U. S. Department of Energy, Richland Operations Office
Environmental Restoration Contract
Bechtel Hanford, Inc.

UNIT MANAGERS MEETING

DECEMBER 1995

N Area Project

RECEIVED
FEB 26 1996

P. M. Pak
RL Project Manager

M. E. Greenidge
ERC Project Manager

MAR 1996
RECEIVED
EDMC

START
9613470.1689
0043000
027744

AGENDA

Project Review:

- Safety & Key Indicators
- Monthly Overview
- Production Curves
- 90 Day Look Ahead
- Significant Issues
- Innovations/Technology
- Performance
- Change Control
- Staffing
- Project Milestone Schedule
- Detail Schedules

Special Topics:

- Consolidated Groundwater Monitoring Program
- Preliminatry Crib Characterization Data
- EDB Regulatory Path Forward

9613470.1690

027744

SAFETY & KEY INDICATORS

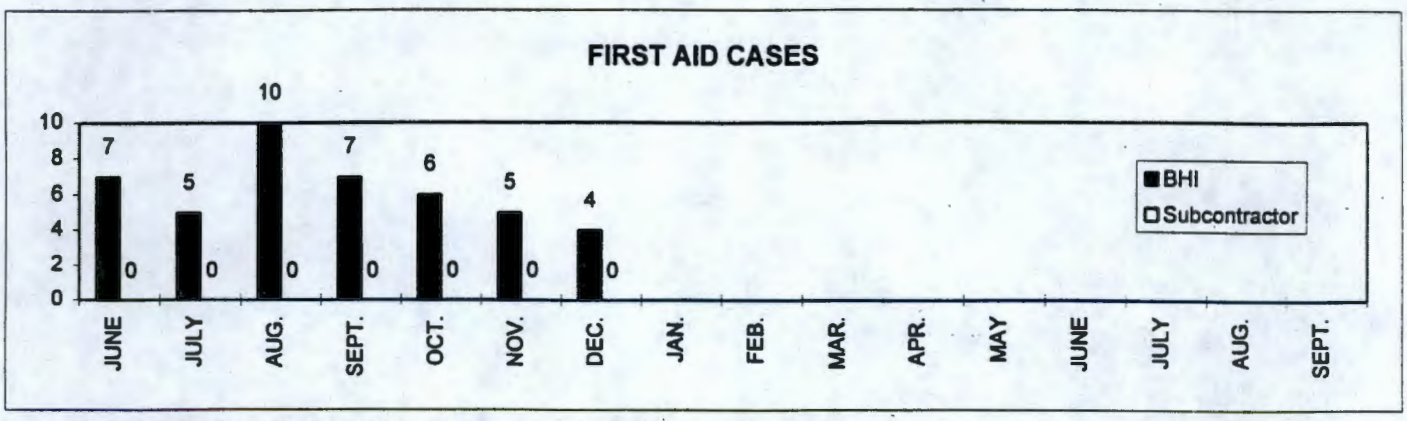
- Continued development of N Area Project VPP implementation based on program key elements criteria. VPP implementation team performed a self assessment using the VPP scoresheet obtaining an average score of 86%.

9613470.1691

027744

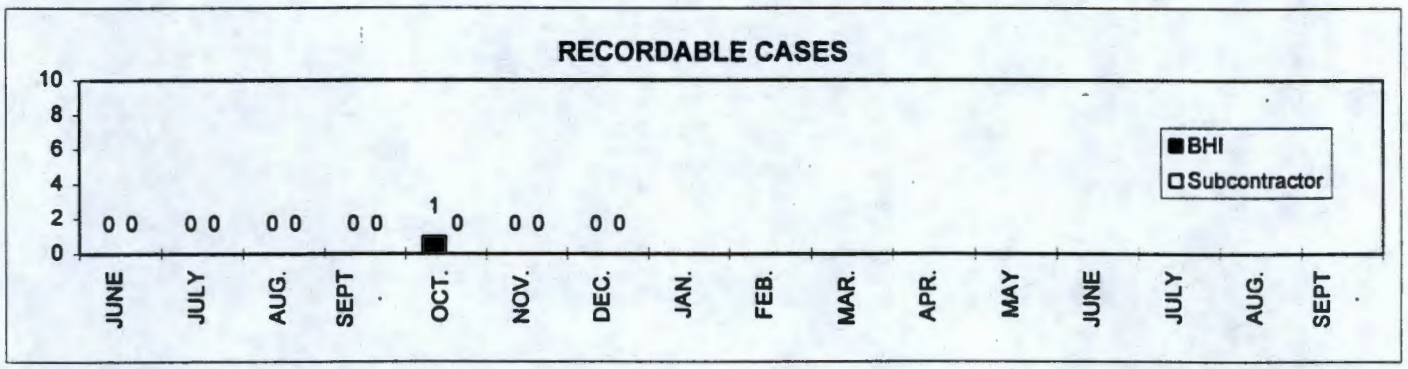
9613470.1692

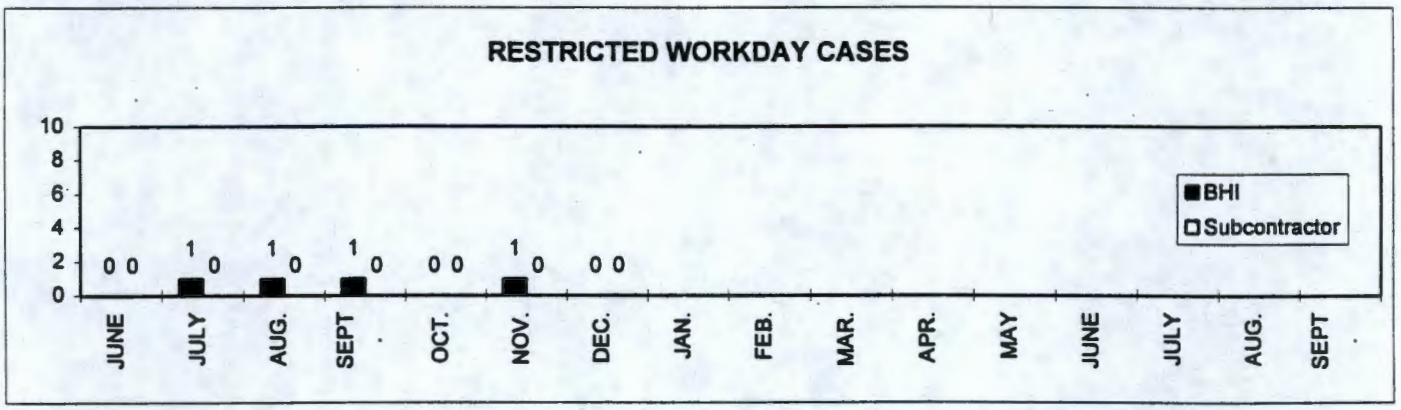
N AREA PROJECT SAFETY STATISTICS AND TRENDS - FY96

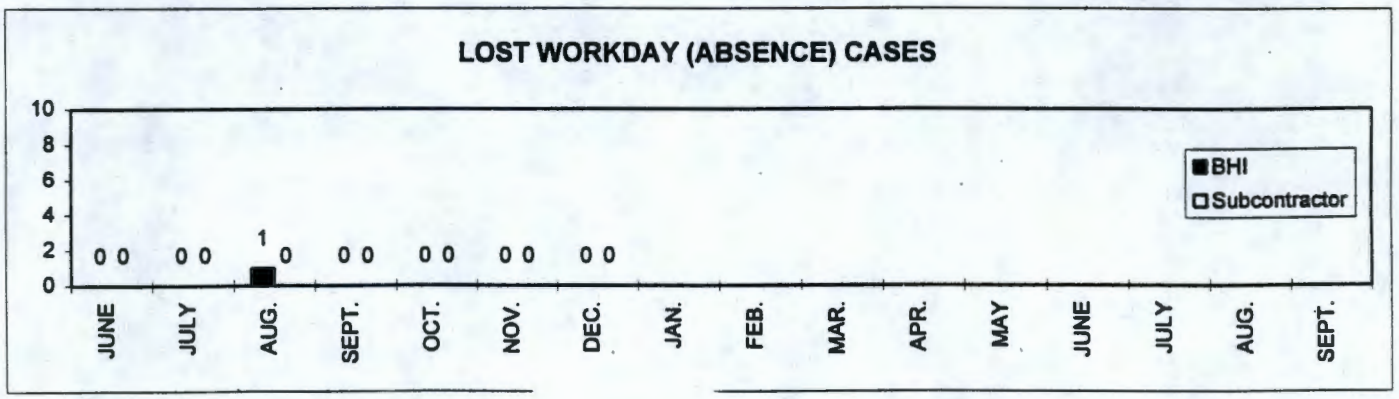


Current Period First Aid Cases

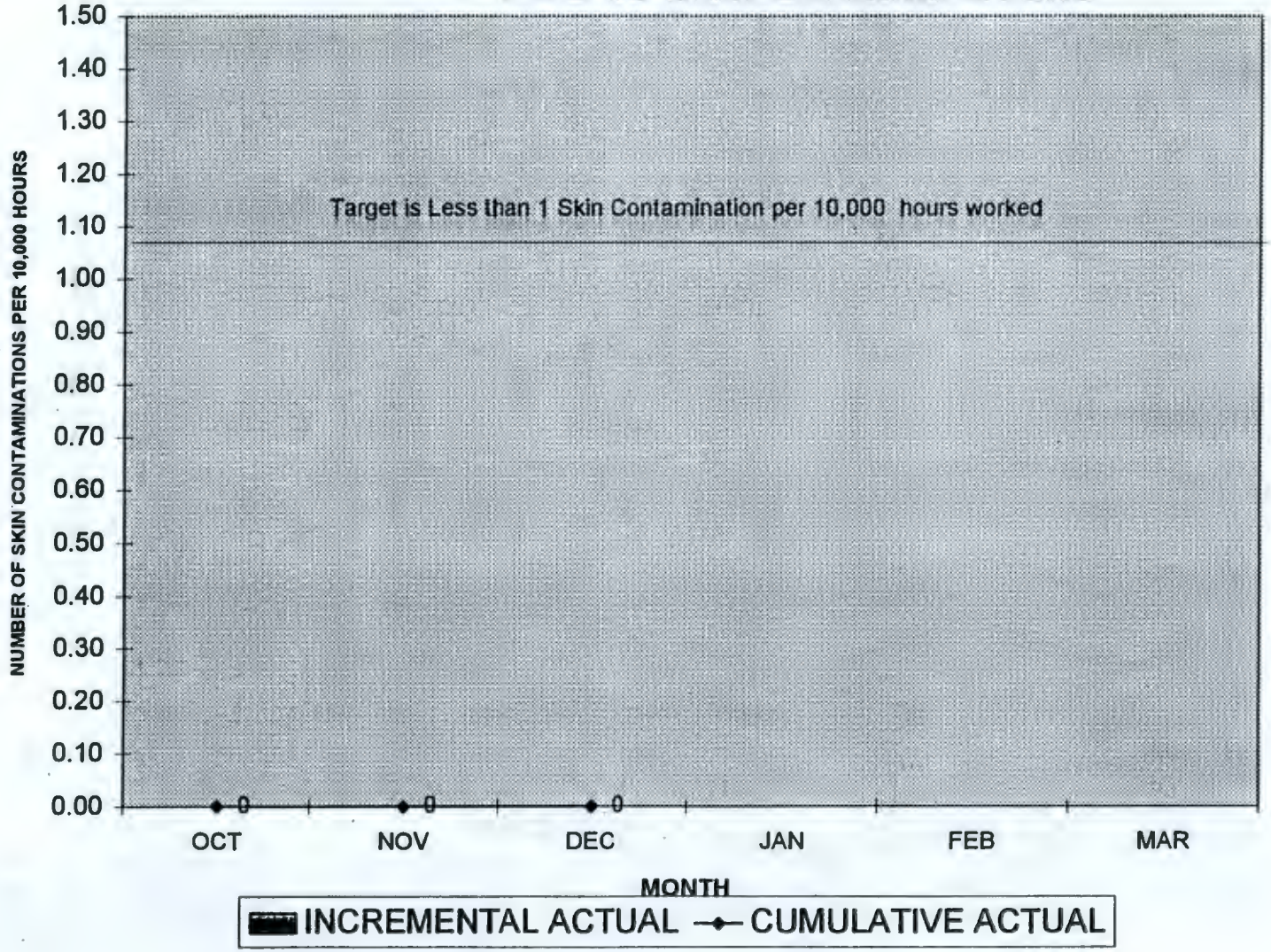
1 - Acid spill to employee's hand.
2 - Strained lower back.
3 - Arm injury, brushed against staple.
4 - Employee fell, contusion/bruise.







N Deactivation
POC #3 Skin Contaminations



96153470.1693

MONTHLY OVERVIEW

- Completed sampling of sediment in Emergency Dump Basin on 12/21/95.
- Completed canister removal from N Basin.
- Completed turnover/closeout documentation on 12 facilities. (11 were planned)
- Continued low dose removals from N Basin. (focus on fuel baskets)
- Declared readiness for RL independent Readiness Assessment on ROSEE. (Terminated 12/19/95).
- Processed 2.4 million gallons of water at N Springs Pump & Treat (target was 2.2? million gallons). To-date results have exceeded design criteria of 42 pCi/L
- Completed all drilling activities for crib characterization (ahead of schedule on 12/28/95).

9615470.1694

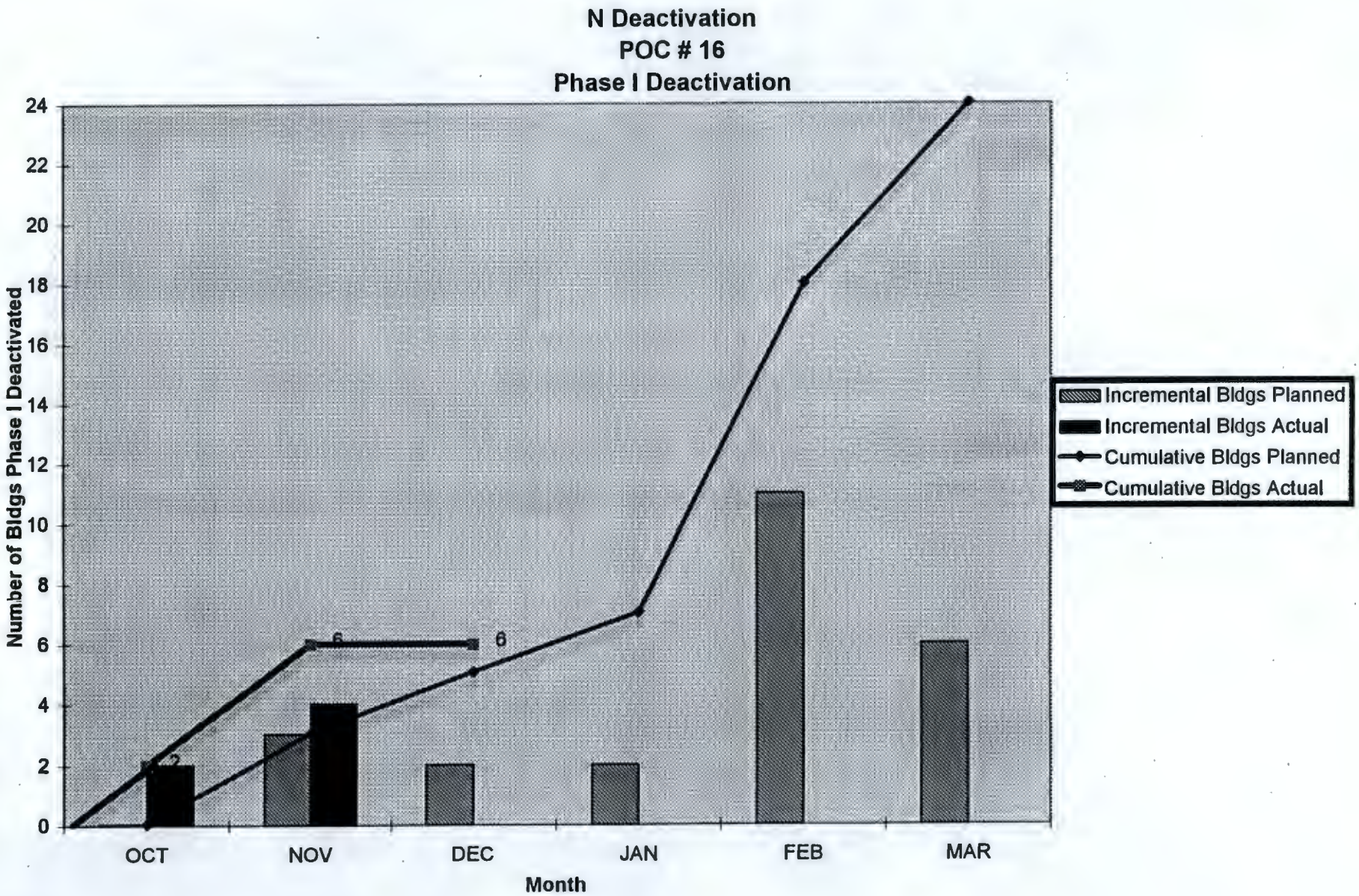
MONTHLY OVERVIEW (continued)

- Completed negotiations and signed agreement to incentivize the crib characterization/ LFI/QRA workscope.
- Completed procurement of high dose casks.

