CONTRACT NO. N62470-85-C-8040



DEPARTMENT OF THE NAVY

ATLANTIC DIVISION NAVAL FACILITIES ENGINEERING COMMAND NORFOLK, VIRGINIA 23511-6287

CENTRAL AND BUILDING STEAM DISTRIBUTION SYSTEMS AND STEAM TRAP SURVEY

AT

MARINE CORPS BASE CAMP LEJEUNE, NORTH CAROLINA

BY

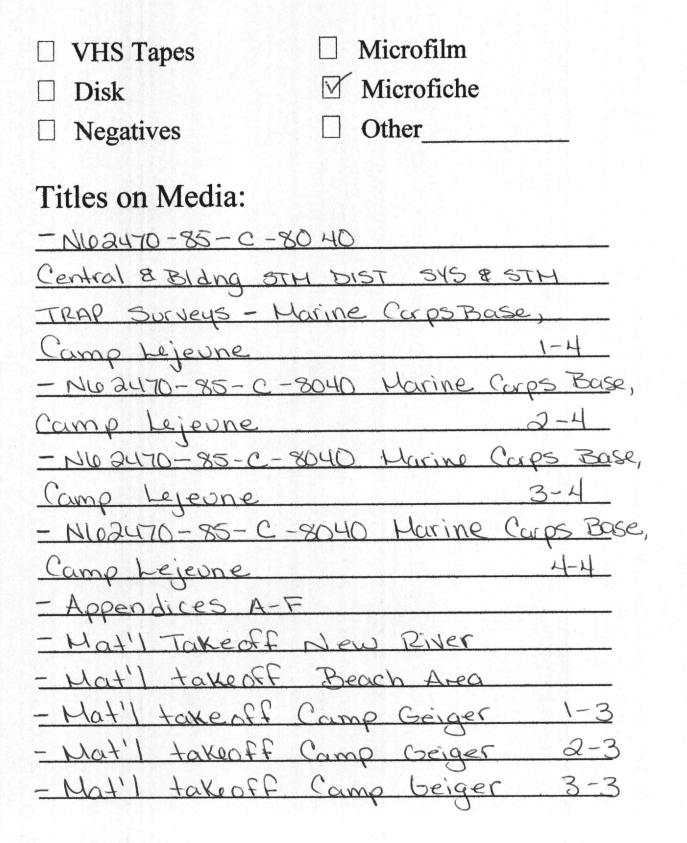
CHAS. T. MAIN, INC.







Media Form



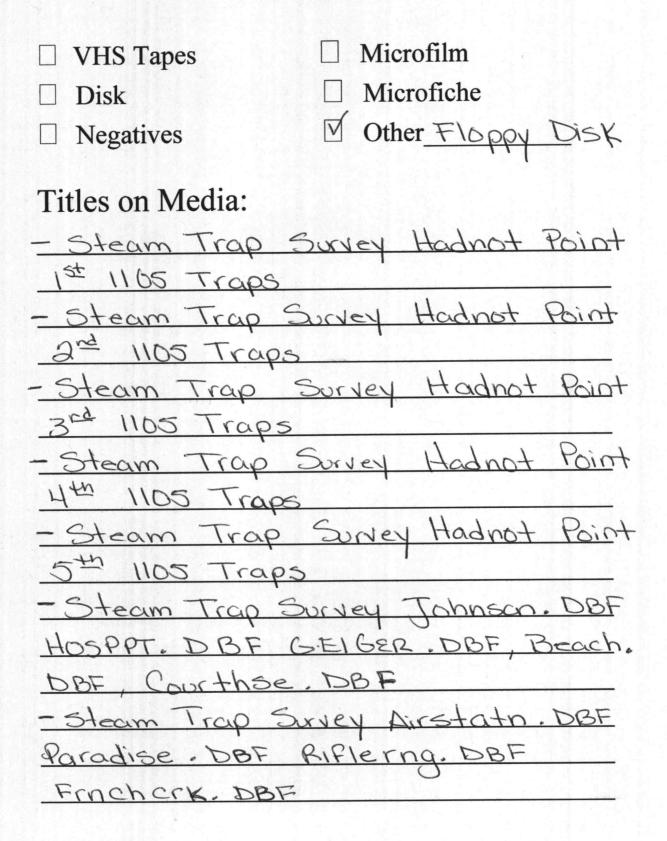
Titles on Media:

-Mat'l takeoff Camp Johnson 1-2 -Mat'l takeoff Camp Johnson 2-2 - Mat'l takeoff Court Hoose Bay - Mat'l takeoff French Creek - Mat'l take off Hadnot Pt. 1-4 - Mat'l take off Hadnot Pt. 0-4 -Mat'l take off Hadnot Pt. 3-4 - Matil takeoff Hadnot Pt. 4-4 - Mat'l take off Hospital Point - Mat'l take off Paradise Point - Mat'l take off Rifle Range - Insulation New River Air Station 1-2 -Insulation New River Air Station 2-2 - Insulation Beach Area - Insulation Camp Geiger 1-3 -Insulation Camp Geiger 2-3 - Insulation Camp Geiger 3-3 -Insulation Camp Johnson 1-3 -Insulation Camp Johnson 2-3 - Insulation Camp Johnson 3-3 - Insulation Courthouse Bay

Titles on Media:

- Insulation French Creek	aparanan di Kabupatèn Sharanan Indonesi di Kabupatèn Sharanan
- Insulation Hadnot Pt.	1-9
- Insulation Hodnot Pt.	2-9
- Insulation Hadnot Pt.	3-9
- Insulation Hadnot Pt.	4-9
- Insulation Hadnot Pt.	5-9
- Insulation Hadnot Pt.	10-9
- Insulation Hadnot Pt.	7-9
- Insulation Hadnot Pt.	8-9
- Insulation Hadnot Pt.	<u> 9-9</u>
- Insulation Hospital Pt.	1-2
-Insulation Hospital Pt.	2-2
- Insulation Paradise Pt.	
- Insulation Rifle Range	1-2
- Insulation Rifle Range	2-2
0	

Media Form





CHAS. T. MAIN, INC.

TWO FAIRVIEW PLAZA, 5950 FAIRVIEW RD., P. O. BOX 240236, CHARLOTTE, N. C. 28224, TEL. 704/554-1100

September 17, 1987

1417-48-6000

SUBJECT: Marine Corp Base Contract No. N62470-85-C-8040 Central and Building Steam Distribution Systems and Steam Trap Surveys at the MCB, Camp Lejeune, Jacksonville, NC

Commander Atlantic Division ATTN: Code 111 Naval Facilities Engineering Command Norfolk, VA 23511-6287

Gentlemen:

We are pleased to present two (2) complete revised sets of the Energy Report and four (4) sets of microfiche for Camp Geiger, Rifle Range, Hadnot Point, Hospital Point, French Creek, Courthouse Bay, Beach Area, Paradise Point, Camp Johnson, and New River Air Station.

The mylars of the BSDS diagrammatic sketches have been previously sent in a separate mailing, and the Steam Trap Report will be sent later. The Energy Report was reissued in its entirety to simplify the insertion of the new information. The revised pages have been identified with an R-l symbol next to the page number.

A copy of the comments on the draft report and MAIN responses follow this letter. The comments have been numbered for reference purposes.

The final report also contains the Executive Summary which follows the Table of Contents.

If you have any further questions, please advise.

Very truly yours,

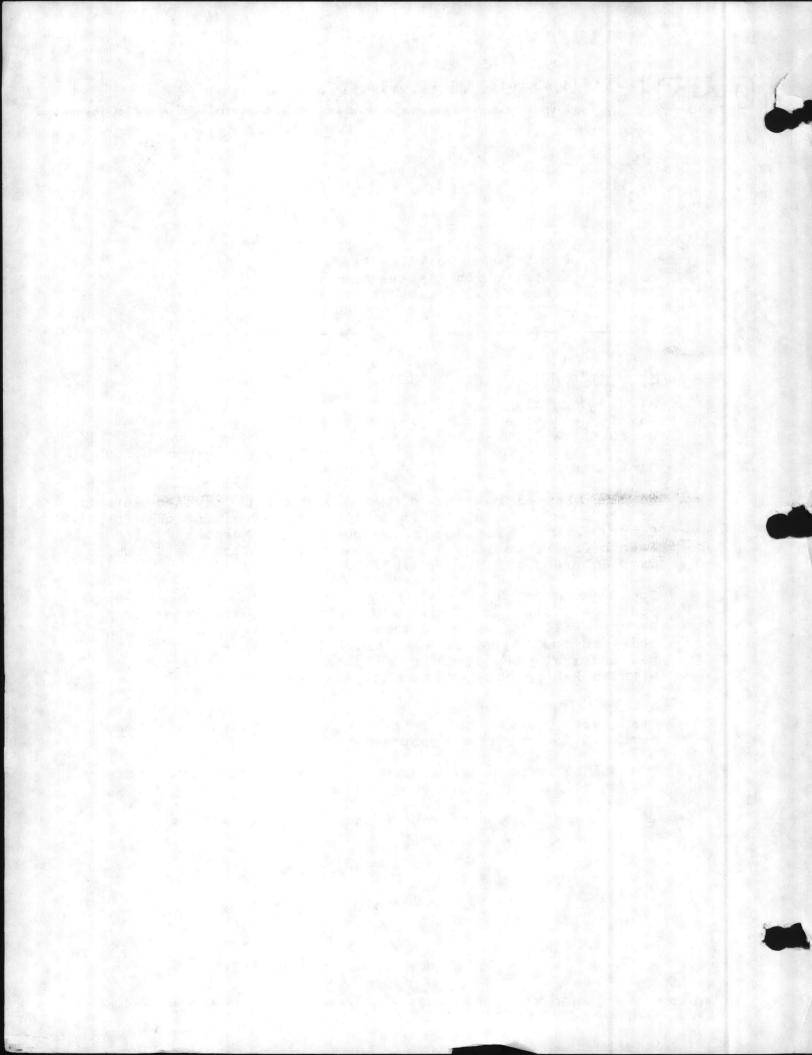
CHAS. T. MAIN, INC.

Rogers G. Howell, P.E.

Project Manager

NEW YORK, NEW YORK • BOSTON, MASSACHUSETTS • CHARLOTTE, NORTH CAROLINA • PORTLAND, OREGON RGH/moe

Attachments





DEPARTMENT OF THE NAV

ATLANTIC DIVISION NAVAL FACILITIES ENGINEERING COMMAND NORFOLK. VIRGINIA 23511-6287 TELEPHONE NO

IN REPLY REFER TO

11300 1112JDK

2 0 AUG 1987

(804) 444-9573

Charles T. Main, Incorporated Two Fairview Plaza P.O. Box 240316 Charlotte, NC 28224-8836

> Re: Contract N62470-85-B-8040, Building Steam Distribution System and Trap Survey at Marine Corps Base, Camp Lejeune and Marine Corps Air Station, Cherry Point

Gentlemen:

The Draft Report for the MARCORB Camp Lejeune has been reviewed and the following comments are provided:

a. Trap data on the floppy disk does not have a separate field for building number. There is a field called "location" which contains the building number and other information related to the location. Please create a separate field called BLDG and dedicate that field for the building number only with alphanumeric designation such as "AS4151" (not BLDG - AS4151).

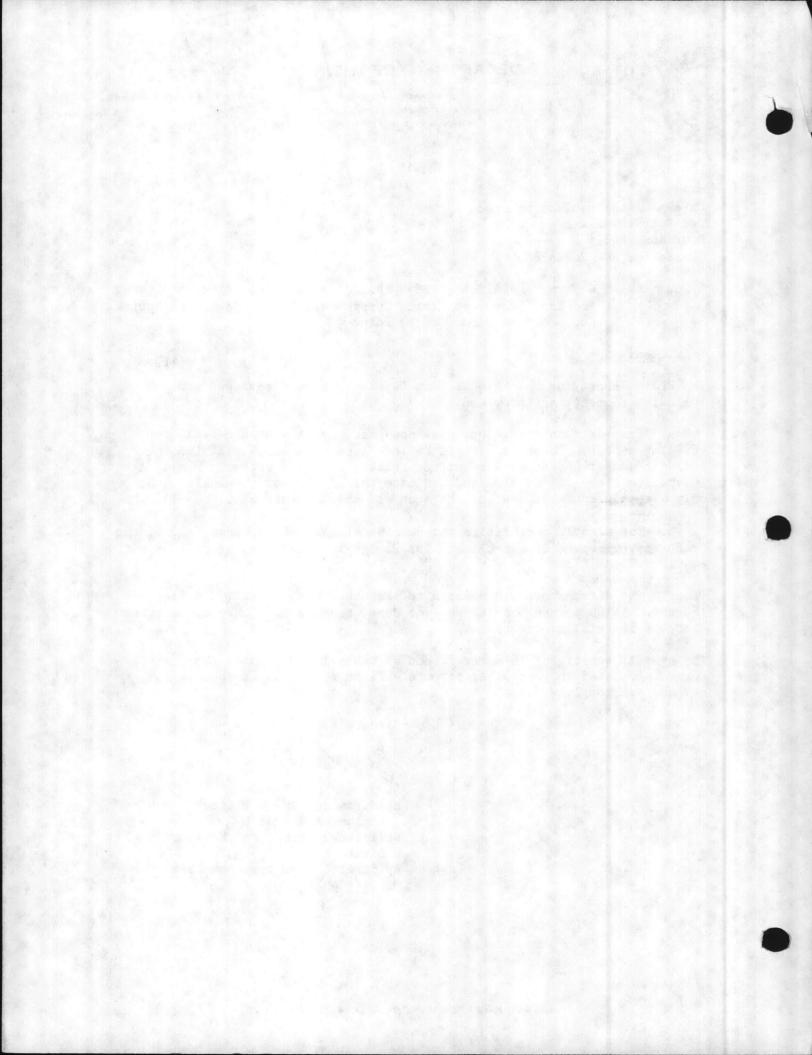
b. The example calculation for outside air shutoff on page 4-59 of the Draft Energy Report is not clear. The Energy Savings calculation does not equal 69.74 MBTU/YR.

c. The attachments are related to sketches, steam traps, and line lengths. A 100 percent review was not done; therefore, please check other sketches for similar errors.

The overall quality of this report and sketches is very good. Navy review comments related to your other reports will be forwarded as soon as the reviews are complete.

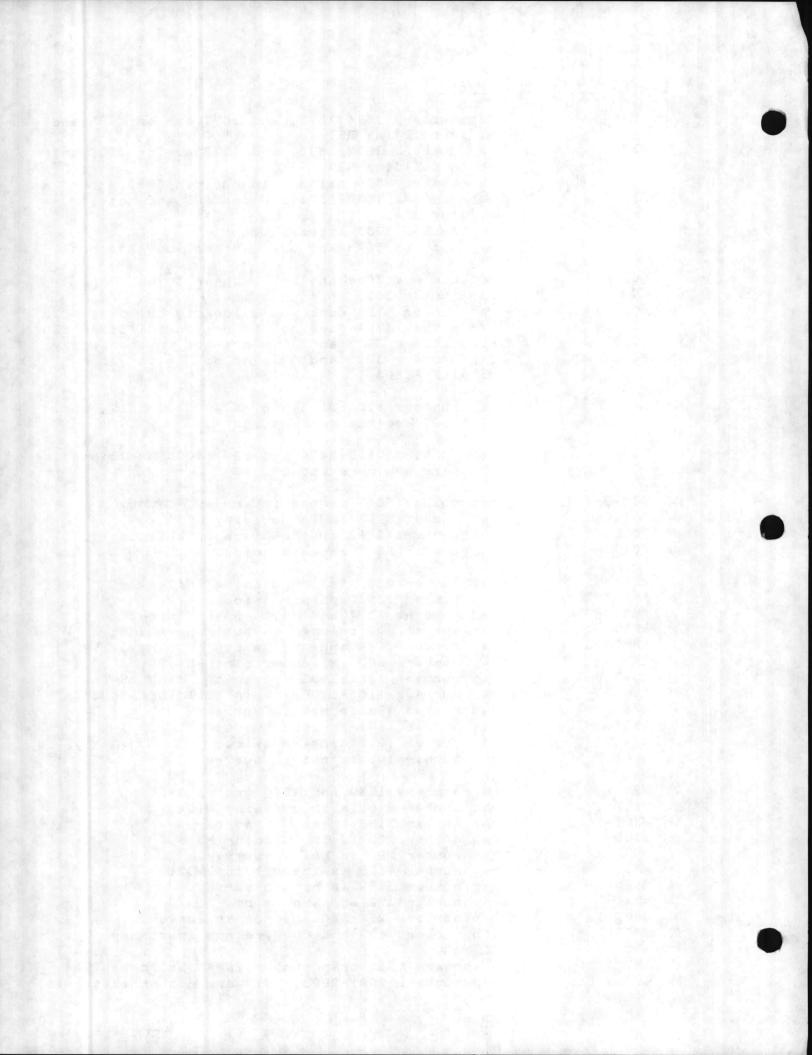
Sincerely,

K. J. HANSEN, P.E.
Head, Energy and Utilities Engineering Branch
Utilities, Energy and Environmental Division
By direction of the Commander



	SKETCH *	COMMENT
۱.	RR1-1	Trap numbers 1674,1675, and 1677 are on CSDS and not in building RR1.
2.	RR2-1	Trap numbers 1672,1673, and 1678 are on CSDS and not in building RR2.
		Trap number 2539 belongs in building RR1.
3.	RR4-1	Trap numbers 1669-1671 are on CSDS and not in building RR4.
4.	RR5-6,7	Trap number 2236 appears twice.
		Trap numbers 5695 and 5696 are not on sketches.
5.	FC200-1	Trap numbers 3804 and 3820 appear twice.
	FC251-1	Trap number 3625 appears twice.
7.	FC301-1	Trap number 3727 does not belong in building FC301.
8.	FC302-1	Trap number 3724 does not belong in building FC302.
	FC303-2	Trap numbers 3988 and 3989 are not in the survey.
10.	FC303-2,3	Trap numbers 3922 and 3974 do not belong in
		building FC303.
П,	H15A	Trap numbers 5103-5113,6181-6199,6301-6312, and
		6351-6397 are not on sketches.
12.	G650	Trap numbers 5413-5424 and 5993-6000 are listed,
	an an an an a' she	but there are no sketches.
	TC719-1	Trap number 5647 is not in survey.
14.	TC749-1	Trap number 5993 is in building G650.
15.	TC753-1	Trap numbers 5282 and 5283 are in building TC737.
К.	TC1046-1	Trap number 6045 appears twice.
17.	AS216-5	Trap number 6331 is in building AS414.
	AS217-2	Trap number 1353 appears twice.
	AS217-7,8	Trap numbers 1311 and 1312 appear twice.
	AS226-1	Trap number 300 belongs in building AS266.
	AS504-3	Trap number 1984 appears twice.
	AS518-1	Trap number 1880 is in building AS4100.
	AS4030-1	Trap numbers 1101-1103 are in building AS4108.
	AS4035-1	Trap numbers 1106-1108 are in building AS4031.
	AS4100-1	Trap number 192 is not in survey.
	AS4106-3,4	Trap number 1892 appears twice.
	AS4106-6	Trap number 1916 appears twice.
28.	AS4108-5	Trap number 193 is not in survey.
	M90-2	Trap numbers 1539 and 1540 are on CSDS.
	M127-1	Trap number 876 is in building M104.
	M301-1	Trap number 3160 is not in survey.
32.	M308-1	Trap number 228 is in building M516.
	-	Trap number 299 is not in survey.
	M309-1	Trap number 4115 is in building M324.
	M406-1	Trap number 3159 is not in survey.
	M520-1	Trap number 279 appears twice.
	M602-1	Trap numbers 254-258 are not in survey.
\$1.	M607-1	Trap numbers 659 and 660 are not in survey.
	BB2-1	It appears that trap number 2984 should be 2964.
39.	BB7-2-5	Trap numbers 2991-2993, 3010 are not on sketches.

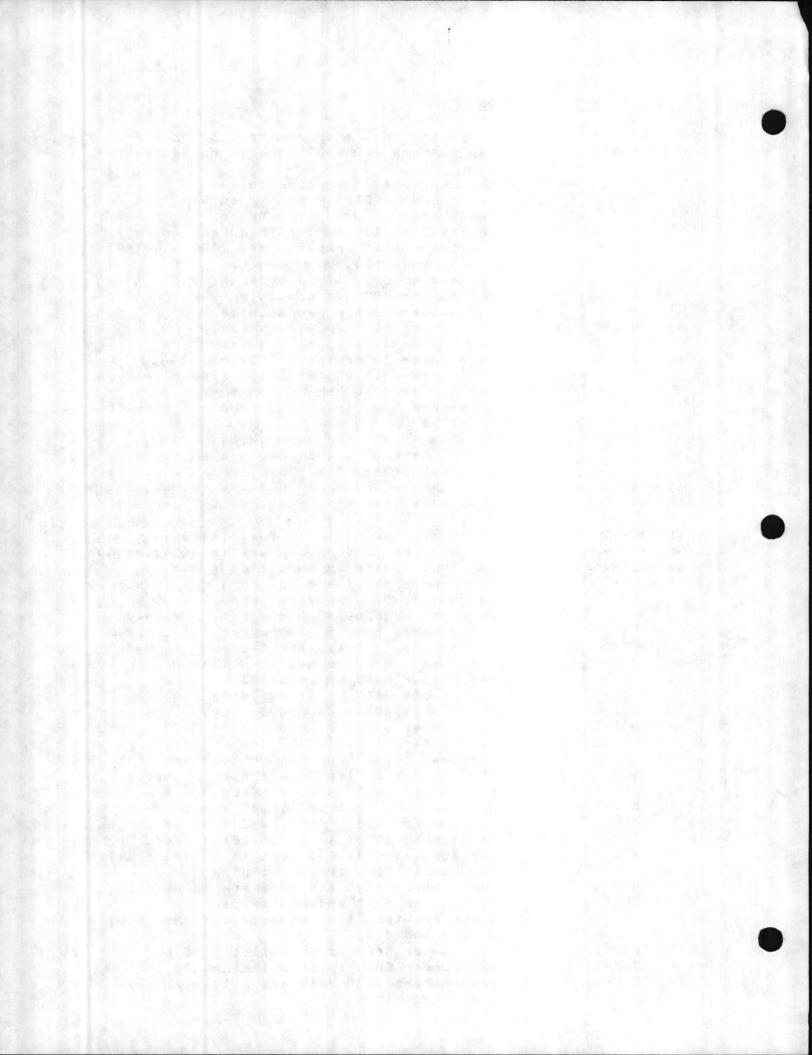
ATTACHMENT A



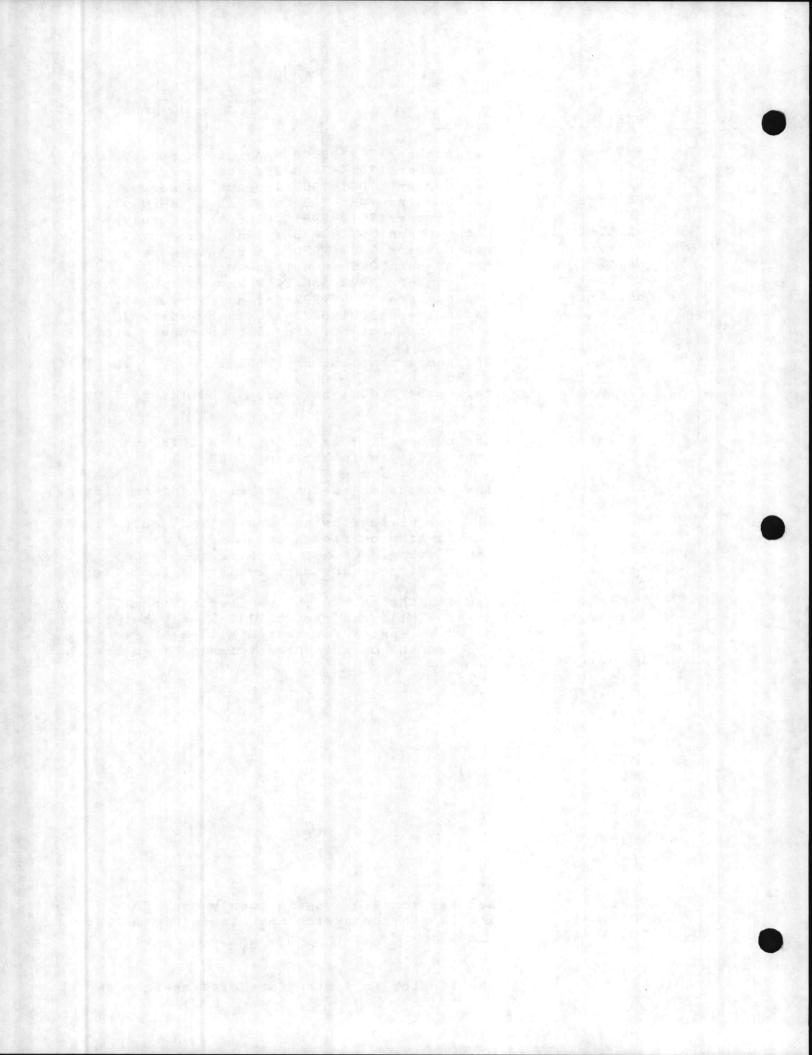
SKETCH *

COMMENT

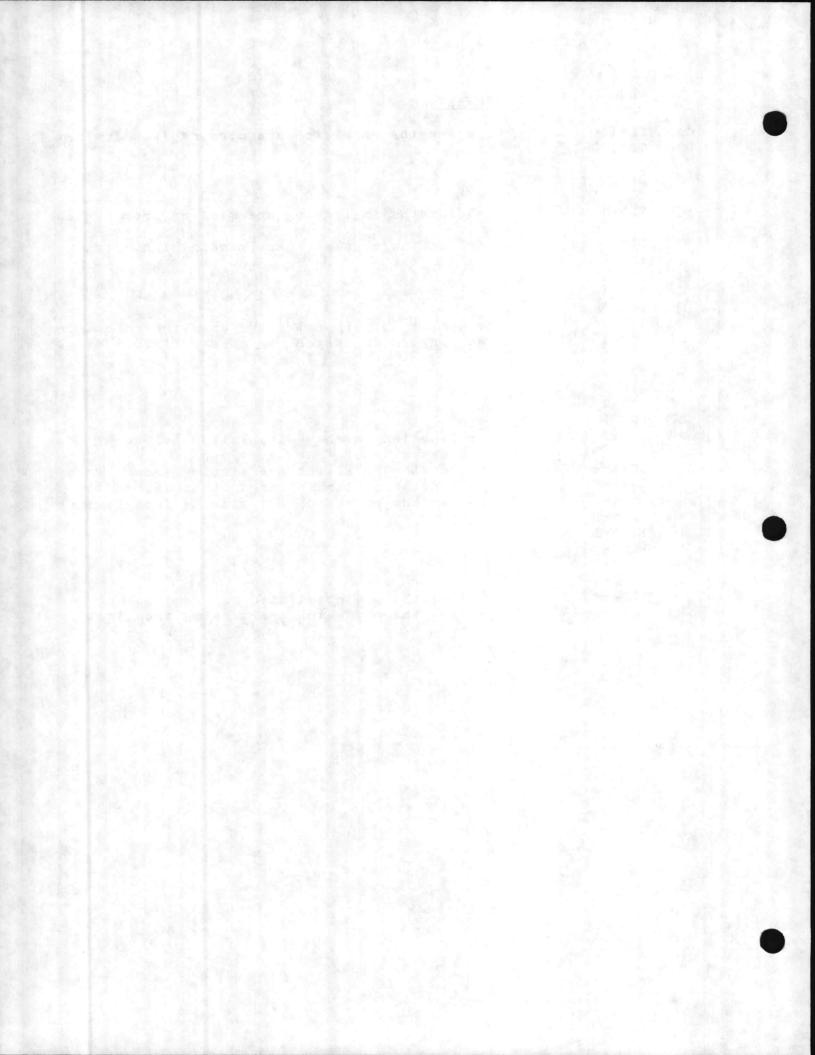
40	BB12-1	It appears that trap number 2789 should be 2798.
41,		Trap numbers 3025-3028 are in building BB272.
		the product of the the building bb2/2.
42	2-1.4	Trap number 4816 appears twice.
43.		Trap number 10012 is not in survey.
	10-2	Trap number 5039 appears twice.
45.	12-2,3	Trap numbers 4664 and 4675 appear twice.
46.		It appears that trap numbers 7491 and 7492 should
		be 7691 and 7692.
		Trap number 8007 is in building 116.
		Trap number 8008 is not in survey.
47.	25-2	Trap number 6973 appears twice.
48.	25-3	Trap number 6625 appears twice.
49.	59-3,4	Trap number 6944 appears twice.
50.	60-3,4	Trap number 10068 appears twice.
51.	84-2	Trap numbers 10100 and 10101 appear twice.
		Trap number 10102 is not in survey.
52.	102-1	It appears that trap numbers 67-73 should be
		7267-7273.
53.	205-2	Trap number 4573 appears twice.
54.	211-3	Trap numbers 4544 and 4545 are in building 213,
		and trap numbers 7533-7543 are in building 111.
	216-1	Trap numbers 7625 and 7626 are in building 116.
56.	217-1	It appears that trap numbers 69-77 should be
		12169-12177.
57.		Trap number 10142 is in building 302.
	408-4	Trap numbers 12396-12398 are in building 803.
	424-2	Trap number 4446 is in building 325.
60.	510-1	Trap numbers 5394 and 5396 are not in survey.
		Trap number 5394 appears twice.
61.	510-3	Trap numbers 5389-5392 are not in survey.
	514-1,2	Trap numbers 5366-5388 are not in survey.
	517-2	Trap number 5730 appears twice.
	909-2	Trap number 6702 is near building 908 in survey.
	910-1	Trap number 8463 is in building 1771.
	914-1 1005-1	Trap number 3467 is in building 1103.
		Trap number 10322 is not in survey.
	1006-1	Trap number 6762 is in building 1120.
	1101-1 1116-1	Trap numbers 10300-10309 are in building 1201.
	1120-1	It appears that trap number 3806 should be 3809.
	1200-1	Trap numbers 6771-6773 are not in survey.
	1202-3,4	Trap number 3935 appears twice.
	1300-1	Trap numbers 10342 and 10343 appear twice.
	1304-1	Trap numbers 6636, 6637, and 6639 are in building 25. Trap number 10364 is in building 1404.
	1400-2	Trap numbers 6411-6418 are in building 411.
	1401-1	Trap number 7000 is in building 114.
	1403-1	Trap numbers 6647 and 6648 are in building 25.
	1502-1	Trap number 6282 appears twice.
1000		It appears that trap numbers 6387 and 6391 should
		be 6287 and 6291.
80	1611-1	Trap number 6462 is in building 1610.
	1706-1	Trap number 6089 is in building 1701.
	1770-1	Trap numbers 7438-7440 are not in survey.
0~		the numbers (100 (110 m/s not In survey.



