Decommissioning Study of the Yankee Rowe Independent Spent Fuel Storage Installation

Prepared for Yankee Atomic Power Company

Knight Cost Engineering Services, LLC December, 2012

TABLE OF CONTENTS

1.0	INTRODUCTION	3
2.0	SUMMARY	4
3.0	DECOMMISSIONING COST ESTIMATING METHODOLOGIES	7
4.0	ASSUMPTIONS	8
5.0	SCHEDULES	10
6.0	PROJECT MANAGEMENT	12
	6.1 UTILITY STAFF	12
	6.2 DECOMMISSIONING GENERAL CONTRACTOR	12
	6.3 SECURITY	13
7.0	REFERENCES	14
ΑP	PENDIX A	15

1.0 INTRODUCTION

The purpose of this study is to identify the costs associated with the decommissioning of the Yankee Rowe (YR) Independent Spent Fuel Storage Installation (ISFSI). This estimate includes only the structures, systems and land within the NRC licensed area. The YR ISFSI is located in the South East portion of the former reactor site. The NAC-MPC fuel storage and transport canister system chosen by YR is licensed by the NRC for both storage and transportation.

There are 16 dry storage casks on the 50 by 180-foot, three-foot-thick concrete pad at the YR ISFSI. Fifteen of the casks contain the 533 spent fuel assemblies and one cask stores sections of the reactor vessel internals that are classified as Greater Than Class C (GTCC) waste. Each vertical concrete cask has a three and a half-inch steel liner surrounded by 21 inches of reinforced concrete. The entire dry storage process -- procuring materials, fabricating the fuel containers, constructing the storage facility and transferring spent fuel was completed in June 2003.

2.0 SUMMARY

Decommissioning is the safe removal of a facility or site from service and the reduction of radioactivity to a level that permits either the release of the property for unrestricted use and NRC license termination; or a restricted release of the property and NRC license termination. This estimate includes all costs incurred to release the property for unrestricted use.

On June 17, 2011, the NRC published a final rule amending its regulations to improve decommissioning planning. The rule will become effective on December 17, 2012 and requires compliance by March 31, 2013. This rule will require licensees to report additional details in their decommissioning cost estimate. To assist in the implementation of the new rule, the NRC issued NUREG-1757, "Consolidated Decommissioning Guidance, Financial Assurance, Recordkeeping and Timeliness."

NUREG-1757 does not apply to licensees under 10CFR Part 50 nor does it eliminate the need to follow Regulatory Guide 1.202 or NUREG-1713. It does provide additional information to support the development of the cost estimate. This cost estimate was prepared in accordance with the guidelines provided in RG 1.202 and NUREG-1713. In addition, it does take into account the guidelines identified in NUREG-1757.

NUREG-1757 specifies that a contingency of 25% is to be included in the estimate. This estimate takes exception to this contingency level for two reasons. First, the estimate is conservative in that the entire storage pad, concrete overpacks and overpack liners are assumed to be disposed of as potentially contaminated. Second, the YR site has recently been successfully decommissioned. Many of the key personnel involved in that project remain at the YR ISFSI. The lessons learned from that project will be incorporated in the YR ISFSI decommissioning. For this reason it is felt that a 10% contingency is adequate to cover unknown and unplanned occurrences.

The total cost including contingency is \$9.8 million, \$8.5 million for radiological removal and \$1.3 million for non-radiological removal. Table 2-1 provides a summary of costs. Cost details are provided in Appendix A

TABLE 2-1 SUMMARY OF COSTS

	Total Cost	Radiological Removal \$	Non- radiological <u>Removal \$</u>
Grand Total Building	\$9,848,120	\$8,510,833	\$1,337,287
Tax on General Contractor	\$0	\$0	\$0
General Contractor with contingency	\$6,033,612	\$5,214,301	\$819,311

Site Costs with	contingency	\$3,814,508	\$3,296,532	\$517,976
General Contra	actor	\$5,485,102	\$4,740,274	\$744,828
Site Costs		\$3,467,735	\$2,996,847	\$470,888
YR ISFSI		\$8,952,837	\$7,737,121	\$1,215,710
PERIOD DEI	PENDENT COSTS	\$5,814,531	\$5,024,970	\$789,562
1.1	YR Site Costs	\$3,467,735	\$2,996,847	\$470,88
1.1.1	Project Management	\$1,222,720		
1.1.2	Security Staff	\$889,014		
1.1.3	Fees	\$325,000	\$280,868	\$44,13
1.1.4	Insurance	\$631,000	\$545,316	\$85,68
1.1.5	Legal	\$200,000	\$172,842	\$27,15
1.1.6	Property Taxes	\$200,000	\$172,842	\$27,15
1.2	General Contractor	\$2,346,796	\$2,028,122	\$318,67
1.2.1	Decommissioning General Contractor	\$1,209,290		
1.2.2	Waste Packaging Crew	\$512,621		
1.2.3	Equipment & Materials	\$624,885		
ACTIVITIES		\$3,138,305	\$2,712,151	\$426,15
1.3	Project Engineering	\$21,108	\$18,242	\$2,86
1.3.1	Procedure Development and Review - Offsite	\$10,554		
	Preparation of QA and Safety Documents -			
1.3.2	Offsite (in parallel with 1.2.1)	\$10,554		
	Site Mobilization and General Employee	\$10 <i>C CC</i> 0	PO2 194	©11 10
1.4	Training (GET)	\$106,669	\$92,184	\$14,48
1.4.1	Site Mobilization	\$27,198 \$71,738		
1.4.2	General Employee Training	•		
1.4.3	Site Specific Training	\$7,733	010 440	\$1,95
1.5	Site Preparation - Performed by Staff	\$14,404	\$12,448	\$1,95
1.5.1	Initial Site Survey			
1.5.2	Setup work areas			
1.5.3	Decontamination Readiness Review	67 202	. 66.004	\$97
1.6	Disconnect all utilities to work areas.	\$7,202 \$3,601	\$6,224	\$7/
1.6.1	Electrical	\$1,800		
1.6.2	Ventilation			
1.6.3	Piping	\$1,800	P2 525 505	\$61,17
1.7	Removal inside security fence	\$2,596,684 \$3,305	\$2,535,505	\$3,30
1.7.1	Remove Guard Posts	,	ΦΛ.	
1.7.2	Instrument Enclosure	\$8,375	\$0	\$8,37
1.7.3	Remove VCCs	\$1,208,823	\$1,208,823	\$
1.7.3.1	Exterior Concrete	\$612,010	\$0	\$
1.7.3.2	Steel liner	\$596,812	\$1.207.692	
1.7.4	Remove Concrete Pad	\$1,326,683	\$1,326,683	
	range great de annue	ሰሳሱ ሳሳሶ		ውን ሲጣር
1.7.5 1.7.6	Remove Fence and Towers Remove Light Towers	\$39,399 \$10,100		\$39,39 \$10,10

Page 5 of 15

1.8.1	Remove Nuisance Fence	\$70,485		\$70,485
1.8.2	Retaining Wall	\$46,334		\$46,334
1.0.2	Conduit and wire - Instrument Enclosure to	\$40,534		\$40,334
1.8.3	Utility Pole	\$23,208		\$23,208
1.8.4	Remove road inside licensed area	\$190,915		\$190,915
1.8.5	Remove vehicle barriers	\$3,373		\$3,373
1.8.10	Miscellaneous	\$3,373		د ا درد
1.0.10	Final Site Survey Structure gone - By DGC			
1.9	Staff	\$25,000	\$21,605	\$3,395
1.9.1	Prepare Final Status Survey Plan	\$23,000	\$21,005	\$3,373
1.9.2	Soil Sampling			
1.9.3	Direct Survey			
1.9.4	Sampling Analysis			
1.9.5	Prepare Final Status Survey Report			
1.1	Orise Site Release Confirmation			
1.11	Outside areas	\$2,904		\$2,904
1.11.1	Backfill, grade and seed	\$2,904		\$2,904
1.12	Demolition Crew Demobilization	\$19,465	\$16,822	\$2,643
1.13	Final Project Report - Offsite	\$10,554	\$9,121	\$1,433

3.0 DECOMMISSIONING COST ESTIMATING APPROACH

Two types of costs were determined in this estimate: activity costs and level of effort costs. The activity costs were developed utilizing a unit cost factor approach. Site material quantities for concrete, steel and equipment where developed from site specific drawings. Productivity factors were applied to these quantities to determine activity durations. Labor crews were developed and applied to the material quantities to determine labor costs and person-hours. The activity durations were used to develop a project schedule.