9613470.1695

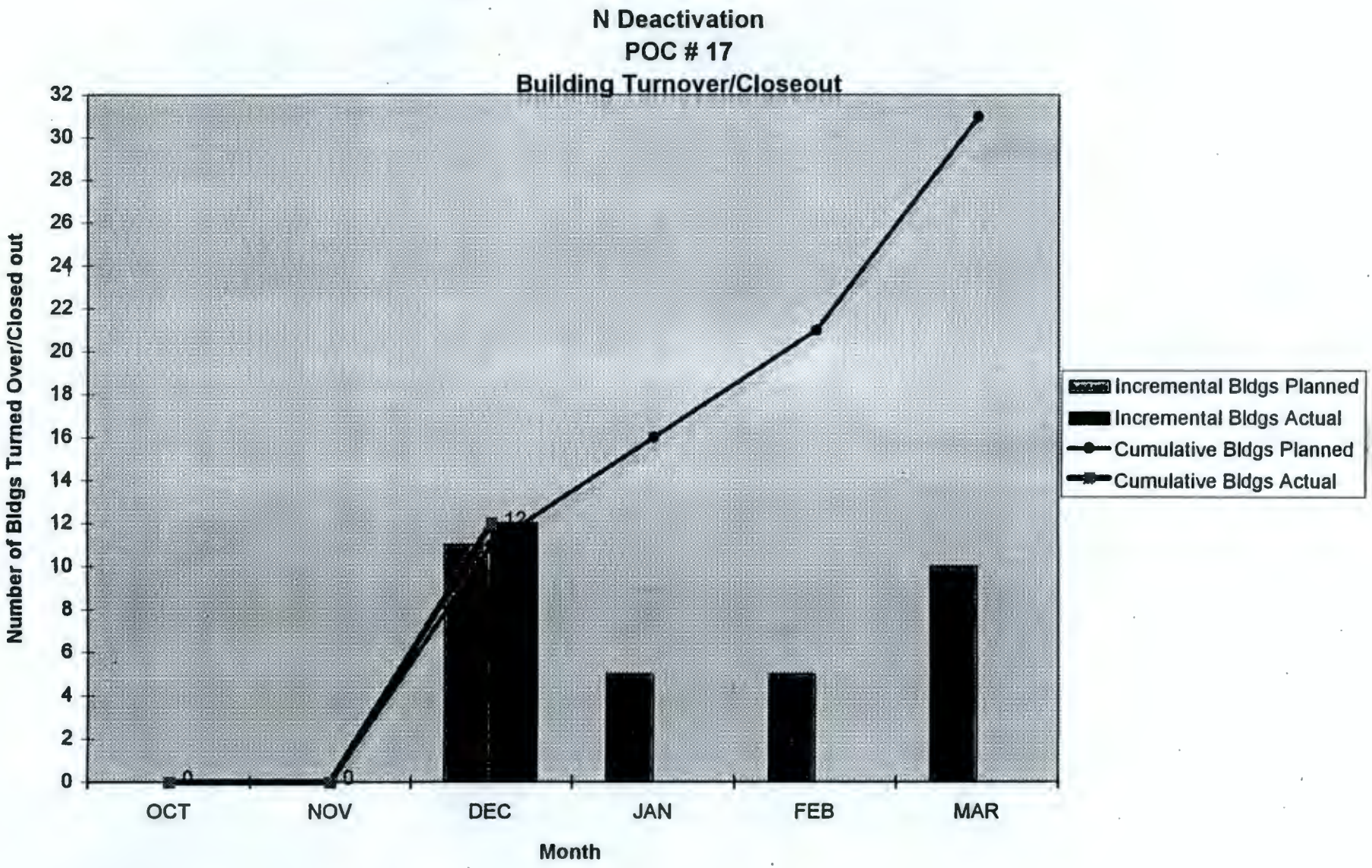
PRODUCTION CURVES

9613470.1696



C:\POC\BSDFACT.xls

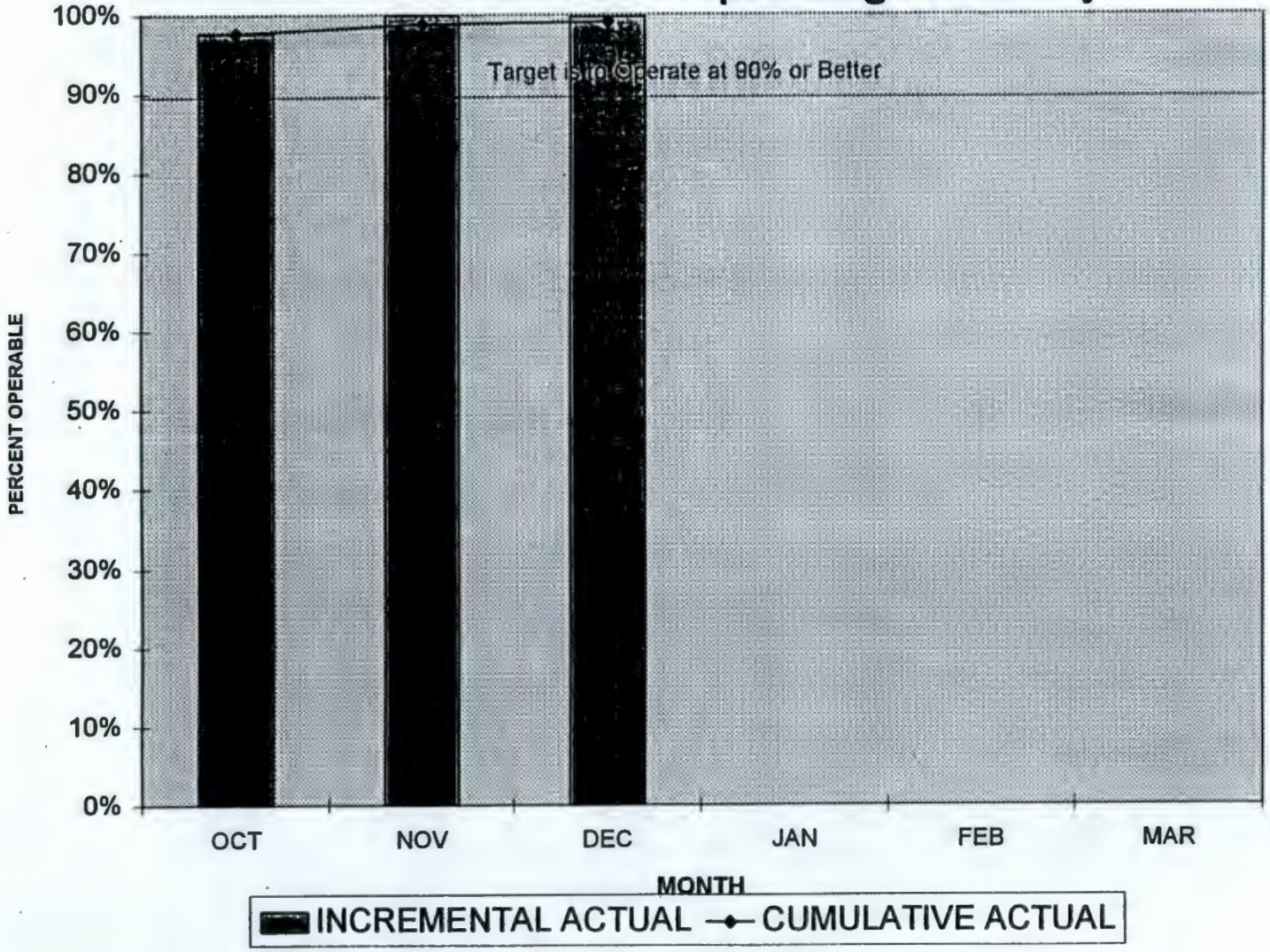
9615470.1697



C:\POC\pkgclose.xls

9613470.1698

100NR Pump & Treat
POC #10 Operating Efficiency

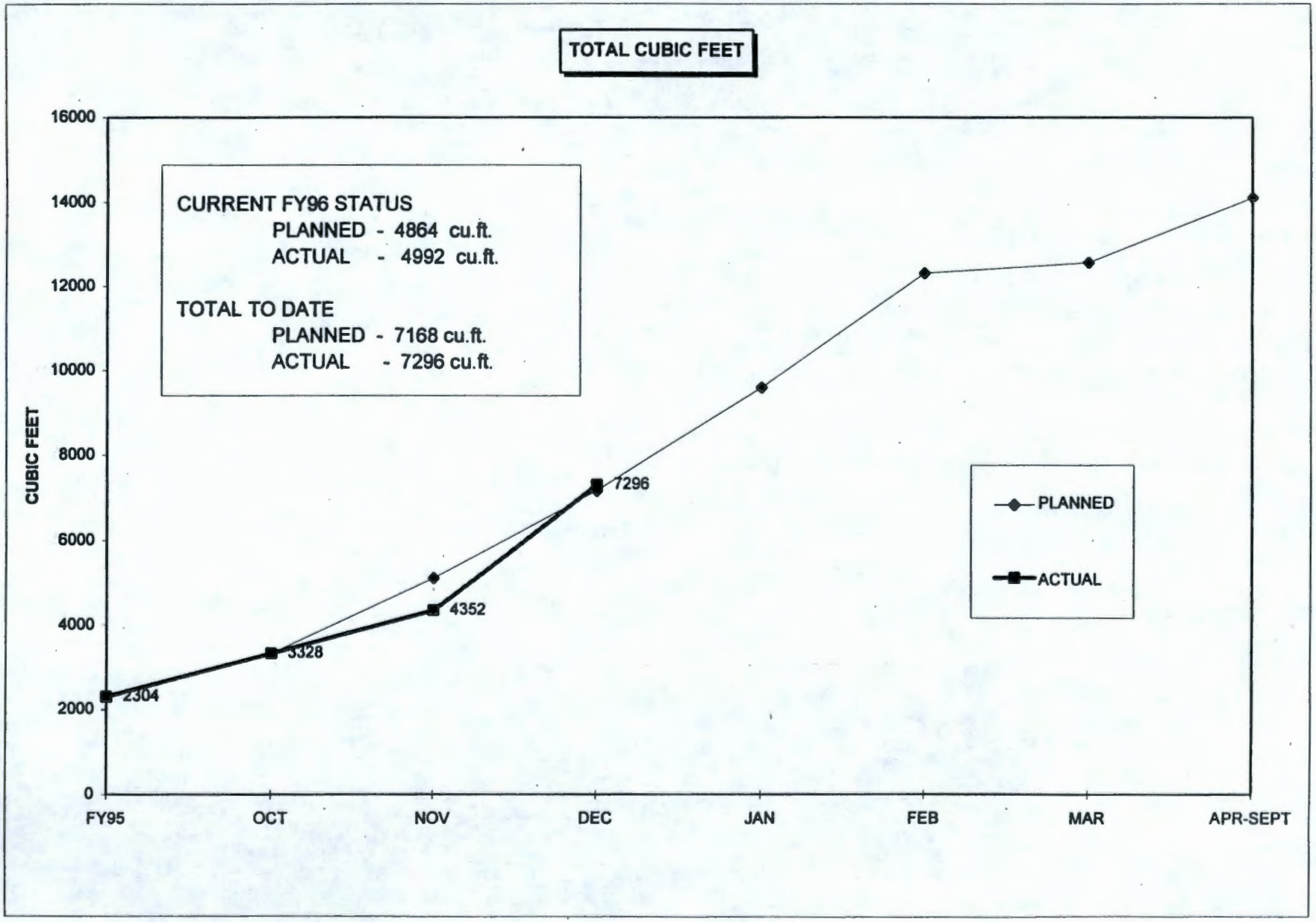


C:\POC\OPERABLE.XLS

96154/U.1699

N BASIN CLEANUP

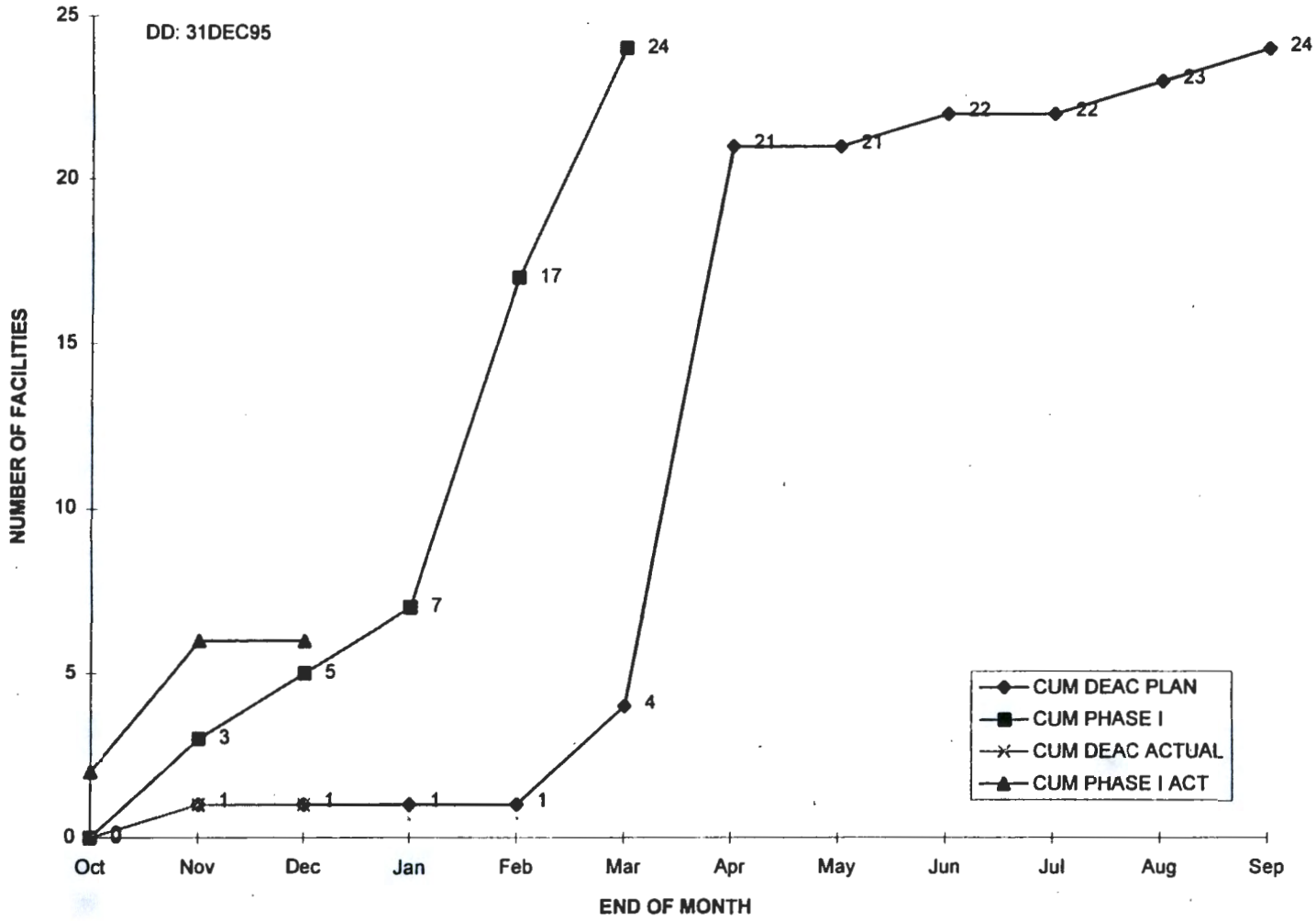
12/31/95



CUBFEET.XLS

96154/0.1/00

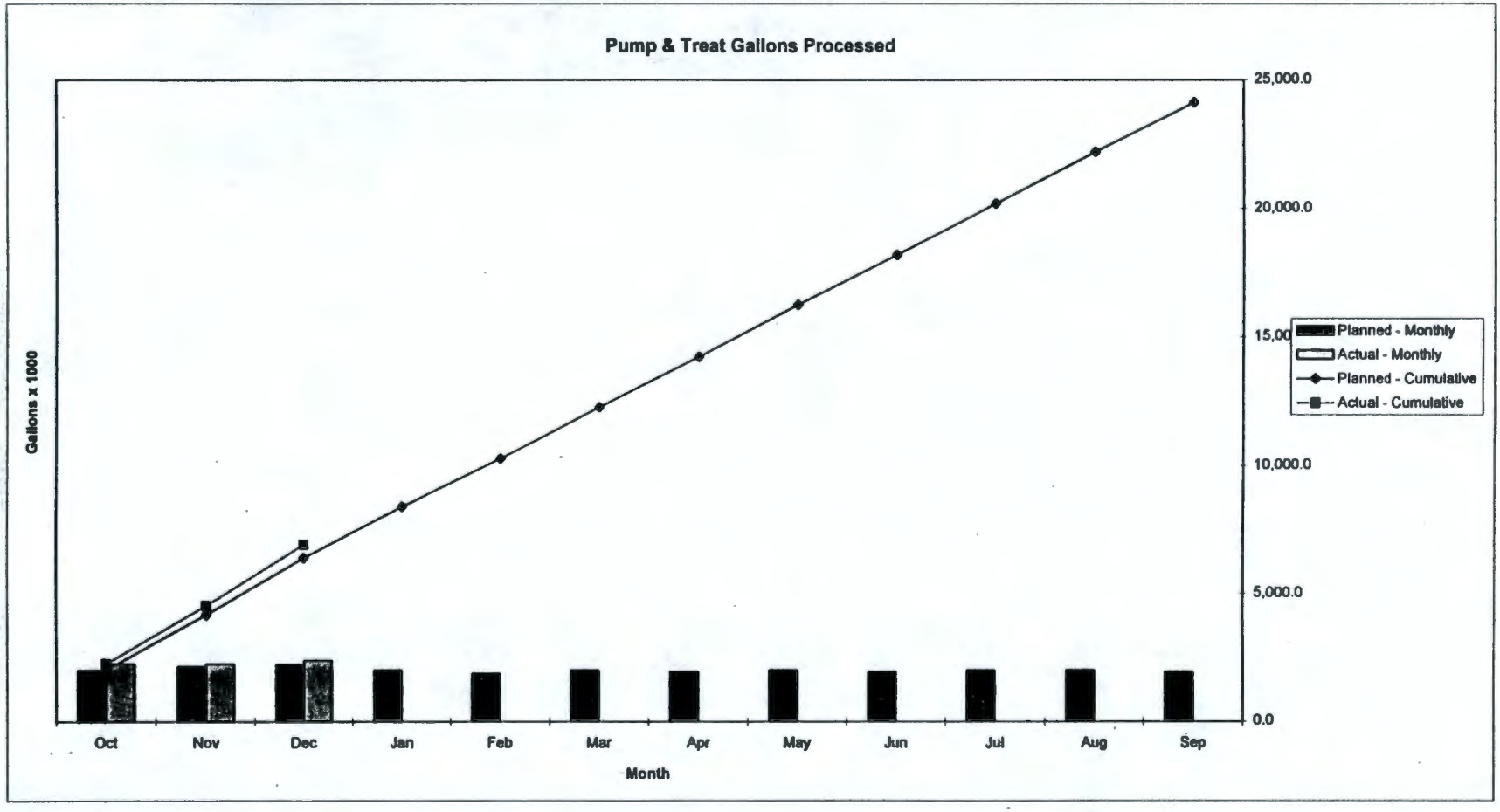
DEACTIVATION PRODUCTION CURVES



9613470.1701

PUMP & TREAT QUANTITIES

Nov-95



x 1000

Quantities	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Planned - Monthly	2,009.0	2,158.7	2,218.5	2,009.0	1,879.0	2,009.0	1,944.0	2,009.0	1,944.0	2,009.0	2,009.0	1,944.0
Actual - Monthly	2,261.1	2,259.8	2,384.3									
Planned - Cumulative	2,009.0	4,167.7	6,386.2	8,395.2	10,274.2	12,283.2	14,227.2	16,236.2	18,180.2	20,189.2	22,198.2	24,142.2
Actual - Cumulative	2,261.1	4,520.9	6,905.2									

Assumes 10% Downtime, 50 gpm operation

961547D.1702

90 DAY LOOK AHEAD

- Perform technical demonstration on 3M cartridge filter system for N Basin Water.
- Develop ISP package for EDB work scope.
- Complete low dose hardware removal.
- Fabrication of high dose casks.
- Accelerate tank cleanout contract award.
- Initiate Project Readiness Evaluation for High Dose Removal.
- Begin high dose removal in N Basin.
- Repeat BHI independent Readiness Evaluations for ROSEE on 2/5/96.
- Repeat RL independent Readiness Assessment for ROSEE on 2/12/96.
- Complete turnover/closeout packages for 19 buildings.
- Complete Phase I Deactivation of 18 facilities.

9613471.1705

90 DAY LOOK AHEAD (continued)

- Complete design of in situ treatment trench.
- Issue treatability test plan to regulators for In Situ Treatment zone.
- Develop subcontract specifications for EDB sediment removal.
- Submit letter report on preferred disposal method for EDB sediment. (POC)
- Issue groundwater monitoring program consolidation report to DOE/RL (POC 1/24/96).
- Issue performance evaluation report on P & T to DOE/Regulators (TPA 2/24/96).

9613470.1704

SIGNIFICANT ISSUES/CONCERNS

Issue: EDPI 4.32 RE process is more cumbersome than MOU for N Basin.

