft length   15 ft lift

Water Supply Pump   3 by 3 centrifugal powered by a 1 cylinder Agrale
Number of Jets   1   ft length   N/A ft lift
3   inch diameter pipe

Feed Rate   16 yd3/hr @   80% operation   13 yd3/hour net

Daily Feed   10 hours @   80% operation   104 yd3/day

The slurry is flowing at recommend speed but at a low volume.
The sluicebox is well fitted with medium weight expanded metal and Nomad matting..
The sluicebox is a little too wide for its gravel pump output and it is a little too short.
The gravel slurry is fairly thick.

Mike Vieira's Operation Baramalli Creek   Christopher DeAbreu GM   Not Refitte

Camp	Location:	06-25.13 N	59-06.97 W	WGS 84	
		710,357 N	266,097 E	SAM 56	
Pit	Location:	06-25.71 N	59-06.86 W	WGS 84	
		711,416 N	266,294 E	SAM 56	

Deposit: Narrow valley alluvial deposit known as Baramalli Creek.
About 12 feet deep including 8 feet of red-brown silt overburden
overlying about 3 feet of cemented catch-cow gravels.
High proportion of rocks, due to coarse gravels and catch-cow.
Pit is about 70 by 180 feet by 12 feet deep.   Difficult to work with jets.

Mining: Open pit with hydraulic jets only

Original Sluicebox dimensions (Imperial)   08-mars

Description	Length ft	Width ft	Depth inch	Area ft2	Volume yd3	
Boil Box	1,5	4,6	7,0	7	0,15	Wooden Boil Box
Top Sluice	8,6	4,6	1,0	40	0,12	Med Exp/Nomad
	1,3	4,6	1,0			Bare wood
Bottom Sluice	3,3	4,9	1,0	16	0,05	Med Exp/Braz
	5,0	4,9	0,5	25		Ribbed Braz Carpet
Combined	19,7	4,5		88	0,32	Total Con Vol yd3

Sluice Slope	2,0	in/ft	9	Degrees	17%	Percent
Bottom	2,3	in/ft	11	Degrees	19%	Percent

Gravel Pump   4 by 4 Dambrose Gravel Pump powered by a 1 cylinder Agrale
Pipeline   6 inch PVC   ft length   20 ft lift

Water Supply Pump   4 by 6 Berkley Centrifugal pump with 4 cylinder Perkins
Number of Jets   2   ft length   N/A ft lift
          4 inch diameter PVC pipe

Feed Rate   14 yd3/hr @   75% operation   11 yd3/hour net

Daily Feed   10 hours @   75% operation   81 yd3/day

Excellent speed, flow rates, riffles and matting. Sluicebox is a little wide and short.
The sluicebox needs expanded metal and Nomad matting in the lower sluice run.
The operator needs a hydraulic excavator to break up the catch-cow in the pit.

Katchia   Baramalli Creek   Not Refitted

Pit   Location: 06-26.01 N   59-06.98 W   WGS 84
                          711,978 N   266,072 E   SAM 56

Deposit: Narrow valley alluvial deposit on Baramalli Creek.
                11 feet deep, 4 feet of red/brown silt, pegas layer, 5 feet of gray fine sand,
                overlying 2 feet of cemented "catch-cow" gravels, similar to upstream.
                There is a high percentage of cobble size rock in this material.
                The operator was cutting through overburden silts.
                The pit is approximately 40 feet wide by 120 feet long and 11 feet deep.

Mining: Open pit with hydraulic jet only

Original Sluicebox dimensions (Imperial)   08-mars

Description	Length	Width	Depth	Area	Volume	
	ft	ft	inch	ft2	yd3	
Boil Box	1,8	2,9	6,0	4	0,09	Wooden Boil Box
Top Sluice	2,5	2,9	1,0	7	0,02	Plastic mesh/Nomad
	2,5	2,9	0,5	7	0,01	Bare Brazilian Carpet
Bottom Sluice	3,2	3,3	1,0	10	0,03	Plastic mesh/Brazilian
	3,2	3,3	0,5	10	0,02	Bare Brazilian Carpet
Combined	13,1	3,0		39	0,18	Total Con Vol yd3

Sluice Slope	2,0	in/ft	9	Degrees	17%	Percent
Bottom	1,8	in/ft	9	Degrees	15%	Percent

Gravel Pump   4 by 4 Dambrose Gravel Pump powered by a 2 cylinder Agrale
Pipeline   4 inch PVC   150 ft length   25 ft lift

Water Supply Pump   3 by 3 centrifugal powered by a 1 cylinder Agrale
Number of Jets   1   100 ft length   5 ft lift
                3 inch diameter lay flat hose

Feed Rate   6 yd3/hr @   75% operation   5 yd3/hour net

Daily Feed   10 hours @   75% operation   35 yd3/day

This sluicebox is much too wide for the output of the gravel pump.
Wood strips (checks) are located every 8 inches along both sections of the sluicebox.
These strips just hang onto gravel and clog up the sluice runs.
The plastic mesh should be replaced with coarse expanded metal riffles.

