ORIGINAL

INTERNATIONAL TECHNOLOGY CORPORATION

ASSESSMENT OF COSTS

FOR

DECOMMISSIONING

OF

AlChemIE, INC. - OLIVER SPRINGS FACILITY

Submitted by

IT CORPORATION
312 Directors Drive
Knoxville, TN 37923

NOVEMBER 3, 1987

307148

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INTERNATIONAL TECHNOLOGY CORPORATION

November 2, 1987

Mr. Dennis L. Bell
ALChemIE, Inc.
Pine Ridge Office Park
702 S. Illinois Avenue
Oak Ridge, TN 37830

Dear Mr. Bell:

Enclosed is IT Corporation's Cost Assessment for the decontamination, decommissioning and waste disposal of the ALChemIE Oliver Springs Facility.

Please feel free to contact Mr. Peter Keegan or me with any questions or discussions. We look forward to working with you in the future.

Sincerely,

George E. Krauter
General Manager, Nuclear Services

GEK/lt

Enclosure

cc: File 307148

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I. PROJECT DESCRIPTION

AlChemIE, Inc., will soon begin design and construction of a 120 machine plant in Oliver Springs, Tennessee, using the gas centrifuge technology to enrich various stable isotopes for commercial utilization. This plant will be expanded in stages to a maximum of 600 machines. The gas centrifuge equipment and technology will be received from the Department of Energy (DOE). Before AlChemIE receives this equipment, the DOE requires assurance that adequate funding will be available for the final disposition of all classified and uranium contaminated equipment and materials received from DOE.

The gas centrifuge equipment and piping includes classified material, uranium contaminated material and Resource Conservation and Recovery Act (RCRA) controlled material. After operations begin, this equipment, and associated auxiliaries (described in Table 1 for a 600 machine plant), will become contaminated or be further contaminated by the feed compounds (see Table 2). The product residue, in many cases, is a toxic material and must have its disposal strictly controlled.

Decommissioning of this facility at the end of its life will require disposal of parts of the process equipment and auxiliaries in one of the following classifications:

- Classified burial grounds
- Uranium contaminated burial grounds
- Toxic materials burial grounds
- Landfill for industrial refuse.

All classified equipment and materials must be buried in a DOE classified burial ground, and although uranium contaminated materials are acceptable at the DOE facility, toxic substances are not. All classified items contaminated with toxic material will be decontaminated before burial.

In each of the respective commercial burial grounds, uranium contaminated and toxic materials can be received but not co-mingled. Uranium contaminated materials must go to the radioactive material burial ground and toxic materials must go to the toxic material burial ground. Finally,

industrial landfills may not receive any classified, uranium contaminated or toxic materials. Therefore, a major portion of the decommissioning effort will involve segregating each class of material into discrete categories for final disposal while trying to keep the cost of the decommissioning to a minimum.

It should be noted that this stable isotope enriching plant will be constructed in stages, presently planned as 120 machines initially plus three additional stages of 160 machines each for the total of 600 centrifuges. Hence, the decommissioning scope, and therefore the cost, will increase with time. Centrifuge machines will also fail with time. This in turn will reduce the total decommissioning cost at plant shutdown since these failed classified and/or contaminated machine components received from DOE will be disposed of as appropriate and as required at the time of failure. Thus, estimates for decommissioning and disposal of the classified and contaminated equipment received from DOE or contaminated by AlChemIE are listed in Table 11 under three headings in order to establish a range of costs. These three estimates are for the following: (1) No machines assembled with all GCEP equipment in storage at Oliver Springs, (2) 120 machine plant in operation, and (3) 600 machine plant in operation.

These estimates are given as "planning level" cost estimates for the decommissioning effort that will be involved in terminating operations at the Oliver Springs facility. A complete plan for the appropriate stage of operation will be prepared during the engineering phase of the decommissioning.

II. DECOMMISSIONING

A. DECOMMISSIONING PLAN

The decommissioning, as appropriate, of the AlChemIE, Inc., Oliver Springs facility will be conducted in accordance with a decommissioning plan. The decommissioning plan will be prepared during the engineering phase of the decommissioning. The plan will serve as a description of the history of the facility and equipment to the time

of termination, a description of the decommissioning methodology, and a forum where the goals of the decommissioning effort are stated. An outline of a decommissioning plan is given as Table 3.

B. PROJECT APPROACH

The decommissioning activities to be conducted at the AlChemIE, Inc., Oliver Springs facility will be conducted in four discrete phases:

- Engineering
- Mobilization
- Decommissioning
- Demobilization

Each of these phases will be made up of a number of chronologically related tasks and subtasks. An outline of the tasks and subtasks for each phase is given in Table 4.

C. PROJECT ORGANIZATION

The decommissioning of the AlChemIE, Inc., Oliver Springs facility will take about one year, for a 600 machine plant, and will involve approximately 52 people. A breakdown of personnel types and hours for this phase of the decommissioning is shown in Table 5C. Similar breakdowns for the two other selected stages of operation are shown as Tables 5A and 5B. In any event, the Phase 3 decommissioning activities will be conducted on a 5 day per week basis. Shift structures for each of these three stages are given in Tables 6A, 6B, and 6C and the breakdowns of the labor hours associated with these activities are given in Tables 7A, 7B, and 7C.

III. PROJECT COST

The cost associated with performing the decommissioning activities at the AlChemIE, Inc., Oliver Springs facility is given in Tables 8A, 8B, and 8C. The estimates have been broken down for each of the three selected stages by phase and cost category.

A. VARIABLES

There are a number of variables that affect the cost of performing any decommissioning project. A number of these variables are discussed below. The result of how these variables affect the cost of the decommissioning effort is reflected in Table 11.

1. Machine Use

In order to reduce the mixed waste problem at the time of decommissioning, a conscious effort will be made to use machines that are presently contaminated with uranium to enrich the isotopes that do not leave RCRA controlled residues. Those machines that are not presently contaminated with uranium will be used to process feed materials that may leave RCRA controlled residues. Table 10 is a list of the feed compounds that may produce RCRA controlled residues. In addition, the two machines that will be involved in processing the SbH_3 should be noted for special handling. Although this is not a RCRA controlled substance, there are added precautions that will be used in working with this substance and its residues.

It should also be noted that all of the toxic substances will be disposed of as "heavy metal" wastes. Burial grounds, such as ChemWaste Emelle of Emelle, Alabama, that dispose of heavy metal wastes do not discern between single and multiple contaminants. Therefore, the machines used to process any of the feed compounds given in Table 10 could be intermixed, from a decommissioning standpoint.

If this use of machines is fully employed, one-third of the machines will only have non-toxic residues added to them as a result of operations at the AlChemIE, Inc., Oliver Springs facility. This means uranium contaminated classified equipment or material in this category will not need to be decontaminated prior to classified disposal and unclassified equipment or material that originally had no uranium contamination could be directly disposed of as refuse or salvage without any decontamination. In addition,

two discrete decontamination baths would be used when needed, one for uranium contaminated materials and one for RCRA controlled materials. This will minimize additional processing to prevent mixed waste problems. An overall labor saving of approximately $35,000 -- and a waste cost reduction of approximately $65,000 -- will be realized by employing this machine use method.

2. Scrap

In segregating the unclassified waste, an effort should be made to set aside non-contaminated and decontaminated scrap. The scrap should then be gathered into discrete salvage bins that will be collected and hauled away to the scrap yard. This gives the double advantage of providing an income from the scrap as well as reducing the refuse transportation and refuse disposal costs.

Some equipment will have residual value to perform tasks for which it was designed. The mass spectrometers, pumps, and some of the electrical gear used in the facility will be able to be salvaged and sold for re-use. In addition, Table 9, gives the approximate scrap value that could be realized from an organization such as Southern Alloy of Rockwood, Tennessee, for re-sale of salvaged metals.

3. Contract Type

The contractor performing this decommissioning will have some level of uncertainty in bidding this scope of work. Currently in the cost estimates there is a 15% contingency to cover this uncertainty, should the decommissioning be performed on a fixed price basis. Should the contract be changed to time-and-materials or cost-plus fixed fee, the contingency would not be appropriate in the bid. However, the contingency will then need to be added into the contract administrators budget to ensure adequate funds are available to cover unforeseen costs.