Action: Follow up on feedback provided in comparing EDPI-4.32 versus MOU for N Basin REs.

Issue: Weather inversions - Radon in Basin causes 3 day delay.

Action: Rad Con is evaluating whether or not air monitoring is needed for alpha.

9615470.1705

INNOVATIONS/TECHNOLOGY

- 3M Ion Specific Impregnated Filter Cartridge System for use at Pump-and-Treat and N Basin.

961547D.1706

PERFORMANCE

9613470.1707

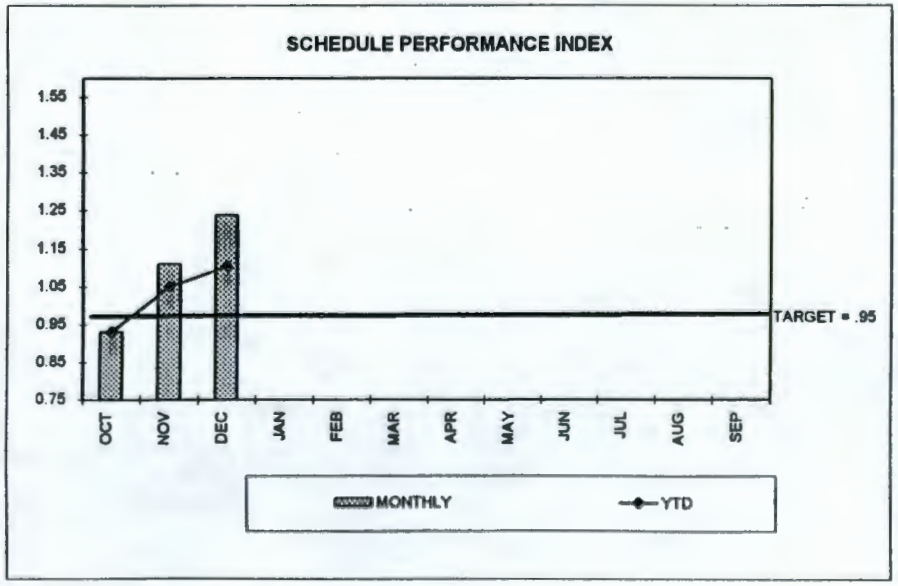
ADS Cost Performance Report

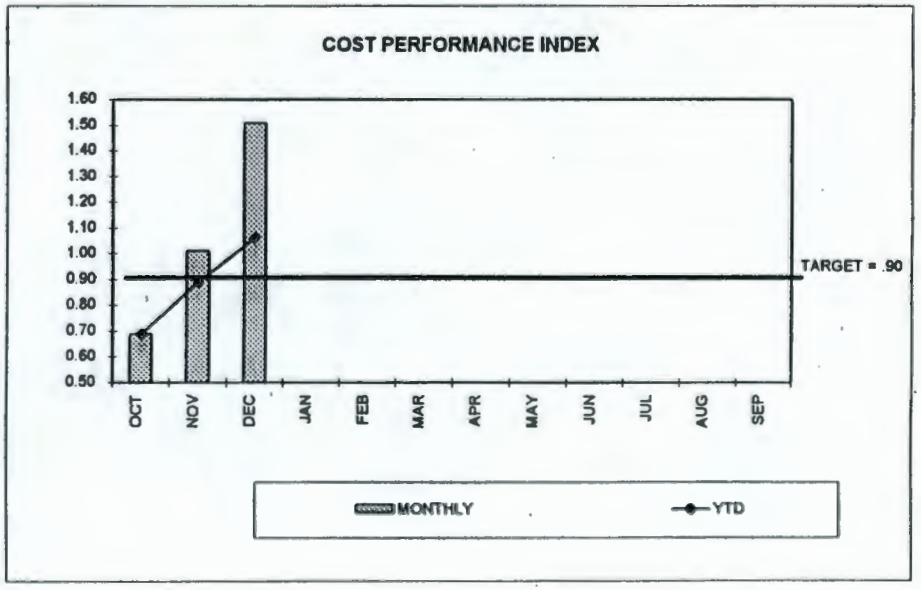
Month Ending: December 31,1995

(Dollars In $1,000)

1/15/96

ADS 31250: 100 NR REMEDIAL ACTIONS		CURRENT PERIOD					FISCAL YEAR TO DATE					FISCAL YEAR BUDGET / EAC			
		Budgeted Cost of Work		Actual Cost of Work	Performance		Budgeted Cost of Work		Actual Cost of Work	Performance		FY96 Work Plan	Current Budget	Fiscal Year	EAC vs. Budget
COST ACCOUNT	TITLE	Sched (S)	Perf (P)	Perf (A)	SPI (S/P)	CPI (A/P)	Sched (S)	Perf (P)	Perf (A)	SPI (S/P)	CPI (A/P)	Budget	Baseline	EAC	Variance
1PG1104	100-NR-1 FEASIBILITY STUDIES	6.3	6.3	0.6	1.00	0.10	18.6	18.6	5.3	1.00	0.28	322.0	322.0	322.0	
1PG2103	100-NR-2 CHARACTERIZATION	33.7	35.3	17.6	0.95	0.50	104.2	94.2	43.9	1.11	0.47	305.0	323.0	323.0	
1PG2022	ERA IMPLEMENTATION	199.0	151.4	273.2	1.31	1.80	652.9	591.1	697.9	1.10	1.18	2,034.0	2,124.0	2,124.0	
1PG2207	ERA UPGRADE	-	-	-			-	-	-			1,833.0	1,833.0	616.0	1,217.0
	SUBTOTAL	239.0	193.0	291.4	1.24	1.51	775.7	703.9	747.1	1.10	1.06	4,494.0	4,602.0	3,385.0	1,217.0
1PG1103	100-NR-1 CHARACTERIZATION	830.0	948.8	681.7	0.87	0.72	2,006.1	1,679.7	1,104.1	1.19	0.66	3,189.0	3,189.0	2,187.0	1,002.0
1PG2104	100-NR-2 FEASIBILITY STUDIES	82.5	84.1	165.4	0.98	1.97	264.3	160.5	300.0	1.65	1.87	941.0	941.0	1,618.1	(677.1)
1PGD101	PERFORMANCE FEE	6.7	6.7	(1.1)	1.00	(0.16)	20.0	20.0	(1.2)	1.00	(0.06)	267.0	267.0	267.0	
1PGD201	PERFORMANCE FEE	8.2	8.2	6.6	1.00	0.80	24.7	24.7	27.9	1.00	1.13	329.0	329.0	329.0	
1PGD401	PERFORMANCE FEE	7.8	7.8	14.7	1.00	1.88	23.3	23.3	52.0	1.00	2.23	311.0	311.0	311.0	
	Adjustments		-	(51.4)			-	-	(53.0)			-	-	-	
												-	-		
ADS 31250	N DEACTIVATION	1,174.2	1,248.6	1,107.3	0.94	0.89	3,114.1	2,612.1	2,176.9	1.19	0.83	9,631.0	9,639.0	8,097.1	1,541.9





