

Lockheed Environmental Systems & Technologies Co.
Lockheed Analytical Services
975 Kelly Johnson Drive Las Vegas, Nevada 89119-3705
Telephone 702-361-0220 800-582-7605 Facsimile 702-361-8146

0045564



June 20, 1996

Joan Kessner
Bechtel Hanford, Inc.
3350 George Washington Way
MISN B1-35
Richland, WA 99352



RE: Log-in No: L7145
Quotation No: Q400000-B
Document File No: 0523596
WHC Document Control No: 373

The attached data report contains the analytical results of samples that were submitted to Southwest Research Institute (SWRI) on 23 May 1996.

The case narratives included in the following attachments provide a detailed description of all events that occurred during sample preparation, analysis, and data review specific to the samples and analytical methods requested. The SWRI SDG# of 71623 corresponds to the Lockheed SDG# L7145.

If you have any questions concerning the analysis or the data please call Kathleen M. Hall at (509) 375-4741.

"I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

Sincerely,

Kathleen M. Hall
Client Services Representative

XX/kmh

cc: Client Services
Document Control



000001

SOUTHWEST RESEARCH INSTITUTE

6220 CULEBRA ROAD • POST OFFICE DRAWER 28510 • SAN ANTONIO, TEXAS, USA 78228-0510 • (210) 684-5111 • TELEX 244846

Chemistry and Chemical Engineering Division
Department of Environmental Chemistry

June 5, 1996

Lockheed Analytical Services
2950 George Washington Parkway
Suite A
Richland, Washington DC 99352
Attn: Kathleen Hall

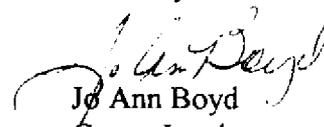
Subject:	SwRI Project Number:	01-6301-002
	SDG:	71623 (BOHG 98)
	SwRI Work Order Number:	9114
	Samples Received:	May 23, 1996

Dear Sir:

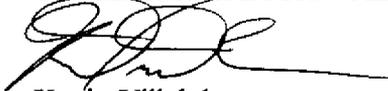
Enclosed please find the Particle Size data for the above referenced case.

If you should have any questions, please do not hesitate to call me at 210/522-2169.

Sincerely,


Jo Ann Boyd
Group Leader
Quality Assurance Unit,
Division 01

TECHNICAL APPROVAL:



Kevin Villalobos
Group Leader

JAB/sks

Encl

cc: Karen Germann, Lockheed Analytical Services, 975 Kelly Johnson Dr., Las Vegas, NV 89119



SAN ANTONIO, TEXAS

HOUSTON, TEXAS • DETROIT, MICHIGAN • WASHINGTON, DC

000002

SOUTHWEST RESEARCH INSTITUTE
CLIENT: LOCKHEED ANALYTICAL
SDG NO.: 71623 (BOHG 98)
VTSR: MAY 23, 1996

NARRATIVE

000003

LOCKHEED ANALYTICAL SDG: 71623 (BOHG 98)

SwRI Project Number: 01-6301-002

SwRI Work Order Number: 9114

June 5, 1996

Page 1

LOCKHEED ANALYTICAL/ SDG: 71623 (BOHG 98)

1. One (1) sediment sample for Partical Size and Radscreen Analysis:

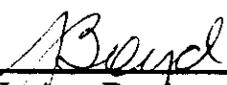
SwRI	Customer ID
71623	BOHG 98

2. The sample was received at SwRI on May 23, 1996 for a ten (10) day turnaround time from Validated Time of Sample Receipt (VTSR).
3. Quality Control Sample Identification: BOHG 98 Duplicate

PARTICAL SIZE ANALYSIS

1. The sample was analyzed according to ASTM Method D422.
2. The duplicate RPD met the method QC of $\leq 20\%$.
3. The sample was analyzed within forty (40) days of the Collection End Date (CED).

"I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Director or his designee, as verified by the following signature."



Jo Ann Boyd
Group Leader
Quality Assurance Unit
Division 01

⁵
 6/4/96

 Date *JB*

Collector Doug Bowers	Company Contact S. Kretzschmar	Telephone 376-2740
Project Designation 100N Emergency Dump Basin Sediment Sampling	Sampling Location 100N	SAF No. B96-110
Ice Chest No. SN 0195/0001	Field Logbook No. EFL 1133-1	Method of Shipment Air freight
Shipped To Southwest Research Institute	Offsite Property No.	Bill of Lading/Air Bill No.