Table 1. Centrifuge Sub-Assemblies and Other Classified or Contaminated Equipment Description
600 Machine Plant

	Number	Final Volume (ft^3)	Weight/Unit (lbs)
Rotors	1510 each	10	1000
Casings	620 each	15	8000
Heat shield	900 each	4	100
Diffusion pumps	1600 each	0.25	20
Scoop post	1245 each	2	40
Scoops, feed ports & SPIS	1380 each	0.25	20
Upper suspension	1245 each	18	300
Lower suspension	720 each	0.5	10
Lower drive and closure	675 each	9	400
Bottom yoke	620 each	13.5	100
Piping and manifold	620 each	2	100
Wiring harness	650 each	0.25	10
Vacuum gauges	120 each	0.1	1
Flex connectors	3040 each	0.05	20
Machine valve sets	660 each	0.1	200
Aluminum pipe 1"	16000 feet	0.007	0.33
Aluminum pipe 4"	9000 feet	0.042	1.25
Steel pipe 4"	1000 feet	0.042	4
Steel pipe 3"	1000 feet	0.037	2
Steel pipe 2"	1000 feet	0.025	1.7
Steel pipe 1/2"	2000 feet	0.005	0.25
Aluminum pipe 2"	2000 feet	0.025	1
MDP	1600 each	3.0	100
MVIP	1600 each	1.0	25
Cascade isolation valves	300 each	0.1	40
Sample valves	100 each	0.05	5
Sensor valves	100 each	0.05	5
PV and EV valves	200 each	0.1	30
Portable carts	58 each	10	150
Mass specs	2 each	1	500
RBCS & controls	1 each	405	10000
Assembly stands	2 each	405	6000
Recycle & Assembly tooling	2 each	50	2000
PV pumps	30 each	8	800
Chem traps	24 each	2	200
Portable feed systems	8 each	0.1	5
Portable withdrawal system	12 each	0.1	5

Table 2. Exposure of Centrifuges to Feed Compounds[1]
AIChemIE Proprietary Information

Feed Compound[2]	Number of Centrifuges Exposed to Feed Compound	Compound Used[3] Per Year (kg/year)
TeF_6	20	500
$(CH_3)_2$ Hg	240	44,000
CF_3Cl	10	2,900
$(CH_3)_2$ Zn	20	2,600
SiF_4	20	750
CrO_2F_2	120	65
$Fe(CO)_5$	20	276
BF_3	120	2,500
GeF_4	10	25
SeF_6	3	2
CF_3Br	3	355
WF_6	3	2
VF_5	3	2
$(CH_3)_3$ Ga	3	12
MoF_6	3	160
SbH_3	2	2
IrF_6	2	2
$Pb(CH_3)_4$	2	2
$Ru(CO)_4$	2	2
$(CH_3)_2$ Cd	10	55
$(CH_3)_3$ In	2	2
SnH_4	2	2
TaF_5	2	2
ReF_6	2	2
$(C_2H_5)_2$ Zn	60	3,100

[1]Associate piping is also exposed. There are small feed and withdrawal systems exposed to each compound.

[2]Non-radioactive.

[3]Only some used each year.

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Table 3. Decommissioning Plan Outline

1.0 Introduction

2.0 Site Descriptions

- 2.1 History
- 2.2 Physical
- 2.3 Radiological

3.0 Project Objective

4.0 Disposition Mode

5.0 Activity Descriptions

6.0 Waste Management

- 6.1 Volume
- 6.2 Type
- 6.3 Packaging
- 6.4 Disposition

7.0 Property Disposition

8.0 Safety

- 8.1 Industrial
- 8.2 Radiological
- 8.3 Emergency Response & Readiness

9.0 Cost and Schedule

10.0 Project Control

- 10.1 Management Organization
- 10.2 Quality Assurance
- 10.3 Training
- 10.4 Health and Safety
  - Industrial
  - Radiological
- 10.5 Financial
  - Cost Control
  - Funding

Table 4. Phase, Task and Subtask Descriptions

Phase 1: Engineering

Plans

- Decommissioning plan
- ALARA plan
- Safety and health plan
- Survey and sampling plan
- Release of facility
- QA plan
- Security

Procedures

- Work procedures
- Sampling procedures
- Survey procedures
- Waste packaging procedures
- Waste segregation procedures
- Waste shipping procedures
- Decontamination

Permits

- State of Tennessee
- NRC
- City of Oliver Springs
- DOE Use of Burial Grounds

Phase 2: Mobilization

Personnel

- Site-specific training
- Physicals & baseline bioassays

Equipment

- Rentals
- Consumables
- Special tooling
- Order long lead time items
- Assemble equipment at facility

Table 4.
(Continued)

Phase 3: Decommissioning

Pre-work survey

- Radiological
- Toxicological

D&D activities

- Dismantle machines
- Segregate waste types
- Decontaminate as necessary
- Package various waste forms
- Ship waste to appropriate burial facility

Final release survey

- Radiological
- Toxicological

Third party check survey (QA)

Phase 4: Demobilization

Personnel

- Exit physical & bioassay
- Exit interview

Equipment

- Return Rentals
- Package & ship other equipment
- Conduct final site inspection

Table 5A. Labor Hours
Equipment in Storage Only

Labor	Phase 1: Engineering	Phase 2: Mobilization	Phase 3: Decom.	Phase 4: Demob.	Totals
Project Manager	346	80	1040	120	1586
Shift Supervisor	346	80	1040	120	1586
Engineer	692	80	1040	120	1932
HP Supervisor	173	80	1040	120	1413
HP Technician	0	80	3120	120	3320
IH Technician	173	80	2080	120	2453
Maintenance Supervisor	173	80	1040	0	1293
Maintenance Technician	0	80	1040	0	1120
Decon Technician	0	1440	18077	1440	20957
Clerk	0	80	1040	120	1240
Secretary	346	80	1040	120	1586
Total	2249	2240	31597	2400	38486

Table 5B. Labor Hours
120 Machine Plant in Operation

Labor	Phase 1: Engineering	Phase 2: Mobilization	Phase 3: Decom.	Phase 4: Demob.	Totals
Project Manager	346	80	1560	120	2106
Shift Supervisor	346	80	1560	120	2106
Engineer	692	80	1560	120	2452
HP Supervisor	173	80	1560	120	1933
HP Technician	0	80	4680	120	4880
IH Technician	173	80	3120	120	3493
Maintenance Supervisor	173	80	1560	0	1813
Maintenance Technician	0	80	1560	0	1640
Decon Technician	0	1440	26451	1440	29331
Clerk	0	80	1560	120	1760
Secretary	346	80	1560	120	2106
Total	2249	2240	46731	2400	53620

Table 5C. Labor Hours
600 Machine Plant in Operation

Labor	Phase 1: Engineering	Phase 2: Mobilization	Phase 3: Decom.	Phase 4: Demob.	Totals
Project Manager	346	80	1600	120	2146
Shift Supervisor	346	80	1600	120	2146
Engineer	692	80	3200	120	4092
HP Supervisor	173	80	1600	120	1973
HP Technician	0	80	6400	120	6600
IH Technician	173	80	4800	120	5173
Maintenance Supervisor	173	80	1600	0	1853
Maintenance Technician	0	80	1600	0	1680
Decon Technician	0	1440	51932	1440	54812
Clerk	0	80	1600	120	1800
Secretary	346	80	1600	120	2146
Total	2249	2240	77532	2400	84421

Table 6A. Shift Manpower Loading
Equipment in Storage Only

Shift 1	Shift 2
1 Project Manager	1 Maintenance Supervisor
1 Engineer	1 Maintenance Technician
1 Shift Supervisor	1 IH Technician
1 HP Supervisor	
3 HP Technicians	
1 IH Technician	
18 Decon Technicians	
1 Secretary	
1 Clerk	

Table 6B. Shift Manpower Loading
120 Machine Plant in Operation

Shift 1	Shift 2
1 Project Manager	1 Maintenance Supervisor
1 Engineer	1 Maintenance Technician
1 Shift Supervisor	1 IH Technician
1 HP Supervisor	
3 HP Technicians	
2 IH Technicians	
17 Decon Technicians	
1 Secretary	
1 Clerk	

