CLASS III COST ANALYSIS

UNITED STATES

ENVIRONMENTAL PROTECTION AGENCY

OFFICE OF DRINKING WATER

APRIL 30, 1980

CLASS III COST ANALYSIS

This document presents a discussion of the costs which will be incurred by industry and State governments by implementing the Class III program requirements of the Underground Injection Control program. The discussion also responds to comments received as a result of the proposed regulations, and, for simplicity, is presented in a format which parallels the report "Analysis of Costs - Underground Injection Control Regulations, Class I and Class III Wells," Temple, Barker and Sloane, Inc., May 1979. Other supporting information is contained in "Development of Procedures for Subclassification of Class III Injection Wells," Geraghty and Miller, Inc., April 1980.

Costs to Operators

The TBS report contained an inventory of Class III well sites under the UIC program; this inventory is updated in the G&M report and is summarized in Table 1 and Figure 1. This revision to the inventory alters the operator costs presented by TBS because most costs were calculated on a well site basis. The following sections discuss the cost impact of the inventory update and revisions made to the regulations as the result of public comment.

Geothermal Wells

There are 6 sites containing 25 wells located in California and Oregon; it is anticipated that there will be 50 wells in operation by 1985. Current industry practice involves casing and cementing, and operation in conformance to Department of Energy regulations. The UIC program will not alter the operation of the wells, but the operators will have to show initial mechanical integrity of wells as part of their UIC permit application and will have to report operating data to the UIC regulating agency quarterly.

Preparing the application for a UIC permit is estimated to require one work-month (at $1700/work month) per site to reformat existing information including cementing records for each well. Operators will submit quarterly reports to UIC regulating agencies with a time requirement of 1 day per report. The time required would be 6 sites x 4 reports/year x 5 years = 120 days. The estimated labor cost is $75/ work day.

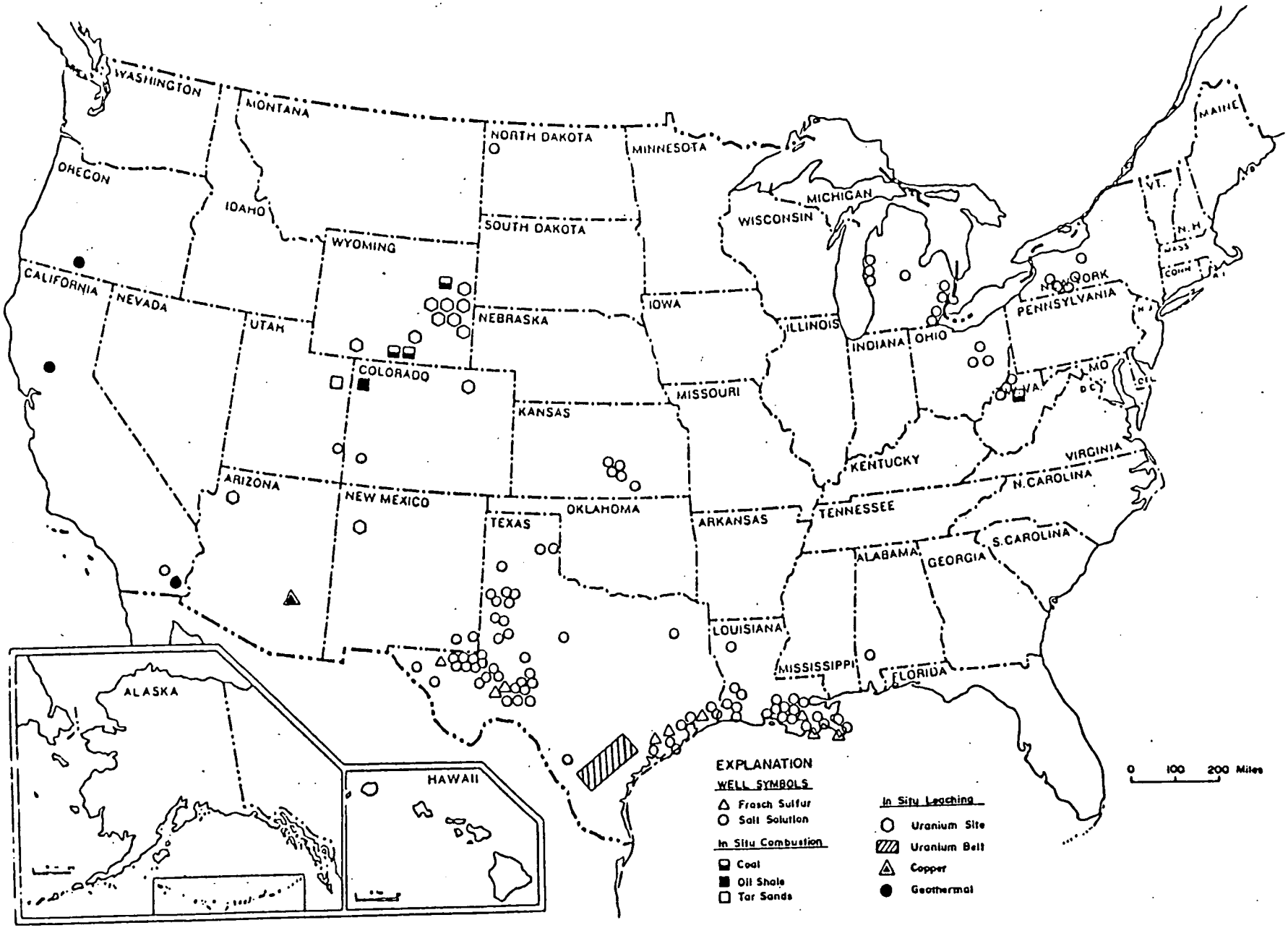

Figure 1. Principal Locations of Class III Injection Well Sites.