The level of effort costs such as equipment rental and the General Contractor (GC) staff were developed based on the project schedule duration. A rental equipment file was developed for the construction effort. The GC staff is assumed to be on-site for the duration of the project. The Oversight staff cost is another level of effort cost that is included in the cost estimate.

Bulk removal of the storage pad and concrete storage casks is assumed to be performed using an excavator with a hydraulic hammer attachment. The steel liner will be segmented utilizing torch cutters. All of this waste will be trucked off-site for processing. This leads to a large disposal volume; however, at a lower rate for bulk processing than for direct burial. In addition, there will be far less characterization and iterative decontamination. Clean structures will be demolished using mechanical means and disposed of at a local landfill.

In addition to the removal labor there is a dedicated waste packaging crew included in this estimate. This crew will consolidate, package and prepare containers for transportation. The waste packaging is estimated to remain on site for the duration of the project. This crew consists of 2 laborers; 1 Health Physics Technician; 1 Equipment Operator and 1 Foreman.

4.0 ASSUMPTIONS

Following is a list of assumptions developed by KCES in completing this study. These assumptions are based on the most current decommissioning methodologies and site-specific considerations.

- 1. Component quantities were developed from actual plant listings.
- 2. Concrete volumes were developed from plant drawings.
- 3. The oversight staff is assumed to be the similar size and configuration as it is currently.
- 4. The oversight staff positions and costs were supplied by the Company and represent July, 2012 salary and benefit data.
- Subcontractor base labor rates and fringe benefits were taken directly from the 2012
 R. S. Means Heavy Construction Cost Data and adjusted to Massachusetts based on the City Cost Indexes for Pittsfield, MA.
- 6. Activity labor costs do not include any allowance for delays between activities, nor is there any cost allowance for craft labor retained on-site while waiting for work to become available.
- 7. All **skilled laborers** will be supplied locally and hired by the Decommissioning General Contractor (DGC).
- 8. The cost for **Utility personnel** assisting the DGC to develop decommissioning activity specifications is included in the Utility Staff costs.
- 9. The separate DGC staff salaries, including overhead and profit, were determined by KCES.
- 10. **Transportation** costs are based on actual mileage from YR to Memphis, TN processing facility utilized in the estimate.
- 11. The ISFSI Concrete Pad, VCC exterior concrete and VCC liner steel are assumed to be Class A waste. This waste will be disposed of at the Studsvik processing facility in Tennessee. A disposal rate of \$0.13 per pound has been used in this estimate and is based on information provided by Studsvik.
- 12. The following buildings are disposed of as Clean waste in local landfill. A disposal rate of \$91.80 per ton has been used in this estimate and is based on information provided in the 2012 R. S. Means Building Construction Cost Data.

Guard Posts Instrument Enclosure Security Fence
Light Towers
Nuisance Fence
Retaining Wall
Conduit and wire - Instrument Enclosure to Utility Pole
Road inside licensed area
Vehicle barrier

- 13. All costs used in these calculations were current on July, 2012.
- 14. The costs of all required safety analyses and safety measures for the protection of the general public, the environment, and decommissioning workers are included in the cost estimates.
- 15. It is assumed that all MPCs containing both spent fuel and GTCC will have been removed from site prior to the start of decommissioning.
- 16. Property taxes are included in the estimate at the current cost of \$200,000 per year.
- 17. Fees are included in the estimate at the current cost of \$325,000 per year.
- 18. Insurance costs are included in the estimate at the current cost of \$631,000 per year.
- 19. Legal costs are included in the estimate at the current cost of \$200,000 per year.
- 20. The decommissioning will be performed under the current regulations.
- 21. Removal of the pad and concrete overpacks will be performed in Tyvek coveralls. **Productivity rates** have been adjusted to account for this.
- 22. No **subsurface material** is assumed to require remediation regarding radionuclides. This assumption is justified because: 1) the ISFSI area was confirmed to be clean of radiological contaminants prior to the construction of the ISFSI; 2) the ISFSI area will be maintained clean of loose radiological contaminants during the storage period; 3) the irradiated fuel and GTCC waste are stored in sealed canisters; 4) nuclear activation of the VCCs, VCCs liners, and ISFSI pad are anticipated; the activation products will remain fixed during the storage period; and 5) if contamination of subsurface material occurs during decommissioning activities, the contamination is expected to remain below the decommissioning criteria of 25 millirem per year Total Effective Dose Equivalent.

5.0 SCHEDULE

A scenario-specific schedule has been developed for estimate.

Activity durations were determined based on the unit cost factor approach. Plant material inventory quantities were developed from site specific material. Unit rates for cost, man hours and schedule hours were applied to the material quantities. From this calculation the removal or decontamination cost, total man hours and total schedule hours were determined for an activity. The schedule hours are then entered into the schedule to determine project duration. Two work crews are assumed for the concrete pad and concrete overpacks. All other work was assumed to be performed by one crew. Work outside of the security fence will be performed in parallel with the work inside the fence. The total project duration is 6.96 months.

Figure 5-1 provides the detailed decommissioning schedule.