Table 6C. Shift Manpower Loading
600 Machine Plant in Operation

Shift 1	Shift 2	Shift 3
1 Project Manager	1 Shift Supervisor	1 Maintenance Supervisor
1 Engineer	1 Engineer	1 Maintenance Technician
1 HP Supervisor	2 HP Technicians	1 IH Technician
2 HP Technicians	1 IH Technician	
1 IH Technician	18 Decon Technicians	
18 Decon Technicians	1 Clerk	
1 Secretary		

Table 7A. Decontamination Technician Work Breakdown (Phase III)
Equipment in Storage Only

Man Hours	Work Description
1860	Decon/dispose 620 casings x 3 mhrs
2700	Decon/dispose 900 heat shields x 3 mhrs
7852	Decon/dispose 1510 rotors x 5.2 mhrs
160	Dispose 1600 diffusion pumps x 0.1 mhrs
249	Decon/dispose 1254 scoop posts x 0.2 mhrs
276	Decon/dispose 1380 scoops/SPIS x 0.2 mhrs
2241	Decon/dispose 1245 upper susp x 1.8 mhrs
720	Decon/dispose 720 lower susp x 1 mhr
675	Decon/dispose 675 lower drive x 1 mhr
24	Vacuum gauges decon/disp 120 x 0.2 mhrs
160	MDP dispose 1600 x 0.1 mhrs
160	MVIP dispose 1600 x 0.1 mhr
200	RBCS and controls
800	Miscellaneous
18077	

Table 78. Decontamination Technician Work Breakdown (Phase III)
120 Machine Plant in Operation

Man Hours	Work Description
8450	Disassemble, decon/dispose 130 casings x 65 mhrs
1470	Decon/dispose 490 casings x 3 mhrs
2250	Decon/dispose 750 heat shields x 3 mhrs
7030	Decon/dispose 1352 rotors x 5.2 mhrs
145	Dispose 1450 diffusion pumps x 0.1 mhrs
219	Decon/dispose 1095 scoop posts x 0.2 mhrs
246	Decon/dispose 1230 scoops/SPIS x 0.2 mhrs
1971	Decon/dispose 1095 upper susp x 1.8 mhrs
588	Decon/dispose 588 lower susp x 1 mhr
540	Decon/dispose 540 lower drive x 1 mhr
22	Vacuum gauges decon/disp 110 x 0.2 mhrs
1000	Remove, decon/dispose piping (8300') valves, connections, etc.
160	MDP dispose 1600 x 0.1 mhrs
160	MVIP dispose 1600 x 0.1 mhr
400	RBCS and controls
600	Assembly stands
1200	Miscellaneous
26451	

Table 7C. Decontamination Technician Work Breakdown (Phase III)
600 Machine Plant in Operation

Man Hours	Work Description
39650	Disassemble, decon/dispose 610 casings x 65 mhrs
30	Decon/dispose 10 casings x 3 mhrs
780	Decon/dispose 260 heat shields x 3 mhrs
4420	Decon/dispose 850 rotors x 5.2 mhrs
94	Dispose 940 diffusion pumps x 0.1 mhrs
121	Decon/dispose 605 scoop posts x 0.2 mhrs
148	Decon/dispose 740 scoops/SPIS x 0.2 mhrs
1089	Decon/dispose 605 upper susp x 1.8 mhrs
105	Decon/dispose 105 lower susp x 1 mhr
55	Decon/dispose 55 lower drive x 1 mhr
2000	Remove, decon/dispose piping (43,000') valves, connections, etc.
320	MDP dispose 1600 x 0.2 mhrs
320	MVIP dispose 1600 x 0.2 mhr
400	RBCS and controls
600	Assembly stands
1800	Miscellaneous
51932	

TABLE 8A

Cost Estimate - Equipment in Storage Only

AIChemIE DECOMMISSIONING
AIChemIE, INC.
OAK RIDGE, TENNESSEE

COST ITEM	RATE $/HR	PHASE 1 ENGINEERING QUANTITY HRS	PHASE 1 TOTAL $	PHASE 2 MOBILIZATION QUANTITY HRS	PHASE 2 TOTAL $	PHASE 3 DECOMMISSIONING QUANTITY HRS	PHASE 3 TOTAL $	PHASE 4 DEMOBILIZATION QUANTITY HRS	PHASE 4 TOTAL $	TOTALS QUANTITY HRS	TOTALS TOTAL $
LABOR											
PROJECT MANAGER	$25.00	346	$8650.00	80	$2000.00	1040	$26000.00	120	$3000.00	1586	$39650.00
SHIFT SUPERVISOR	$16.00	346	$5536.00	80	$1280.00	1040	$16640.00	120	$1920.00	1586	$25376.00
ENGINEER	$15.00	692	$10380.00	80	$1200.00	1040	$15600.00	120	$1800.00	1932	$28980.00
HP SUPERVISOR	$15.00	173	$2595.00	80	$1200.00	1040	$15600.00	120	$1800.00	1413	$21195.00
HP TECHNICIAN	$12.00	0	$0.00	80	$960.00	3120	$37440.00	120	$1440.00	3320	$39840.00
IH TECHNICIAN	$15.00	173	$2595.00	80	$1200.00	2080	$31200.00	120	$1800.00	2453	$36795.00
MAINTENANCE SUPERVISOR	$15.00	173	$2595.00	80	$1200.00	1040	$15600.00	0	$0.00	1293	$19395.00
MAINTENANCE TECHNICIAN	$10.00	0	$0.00	80	$800.00	1040	$10400.00	0	$0.00	1120	$11200.00
DECON TECHNICIAN	$8.00	0	$0.00	1440	$11520.00	18077	$144616.00	1440	$11520.00	20957	$167656.00
CLERK	$5.00	0	$0.00	80	$400.00	1040	$5200.00	120	$600.00	1240	$6200.00
SECRETARY	$6.00	346	$2076.00	80	$480.00	1040	$6240.00	120	$720.00	1586	$9516.00
SUBTOTAL			$34427.00		$22240.00	31597	$324536.00		$24600.00		$405803.00
OVERHEAD	1.3		$44755.10		$28912.00		$421896.80		$31980.00		$527543.90
G & A	0.12		$9501.85		$6138.24		$89571.94		$6789.60		$112001.63
TOTAL LABOR			$88683.95		$57290.24		$836004.74		$63369.60		$1045348.53

TABLE 8A (cont.)

AIChemIE DECOMMISSIONING
AIChemIE, INC.
OAK RIDGE, TENNESSEE

COST ITEM	RATE $/HR	PHASE 1 ENGINEERING QUANTITY HRS	PHASE 1 TOTAL $	PHASE 2 MOBILIZATION QUANTITY HRS	PHASE 2 TOTAL $	PHASE 3 DECOMMISSIONING QUANTITY HRS	PHASE 3 TOTAL $	PHASE 4 DEMOBILIZATION QUANTITY HRS	PHASE 4 TOTAL $	TOTALS QUANTITY HRS	TOTALS TOTAL $
TRAVEL & LIVING											
PER DIEM	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00		$0.00
MILEAGE	$0.21	2270.63	$476.83	630	$132.30	12285	$2579.85	945	$198.45		$3387.43
AIRFARE	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00		$0.00
SUBTOTAL			$476.83		$132.30		$2579.85		$198.45		$3387.43
G & A	0.12		$57.22		$15.88		$309.58		$23.81		$406.49
TOTAL T & L			$534.05		$148.18		$2889.43		$222.26		$3793.92

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TABLE 8A (cont.)