Data Turnaround
 Priority
 Normal
 5-20 5-22-96

Possible Sample Hazards/Remarks	Preservation	none																	
	Type of Container	G																	
	No. of Container(s)	1																	
Special Handling and/or Storage	Volume	1 L																	
SAMPLE ANALYSIS		Particle Size																	

Sample No.	Matrix*	Date Sampled	Time Sampled																
B04G98	DS	5-22-96	1012	X															

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS				Matrix*	
Relinquished By	Date/Time	Received By	Date/Time	If activity scan is required remove it from the main sample. Type A container being used does not allow for multiple sample containers inside of containment vessel. Sample jar is reading 4mR on contact & contains 300 grams of wet sediment				S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drum Solids DL - Drum Liquids T - Tissue WI - Wipe L - Liquid V - Vegetation X - Other	
<i>Doug Bowers</i>	5-22-96/1237	<i>Eric Behrman</i>	5-22-96						
<i>Eric Behrman</i>	5-22-96	<i>Eric Behrman</i>	5-22-96						
<i>Eric Behrman</i>	5-22-96	<i>Eric Behrman</i>	5-22-96						
Relinquished By	Date/Time	Received By	Date/Time	Date/Time				0000002	
<i>R. Placer</i>	5/23/96	<i>R. Placer</i>	5/23/96						
LABORATORY SECTION	Received By	Title	Date/Time						

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TELECOPIER: 210/522-5720

000003

RADIOACTIVE MATERIAL RECEIVING FORM

Type of Shipment, Mark the Applicable Items

1. Excepted or Limited Quantity : Nat. U, Th, or DU , Article/Inst. , LQ , Empty

2. Surface Contamination Only : SCO-I , SCO-II

3. Low Specific Activity : LSA-I , LSA-II , LSA-III

4. Industrial Package : IP-1 , IP-2 , IP-3

5. Type A Package/Material : White-I , Yellow-II , Yellow-III

6. Type B Package/Material : B , B (U) , B (M) , Hwy. Rt. Cont.

7. Exclusive Use Vehicle

Receiving Check List - Refer to TRCR 21.906

	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Shipping Papers Were Provided	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Visible Damage to or Crushing of Package	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Leakage Observed or Wet Package	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Loose Contamination Levels on Exterior of Package:		
Beta and gamma less than 22 dpm/cm ² (1320 Bq/cm ²)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Alpha less than 2.2 dpm/cm ² (132 Bq/cm ²)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Radiation Dose Rates Within Limits and as Described by Shipper	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Shipment Checked Within 3 Working Hours of Receipt	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Radioactive Material Inventory Data

Source Serial or ID No. on Shipping Papers , or fill-in as needed: W.O.

Solid , Liquid , Gas , Prim. Std. , 2nd Std. , 3rd Std. , NIST

Sealed : Alpha, 90d , Beta-γ, 180d , Double Encapsulated , Normal Form (unsealed - no leak-test)

Radionuclide	Radioactivity	Date
<u>Sr-90</u>	<u>2.44 uCi</u>	<u>5-22-96</u>
<u>Cs-60</u>	<u>18.4</u>	<u>↓</u>
<u>Cs-137</u>	<u>2.53</u>	<u>↓</u>
<u>Pu-239</u>	<u>2.235</u>	<u>↓</u>
<u>Pu-240</u>	<u>2.235</u>	<u>↓</u>

For Sealed Sources, Leak-Test Report Provided: No , Yes , Date NA

Shipper/Carrier: On Shipping Papers , or fill-in as needed: Fedex

Assign to: Amy Settler

Location to be Stored and Date: Bldg 199 Lab 101 5-23-96

Remarks and Comments: Seal # (Red Tape) intact - (300 grams)

Receiver's/Checker's Signature

Received by: John P. Hegeman Date Received: 5-23-96

HEALTH HAZARDS

Radiation presents minimal risk to lives of persons during transportation accidents.

Undamaged packages are safe; damaged packages or released material can cause external radiation exposure; released material entering or contaminating the body can cause internal radiation exposure.

Type A packages (cartons, boxes, drums, articles, etc.) identified as "Type A" by marking on packages or by shipping papers contain non-life endangering amounts. Partial releases might be expected if packages are damaged in moderately severe accidents.