Figure 5-1
Project Schedule

Project Schedule ID Task Name													
ID Task Name	Duration	Start	Finish	1st Quarter	2nd Quarter	3rd Quarter							
1 Project Start	0 days	Thu 1/2/14	Thu 1/2/14	∳ 11/2		,							
2 Project Engineering	5 days	Thu 1/2/14	Wed 1/8/14										
3 Procedure Development and Review - Offsite	5 days :	Thu 1/2/14	Wed 1/8/14	ing.	Ť	:							
4 Preparation of QA and Safety Documents - Offsite	5 days	Thu 1/2/14	Wed 1/8/14										
5 Site Mobilization and General Employee Training (GET)	9 days	Thu 1/9/14	Tue 1/21/14	Commenced	4	;							
6 Site Mobilization	3 days	Thu 1/9/14	Mon 1/13/14		į	;							
7 General Employee Training	5 days	Tue 1/14/14	Mon 1/20/14	i Tita									
8 Site Specific Training	1 day	Tue 1/21/14	Tue 1/21/14										
9 Site Preparation - Performed by Staff	4 days	Wed 1/22/14	Mon 1/27/14			-							
10 Initial Site Survey	2 days	Wed 1/22/14	Thu 1/23/14		:	a de la companya de l							
11 Setup work areas	1 day	Fri 1/24/14	Fri 1/24/14	<u> </u>		:							
12 Decontamination Readiness Review	1 day	Mon 1/27/14	Mon 1/27/14	$\mathbb{I}_{\mathbf{r}}$									
13 Disconnect all utilities to work areas.	2 days	Tue 1/28/14	Wed 1/29/14		!								
14 Electrical	1 day	Tue 1/28/14	Tue 1/28/14	6		:							
15 Ventilation	0.5 days	Wed 1/29/14	Wed 1/29/14	i i i i i i i i i i i i i i i i i i i		:							
16 Piping	0.5 days	Wed 1/29/14	Wed 1/29/14	i i i i i i i i i i i i i i i i i i i									
17 Removal Inside Socuirty Fence	90.13 days	Thu 1/30/14	Thu 6/5/14			▼ :							
18 Remove Guard Posts	0.59 days	Thu 1/30/14	Thu 1/30/14										
19 Remove Instrument Enclosure	1.24 days	Thu 1/30/14	Fri 1/31/14	T		:							
20 Remove VCCs	49.22 days	Fri 1/31/14	Fri 4/11/14	· ·									
21 Exterior Concrete	12.55 days	Fri 1/31/14	Wed 2/19/14										
22 Steel liner	36.67 days	Wed 2/19/14	Fri 4/11/14			:							
23 Remove Concrete Pad	27.21 days	Fri 4/11/14	Tuế 5/20/14			·							
24 Remove Fence and Towers	9.41 days	Tue 5/20/14	Mon 6/2/14			1,							
25 Remove Light Towers	2.46 days	Mon 6/2/14	Thu 6/5/14		1	O ₁							
26 Removal Outside Security Fence	39.79 days	Thu 1/30/14	Wed 3/26/14	V.		:							
27 Remove Nuisance Fence	17.21 days	Thu 1/30/14	Mon 2/24/14										
28 Remove Retaining Wall	5.14 days	Mon 2/24/14	Mon 3/3/14			:							
29 Remove Conduit and Wire	6.44 days	Mon 3/3/14	Tue 3/11/14		E								
30 Remove road inside licensed area	10.33 days	Tue 3/11/14	Wed 3/26/14										
31 Remove vehicle barrier	0.67 days	Wed 3/26/14	Wed 3/26/14										
32 Final Site Survey Structure gone - By DGC Staff	23 days	Thu 6/5/14	Tue 7/8/14	:									
33 Prepare Final Status Survey Plan	5 days	Thu 6/5/14	Thu 6/12/14		# 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1								
34 Soil Sampling	5 days	Thu 6/12/14	Thu 6/19/14	!	:	E. J.							
35 Direct Survey	3 days	Thu 6/19/14	Tue 6/24/14	:	:								
36 Sampling Analysis	5 days	Tue 6/24/14	Tue 7/1/14		- 5	hat La							
37 Prepare Final Status Survey Report	5 days	Tue 7/1/14	Tue 7/8/14	•		E. E.							
38 Orise Site Release Confirmation	0 days	Tue 7/8/14	Tue 7/8/14	:		₽ ¬ ^{7/8}							
39 Outside areas	5.93 days	Tue 7/8/14	Wed 7/16/14	· ·									
40 Backfill, grade and seed	5.93 days	Tue 7/8/14	Wed 7/16/14	•		; tš.							
41 Demolition Crew Demobilization	2 days	Wed 7/16/14	Frì 7/18/14	:		<u> </u>							
42 Final Project Report - Offsite	10 days	Fri 7/18/14	Frì 8/1/14			<u>laid</u>							

6.0 PROJECT MANAGEMENT

There are three components to project management during decommissioning, Oversight Staff (staff), Decommissioning General Contractor Staff (DGC) and Security. The person levels for each are identified below.

6.1 OVERSIGHT STAFF

The staff size is currently at a level of 18 and is assumed to be maintained at this level and at a similar configuration during the decommissioning. In addition, one final status survey resource will be added and one licensing person will be added to assist in the decommissioning. The staff will provide DGC oversight as well as maintain license compliance. Table 7-1 provides a summary of this staff.

TABLE 6-1 OVERSIGHT STAFF

<u>Staff</u>	Number
President	1
Cask Relicensing Project Manager	1
Workers Concerns Manager	1.
Business Manager	1
ISFSI Manager	2
ISFSI QA Manager	1
Director Government Relations	1
General Counsel	1
Business Administrator	1
Treasurer	1
Accountant	1
Benefits Manager	1
IT Services	1
ISFSI Operations Specialist	2
Program Manager	1
ISFSI Administrator	1
Licensing Engineer	1
Security Manager	1
	20

6.2 DECOMMISSIONING GENERAL CONTRACTOR

The DGC will be responsible for all of the physical work. The staff will oversee the work crews., schedule work and supply HP support. The DGC will be responsible for finishing the project on time and on budget. Table 7-2 provides a summary of the DGC staff.

14.00

	TABLE 6-2 DGC STAFF		
		2012 Base <u>Salary</u> \$148,000 \$70,000 \$117,000 \$55,000 \$60,000 \$86,000 \$86,000 \$117,000	Person Level 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0
Project Supervisor Decontamination Tech Instrumentation Tech Tool Crib Attendant		\$79,000 \$55,000 \$55,000 \$43,000	1.00 2.00 1.00 <u>1.00</u>

6.3 SECURITY

Once spent fuel has been removed from the site the security force will be significantly reduced. This estimate assumes a force of 13 guards and one manager. This will allow a security person level of 5 guards during work time and two guards all other times. The guard force was assumed to consist of various levels of guards and the rate used has been adjusted accordingly.

7.0 References

- 1. R.S. Means, Inc, Building Construction Cost Data, Kingston, Massachusetts, 2012.
- 2. Regulatory Guide 1.202, "Standard Format and Content of Decommissioning Cost Estimates for Nuclear Power Reactors"
- 3. NUREG-1713, "Standard Review Plan for Decommissioning Cost Estimates for Nuclear Power Reactors"
- 4. NUREG-1757, "Consolidated Decommissioning Guidance, Financial Assurance, Recordkeeping and Timeliness"