AlCheaIE DECOMMISSIONING
AlCheaIE, INC.
OAK RIDGE, TENNESSEE

COST ITEM	RATE $/HR	PHASE 1 ENGINEERING QUANTITY HRS	TOTAL $	PHASE 2 MOBILIZATION QUANTITY HRS	TOTAL $	PHASE 3 DECOMMISSIONING QUANTITY HRS	TOTAL $	PHASE 4 DEMOBILIZATION QUANTITY HRS	TOTAL $	TOTALS QUANTITY HRS	TOTAL $
MATERIALS & SUPPLIES											
SAMPLES	$175.00	0	$0.00	25	$4375.00	500	$87500.00	0	$0.00		$91875.00
EQUIPMENT & SUPPLIES			$3900.00		$5938.00		$446932.50		$5141.50		$461912.00
BONDS/PERMITS	$0.00		$37500.00		$0.00		$0.00		$0.00		$37500.00
SUBTOTAL			$41400.00		$10313.00		$534432.50		$5141.50		$591287.00
G & A	9.12		$4968.00		$1237.56		$64131.90		$616.98		$70954.44
TOTAL M & S			$78900.00		$10313.00		$534432.50		$5141.50		$628787.00

TABLE 8A (cont.)

AIChemE DECOMMISSIONING
AIChemE, INC.
OAK RIDGE, TENNESSEE

COST ITEM	RATE $/HR	PHASE 1 ENGINEERING QUANTITY HRS	TOTAL $	PHASE 2 MOBILIZATION QUANTITY HRS	TOTAL $	PHASE 3 DECOMMISSIONING QUANTITY HRS	TOTAL $	PHASE 4 DEMOBILIZATION QUANTITY HRS	TOTAL $	TOTALS QUANTITY HRS	TOTAL $
SUBCONTRACTS											
WASTE DISPOSAL											
CLASSIFIED	$0.56	0	$0.00	0	$0.00	61626	$34510.56	0	$0.00		$34510.56
CONTAMINATED	$33.00	0	$0.00	0	$0.00	2500	$82500.00	0	$0.00		$82500.00
TOXIC	$44.00	0	$0.00	0	$0.00	4412	$194128.00	0	$0.00		$194128.00
REFUSE	$1.00	0	$0.00	0	$0.00	1600	$1600.00	0	$0.00		$1600.00
OIL	$450.00	0	$0.00	0	$0.00	15	$6750.00	0	$0.00		$6750.00
TRANSPORT CLASSIFIED	$250.00	0	$0.00	0	$0.00	54.209	$13552.25	0	$0.00		$13552.25
TRANSPORT CONTAMINATED	$700.00	0	$0.00	0	$0.00	2	$1400.00	0	$0.00		$1400.00
TRANSPORT TOXIC	$900.00	0	$0.00	0	$0.00	2.848	$2563.20	0	$0.00		$2563.20
TRANSPORT OIL	$900.00	0	$0.00	0	$0.00	1	$900.00	0	$0.00		$900.00
TRANSPORT REFUSE	$90.00	0	$0.00	0	$0.00	40	$3600.00	0	$0.00		$3600.00
SUBTOTAL			$0.00		$0.00		$341504.01		$0.00		$341504.01
G & A	0.12		$0.00		$0.00		$40980.48		$0.00		$40980.48
TOTAL SUBCONTRACTS			$0.00		$0.00		$345104.01		$0.00		$345104.01

TABLE 8B

Cost Estimate - 120 Machine Plant in Operation

AIChemIE DECOMMISSIONING
AIChemIE, INC.
OAK RIDGE, TENNESSEE

COST ITEM	RATE $/HR	PHASE 1 ENGINEERING QUANTITY HRS	TOTAL $	PHASE 2 MOBILIZATION QUANTITY HRS	TOTAL $	PHASE 3 DECOMMISSIONING QUANTITY HRS	TOTAL $	PHASE 4 DEMOBILIZATION QUANTITY HRS	TOTAL $	TOTALS QUANTITY HRS	TOTAL $
LABOR											
PROJECT MANAGER	$25.00	346	$8650.00	80	$2000.00	1560	$39000.00	120	$3000.00	2106	$52650.00
SHIFT SUPERVISOR	$16.00	346	$5536.00	80	$1280.00	1560	$24960.00	120	$1920.00	2106	$33696.00
ENGINEER	$15.00	692	$10380.00	80	$1200.00	1560	$23400.00	120	$1800.00	2452	$36780.00
HP SUPERVISOR	$15.00	173	$2595.00	80	$1200.00	1560	$23400.00	120	$1800.00	1933	$28995.00
HP TECHNICIAN	$12.00	0	$0.00	80	$960.00	4680	$56160.00	120	$1440.00	4880	$58560.00
IH TECHNICIAN	$15.00	173	$2595.00	80	$1200.00	3120	$46800.00	120	$1800.00	3493	$52395.00
MAINTENANCE SUPERVISOR	$15.00	173	$2595.00	80	$1200.00	1560	$23400.00	0	$0.00	1813	$27195.00
MAINTENANCE TECHNICIAN	$10.00	0	$0.00	80	$800.00	1560	$15600.00	0	$0.00	1640	$16400.00
DECON TECHNICIAN	$8.00	0	$0.00	1440	$11520.00	26451	$211608.00	1440	$11520.00	29331	$234648.00
CLERK	$5.00	0	$0.00	80	$400.00	1560	$7800.00	120	$600.00	1760	$8800.00
SECRETARY	$6.00	346	$2076.00	80	$480.00	1560	$9360.00	120	$720.00	2106	$12636.00
SUBTOTAL			$34427.00		$22240.00	46731	$481488.00		$24600.00		$562755.00
OVERHEAD	1.3		$44755.10		$28912.00		$625934.40		$31980.00		$731581.50
G & A	0.12		$9501.85		$6138.24		$132890.69		$6789.60		$155320.38
TOTAL LABOR			$88683.95		$57290.24		$1240313.09		$63369.60		$1449656.88

TABLE 8B (cont.)

AlCheaIE DECOMMISSIONING
AlCheaIE, INC.
OAK RIDGE, TENNESSEE

COST ITEM	RATE $/HR	PHASE 1 ENGINEERING QUANTITY HRS	TOTAL $	PHASE 2 MOBILIZATION QUANTITY HRS	TOTAL $	PHASE 3 DECOMMISSIONING QUANTITY HRS	TOTAL $	PHASE 4 DEMOBILIZATION QUANTITY HRS	TOTAL $	TOTALS QUANTITY HRS	TOTAL $
TRAVEL & LIVING											
PER DIEM	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00		$0.00
MILEAGE	$0.21	2270.63	$476.83	630	$132.30	18427.5	$3869.78	945	$198.45		$4677.36
AIRFARE	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00		$0.00
SUBTOTAL			$476.83		$132.30		$3869.78		$198.45		$4677.36
G & A	0.12		$57.22		$15.86		$464.37		$23.81		$561.28
TOTAL T & L			$534.05		$148.18		$4334.15		$222.26		$5238.64

TABLE 8B (cont.)

AIChemIE DECOMMISSIONING
AIChemIE, INC.
OAK RIDGE, TENNESSEE

COST ITEM	RATE $/HR	PHASE 1 ENGINEERING QUANTITY HRS	PHASE 1 TOTAL $	PHASE 2 MOBILIZATION QUANTITY HRS	PHASE 2 TOTAL $	PHASE 3 DECOMMISSIONING QUANTITY HRS	PHASE 3 TOTAL $	PHASE 4 DEMOBILIZATION QUANTITY HRS	PHASE 4 TOTAL $	TOTALS QUANTITY HRS	TOTALS TOTAL $
MATERIALS & SUPPLIES											
SAMPLES	$175.00	0	$0.00	25	$4375.00	500	$87500.00	0	$0.00		$91875.00
EQUIPMENT & SUPPLIES			$3900.00		$5938.00		$446932.50		$5141.50		$461912.00
BONDS/PERMITS	$0.00		$37500.00		$0.00		$0.00		$0.00		$37500.00
SUBTOTAL			$41400.00		$10313.00		$534432.50		$5141.50		$591287.00
G & A	0.12		$4968.00		$1237.56		$64131.90		$616.98		$70954.44
TOTAL M & S			$78?90.00		$10313.00		$534432.50		$5141.50		$628787.00

TABLE 8B (cont.)