Type B packages (large and small, usually metal) identified as "Type B" by marking on packages or by shipping papers contain potentially life endangering amounts. Because of design, evaluation, and testing of packages, life endangering releases are not expected in accidents except those of utmost severity.

Some radioactive materials cannot be detected by commonly available instruments.

Water from control of cargo fire may cause pollution.

FIRE OR EXPLOSION

Some of these materials may burn, but most do not ignite readily.

Radioactivity does not change flammability or other properties of the materials.

Type B packages are designed to withstand temperatures of 1475 deg F (800 deg C)

EMERGENCY ACTION

Priority response actions may be performed before taking radiation measurements.

Priorities are life saving, control of fire and other hazards, and first aid. Isolate hazard area and deny entry. Notify Radiation Authority of accident conditions.

Keep unnecessary people at least 150 feet upwind of spill; greater distances may be necessary for people downwind, or if advised by Radiation Authority.

Uninjured persons or equipment with suspected contamination should be detained or isolated; delay cleanup until instructions are received from Radiation Authority.

Positive pressure self-contained breathing apparatus (SCBA) and structural firefighters' protective clothing will provide adequate protection against internal radiation exposure, but not external exposure.

CALL Emergency Response Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, CALL CHEMTREC AT 1-800-424-9300.

If water pollution occurs, notify the appropriate authorities.

FIRE

Do not move damaged packages; move undamaged packages out of fire zone.

Small Fires: Dry chemical, CO₂, water spray or regular foam.

Large Fires: Water spray, fog (flooding amounts).

SPILL OR LEAK

Do not touch damaged packages or spilled material.

Slightly damaged or damp outer surfaces seldom indicate failure of inner container.

Small Liquid Spills: Cover with sand, earth or other noncombustible absorbent material.

Dike to collect cargo fire control water.

FIRST AID

Use first aid treatment according to the nature of the injury.

If persons have contacted released material, use standard hazmat procedures for care of contaminated persons, for transport of the injured, and for notifications to authorities.

RADIOACTIVE MATERIAL, NOS, 7, UN2982

000006

DUPLICATE RESULTS

NAME: ITAS-RICHLAND SDG: W0853
 SAMPLE ID: G1229501 MATRIX: OTHER
 CLIENT ID: FT5111-01 DATE RECEIVED: 12/22/95 11:00:00 A
 ORIG LAB SAMPLE ID: 51229501

ISOTOPE	DUP RESULT	COUNTING ERROR %	TOTAL ERROR %	MDA	REPORT UNIT	YIELD	METHOD NUMBER	ORIG RESULT	RPD
PU-238	6.16E+01	2.4E+01	2.6E+01	9.20E+00	pCi/g	74.40%	RD3209	5.99E+01	2.78%
PU239/40	7.84E+02	8.5E+01	1.5E+02	9.20E+00	pCi/g	74.40%	RD3209	7.47E+02	4.88%
AM-241	3.42E+02	2.4E+02	2.4E+02	N/A	pCi/g	N/A	RD3219	6.10E+02	56.25%
CO-58	-3.23E+02	2.5E+02	2.5E+02	3.95E+02	pCi/g	N/A	RD3219	-2.04E+02	45.16%
CO-60	6.14E+04	1.2E+03	6.2E+03	N/A	pCi/g	N/A	RD3219	6.27E+04	2.11%
CS-137DA	8.43E+03	4.2E+02	9.4E+02	N/A	pCi/g	N/A	RD3219	7.73E+03	8.62%
EU-152	-2.74E+02	3.0E+02	3.0E+02	4.77E+02	pCi/g	N/A	RD3219	-1.26E+01	182.41%
EU-154	3.78E+02	3.3E+02	3.3E+02	6.27E+02	pCi/g	N/A	RD3219	3.65E+02	3.58%
EU-155	8.98E+01	1.6E+02	1.6E+02	2.56E+02	pCi/g	N/A	RD3219	-8.68E+01	1890.24%
FE-59	2.50E+02	6.7E+02	6.7E+02	1.10E+03	pCi/g	N/A	RD3219	7.76E+02	102.46%
ALPHA	7.74E+02	1.5E+02	1.7E+02	5.56E+01	pCi/g	100.00%	RD3222	6.73E+02	13.93%
BETA	5.10E+04	6.2E+02	5.6E+03	3.33E+01	pCi/g	100.00%	RD3222	6.33E+04	21.64%
STRONTIUM	8.14E+03	1.2E+02	2.4E+03	1.78E+01	pCi/g	92.90%	RD3204	7.28E+03	11.08%
TOTAL-URANIUM	5.18E+00	N/A	1.2E+00	4.50E-04	ug/g	N/A	RD4200	5.37E+00	3.70%

Number of Results: 14

"Worse Case" Data for this sample of Sediment.