APPENDIX A

	Uncorrected Direction Adjust Great Disc. of House Press, Factor Detail	ed LSA Waste Hazer Gouss on Mondouses Disp., Vol. (ed.) Worter Vol. (ed.)	Missed Clean Lond Activitied Motor airs, Motor airs, Water Weste Weste Waste Conversables, LSIA Waste Volume (CD	
Grand Total Building				\$3,848,120 \$6,510,833 \$1,337,287
Contingency ×				\$396,294
Tax on General Contractor 0.00%			\$6 50 50	so so so so
General Contractor with continuous 16.00%			\$763.251 \$2,940.107 \$2,114,922	
Site Costs with continuency			\$1,491,600 \$2,322,908 \$0	\$6 \$3,814,508 \$3,296,532 \$517,976
General Contractor		34,684 94,427	548.352 \$893.864 \$2,678,280 \$1,922,657	\$190,301 \$5,485,102 \$4,740,274 \$744,828
Site Costs		39,789 0	\$1,366,000 \$2,111,736 \$0	
YR (SPA)		74.473 54.427	\$48.382 \$2,043,884 \$4,790,014 \$1,022,657 \$1,980,685 \$3,838,648 \$0	
PERIOD DEPENDENT COSTS		61,439	\$1,980,665 \$3,833,646 \$0 \$1,366,000 \$2,111,735	\$3,487,725 \$2,998,847 \$470,888
1.1 YR Site Costs		39,789	\$1,386,000 \$2,111,739	80701,100 96,000,001
Protect curation = 211,90 date/7deve/v/k = 150,71 verking days	30.14 6.96 months			is a second of the second of t
Labor cost > 4,790.014 (Vesd to determine small tool scets and H	IP Sunded			
1.1.1 Project Management		24.114	\$1,222,720	\$1,222,720
	Duration, days* Use Factor Cost Man-hi	NAME OF THE STATE		
President 1 \$60.53 Cask Relicensing Project Monager 1 \$29.17	Durefon, days* Use Factor Cost Man-hi 150.71 103.00% \$97.095 1.3 150.71 100.00% \$35,167 1.3	205.71 1 205.71 1		
Workers Concerns Manager 1 \$11.54 Business Manager 1 \$26.67	150.71 100.00% \$13.912 1. 150.71 100.00% \$32.155 1. 160.71 100.00% \$245.209 2.	206.71 1 205.71 1		
ISSEC CLA Management	160.71 100.00% \$245,209 2. 150.71 100.00% \$10,434 1.	411.43 2 208.71 1		
Director Government Relations \$40.13	150.71 100.00% \$48,382 1.0 150.71 100.00% \$30.916 1.0	295.71 1 205.71 1		
Director Government Rolations \$40.13	193.71 103.09% \$10.434 1.2 193.71 103.09% \$10.434 1.2 193.71 103.09% \$10.09% \$10.434 1.2 193.71 103.09% \$23.96 1.2 193.71 103.09% \$23.97 1.2 193.71 103.09% \$23.50 1.2 193.71 103.09% \$25.750 1.2 193.71 103.09% \$18.89 1.2	205.71 1 205.71 1		
	150.71 100.00% \$82,580 1, 150.71 100.00% \$16,695 1,	200 71 1 200		
IT Services 1 \$72.12 ISFSI Operations Specialist (Includes I FSS Man 2 \$81.08	190.71 100.00% \$18,885 1, 150.71 100.00% \$488.85 1, 150.71 100.00% \$198.85 2, 150.71 100.00% \$71.184 1, 150.71 100.00% \$50.441 1,	206.71 1 411,43 2		
Program Mansase 1 559.04 ISFSI Administrator 1 842.25	150.71 100.00% \$50.941 1	205.71 1 206.71 1 205.71 1		
Licensing Engineer 1 \$49.60 Gross by Memocer 1 \$52.92		205.71 1 205.71 1 114.29 20.00		
1.12 Security Staff	91,222,729 24.	15.874	\$809.014	\$989,014
Project duration • 211.00 days/7days/vol •	30.14 weeks 8.93 Months	12.014		
Staff Number Rais Security Quarte blended rate 13 \$42.42	Duration, weeks Use Factor Cost Man-b 30.14 100.00% \$584.861 15.	ours 674.20		
Smooth I				
Dental \$1,443.00	Devotion, Months Use Factor Cost 8.9.3 30.00% \$54.7.45 6.9.3 30.00% \$54.7.45 6.9.3 30.00% \$52,889 6.9.3 30.00% \$52,889 6.9.3 30.00% \$82,283			
Arrima \$15,000,00	6.93 30.00% \$52,969 6.93 30.00% \$31,196			
Uniforms \$39,550.00	6.03 30.00% \$82.253 \$835,014 15.	874.29		
1,1.3 Fano \$325,000,00 per voer 1,00 y	rears		\$325,000	\$325,000 \$280,898 \$44,132
1.1.4 Insurance \$831,000,00 per year 1,000 y	ntara		\$831,000	\$631,000 \$545,316 \$85,684
1.1.5 Legal \$200,000,00 per year 1.00 y	ware		\$200,000	\$200,000 \$172,842 \$27,158
1.1.6 Property Taxos \$299.000 00 per year 1.00 y	rears		\$200,000	\$200,000 \$172,842 \$27,158
1.2 General Contractor		21.650	3624.885 \$1.721.611	\$2,346,796 \$2,028,122 \$318,674
1.2.1. Decomplainting General Contractor		14.114	\$1,209,290	\$1,208,290
Project duration = 190.00 days/7days/wk = 135.71 working days	27.14			
Stell Number Rate Project SuperIntendent 1 \$133.27	Duration, days" Use Factor Cost Marsh 135.71 190.00% \$144.988 1.135.71 100.00% \$82.999 1	.085.71 .085.71		
OA Auditorihissector 1 \$76,45 Health & Safety Supervisor 1 \$111.30	135.71 100.00% \$82,999 1 135.71 100.00% \$120,637 1	.085.71 .085.71		
Health A Safety Rupenvisor 1 \$111.30 Perkentin Sheel hist 3 \$78.45 Cost Control Accounted 1 \$65.24 Cost Control Accounted 1 \$65.24 Settleduer \$ 1 \$66.97 Cost Control Accounted 1 \$66.97 Cost Control Accounted 1 \$66.97 Cost Control Accounted 1 \$66.97 Cost Cost Cost Cost Cost Cost Cost Cost	138.71 100.00% \$82,999 1 138.71 100.00% \$70,829 1 138.71 100.00% \$74,885 1	085.71 .085.71 .085.71 .085.71		
Scheduler E \$66.97	135.71 100.00% \$74,990 1 135.71 100.00% \$85,860 1 135.71 100.00% \$85,980 1	085.71		
Engineering Supervisor 1 \$11.00 Project Supervisor 1 \$53.17	135.71 100.00% \$120.837 1 135.71 100.00% \$00.300 1	.085.71		
Decodemination Tech (\$60.37	138.71 100.00% \$120.037 1 138.71 100.00% \$62.099 1 138.71 100.00% \$70.000 1 138.71 100.00% \$70.000 1 138.71 100.00% \$70.000 1 138.71 100.00% \$48.860 1 138.71 100.00% \$48.860 1 138.71 100.00% \$48.800 1 138.71 100.00% \$50.000 1 138.71 100.00% \$50.000 1 138.71 100.00% \$50.000 1 138.71 100.00% \$70.000 1 138.71 100.00% \$70.000 1 138.71 100.00% \$80.000 1	.085.71		
Instrumentation Tech	135.71 100.00% \$70.829 1 135.71 100.00% \$41.093 1 \$1,209.280 14	008.71 008.71 008.71 008.71 008.71 008.71		
122 Waste Packaging Crew	- 100 marketing - 200	7,536	\$512.821	\$612,621
Project duration. ◆ 190.00 davs/7davs/vik.◆	27,14 weeks 7.24 Months			
135.71 working days				
Staff Number Rate Laborars 2 \$89.34	Duration, days Use Fector Cost Mon-F	noine		
Laborans 2 \$60.34 H.P. Teich. 1 \$51.00	Duration, days Use Fector Cost Men- 160.71 100.00% \$199.068 3 150.71 100.00% \$78.864 1	0.014.29 0.007.14 0.507.14 0.507.14		
Load Oper. 1 \$85.30 Poremen 1 \$70.15	150.71 100.00% \$130.070 1 150.71 100.00% \$105.722 1	.807,14 .807,14		
6	\$512.621 7	(536.7)	\$624,885	\$424,885
1.2.3 Equipment & Materials Equipment Questity Role	~		\$674,88Q	grade in contract
Euderment Questive Follow	\$3.210 \$3.077			
Programming sown 3 41-aver Programming the programming 2 51,280 Chipping hunterer blades 20 835	\$2,560 \$708			
Purchase on all comprehense: 2 \$1.360	Clost \$1,210 \$3,240 \$3,500 \$3,500 \$3,500 \$3,700 \$3,			
· · · · · · · · · · · · · · · · · · ·	CONTROL OF THE PARTY OF THE PAR			