AlCheaIE DECOMMISSIONING
AlCheaIE, INC.
OAK RIDGE, TENNESSEE

COST ITEM	RATE $/HR	PHASE 1 ENGINEERING QUANTITY HRS	PHASE 1 ENGINEERING TOTAL $	PHASE 2 MOBILIZATION QUANTITY HRS	PHASE 2 MOBILIZATION TOTAL $	PHASE 3 DECOMMISSIONING QUANTITY HRS	PHASE 3 DECOMMISSIONING TOTAL $	PHASE 4 DEMOBILIZATION QUANTITY HRS	PHASE 4 DEMOBILIZATION TOTAL $	TOTALS QUANTITY HRS	TOTALS TOTAL $
PROJECT TOTAL			$168118.00		$67751.42		$2124183.75		$68733.76		$2428786.53
CONTINGENCY	0.15		$25217.70		$10162.71		$318627.56		$10310.00		$364317.98
FEE	0.1		$19333.57		$7791.41		$244281.13		$7904.34		$279310.45
BID PRICE			$212669.27		$85705.54		$2687092.44		$86947.71		$3072414.96

TABLE 8C

Cost Estimate - 600 Machine Plant in Operation

AIChemIE DECOMMISSIONING
AIChemIE, INC.
OAK RIDGE, TENNESSEE

COST ITEM	RATE $/HR	PHASE 1 ENGINEERING QUANTITY HRS	PHASE 1 TOTAL $	PHASE 2 MOBILIZATION QUANTITY HRS	PHASE 2 TOTAL $	PHASE 3 DECOMMISSIONING QUANTITY HRS	PHASE 3 TOTAL $	PHASE 4 DEMOBILIZATION QUANTITY HRS	PHASE 4 TOTAL $	TOTALS QUANTITY HRS	TOTALS TOTAL $
LABOR											
PROJECT MANAGER	$25.00	345	$8650.00	80	$2000.00	1600	$40000.00	120	$3000.00	2146	$53650.00
SHIFT SUPERVISOR	$16.00	346	$5536.00	80	$1280.00	1600	$25600.00	120	$1920.00	2146	$34336.00
ENGINEER	$15.00	692	$10380.00	80	$1200.00	3200	$48000.00	120	$1800.00	4092	$61380.00
HP SUPERVISOR	$15.00	173	$2595.00	80	$1200.00	1600	$24000.00	120	$1800.00	1973	$29595.00
HP TECHNICIAN	$12.00	0	$0.00	80	$960.00	6400	$76800.00	120	$1440.00	6600	$79200.00
IH TECHNICIAN	$15.00	173	$2595.00	80	$1200.00	4800	$72000.00	120	$1800.00	5173	$77595.00
MAINTENANCE SUPERVISOR	$15.00	173	$2595.00	80	$1200.00	1600	$24000.00	0	$0.00	1853	$27795.00
MAINTENANCE TECHNICIAN	$10.00	0	$0.00	80	$800.00	1600	$16000.00	0	$0.00	1680	$16800.00
DECON TECHNICIAN	$8.00	0	$0.00	1440	$11520.00	51932	$415456.00	1440	$11520.00	54812	$438496.00
CLERK	$5.00	0	$0.00	80	$400.00	1600	$8000.00	120	$600.00	1800	$9000.00
SECRETARY	$6.00	346	$2076.00	80	$480.00	1600	$9600.00	120	$720.00	2146	$12876.00
SUBTOTAL			$34427.00		$22240.00	77532	$759456.00		$24600.00		$840723.00
OVERHEAD	1.3		$44755.10		$28912.00		$987292.80		$31980.00		$1092939.90
G & A	0.12		$9501.85		$6138.24		$209609.86		$6789.60		$232039.55
TOTAL LABOR			$88683.95		$57290.24		$1956358.66		$63369.60		$2165702.45

TABLE 8C (cont.)

AlCheaIE DECOMMISSIONING
AlCheaIE, INC.
OAK RIDGE, TENNESSEE

COST ITEM	RATE $/HR	PHASE 1 ENGINEERING QUANTITY HRS	PHASE 1 TOTAL $	PHASE 2 MOBILIZATION QUANTITY HRS	PHASE 2 TOTAL $	PHASE 3 DECOMMISSIONING QUANTITY HRS	PHASE 3 TOTAL $	PHASE 4 DEMOBILIZATION QUANTITY HRS	PHASE 4 TOTAL $	TOTALS QUANTITY HRS	TOTALS TOTAL $
TRAVEL & LIVING											
PER DIEM	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00		$0.00
MILEAGE	$0.21	2270.63	$476.83	630	$132.30	25200	$5292.00	945	$198.45		$6099.58
AIRFARE	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00		$0.00
SUBTOTAL			$476.83		$132.30		$5292.00		$198.45		$6099.58
G & A	0.12		$57.22		$15.88		$635.04		$23.81		$731.95
TOTAL T & L			$534.05		$148.18		$5927.04		$222.26		$6831.53

TABLE 8C (cont.)

AIChemIE DECOMMISSIONING
AIChemIE, INC.
OAK RIDGE, TENNESSEE

COST ITEM	RATE $/HR	PHASE 1 ENGINEERING QUANTITY HRS	TOTAL $	PHASE 2 MOBILIZATION QUANTITY HRS	TOTAL $	PHASE 3 DECOMMISSIONING QUANTITY HRS	TOTAL $	PHASE 4 DEMOBILIZATION QUANTITY HRS	TOTAL $	TOTALS QUANTITY HRS	TOTAL $
MATERIALS & SUPPLIES											
SAMPLES	$175.00	0	$0.00	25	$4375.00	500	$87500.00	0	$0.00		$91875.00
EQUIPMENT & SUPPLIES			$3900.00		$5938.00		$446932.50		$5141.50		$461912.00
BONDS/PERMITS	$0.00		$37500.00		$0.00		$0.00		$0.00		$37500.00
SUBTOTAL			$41400.00		$10313.00		$534432.50		$5141.50		$591287.00
G & A	0.12		$4968.00		$1237.56		$64131.90		$616.98		$70954.44
TOTAL M & S			$78[illegible]9.00		$10313.00		$534432.50		$5141.50		$628787.00

TABLE 8C (cont.)

A:CheaIE DECOMMISSIONING
AlCheaIE, INC.
OAK RIDGE, TENNESSEE

COST ITEM	RATE $/HR	PHASE 1 ENGINEERING QUANTITY HRS	TOTAL $	PHASE 2 MOBILIZATION QUANTITY HRS	TOTAL $	PHASE 3 DECOMMISSIONING QUANTITY HRS	TOTAL $	PHASE 4 DEMOBILIZATION QUANTITY HRS	TOTAL $	TOTALS QUANTITY HRS	TOTAL $
SUBCONTRACTS											
WASTE DISPOSAL											
CLASSIFIED	$0.56	0	$0.00	0	$0.00	61626	$34510.56	0	$0.00		$34510.56
CONTAMINATED	$33.00	0	$0.00	0	$0.00	2500	$82500.00	0	$0.00		$82500.00
TOXIC	$44.00	0	$0.00	0	$0.00	4412	$194128.00	0	$0.00		$194128.00
REFUSE	$1.00	0	$0.00	0	$0.00	1600	$1600.00	0	$0.00		$1600.00
OIL	$450.00	0	$0.00	0	$0.00	15	$6750.00	0	$0.00		$6750.00
TRANSPORT CLASSIFIED	$250.00	0	$0.00	0	$0.00	54.209	$13552.25	0	$0.00		$13552.25
TRANSPORT CONTAMINATED	$700.00	0	$0.00	0	$0.00	2	$1400.00	0	$0.00		$1400.00
TRANSPORT TOXIC	$900.00	0	$0.00	0	$0.00	2.848	$2563.20	0	$0.00		$2563.20
TRANSPORT OIL	$900.00	0	$0.00	0	$0.00	1	$900.00	0	$0.00		$900.00
TRANSPORT REFUSE	$90.00	0	$0.00	0	$0.00	40	$3600.00	0	$0.00		$3600.00
SUBTOTAL			$0.00		$0.00		$341504.01		$0.00		$341504.01
G & A	0.12		$0.00		$0.00		$40980.48		$0.00		$40980.48
TOTAL SUBCONTRACTS			$0.00		$0.00		$345104.01		$0.00		$345104.01

TABLE 8C (cont.)