	SKETCH .	COMMENT
83.	HP57-1	Trap numbers 7993-8000 are not in survey.
84.	HP105-1	Trap numbers 7974-7976 are not in survey.
85.	HP115-1	Trap numbers 7981-7983 are not in survey.
86.	HP125-1	Trap numbers 7985-7987 are not in survey.
87.	HP127-1	Trap numbers 7979-7981 are not in survey.
88.	HP135-1	Trap numbers 7971-7973 are not in survey.
89.	HP140-1	Trap numbers 7967-7970 are not in survey.
90.	HP145-1	Trap number 7966 is not in survey.
91.	HP155-1	Trap numbers 7988 and 7989 are not in survey.
92.	HP175-1	Trap numbers 7990-7992 are not in survey.
93.	HP255-1	Trap numbers 8021-8023 are in building 226.
94.	S86-1	It appears that building 586 in survey should be \$86.
9 5.	596-1	It appears that building 596 in survey should be S96.
% .	S1210-1	Trap numbers 6021-6024 are in buildings 1207 1208.
97.	2600-1	Trap number 3283 is in building 2615 and trap
and the		number 3244 is in building 2003.
9 8.	AS4146-1	Line lengths on sketch are missing from listing.
99.	RR2-5	Only 2 line lengths are in listing, actually 24.
100.	RR4-6	Line lengths on sketch are missing from listing.
101.	RR10-1	Line listing does not match sketch. (0-0-5-5)
102.	RR11-8	Line lengths on sketch are missing from listing.
103.	M104-6	Line lengths on sketch are missing from listing.
104.	M112-1	Building M112 has sketch M112-1 only but listing
		includes lengths for sketch M112-8.
	M210-1	Line lengths on sketch are missing from listing.
	M305-1	
	M316-1	2019년 - 김희 영화
	M321-1	
	M324-5	
	M516-1	
	M518-1	
	M522-1	
	M604-1	
	M607-1	
	M609-1	
	M614-1	
	M616-1	
118.	M622-1	
119	TC910-4.5	Sketches for 910-4,5 are poorly copied.
	TC1029-1	Line lengths on sketch are missing from listing.
	TC1048-1	
	TC1049-1	
	TC1055-1	
	TC1062-1	Line lengths in listing are missing from sketch.

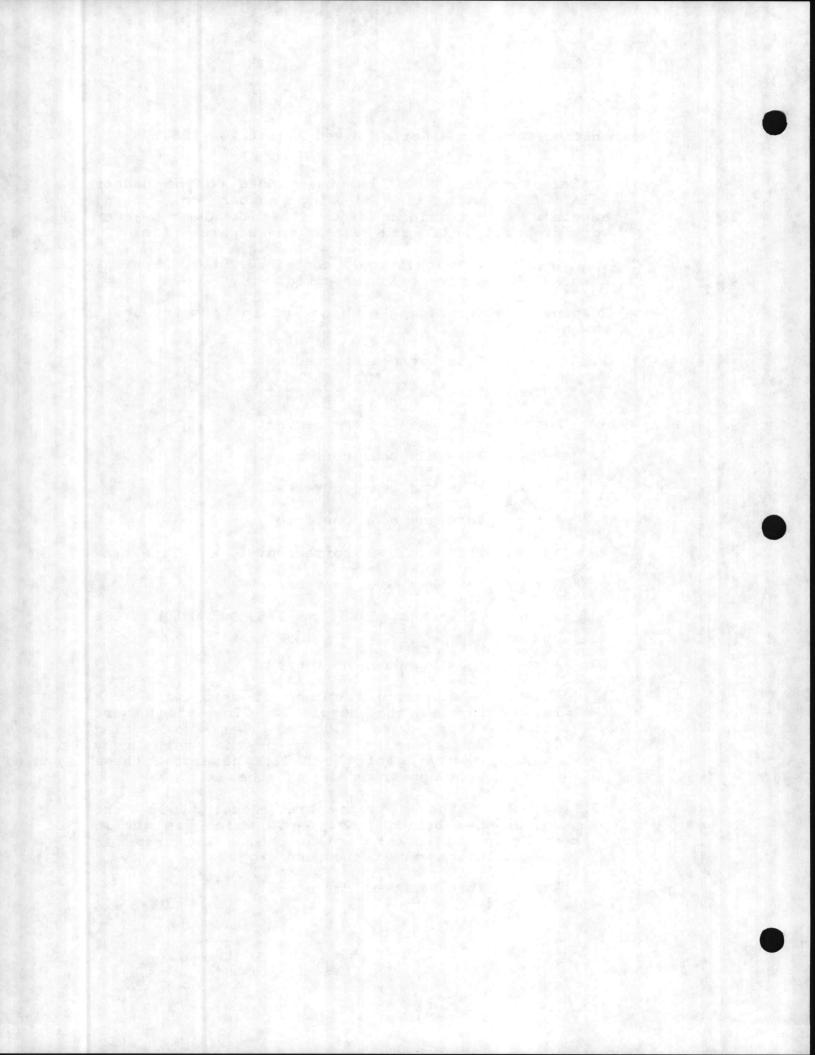


	SKETCH *	COMMENT
125.	TC1110-1	Line lengths on sketch are missing from listing.
126.	TC1119-1	
127.	BA128-1	
128.	BB5-1	Line lengths in listing are missing from sketch.
129.	114-1	Line lengths on sketch are missing from listing.
130.	119-1	•
131.	123-1	그는 것 같은 것 같은 것 같은 것 같아. 것 같은 것 같은 것 같은 것 같아.
132.	127-1	
133.	203-1	그는 그는 것이 같은 것이 같이 잘 못 하는 것 같이 같이 많이 많이 많을까?
134.	211-2	The symbol 'NT' is not shown on standard drawing.
135.	304-2	Line lengths on sketch are missing from listing.
136.	315-2	in the second are missing from fisting.
137.	317-2	
138.	416-2	
139.	419-2	
140.	423-2	
141.	460-2	Some line lengths have insulation but no
		thicknesses.
142.	1041-4	Line lengths on sketch are missing from listing.
143.	1041-5	Line lengths in listing are not on sketch. (12')
144.	1104-1	Line lengths on sketch are missing from listing.
145.	1106-1	· · · · · · · · · · · · · · · · · · ·
146.	1107-1	
147.	1120-1	
148.	1207-1	
149.	1208-1	
150.	1209-4	Line lengths are not listed for sketch.
151.	1300-1	Line lengths on sketch are missing from listing.

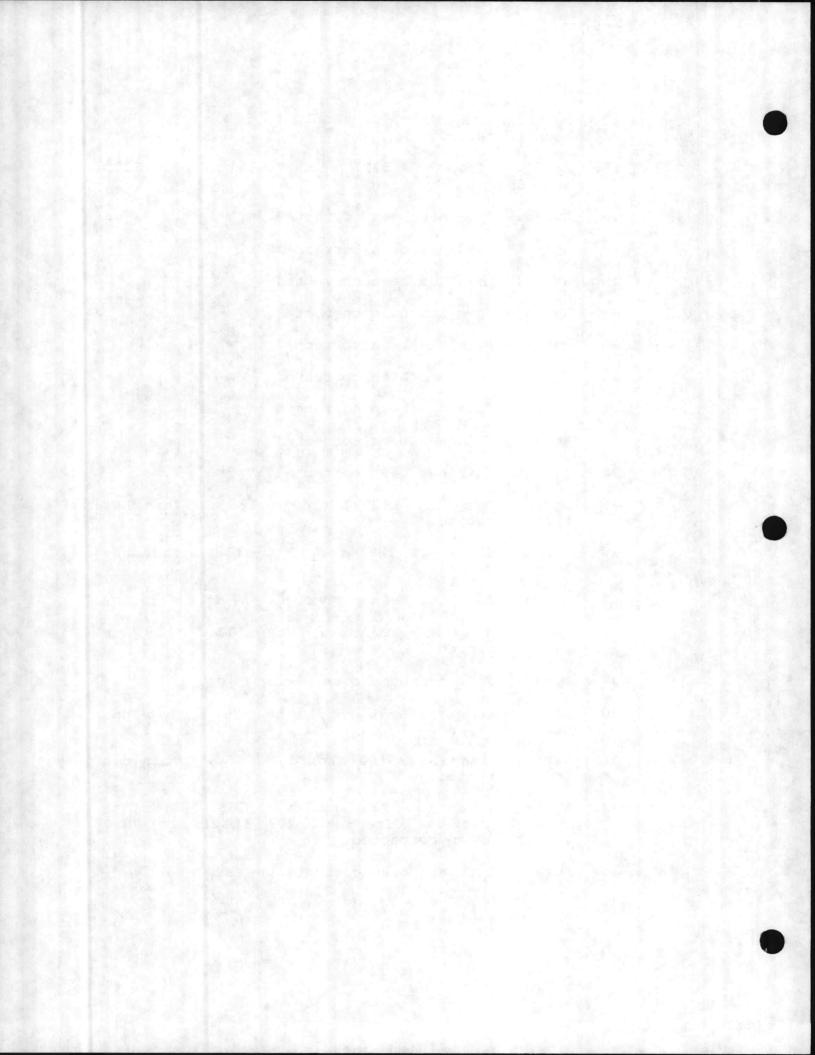


Response To Comments - Letter Dated August 20, 1987

- A. A field entitled "BLDG" has been added to the Hadnot Point file with the building number only being entered. The remaining nine files for Camp Lejeune were prepared by EEC and contain the separate field.
- B. The example calculation contained typographical errors. These have been corrected.
- C. Responses (Note: Each sketch no. on the comment sheet was numbered.)
 - 1. Agree. This has been corrected.
 - 2. Agree. This has been corrected.
 - 3. Agree. This has been corrected.
 - 4. Agree. This has been corrected.
 - 5. Agree. This has been corrected.
 - 6. Agree. This has been corrected.
 - 7. Agree. This has been corrected.
 - 8. Agree. This has been corrected.
 - 9. Agree. Trap Nos. 3988 and 3989 should be 3688 and 3689.
 - 10. Agree. This has been corrected.
 - 11. Agree. A substantial amount of demolition work is ongoing at the hospital. The area where these traps were located was undergoing demolition between the time of the trap survey and the sketching of the BSDS; therefore, these traps do not appear on the sketches.
 - 12. Agree. These traps are located in the boilerhouse building No. G-650 which was not in the scope of work to be sketched. The traps in the buildings were tested and tagged.
 - 13. Agree. This has been corrected.



- 14. Agree. Trap No. 5993 should be 5393. This has been corrected.
- 15. Agree. Trap No. 5282 and 5283 should be 5382 and 5383.
- 16. Agree. This has been corrected.
- 17. Agree. This has been corrected.
- 18. Agree. This has been corrected.
- 19. Agree. This has been corrected.
- 20. Agree. This has been corrected.
- 21. Agree. This has been corrected.
- 22. Agree. This has been corrected.
- 23. Agree. This has been corrected.
- 24. Agree. This has been corrected.
- 25. Agree. Trap No. 192 should be 1883. This has been corrected.
- 26. Agree. Trap No. 1892 should be 178. This has been corrected.
- 27. Agree. This has been corrected.
- 28. Agree. Trap No. 193 should be 1300. This has been corrected.
- 29. Agree. This has been corrected.
- 30. Agree. Trap No. 876 should be 926. This has been corrected.
- 31. Agree. Trap No. 3160 should be 350. This has been corrected.
- 32. Agree. Trap No. 228 should be 288. This has been corrected. Trap No. 299 should be 289. This has been corrected.
- 33. Agree. This has been corrected.

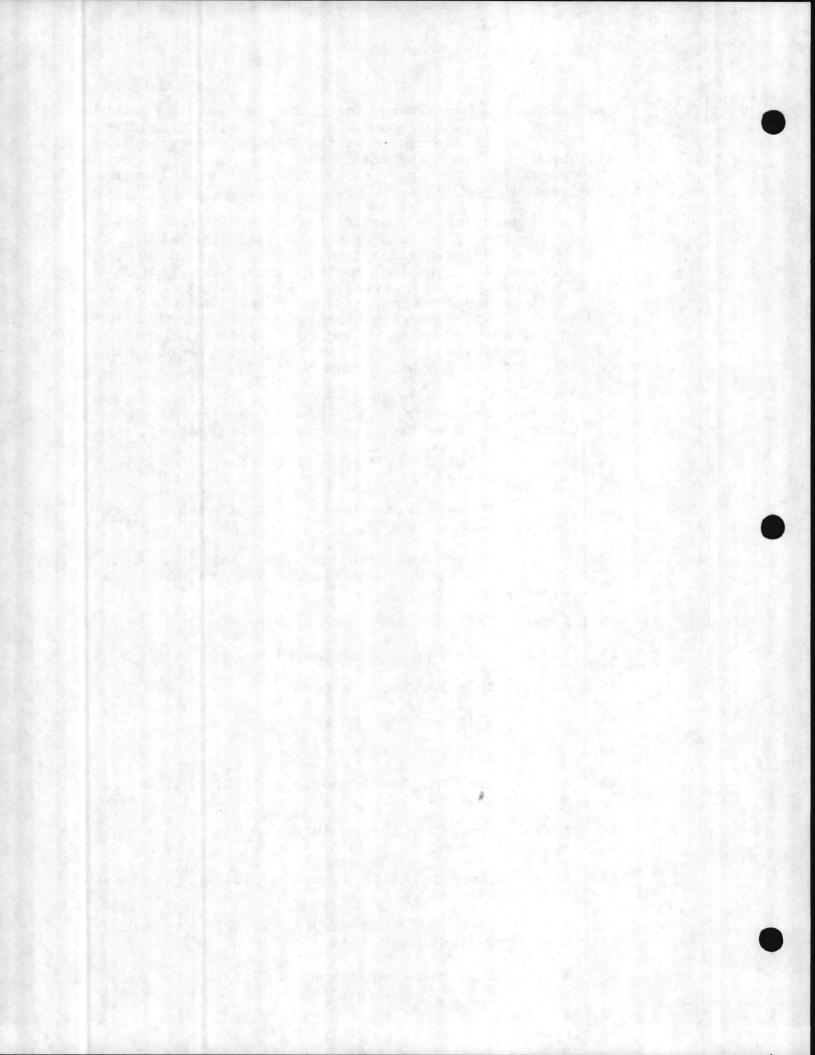


- 34. Agree. The timing for this project was such that the steam trap analysis was scheduled before the sketching of the BSDS. Discrepancies between the sketches and the trap report resulted from one or more of the following reasons:
 - a. Maintenance modifications to facilities after the trap analysis with the addition or deletion of a tested steam trap.
 - b. Steam trap tags being removed by facility occupants resulting in a trap being surveyed twice. (All traps found to be untagged during the sketching portion of the project were assumed to be missed and were tested. A trap could be tested twice if the tag was removed.)

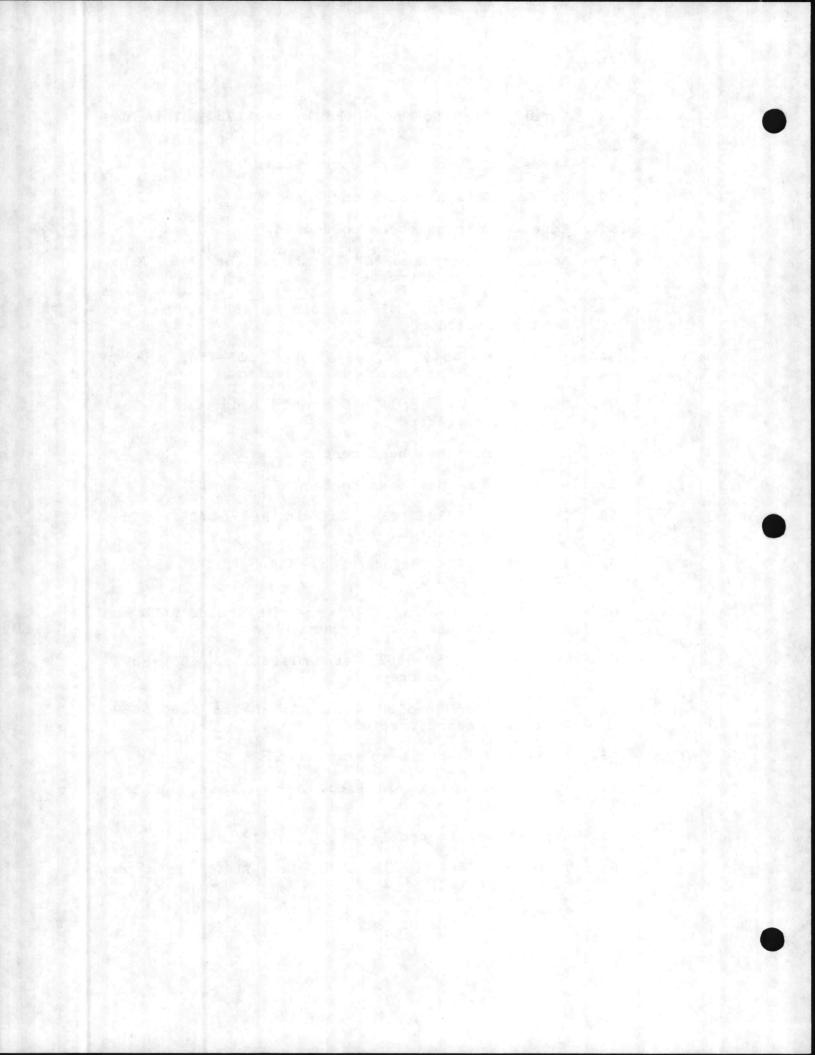
Therefore, a small number of discrepancies between the sketches and the steam trap reports remain which we have been unable to resolve.

- 35. Agree. Trap No. 279 should be 276. This has been corrected.
- 36. Traps 254-258 were listed as A254-A258. This has been corrected.
- 37. Traps 659 and 660 were listed as A659 and A660. This is a characteristic of EEC's numbering system.
- 38. Agree. This has been corrected.
- 39. Agree. This has been corrected.
- 40. Agree. This has been corrected.
- 41. Agree. This has been corrected.
- 42. Agree. This has been corrected.
- Agree. Trap No. 10012 should be 4862. This has been corrected.
- 44. Agree. Trap No. 5039 should be 5030. This has been corrected.
- 45. Agree. Trap No. 4675 should be 4677. This has been corrected.
- 46. Agree. Trap No. 8008 should be 8006. This has been corrected.

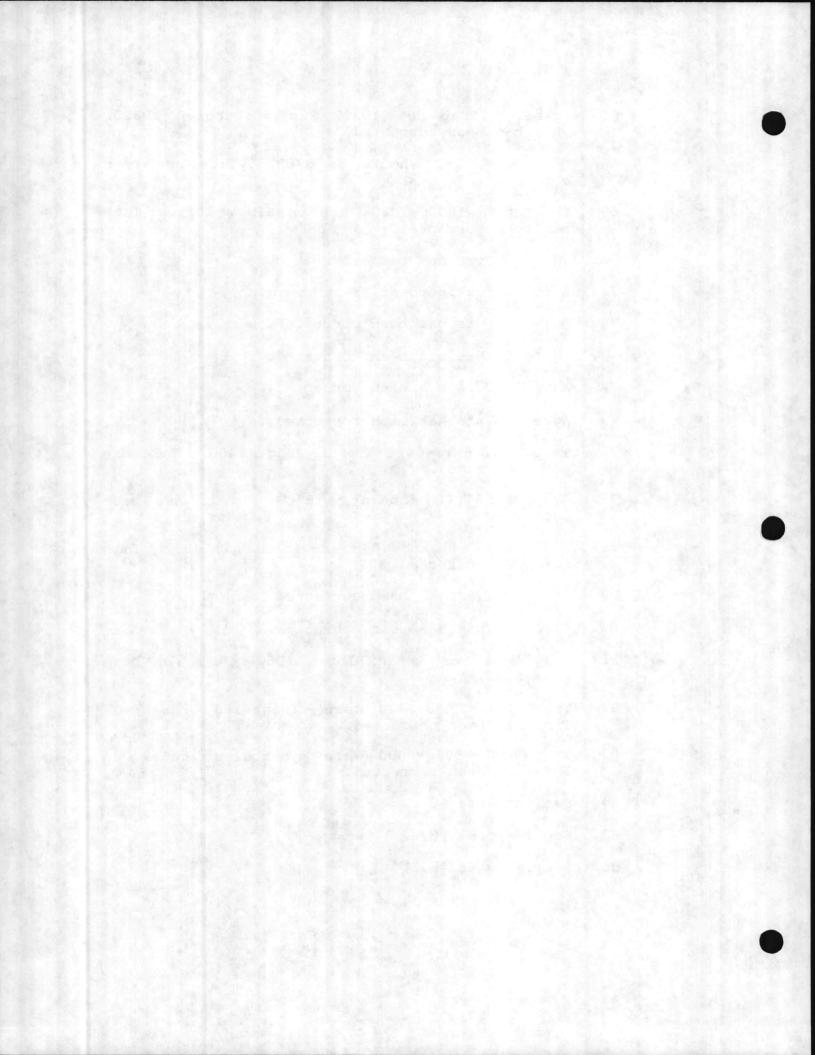
47. Agree. This has been corrected.



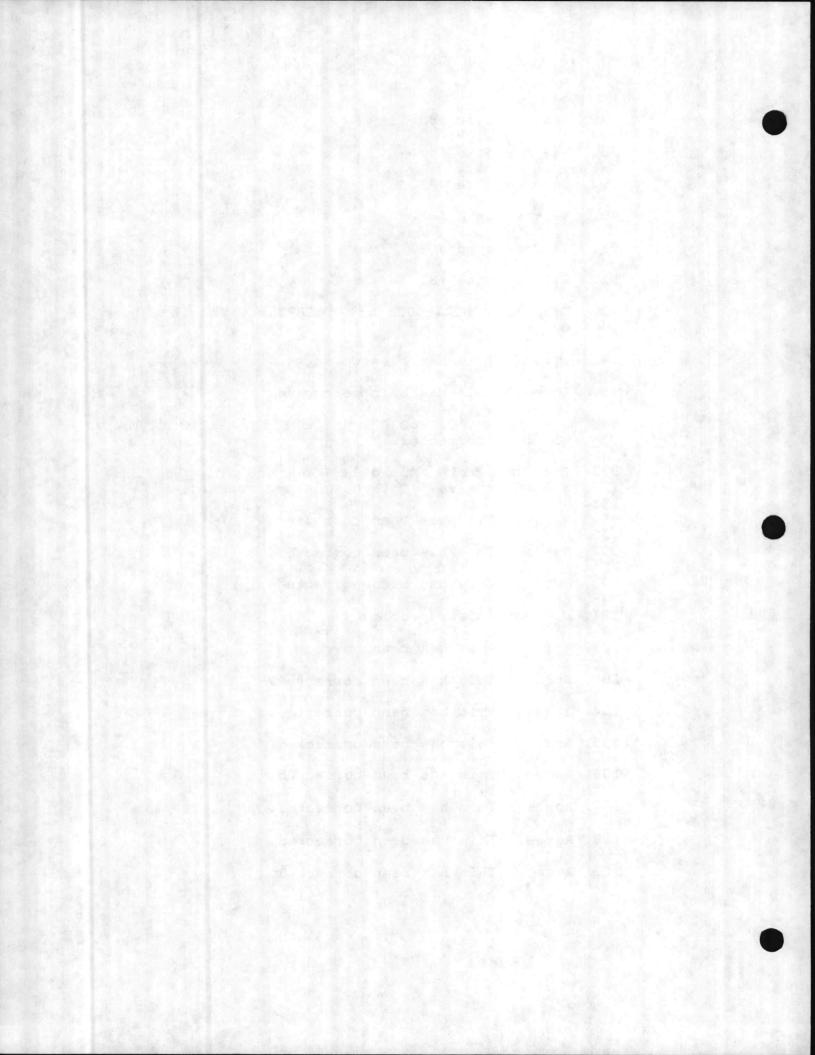
- 48. Agree. Trap No. 6625 should be 6125. This has been corrected.
- 49. Agree. This has been corrected.
- 50. Agree. This has been corrected.
- 51. Agree. This has been corrected.
- 52. Agree. Trap Nos. 67-73 should be 7267-7273. This has been corrected.
- 53. Agree. Trap No. 4573 should be 4577. This has been corrected.
- 54. Trap Nos. 4544 and 4545 and 7533-7543 are in Bldg. 111. This has been corrected.
- 55. Trap Nos. 7625 and 7626 are in Bldg. 216. This has been corrected.
- 56. Agree. This has been corrected.
- 57. Agree. This has been corrected.
- 58. Trap Nos. 12396-12398 are in Bldg. 408. This has been corrected.
- 59. Trap No. 4446 is in Bldg. 424. This has been corrected.
- 60. Trap Nos. 5394 and 5396 were mislabeled 5694 and 5696. This has been corrected.
- 61. Trap Nos. 5389-5392 were mislabeled 5689-5692. This has been corrected.
- 62. Trap Nos. 5366-5388 were mislabeled 5666-5688. This has been corrected.
- 63. Agree. This has been corrected.
- 64. Trap No. 6702 is in Bldg. 909. This has been corrected.
- 65. Did not locate problem.
- 66. Trap No. 3467 is in Bldg. No. 914. This has been corrected.