				Uncorrected Disistion		Adjusted		LSA Same	Hazariona	Bellux	Mound West:	Clean Wase	Less Weste	Autivated Waste	Motorials, Consumbles,	2 .0 (1)	LSA Wesse	Securdonia Waster Cost	Mixed Weste Cost	Clean Waste Cost	Lead Weste Cost	Activated Waste Cost	Total Cost	85.42% Rediological Removal \$	13.58% Nun-radiolasteal Removal \$
Sufery go Fall grote Fall grote Hardhade Hardhade Flored bal Drailer re Pertabile Torch Re Front ent Hadrauli Bocassin Chappile Hydrauli Bocassin Drailer Drailer Bocassin	interno - Instruction Invasing procession Invasing procession	30 \$30 100 \$12 3 \$142 5 \$183 50 \$40 2 \$840 2 \$840 2 \$840 3 \$190 2 \$10 1 \$2,250 1 \$2,250 1 \$2,250 1 \$3,668 1 \$2,250 1 \$3,668 1 \$3,	\$600 \$1.100 \$422 \$656 \$1.200 \$1.400 \$3,744 \$670 \$3,423 \$40,141 \$10,342 \$3,423 \$1,414 \$3,500 \$11,440 \$11,440 \$11		Prosl. Factor	Discretions	Manuhinsun.	Diss. Ved (eQ)	Waste Val (st)	Volume (cf)	Yoluna (d)	Yolkoo LCS	Yolune (gD)	Account (ed)	& Equipment	Liffee (1208	Cost	3.098	1.05	1.096	3.0%		43998-5299		
Project	126.90 98.00	days/?days/ek = working days	18.0	O weeks	4,14 1	dorths																			
	file 2 / Intendedus Overte 4 / Francideus Overte 4 / Francideus Overte 4 / Francideus Overte 5 / Francideus Overte 5 / Francideus Overte 5 / Francideus Oberca 1 / Francideus Overte 5 / Francideus	Duration 90,00 dev 90,00 dev 90,00 dev 90,00 dev 0,00 dev	_	# workers 8-50 8-50 8-50 8-50 8-50 8-50 27.00 27.00 27.00	1.530 3.060 3.060 8 3.53 3.53 9 112 19	Unit Ohy 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Unit Cost 7 2 1 38 2 195 34 250	Cost 19,067 8,059 3,672 272 623 1,831 3,868 4,573 10,472																	
ACTIVITIES				2.178		2.178	13.034	64,427	o			548,352						\$0	\$8	\$190,301	\$0	90	\$3 136.306	\$2,712,151	\$428,154 \$2,866
1.3 Protect	Engineering 1 Procedure Development and Review - Offsite			50 40	1.00	80 40	240 120	٥	0	*	0 (0	0		\$0	\$21,108 \$16,554	\$0	\$0	\$0	\$0	\$0		\$21,108 \$10,554	\$18.242	\$2,000
	Staff Project Specialist Project Specialist Project Manager Certified Hentith Privalest	Number 2 1 1 4	Rate \$81.08 \$101.89 \$101.69	Duration 40 29 26 40	PLF 1.00 1.00 1.00	Cost \$6.487 \$2.034 \$2.034 \$10.864	Men-hours 80 20 20 120									20.2288							\$10.594		
133	Preparation of QA and Safety Documents - Offsite (in pa Staff Protect Specialist Protect Managery Cettifled Health Physicot	erefiel with 1.2.1) Number 2 1	Rate \$81.08 \$101.69	40 Duration 40 20	1.00 PLF 1.00 1.00	40	120 Cost 6.487 2.034	Mari-hours 80 20								\$10.564							**************************************		
ti canta	Certified Health Physicst obilization and General Employee Training (GET)	1	\$101.09	20 40 72	1.00	72	2.034 10.554 683	120							\$37.076	559 594							\$108,889	\$92,184	\$14,485
	Site Mobilization			24	7.00	24	317								\$4,000								127,198		
	Crew 1 Project Superintendent 1 GA Auditoritancester 1 Healish & Salaki Aumerican 1 Healish & Salaki Aumerican 1 Cost Control Accounted 1 Cost Control Accounted 1 Cost Control Accounted 1 Democlated Socialist 1 Industrial Salaki 1 Industrial Salaki 2 Democraticaniston Tech 1 Instrumentation Tech 1 Instrumentation Tech 1 Instrumentation Tech 2 Equation Cost 2 Potentian 2 Control 2 Equation Cost 2 Technique 2 Equation Cost 3 Technique 3 Control 3 Technique 4 Technique 5 Technique 6 Technique 7 Technique 7 Travel to alte	Sans 30 \$66.34 \$70.15 \$94.66	Coat. Chr 30.00 50	With Period Depart With Period Cocent With Period Cocent With Period Cocent With Period Cocent With Period Depart With Period Cocent	ient costs lent costs lent costs lent costs lent costs lent costs lent costs																				
	Stephna of entripment Sof up office and amerities Fernikarize staff with familie	4 tv 4 tv 4 tv 24 te	t r r																						
		24 x 10 x	\$964.53 \$400.00			daragement only									\$33,075	578.863							\$71.738		
142	Ceneral Emstovee Training Crew 1 Protect Subservisionshord 1 Protection Subservisionshord 1 CA Aurilland*nearctor 1 Proteinstain/Publication Sandeslatd 1 Cost Central Accountant 1 Cost Central Accountant 1 Demosition Selectains 1 Industrial Safety 1 Enstements Subservisor 1 Protect Subservisor 1 Protect Subservisor 1 Trainin-residents Tech 1 Tool Cab Alteradors 2 Edwar Doer 7 Lathoring 2 Crestiansa	Pate. \$ her \$0.00	Cost. \$-hir 50 00 \$0.00	40 With Pleviod Depoint With Period Depoint Wi	dent costs dent costs	40.00	136								322,1/73	-20,003									