AIChemIE DECOMMISSIONING
AIChemIE, INC.
OAK RIDGE, TENNESSEE

COST ITEM	RATE $/HR	PHASE 1 ENGINEERING QUANTITY HRS	TOTAL $	PHASE 2 MOBILIZATION QUANTITY HRS	TOTAL $	PHASE 3 DECOMMISSIONING QUANTITY HRS	TOTAL $	PHASE 4 DEMOBILIZATION QUANTITY HRS	TOTAL $	TOTALS QUANTITY HRS	TOTAL $
PROJECT TOTAL			$168118.00		$67751.42		$2841822.21		$68733.36		$3146424.99
CONTINGENCY	0.15		$25217.70		$10162.71		$426273.33		$10310.00		$471963.75
FEE	0.1		$19333.57		$7791.41		$326809.55		$7904.34		$361838.87
BID PRICE			$212669.27		$85705.54		$3594905.09		$86947.71		$3980227.61

Table 9. Scrap Value

Item	Total Scrap (lbs)	Value ($/lb)	Total Value
Plant Equipment	---	---	$200,000
Steel	5,600,000	0.01	56,000
Aluminum	186,200	.20	37,200
Copper	12,000	.40	4,800
Lead	10,000	.20	2,000
			$300,000

Table 10. List of Feed Compounds that will Leave RCRA Residue

Feed Compound	Residue	# of Centrifuges
$(CH_3)_2Hg$	Hg	240
CrO_2F_2	Cr	120
SeF_6	Se	3
$Pb(CH_3)_4$	Pb	2
$(CH_3)_2Cd$	Cd	10

Table 11. Summary of Decommissioning Costs

	Equipment in Storage Only	120 Machine Plant in Operation	600 Machine Plant in Operation
Total Cost	$2,559,137	$3,072,414	$3,980,227
Scrap Value	300,000	300,000	300,000
Net Decommissioning Cost	$2,259,137	$2,772,414	$3,680,227

Table 12. Summary of Net Funding Requirements

	Equipment in Storage Only	120 Machine Plant in Operation	600 Machine Plant in Operation
Net Decommissioning Cost, Table 11	$2,259,137	$2,772,414	$3,680,227
Minimum Value of Unclassified Equipment	2,000,000[1]	1,750,000[2]	1,500,000[2]
Net Funding Requirements	$ 259,137	$1,022,414	$2,180,227

[1]See Paragraph 3.B, Centrifuge Equipment Agreement and Bill of Sale, USDOE to AlChemIE. However, it should be noted that this number is the DOE estimate of the scrap value of all the GCEP unclassified equipment to be transferred to AlChemIE. The actual value is probably much higher than this number.

[2]Estimates based on plant usage from storage and subsequent reduction in value.

[3]See companion report for decommissioning of the CPDF facility. As noted in this report, savings can be realized by combining the two tasks of decommissioning. The total funding requirements can thus be determined by combining those listed above with those listed in Table II of the CPDF report.

MARSHALL AND STEVENS
INCORPORATED

Ten Penn Center
Suite 900
Philadelphia, PA 19103-9977
(215) 561-5600

March 12, 1988

Mr. Dennis L. Bell
Chief Executive Officer
AlchemIE, Inc.
513 Highway Wood Road
Knoxville, Tennessee 37922

File Reference No.: 40-0530

Dear Mr. Bell:

In accordance with your request, we have prepared an appraisal of the orderly liquidation value of the classified equipment to be acquired by AlchemIE, Inc., from the Department of Energy (DOE). The equipment is located both at Piketon, Ohio and Oakridge, Tennessee.

Based upon the data and conclusions presented in this letter report, we have estimated the orderly liquidation values of the classified equipment as of February 12, 1988 as follows:

Piketon, Ohio	(GCEP)	$44,902,000
Oakridge, Tennessee	(CPDF)	$ 3,098,000
	Total	$48,000,000.

Lists of the assets appraised, together with explanations of appraisal procedures used, are presented in this letter report.

The value opinions expressed in this letter report are contingent upon the conditions set forth in the Assumptions and Limiting Conditions of this report.

A copy of this report and the worksheets from which it was prepared are retained in our files for a period of ten years and are available for your review upon request.

Very truly yours,

Marshall and Stevens Incorporated

MARSHALL AND STEVENS INCORPORATED
/rrm

MARSHALL AND STEVENS
INCORPORATED

111 Parker Street
Suite 500
Tampa, FL 33606
(813) 251-4144

February 22, 1988

AlChemIE, Inc.
Pine Ridge Office Park - Suite 202B
702 South Illinois Avenue
Oak Ridge, Tennessee 37830

File Reference No.: 40-0530

Attention: Mr. Dennis L. Bell
Chief Executive Officer

Gentlemen:

We have prepared an appraisal of certain equipment located at the Gas Centrifuge Enrichment Plant (GCEP) located in Piketon, Ohio.

Based upon the data and conclusions presented in the report, we have estimated the orderly and forced liquidation values of the equipment as follows:

Orderly Liquidation Value	$78,700,000 (Rounded)
Forced Liquidation Value	$39,000,000 (Rounded)

Descriptions of the assets appraised, together with explanations of appraisal procedures used, are presented in this letter report.

The field data from which this report was prepared are retained in our files and are available for inspection upon request.

Very truly yours,

MARSHALL AND STEVENS INCORPORATED

RAH/sp

BALANCE SHEET
ALCHEMIE, INC.
June 30, 1988

ASSETS

CURRENT ASSETS			
Petty Cash			$ 50
Cash in Banks			72,970
Prepaid Expenses			372
Travel Advances			5,615
	TOTAL CURRENT ASSETS		79,007
FIXED ASSETS			
Land - cost		$ 5,000	
Machinery and equipment - cost		58,538	
Furniture and Fixtures - cost		96,453	
		159,991	
Less Accumulated Depreciation		(12,212)	
		147,779	
Classified Equipment - Fair Value	$48,000,000		
Unclassified equipment - Fair Value	50,000,000	98,000,000	98,147,779
OTHER ASSETS			
Unclassified equipment - held for sale @ fair value		28,000,000	
Amortizable asset - finders fee-net		455,958	
Organization Costs	554,392		
Less Amortization	(79,632)	474,760	
Deposits		100	
DOE Escrow		2,000,000	
Interest Receivable - escrow		7,397	30,938,215
		$129,165,001	

Unaudited

BALANCE SHEET
ALCHEMIE, INC.
June 30, 1988

LIABILITIES AND STOCKHOLDERS' EQUITY

CURRENT LIABILITIES		
Accrued Interest		$ 20,365
Payroll Taxes		403
Demand Notes		634,000
TOTAL CURRENT LIABILITIES		654,768
NOTES PAYABLE		
Anderson Cty Bank-Escrow Note	2,000,000	
Fees Payable	436,350	
Contract Lease	2,919	
CIT Commercial Credit	7,176	
First Concord	18,290	2,464,735
DEFERRED CREDIT		
Fair Value of DOE Equipment	126,000,000	
STOCKHOLDERS' EQUITY		
Common Stock	1,344,183	
Stock options	3,550	
Retained Earnings		
prior year (deficit)	(2,235)	
(Loss) year to date	(1,300,000)	45,498
		$129,165,001

Unaudited

PROFORMA STATEMENT OF INCOME
ALCHEMIE, INC.
Year Ending June 30, 1989

SALES		
Isotopes		$ 1,247,000
TOTAL SALES		1,247,000
PRODUCTION COSTS		
Salaries and Fringes	$ 697,000	
Payroll Taxes	48,120	
Utilities	444,000	
Waste Management	12,100	
Feed Gases	74,000	
Lab Analysis	100,000	
TOTAL PRODUCTION COSTS		1,375,220
GROSS PROFIT <DEFICIT>		< 128,220>
OPERATING COSTS		
Salaries and Fringes	504,000	
Payroll Taxes	35,280	
Security	524,000	
Accounting and Audit	48,000	
Licensing	112,000	
Lease	120,000	
Insurance	156,000	
Royalty Fees	24,940	
Travel	72,000	
Outside Consultants	120,000	
Safety Compliance	60,000	
Business Taxes	24,940	
Office Expense	220,400	
Miscellaneous	24,000	
TOTAL OPERATING COSTS		2,045,560
PROFIT <LOSS> FROM OPERATIONS		< 2,173,780>
OTHER DEDUCTIONS		
Interest	541,170	
Franchise and Excise Tax	3,000	
Federal Income Tax	-0-	
Depreciation	4,815,499	
Deferred Income Credit	< 4,800,000>	
Amortization of Start-up Costs	425,094	
TOTAL OTHER DEDUCTIONS		984,763
		< 3,158,543>
SALE OF FIXED ASSETS - Net of Costs		4,500,000
NET INCOME		$ 1,341,457