- 67. Agree. Trap No. 10322 was mislabeled 10320. This has been corrected.
- 68. Trap No. 6762 should be 6782. This has been corrected.
- 69. Trap Nos. 10300-10309 are in Bldg. 1011. This has been corrected.
- 70. Agree. This has been corrected.
- 71. Agree. See response #34 above.
- 72. Agree. This has been corrected.
- 73. Agree. This has been corrected.
- 74. Agree. This has been corrected.
- 75. Agree. This has been corrected.
- 76. Trap Nos. 6411-6418 are in Bldg. 1400. This has been corrected.
- 77. Trap No. 7000 should be 5700. This has been corrected.
- 78. Trap No. 6647 and 6648 are in Bldg. 1403. This has been corrected.
- 79. Agree. This has been corrected.
- 80. Agree. This has been corrected.
- 81. Trap No. 6089 is in Bldg. 1706. This has been corrected.
- 82. Trap Nos. 7438-7440 were mislabeled 1738-1740. This has been corrected.
- 83. Trap Nos. 7966-8000 were mislabeled 9666-9700. This has been corrected.
- 84. See response #83.
- 85. See response #83.
- 86. See response #83.

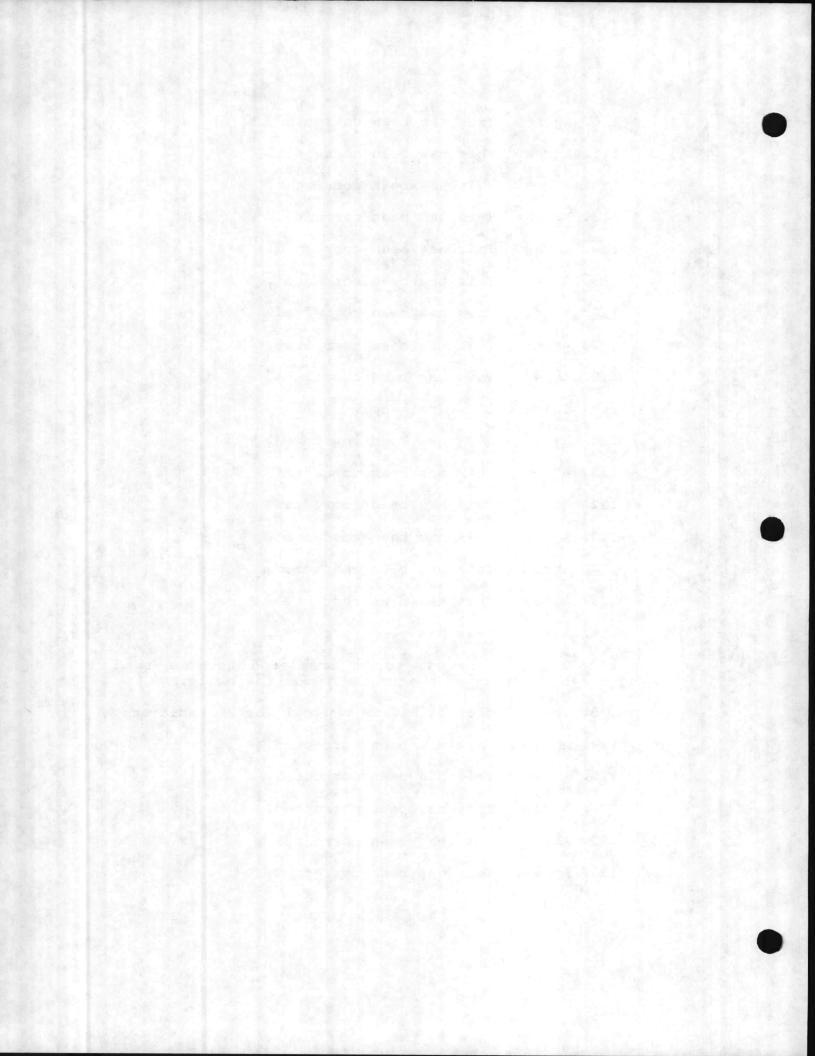


- 87. See response #83.
- 88. See response #83.
- 89. See response #83.
- 90. See response #83.
- 91. See response #83.
- 92. See response #83.
- 93. Trap Nos. 8021-8023 are in HP255. This has been corrected.
- 94. Agree. This has been corrected.
- 95. Agree. This has been corrected.
- 96. Trap Nos. 6021-6024 are in Bldg. S1210. This has been corrected.
- 97. Trap No. 3283 should be 3293 and Trap No. 3244 should be 3294. This has been corrected.
- 98. Agree. This has been corrected.
- 99. Agree. This has been corrected.
- 100. Agree. This has been corrected.
- 101. Did not locate problem.
- 102. Agree. This has been corrected.
- 103. Agree. This has been corrected.
- 104. Agree. This has been corrected.
- 105. Agree. This has been corrected.
- 106. Agree. This has been corrected.
- 107. Agree. This has been corrected.
- 108. Agree. This has been corrected.
- 109. Agree. This has been corrected.



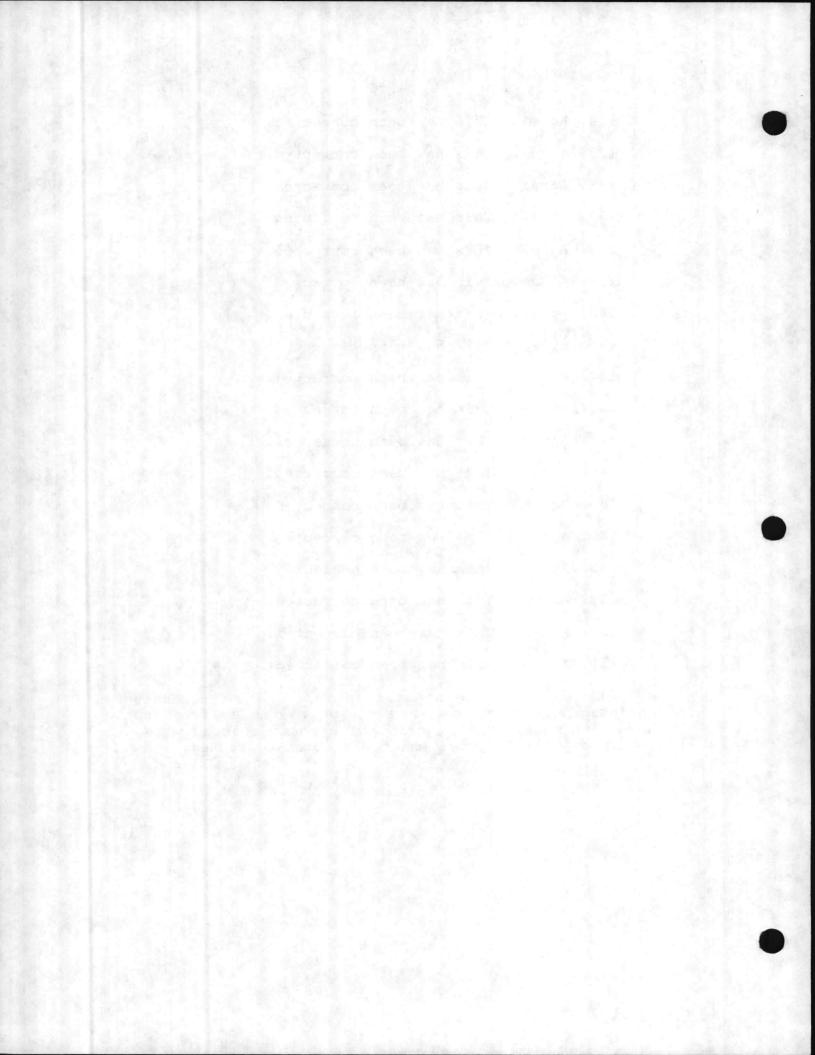
110.	Agree.	This	has	been	corrected	1.		
111.	Agree.	This	has	been	corrected	ι.		
112.	Agree.	This	has	been	corrected	1.		
113.	Agree.	This	has	been	corrected	1.		
114.	Agree.	This	has	been	corrected	1.		
115.	Agree.	This	has	been	corrected	ı.		
116.	Agree.	This	has	been	corrected	1.		
117.	Agree.	This	has	been	corrected	1.		
118.	Agree.	This	has	been	corrected	a.		
119.	These w:	ill be	e rei	issued	1.			
120.	Agree.	This	has	been	corrected	1.		
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All sketches and the steam trap report were extensively reviewed. Corrections in addition to those listed above have been made. The majority of errors detected were due to typographical errors which have been corrected.



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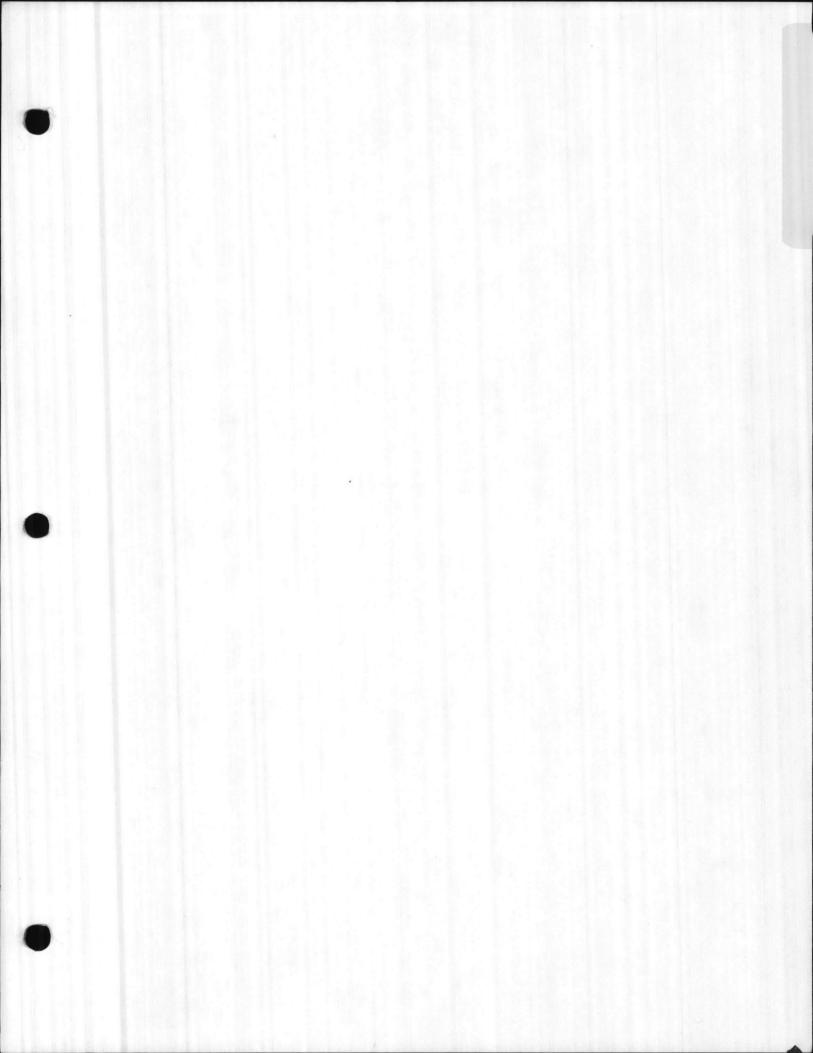
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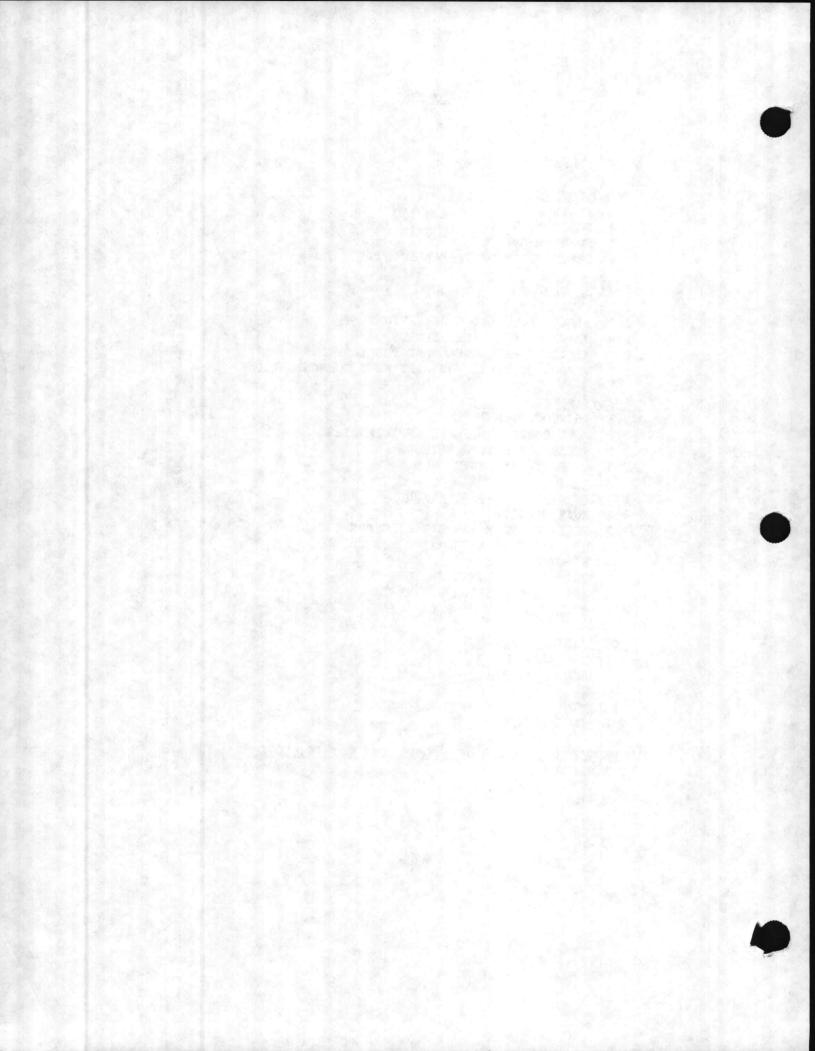




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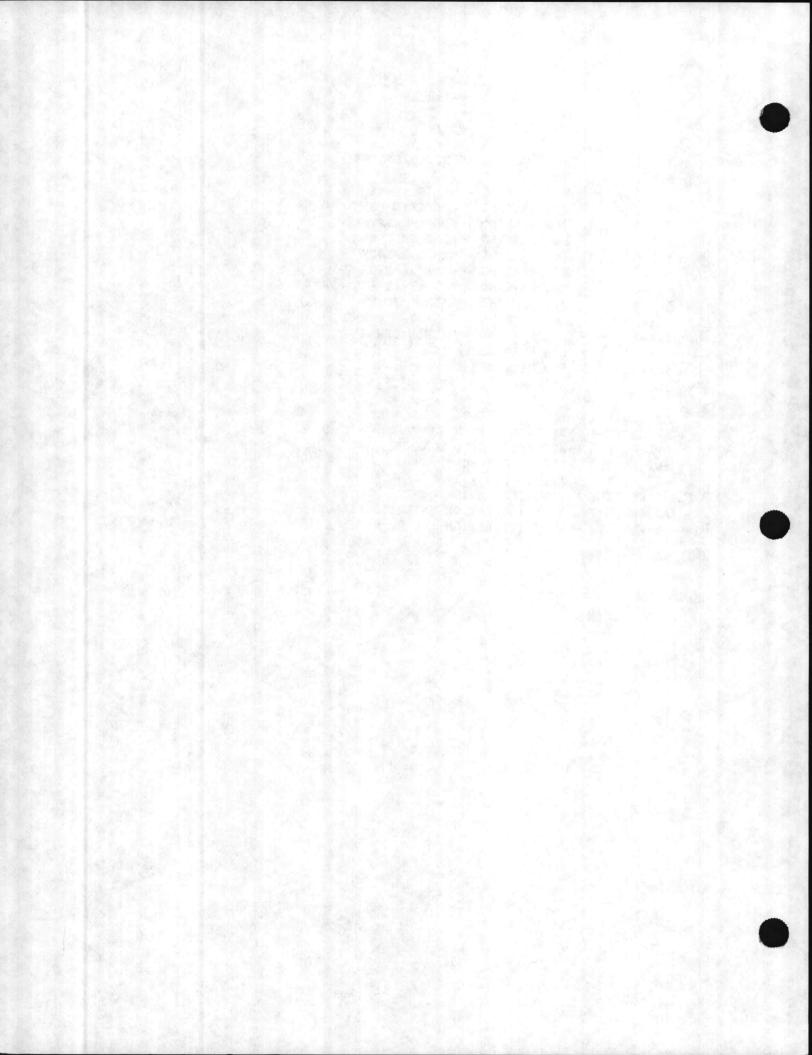
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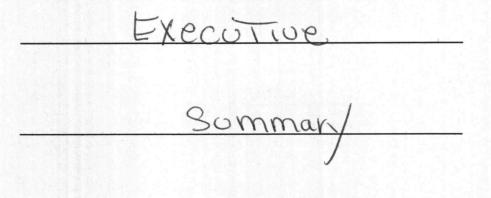
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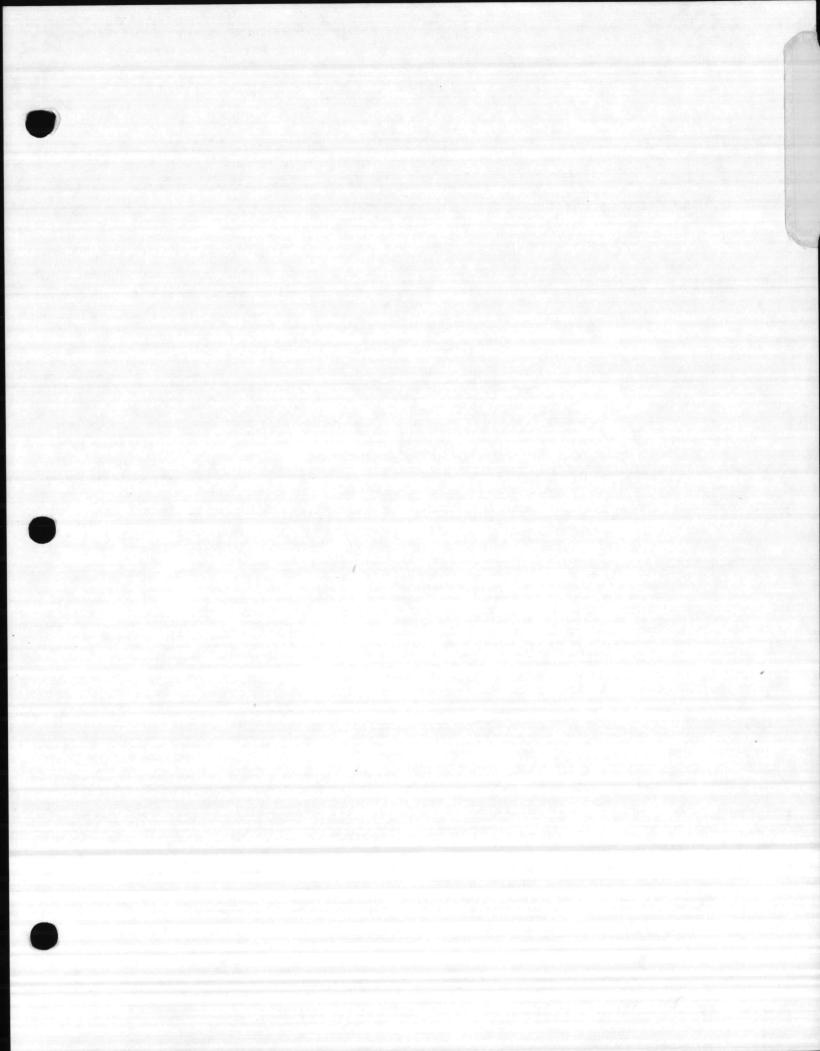
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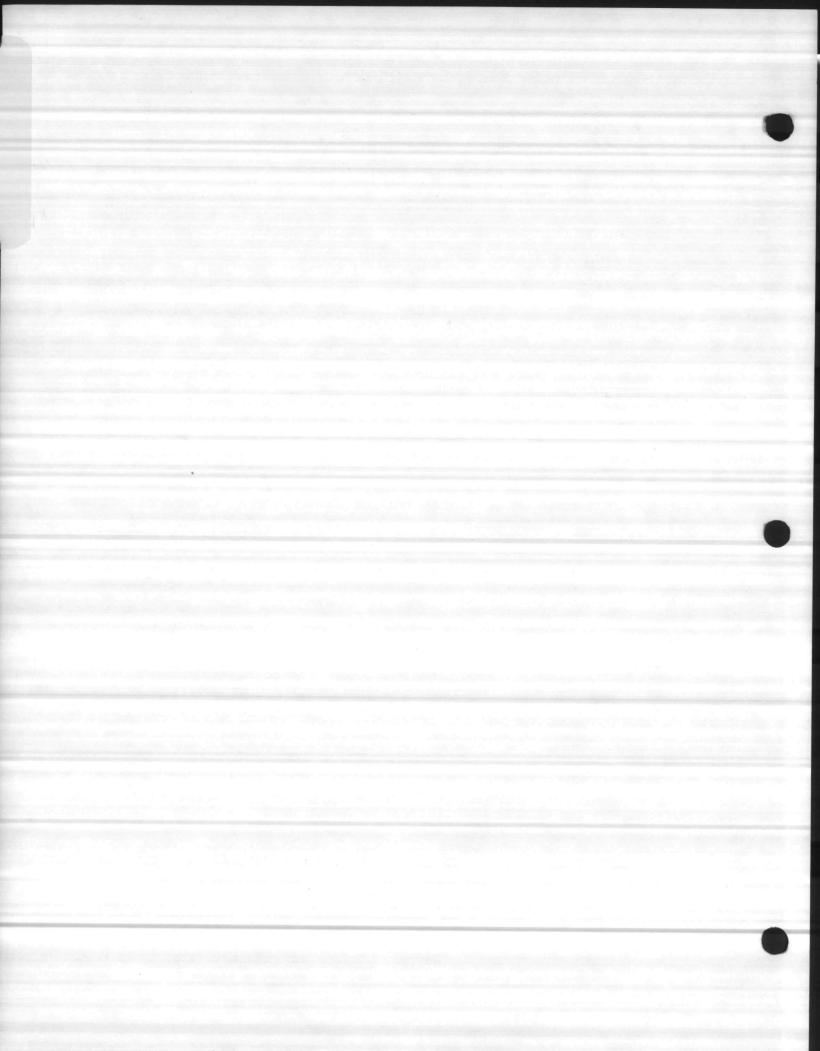


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EXECUTIVE SUMMARY

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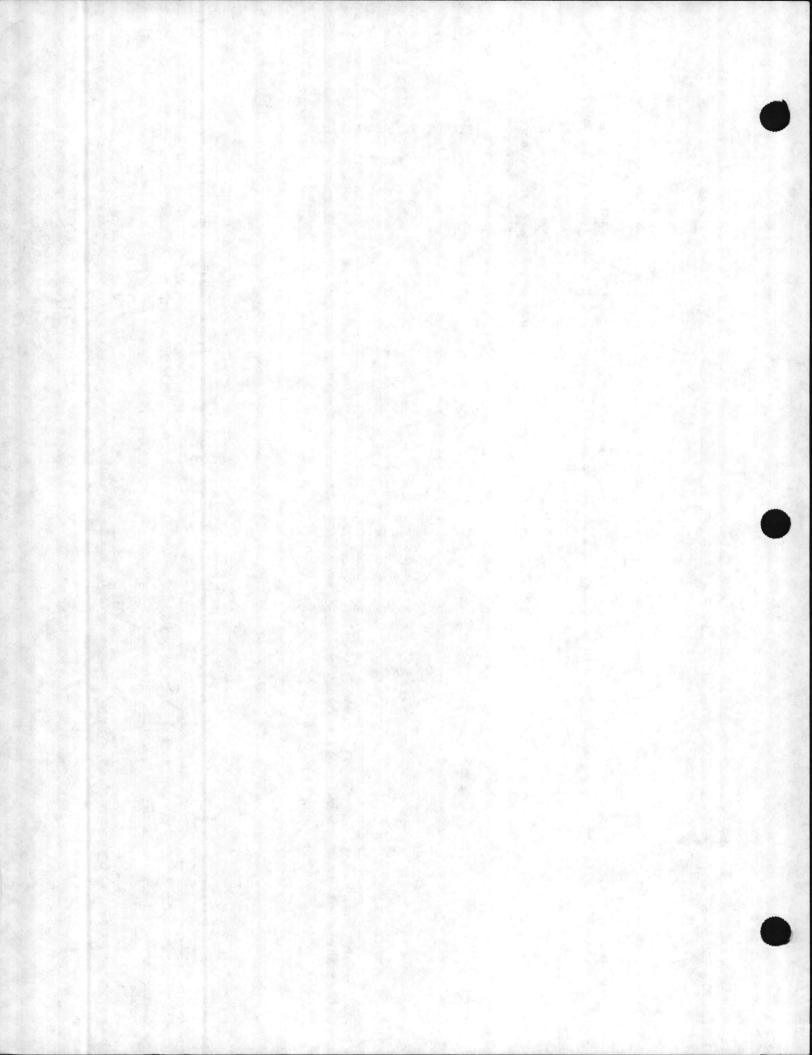
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EXECUTIVE SUMMARY

ES-1 INTRODUCTION

This final report is submitted in accordance with A & E Contract No. N62470-85-C-8040, Central and Building Steam Distribution Systems and Steam Trap Surveys at (1) Marine Corps Base, Camp Lejeune, North Carolina and (2) Marine Corps Air Station, Cherry Point, North Carolina.

<u>Purpose</u> - The overall objective of this study is to identify and quantify the building steam distribution system and steam condensate return system energy losses and to make and support recommendations of corrective measures and capital improvements which will result in energy and monetary savings to the Government.

<u>Scope of Work</u> - This project was divided into three segements:

A. Central Steam and Condensate Return Distribution System (CSDS)

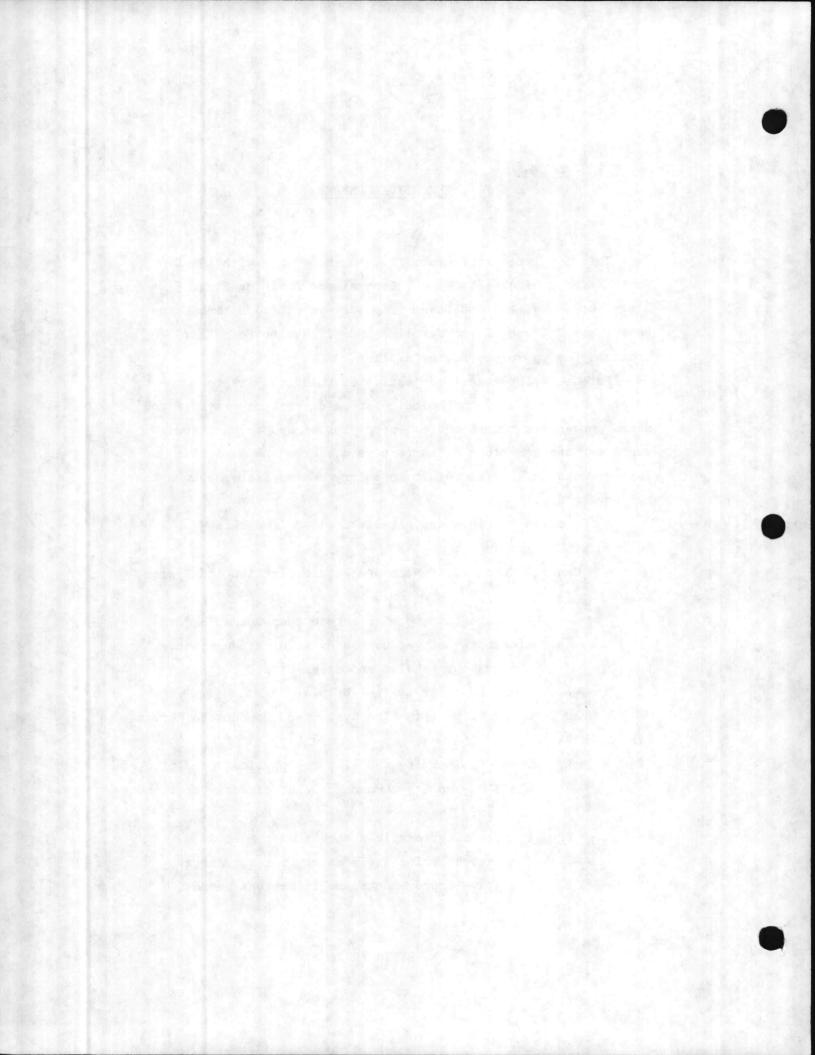
 Evaluate the use of electric sump pumps, or other alternatives, versus the existing steam ejector systems in manholes and steam pits.