						Com	Uncorrected Duratic (No. of Hoses)	m Prod. Factor	Adjusted Duption	Man-bours	LSA Weste Disp. Vol (ef)	Hazardous Waste Vol.(sD	Ballent Yohana (s	Mixe Wash O Volume	e Wasse	Lead Waste D Yothme (eD	Aptivated Waste Values (ef)	Materials, Consumables, & Equipment	Labor Cost	LSA Weste Skati	Hazardous Waste Cest	Mixed Waste Cost	Clean Waste Cost	Lord Wester Cost	Activated Waste Cost	Total Cost	86.42% Redicionical Removal 5	13.56% Non-radiological Removal \$
		in-Vivo in-Vitro				\$600 \$350	27 27	\$16,200,00 \$9,460,00		16,200 9,450				* :		o zaminaro	ARISHADI.	er acceptance	enc.ass	SOME.	MA	14108	16009	siden	36000	1200.5005	removal 2	radiona 4
		Physical @ Blood Tests	tion - assume all certified	1 hr	our and our and our	\$150 \$125	21 27	\$4.050.00 \$3.375,00	\$3,856,34 \$965,58 \$0.00	7.918 4.342 0																		
1.4	1.3	Site Specific Trais	ining	9			6	\$33,075,00 1.00	\$4,832.92 8,00	37.908 216									\$7,733							\$7,733		
		Crew			Rate, \$/hr	Cost, Site				-10									\$1,133							\$1,133		
15 St.	a Dromon			poletiet	\$0.00 \$0.00	\$0.00 \$0.00	With Period Dese With Period Over With Period Over With Period Over With Period Dese With Period Over With Period Over	indent costs indent costs	22.22																			
		Initial Site Survey					18.00		32.00 16.00	0									\$14,404							\$14,404 \$0	\$12,448	\$1,956
			Estimated Duration	18 hr	ne .				2,5155																	30		
1.5		Selua work areas					8.00	1	8.00																	50		
1.5		Decentamination					8.00		8.00																	\$0		
		ct all utilities to work Electrical	K Great.				16.00		16.00	98								\$0	\$7,202							\$7,202	\$6,224	\$976
		Versilation				В	4.00		4.00	24									\$3,601							\$3,601		
4	1.6.3	Ploine				8	4.00		4.00	24									\$1,800							\$1,800		
1.7 Res	moval i	Inside security fence	o				1.333		1,333	9,328	54,427	- 0	0	0	0 2,1	11 0	đ	\$0	\$667,763	\$1,922,657	\$0	\$0	\$6,265	\$0	\$0	\$2,596,684	\$2,535,505	\$81,179
1.7	1,1	Remove Geard Pr	osta			A		1.00	4.71	33	0				21	2			\$2,361	\$0			\$944			\$3,305		\$3,306
		Clean Clean	Inventory Bulkling Concrete Pad	Number 2 2	Length, ft.	Area, so. ft.	Volume, cu. Fl. 648.00 60.00	Weight, Lbs 9,000,00	Vol. Reduc. factor 70.00% -30.00%	Adjusted Volume, ctr. fl. 194 78	# of boxes 0 0	2.00 25.00	hre/ea. cu, vd./dev	PLF	1 4.00	Estimated Use 2012 Me	ens og 50, 02	41 13.33 4320. 2	Scy, porday.	This rate is for	e stab on grade	using hand to	ole, use the se	me rate for this	s work with had	fraulio equipment		
			Waste	Weight this	Volume	No. of containers		Transport, \$	Disposal, \$	272 Total \$	0				4,71													
			Clean Contaminated		272.40 0.00	0.49 0.00	\$0.00 \$0.00	\$134.75 \$0.00	\$8,00	944																		
1.7	1.2	Instrument Enclos	sure			A	10	1.00	9.93	69	D				1,06	2			\$4.975	30			\$3.400			\$6,375		\$8.375
			Inventory	Number	Length, ft.	Area, sq. 9.	Volume, cu. Ft.	Weight, Lbs	Vol. Reduc.	Adjusted Volume, cu, ft.	# of boxes			PLF														
		Clean	Building Concrete Pad	1			1760.4D 162.62	24,392.05	50.00% -30.00%	880 211 1,092	1	8.00 25.00	hrs/ea. cu. yd./day		1 8.00 1 1.93 8.93	Estimated Use 2012 Mo	ans pa 50. C2	41 13.33 4320. 2	5 c. y. per day.	This rate is for	a slab on grade	using hand to	als, use the sa	me rate for this	s work with hye	fraulic eculomen		
			Waste Clean Conteminated	Weight, füs	Volume 1,091 80 0.00	No. of containers 1.76 0.60	Container, \$ \$0.00 \$0.00	Transport, \$ \$485.17 \$0.00	Disposal, \$ \$2,915.24 \$0.00	Total, \$ 3,400 0																		
1.7	.3	Remove VCCs					788	2	788	5,513	19,050		0	0	0	0 0		\$0	\$304,656	\$814,167	50	90	\$0	\$0	\$0	\$1,208.823	\$1,208.823	
1	1.7.3,1	Exterior Concrete	į.			A	201	1.00	200.88	1.406	16,320					0			\$100,854	\$511,356			\$0			\$612,010		
		Comaminated	Inventory Remove concrete		Number 16	Area. sq. ft.	Volume, cu. Ft. 12,553.60	Weidld, Lbs 1,883,040 00	Vol. Reduc. factor -30.00%	Adjusted Volume cu. ft. 16,320		25.00	cu.yd./day	PLF	1.35 200.86	Usa 2012 Ma	ans pg 50, 02	41 13.33 4320, 2	S c. y. ner day,	This rate is for	a eleb on grade	ı uning hand to	ols, use the se	me rate for thi	work with hw	trudic equipmen		
			Waste .	Weicht, lbs	Volume	No. of containers	Conteiner \$	Transport, \$	Disposal. \$	16,320 Total, \$	52				200.86													
1	1.7.3.2	Steel liner	Clean Contaminated	0 00 1.883,040.00	0.00 16.319.68	0.00 62.31 A	\$0.00 \$20,922,67	\$0.00 \$245.638.38	\$3.00 \$244,795.20 586.69	511,356 4,107	2,731					0			\$294,001	\$302,811			90			\$596.812		
			# W						Vol. Reduc.	Adjusted	# of					u			\$294,001	\$302.611			30			2090.612		
		Contaminated	Inventory Remove steel		Number 10	Area, eq. ft. 9,040	Volume, su. Ft. 2,275.68	Weight, Lbs 1,115,083.20	factor -20,00%	Volume, cu. fl. 2.731 2.731	boxes 31 31	0.06	hra/eg.fl.	PLF	1.00 586.69 586.60	Unit Coef fac	tor #2.											
			Wasie Clean Contembated	Weight, lbs 1,115,083,20	Volume 0,00 2,730.82	No. of containers 0.00 30.97	Container. \$ \$0.00 \$12,389.81	Transport, \$ \$0.00 \$149,460.13	Disposal, \$ \$0.00 \$144,980.82	Total, \$ 0 302,511																		
1.7	A	Remove Concrete	e Pad			A	435	1.00	435,41	3,048	35,377					0			\$218,193	\$1,108,490			80			\$1,326,683	\$1,326,683	
		Contaminated	Inventory Remove concrete		Number	Area, sq. ft	Volume, cu. Ft. 27.213.00	Weight, Lbs 0.00 4.081.950.00	Vol. Reduc. factor -30.00%	Adjusted Volume, cu. ft, 0 35.377	Fof boxes 0 113	25.00	au, yd /day	PLF		Use 2012 Me	iens pg 50, 02	41 13.33 4320, 2	5 c. y, per day,	This rate le for	a slab on erade	s using hand to	ols, use the sa	me rate for thi	s work with hw	dreuño equipmen	i,	
			Maria	Mar. 2. 44 -		22.2		n <u>a</u> niin kasias	- <u></u>	35,377	113 Diamond Wire	Diamond Wire			435.41													
			Waste Clean Contentisated	Weisht, the 0.00 4,081,950.00	Volume 0.00 35,376.90	No. of containers 0.00 113,39	\$0.00 \$45.355.00	Transport, \$ \$0.00	\$0.00	Total, \$	culling \$/outt	cutting																
1.7	7,5	Remove Feace a		-,va (.200.00	37,370.90	113,39 A	\$45,355,00 75		\$530,653.50 75.29	1,108,490	0				70	•			697 700	200			gu aren			gen na-		gan ann
***							**	1.00	Vol. Reduc.	Adjusted	# of				70				\$37,729	\$0			\$1.670			\$39,399		\$39,398
									100 40 (407004)																			