9613470.1708

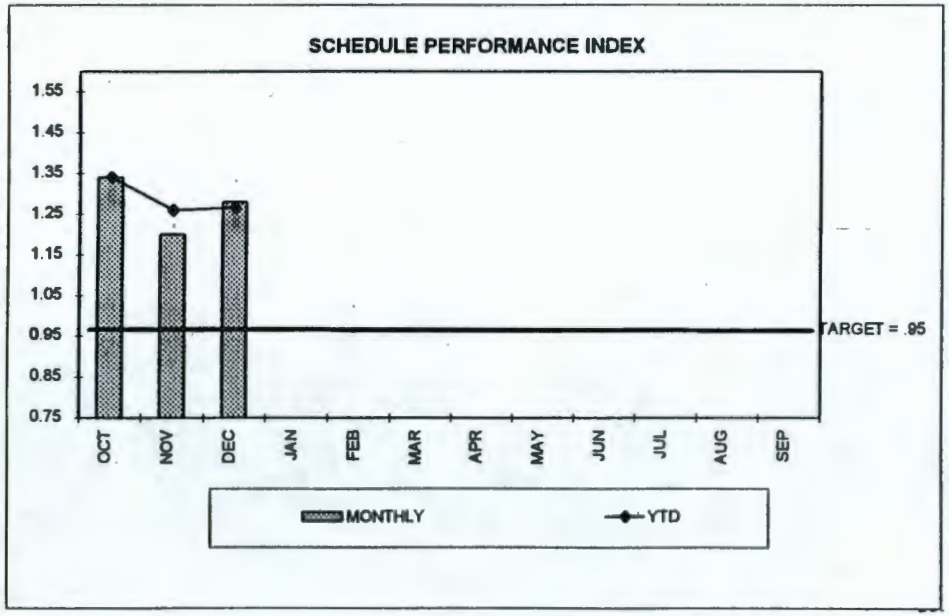
ADS Cost Performance Report

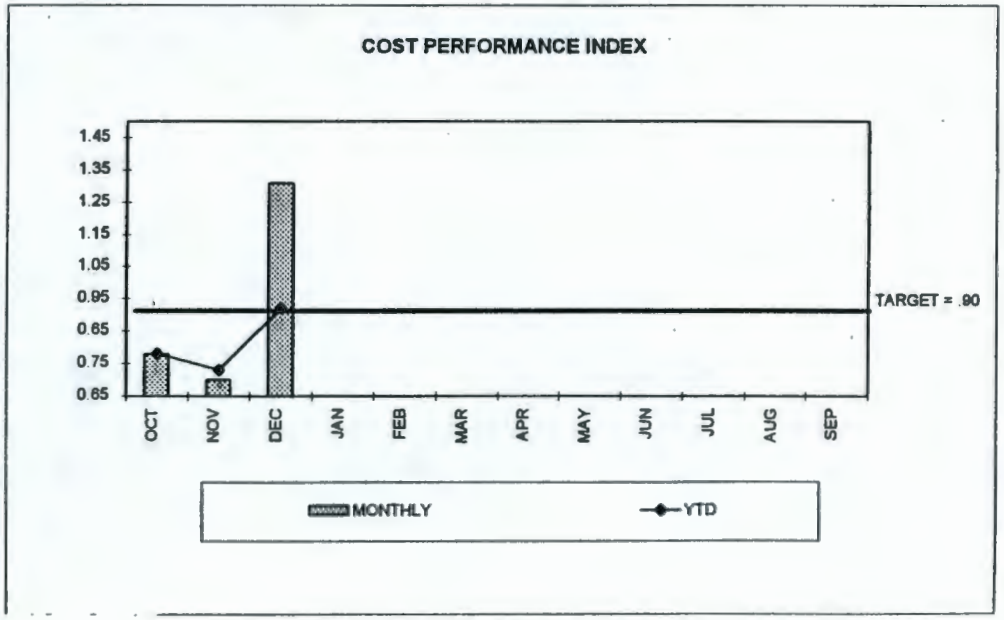
Month Ending: December 31, 1995

(Dollars in $1,000)

1/17/96

ADS 36000: N DEACTIVATION		CURRENT PERIOD					FISCAL YEAR TO DATE					FISCAL YEAR BUDGET / EAC			
		Budgeted Cost of Work		Actual Cost of Work	Performance		Budgeted Cost of Work		Actual Cost of Work	Performance		FY96 Work Plan Budget	Current Budget Baseline	Fiscal Year EAC	EAC vs. Budget Variance
COST ACCOUNT	TITLE	Sched (S)	Perf (P)	Perf (A)	SPI (S/P)	CPI (A/P)	Sched (S)	Perf (P)	Perf (A)	SPI (S/P)	CPI (A/P)				
1UN2102	WASTE HANDLING & DISPOSAL	255.3	87.2	103.0	2.93	1.18	873.3	481.0	264.0	1.82	0.55	4,678.0	4,733.0	3,783.0	950.0
1UN3101	BLDG. & SYS. DEACTIVATION	281.3	260.6	325.7	1.08	1.25	860.3	820.8	652.0	1.05	0.79	5,207.0	5,234.0	4,924.0	310.0
1UN4201	N BASIN CLEANUP	488.1	446.1	724.6	1.09	1.62	1,472.3	1,283.6	1,548.4	1.15	1.20	8,076.0	8,112.0	8,112.0	-
1UN4202	EMERGENCY DUMP BASIN	44.6	41.4	73.7	1.08	1.78	170.5	83.2	124.4	2.05	1.50	1,237.0	1,237.0	1,237.0	
	SUBTOTAL	1,069.3	835.3	1,227.0	1.26	1.47	3,376.4	2,668.7	2,586.9	1.27	0.97	19,198.0	19,318.0	18,056.0	1,260.0
1UN1101	DIRECT PROJECT SUPPORT	15.7	15.7	5.4	1.00	0.34	59.5	59.5	10.3	1.00	0.17	1,393.0	441.0	441.0	
1UN2101	FACILITY COMPLIANCE	241.7	241.8	204.6	1.00	0.85	889.3	692.9	550.4	1.28	0.79	3,919.0	3,930.0	3,480.0	450.0
1UN5101	96 FEE - B&R EW2010401	54.9	54.9	70.6	1.00	1.29	164.8	164.8	211.8	1.00	1.29	2,197.0	2,197.0	2,197.0	
1UN5201	96 FEE - B&R EW2010402	14.4	14.4	16.5	1.00	1.28	43.3	43.3	55.5	1.00	1.28	577.0	577.0	577.0	
*****	Other Cost Account Adjustments			(11.8)					(403.8)						
ADS 36000	N DEACTIVATION	1,396.0	1,162.1	1,514.3	1.20	1.30	4,533.3	3,629.2	3,011.1	1.25	0.94	27,284.0	26,461.0	24,751.0	1,710.0



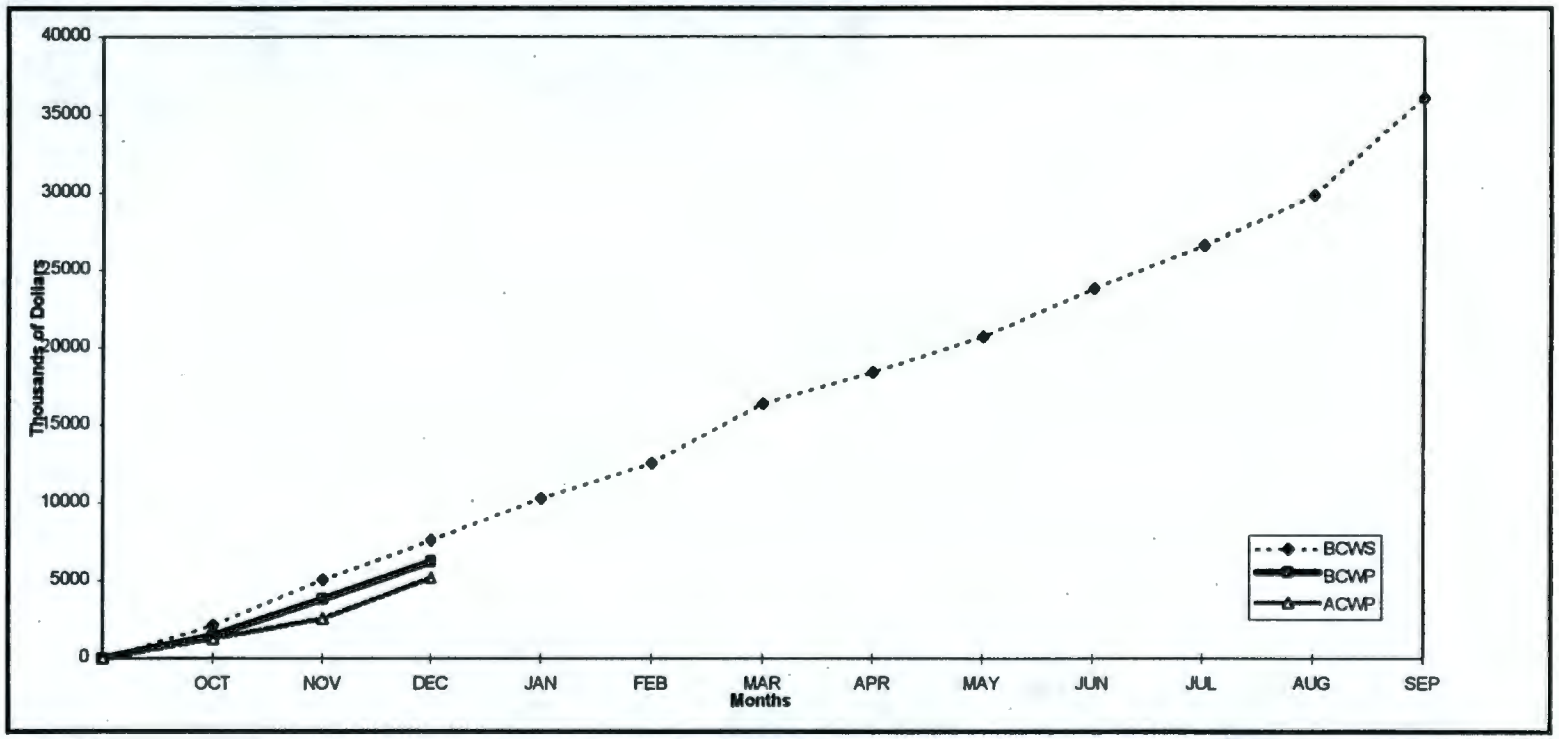


9615470.1709

Performance Graph

N AREA PROJECT

December 1995



	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
FY 96 MULTI-YEAR WORK PLAN												
FYWP	2,306	5,477	8,340	11,316	13,795	17,862	20,110	22,651	25,878	28,594	32,132	37,095
CURRENT PERIOD												
BCWS	2,152	2,925	2,570	2,677	2,271	3,850	2,066	2,298	3,108	2,735	3,256	6,192
BCWP	1,472	2,361	2,411									
ACWP	1,246	1,310	2,622									
YEAR TO DATE												
BCWS	2,152	5,077	7,647	10,324	12,595	16,445	18,511	20,808	23,917	26,651	29,907	36,100
BCWP	1,472	3,830	6,241									
ACWP	1,246	2,566	5,188									
EAC	1,246	2,566	5,188	7,865	10,036	13,788	15,755	17,953	20,962	23,598	26,756	32,848

9615470.1710

Schedule Variance Report

N REACTOR

December 1995

ADS	Desc	VAR	Issue	Impact	Corrective Action
3600	Faciliy Compliance	($196K)	FY96 budget erroneously left money for electrical assessments.	Work scheduled for this budget will not be performed by this project. Assessments are budgeted in ADS 3400.	A BCP is pending change control board approval. Upon approval, this variance will become zero.
3600	Waste Management	($392K)	Waste scheduled for shipment was not shipped.	Temporary overstatement of schedule variance.	None - Schedule variance will decrease when waste is shipped.
3600	N Basin Cleanout	($189K)	Low production rates on low dose debris removal.	None. Water clarity issue is resolved and production rates are increasing. Full schedule recovery is expected.	Continue to monitor production rates.
3600	Emergency Dump Basin	($87K)	EDB work effort was on hold pending FY96 funding reduction exercises.	Delayed sediment sampling and analysis. Impacts ability to meet schedule POC.	Funding reductions are finalized. Negotiations on new target date are in process.
3125	Crib Characteriz a-tion	($326)	Drilling activities delayed due to "high rad" work stoppage in Oct. and Nov.	Significant schedule recovery achieved in December, expect total recovery by end of February.	Drilling has now completed. Schedule recovery is expected in February when sample analysis is complete.
3125	In situ treatment curtain	($104K)	Scope changes and additional regulatory requirements have caused significant schedule delays.	Schedule date for completion by 2/29/95 is unobtainable.	A baseline change proposal has been generated to adjust scope, cost and schedule baselines. Expect BCP approval in January.

9615470.1711

CHANGE CONTROL

9613470.1712

Trend Register

N REACTOR

DECEMBER 1995

ADS #	Trend Date	TRN #	BCP #	Description/Reason	Estimate FY96 $	Baseline $	Schedule Impact	Actions / Notes	Resp Manager
3125									
	05-Jan-96	10	96058	Funding Reduction	($1,217)	$0	N	Incorporated in EAC	Greenidge
	01-Nov-95	6		Moisture logging, stand by costs, Sr90 release, 1301N / 1325N crib characterization	$0	$0	N	Incorporated in EAC	Greenidge
	05-Jan-96	8	96023	In situ treatment - scope increase	$677	$854	Y	Incorporated in EAC	Greenidge
	05-Jan-96	9		Crib Characterization cost savings	($1,002)	$0	N	Incorporated in EAC	Greenidge
3600									
	29-Nov-95	1		Disposal of N Area Waste Stored at KE & KW	$250	$0	N	Verifying Quantities	Greenidge
	29-Nov-95	2	96059	Defer Deactiviation of Facilities 1722N, 105NA, 105NB	($64)	$0	N	BCP is complete. Pending Change Control Board approval.	Greenidge
	29-Nov-95	3	96059	Defer Electrical Upgrade	($246)	$0	N	BCP is complete. Pending Change Control Board approval.	Greenidge

Trend Register

N REACTOR

DECEMBER 1995

ADS #	Trend Date	TRN #	BCP #	Description/Reason	Estimate FY96 $	Baseline $	Schedule Impact	Actions / Notes	Resp Manager
	29-Nov-95	4	96060	Excess Budget for utility assessments	($450)	$0	N	BCP is complete. Pending Change Control Board approval.	Greenidge
	29-Nov-95	5		Decrease in WHC Waste Disposal Rates	($1,200)	$0	N	Not incorporated in EAC	
				Grand Total:	($3,252)	$854			

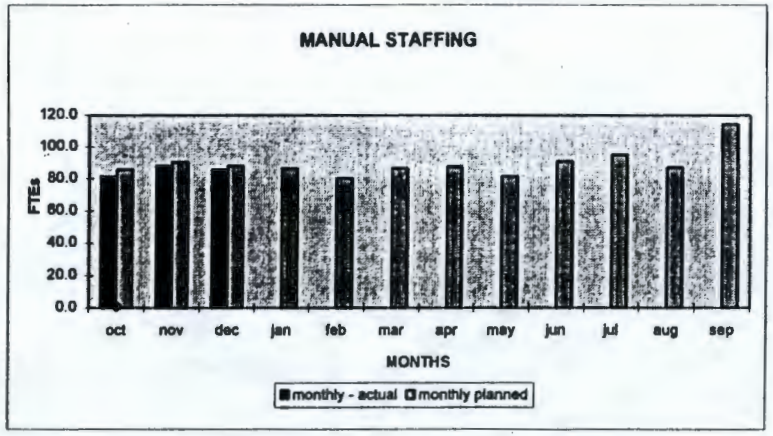
STAFFING

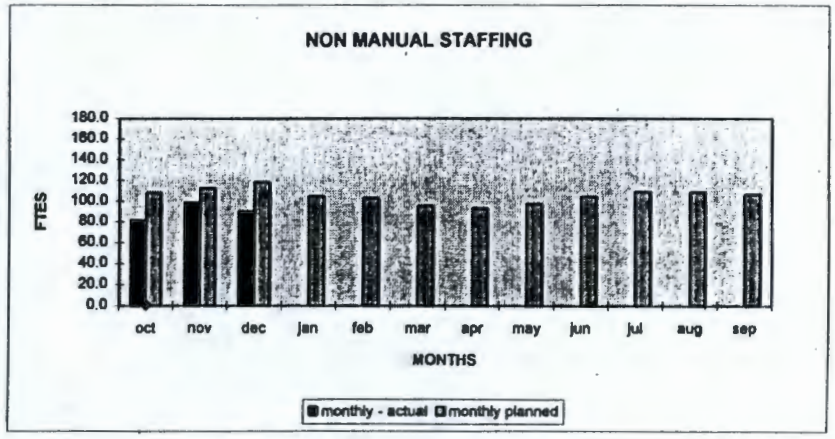
9613470.1715

N AREA PROJECT STAFFING

Month Ending: December 31, 1995

N AREA PROJECT		CURRENT PERIOD				FISCAL YEAR TO DATE			
		Manual Labor		Non manual Labor		Manual Labor		Non manual Labor	
PROJ ACCOUNT	TITLE	Planned FTEs	Actual FTEs	Planned FTEs	Actual FTEs	Planned FTEs	Actual FTEs	Planned FTEs	Actual FTEs
1UN1101	DIRECT PROJECT SUPPORT							0.0	0.4
1UN2101	FACILITY COMPLIANCE	15.3	9.7	9.4	6.5	15.4	11.7	9.4	6.6
1UN2102	WASTE HANDLING & DISPOSAL	3.8	2.9	11.8	6.1	3.8	3.4	11.8	6.1
1UN3101	BLDG. & SYS. DEACTIVATION	15.4	12.2	23.3	14.9	14.6	13.1	23.4	11.9
1UN4201	N BASIN CLEANUP	37.6	44.2	24.4	23.9	41.1	43.3	24.5	21.3
1UN4202	EMERGENCY DUMP BASIN	0.0	2.6	3.4	1.5	0.8	1.9	2.8	1.8
	ADS 3600 Subtotal	**72.1**	**71.6**	**72.3**	**52.9**	**75.8**	**73.4**	**71.9**	**48.1**
1PG1103	100-NR-1 CHARACTERIZATION	11.3	8.1	22.5	9.4	9.1	7.9	18.5	9.7
1PG1104	100-NR-1 FEASIBILITY STUDIES			0.8	0.0			0.8	0.0
1PG2103	100-NR-2 CHARACTERIZATION			1.9	2.1			1.3	1.8
1PG2104	100-NR-2 FEASIBILITY STUDIES			9.3	10.1			9.6	8.0
1PG2022	ERA IMPLEMENTATION	3.1	6.0	14.2	15.8	2.6	4.7	10.9	16.5
1PG2207	ERA UPGRADE								
	ADS 3125 Subtotal	**14.4**	**14.1**	**48.7**	**37.4**	**11.7**	**12.6**	**41.1**	**36.0**
	TOTAL N AREA	**86.5**	**85.7**	**121.0**	**90.3**	**87.5**	**86.0**	**113.0**	**84.1**