000010
312-9052
0008

010002

Southwest Research Institute
Grain Size Report

SwRI Sample ID: 71623
Work Order #: 9114
Project: 01-6301-002

Customer: LOCKHEED ANALYTICAL SERVICES
Client Sample ID: BOHG 98 SDG: 71623
Sample Matrix: SEDIMENT

Total Sample Wt: 55.00

Sieve of +10

Sieve	Wt. Retained	% Retained	% Pass
3"	0	0.0	100.0
2"	0	0.0	100.0
1 1/2"	0	0.0	100.0
1"	0	0.0	100.0
3/4"	0	0.0	100.0
3/8"	0	0.0	100.0
#4	0	0.0	100.0
#10	0	0.0	100.0

Date Analyzed: 05/31/96

Sieve of -20/+200

Weight of Materials used in Hydrometer: 55.0

Sieve	Wt. Retained each Sieve	Yield	Wt. Retained	% Retained	% Pass
#20	0	0.00	0.00	0.0	100.0
#40	5.41	5.41	5.41	9.8	90.2
#60	5.85	11.26	11.26	20.5	79.5
#100	9.68	20.94	20.94	38.1	61.9
#200	18.38	39.32	39.32	71.5	28.5

Date Analyzed: 06/01/96

Specific Gravity: 2.65

Hydrometer ID: 152H-001

Temp.	Reading Time	Hydro. Reading	Hydro. Corr.	Corrected Hydro Reading	L	Diam (mm)	% Finer
23	2	21	6	15	12.9	0.0334	26.455
23	5	17	6	11	13.5	0.0216	19.400
23	15	13	6	7	14.2	0.0128	12.345
23	30	12	6	6	14.3	0.0091	10.582
23	60	10	6	4	14.7	0.0065	7.055
23	250	8	6	2	15.0	0.0032	3.527
23	1440	8	6	2	15.0	0.0013	3.527

Reviewed By:

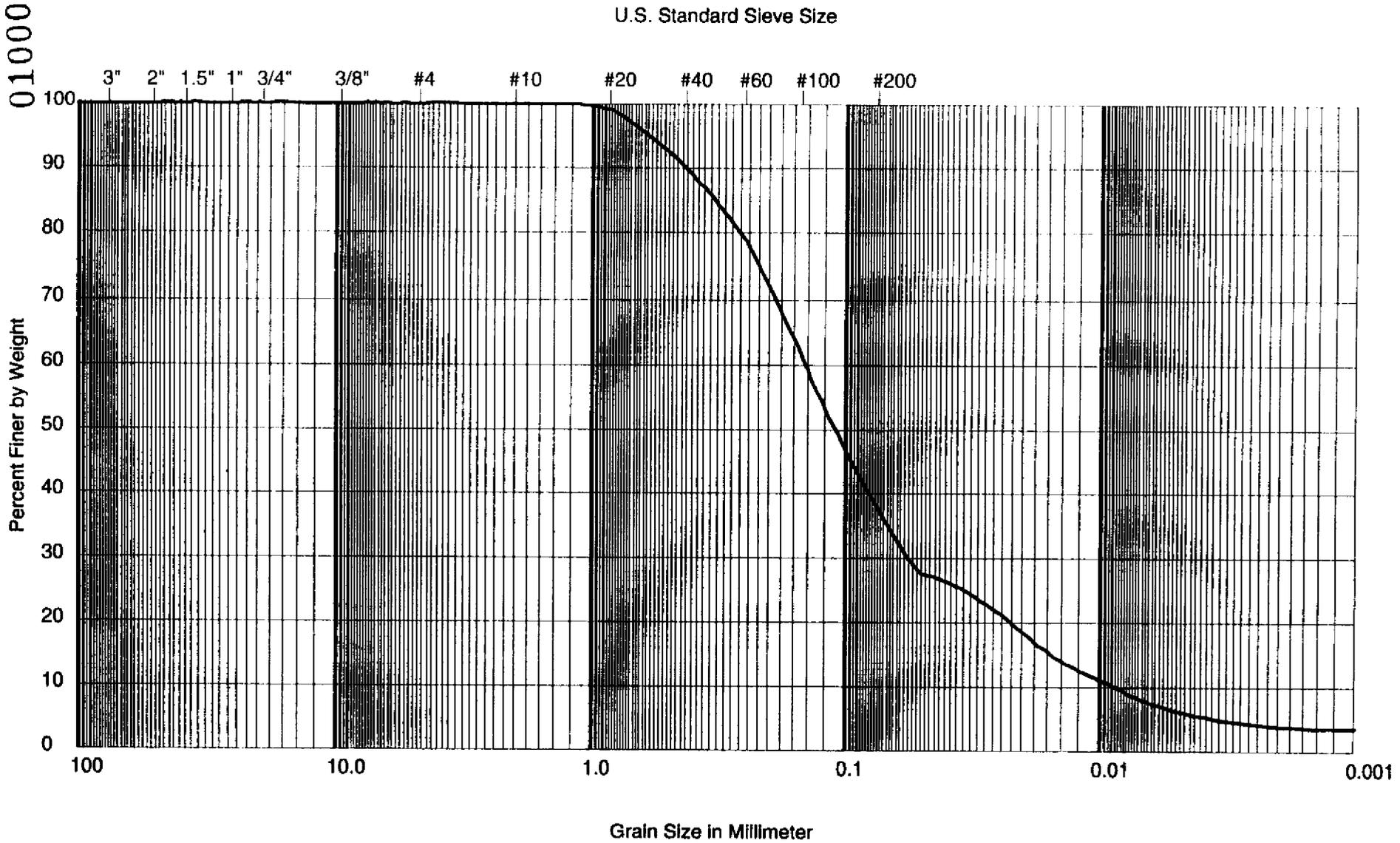
Date Analyzed: 05/31/96

KEVIN VILLALOBOS

Date: 6-4-96
SwRI EWG LABS

010003

910000



SwRI Sample ID: 71623

Work Order: 9114

Project: 01-6301-002

Customer: LOCKHEED ANALYTICAL SERVICES

Client Sample ID: BOHG 98

Sample Matrix: SEDIMENT

Reviewed By: *[Signature]*
 KEVIN VILLALOBOS
 Date: 6-4-96
 SwRI EWG LABS

**Southwest Research Institute
Grain Size Report**

010004

SwRI Sample ID: 71623D
Work Order #: 9114
Project: 01-6301-002

Customer: LOCKHEED ANALYTICAL SERVICES
Client Sample ID: BOHG 98 SDG: 71623
Sample Matrix: SEDIMENT

Sieve of +10

Total Sample Wt: 55.0

Sieve	Wt. Retained	% Retained	% Pass
3"	0	0.0	100.0
2"	0	0.0	100.0
1 1/2"	0	0.0	100.0
1"	0	0.0	100.0
3/4"	0	0.0	100.0
3/8"	0	0.0	100.0
#4	0	0.0	100.0
#10	0	0.0	100.0

Date Analyzed: 05/31/96

Sieve of -20/+200

Weight of Materials used in Hydrometer: 55.0

Sieve	Wt. Retained each Sieve	Yield	Wt. Retained	% Retained	% Pass
#20	0	0.00	0.00	0.0	100.0
#40	5.24	5.24	5.24	9.5	90.5
#60	6.17	11.41	11.41	20.7	79.3
#100	10.89	22.30	22.30	40.5	59.5
#200	18.33	40.63	40.63	73.9	26.1

Date Analyzed: 06/01/96

Specific Gravity: 2.67

Hydrometer ID: 152H-002

Temp.	Reading Time	Hydro. Reading	Hydro. Corr.	Corrected Hydro Reading	L	Diam (mm)	% Finer
23	2	20	5	15	13.0	0.0336	26.455
23	5	16	5	11	13.7	0.0218	19.400
23	15	12	5	7	14.3	0.0129	12.345
23	30	11	5	6	14.5	0.0092	10.582
23	60	9	5	4	14.8	0.0065	7.055
23	250	7	5	2	15.2	0.0032	3.527
23	1440	7	5	2	15.2	0.0014	3.527

Reviewed By: *KW*

Date Analyzed: 05/31/96

KEVIN VILLALOBOS

Date: 6-4-96
SwRI EWG LABS