						Spene	Uncorrected Duration (No. of Hoses)	Prod. Fastor	Adjusted Duration	Man-bizira	LSAWaste Disp_Vol.(cf)	Hazardosas Waste Vol (ot)	Bellast Yolune (af)	Mixed Waste Yoluma (of)	Clean Waste Yolune (cl)	Waste	etivated Materia Waste Consumal datas (ct) & Equips	ies,	LSA War	Hazardo: Waste Cost	s Mixed Waste Cost	Clean Waste Cons	Lend Waste Cost	Activated Waste Cost	Total Cost	86.42% Radiological Removal \$	13.58% Non-radiological Removal \$
			Inventory	Number	Length, fl.	Area, sq. ft.	Valume, cu. Ft.	Weight, Lbs	fector	Volume, cu. ff.	booms			PLF													
		Clean Clean Clean	Fence Poles Footings	66 60	620		516.67 29.74 155.43	23.314.50	0.00% 0.00% 0.00%	517 30 155	0	445 0.50 0.50	fi/day hrs/es hrs/es	1.00 1.00 1.00		2012 RS Means 0 Estimated Estimated	2 41 13.60 1700										
			Waste	Weight, lbs	Volume 701.84	No. of containers	Container, \$ \$0.00	Transport, \$ \$239.26	Disposal, \$ \$1,431.74	702 Total, \$ 1,670					75.29												
			Clean Contaminated		701.84 0.00	No. of containers 0.87 0.00	\$0.00 \$0.00	\$238.26 \$0.00	\$1,431,74 \$0.00	1,870																	
1	1.7.6	Romove Light To	wate			A	20	1,00	19.68 Vol. Reduc	138	a of				105	k		\$9.8	60	\$0		\$260			\$10,100		\$10,100
			Inventory 1	Number	Length, ft.	Area, sq. ft.	Volume, cu. Ft.	Weight, Lbs	festor	Adjusted Volume, su. ft.	poxee.			PLF													
		Clean Clean	Ground Cable Excevate buried size Backlill		1,220		1,41 1,800 1,800		0.00% 0.00% 0.00%	1 0	0	2200.00 200 1,225	LF/day ou, vd./day ou, vd./day	1.00 1.00 1.00	0.55 2.67 0.44	2112 RS Means, p 2012 RS Means 3 2012 RS Means 3	1, 535 26 05 05,10 16 1 23 18,13 0060 1 23 23,14 3020	M0									
		Clean Clean	IR tower Tower base	;			28.19 75.36	11,304.00	0.00%	28 75	0	2.00	hre/es hra/es	1.00 1.00 1.00	2.67 0.44 8.00 8.00	Estimated Estimated											
										105	0				19,66												
			Waste Clean Contaminated	Weight. Ibs	Volume 104,98 0.00	No. of containers 0.13 0.00	Container, \$ \$0.00 \$0.00	Transport, \$ \$35,63 \$6.00	Discosel, \$ \$214.11 \$0,00	Total. \$ 250 0																	
1.8	Removal	outside security fe	non			A	318		318	2.047	0		0	0 0	548,18	1 0	٥	\$0 \$150,	278	\$0	\$0 \$0	\$184,036	\$0	\$0	\$334,315		\$334,316
	1.8.1	Remove Nulsan	se Fence			A	138	1,00	137.67	964	0				629	i i		1.69\$	167	\$0		\$1,497			\$70,485		\$70,485
			Investory	Number	Length, fl.	Area, so. fl.	Volume, cu. Ft.	Weight Lbs	Vol. Reduc.	Adjusted Volume, cu. ft.	# of boxes			PLF													
		Clean Clean Clean	Fence Ground Cable		1,236 1,545		310,00 1.78		0.00%	310 2	0	445 2200.00	filday LP/day	1.00	5.57 0.70	2012 RS Means 0 2112 RS Means,	2 41 13 50 1700 p, 535 26 05 05,10 1 11 23 16 13 0060	M0									
			Excavate buried cipe	126			1.78 3,708 3,708		0.00%	o o	0	200 1,225 0.50	cu. yd /day cu. yd /day	1.00 1.00 1.00 1.00 1.00 1.00	0.70 5.49 0.90 62.50	2012 RS Moons 3	11 23 16.13 0060 11 23 23.14 3020										
		Clean Clean	Poles Footings	125 125			23.06 294.39	44,158,25	0.00% 0.00%	23 294	0	0.50	hra/ea hra/ea	1.00		Estimated Estimated											
			Waste Clean	Weight, the	Volume	No. of containers	Container, \$	Transport, \$ \$213.62	Disposal, \$ \$1.283.61	629 Total. \$ 1.497	1				137,87												
			Clean Contaminated		Volume 829.22 0.00	0.78 0.60	\$0.00	\$213.62 \$0.00	\$0.00	0																	
	1.8.2	Retaining Wall	Townson.		N	B Area, sq. ft.	Volume, cu. Pt.		41.09 Vol. Reduc, factor	247 Adjusted Volume, ou. ft.	# of boxes			PLF	520,000)		\$18.4	194	\$0		\$27,840			\$46,334		\$46.334
		Clean Clean	Wall Footing		1	2000, SQ. R.	2080.00 1386.67	312,000.00 208,000.00	-30.00% -30.00%	2.704 1,803	9	25.00 25.00	cu. vd /day cu. vd./day	1	24.65 16.43	Use 2012 Means Use 2012 Means	pg 50, 02 41 13.33 4 pg 60, 02 41 13.33 4	320, 25 c. v. ser 320, 25 c. v. ser	day. This rate it	s for a slab on a for a slab on	grade esine hend grade veing hand	loois, use the st tools, use the se	sume rate for this armo rate for this	work with hyd	trautic aquiemen trautic aquiomen	L L	
										4,507	14				41.09												
			Waste Clean Conteminated	Weight, lbs 4,506.67 0.00	Volume 529,000.60 0,00	No. of containers 14.44 0.00	Constainer. \$ \$0.00 \$0.00	Transport. \$ \$3,972.22 \$0.00	Disnosal, 3 \$23,868.00 \$0.00	Total, \$ 27,840 0																	
	1.8.3	Conduit and wir	e - Instrument Enclosure t	to Utility Poin		В	51	1.00	61.49 Vol. Reduc.	309 Adjusted	101				1	6		\$23,	175	\$0		533			\$23,208		\$23,208
		Clean Clean	Inventory Excavate buried pipe	Feet	Number	Area. sq. ft.	Volume, es. Ft. 630	Weicht, Lbs	factor 0.00%	Volume, cu. ft.	boxes 0	200 100 1.225	cu, yd/dar	PLF v 1.00	0.93	2012 RS Means	31 23 16.13 0080										
		Clean	Buried pipe, clean Beckfill	630			630 14 630		0.00% 0.00%		0		L. Fiday ou. vd./da	v 1.00 1.00 v 1.00	50.4 0.15	2012 mean p463 2012 RS Means 3	31 23 23 14 3020										
			Westo	Weight, the	Volume 13.74	No. of containers	Container \$	Transport, \$	Disposal, \$	14 Total, \$	0				51.49												
			Clean Contaminated	0.00 0.00	13.74 0.00	0.02 0.00	\$0.00 \$0.00	Transport, \$ \$4.56 \$0.00	\$28.02 \$0.00	33 0																	
	18.4	Remove road in	olde loensed area			8	83	1.00	82.67 Vol. Reduc.	496 Adhested	0 # af				25,38	9		\$37.	210	\$0		\$153,705			\$190,915		\$190,915
		Clean	Inventory Paverment		Number	Weight, Ibs 2,870,910	Area, sq. ff. 39,060	Volume, cu. Pt. 19530.00		Volume, ou. ft. 25,389	boxes 80	420	S.Y./day	PLF 1.00	82.67	2012 RS Moans	02 41 13.17 6050										
										25.389	80				82,67												
			Waste Clean Contaminated	Weight, ibs	Volume 25,389.00 0.00	No. of containers 79.78 0,00	Container. \$ \$0.00 \$0.00	Trensport, \$ \$21,930.56 \$0.00	Discosal, \$ \$131,774.77 \$0.00	Total, \$ 153,705 0																	
	1.8.5	Remove vehicle			0.00	В	44.00		5.38	32					14	0		\$2	412			3961			\$3,373		\$3,373
			Inventory	Feet	Number	Area, eq. ft.	Volume, su. Fl.	Weight, Lbs	Vol. Reduc. fector	Adjusted Volume, eu. ft.	# of boxes			PLF													
		Clean	Foundation Gate assembly				114.64	17,196.00 752,00	-30 00% 0.00%	149	0	25.00 4.00	cu. vd./dav hrs	1.00	1 1.36	Usa 2012 Means estimeted	on 50, 02 41 13.33	1320, 25 c. v. per	day. This rate	is for a slab on	crade usina han	l tools, use the s	arne rate for thi	s work with hy	draulio equipmen	t.	
										149		1			5.36												
			Weste Clean	Weight, fbs 17,948.00	Volume 149,03	No. of containers 0.50	s Conteiner, \$ \$0,00	Transport, \$ \$137,10	Disposal, \$ \$823.81	Total, \$ 961 0																	
			Contemineted	0.00	0.00	0.00	\$0.00	\$0,00	\$0,00	0																	
	1,8.10	Miscellaneous																									
1,9	Final St	le Servey Structure	gone - By DGC Staff				184.00	1.00	184.00	0							\$2	5.000							\$25,000	\$21,60	\$ \$3.395
	1.9.1	Prepare Final 5	Status Survey Plan	45	days =	Work hours 086	hrs	duration, days 5	dava - 40 days is	n parallel with deco	aninolesimmo																
		Soll Sempling		5	days «	40	hrs	5	dava																		
	1.9.3	Direct Survey		3	days =	24	hrs	3	davs																		