9613470.1716

PROJECT MILESTONE SCHEDULES

96 13470.1717

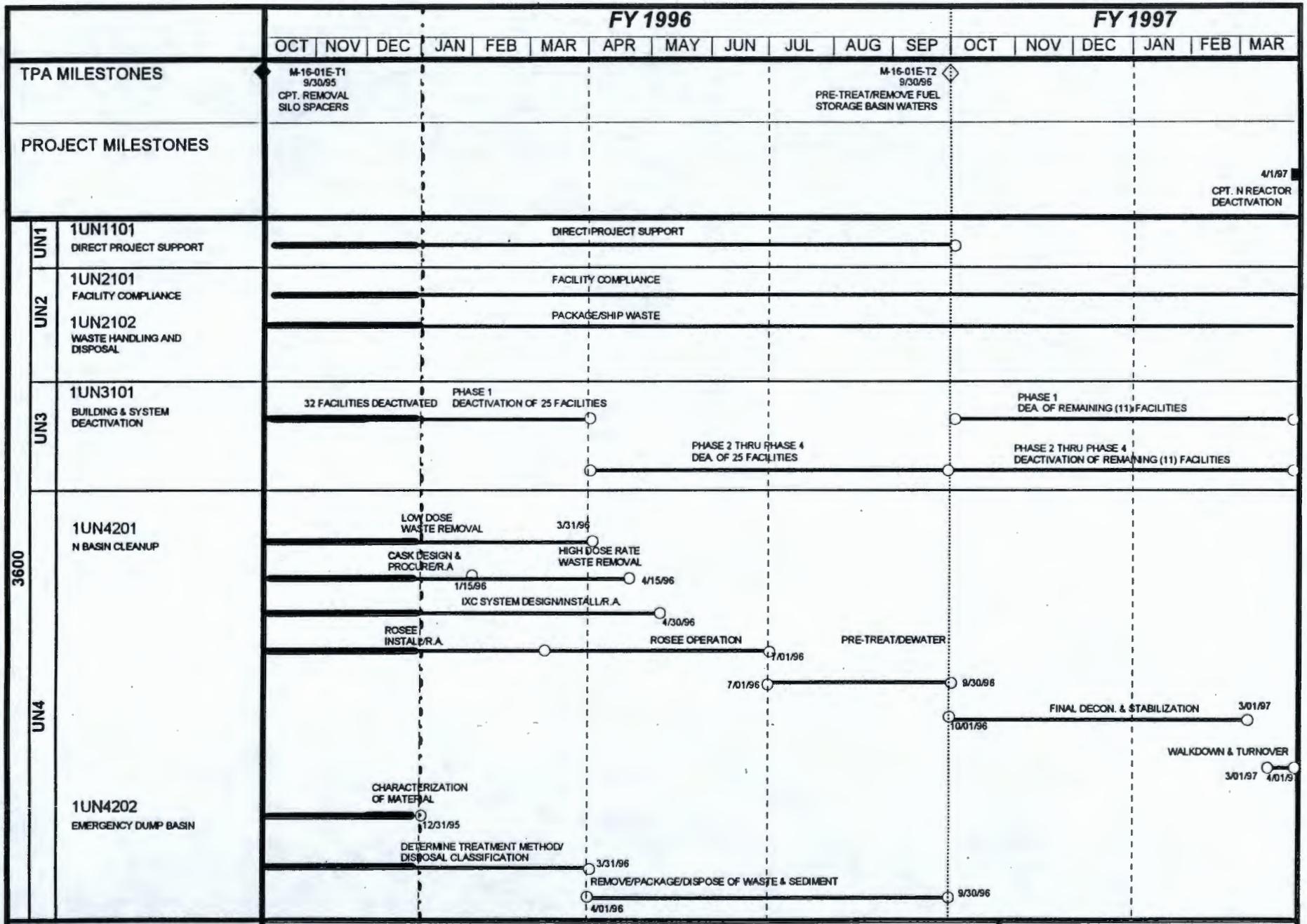
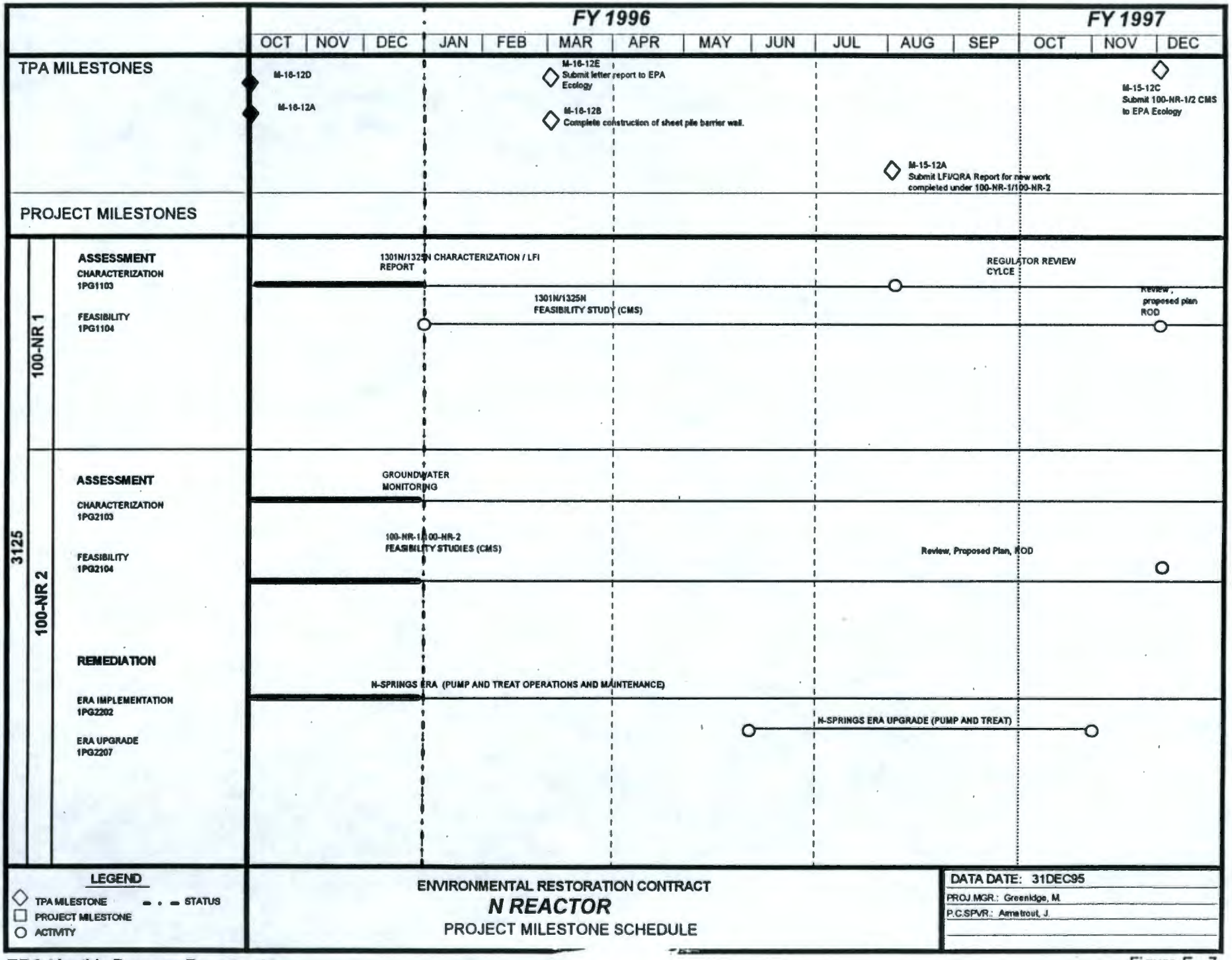


Figure E - 7

9613470.1718



9616470.1719

CONSOLIDATED GROUNDWATER MONITORING PROGRAM

9613470.1720

9613470.1721

100-N Pilot Project: Proposed Consolidated Groundwater Monitoring Program

Purpose

Consolidate Groundwater Programs to minimize cost, time, and effort for groundwater monitoring and to coordinate regulatory compliance activities.

9615470.1722

Subprograms

- RCRA
- 100-NR-2
- ERA Performance
- Sitewide Surveillance (including Washington Department of Health)
- Liquid Effluent
- Near Field
- National Pollutant Discharge Elimination System (NPDES)

Planning Workshop

- Objective was to develop criteria for streamlining the subprograms
- Streamline each subprogram
- Consolidate into one program

Existing Subprograms

- RCRA
  - 1301N, 1325N, 1324N/NA
  - 40 CFR 265
  - 21 wells in existing program
  - Sampled quarterly to semi-annually
  - Located near facilities
- 100-NR-2
  - 100-NPL Agreement Change Control Form
  - 27 wells
  - Sampled semi-annually
  - Located throughout 100-N

Existing Subprograms

- ERA Performance
  - Result of DQO workshop
  - 14 wells
  - Sampled monthly
  - located near 1301N and 1325N
- Sitewide Surveillance
  - DOE orders
  - 15 wells
  - Sampled annually
  - Located throughout 100-N
  - Includes 4 wells sampled for Washington Department of Health

Existing Subprograms

- Liquid Effluent
  - DOE orders
  - 1 wells
  - Sampled annually
  - Located between 1301N and river
- Near Field
  - DOE orders
  - 2 wells and seeps
  - Sampled monthly
  - Located near N-Basin

Existing Subprograms

- NPDES
  - NPDES permit
  - 1 well
  - Sampled quarterly
  - Located between 1301N and river

9613470.1725

Evaluation Process

- Streamline each subprogram
  - Driver
  - Sampling locations
  - Frequency
  - Analytical constituents

- Each well within subprogram evaluated based on:
  - Available water column
  - Flow direction
  - Well construction
  - Well condition
  - Contaminant trends
  - Contaminant distributions
  - Monitoring purpose fulfilled
  - Minimum number of wells to meet requirements
  - Minimum number of analytes to meet requirement
  - Lowest frequency of sampling

96154/U.1726

Development of Consolidated Program

- Comparing/analyzing each well with respect to other subprogram requirements
- Determining if, within a group of wells, one well could meet all subprogram requirements

Proposed Consolidated Program

- Reduces overall groundwater sampling and analysis activities for the 100-N Area while meeting objectives of all subprograms
- 40 wells
- Sampled frequency varies from monthly to annually
- Coverage adequate for all of 100-N

9615470.1727

Conclusions

- Proposed program meet needs of all subprograms
- Proposed program reduces
  - Number of wells by 9
  - Frequency of sampling in 17 wells
  - Number of well trips
  - Program costs by $240,000

Recommendation

- Implement via an NPL agreement
- Subprogram representatives should meet periodically
- Implement in 1996

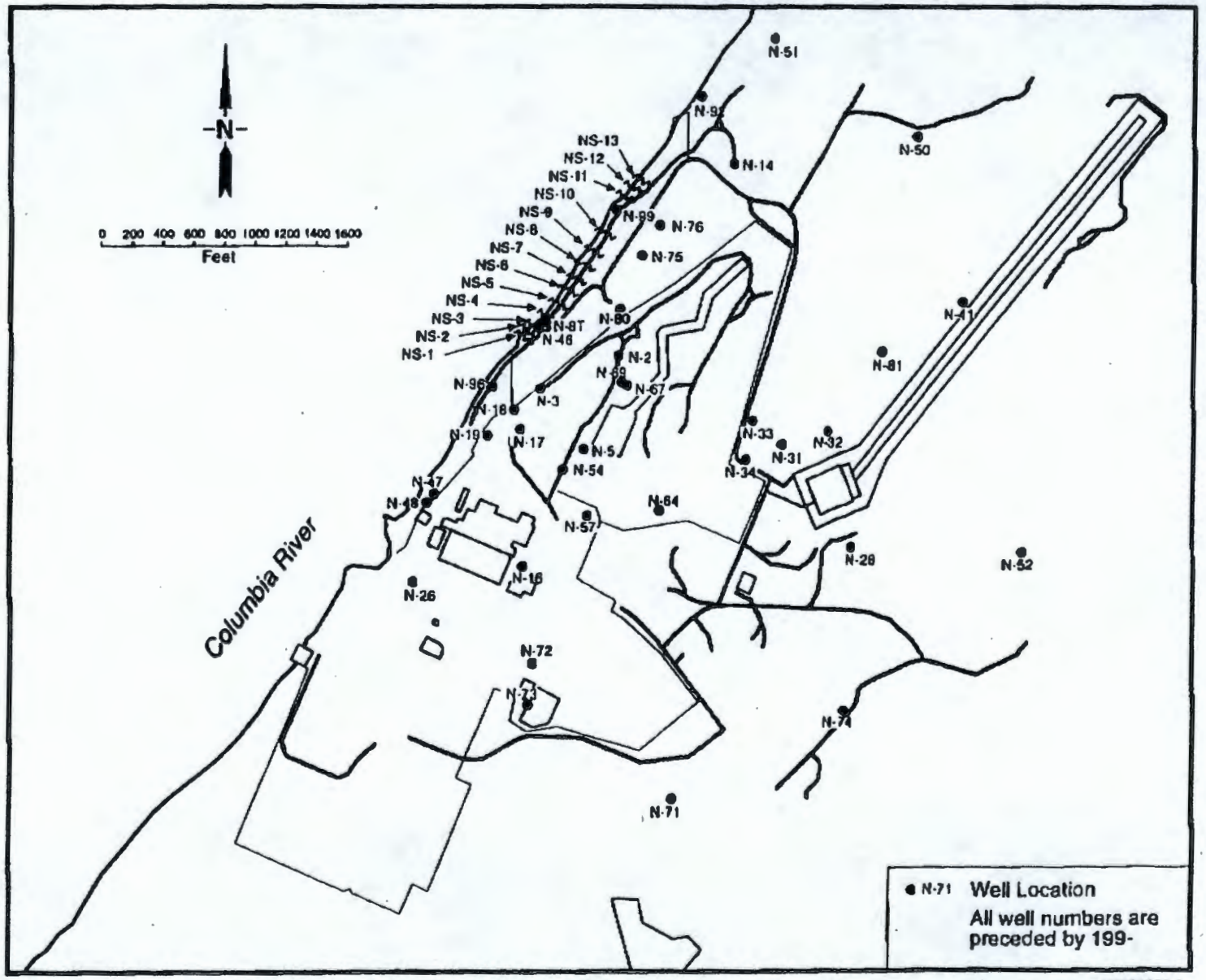
Table 3-1. Wells Within the Existing Groundwater Programs (Sheet 1 of 2)