2. Steam Trap Survey (see below).

B. Building Steam Distribution System and Condensate Return System (BSDS)

- Inspect, identify and list the physical condition of the BSDS and its components that directly contribute to energy losses.
- 2. Prepare diagrammatic sketches of the BSDS.
- 3. Evaluate building steam energy use for energy effective improvements, modifications and/or

ES-1 (R-1)



alterations including control improvements and additional pipe insulation. Stand alone boiler plant buildings are excluded.

C. Steam Trap Survey

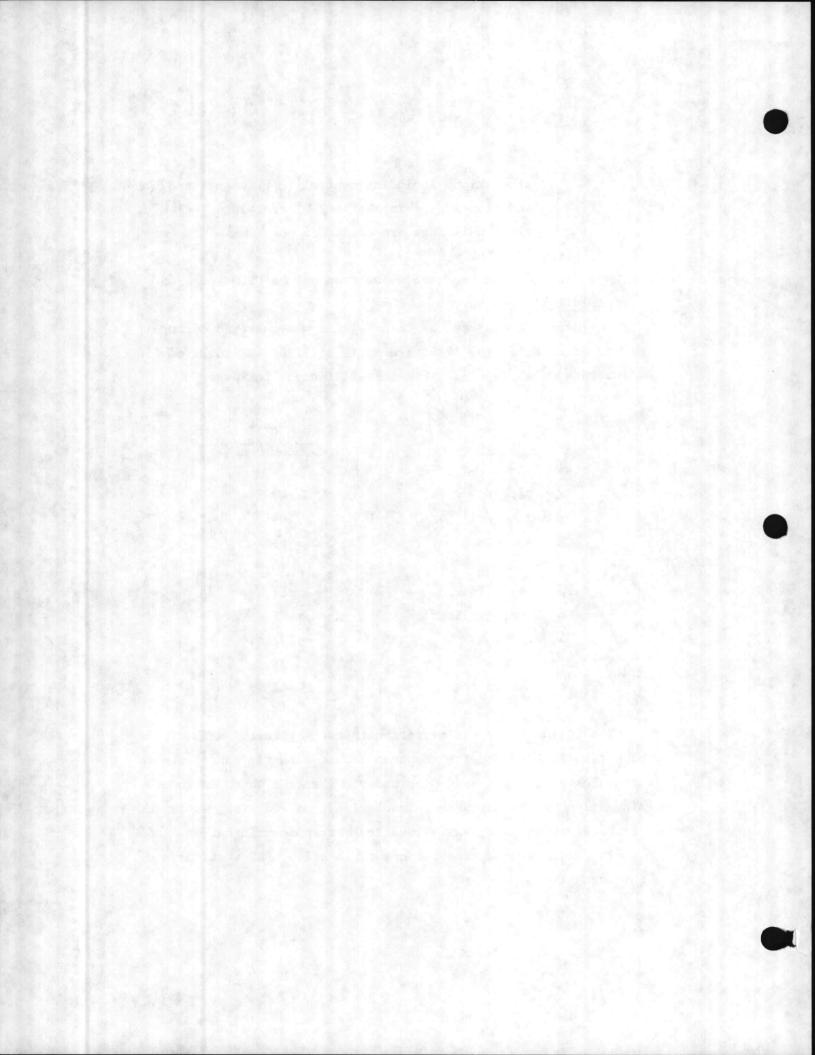
Inspect and tag each steam trap on the CSDS and BSDS. Field Trips and Surveys

The Marine Corps Base at Camp Lejeune was surveyed during the period December 18, 1986 thru April 18, 1987. A total of 650 buildings were surveyed at this installation as follows:

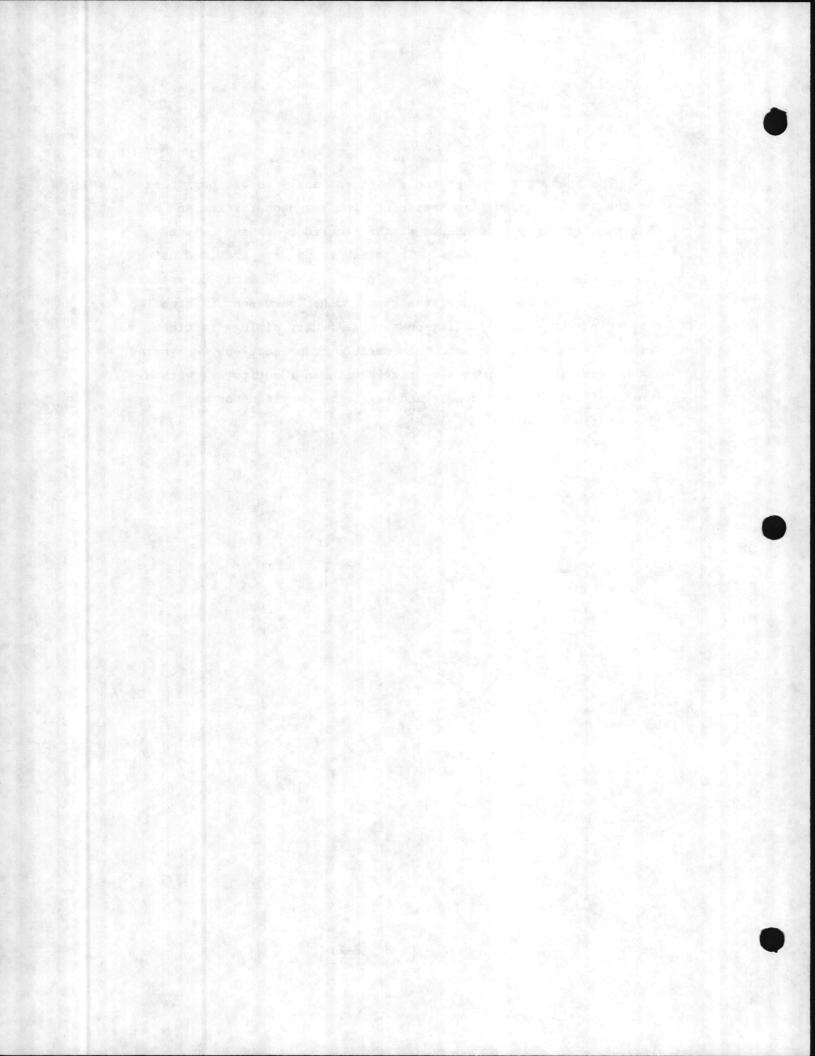
		NO.	OF
INSTALLATION		BUILD	INGS
Beach Area		6	
Camp Geiger		147	
Camp Johnson		109	
Courthouse Bay		25	•
Rifle Range	•	10	
Paradise Point		17	
New River Air Station		49	
Hadnot Point		237	
French Creek		38	
Hospital Point		12	

The field survey was performed in two segments. MAIN inspected the BSDS and its components that directly contribute to energy losses and prepared diagrammatic sketches which included information on the pipe size, insulation type and size, estimated lengths of sized pipe, valve locations, trap identification numbers, major steam using components location, PRV stations and CSDS connections.

ES-2 (R-1)



The steam trap survey and subsequent analysis was performed by the subcontracted firm Armstrong, Inc. at Hadnot Point and by Energy Efficiency Consultants at the remainder of Camp Lejeune under the direction of MAIN. The steam traps were examined using an ultrasonic gun. From this examination, a determination was made concerning the condition of the trap. Other pertinent information regarding the trap installation such as faulty piping practices, misapplied steam traps, and inaccessible trap locations were noted. Each accessible trap was also tagged with an identity tag with a unique identification number and tags were provided for all inaccessible traps.



ES-2 COST AND ENERGY SAVINGS

<u>Energy Conservation Opportunities</u> - A brief summary of each ECO investigated is as follows:

<u>4.2 Replace Steam Manhole Ejectors (CSDS)</u> - This opportunity replaces the existing manhole steam ejectors which have been discontinued by the manufacturer resulting in a very high cost maintenance problem due to parts being available on a special order basis only. The replacement is a syphon jet pump which consists of a thermodynamic trap and a steam syphon. The primary savings is due to a reduced maintenance cost with a minimal energy savings. The total cost of installation for 400 manholes is \$187,200 which will results in a cost savings of \$193,600/yr and a Savings to Investment Ratio (SIR) of 7.8.

<u>4.3 Upgrade Pipe Insulation</u> - This ECO upgrades the current insulation thicknesses from the existing bare pipe or substandard levels to thicknesses recommended by ASHRAE. Preformed fiberglass insulation of the appropriate thickness would be installed on the bare lines or added over the existing insulation to reach the recommended thicknesses. A total construction cost of \$1,307,352 would result in an energy savings of 251,319 MBtu/yr. which is equivalent to \$620,041/yr. with an SIR of 6.3. The installation breakdown is shown in Table ES-1.

<u>4.4 Night Setback</u> - This is the first of three control opportunities investigated. This ECO would install night setback controls to limit the operation of the heating systems during the unoccupied hours. This ECO would be applicable to 86 buildings at a construction cost of \$202,045 with an energy savings of 21,723 MBtu/yr. which is equivalent to \$49,821/yr. with an SIR of 2.5. This ECO was combined with the other two control modifications. See paragraph 4.7, Combined Controls.

ES-4 (R-1)

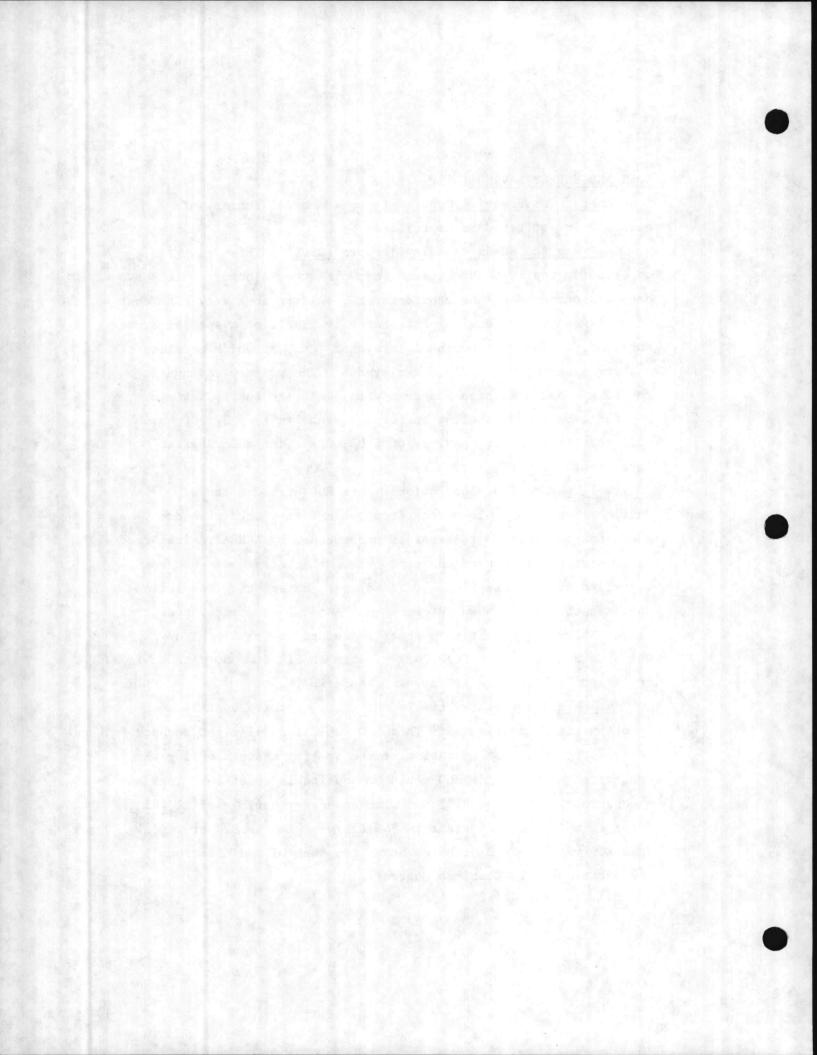
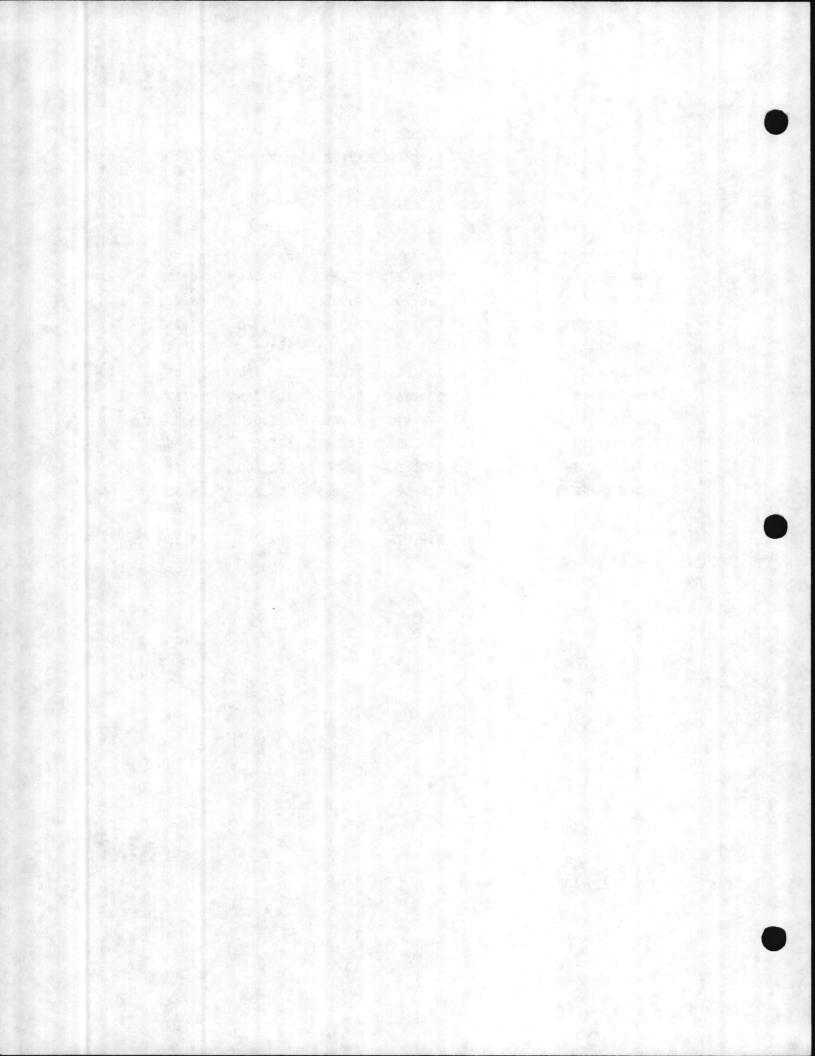


TABLE ES-1 UPGRADE PIPE INSULATION SUMMARY

	ENERGY SAVING	CAPITAL		
INSTALLATION	MBTU/YR.	\$/YR.	COST \$	SIR
BEACH AREA	3,938.427	11,461	18,944	8.15
HOSPITAL POINT	47,366.701	105,628	176,033	8.07
COURTHOUSE BAY	7,817.901	22,750	42,770	7.15
CAMP GEIGER	27,855.980	81,061	153,254	7.11
RIFLE RANGE	12,104.915	35,225	67,224	7.05
CAMP JOHNSON	16,839.867	49,004	103,385	6.37
AIR STATION	15,178.842	44,170	101,880	5.83
HADNOT POINT	113,487.252	253,077	598,027	5.69
PARADISE POINT	3,910.616	11,380	27,100	5.65
FRENCH CREEK	2,818.575	6,285	18,735	4.50
TOTAL	251,319.076	620,041	1,307,352	6.38





<u>4.5 Outside Air Limit Shutoff</u> - This ECO would install controls to shut off the steam supply to the buildings during periods of mild weather in the heating season. This ECO would be applicable to 32 buildings at a construction cost of \$42,408 with an energy savings of 2,524 MBtu/yr. which is equivalent to \$6,532/yr. with an SIR of 1.6. This ECO was combined with the other two control modifications. See paragraph 4.7, Combined Controls.

Hot Water Outside Air Reset - This ECO would install controls to change the hot water temperature supplied to the buildings to match the actual heating load. This ECO, also has an SIR less than 1.0 for all buildings, but when combined with the other control options, it became viable. See paragraph 4.7, Combined Controls.

<u>Combined Control ECO</u> - The ECO would install controls to provide all control strategies discussed in the preceding three paragraphs. The cost of combining the three control systems does not exceed the cost of a single control system by a large amount due to the duplication of components. This ECO would be applicable to 128 buildings at a construction cost of \$283,334 with an energy savings of 32,172 MBtu/yr. which is equivalent to \$75,745/yr. with an SIR of 2.7. The installation breakdown is shown in Table ES-2.

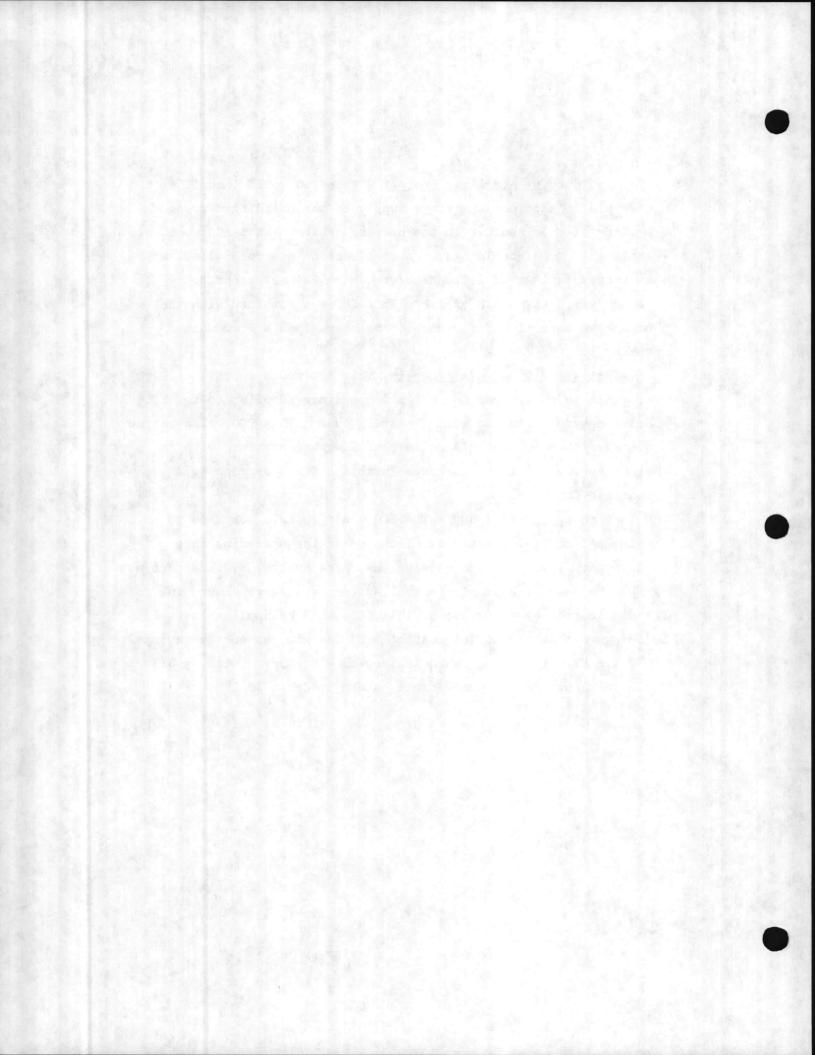
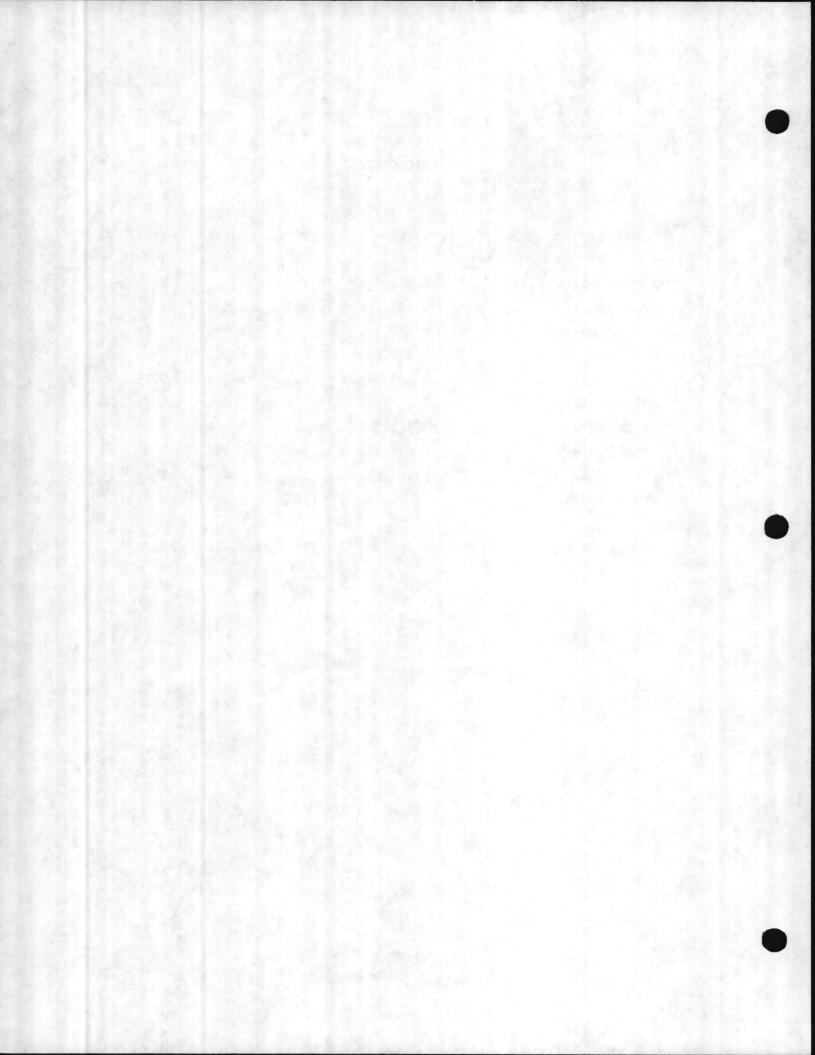


TABLE ES-2 COMBINED CONTROL SUMMARY

	NO. OF	ENERGY SAVINGS	i puter teres	CAPITAL	
INSTALLATION	BLDGS.	MBTU/YR	\$/YR	COST \$	SIR
••••••					
HOSPITAL POINT	6	2,938.196	6,552	14,511	4.58
HADNOT POINT	74	21,887.406	48,810	165,925	2.98
AIR STATION	13	2,447.371	7,122	26,989	2.68
BEACH AREA	3	627.487	1,826	8,831	2.10
RIFLE RANGE	8	881.979	2,567	12,113	2.15
FRENCH CREEK	6	1,467.057	3,272	17,405	1.91
CAMP JOHNSON	10	1,191.241	3,467	21,949	1.60
COURTHOUSE BAY	2	470.566	1,369	9,363	1.48
CAMP GEIGER	5	189.864	553	4,434	1.26
PARADISE POINT	1	71.189	207	1,814	1.16
TOTAL	128	32,162.356	75,745	283,334	2.72

ES-7 (R-1)



ES-3 PROJECTS DEVELOPED

The savings opportunities have been grouped into projects based upon similarity of improvements. The project grouping at this installation is as shown in Table ES-3.

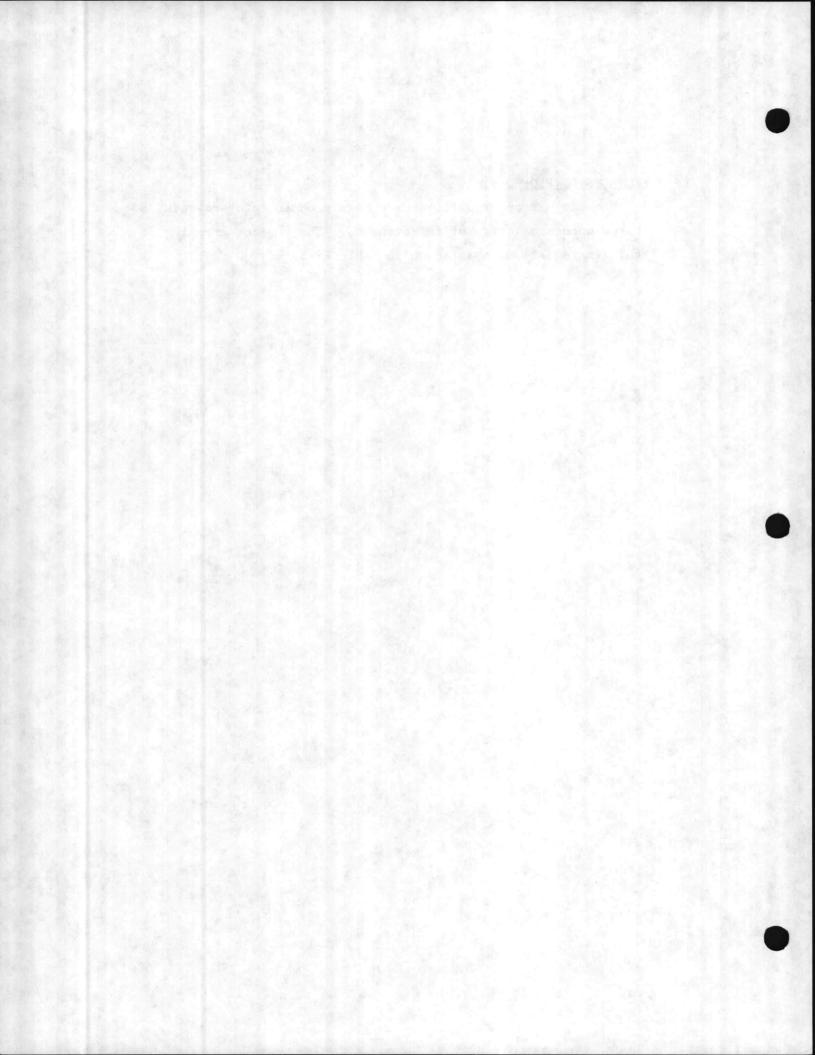
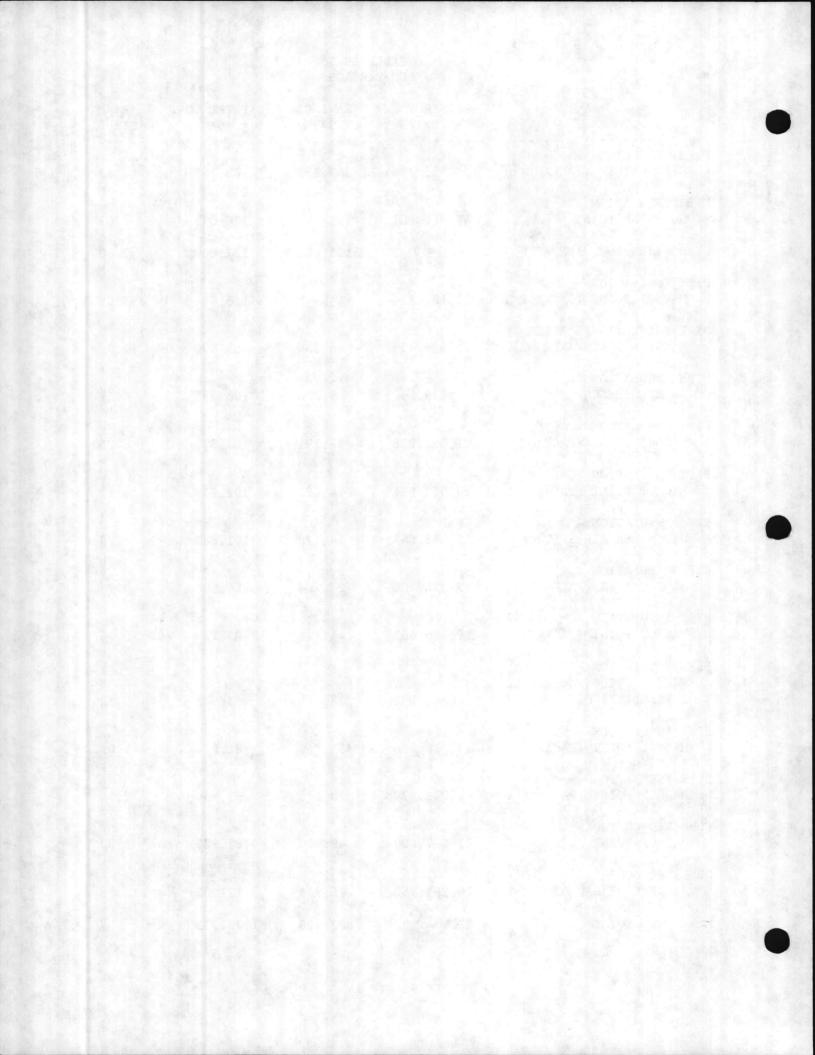


TABLE ES-3 ECO PACKAGES

PACKAGE	ENERGY MBTU/YR	SAVINGS \$/YR	CAPITAL COST \$	SIR
DIDE INCULATION			••••••	
PIPE INSULATION - CAMP GEIGER (PACKAGE 1)	18,335.774	53,357	88,348	8.12
PIPE INSULATION - HOSPITAL POINT	47,366.701	105,621	176.033	8.07
SYPHON JET SUMP PUMPS	0	193,600	187,200	7.80
PIPE INSULATION - HADNOT POINT (PACKAGE 1)	29,133.814	64,942	113,684	7.69
PIPE INSULATION - RIFLE RANGE & BEACH AREA	15,996.439	46,550	85,890	7.29
				1.25
PIPE INSULATION - CAMP JOHNSON	16,839.867	49,004	103,385	6.37
PIPE INSULATION -				
HADNOT POINT (PACKAGE 2)	21,655.238	48,291	104,321	6.26
PIPE INSULATION -				
HADNOT POINT (PACKAGE 3)	19,953.834	44,497	102,959	5.81
PIPE INSULATION -				
NEW RIVER AIR STATION	15,178.842	44,170	101,880	5.83
PIPE INSULATION - CAMP GEIGER (PACKAGE 2)	9,520.206	27,704	64,906	5.74
PIPE INSULATION -				
HADNOT POINT (PACKAGE 4)	19,795.461	44,144	103,129	5.76
PIPE INSULATION - FRENCH CREEK, COURTHOUSE	BAV			
& PARADISE POINT	14,547.092	35,099	88,605	5.32
PIPE INSULATION -				
HADNOT POINT (PACKAGE 5)	13,928.926	31,062	81,978	5.09
PIPE INSULATION -				
HADNOT POINT (PACKAGE 6)	9,019.979	20,155	91,956	2.94
COMBINED CONTROLS				
HADNOT POINT	21,887.809	48,810	165,925	3.00
COMBINED CONTROLS				
ALL EXCEPT HADNOT POINT	10,284.950	26,934	121,037	2.26
TOTAL	283,444.932	883,926	1,781,236	



ES-4 SUMMARY AND CONCLUSIONS

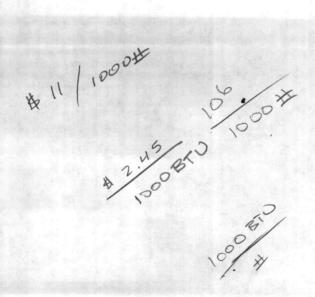
<u>Summary</u> - A total of 650 buildings were surveyed and evaluated for energy and cost savings opportunities. Sketches of the BSDS were prepared and the steam traps were inspected.