							Cook	Chemented Date (Che. of Hear)		Adjusted Dantion	Mushous	1.5A Waste Dass, Yol (cf)	Harnedous Waste Yol (cf)	Ballest Yolome (st)	Missed Weste Volume (cf.)	Clean Waste Ynjame (cf)	i.esd Waste Yohane (cf.)	Activated Waste Yolume (st)	Materials. Consumbles, & Equipment	Labor Cost	LSA Wasse Cost	Hiszardous Weste Cost	Mined Water Cost	Closes Waste Cont	Lead Wans Cost	Assisted Wasse Coss	Total Cost	88.42% Radiological Plantoval \$	13.58% Nen-tesfologi Removal \$	
1	1.9.5 Precere Fin	nel Status Surve	ry Report		10 des	N/4 =	80	tera	5	days - five days	overlap with 1.16.4	•																		
							504		23																					
Ser	oplina analysis		00.002	per sample x		50	samples =	\$25,000 00																						
1.10 Oil	se Site Release Co:	offemation																										\$0		\$0
Thi	s activity will occur i	in peruliel with	1.5.																											
1.11 Out	tskie grees						A	47.	42 1	00 47.4	2 335	2 0	8.00	0.0	0.00	0.00	0.00	0.00	\$2.904	80	\$0	\$0	50	\$0	\$0	50	\$2,904		\$2	2,904
		ade and seed					A	47.		00 47.4		2							\$2,904								\$2.904		\$2	2.904
		Invento Grade Seed			w	Vidih	Depth	Aree sa 8. 87,129 87,126	Volume, cu	Vot. Reduc. Ft. factor 0.009 0.009		9 0		sq ft/8 hr day sq ft/8 hr day	PLF 1.00 1.00	30 9	2009 RS Mear 2009 RS Mear													
												0 0				47 42														
		Weste Seed a Structu	progradupe bra	Area, so. ft. 87,120.00		ofton, \$-SF	Material, \$/57 \$0.20	Eoviziment \$7 \$0.10	SY Volume ou	Ft. Cost. \$100. vd \$34.67	Total. \$ 2,904 0 2,904		4 32 92 19.13 1000 4 31 05 16.10 0800		23 24 0400															
1.12 Do	mostion Crew Demo	obilization							16	•	6 200	1							\$4,000	\$15,485							\$19,465	\$16,822	52	2,843
	Crew	1 CA Au 1 Health 1 Packer 1 Cost C 1 Sched 1 Domol 1 Industr 1 Engine 1 Protect 2 Decori	Itien Specialist fal Safety vesting Supervise Superviser tamination Tec- mentation Tech mination Tech mination Tech mination Tech mination Tech mination Oper tr man mxan	evisor Specialisi ant	\$8 56 57 \$9	56. \$7e 56.30 56.34 70.15 54.06	\$0.00	With Period De With Period So With Period So With Period De With Period De	pendent costs condent costs																					
	Dispose of General sh Travel horr	f unused materi to steanun ne		KIN.		4 4 4 18	nr ltr ltr																							
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1,13 Fir	nal Project Report -	Offsite					A	80	06	0.08 00.0	0 12	0								\$10.554							\$10.554	\$9,121		11,433
	Staff Protect Sp Protect Ma Contified H				No	2 1 1 4	Rutu \$81.06 \$101.59 \$101.69	Diretton	20	Cost 96.48 00 \$2.03 00 \$2.03 \$10.55	2	0																		

ENCLOSURE 2

CERTIFICATION OF FINANCIAL ASSURANCE

CERTIFICATION OF FINANCIAL ASSURANCE

NRC Licensee:

Yankee Atomic Electric Company
Yankee Rowe Independent Spent Fuel Storage Installation
NRC License No. DPR-3 (NRC Docket Nos. 50-029 and 72-31)
49 Yankee Road
Rowe, MA 01367

Issued to: U.S. Nuclear Regulatory Commission

Certification:

I hereby certify that Yankee Atomic Electric Company (YAEC) is the licensee for the Yankee Rowe Independent Spent Fuel Storage Installation (Yankee Rowe ISFSI) and that I, the undersigned, am authorized to provide this Certification of Financial Assurance with respect to the radiological decommissioning of the Yankee Rowe ISFSI.

During the operation of this ISFSI, spent nuclear fuel and Greater than Class C waste will be stored at the Yankee Rowe ISFSI in storage casks licensed under 10 CFR 72. Pursuant to contracts with the Department of Energy the spent fuel and associated casks will ultimately be removed from the ISFSI location, and YAEC will dispose of other radiological waste in accordance with NRC regulations, at which time the Yankee Rowe ISFSI will be decommissioned in accordance with NRC regulations.

I further certify that financial assurance in an amount sufficient to fund Yankee Rowe ISFSI radiological decommissioning at the time of such decommissioning has been provided, pursuant to 10 CFR 72.30, as described in the letter to which this Certification is attached. That radiological decommissioning funding assurance is premised on a site-specific decommissioning cost estimate and funding methodology described therein, in the amount of:

Yankee Rowe ISFSI

\$ 8.5 million (inclusive of contingency)

Carla M. Pizzella

Yankee Atomic Electric Company

Vice President, Chief Financial Officer, and Treasurer

Phone (860) 267-6426 x304

Corporate Seal

Date \2/\2

ENCLOSURE 3

TOTAL COSTS ASSOCIATED WITH THE YANKEE ROWE ISFSI, INCLUDING COST ESTIMATE FOR MANAGING IRRADIATED FUEL AND GTCC WASTE

Yankee Atomic Electric Company Irradiated Fuel & GTCC Waste Management and ISFSI Decom Estimate Represented in 2013 Dollars

	Data										
FERC Summary	Sum of 2013	Sum of 2014	Sum of 2015	Sum of 2016	Sum of 2017	Sum of 2018	Sum of 2019	Sum of 2020	Sum of 2021	Sum of 2022	2013 - 2022
Contingency	\$357,690	\$343,148	\$353,128	\$375,690	\$375,315	\$325,315	\$727,380	\$747,630	\$0	\$514,798	\$4,120,094
Insurance	\$431,000	\$537,667	\$431,000	\$431,000	\$431,000	\$431,000	\$431,000	\$431,000	\$0	\$1,054,000	\$4,608,667
Labor - Non-Manual	\$1,600,750	\$1,600,750	\$1,600,750	\$1,600,750	\$1,600,750	\$1,600,750	\$1,600,750	\$1,620,750	\$0	\$1,024,750	\$13,850,750
Labor - Security	\$2,380,000	\$2,380,000	\$2,380,000	\$2,380,000	\$2,380,000	\$2,380,000	\$2,380,000	\$2,380,000	\$0	\$0	\$19,040,000
Materials & Supplies	\$75,000	\$75,000	\$75,000	\$75,000	\$75,000	\$75,000	\$75,000	\$75,000	\$0	\$20,000	\$620,000
Miscellaneous	\$80,950	\$80,950	\$80,950	\$80,950	\$80,950	\$80,950	\$80,950	\$80,950	\$0	\$38,700	\$686,300
Outside Services - A&G	\$528,100	\$720,600	\$776,850	\$1,478,100	\$1,470,600	\$470,600	\$478,100	\$470,600	\$0	\$577,530	\$6,971,080
Outside Services - Fuel Loading	\$0	\$0	\$0	\$0	\$0	\$0	\$260,000	\$700,000	\$0	\$0	\$960,000
Outside Services - ISFSI OP's	\$438,000	\$548,000	\$548,000	\$548,000	\$548,000	\$548,000	\$548,000	\$548,000	\$0	\$75,000	\$4,349,000
Outside Services - Legal	\$900,000	\$200,000	\$450,000	\$200,000	\$200,000	\$200,000	\$700,000	\$450,000	\$0	\$1,600,000	\$4,900,000
Outside Services - NON-RAD D&D of ISFSI	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,370,719	\$0	\$1,370,719
Outside Services - RAD D&D of ISFSI	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$8,723,604	\$0	\$8,723,604
Property Taxes	\$260,000	\$260,000	\$260,000	\$260,000	\$260,000	\$260,000	\$260,000	\$260,000	\$0	\$100,000	\$2,180,000
Regulatory Fees	\$390,000	\$390,000	\$390,000	\$390,000	\$390,000	\$390,000	\$390,000	\$390,000	\$0	\$598,000	\$3,718,000
Utilities	\$70,000	\$70,000	\$70,000	\$70,000	\$70,000	\$70,000	\$70,000	\$70,000	\$0	\$60,000	\$620,000
Grand Total	\$7,511,490	\$7,206,115	\$7,415,678	\$7,889,490	\$7,881,615	\$6,831,615	\$8,001,180	\$8,223,930	\$10,094,323	\$5,662,778	\$76,718,214

Note 1: The cost of management of irradiated fuel and GTCC waste is calculated as follows:

\$76,718,214 Grand Total from Above (\$1,370,719) Non-Rad D&D ISFSI (\$8,723,604) Rad D&D ISFSI

\$66,623,891 Management of Irradiated Fuel and GTCC Waste

Note 2: The cost of RAD and NON-RAD D&D of the ISFSI in 2013 dollars as provided in the column labeled "Sum of 2021" is derived by escalating the value of the cost estimates provided in Enclosure 1 by 2.5%.