The Brazilian carpet should be replaced with unbacked Nomad matting.

WATER FLOW RATES (continued)

Description	Factor	Rahaman Original 08-mars	Capishava Original 08-mars	Gomes Original 08-mars	M Vieira Original 12-mars	Katchia Original 12-mars
Slurry Velocity m/s		1,6	1,0	1,5	1,3	1,3
Slurry Velocity ft/s		5,1	3,2	4,8	4,4	4,1
% Recommended		102%	64%	95%	88%	82%
Depth of Water cm		3,5	3,2	2,4	3,1	2,1
Depth in inches		1,4	1,3	0,9	1,2	0,8
Width of Sluice Run m		1,3	0,9	1,0	1,4	0,9
Width in feet		4,3	3,0	3,3	4,6	2,9
Slurry cms	0,800	0,058	0,023	0,027	0,047	0,019
Slurry Flowrate Igpm		759	301	358	623	250
Slurry Flowrate USgpm		912	361	430	748	300
% Recommend by Width		109%	63%	69%	84%	53%
For Angle Iron Riffles		55%	31%	34%	42%	27%
		4,7	1,9	2,2	3,9	1,6

Fazil Rahman was already operating at nearly optimum water flow rates.
Capishava, Gomes and Katchia's sluiceboxes were too wide for the output of their pumps.

Pay Gravel Feed Rates continued

Description	Factor	Rahaman Original 08-mars Overburden	Capishava Original 08-mars	Gomes Original 08-mars	M Vieira Original 12-mars	Katchia Original 12-mars
Solids %		12%	13%	13%	7%	7%
Solids cms	1,00	0,0071	0,0030	0,0034	0,0031	0,0013
Sluice Solids Lyd3/hr		33	14	16	14	6
% Recommend by Feed		96%	58%	62%	39%	27%
For Angle Iron Riffles		48%	29%	31%	19%	13%

Rahaman, Capishava and Gomes were operating at very high solids volume densities.
They were jetting previously worked Porknocker tailings that are easy to fluidize.

DISTRIBUTION OF RADIOTRACERS ALONG THE LENGTH OF THE SLUICES

A COMPARISON OF THE ORIGINAL & CONVERTED SLUICEBOXES

Peter Thompson's Operation   Right limit of Oko Creek Valley   Ainton Vieira GM

	Original Sluicebox				**New Refitted New Sluicebox**			
Distance	Final Reading					Final Reading		
From Top	CPS	% Total	Cumulative		CPS	% Total	Cumulative	
feet		37%				62%		
2		0,0%	0,0%	Boil Box	27 900	28,2%	28,2%	Mexp/Nom
4	9 800	12,7%	12,7%	Bare Nomad	8 700	8,8%	37,0%	Mexp/Nom
6	7 000	9,1%	21,8%	Mesh/Brazil	5 200	5,3%	42,3%	Mexp/Nom
8	700	0,9%	22,7%	Mesh/Brazil	8 900	9,0%	51,3%	Mexp/Nom
10	4 000	5,2%	27,9%	Mesh/Brazil	2 500	2,5%	53,8%	Mexp/Nom
12	2 500	3,2%	31,2%	Bare Ribbed	3 000	3,0%	56,9%	Mexp/Nom
14	4 200	5,5%	36,6%	Bare Ribbed	2 200	2,2%	59,1%	Angl/Nom
16		0,0%	36,6%	Bare Rib Braz	900	0,9%	60,0%	Angl/Nom
18		0,0%	36,6%	Bare Rib Braz	2 200	2,2%	62,2%	Angl/Nom
20	end	0,0%	36,6%	Bare Brazil	end	0,0%	62,2%	Angl/Nom
Total	28 200	37%			61 500	62%		