Sixteen projects were developed which will conserve 283,445 MBtu/yr. which is equivalent to \$690,326/yr. plus \$193,600/yr. in maintenance cost savings for a total of \$883,926/yr. for a total investment of \$1,781,236.

The savings resultings from steam trap repairs as summarized in the Armstrong steam trap report is 209,196 MBtu/yr. which is equivalent \$577,312 for a total investment of \$164,900. See Table ES-4 for a breakdown by installation.

The total savings from all projects including the replacement of defective traps is 492,641 MBtu/yr. which is equivalent to \$1,267,638/yr. plus \$193,600/yr in maintenance cost savings for a total of \$1,461,238/yr for a total investment of \$1,946,136.

<u>Conclusions</u> - The base should proceed with implementation of the projects listed in Table ES-5, subject to the availability of funding.



ES-10 (R-1)

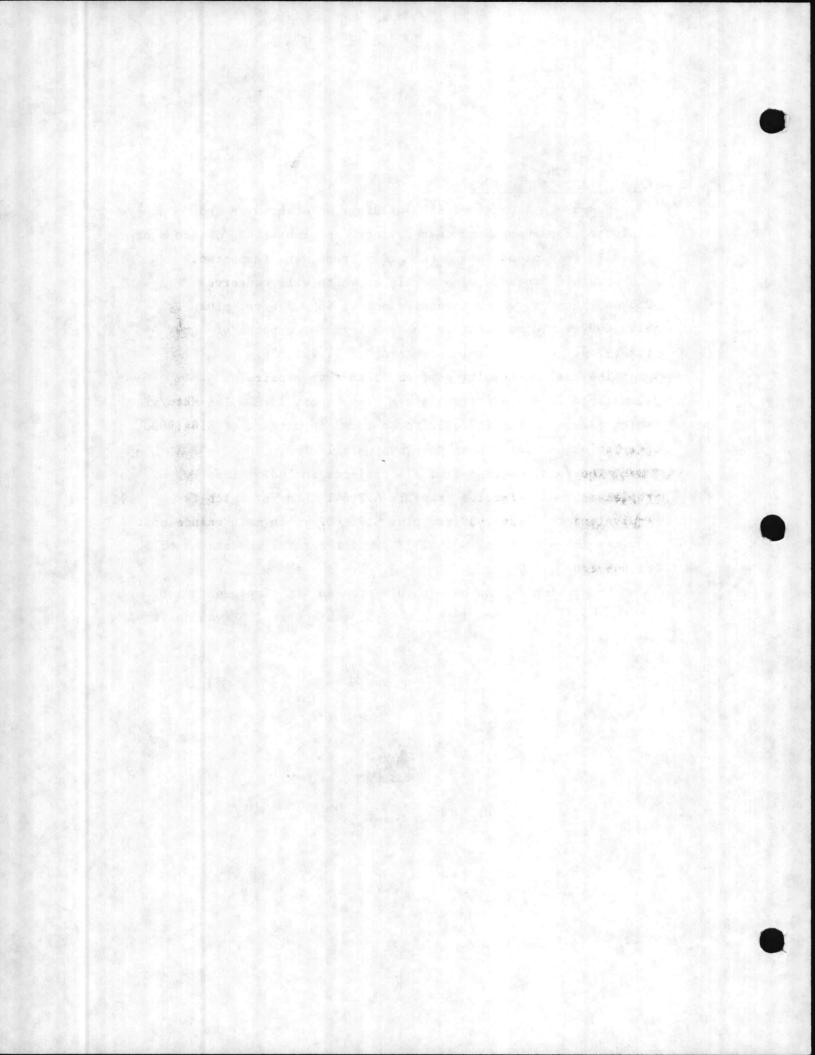


TABLE ES-4 REPLACE DEFECTIVE TRAPS SUMMARY

			FAILED			
	ENERGY SAV	INGS	NO. OF	TOTAL		
INSTALLATION	MBTU/YR.	\$/YR.	TRAPS	TRAPS	COST	SIR
HADNOT POINT	66,966	191,522		5,696	36,100	53.8
PARADISE POINT	4,638	12,350	65	255	6,500	19.3
BEACH AREA	3,841	10,220	11	92	1,100	94.3
CAMP JOHNSON	15,378	40,940	87	997	8,700	47.7
CAMP GEIGER	27,051	71,960	135	882	13,500	54.1
FRENCH CREEK	15,500	44,350	47	417	4,700	95.7
AIR STATION	19,307	51,430	161	890	16,100	32.4
COURTHOUSE BAY	13,315	35,400	97	431	9,700	37.0
RIFLE RANGE	22,404	59,620	154	577	15,400	39.3
HOSPITAL POINT	20,796	59,520	268	844	26,800	22.5
					~	
TOTAL	209,196	577,312	1,386	11,081	138,600	42.3

ES-11 (R-1)

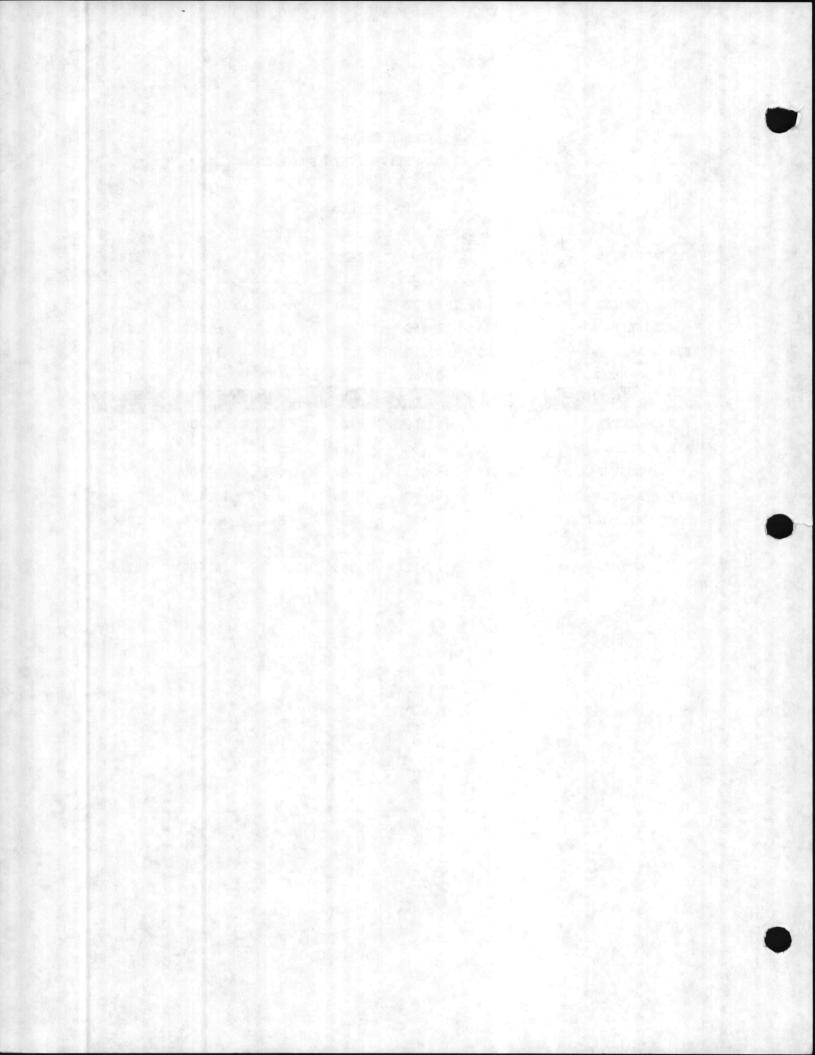
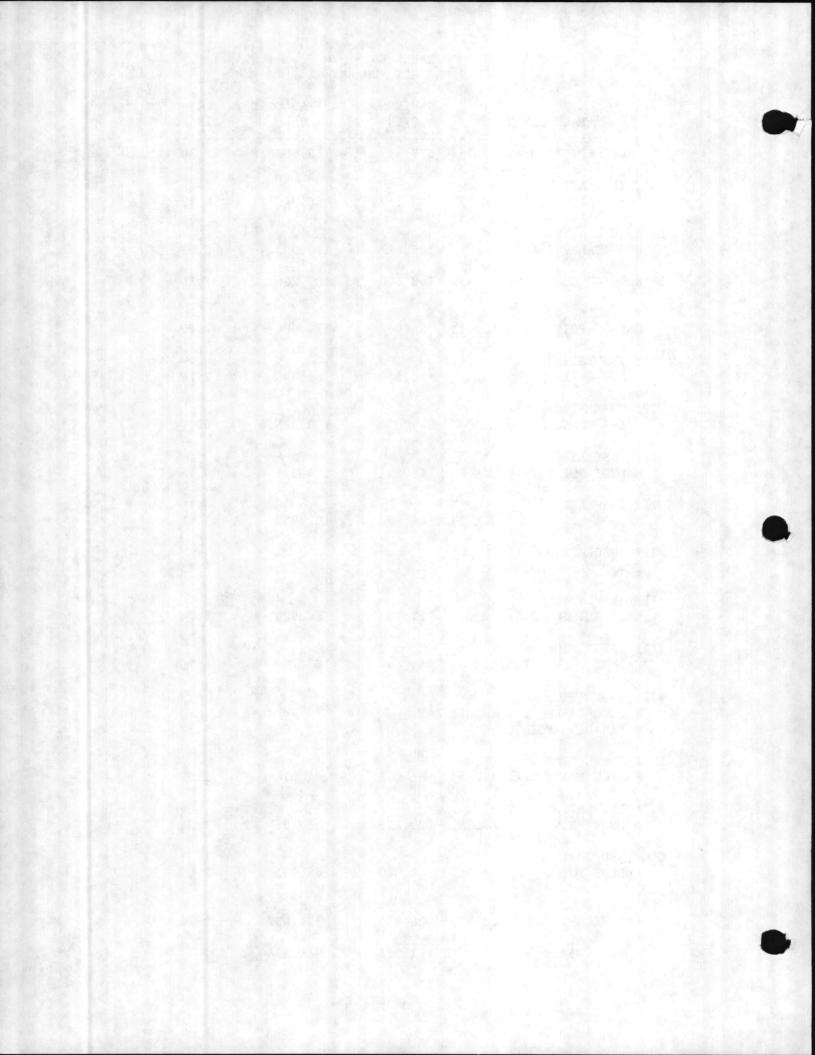


TABLE ES-5 PROJECT SUMMARY

PACKAGE	SAVINGS \$/YR	CAPITAL COST	SIR
REPLACE DEFECTIVE TRAPS	577,312	164,900	42.30
PIPE INSULATION -			
CAMP GEIGER (PACKAGE 1)	53,357	88,348	8.12
PIPE INSULATION -			
HOSPITAL POINT	105,621	176,033	8.07
SYPHON JET SUMP PUMPS	193,600	187,200	7.80
PIPE INSULATION -			1 · 3 ·
HADNOT POINT (PACKAGE 1)	64,968	113,684	7.69
PIPE INSULATION - RIFLE			
RANGE & BEACH AREA	46,550	85,890	7.29
PIPE INSULATION -			
CAMP JOHNSON	49,004	103,385	6.37
PIPE INSULATION -			
HADNOT POINT (PACKAGE 2)	48,291	104,321	6.26
PIPE INSULATION -			
HADNOT POINT (PACKAGE 3)	44,497	102,959	5.81
PIPE INSULATION -			
NEW RIVER AIR STATION	44,170	• 101,880	5.83
PIPE INSULATION -			
CAMP GEIGER (PACKAGE 2)	27,704	64,906	5.74
PIPE INSULATION -			
HADNOT POINT (PACKAGE 4)	44,144	103,129	5.76
PIPE INSULATION -			
FRENCH CREEK, COURTHOUSE	BAY		
& PARADISE POINT	35,099	88,605	5.32
PIPE INSULATION -			
HADNOT POINT (PACKAGE 5)	31,062	81,978	5.09
PIPE INSULATION -			
HADNOT POINT (PACKAGE 6)	20,115	91,956	2.94
COMBINED CONTROLS			
HADNOT POINT	48,810	165,925	3.00
COMBINED CONTROLS			
ALL EXCEPT HADNOT POINT	26,934	121,037	2.26
TOTAL	1,461,238	1,946,136	



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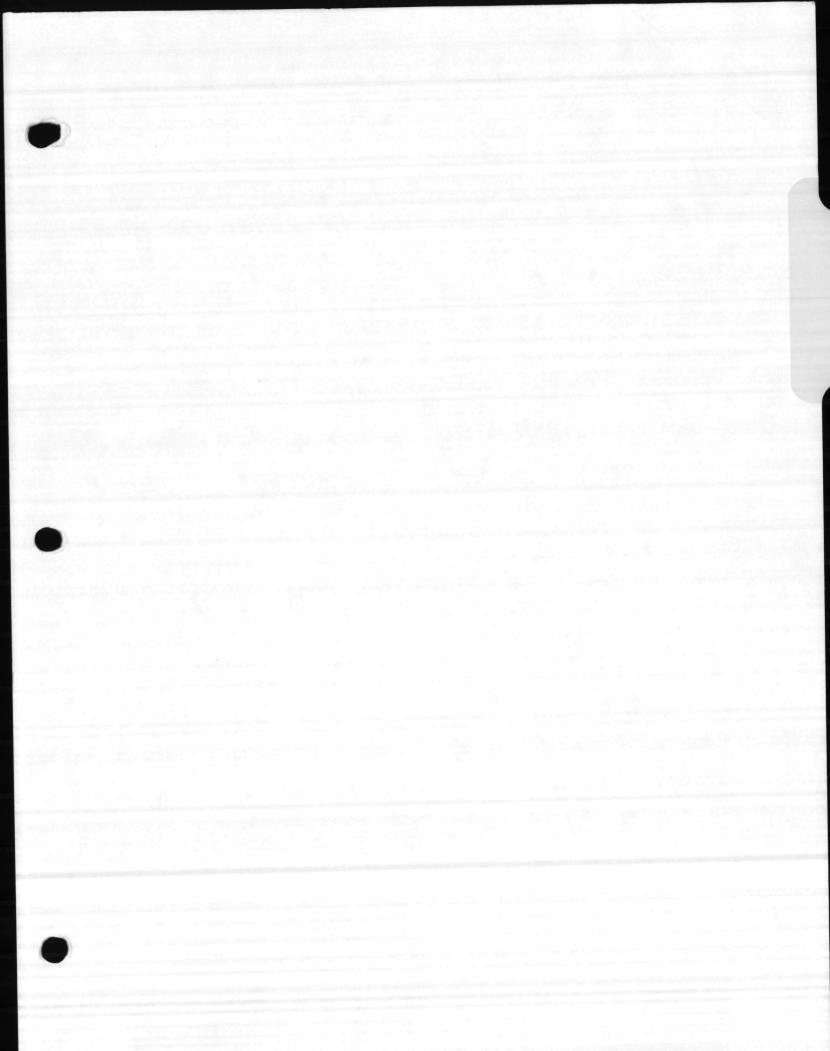
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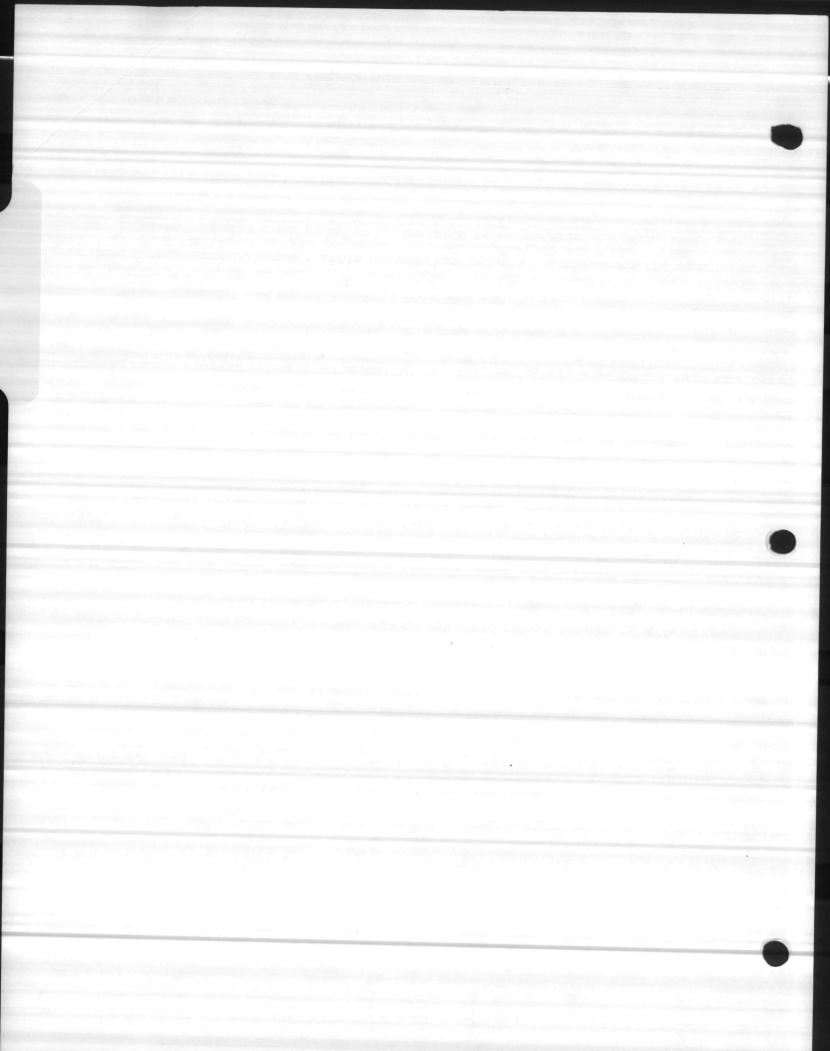
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1.0 INTRODUCTION

1.1 PURPOSE

The prime objective of this study is to identify and quantify the building steam distribution system and steam condensate return system energy losses and to make and support recommendations of corrective measures and capital improvements which will result in energy and monetary savings to the Government. The objectives of this report are to:

- Develop a systematic plan of projects and actions to reduce energy consumption at Camp Lejeune and Cherry Point.
- Use and incorporate into this systematic plan all applicable data.
- Study state-of-the-art methods of energy conservation which are practical and economically feasible.
- List and prioritize all energy conservation projects investigated.
- Frepare preliminary programming and planning documents (Form DD 1391) for selected, feasible energy conservation projects.

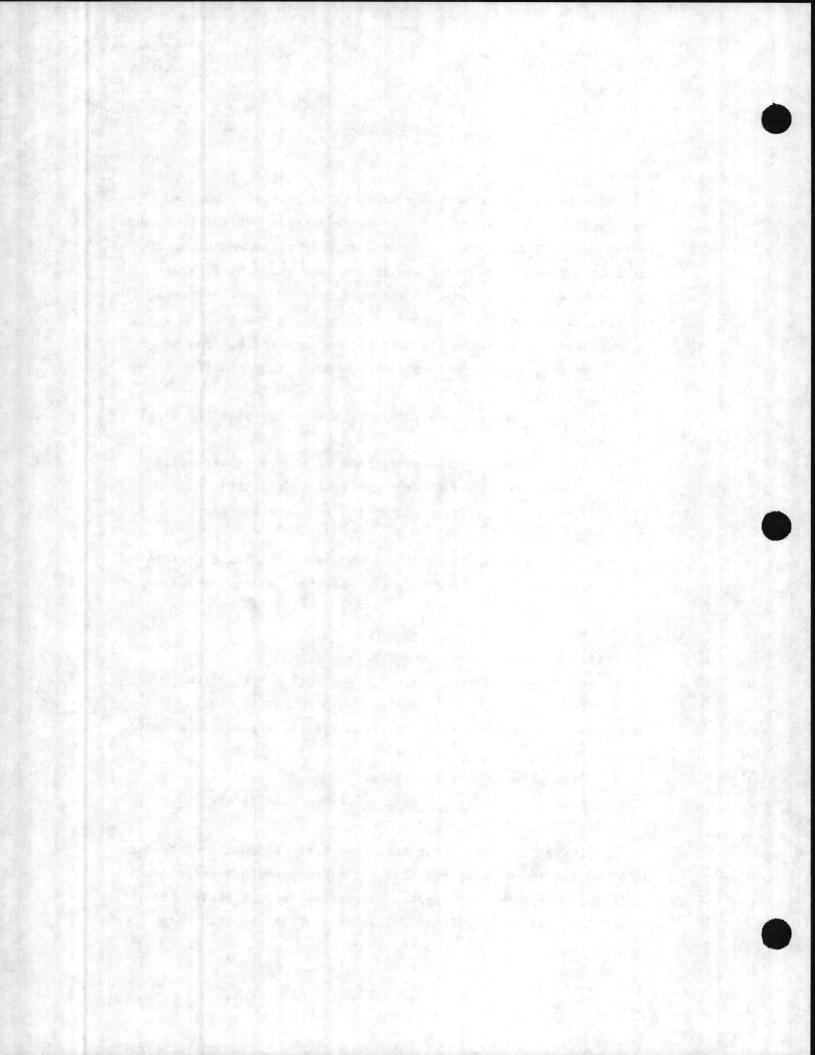
1.2 SCOPE OF WORK

This project is divided into three segements Central Steam and Condensate Return Distribution System (CSDS)

 Evaluate the use of electric sump pumps, or other alternatives, versus the existing steam ejector systems in manholes and steam pits.

 Steam Trap Survey (see below).
 Building Steam Distribution System and Condensate Return System (BSDS)

1. Inspect, identify and list the physical condition of the BSDS and its components that directly contribute to energy losses including pipe sizes and lengths, expansion joints, valves, heat exchangers, missing insulation, insulation type and thickness,



abandoned piping, condensate return system and components and steam leaks.

2. Prepare diagrammatic sketches which include information on the pipe size, insulation type and thickness, estimated length of pipe, valves, steam trap locations and identification numbers and major steam components such as PRV stations and connections to the CSDS.

3. Evaluate building steam energy use for energy effective improvements, modifications and/or alterations including control improvements and additional pipe insulation. Stand alone boiler plant buildings are excluded.

Steam Trap Survey

Inspect each steam trap providing the following information:

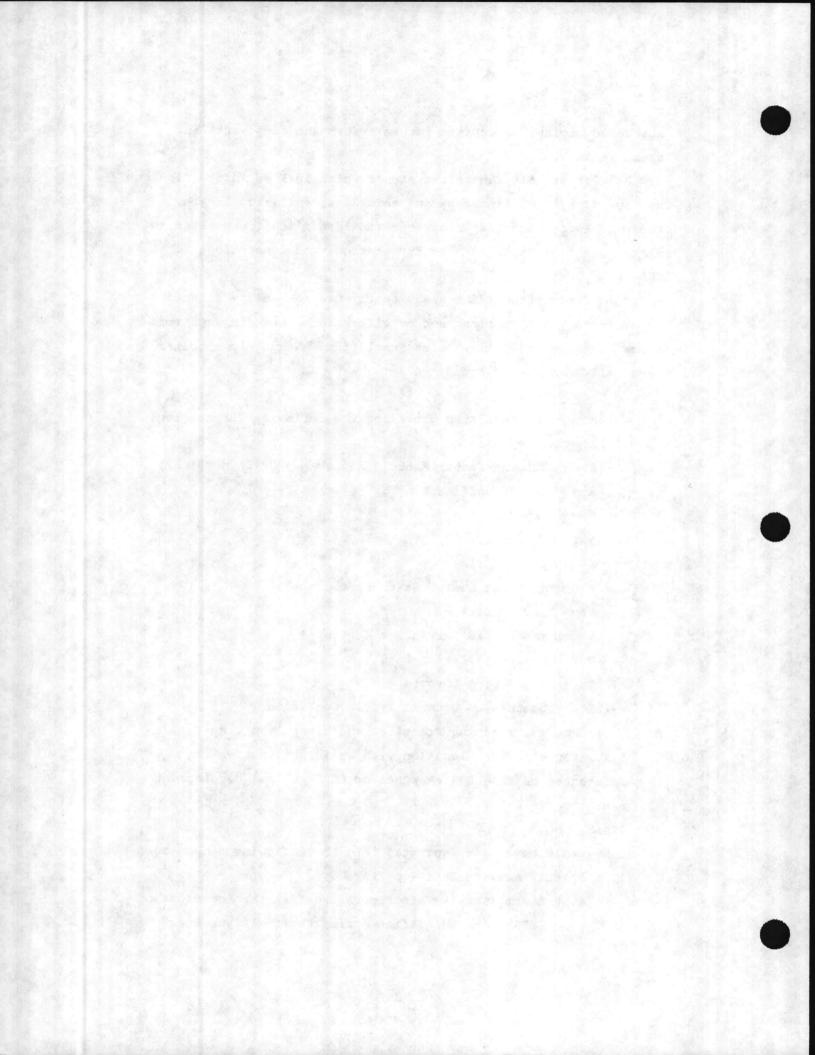
- 1. Survey Date
- 2. Building Number/Manhole Number/Map Grid Coordinates
- 3. Trap Identification
- 4. Trap Function
- 5. Manufacturer
- 6. Type and Size
- 7. Inlet and Outlet Steam Pressure
- 8. Trap Condition
- 9. Recommended Corrective Action
- 10. Trap Installation Date
- 11. Trap Piping Layouts
- 12. Comments on General System Condition
- 13. Faulty Piping Practices and Misapplied Traps.