Well No.	RCRA	NR-2	Performance Monitoring	Surveillance	Near Field	Liquid Effluent	NPDES
199-N-2	X		X	X			
199-N-3	X	X	X	X			
199-N-5				X			
199-N-8T							X
199-N-14	X		X	X			
199-N-16		X					
199-N-17		X					
199-N-18		X					
199-N-19		X					
199-N-20		X					
199-N-21		X					
199-N-25		X					
199-N-26		X					
199-N-27	X						
199-N-29		X					
199-N-31			X				
199-N-32	X	X					
199-N-34	X						
199-N-41	X						
199-N-43	X						
199-N-46			X			X	
199-N-47					X		
199-N-48					X		
199-N-49		X					
199-N-50		X					
199-N-51		X					
199-N-52				X			
199-N-54		X					
199-N-57	X						
199-N-59	X						
199-N-64		X					
199-N-66		X					
199-N-67	X	X	X	X			
199-N-69	X			X			
199-N-70	X	X					
199-N-71	X	X					

Table 3-1. Wells Within the Existing Groundwater Programs (Sheet 2 of 2)

Well No.	RCRA	NR-2	Performance Monitoring	Surveillance	Near Field	Liquid Effluent	NPDES
199-N-72	X						
199-N-73	X	X					
199-N-74	X	X					
199-N-75	X	X	X				
199-N-76	X	X	X	X			
199-N-77	X	X					
199-N-80		X		X			
199-N-81	X			X			
199-N-92A			X				
199-N-96A			X				
199-N-99A			X				
199-N-103A			X				
199-N-105A			X				
199-N-106A			X				
Seep Wells					X		

Proposed Consolidated Program



E9601050.2

Table 5-1. Wells Within the Proposed Groundwater Program

Well No.	RCRA	NR-2	Performance Monitoring	Surveillance	Near Field	Liquid Effluent	NPDES
199-N-2	X	X	X				
199-N-3	X	X	X	X			
199-N-5				X			
199-N-8T							X
199-N-14			X	X			
199-N-16		X		X			
199-N-17		X					
199-N-18		X		X			
199-N-19				X			
199-N-26				X			
199-N-28	X			X			
199-N-31			X				
199-N-32	X	X					
199-N-33				X			
199-N-34	X			X			
199-N-41	X			X			
199-N-46			X			X	
199-N-47				X	X		
199-N-48					X		
199-N-50		X		X			
199-N-51		X		X			
199-N-52				X			
199-N-54		X					
199-N-57	X			X			
199-N-64		X					
199-N-67		X	X	X			
199-N-69				X			
199-N-71	X			X			
199-N-72	X						
199-N-73	X						
199-N-74	X			X			
199-N-75		X	X				
199-N-76		X	X	X			
199-N-80				X			
199-N-81	X	X		X			
199-N-92A		X	X				
199-N-96A		X	X				
199-N-99A		X	X				
199-N-103A			X				
199-N-105A	X		X				
199-N-106A			X				
Seep Wells					X		

Table 5-2. Analytes and Sampling Frequency for the Proposed Consolidated Program (Sheet 1 of 3)

Well No.	Frequency	Conductivity	Eh	pH	Temperature	Turbidity	Alkalinity	Ammonia	Anions	Ca, Mg, SO4 (EAL)	ICP-M	ICP-M (F)	Chromium	Iron	Oil/Grease	TPH	TPH (EAL)	TOC	TOX	Alpha	Beta	Gamma Scan	Gamma Scan (F)	Strontium-90	Strontium-90 (F)	Tritium	Iodine-129	Technetium-99
199-N-2	A	NR		NR	NR	NR	RC		NR RC			NR RC									NR			NR		NR		
	S	RC		RC		RC												RC	RC									
	M	PM	PM	PM	PM					PM														PM				
199-N-3	A	NR		NR	NR	NR	RC		NR SV RC			NR RC								SV	NR	SV		NR		NR SV		
	S	RC		RC		RC												RC	RC									
	M	PM	PM	PM	PM					PM							PM							PM				
199-N-5	A								SV															SV		SV		
199-N-8T	Q			NP	NP			NP					NP	NP	NP													
199-N-14	A																			SV		SV		SV		SV	SV	SV
	M	PM	PM	PM	PM					PM														PM				
199-N-16	A	NR		NR	NR	NR			NR SV			NR			NR	NR					NR			NR SV				
199-N-17	A	NR		NR	NR										NR	NR												
199-N-18	A	NR		NR	NR				SV						NR	NR										SV		
199-N-19	A								SV															SV				
199-N-26	A								SV															SV				
199-N-28	A						RC		RC			RC												SV				
	S	RC		RC		RC												RC	RC									
199-N-31	M	PM	PM	PM	PM																			PM				
199-N-32	A	NR		NR	NR	NR			NR RC			NR RC									NR			NR		NR		
	S	RC		RC		RC	RC											RC	RC									
199-N-33	A										SV	SV										SV	SV					

9613470.1732

Table 5-2. Analytes and Sampling Frequency for the Proposed Consolidated Program (Sheet 2 of 3)

Well No.	Frequency	Conductivity	Eh	pH	Temperature	Turbidity	Alkalinity	Ammonia	Anions	Ca, Mg, SO4 (EAL)	ICP-M	ICP-M (F)	Chromium	Iron	Oil/Grease	TPH	TPH (EAL)	TOC	TOX	Alpha	Beta	Gamma Scan	Gamma Scan (F)	Strontium-90	Strontium-90 (F)	Tritium	Iodine-129	Technetium-99
199-N-34	A								RC			RC												SV				
	S	RC		RC		RC	RC											RC	RC									
199-N-41	A						RC		RC			RC												SV				
	S	RC		RC		RC												RC	RC									
199-N-46	A																			LE	LE	LE						
	M	PM	PM	PM	PM																			LE PM		LE		
199-N-47	A																							SV				
	Q																					NF						
199-N-48	Q																					NF						
199-N-50	A	NR		NR	NR																NR					NR SV		
199-N-51	A	NR		NR	NR																NR			SV	SV	NR		
199-N-52	A																							SV		SV		
199-N-54	A	NR		NR	NR	NR			NR			NR			NR	NR					NR			NR				
199-N-57	A						RC		RC			RC												SV				
	S	RC		RC		RC												RC	RC									
199-N-64	A	NR		NR	NR	NR			NR			NR									NR			NR		NR		
199-N-67	A	NR		NR	NR	NR			NR			NR									NR			NR SV		SV		
	M	PM	PM	PM	PM					PM														PM				
199-N-69	A																							SV		SV		
199-N-71	A						RC		RC			RC												SV		SV		
	S	RC		RC		RC												RC	RC									
199-N-72	A						RC		RC			RC																
	S	RC		RC		RC												RC	RC									

9613470.1733

Table 5-2. Analytes and Sampling Frequency for the Proposed Consolidated Program (Sheet 3 of 3)

Well No.	Frequency	Conductivity	Eh	pH	Temperature	Turbidity	Alkalinity	Ammonia	Anions	Ca, Mg, SO4 (EAL)	ICP-M	ICP-M (F)	Chromium	Iron	Oil/Grease	TPH	TPH (EAL)	TOC	TOX	Alpha	Beta	Gamma Scan	Gamma Scan (F)	Strontium-90	Strontium-90 (F)	Tritium	Iodine-129	Technetium-99
199-N-73	A						RC		RC			RC																
	S	RC		RC		RC												RC	RC									
199-N-74	A						RC		RC			RC												SV		SV		
	S	RC		RC		RC												RC	RC									
199-N-75	A	NR		NR	NR	NR			NR			NR									NR			NR		NR		
	M	PM	PM	PM	PM					PM														PM				
199-N-76	A	NR		NR	NR	NR			NR			NR								SV	NR	SV		NR SV		NR		
	M	PM	PM	PM	PM					PM														PM				
199-N-80	A																							SV		SV		
199-N-81	A	NR		NR	NR	NR	RC		NR RC			NR RC									NR			NR SV		NR		
	S	RC		RC		RC												RC	RC									
199-N-92A	A	NR		NR	NR	NR			NR			NR									NR			NR		NR		
	M	PM	PM	PM	PM																			PM				
199-N-96A	A	NR		NR	NR	NR			NR			NR									NR			NR		NR		
	M	PM	PM	PM	PM												PM							PM				
199-N-99A	A	NR		NR	NR	NR			NR			NR									NR			NR		NR		
	M	PM	PM	PM	PM																			PM				
199-N-103A	M	PM	PM	PM	PM					PM							PM							PM				
199-N-105A	A						RC		RC			RC																
	S	RC		RC		RC												RC	RC									
	M	PM	PM	PM	PM					PM														PM				
199-N-106A	M	PM	PM	PM	PM					PM														PM				
Seep Wells	A																					NF		NF		NF		

A = Annually, S = Semi Annually, Q = Quarterly, M = Monthly, F = Filtered

RC = RCRA, NR = NR-2, PM = Performance Monitoring, SV = Surveillance, NF = Near Field, LE = Liquid Effluent, NP = NPDES

9613470.1734

PRELIMINARY CRIB CHARACTERIZATION DATA

9613470.1735

RADIOLOGICAL ACTIVITY IN SOIL SAMPLES FOR BOREHOLE B2536 ANALYZED BY 222-S LABORATORY

DRILL INTERVAL (feet)	RADIOLOGICAL ACTIVITY (Picocuries /gm)																Comments
	Total Alpha	Total Beta	Pu 239/240	Am-241	K-40	Mn-54	Co-60	RuRh-106	Cs-134	Cs-137	CePr-144	Eu-154	Eu-155	Ra-226	Th-228	Sr-90	
N/A	13900	305,000	12,700	17,300	-	-	56,300	-	-	102,000	-	11,800	4,120 34% error	-	-	92,299.9	Soil sample collected in September, 1995, while setting the starter casing for the borehole.
9.0 - 11.0	941	63,700	Lab ran out of soil	856 45.97% error	<422	<140	107,000	<1930	<97.9	12,100	<456	1030 30.37% error	355 45.89% error	<1410	<5270	3250	Split spoon sample. Up to 15 mR/hr window open; 9 mR/hr window closed, on contact with soil. "Hot" rock reading 16 mR/hr window open, 15 mR/hr window closed.
11.0 - 13.0	38,200	60,600	689	1130 30.68% error	<457	<127	132,000	<1740	<87.8	15,100	<402	1370	304 47.92% error	<1260	<4650	12,600	Split spoon sample. Up to 31 mr/hr window open, 25 mR/hr window closed, 220 cpm alpha. Large gravels in the "cleanout material" from the drive barrel read up to 150 mR/hr, probably "hot" coating on the gravels too large to collect with the 5" O.D. split spoon. Probable crib bottom contact at 11.5 feet (between the C and D liners) indicated by higher beta/gamma readings and only place with field detectable alpha activity.
23.0	<2.52	4,310	-	-	0.11	<0.568	23.9	<28.6	2.61	2,790 25.58% error	<11.2	<0.978	<5.55	<44.5	152	1,170	Grab sample from the drive barrel. Up to 1.0 mR/hr window open, 0.5 mR/hr window closed, on contact with soil.
28.0 - 30.0	<2.18	2,810	-	-	<7.02	<0.265	5.82	<4.81	<0.282	5.81	<6.5	<0.557	<2.01	<6.77	<54.2	1,550	Split spoon sample. Up to 0.7 mR/hr window open, 0.4 mR/hr window closed.
28.0 - 30.0	<3.39	2,490	-	-		<0.258	5.25	<4.69	<0.225	5.69		<0.567	<1.85	<9.28	50.4	1,350	Duplicate.
36.0	ARCHIVED ONLY - NOT SUBMITTED FOR ANALYSIS																Grab sample from the drive barrel. Up to 60,000 dpm on contact with soil.
40.0	<1.44	1,680	-	-	11.6	<0.097	1.20	<1.85	<0.097	<0.143	<2.51	<0.286	<0.716	<3.36	<19.9	1,080	Grab sample from the drive barrel. Up to 40,000 dpm on contact with soil. Additional results reported include: 0.951pCi/gm Pb-214 (high uncertainty); 0.733 pCi/gm Ac-228 (high uncertainty).
45.0	ARCHIVED ONLY - NOT SUBMITTED FOR ANALYSIS																Grab sample from the drive barrel. Up to 30,000 dpm on contact with soil.
50.0	<0.968	145	-	-	2.05 high uncertainty	<0.105	0.786	<1.76	<0.076		<1.17	<0.294	<0.332	<2.07	<8.84	188	Grab sample from the drive barrel. Up to 4,000 dpm on contact with soil.
54.0	ARCHIVED ONLY - NOT SUBMITTED FOR ANALYSIS																Grab sample from the drive barrel. Up to 3,500 dpm on contact with soil.
57.0 - 59.0	<1.96	124	-	-	16.9 (24.62% error)	<0.241	1.15 (21.64% error)	<3.52	<0.144	<0.410	<2.44	<0.524	<0.703	<4.94	<20.6	63.1	Split spoon sample. Up to 2,500 dpm on contact with soil.
69.0	2.77	123	-	-	17.0 (25.97% error)	<18.3	70.9	<3.36	<0.161	<0.421	<2.45	<0.49	<0.697	<4.53	<18.2	54.6	Grab sample from the drive barrel. Up to 2,500 dpm.
74.0	ARCHIVED ONLY - NOT SUBMITTED FOR ANALYSIS																

"<" indicates that for this particular sample and weight of sample analyzed, the mimimum detection limit for the sample. It does not mean that the particular isotope is present below this value, nor does it mean that the isotope is not present.

Data for plutonium will be given if total alpha is measured in the sample above the amount specified in the SOW (≥ 20 pCi/gm).