Unaudited

PROFORMA STATEMENT OF INCOME
ALCHEMIE, INC.
Year Ending June 30, 1989 (by quarter)

Quarter	1	2	3	4	Totals
SALES					
Isotopes	$ -0-	$ 35,000	$ 582,000	$ 630,000	$ 1,247,000
PRODUCTION COSTS					
Salaries and Fringes	90,000	135,000	236,000	236,000	697,000
Payroll Taxes	6,300	9,450	16,520	15,850	48,120
Utilities	51,000	152,000	163,000	78,000	444,000
Waste Management	500	7,200	2,200	2,200	12,100
Feed Gases	-0-	6,000	30,000	38,000	74,000
Lab Analysis	25,000	25,000	25,000	25,000	100,000
TOTALS	172,800	[illegible]650	472,720	395,050	1,375,220
Gross Profit (Loss)	(172,800)	(299,650)	109,280	234,950	(128,220)
OPERATING COSTS					
Salaries and Fringes	126,000	126,000	126,000	126,000	504,000
Payroll Taxes	8,820	8,820	8,820	8,820	35,280
Security	131,000	131,000	131,000	131,000	524,000
Accounting & Audit	12,000	12,000	12,000	12,000	48,000
Licensing	28,000	28,000	28,000	28,000	112,000
Lease	30,000	30,000	30,000	30,000	120,000
Insurance	39,000	39,000	39,000	39,000	156,000
Royalty fees	-0-	700	11,640	12,600	24,940
Travel	18,000	18,000	18,000	18,000	72,000
Outside Consultants	30,000	30,000	30,000	30,000	120,000
Safety Analysis	15,000	15,000	15,000	15,000	60,000
Business Taxes	-0-	700	11,640	12,600	24,940
Office Expenses	55,100	55,100	55,100	55,100	220,400
Miscellaneous	6,000	6,000	6,000	6,000	24,000
TOTALS	498,920	500,320	522,200	524,120	2,045,560
Profit (Loss)	(671,720)	(799,970)	(412,920)	(289,170)	(2,173,780)
OTHER DEDUCTIONS					
Interest	135,292	135,292	135,292	135,294	541,170
F & E Taxes	750	750	750	750	3,000
Federal Income Tax	-0-	-0-	-0-	-0-	-0-
Depreciation	1,203,875	1,203,875	1,203,875	1,203,874	4,815,499
Deferred Income Cr.	(1,200,000)	(1,200,000)	(1,200,000)	(1,200,000)	(4,800,000)
Amortization	106,273	106,273	106,273	106,275	425,094
TOTALS	246,190	246,190	246,190	246,193	984,763
	(917,910)	(1,046,160)	(659,110)	(535,363)	(3,158,543)
SALE OF FIXED ASSETS	-0-	-0-	2,250,000	2,250,000	4,500,000
NET INCOME	($ 917,910)	($1,046,160)	$ 1,590,890	$ 1,714,637	$ 1,341,457

Unaudited

PROFORMA STATEMENT OF INCOME
ALCHEMIE, INC.
Five Year

Year	1	2	3	4	5	Totals
SALES						
Isotopes	$ 1,247,000	$ 7,350,000	$21,664,000	$18,746,000	$32,572,000	$81,579,000
PRODUCTION COSTS						
Salaries and Fringes	697,000	804,000	912,000	940,000	968,000	4,401,000
Payroll Taxes	48,120	68,000	70,000	72,000	74,000	332,120
Utilities	444,000	565,000	582,900	600,400	618,800	2,811,100
Waste Management	12,100	9,200	9,600	10,400	10,400	51,700
Feed Gases	74,000	267,000	426,000	284,000	284,000	1,335,000
Lab Analysis	100,000	103,000	106,000	109,000	112,000	530,000
TOTALS	1,375,220	1,896,200	2,106,500	2,015,800	2,067,200	9,460,920
Gross Profit <Loss>	< 128,220>	5,453,800	19,557,500	16,730,200	30,504,800	72,118,080
OPERATING COSTS						
Salaries and Fringes	504,000	519,000	534,000	548,000	564,000	2,669,000
Payroll Taxes	35,280	36,120	37,380	38,360	39,480	186,620
Security	524,000	524,000	524,000	524,000	524,000	2,620,000
Accounting & Audit	48,000	48,000	48,000	48,000	48,000	240,000
Licensing	112,000	12,000	12,000	12,000	12,000	160,000
Lease	120,000	120,000	120,000	120,000	120,000	600,000
Insurance	156,000	160,800	165,600	170,400	175,600	828,400
Royalty Fees	24,940	147,000	433,280	374,920	651,440	1,631,580
Travel	72,000	74,000	76,000	78,500	81,000	381,500
Outside Consultants	120,000	123,600	127,200	130,800	134,000	635,600
Safety Analysis	60,000	62,000	63,600	65,200	67,200	318,000
Business Taxes	24,940	147,000	433,280	374,920	651,440	1,631,580
Office Expenses	220,400	227,000	233,500	240,000	247,600	1,168,500
Miscellaneous	24,000	24,000	24,000	24,000	24,000	120,000
TOTALS	2,045,560	2,224,520	2,831,840	2,749,100	3,339,760	13,190,780
Income from Operations	< 2,173,780>	3,229,280	16,725,660	13,981,100	27,165,040	58,927,300
OTHER DEDUCTIONS						
Interest	541,170	1,578,045	1,750,000	1,000,000	125,000	4,994,215
F & E Taxes	3,000	43,208	823,149	694,476	1,532,013	3,095,846
Federal Income Tax	-0-	213,156	4,367,643	3,682,242	8,143,520	16,406,561
Depreciation	4,815,499	4,815,499	4,815,499	4,815,499	4,815,499	24,077,495
Deferred Income Cr.	< 4,800,000>	< 4,800,000>	< 4,800,000>	< 4,800,000>	< 4,800,000>	(24,000,000>
Amortization	425,094	965,598	1,291,002	1,441,002	1,540,998	5,663,694
TOTALS	984,763	2,815,506	8,247,293	6,833,219	11,357,030	30,237,811
	< 3,188,543>	413,774	8,478,367	7,147,881	15,808,010	28,689,489
SALE OF FIXED ASSETS	4,500,000	9,000,000	-0-	-0-	-0-	13,500,000
NET INCOME	$ 1,341,457	$ 9,413,774	$ 8,478,367	$ 7,147,881	$15,808,010	$42,189,489