Also, tag each trap location with an identification tag referenced on the BSDS sketches or CSDS general development map.

1.3 SUBMITTALS

Submittals have been separated into the following components:

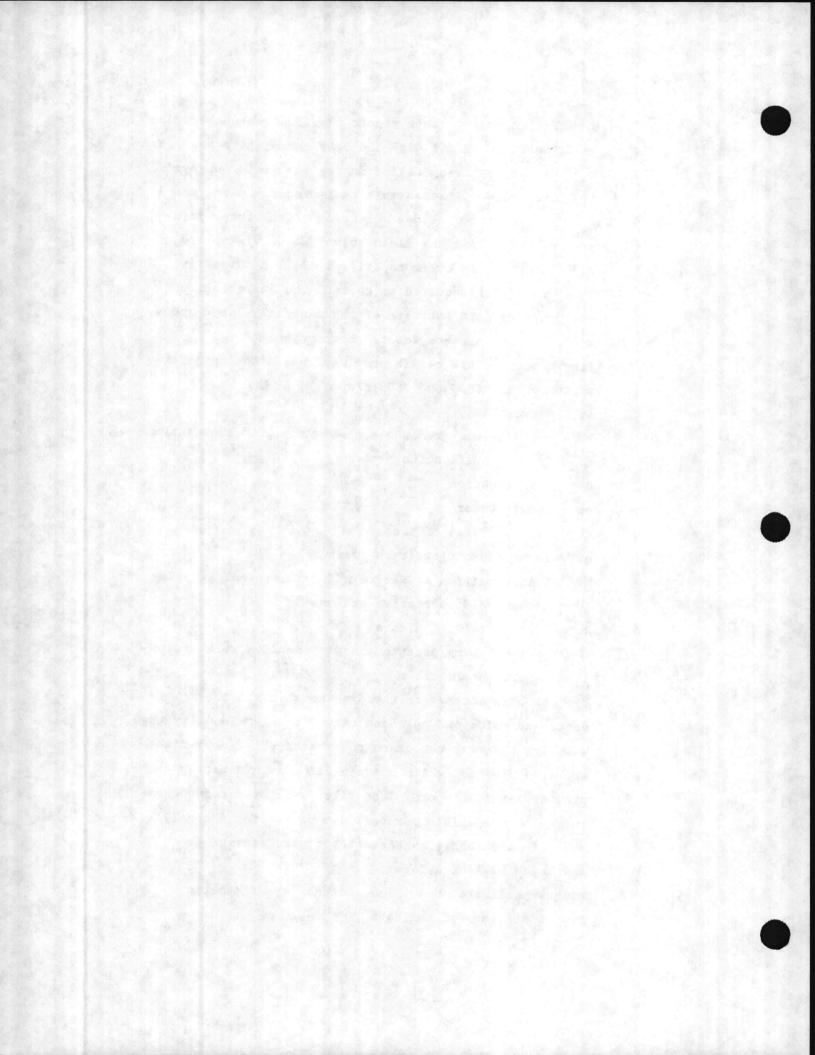
- 1. Special Advance Data Reports
 - a. Steam leaks This report provides the locations of BSDS leaks identified during the field survey.



- b. Failed traps This report provides tag numbers and locations of all CSDS and BSDS traps which were identified as having failed during the field survey.
- c. Misapplied, inaccessible or improperly piped traps -This report provides a listing of the traps identified during the field survey to be misapplied, inaccessible or improperly piped with corrective procedures required to correct the installation including an estimate of the material, labor and associated costs for the correction.
- 2. Trap Report This report provides the following information on all CSDS and BSDS traps:
 - a. Survey date
 - b. Building number/manhole number/map grid coordinate
 - c. Trap identification number
 - d. Trap function
 - e. Manufacturer
 - f. Type and size of trap
 - g. Inlet and outlet steam pressure
 - h. Trap condition as determined by ultrasonic testing
 - i. Recommended corrective actions
 - j. Trap installation date
 - k. Faulty piping practices and misapplied steam traps
 - 1. General comments

Each trap is located on the diagrammatic sketches described below and has been tagged with an identity tag matching the trap number on the sketches. Floppy disks are also provided which contain all the information provided in the report. The files were prepared for use on an IBM compatible personal computer using dBase III+ which is a database management software package developed by Ashton Tate.

 Diagrammatic sketches - The sketches are schematic representations of the BSDS.



4. Energy report - This report provides the results of the evaluation of energy effective improvements, modifications and/or alternations to the BSDS with identified energy conservation opportunities, ECIP life cycle analysis sheets, and preliminary 1391's.

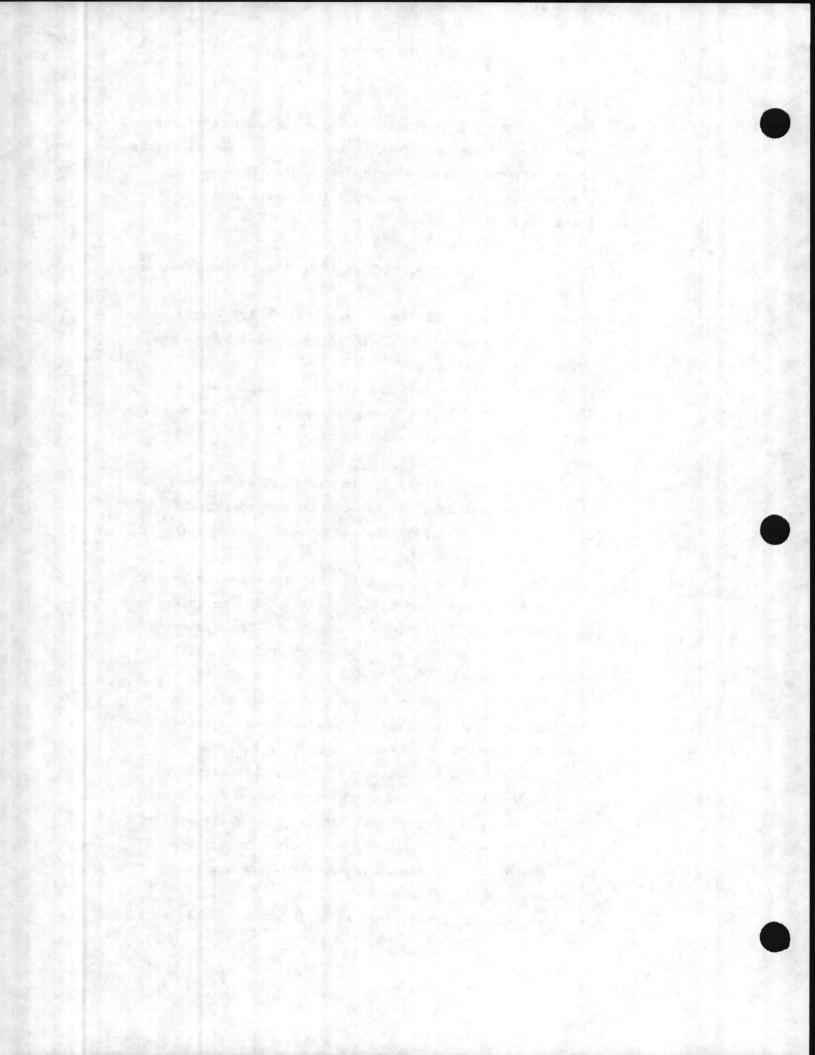
1.4 DESCRIPTION OF INSTALLATIONS

The study is further subdivided into three installations as follows:

- Cherry Point Naval Air Rework Facility (NARF) This installation consists of 25 buildings served by the steam distribution system.
- MCAS Cherry Point This installation consists of 111 buildings served by the steam distribution system and 21 buildings with stand-alone boilers.
- 3. Camp Lejeune
 - Beach Area consists of six buildings served by 1200 lineal feet of aboveground steam and condensate distribution lines supplied from the steam plant in Building BA106.
 - b. Camp Geiger consists of 147 buildings served by both overhead steam and condensate lines and an underground portion which includes 23 manholes. The system is supplied from the steam plant in Building G-650.
 - c. Monford Point (Camp Johnson) consists of 109 buildings served by 16,400 lineal feet of aboveground steam and condensate lines supplied from the steam plant in Building M625 or Building M230.
 - d. Courthouse Bay consists of 25 buildings served by both underground and overhead steam and condensate lines consisting of 2000 lineal feet of aboveground lines and an underground portion which includes 10 manholes. The system is supplied from the steam plant in Building BB-9.

e. Rifle Range consists of 10 buildings served by an

1-4

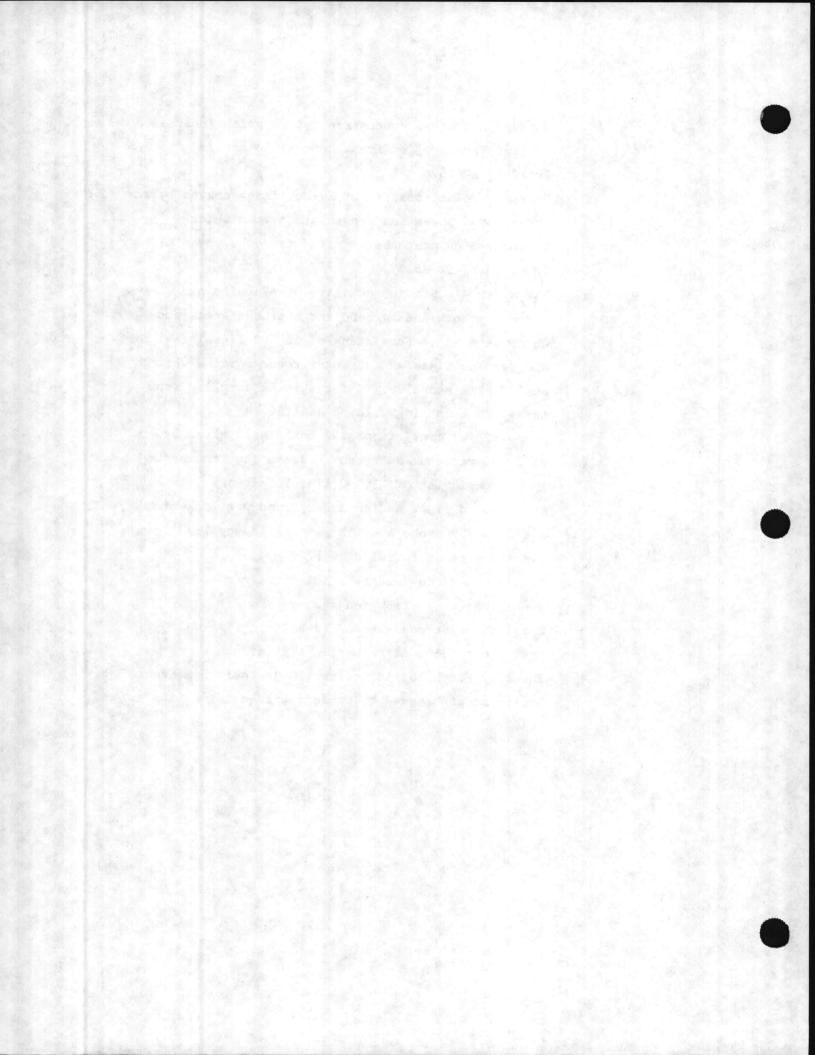




underground steam condensate system which includes 10 manholes supplied from the steam plant in Building RR-15.

- f. Paradise Point consists of 17 buildings served by an underground steam and condensate system which includes nine manholes supplied from the steam plant in Building PP-2615.
- g. New River Air Station consists of 49 buildings served by both underground and overhead steam and condensate lines consisting of 20,500 lineal feet of aboveground lines and an underground portion which includes 12 manholes. The system is supplied from the steam plant in Building AS4115.
- h. Hadnot Point consists of 237 buildings served by both underground and overhead steam and condensate lines consisting of 21,200 lineal feet of aboveground lines and an underground portion which includes 299 manholes. The system is supplied from the steam plant in Building 1700.
- French Creek consist of 38 buildings served by the Hadnot Point distribution system.
- j. Hospital Point consists of 12 buildings served by the Hadnot Point distribution system.
- k. There are eight buildings that have their own steam boiler or are served by an adjacent building with a boiler.





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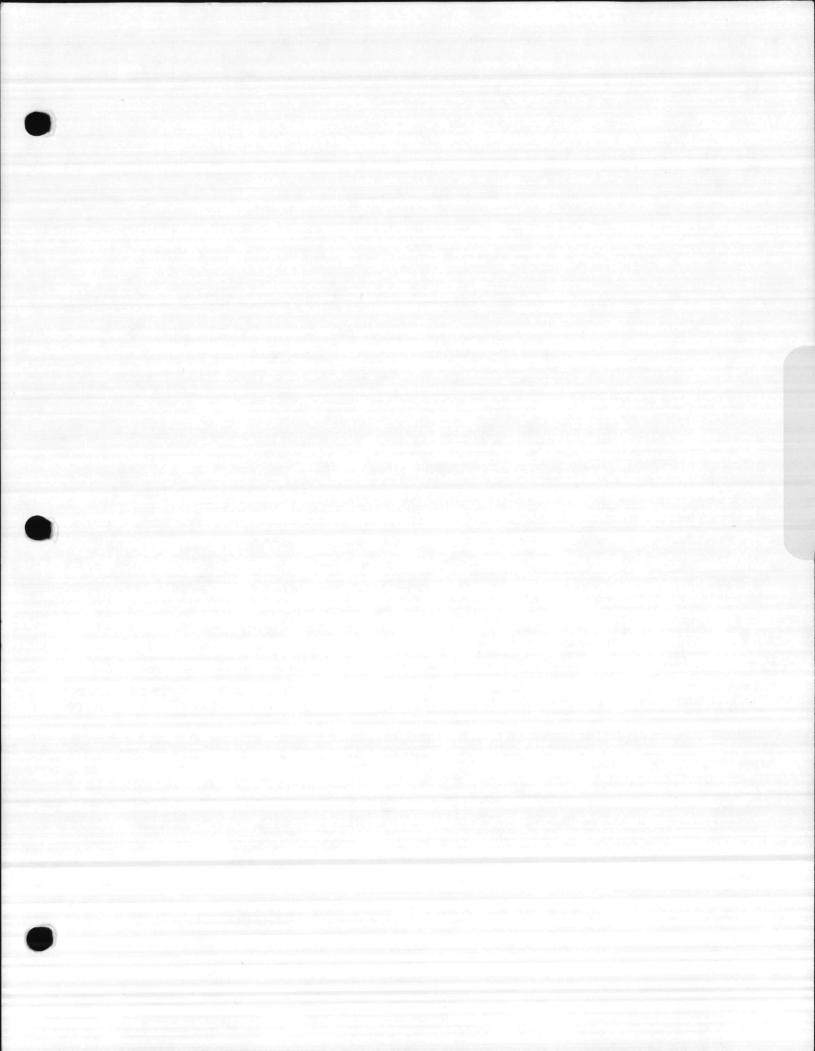
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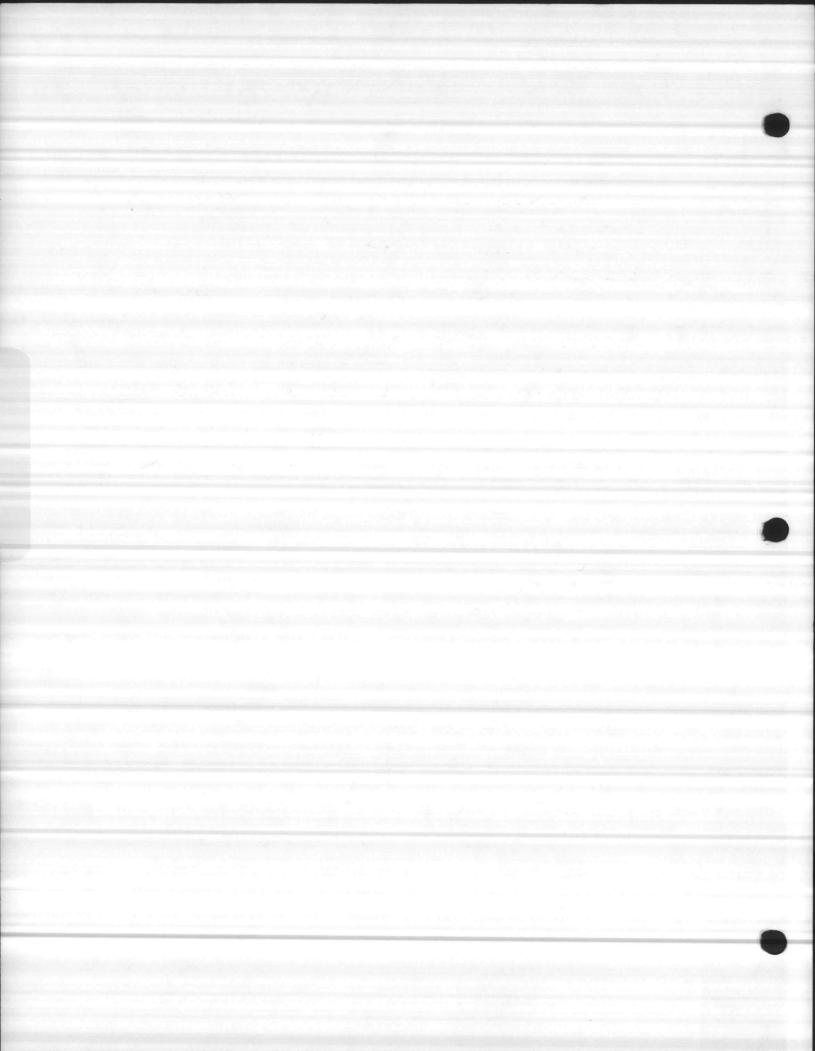
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2.0 SOURCES OF DATA

2.1 INTRODUCTION

This section discusses methods of data collection, vendor contacts for equipment sizing and cost information, and copies of related correspondence.

2.2 FIELD TRIPS AND OBSERVATIONS

The Cherry Point Naval Air Rework Facility was surveyed during the period September 8, 1986 thru October 30, 1986. The Marine Corps Air Station at Cherry Point was surveyed during the period November 1, 1986 thru December 17, 1986. The Marine Corps Base was surveyed during the period December 18, 1986 thru April 23, 1987.

A total of 823 buildings were surveyed with installation totals of:

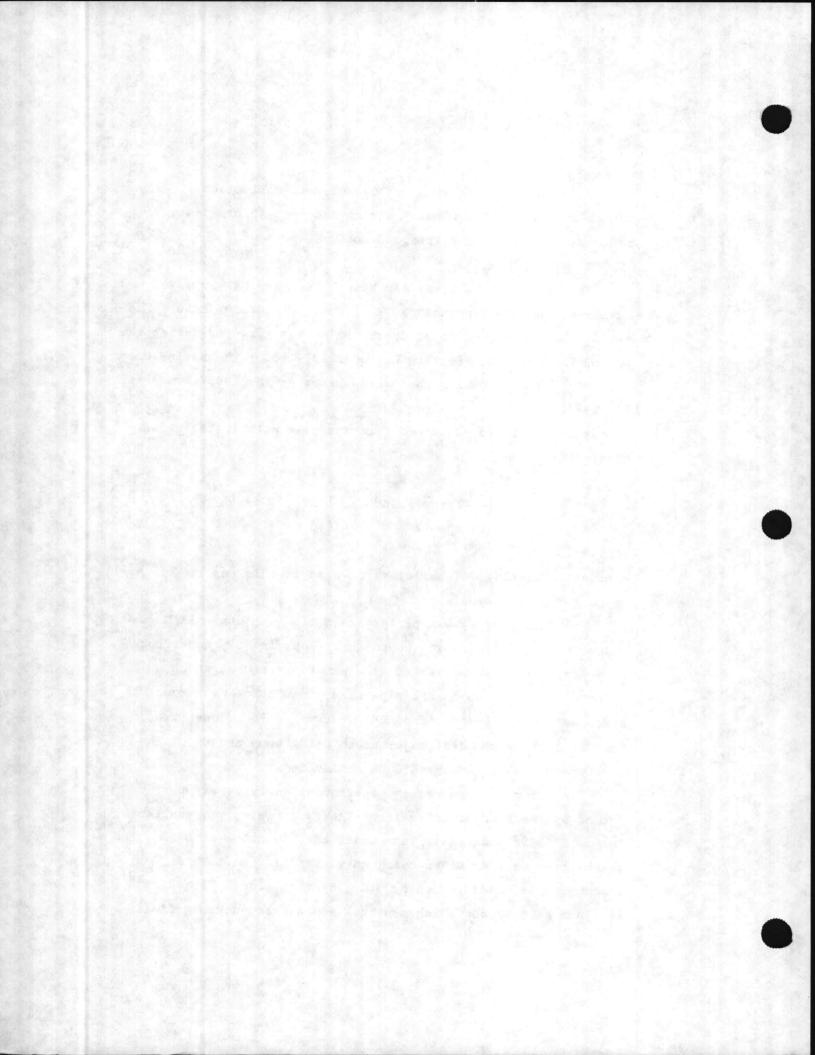
Cherry Point NARF	-	25
MCAS Cherry Point	-	132
Camp Lejeune	-	666

A consolidated list of buildings covered in this report is enclosed in Appendix A.

The field survey was performed in two segments. MAIN inspected the BSDS and its components that directly contribute to energy losses and prepared diagrammatic sketches which included information on the pipe size, insulation type and size, estimated lengths of sized pipe, valve locations, trap identifications numbers, major steam using components locations, PRV stations and CSDS connections.

The steam trap survey and subsequent analysis was performed by the subcontracted firms Energy Efficiency Consultants, Inc. (EEC) or Armstrong, Inc. under the direction of MAIN. The steam traps were examined using an ultrasonic gun. This instrument is manufactured by U.E. Systems, Inc. It has an aluminum alloy probe which measures sound frequency. A final

2-1



reading is derived from a calibrated scale in conjunction with a visual indication and an audio signal. From this examination, a determination is made concerning the condition of the trap. Other pertinent information regarding the trap installation such as faulty piping practices, misapplied steam traps, and inaccessible trap locations were noted. Each accessible trap was also tagged with an identity tag with a unique indentification number and a tag was provided for all inaccessible traps.

2.3 DRAWINGS AND BASE RECORDS

Information collected during the building surveys was supplemented by reviewing drawings for many of the buildings. Site plans for the installations were obtained and were used throughout the survey.

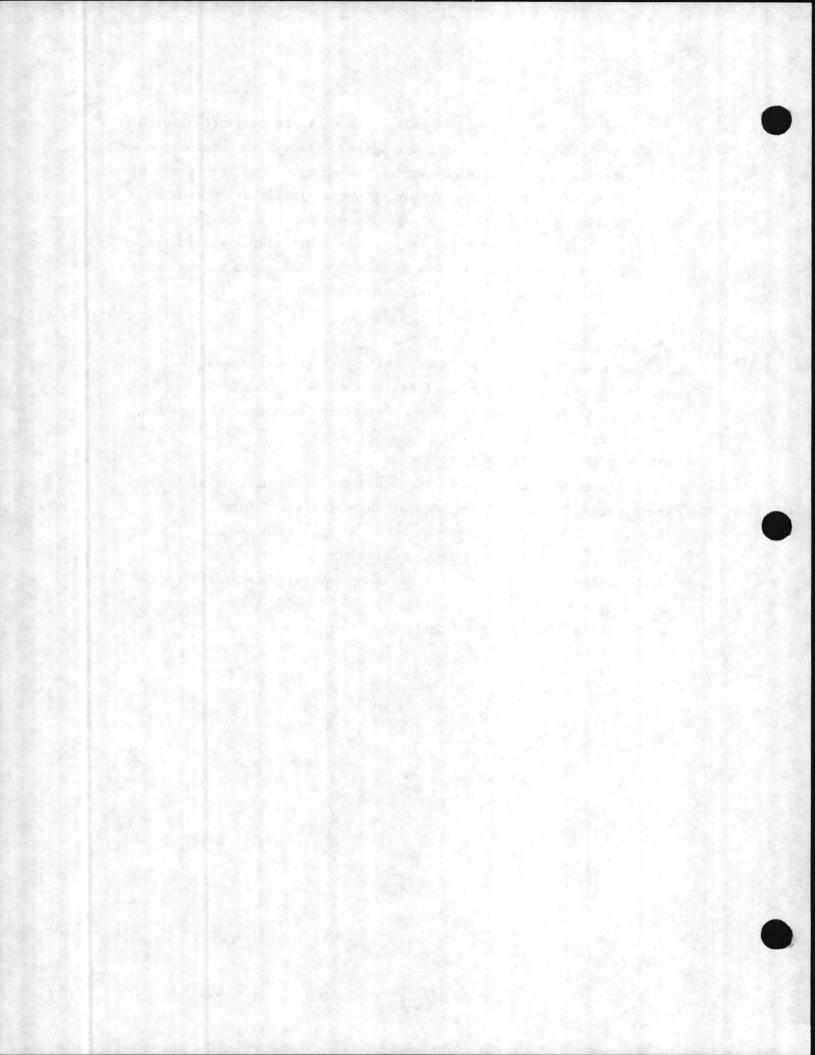
2.4 MILITARY AND GOVERNMENT PUBLICATIONS

This report was prepared in accordance with numerous military and government publications. These documents are referenced throughout the report.

2.5 VENDOR CONTACTS AND PERTINENT COMMUNICATIONS

Manufacturers of equipment and supplies have been contacted providing size, cost and operating information for various items of equipment analyzed in the report.