Table 1

ESTIMATED AND PROJECTED NUMBER OF CLASS III SPECIAL PROCESS INJECTION WELLS AND SITES

	Sites	Wells	
	1979/1980	1979/1980	(Projected) 1985
Sulfur Mining (Frasch Process)	8 - 10	500 a/	500 - 600
Solution Mining of Salt	80	1,000 b/	1,100
In-situ Leaching			
Uranium	35	6,300	18,000
Copper and other metals c/	2 - 3	10 - 20	30 - 50
In-situ Combustion c/	7	30	300
Coal		--	--
Lignite		--	--
Oil shale		--	--
Tar sand		--	--
Geothermal Energy	6	25 d/	50
	140±	7,785±	25,500±

a/ Replace 300-500 wells per year.

b/ Replace about 100 wells per year. May include some converted oil and gas wells.

c/ Pilot and experimental studies only.

d/ Mostly in California and Oregon.

Salt Solution Mining
Summary of Costs to Operators
(thousands of 1977 dollars)

Number of sites	80
Number of wells	1,000

One time costs		Recurring Costs		
Permitting	$ 204	Monitoring	$180	
Testing	519	Reporting	165	
Remedial action	1,500			
Monitoring wells	3,000			
subtotal	$5,223	subtotal	$345	
Total				$5,568

Solution Mining of Potash

Solution mining of potash is conducted at one site with 1 extraction and 17 injection wells in Moah, Utah. Initial permitting will require approximately $30,000 of consultant services. No initial mechanical integrity testing will be required. Quarterly reporting requirements will force the hiring of an additional employee at an annual cost of $20,000. Operator costs of compliance are summarized below.

Solution Monitoring of Potash
Summary of Cost to Operators
(thousands of 1977 dollars)

Number of sites	1
Number of wells	17

One time costs		Recurring Costs		
Permitting	$30	Monitoring	$ 0	
Testing	0	Reporting	100	
subtotal	$30	subtotal	$100	
Total				$130

Class III
Summary Costs to Operators
(Thousands of 1977 dollars)

	One time costs		Recurring Costs	
Geothermal Wells				
Permitting	$ 10	Monitoring	$ 0	
Testing	0	Reporting	9	
Subtotal	$ 10		$ 9	
Total				$ 19
In-Situ Gasification				
Permitting	$ 10	Monitoring	$ 0	
Testing	0	Reporting	11	
Subtotal	$ 10		$ 11	
Total				21
In-Situ Uranium Leaching				
Permitting	$ 60	Monitoring	$ 0	
Testing	0	Reporting	53	
Subtotal	$ 60		$ 53	
Total				$ 113
In-Situ Copper Leaching				
Permitting	$ 31	Monitoring	$ 18	
Testing	0	Reporting	9	
Monitoring wells	300			
Subtotal	$ 331		$ 27	
Total				$ 358
Frasch Sulfur Mining				
Permitting	$ 34	Monitoring	$ 0	
Testing	0	Reporting	15	
Subtotal	$ 34		$ 15	
Total				$ 49
Salt Solution Mining				
Permitting	$ 204	Monitoring	$180	
Testing	519	Reporting	165	
Remedial action	1,500			
Monitoring wells	3,000			
Subtotal	$5,223		$345	
Total				$5,568
Potash				
Permitting	$ 30	Monitoring	$ 0	
Testing	0	Reporting	100	
Subtotal	$ 30		$100	
Total				$ 130
Totals	$5,698		$560	
Grand Total, Cost to operators				$6,258

Class III
State Program Costs

State governments will incur certain costs in developing, implementing and operating the UIC program. One time costs for program development, and program hearings, and recurring costs for enforcement and annual report preparation are unchanged in the analysis; for details on their development see Chapter III of the TRS report.

Permit application handling and hearing costs are related to the number and type of permits handled. The following table summarizes the time requirements for permitting and hearings:

Class III Wells
State Program Time Requirement Assumption

Practice	Total Number of sites	Work days/site - for permitting	Proportion of permits requiring hearing
Geothermal	6	5-10	0
In-Situ Gasification	7	10-20	0
In-Situ-Uranium Leaching	35	20-40	50
In-Situ-Copper Leaching	3	20-40	50
Frasch Sulfur Mining	10	30-40	25
Salt Solution Mining	80	10-30	15
Potash Solution Mining	1	10-30	0
	142		

Using the information above, the following is the cost to state government.

One-Time State Work Year Estimates

Program Element	Work-year required
Program Development	2.8
Program Hearing	0.9
Permitting	20.7
Permit Hearing	3.0
	27.4

State personnel will be required to review the quarterly reports which are submitted by the operators. It is estimated that 7 work hours per report will be required for this review. Recurring costs are summarized in the following table.

Recurring Work Year Estimates

Program Elements	Work-years required
Quarterly reports	2.2
Enforcement	6.3
Annual Report	1.0
Annual Total	9.5 work years/year

State personnel costs are estimated to be $22,500 per 220 day work year plus 15% for overhead. Total State costs are summarized below.

Total State Program Costs
(thousands of 1977 dollars)

Onetime Costs		
Program Development		$ 72
Program Hearings		23
Permitting		536
Permit Hearings		78
	Subtotal	$709
Recurring Costs		
Quarterly Reports		$ 285
Enforcement		815
Annual Reports		130
	Subtotal	$1,230
Total		$1,939