REVISED: December 15, 1995

9614471 1746

Project: 1301-N/1325-N LWDF Drilling		**Well No:** B2536	**Page 1 of 2**
Date Started: 11-28-95	**Date Completed:** 12-8-95	**Total Depth:** 76.00	**Static Water Level:** 75.00
Logged By: D. C. Weekes	**Checked By:**	**Surface Elevation:** 463.65	**Casing Elevation:**
Drilling Co: Water Development Co.	**Driller:** M. Wraspir/G. Howell	**Northing:**	**Easting:**
Drilling Method: Cable tool		**Drilling Equipment:** Bucyrus Erie 22W	
Screen: NA			
Filter Pack: NA			
Permanent Casing:		**Temporary Casing:** 16" 0-9', 10" 0-16.2', 8" 0-75.2'	
Comments: Characterization borehole through 1301-N Crib (see DOE/RL-94-104) elevation is in FEET NAVD88 (estimated)			

Elev'n (Feet) / Depth (Feet)	Casing Strings (inches)	Well Construction	Sample	Interval	Remarks	Lithology	Gross Gamma Log	Sieve Analysis (clay, silt, sand, gravel, fines)	% CaCO3 / % Moist	Rad Cnt pCi/g
460	16					0-9 Sandy GRAVEL: BACKFILL not logged by geologist				
10 / 450	10		CH	9.8		9-28 Silty Sandy GRAVEL				
			CH	11.0	BOGLF4 222S, BOGL88 QUAN, AR	16 mR/hr				
				13.0	BOGLF5 222S, BOGL89 QUAN, AR	Max reading of 31 mR/hr at 11.5 ft 120-220 cpm alpha				
	8					5 mR/hr				
						7 mR/hr				
						5 mR/hr				
						5 mR/hr				
20 / 440						1 mR/hr				
						1 mR/hr				
						0.6 mR/hr				
				22.5		3 mR/hr				
				23.0	BOGLF7 222S, BOGL90 MT, AR	1 mR/hr				
						1 mR/hr				
						<0.5 mR/hr				
						40,000 dpm				
30 / 430				28.8		28-38 Gravelly SAND				
			CH	30.0	BOGLF6 222S, BOGLF8 222S DUP, BOGL91 QUAN, BOGL92 QUAN DUP BOGL93 MT, AR	40,000 dpm				
						40,000 dpm				
				35.5		40,000 dpm				
				36.0	AR	60,000 dpm				
						30,000 dpm				
40 / 420				39.5		38-43(?) Sandy GRAVEL				
				40.0	BOGLF9 222S, AR	30,000 dpm				
						Hanford-Ringold Contact at 42 ft				
						20,000 dpm				
				44.5		42-48 Silty Sandy GRAVEL: BASALT-POOR				
						CZ SP/C B	20 — 120	10 — 90		

96134701737

Project: 1301-N/1325-N LWDF Drilling

Well No: B2536

Elev'n (Feet) / Depth (Feet)	Casing Strings (inches)	Well Construction	Sample	Interval	Remarks	Lithology	Gross Gamma Log	Sieve Analysis (clay, silt, sand, gravel; fines)	% CaCO3 / % Moist	Rad Cnt pCi/g
				45.0	AR	30,000 dpm				
						30,000 dpm				
				49.5		20,000 dpm				
50				50.0	BOGLG0 222S, AR	20,000 dpm				
						48-52 Gravelly SAND				
						20,000 dpm				
				53.5		<d dpm				
410				54.0	AR	52-55 Silty Sandy GRAVEL				
						<d dpm				
				58.0		55-76 Sandy GRAVEL				
				59.0	BOGLG1 222S, BOGL95 QUAN, AR	<0.5 mR/hr 2,500 dpm				
60						2,000 dpm				
						2,000 dpm				
						2,000 dpm				
400						2,000 dpm				
						2,000 dpm				
						<1,000 dpm				
						<1,000 dpm				
				68.5		<1,000 dpm				
70				69.0	BOHIV6 222S, AR	1,000 dpm				
						2,500 dpm				
						2,500 dpm				
				73.5		<1,000 dpm				
390				74.0	AR	<1,000 dpm				
						<d dpm				
						Water at 75 ft				
						TD = 76 ft				
80										
380										
90										
370										
100										
360										

Lithology legend: CZ SP/C B

Gross Gamma Log: 20 – 120

Sieve Analysis: 10 – 90

% CaCO3 ▬ ▬ ▬ ▬ ⊡

% Moist ▬▬●

Rad Cnt pCi/g

B2536/0.1/6/96

RADIOLOGICAL ACTIVITY IN SOIL SAMPLES FOR BOREHOLE B2537 ANALYZED BY 222-S LABORATORY

DRILL INTERVAL (feet)	RADIOLOGICAL ACTIVITY (Picocuries /gm)														Comments
	Total Alpha	Total Beta	K-40	Mn-54	Co-60	RuRh-106	Cs-134	Cs-137	CePr-144	Eu-154	Eu-155	Ra-226	Th-228	Sr-90	
14.5 - 16.5	1.40	2280	<43.1	<5.05	522	<109	<5.54	3200	<66.7	<9.05	<16.1	<121	<427	139	Split spoon sample. 250,000 dpm contact soil; 4 mR/hr window open, 1 mR/hr window closed (lots of beta). 3,000 dpm on jar.
18.0	51.1 (73.7 Pu239 / 240, 11.2 Pu238)	17600	<43.3	<9.49	3300	<184	17.1 29% error	15700	<107	<18.3	<24.1	<200	<651	785	Drive barrel grab sample. 300,000 dpm; 3 mR.hr, on contact with soil. 30,000 dpm on contact sample jar. 222-S ran Pu because alpha activity was greater that 20 piCi/gm (per SOW).
23.0 - 25.0	<1.33	2690	<48.4	<1.35	10.4	<31.4	<1.5	108	<22	<3.99	<6.09	<36.1	<165	1410	Split spoon sample. 80,000 dpm contact soil. 3,000 dpm on contact with sample jar.
23.0 - 25.0	<1.45	2770	<13	<0.978	14.2	<16.1	<1.32	84.9	<15.5	<3.64	<4.21	<27.1	<115	1380	Duplicate sample. 2,000 dpm on sample jar.
28.0	<1.31	435	<35.4	<0.943	3.53	<20	<0.96	24.1	<12	<2.2	<3.18	<20.8	<81	195	Drive barrel grab sample. 7,000 dpm. <D on sample jar.
32.5	<1.38	228	<15.7	<0.591	<0.999	<10.6	<0.62	<1.34	<6.89	<1.61	<1.66	<11.7	<51.7	119	Drive barrel grab sample. Up to 7,000 dpm. <D on sample jar.
42.0 - 44.0	<1.02	80.9	<27.1	<0.589	<0.832	<12.6	<0.54	<1.73	<7.42	<2.24	<1.98	<1.29	<48.9	24.6	Split spoon sample. <D on contact with soil.
47.0	<1.86	34.8	<35.2	<0.969	<0.976	<14.4	<0.81	<2.27	<9.32	<3.11	<2.12	<16.2	<63.5	4.33	Drive barrel grab sample. <D on contact with soil.
52.0	<2.46	20.0	<12.6	<0.988	<1.37	<18.9	<0.69	<1.70	<10.1	<3.76	<2.68	<21.8	<75.4	1.38	Drive barrel grab sample. <D on contact with soil.
57.0	SAMPLE WAS ARCHIVED ONLY AND NOT SUBMITTED TO 222-S FOR ANALYSIS.														Drive barrel grab sample. Up to 3,000 dpm.
59.5	<1.53	537	<2.51	<0.876	<1.77	<17.6	<0.86	<2.52	<11.1	<3.74	<2.62	<20.3	<74.6	239	Drive barrel grab sample. Up to 10,000 dpm.
62.0 - 63.8	1.65	272	<16.6	<0.719	<0.985	<15.8	<0.83	<2.06	<8.47	<1.92	<2.21	<14.7	<61.7	24.7	Split spoon sample. Up to 5,000 dpm.
69.0	<1.47	74	<30.0	<0.765	<0.64	<13.6	<0.46	<1.86	<7.54	<2.41	<1.80	<14.1	<50.4	129	Drive barrel grab sample. Up to 5,000 dpm.

"<" indicates that for this particular sample and weight of sample analyzed, the mimimum detection limit for the sample. It does not mean that the particular isotope is present below this value, nor does it mean that the isotope is not present.

Data for plutonium will be given if total alpha is measured in the sample above the amount specified in the SOW (≥ 20 pCi/gm).

Revised: December 1, 1995

Project: 1301-N/1325-N LWDF Drilling		Well No: B2537	Page 1 of 2
Date Started: 11-6-95	Date Completed: 11-16-95	Total Depth: 75.00	Static Water Level: 72.00
Logged By: DC Weekes	Checked By:	Surface Elevation: 460.65	Casing Elevation: 461
Drilling Co: Water Development Co.	Driller: G. Howell/M. Wraspir	Northing: 149690.00	Easting: 571460.00
Drilling Method: Cable tool		Drilling Equipment: Bucyrus-Erie 22W	
Screen: NA			
Filter Pack: NA			
Permanent Casing:		Temporary Casing: 10" 0-36.4', 8" 0-70.8'	
Comments: Characterization borehole next to 1301-N Trench (see DOE/RL-94-104) elevation is in FEET NAVD88 (estimated), location in METERS WCS83/91S (estimated)			

Elev'n (Feet)	Depth (Feet)	Casing Strings (inches)	Well Construction	Sample	Interval	Remarks	Lithology	Gross Gamma Log	Sieve Analysis (clay, silt, sand, gravel, fines)	% CaCO3 / % Moist	Rad Cnt pCi/g
		10					0-8 Silty Sandy GRAVEL: BACKFILL				
							8-14 Silty GRAVEL				
450	10										
					15.0		14-14.5 Sand Lens				
					15.5	BOGL72 PH	14.5-21 Silty Sandy GRAVEL				4.03
					16.5	BOGLD2 222S,					
					17.5	BOGL71 QUAN					2.98
					18.0	BOGLD5 222S, BOGL76 PH, AR					
440	20						21-27 SAND (f-vf)				
					23.5						
					24.0	BOGLD3 222S,					
					24.5	BOGLD4 222S DUP,					8.86
					25.0	BOGL73 QUAN,					
					27.5	BOGL75 QUAN DUP	27-32 Sandy GRAVEL				
					28.0	BOGL74 PH AR					3.83
430	30					BOGLD6 222S,					
					32.0	BOGL77 PH, AR					
					32.5	BOGLD7 222S, BOGL78 PH, AR	32-39 Silty Sandy GRAVEL				2.6
					35.5						
		8			36.0	AR	Hanford-Ringold Contact at 39 ft				
420	40						39-50 Silty Sandy GRAVEL: BASALT-POOR				
					42.5						
					43.0	BOGLD8 222S,					
					43.5	BOGL81 QUAN					6.48
							CZ SP/CB	20 120	10 90		

9613470.1740

Project: 1301-N/1325-N LWDF Drilling	Well No: B2537	Page 2 of 2

Elev'n (Feet)	Depth (Feet)	Casing Strings (inches)	Well Construction	Sample	Interval	Remarks	Lithology	Gross Gamma Log	Sieve Analysis (clay, silt, sand, gravel; fines)	% CaCO3 / % Moist	Rad Cnt pCi/g
				C	44.0	BOGL80 PH, AR					
					46.5	BOGLD9 222S,					2.84
					47.0	BOGL82 PH, AR					
410	50						50-59 SAND (f-vf)				
				C	51.5						
					52.0	BOGLF0 222S, BOGL83 PH, AR					4.27
				AR	56.5						
					57.0	AR					
				C	59.0						
					59.5	BOGLF1 222S, BOGL84 PH, AR	59-62 Sandy GRAVEL				4.93
400	60										
				AR	62.3						
				PH	62.8	AR	62-66.5 Silty Sandy GRAVEL				2.77
				PH	63.3	BOGL85 PH					
					63.8	BOGLF2 222S, BOGL86 QUAN					
							66.5-68.5 SAND: vc-m, thin bed				
				C	68.5						
					69.0	BOGLF3 222S, BOGL87 PH, AR	68.5-72.5 Silty Sandy GRAVEL				3.2
390	70	7									
							Water at 72 ft				
							TD = 72.5 ft				
380	80										
370	90										
360	100										

CZ S P/C B

20 120

10 90

9613470.1741

RADIOLOGICAL ACTIVITY IN SOIL SAMPLES FOR BOREHOLE B2539 ANALYZED BY 222-S LABORATORY

DRILL INTERVAL (feet)	RADIOLOGICAL ACTIVITY (Picocuries /gm)														Comments
	Total Alpha	Total Beta	K-40	Mn-54	Co-60	RuRh-106	Cs-134	Cs-137	CePr-144	Eu-154	Eu-155	Ra-226	Th-228	Sr-90	
8.0 - 10.0	5.26	2,440	10.1	1.11	225	<9.29	<0.478	371	<5.29	<1.05	<1.37	<9.32	<36.5	1080	Split spoon sample. Up to 30,000 dpm on contact with soil. 6.51 pCi/gm Am-241- high uncertainty (48.6%).
10.0 - 12.0	0.969	1,610	9.18	<0.13	3.83	<2.07	<0.105	<0.211	<2.29	<0.332	<0.677	<3.28	<18.2	866	Split spoon sample. Up to 30,000 dpm on contact with soil, mostly beta; no alpha.
17.0 - 19.0	<1.15	579	6.56	<0.109	1.65	<1.67	<.0917	<0.14	<1.57	<0.287	<0.448	<2.29	<12.0	331	Split spoon sample. Up to 15,000 dpm on contact with soil, mostly beta.
24.0 - 26.0	0.981	346	<17.9	<0.417	1.73	<7.23	<0.402	<0.498	<5.79	<1.20	<1.05	<10.0	<27.6	193	Split spoon sample. Could be up to 3,000 dpm on contact with soil; difficult to determine because background is high.
24.0 - 26.0	<1.42	319	7.19	<0.209	1.95	<4.08	<0.185	<.415	<3.33	<0.654	1.05	<4.83	<28.3	147	Duplicate sample.
30.0	0.912	228	<6.83	<0.246	2.78	<3.99	<0.241	<0.512	<3.02	<0.681	<0.826	<5.23	<22.9	127	Grab sample. Could be up to 6,000 dpm; difficult to determine as background is high.
39.0 - 41.0	<1.45	30.5	9.86 20% error	<0.089	<0.542	<1.42	<0.763	<0.14	<0.936	<0.264	<0.264	<1.77	<7.23	23.4	Split spoon sample. <Detectable above background with field instruments. Other isotopes detected by GEA: 0.709 pCi/gm BI-214(28.12% error, 0.787 pCi/gm PB-214(45.15% error), 0.794 pCi gm AC-228 (40.47% error).
50.0	1.15	11.3	13.00	<0.10	1.25	<1.60	<0.084	<0.151	<1.03	<0.340	<0.293	<2.01	<7.82	4.61	Grab sample. <Detectable abov e background with field instruments. Other isotopes detected by GEA: 0.929 pCi/gm BI-214 (25.96% error), 1.62 pCi/gm PB-214 (27.74% error), 0.850 pCi/gm AC-228 (47.62% error).
59.5 - 61.5	<0.997	42.3	13.8	<0.11	1.42	<1.76	<0.904	<0.144	<1.05	<0.311	<0.288	<1.98	<8.16	18.1	Split Spoon sample. <Detectable above background with field instruments. Other isotopes detected by GEA: 0.846 pCi/gm BI-214 (25.62% error), 1.16 pCi/gm PB-214 (35.73% error), 0.866 pCi/gm AC-228 (35.81% error).

"<" indicates that for this particular sample and weight of sample analyzed, the mimimum detection limit for the sample. It does not mean that the particular isotope is present below this value, nor does it mean that the isotope is not present.