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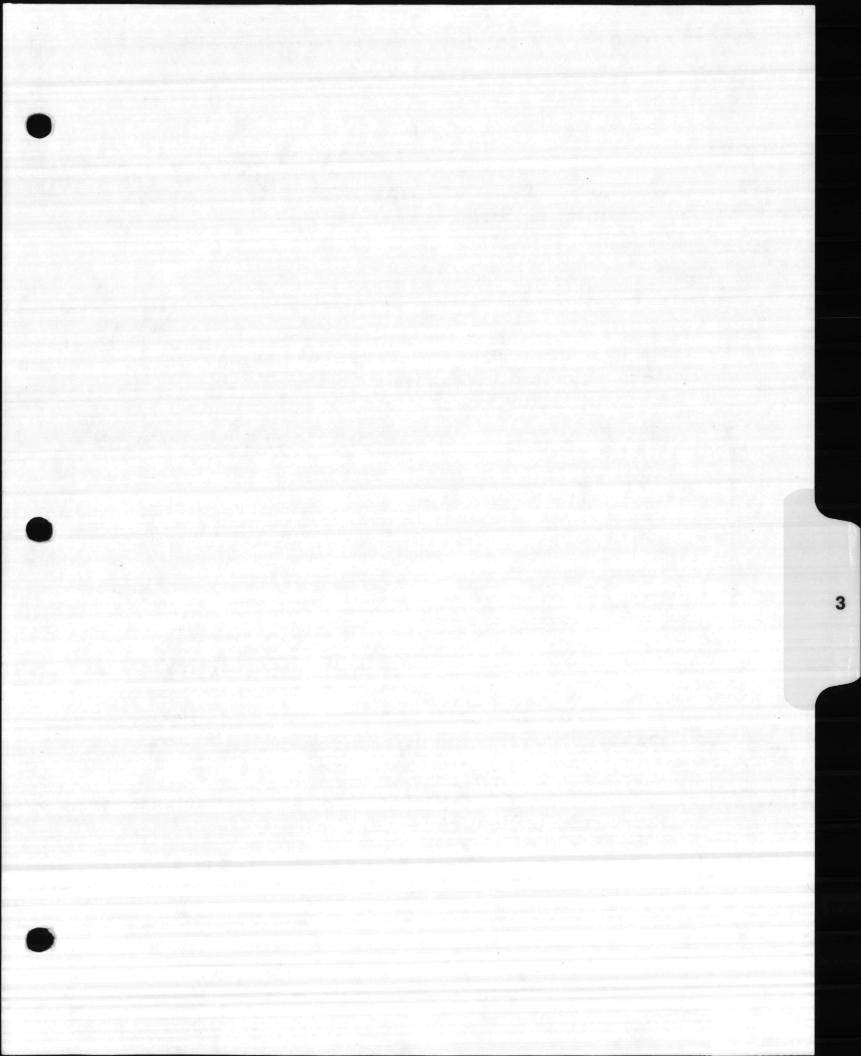
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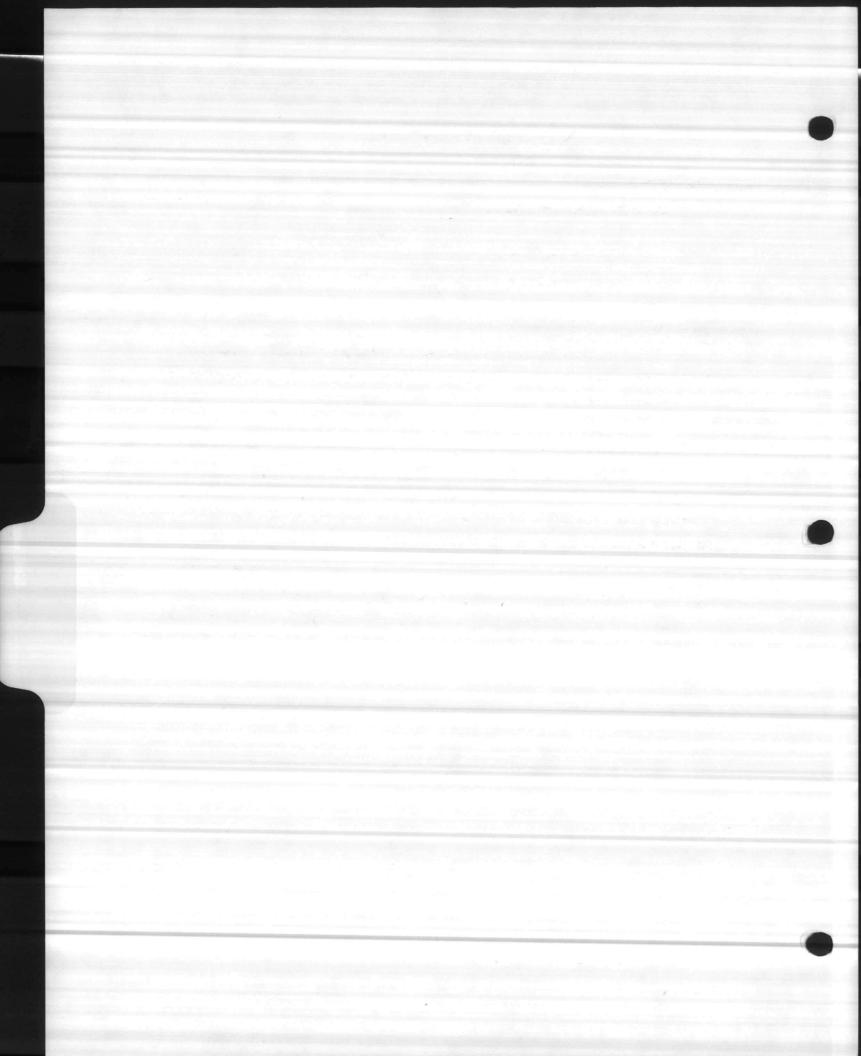
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3.0 ANALYSIS METHODOLOGY

3.1 INTRODUCTION

The following sections discuss:

- 3.2 Fuel Cost and Plant Efficiency
- 3.3 General Analysis Methods
- 3.4 Economic Analysis

3.2 FUEL COSTS AND PLANT EFFICIENCIES

Table 3.2.1, Fuel Cost Summary presents current cost for electricity coal and oil. Cost and efficiencies were provided by NAVFAC-Atlantic.

3.3 GENERAL ANALYSIS METHODS

<u>Introduction</u> -Data Management for this study used an IBM AT and an IDS (IBM compatible) computer. The software package used the lastest version of dBase III + which is a database management software package development by Ashton-Tate. It is commercially available and provides state-of-the-art capabilities and flexibilities in the manipulation of large amounts of data. It has proven reliability, straight forward application, and is widely accepted in the business, industrial and utility communities. The program was used to transfer data from the field survey sheets and sketches into computer files which have subsequently been used in the Energy Conservation Opprotunity (ECO) and Energy Conservation Investment Program (ECIP) analyses.

The calculation methodology for each ECO is presented in Section 4.0. A detailed explanation of this procedure is provided below. The rational for combining various ECOs into DD1391 packages are presented in Section 6.0. The development of the equations used to complete the repetitive calculations involved in the ECO analyses and the resulting tables of supporting information are subsequently presented.

Eco Analysis - Separate methodologies have been developed

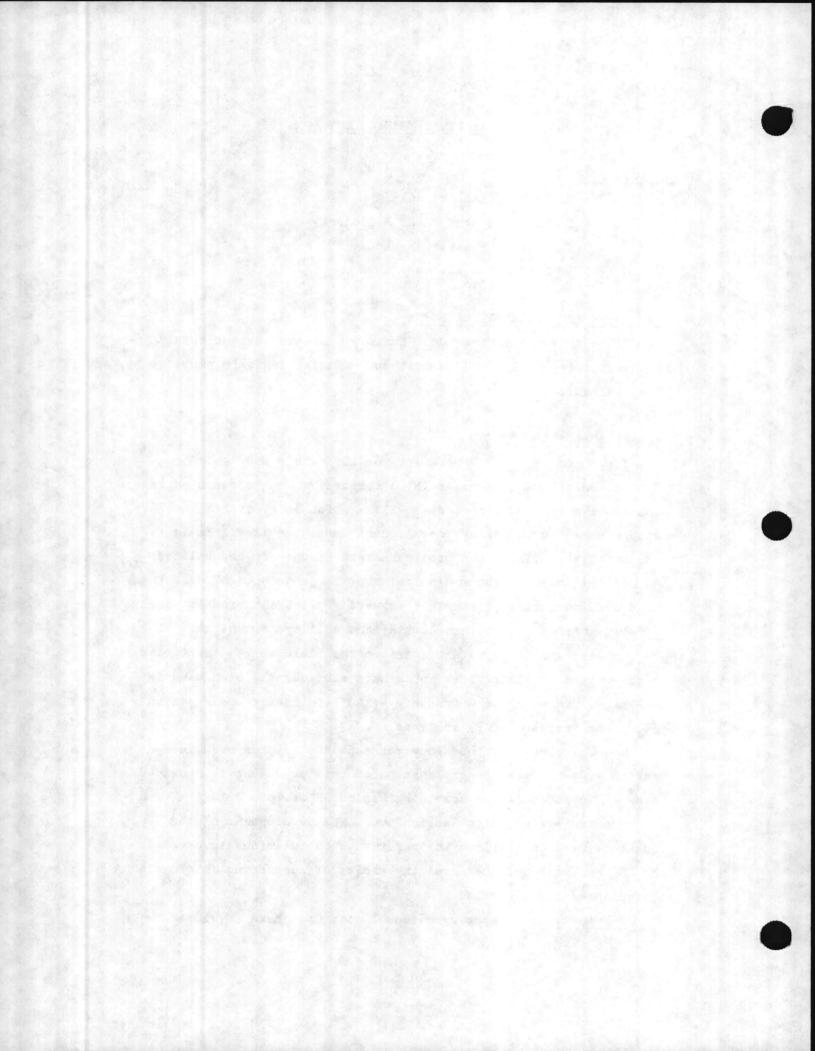
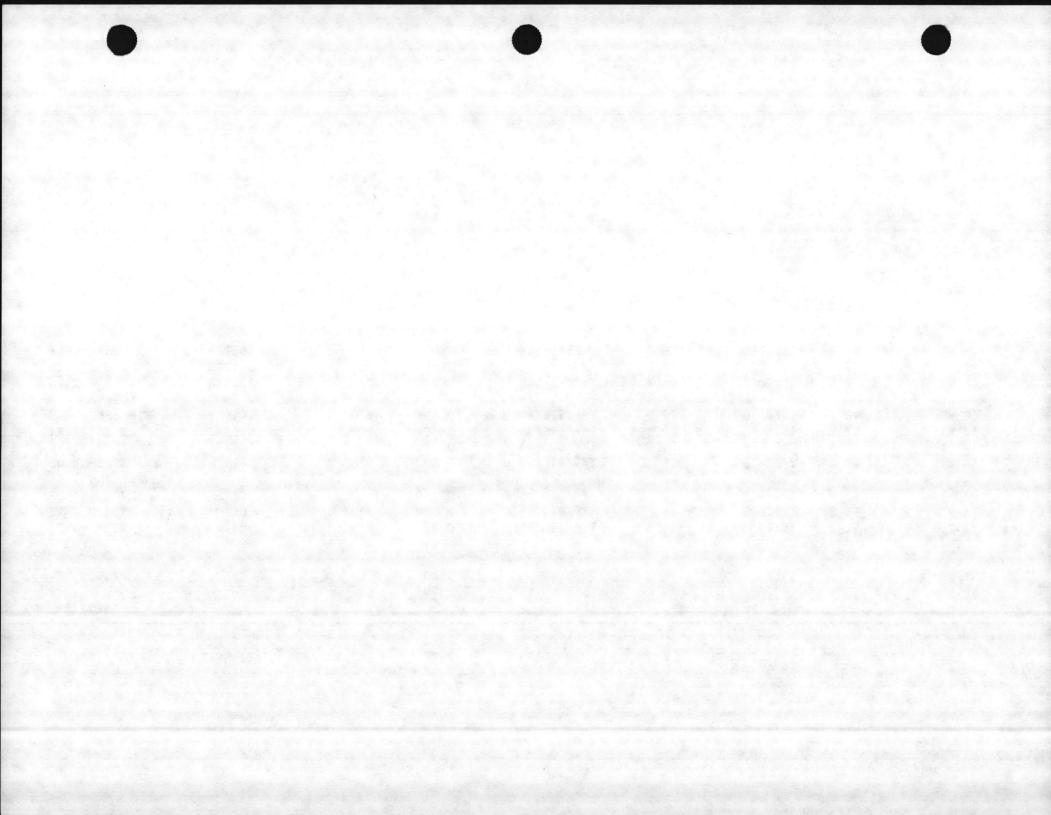


TABLE 3.2-1 UTILITY COST SUMMARY

INSTALLATION	STEAM PLANT BLDG. NO.	EFFICIENCY %	FUEL Type	UNIT COST \$/UNIT	\$/MBTU	ELECTRICITY \$/KWH	COST \$/MBTU	DEMAND CHARGE \$/KW
CHERRY POINT								
NARF	the second s	73	COAL	54.68/TON	2.28	0.03265	9.57	84.48
AIR STATION		73	COAL	54.68/TON	2.28	0.03265	9.57	84.48
CAMP LEJEUNE								
BEACH AREA	BA106	70.4	#6F.O.	0.442019/gal	2.91	0.02781	8.15	14.81
CAMP GEIGER	G650	70.4	#6F.O.	0.442019/gal	2.91	0.02781	8.15	14.81
MONTFORD PT. (CAMP JOHNSON)	M625	70.4	#6F.O.	0.442019/gal	2.91	0.02781	8.15	14.81
COURTHOUSE BAY	BB9	70.4	#6F.O.	0.442019/gal	2.91	0.02781	8.15	14.81
RIFLE RANGE	RR15	70.4	#6F.O.	0.442019/gal	2.91	0.02781	8.15	14.81
PARADISE PT.	PP2615	70.4	#6F.O.	0.442019/gal	2.91	0.02781	8.15	14.81
NEW RIVER AIR STATION	AS4151	70.4	#6F.O.	0.442019/gal	2.91	0.02781	8.15	14.81
HADNOT PT.	HP1700	73	COAL	53.42/TON	2.23	0.02781	8.15	14.81
HOSPITAL PT.	HP1700	73	COAL	53.42/TON	2.23	0.02781	8.15	14.81
FRENCH CREEK	HP1700	73	COAL	53.42/TON	2.23	0.02781	8.15	14.81

N 50

13000



for analyzing ECOs using field data collected during the field survey. The basic steps employed in this procedure are discussed below.

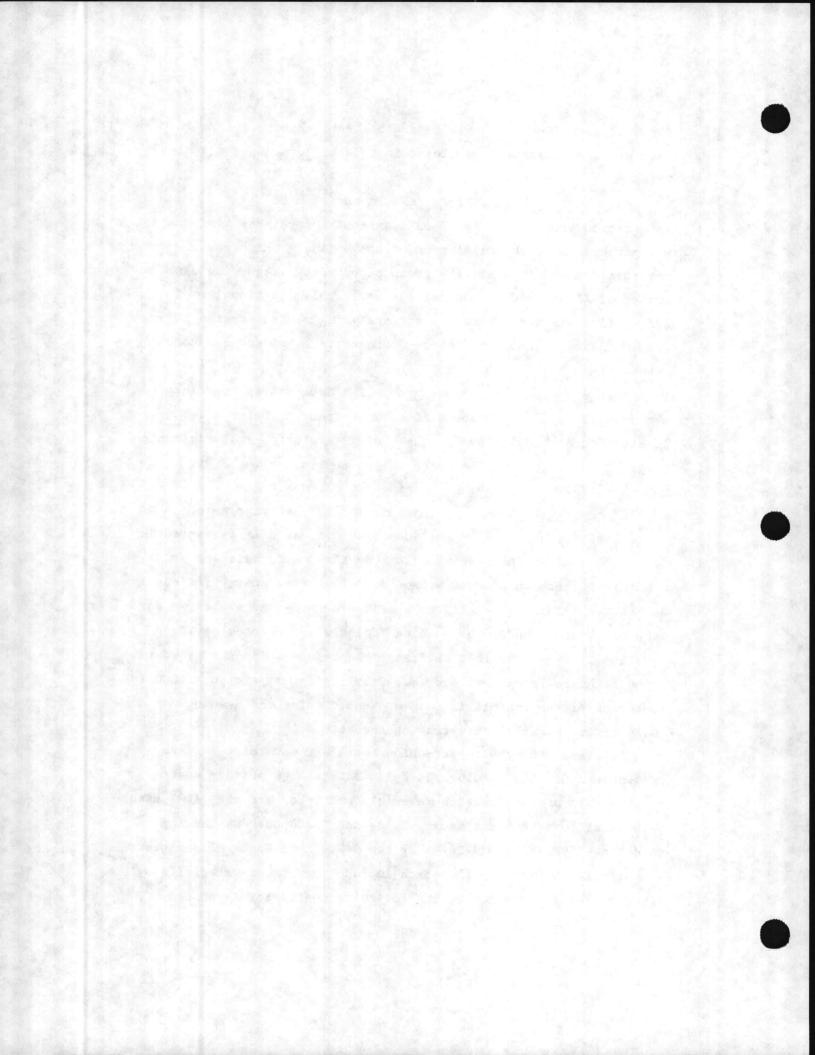
<u>Step 1-Field Data Collection</u> - In addition to the information provided on the BSDS diagrammatic sketches, information was gathered on each building or on one building which was determined to be typical of a group of buildings regarding size, number of floors and mechanical systems. This additional information was used primarily for analyzing control system ECOs and consisted of building square footage, wall, window and door areas.

<u>Step 2 - Data Entry Procedures</u> - The data was entered into standard dBase III + database files. Separate computer files were created for each building for the piping insulation analysis and a single file was created for each of the control system ECOs.

Step 3 - Energy Savings Methodology and Cost

of Installation - An introduction and description of the existing condition and the ECO to be evaluated is presented in Section 4.0 under the headings "Introduction" and "Existing Condition". For each ECO a method of calculating energy savings is determined. These are industry accepted methods and are shown for each of the ECOs under the heading "Calculation Methodology." An equation is developed that estimates the reduction in energy lost through the building envelope (boundary), given a particular ECO is implemented. An example is then presented under the heading "Calculation Example" illustrating the methodology.

For each ECO, the construction costs are developed and are presented under the heading "Cost Estimate". The primary sources for the cost of construction materials and labor are the "1987 Means Mechanical Cost Data Estimating Guide and "EMCS Cost Estimating Guidelines" HNDSP 83-049-ED-ME by the U.S. Army Corps of Engineers - Huntsville Division. The costs include the direct material and labor prices in addition to the following contractor expenses:



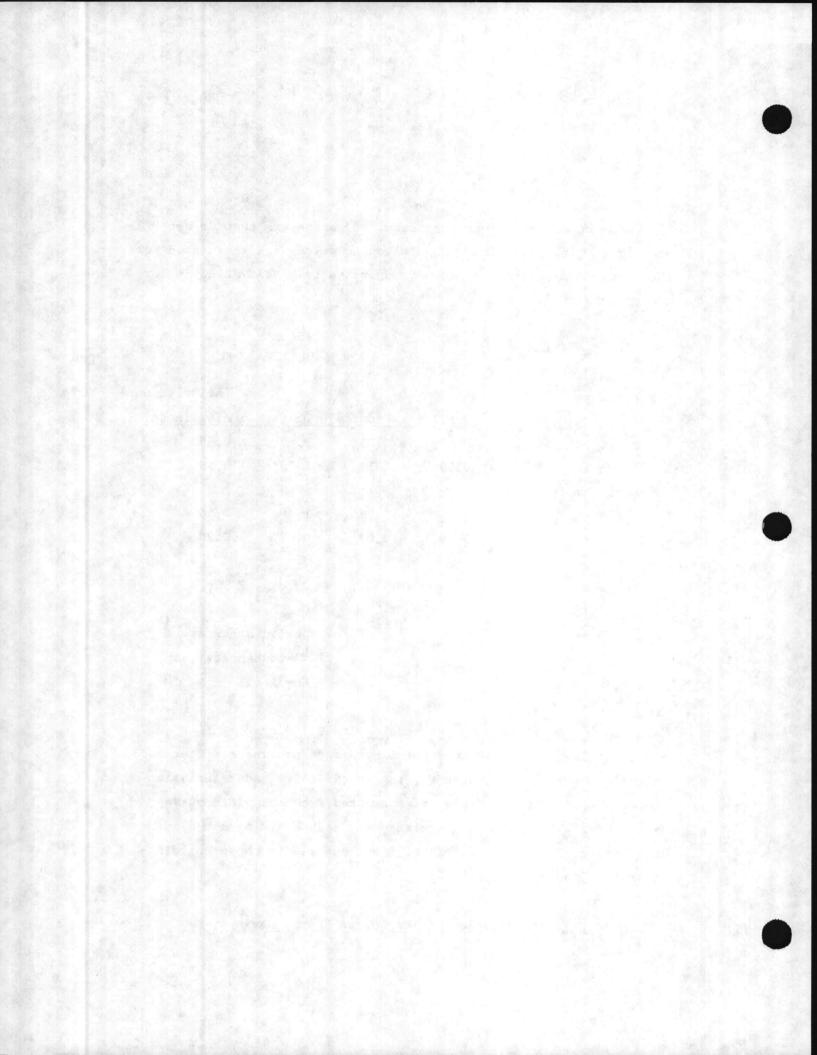
Overhead	15%
Profit	10%
Bond	18

Many of the equations used required parameters that do not vary at the installations. The following values are those used for these standard parameters and were provided by NAVFAC-Atlantic for use in this study:

	Indoor				
	Design				
Structure	Temp.				Infiltration
Туре	(deg.F)	Uwall	Uroof	Uglass	cfm/lin.ft.
1. Office	68	0.10	0.09	0.62	0.25
2. Occ.Whse	65	0.39	0.19	1.10	0.50
3. Unocc.Whse	/				
Hanger	55	0.76	1.28	1.10	0.50
4. Hospital	72	0.10	0.09	0.62	0.20
Outdoor desig	gn temp			23 deg.	F
Wind velocity	7			0 mph	
Pipe temperat	ture			Design S	Steam or
				Conde	ensate Temp.
Heating Seaso	on			Nov-Apr	11

<u>Step 4 - Application of Methodology to Buildings</u> - The equations developed in Step 3 are programmed into the computer and building parameters required for the specific ECO under analysis are extracted from the dBase files created from the field survey data. Energy savings are calculated for each building surveyed with savings from the typical buildings applied to those buildings determined to be identical.

Step 5 - Determination of Raw Source Energy Savings .



Total energy cost savings is dependent upon the type fuel used to provide steam for the building. Heating efficiencies were provided for use in this study to account for energy losses through the distribution system and the heating plant. Once the boundary energy savings are calculated, it is divided by efficiency for the appropriate fuel type and heating plant to determine the raw source energy savings.

3.4 ECONOMIC ANALYSIS

<u>Introduction</u> - Life cycle cost analysis for energy retrofit construction projects is required by the National Energy Conservation Act of 1978, Public Law 95-619 (NECPA). Analysis is in accordance with the Code of Federal Regulations, Title 10 -Energy, and the Assistant Secretary of Defense for Manpower, Reserve Affairs and Logistics Memorandum 31 August 1982.

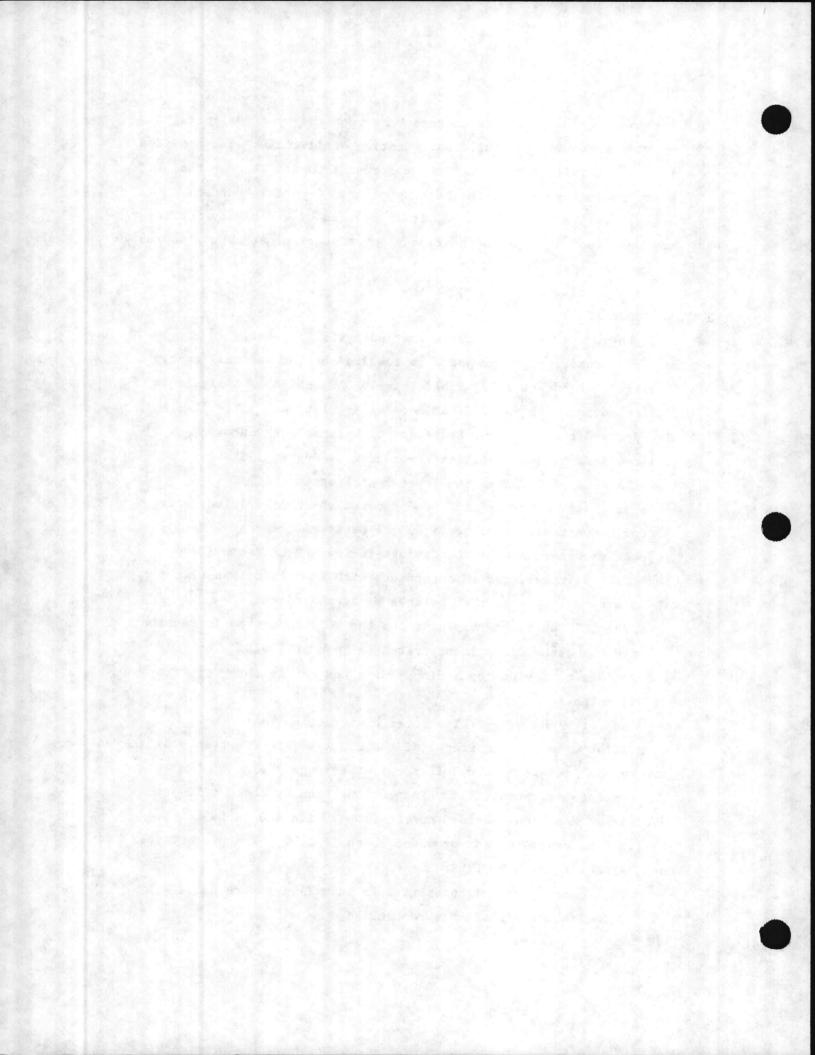
The Energy Conservation Investment Program (ECIP) is a military construction funded program which prioritizes energy retrofit construction projects on the basis of greatest life-cycle payback as determined by the Savings-to-Investment Ratio (SIR). The ECIP is implemented in accordance with the objectives of the NECPA and the Department of Defense Management Plan.

The ECIP analyses completed for the ECOs presented in Section 4.0 use the methodology incorporated in Form DD 1391C. The ECIP form has been provided on a floppy disk for use in this report by NAVFAC-Atlantic.

<u>Report Methodology</u> - The total construction cost quantities developed in Step 3 of the ECO Analysis (Section 3.3) are entered in Item 1A of the ECIP form. (See page 3.6) The Contingency, Supervision, Inspections, and Overhead (SIOH), percentage has been provided on the floppy disk and is 5.5%. The Design Cost has also been provided which is 6.0%. The project year has been established to be FY88.

Fuel costs (\$/MBtu), presented in item 2-1A-F, are those listed in Section 3.2 of this report.