Unaudited

PROFORMA CASH FLOW STATEMENT
ALCHEMIE, INC.
Five Year

	Quarter Q1	Q2	Q3	Q4	Year Y1	Y2	Y3	Y4	Y5	TOTALS
SOURCES OF CASH										
Isotopes Sales	$ -0-	$ 35,000	$ 582,000	$ 630,000	$ 1,247,000	$ 7,350,000	$21,664,000	$18,745,000	$32,572,000	$81,579,000
Fixed Asset Sales	-0-	-0-	2,250,000	2,250,000	4,500,000	-0-	-0-	-0-	-0-	4,500,000
Bank Loans	295,000	100,000	2,500,000	3,500,000	6,395,000	7,000,000	-0-	-0-	-0-	13,395,000
TOTAL SOURCES	295,000	135,000	5,332,000	6,380,000	12,142,000	14,350,000	21,664,000	18,745,000	32,572,000	99,474,000
USES OF CASH										
Production Costs	172,000	334,650	472,720	395,650	1,375,220	1,895,280	2,106,500	2,015,800	2,067,200	9,460,900
Operating Costs	486,920	487,620	498,562	499,520	1,972,620	2,023,520	2,350,560	2,326,180	2,640,320	11,319,200
Loan Reduction	-0-	-0-	-0-	-0-	-0-	1,023,000*	6,000,000*	7,000,000*	1,000,000*	15,000,000
State and Federal Tax	-0-	-0-	-0-	3,000	3,000	256,364	5,130,792	4,376,718	9,675,533	19,502,407
Interest Expense	135,292	135,292	135,292	135,294	541,170	1,578,045	1,750,000	1,000,000	125,000	4,994,215
Research & Develpmt	-0-	-0-	500,000	500,000	1,000,000	2,000 000	1,000,000	500,000	500,000	5,000,000
Start-up Costs	503,000	716,000	527,000	295,000	2,151,000	254,000	-0-	-0-	-0-	2,405,000
Equipment Tear-down and removal	-0-	-0-	2,000,000	2,000,000	4,000,000	6,000,000	3,000,000	-0-	-0-	13,000,000
TOTAL USES	1,298,812	1,673,562	4,243,572	3,827,864	11,043,010	15,043,129	21,397,852	17,218,698	16,008,053	80,710,742
CUMULATIVE	($1,003,812)	($2,541,574)	($1,453,146)	$ 1,098,990	$ 1,098,990	$ 405,661	$ 672,009	$ 2,199,311	$18,763,258	$18,763,258

* Assume take out at end of year - full year interest figured.

Unaudited

DEPRECIATION
ALCHEMIE, INC.
Five Years

	Machinery & Furniture(1)	Classified Equipment(2)
June 30, 1988 Cost	$ 154,991	-
Fair Value	-	$40,000,000

Depreciation per year	TOTALS
June 30, 1988 (1/2 year)	$ 7,750
June 30, 1989	4,815,499
June 30, 1990	4,815,499
June 30, 1991	4,815,499
June 30, 1992	4,815,499
June 30, 1993	4,815,499

(1)Assume 10 year SL - 6 months 1st year
(2)Assume 10 year SL - 12 months 1st year - off setting credit to accumulate depreciation and a line reduction of the deferred credit to equity beginning July 1, 1988. Only the classified DOE equipment is depreciated.

Unaudited

TAX COMPUTATION
ALCHEMIE, INC.

Year Ending June 30, 1989		
Net Income		$ 1,341,457
Loss 6-30-87		‹ 2,235›
Estimated loss 6-30-88		‹ 1,300,000›
		$ 39,222
		==========
Estimate No Tax for 1st Year		
No Franchise and Excise Tax		
Year Ending June 30, 1990		
Net Income before tax		$ 670,138
Franchise	$ 3,000	
Excise	40,208	43,208
		626,930
		34%
		$ 213,156
		==========
Year Ending June 30, 1991		
Net Profit before tax		$13,669,159
Franchise	$ 3,000	
Excise	820,149	823,149
		$12,846,010
		34%
		$ 4,367,643
		==========
Year Ending June 30, 1992		
Net Profit before tax		$11,524,599
Franchise	$ 3,000	
Excise	691,476	694,476
		10,830,123
		34%
		$ 3,682,242
		==========
Year Ending June 30, 1993		
Net Profit before tax		$25,483,543
Franchise	$ 3,000	
Excise	1,529,013	1,532,013
		23,951,530
		34%
		$ 8,143,520
		==========

Unaudited

AMORTIZATION
ALCHEMIE, INC.
thru June 30, 1993

	Start-up Cost	R & D Costs	Totals	(1) Per Month Amortization
Y/E June 30, 1987	$ 402,543	$ -0-	$ 402,543	$ 6,636
Y/E June 30, 1988	151,789	-0-	151,789	2,530
Y/E June 30, 1989	2,151,000	1,000,000	3,151,000	52,517
Y/E June 30, 1990	254,000	2,000,000	2,254,000	37,567
Y/E June 30, 1991	-0-	1,000,000	1,000,000	16,667
Y/E June 30, 1992	-0-	500,000	500,000	8,333
Y/E June 30, 1993	-0-	500,000	500,000	8,333
Totals	$ 2,959,332	$ 5,000,000	$ 7,959,332	$ 132,583

Amortization Per Year	
Y/E June 30, 1987 (as computed)	$ 6,636
Y/E June 30, 1988 (6636X12+6X2530)	94,812
Y/E June 30, 1989 (6636+2530X12+6X52517)	425,094
Y/E June 30, 1990 (61683X12+6X37567)	965,598
Y/E June 30, 1991 (99250X12+6X16667)	1,291,002
Y/E June 30, 1992 (115917X12+6X8333)	1,441,002
Y/E June 30, 1993 (124250X12+6X8333)	1,540,998
Total	$ 5,765,142
Unamortized Balance @ June 30, 1993	$ 2,194,190

(1)Assume mid-year convention (i.e. six months) for all but 1st year which was computed for one month

Unaudited

INTEREST EXPENSE
AICHEMIE, INC.
Per Year

Year Ending June 30, 1989		
Deposit Loan - Anderson Cty Bank	$ 2,000,000	
Anderson County Bank		250,000
Anderson County Bank		384,000
Anderson County Bank	95,000	
Anderson County Bank (July 1988)		300,000
Anderson County Bank (Anticipated)		3,029,000
		10.5%
		318,045
Credit Line Draw		
$2,500,000 for 2 quarter	$ 131,250	
$3,500,000 for 1 quarter	91,875	223,125
First Year Interest		$ 541,170
Year Ending June 30, 1990		$ 3,029,000
Balance from above		2,500,000
$2,500,000 for 1 year		3,500,000
$3,500,000 for 1 year		7,000,000
$7,000,000 for 1 year		15,029,000
		10.5%
Second Year Interest		$ 1,578,045
Year Ending June 30, 1991		$15,029,000
Balance from above		
Take down (payoff) prior y/e	1,029,000	
		14,000,000
		12.5%
Third Year Interest		$ 1,750,000
Year Ending June 30, 1992		$14,000,000
Balance from above		
End of prior year pay back	6,000,000	
		8,000,000
		12.5%
Fourth Year Interest		$ 1,000,000
Year Ending June 30, 1993		$ 8,000,000
Balance from above		
End of prior year pay back	7,000,000	
		1,000,000
		12.5%
Fifth Year Interest		$ 125,000

Unaudited

DISPOSITION OF DOE ASSETS
ALCHEMIE, INC.

	AlChemIE Production Department	AlChemIE Asset Conversion Department	Totals
Per Marshall and Steven Appraisal Report			
Classified Equipment GCEP	$ 44,902,000		$ 44,902,000
Unclassified Equipment		$ 78,000,000	78,000,000
Classified Equipment CPDF	3,098,000		3,098,000
TOTALS	$ 48,000,000	$ 78,000,000	$126,000,000
Amount of unclassified equipment transferred from asset conversion department to production department	50,000,000	(50,000,000)	-0-
Equipment			
To be used in production	$ 98,000,000		
To be converted		$ 28,000,000	
Proformas Asset Amt Conversion Plan			
Amount to be liquidated		$ 28,000,000	
Costs of tearing down/moving- D&D Reserve for CPDF & O.S.		13,000,000	15,000,000
Other selling costs - 10%		1,500,000	
NET PROCEEDS		13,500,000	
Amount of cash transferred to production dept.		(13,500,000)	
Amount conversion deparmment depleted		$ -0-	

See proforma statment of income - all departments
'sale of fixed assets'

Unaudited

DOCKET NO. 50-603 & 50-604
CONTROL NO. 24742
DATE OF DOC. Sept. 12, 1988
DATE RCVD. Sept. 16, 1988

FCUF	FDR ✓
FCAF ✓	LPDR
	I&E REF. ✓
	SAFEGUARDS ✓
FCTC	OTHER ✓
DATE 9/16/88	INITIAL

DOCKET NO. 50-603 & 50-604
CONTROL NO. 24742
DATE OF DOC. Sept. 12, 1988
DATE RCVD. Sept. 16, 1988

FCUF ____ PDR ✓
FCAF ✓ LPDR ____
I & E REF. ✓
SAFEGUARDS ✓
FCTC ____ OTHER ✓
DATE 9/16/88 INITIAL ____