Project: 1301-N/1325-N LWDF Drilling		Well No: B2539	Page 1 of 2
Date Started: 12-19-95	Date Completed: 12-28-95	Total Depth: 65.50	Static Water Level: 63.00
Logged By: DC Weekes	Checked By:	Surface Elevation: 453.26	Casing Elevation: 451
Drilling Co: Water Development Co.	Driller: M. Wraspir/G. Howell	Northing: 149630.00	Easting: 571900.00
Drilling Method: Cable tool		Drilling Equipment: Bucyrus-Erie 22W	
Screen: NA			
Filter Pack: NA			
Permanent Casing:		Temporary Casing: 10" 0-21', 8" 0-64.64'	

Comments: Characterization borehole next to 1325-N Crib (see DOE/RL-94-104) elevation is in FEET NAVD88 based on elevation of casing at 1-N-35

Elev'n (Feet) / Depth (Feet)	Casing Strings (inches)	Well Construction	Sample	Interval	Remarks	Lithology	Gross Gamma Log	Sieve Analysis (clay, silt, sand, gravel, fines)	% CaCO3 / % Moist	Rad Cnt pCi/g
450	10					0-8 Sandy GRAVEL: BACKFILL				
						<500 dpm				
						<1,000 dpm				
						<1,000 dpm				
						<1,000 dpm				
						<1,000 dpm				
				9.0		30,000 dpm				
10				9.5	B0HIV7	8-10 Silty Sandy GRAVEL				
				10.0	222S,B0GL97	45,000 dpm				
				10.5	QUAN,B0GL96 MT	10-44 Sandy GRAVEL				
440				11.0	ONLY,AR	30,000 dpm				
				12.0	B0GL98 PH,B0HIV8	30,000 dpm				
					222S,B0GL99	30,000 dpm				
					QUAN,AR	30,000 dpm				
				17.5		20,000 dpm				
				18.0	B0GLB0 PH,B0HIV9	5,000 dpm				
20				19.0	222S,B0GLB1					
					QUAN,AR	9,500 dpm				
430	8									
				24.5		4,000 dpm				
				25.0	B0GLB2 PH,B0HIW1	2,500 dpm				
				26.0	222S,B0HIW2 222S					
					DUP,B0GLB3	2,500 dpm				
					QUAN,B0GLB4					
30				29.5	QUAN DUP	4,000 dpm				
				30.0	AR	6,000 dpm				
					B0HIW3					
					222S,B0GLB5	2,500 dpm				
420				34.5	PH,AR	2,500 dpm				
				35.0	AR					
						2,000 dpm				
						3,500 dpm				
						4,000 dpm				
				39.5						
40				40.0	B0GLB7 PH,B0HIW4					
				41.0	222S,B0GLB6	2,500 dpm				
					QUAN,AR					
410						4,000 dpm				
						HANFORD/RINGOLD CONTACT				
				44.5						
						CZ SP/C B	20 120	10 90		

96159470.1743

Project: 1301-N/1325-N LWDF Drilling | **Well No:** B2539 |

Elev'n (Feet) / Depth (Feet)	Casing Strings (inches)	Well Construction	Sample	Interval	Remarks	Lithology	Gross Gamma Log	Sieve Analysis (clay, silt, sand, gravel; fines)	% CaCO3 / % Moist	Rad Cnt pCi/g
				45.0	AR	AT 43 FT				
						44-64.5 Silty Sandy GRAVEL				
						no contam				
				49.5		1,500 dpm				
50				50.0	B0HIW5	1,500 dpm				
					222S,B0GLB9 PH	1,500 dpm				
-400						1,000 dpm				
				54.5		1,000 dpm				
				55.0	AR	1,000 dpm				
						2,500 dpm				
						1,500 dpm				
						no contam				
60				60.0	B0H5N9	2,000 dpm				
				60.5	222S,B0GLC1	1,000 dpm				
				61.5	PH,AR	1,000 dpm				
-390						2,000 dpm WATER AT 63 FT				
						<1,000 dpm				
						TD = 64.5 ft				
70										
-380										
80										
-370										
90										
-360										
100										
-350										

Lithology legend: CZ SP/C B

Gross Gamma Log: 20 – 120

Sieve Analysis: 10 – 90

96159470.1744

GEOLOGIC/GEOPHYSICAL SUMMARY FOR 1301N/1325N LFI

Geology

- Lithology ranged from silty sand to sandy gravel
- Borehole B2537 displayed the widest range of lithologies; B2539 the least with predominantly silt sandy gravel
- Most radiologic contamination found in the upper 20 feet of the borings
- Hanford/Ringold contact at 42 feet in B2536, 39 feet in B2537, and 44 feet in B2539
- Water table encountered at 75 feet in B2536, 72 feet in B2537, 63 feet in B2539
- Maximum contamination usually found as coatings on cobbles

Physical Properties Data for B2537

- Moisture content ranged from 2.6 to 8.86 wt % (11 samples)
- Saturated hydraulic conductivity ranged from 3.2×10^{-5} to 8.2×10^{-4} cm/sec (4 samples)
- 11 samples analyzed for particle size distribution
- Bulk density ranged from 1.76 to 2.08 g/cm^3 (4 samples)
- Porosity ranged from 0.24 to 0.35
- Moisture retention to be run on 4 samples

Physical Properties Data for B2539

- Not run at this time
- 8 moisture samples
- 4 split spoon samples (particle size distribution, moisture retention, bulk density, porosity)
- 3 grab samples for particle size distribution

Geophysical

- Spectral gamma logs run by WHC and Schlumberger correlate well
- Schlumberger ran spectral gamma, lithodensity, and neutron moisture in all boreholes
- Radiological contamination found throughout each borehole, however; most is found in upper 20 feet
- Minor spike of contamination between old water table and current water table
- Generally excellent correlation between lithology, radiological analyses from 222S lab, and physical properties

Figure A-1. Conceptual Model for Cobalt-60.

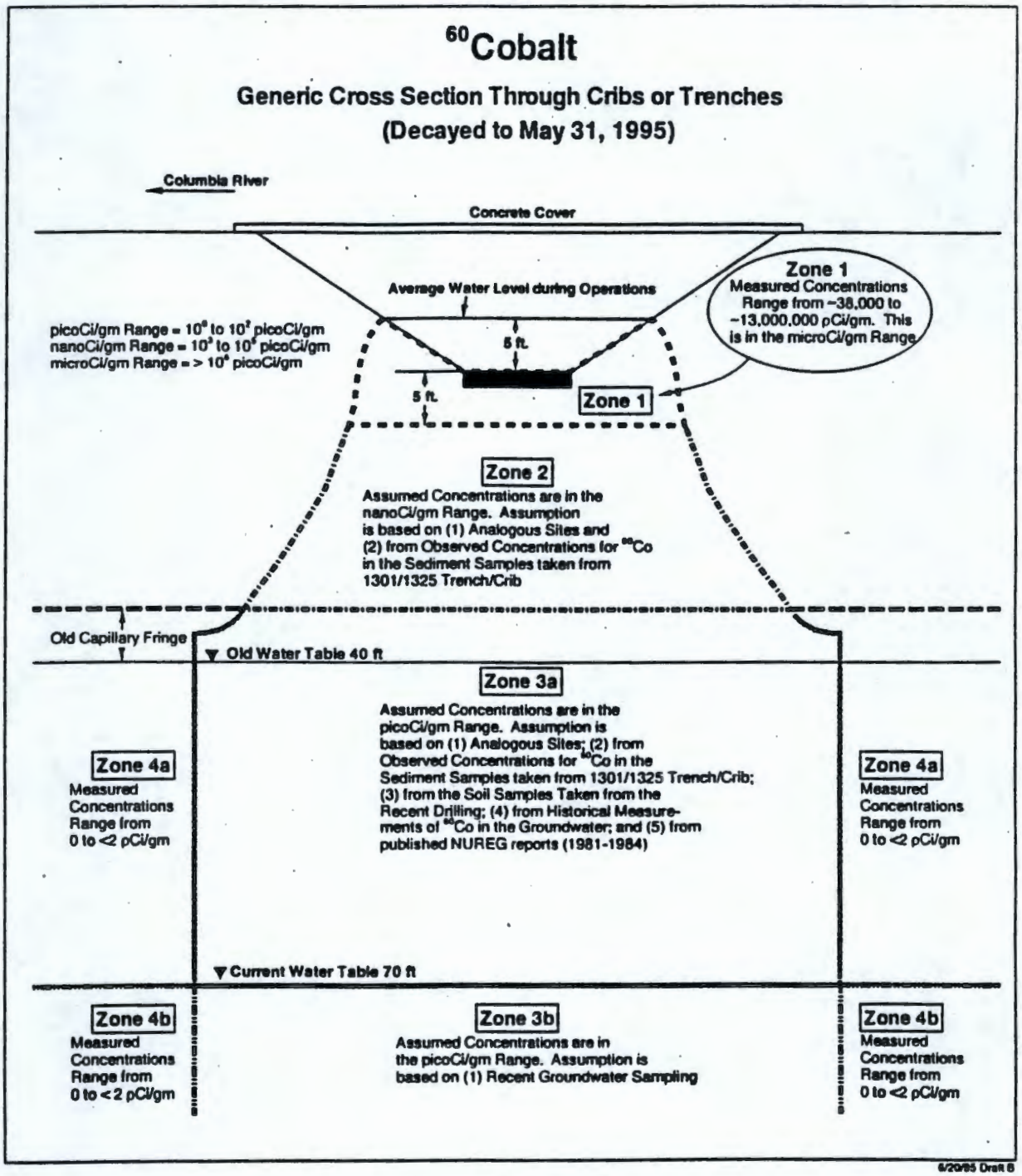


Figure A-2. Conceptual Model for Cesium-137.

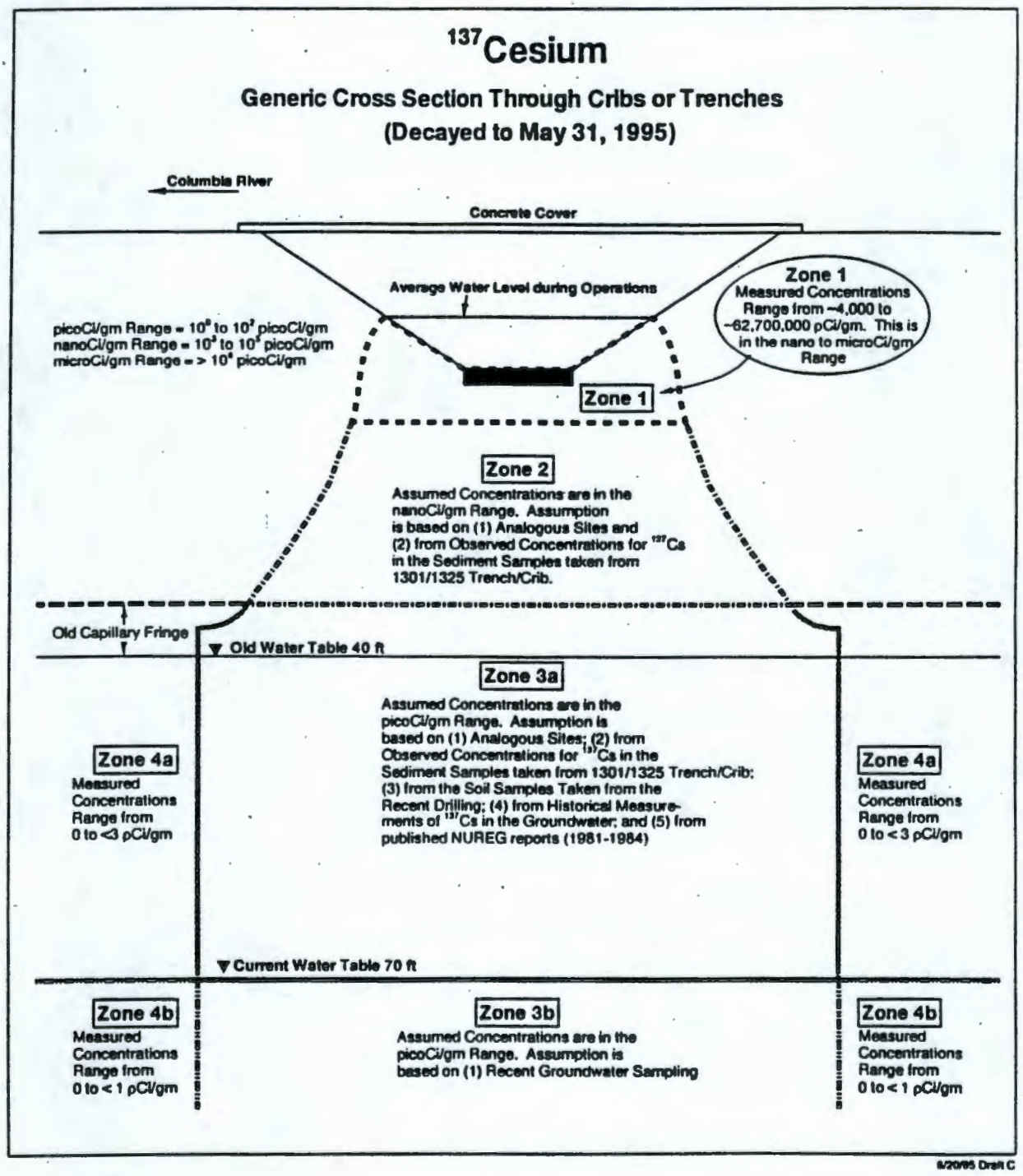
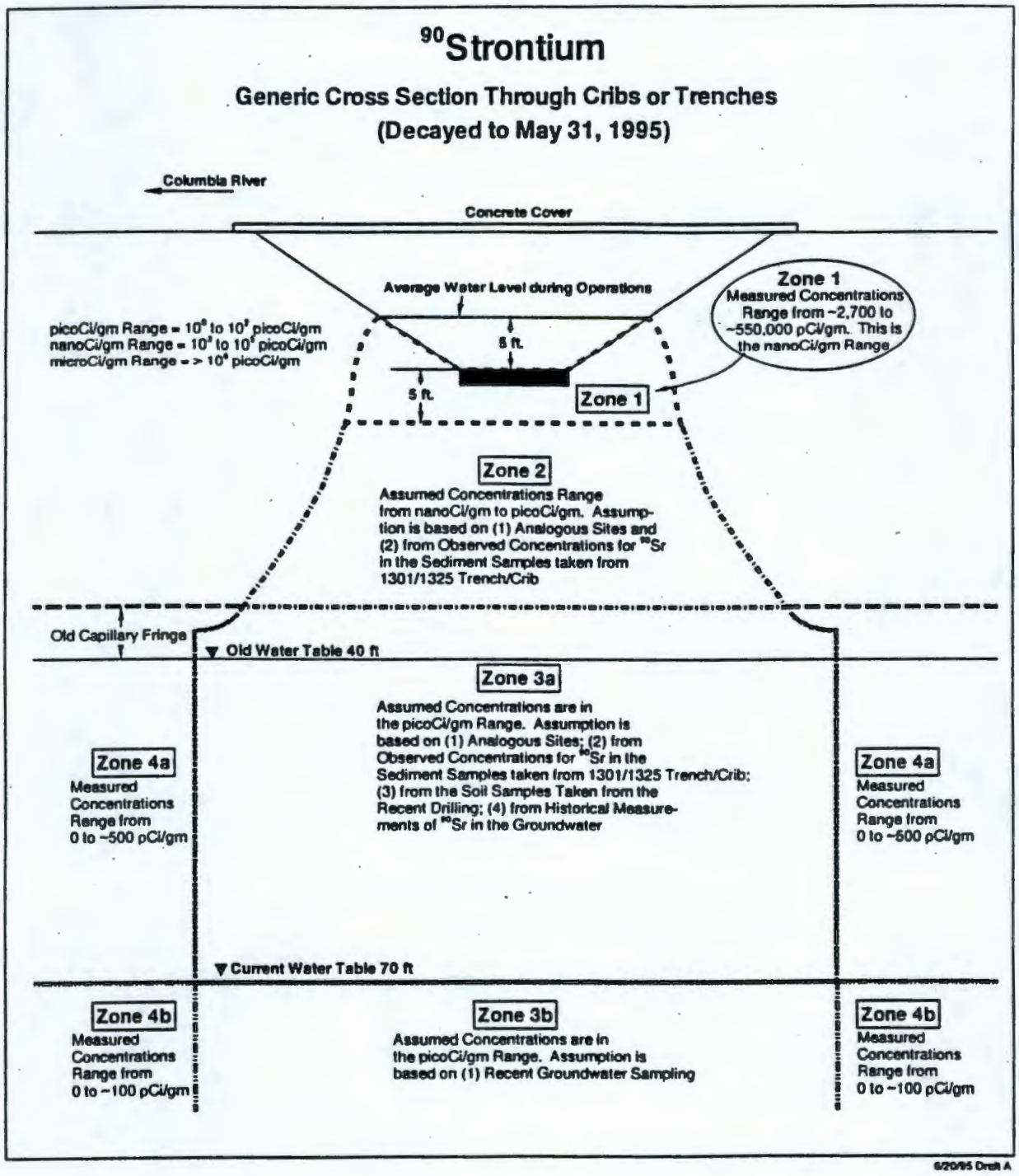


Figure A-3. Conceptual Model for Strontium-90.



EDB REGULATORY PATH FORWARD

961370.1749

027744