GOLD AND TRACERS RECOVERED BY ORIGINAL AND REFITTED SLUICE

	Original Thompson Sluicebox				**New Refitted Thomposon Sluicebox**			
Mesh	Recovered gold		Recovered		Recovered	Recovered gold		Diameter
Size	raw grams	dist %	Tracers		Tracers	raw grams	dist %	mm
	(estimated)	(estimated)				actual	actual	
+8	0,3	1,4%	47% <estimated>		61%	0,3	1,4%	2,380
+14	0,9	3,9%	52%		68%	0,7	3,9%	1,190
+28	2,2	9,8%	48%		72%	1,7	9,8%	0,595
+48	7,4	32,3%	16%		68%	5,7	32,3%	0,297
+100	9,6	41,8%	36%		64%	7,4	41,8%	0,149
+200	2,3	9,9%	31% <estimated>		54%	1,7	9,9%	0,074
-200	0,2	0,9%	27% <estimated>		48%	0,2	0,9%	
Total	22,9	100,0%				17,4	100,0%	

Recovery of Radiotracers   37%   62% Recovery of Radiotracers

Average Weighted Recovery   31%   65%   Average Weighted Recovery

Notes: Recovery of +8 mesh (2.4 mm) and +200 mesh (0.074 mm) are estimated based on

previous radiotracer testing experience.

Notes: The recovered gold particle size distribution was not measured but was assumed to be the same as the actual recovered gold size distribution for the newly refitted sluicebox.

Notes: Seven +100 mesh (0.150 mm) radiotracers were caught in the cotton packing in the new sluicebox.

Notes: The weighted average recovery of the refitted sluicebox is about twice as high as the original sluicebox but is still low at only 65%.

Notes: The recovery of each size fraction of radiotracers was essentially the same in the new sluice. This indicates that a similar percentage of gold in each size range was not washed from clay. The low overall gold recoveries of the new sluiceboxe were due to gold particles locked in clay balls that were washed out into the tailings.

Fazal Sheriff's Refitted Sluicebox   Right limit of Oko Creek Valley

New Refitted New Sluicebox

Distance From Top feet	CPS	% Total	Cumulative 100%	
2	33 800	76,3%	76,3%	Medium Exp Metal/Nomad
4	6 200	14,0%	90,3%	Medium Exp Metal/Nomad
6	2 400	5,4%	95,7%	Medium Exp Metal/Nomad
8	900	2,0%	97,7%	Bare Brazilian Carpet
10	500	1,1%	98,9%	Medium Exp Metal/Nomad
12		0,0%	98,9%	Medium Exp Metal/Nomad
14		0,0%	98,9%	Medium Exp Metal/Nomad
16		0,0%	98,9%	Bare Brazilian Carpet
18		0,0%	98,9%	Bare Brazilian Carpet
20	500	1,1%	100,0%	One inch Angle Iron/Nomad
22		0,0%	100,0%	One inch Angle Iron/Nomad
24		0,0%	100,0%	One inch Angle Iron/Nomad
26		0,0%	100,0%	One inch Angle Iron/Nomad
		end		
Total	44 300	100,0%		

Notes: All of the 100 radiotracers were recovered in Fazal Sherriff's new sluicebox.

Notes: This sluicebox had a higher recovery than Thompson's new box due to an absence of clay in the pay gravels. There were no free gold losses associated with unwashed clay balls.

Notes: Almost all of the radiotracers (96%) were recovered in the first 6 feet of the sluicebox.

Notes: There are additional recoveries at the start of the second section of expanded metal riffles.
This a common occurrence in this sluicebox layout.

Notes: The two radiotracers caught at 20 feet were in the one inch angle iron riffles.
These two radiotracers were +14 mesh (1.2 mm) in size.
This illustrates the need of one inch angle iron riffles to recover chip size gold particles.

ACCURACY OF THESE RESULTS

Radiotracer test result errors are best described by the Binomial Probability Distribution.

The standard error = $\{(n*p*q)^{0.5}\}/n$, where n =100, p = % recovery, and q=1-p.

Peter Thompson's Original Sluicebox:
For the Original Sluicebox test, p =   37% The standard error is   5%
The radiotracer test results will be within 5% of the true value 68% of the time.

Peter Thompson's New Refitted Sluicebox:
For the Refitted Sluicebox test, p =   62% The standard error is   5%
The radiotracer test results will be within 5% of the true value 68% of the time.

Fazal Sheriff's New Refitted Sluicebox:
For the Refitted Sluicebox test, p =   100% The standard error is   0%
The radiotracer test results will be within 1% of the true value 68% of the time.

Notes: Gold recovery estimates are for free gold (not locked with waste minerals such as quartz).

Notes: The previous calculations are based on the pay gravels and operating conditions
encounterd during the sampling period. Pay gravels which are significantly different in
character, gold content and particle size distribution may require different processing
considerations.

Randy Clarkson P.Eng.