3-5

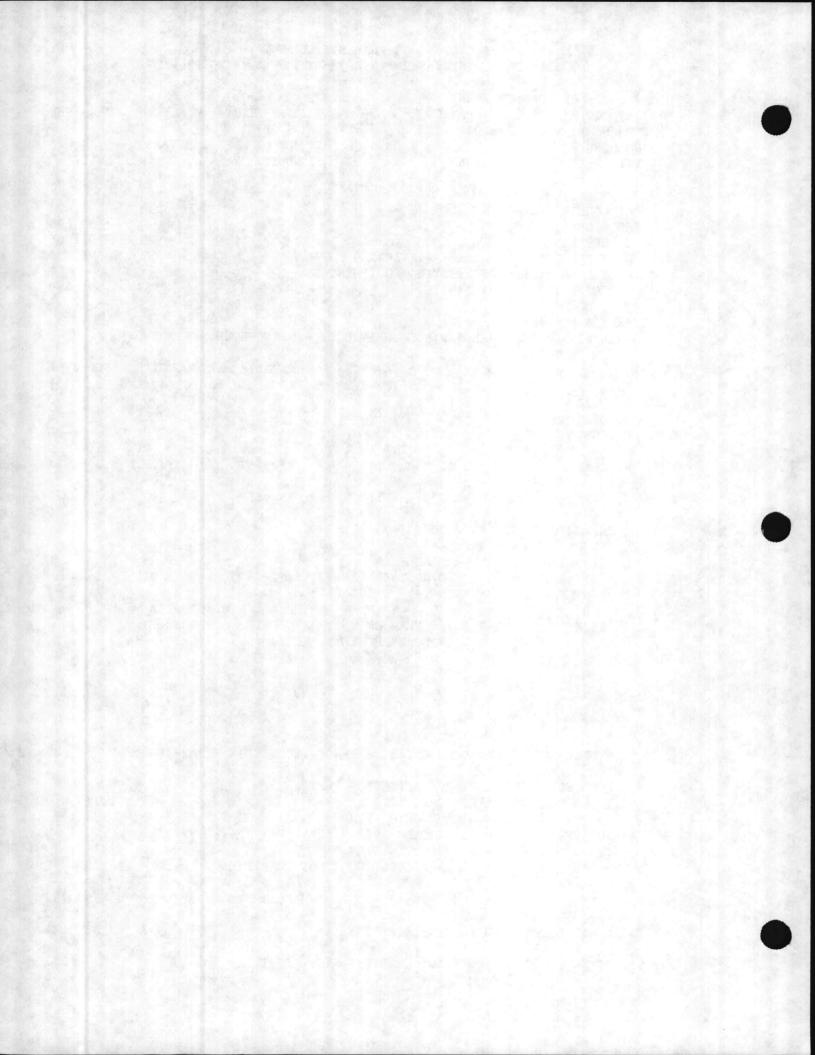


LIFE CYCLE COST ANALYSIS SUMMARY ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

LOCATION:	HADNOT POINT	PROJECT NO.		
PROJECT TITLE:	PIPE INSULATION	FISCAL YEAR:		1988
PORTION NAME:	MISC. BLDGS			
REGION NUMBER:	4	ECONOMIC LIFE	IN YEARS:	25
ANALYSIS DATE:	JUNE 23 1987	PREPARED BY:	LO	SUNDE
1. INVESTMENT C	OST			
A. CONSTRU	ICTION COST		\$	593,422
B. SIOH				32,638
C. DESIGN	COST			35,605
	CREDIT CALC (1A+1B+1C)X.9			595,499
	VALUE OF EXISTING EQUIPMENT			0
	INVESTMENT (1D-1E)	et et als referies and	\$	595,499
2. ENERGY SAVIN	IGS (+) / (-)			

ANALYSIS DATE ANNUAL SAVINGS, UNIT COST \$ DISCOUNTED SAVINGS

			COST				DISCOUNT	
		EL		MBTU/YR(2)	SAVINGS			
	Α.	ELEC	8.15	0		0	0	0
	В.	DIST	0	0		0	0	0
	С.	RESID	0	0		0	0	0
	D.	NG	0	0		0	0	0
	Ε.	COAL	2.23	112,416	250,6	87	13.5	3,384,272
	F.	TOTAL	\$	112,416	250,6	87		3,384,272
3.	NON	ENERGY	SAVINGS (+) / COS	ST (-)				
			RECURRING (+/-)			\$	22	
		(1) DI	SCOUNT FACTOR (TA	ABLE 1)			9.08	
	R	(2) DI	SCOUNTED SAVING/CURRING SAVINGS	COST (3AX3A1)		\$	203	
	р.	NON KL	CONTINC DIVINCO	(1) / 0001 (1	DISCOUNTED	
		ITEM	SAVINGS (+)					
		IIEA	SAVING \$ (+) COST \$ (-)(1) ((4)
	а.		0	0		1	0	
	b.		0	0		1	0	
	c.		0	0		1	0	
	d.	TOTAL	0				0	
	c.	TOTAL	NON ENERGY DISCO	UNTED SAVINGS	(+),COST(-)	(3A2+3Bd4)	203
	D.	PROJEC	T NON ENERGY QUA	LIFICATION TE	ST			
	(1		AX NON ENERGY CAN 3D1 IS = > 3C)		\$	1,116,810
			3D1 IS < 3C		2F5+3D1)/	'1F		0
			3D1b IS = > 1		210.021//			영화 수는 것이
			3D1b $13 < 1$		NOT QUALI	FY		
4.	FIRS	T YEAR	DOLLAR SAVINGS [2F3+3A+(3B1d/	YRS ECONO	MIC	LIFE)] \$	250,709
5.	TOTA	L NET I	ISCOUNTED SAVING	S (2F5+3C)			\$	3,384,475
6.	SIR	(IF < 1	PROJECT DOES NO	T QUALIFY) SI	R = (5/18	r) -		5.7

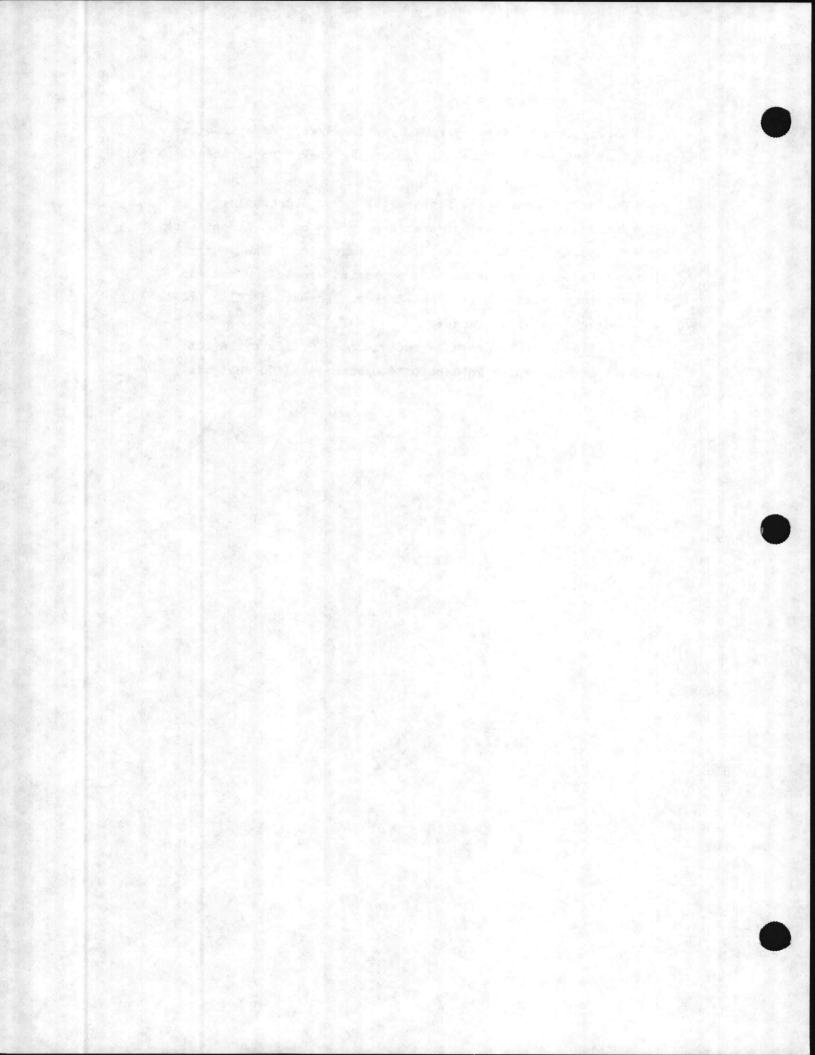


Energy cost savings by fuel type (MBtu/yr), described in Step 5 of Section 3.3, are entered to the ECIP form in items 2-2A-F.

Uniform Present Worth Factors (UPW) for discounting energy and nonenergy savings are as provided on the floppy disk. The UPW factors are based on a 7% discount rate. The energy discount factors include the DOE projected escalation rate in energy prices developed from the Energy Information (EIA) projected real average fuel price index.

<u>Results</u> - Results for the individual ECO life cycle cost analysis are presented in Section 4.0 with each ECO analysis.





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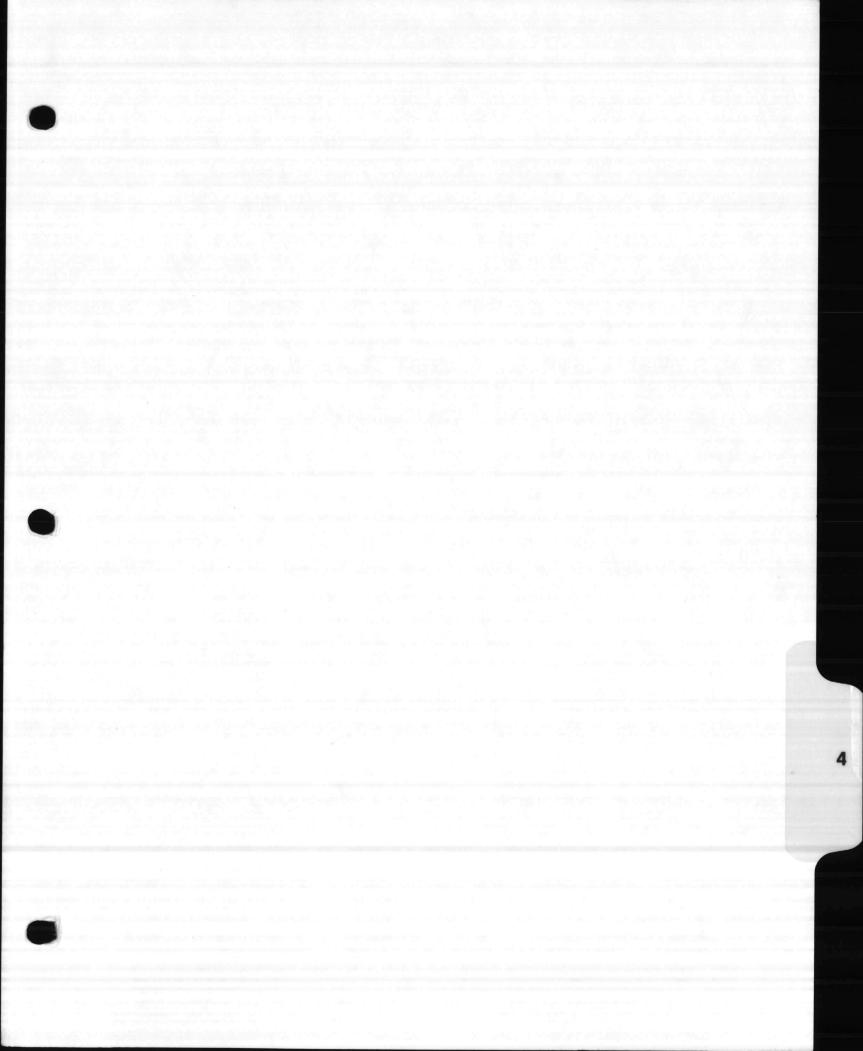
DESCRIPTION:

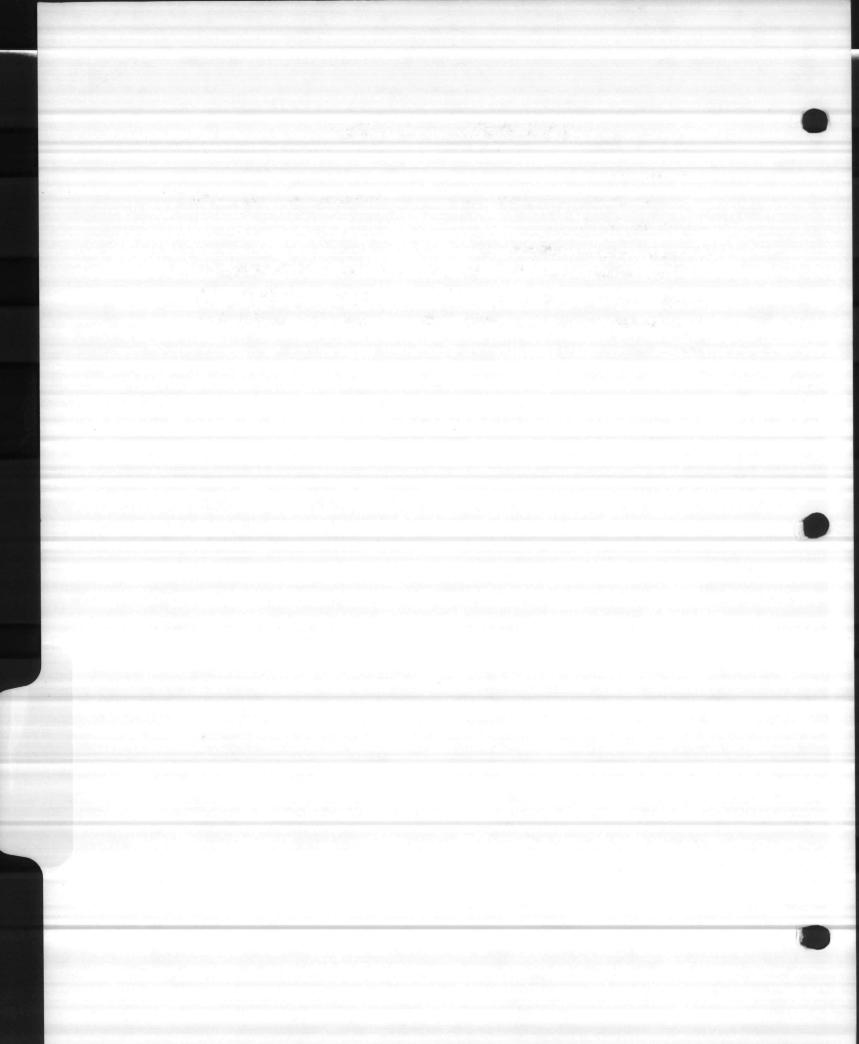
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4.0 STUDIES OF ECO FEASIBILITIES

4.1 INTRODUCTION

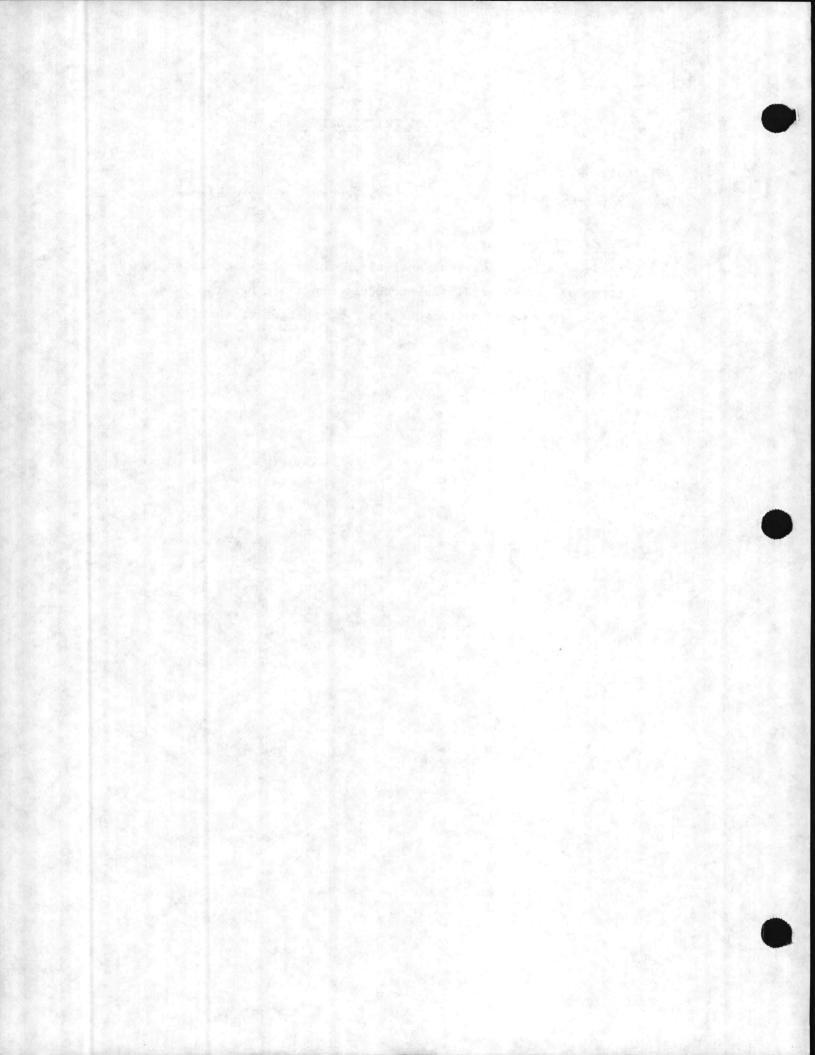
This Section contains the analyses of the energy conservation opportunities (ECOs)

General Analysis Methods

See Section 3.3, "General Analysis Methods" for a detailed explanation of the ECO analysis procedure contained herein. See Section 3.4, "Economic Analysis" for an explanation of the ECIP forms.







4.2 REPLACE STEAM MANHOLE EJECTORS (CSDS)

<u>Introduction</u> - This ECO discusses energy and cost savings which would be realized by replacing the existing manhole and steam pit ejector systems. (Note: This Section is indentical to that in the Naval Air Repair Facility (NARF) report because one maintenance area is responsible for all Cherry Point steam ejectors. Therefore, savings and costs should only be used from one of the two reports.)

Existing Condition - Storm water which has collected in existing manholes or steam pits is currently being ejected from sumps in the manholes either to grade or to a sanitary collection system through use of automatic steam ejectors. A model 2R (See Appendix B) by Penberthy is being used which has been discontinued. Parts are available on a special order basis only which has compounded the maintenance cost for these units. The ejectors have historically been a high maintenance item, so additional spare parts costs and unavailability of these parts has made continued use of these ejectors prohibitive. An automatic sump drainer (See Appendix C) has been provided by Penberthy as a replacement but it has proven to be structurally unsound in this application.

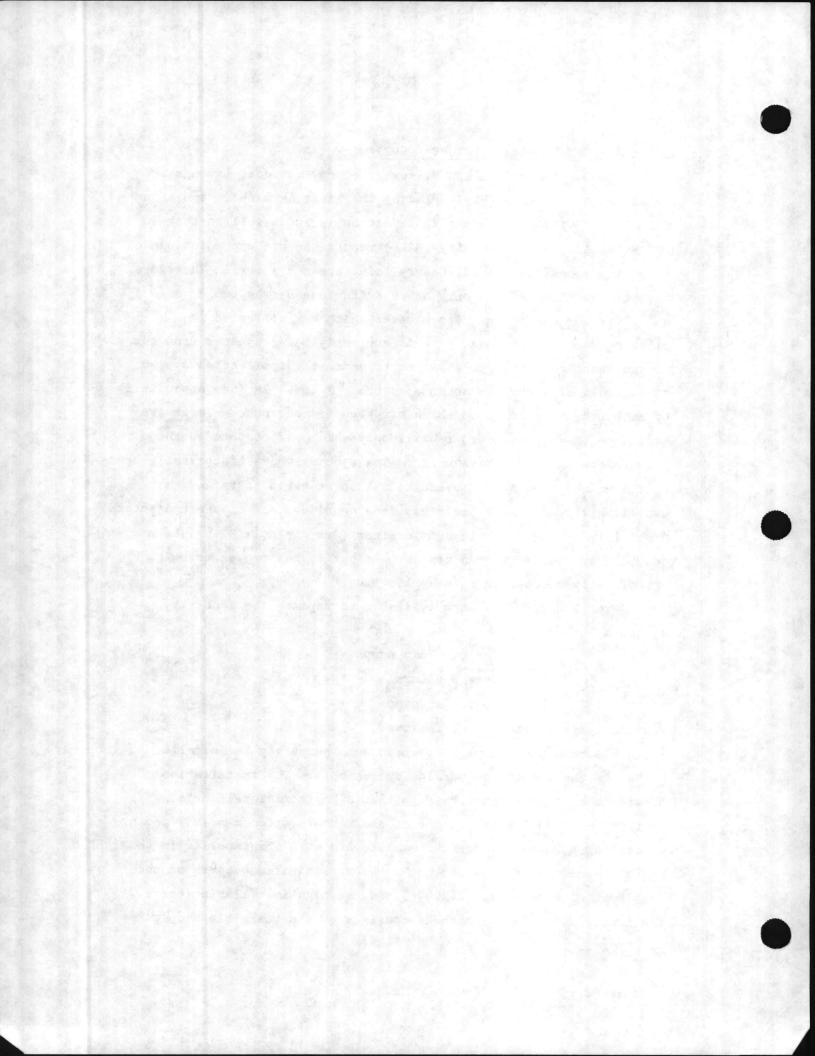
Several alternative are available to replace the Penberthy ejectors:

1. Electric sump pumps

- 2. Water ejectors
- 3. Syphon jet pumps

The analysis of each is as follows:

Electric Sump Pumps: Electric sump pumps may be installed either in the manhole or outside the manhole. The installation outside the manhole consists of either a horizontal self priming centrifugal pump located on top of the manhole or on a nearby pad or a vertical pump mounted on the manhole lid with the impeller in the manhole sump. This arrangement has been eliminated because of the high cost of these pumps (\$2000+) and the high installation costs. The installation in the manhole consists of a submersible sump pump



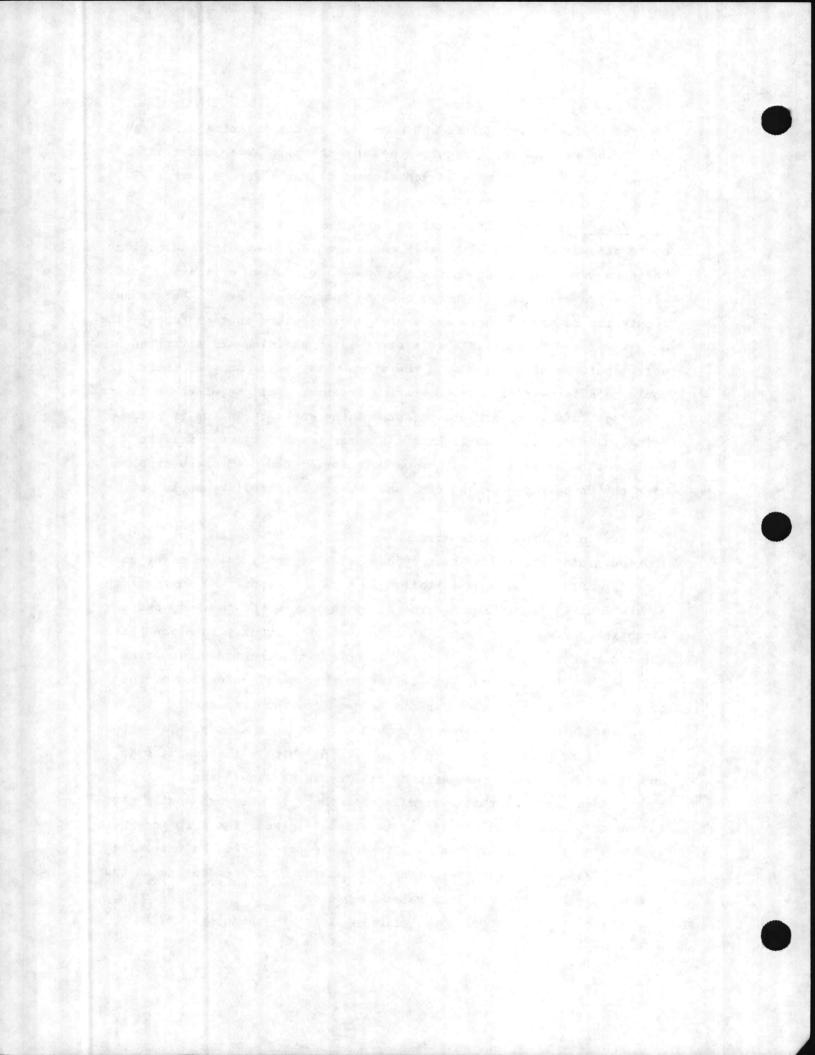
located in the existing sump and connected to the existing discharge line. The main addition required besides the pump is a source of 110 volt power requiring a buried electrical cable from a power source to each sump pump.

<u>Water Ejectors</u>: The existing Penberthy steam ejectors could also be operated with water under pressure providing the motive force to perform the vacuum pumping operation instead of steam. This alternative has been eliminated because there would have to be a water supply run to each manhole and a new pumping system in some cases. The only water source available is treated water and since this treated water would be discharged with the storm water being pumped, there would be a large additional operating expense. Failure of the existing steam ejectors is detectable because of the characteristics of steam being quite visible when leaking. A water powered ejector failure would not be detected until the manhole is flooded. Also the problem with the Penberthy steam ejector spare parts availability would not be solved.

Syphon Jet Pump: This arrangement consists of a thermodynamic trap and a steam syphon. The assembly called a jet pump (See Appendix D) would be installed in a parallel position in the sump at the desired liquid level. The steam piping to the jet pump and the discharge piping would be the same as what is currently in place. As the water level rises in the sump, it covers the thermodynamic steam trap causing the trap to open similar to the normal operation of the trap. Inlet pressure steam is discharged from the trap through the syphon creating a high velocity syphon suction in the sump. The water level will drop until the trap is uncovered, which wil shut the trap and stop the syphon. The jet pump will cycle as liquid enters the sump. Advantages of this system is that there is only one moving part (steam trap disc) which is easily repaired in place, the trap and syphon are readily available at a reasonable price, and the unit also operates as a main drip preventing the backing up of condensate in the existing system when no storm water is present.

Calculation Methodology - Following is the methodology

4-3



used to calculate energy savings from replacement of existing steam manhole ejectors.

Electric Sump Pumps:

Energy Savings = Steam Ejector energy usage - Electric Sump Pump energy usage

Where: Energy savings = MBtu/yr

Electric sump pump energy usage = (see below) Steam ejector energy usage = (see below)

Electric Sump Pump Energy Usage = Sump Pump Operating Hours x HP x 0.746 kw/hp

x 3412 Btu/kw-hr

Where: Sump Pump operating hours = (see below)

HP = motor nameplate horsepower

Sump Pump operating hours = $A \propto R \propto 1$ ft/12 in $\propto 1$ /pump cap. $\propto 1$ hr/60 min $\propto 7.48$ gal/cubic ft.

Where: A = Manhole surface area, sq. ft (use 95 per installation manhole drawings)

> R = Average rainfall, in./yr (Use 54 per National Climatic Data Center - average for 1945 - 1977)

Therefore Sump Pump operating hours = $95 \times 54 \times 1/12 \times 1/20$ x 1/60 x 7.48

= 2.66 hrs/yr

Electric Sump Pump Energy Usage = $2.66 \times 0.5 \times 0.746 \times 3412$ = 3,395 Btu/yr

Steam Ejector Energy Usage = Ejector operating hours x Steam usage/hr. x 1/Plant Eff.

Where: Ejector operating hours (see below)

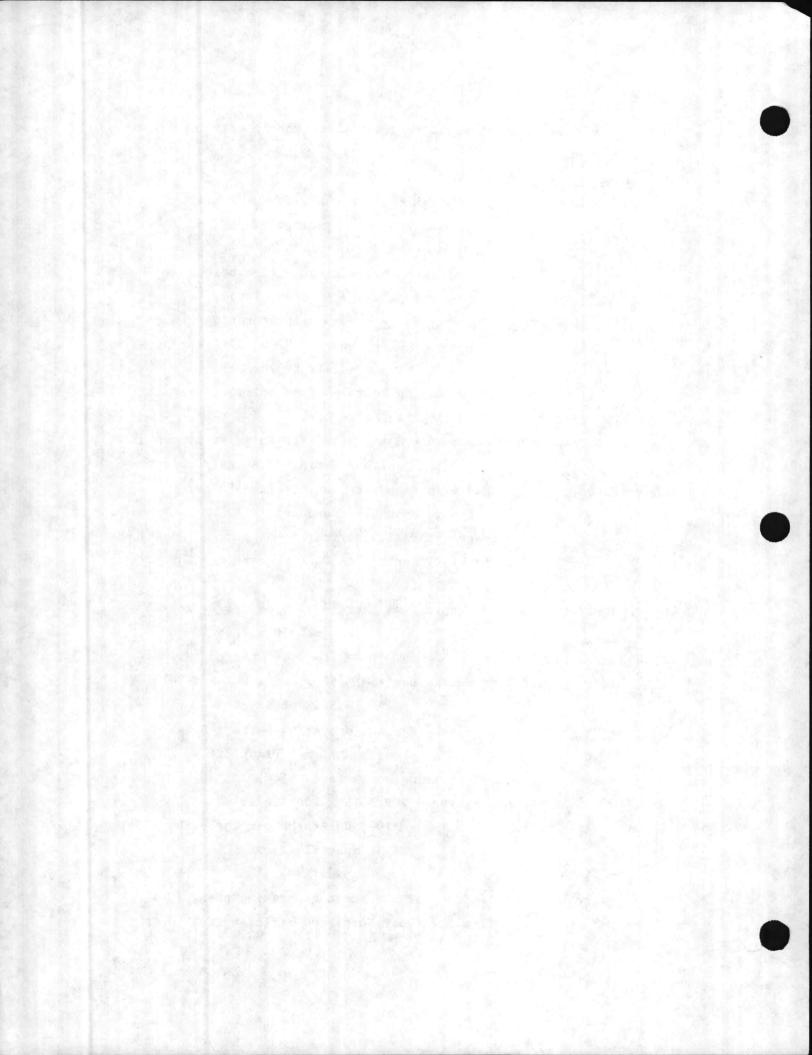
Steam Usage/hr = 109.5 1b x 100 Btu/1b

= 109,500 Btu/hr per Perberthy model

2R-SL specifications

(see Appendix B)

Plant Eff. = Efficiency of the steam generating plant (See Section 3.2 "Fuel Costs and Efficiencies)



Ejector Operating Hours = $A \ge R \ge 1$ ft./12 in. \ge 1/Ejector Cap ≥ 1 hr/60 min \ge 7.48 gal/cubic ft.

Where: A = 95 (see above) R = 54 (see above)

Ejector Cap = 18 gpm (per installation manhole

drawings)

Therefore Steam Ejector Operating Hours = 95 x 54 x 1/12x 1/18 x 1/60 x

7.48

= 2.96 hrs/yr.

Steam Ejector Energy Usage = $2.96 \times 109,500$ Btu/hr x 1/0.73 = 444,000 Btu/yr.

Energy Savings = (444,000 - 3385) x 1 MBtu/1x106 Btu

= 0.44 MBtu/yr

<u>Syphon Jet Pumps</u> - Both syphon jet pumps and the existing ejectors use steam as the motive force and would each have a steam usage essentially the same. Therefore, no energy savings would be realized with this alternative.

To complete the analysis, maintenance costs must be evaluated. Maintenance costs are as follows:

Electric Sump Pumps

Maintenance Cost = Sump pump operating hours x Maintenance cost/yr.

Where: Sump pump operating hours = 2.66/yr.

Maintenance cost/yr = \$100/10 hr. run time (per manufacturer's rep.) Maintenance Cost = 2.66 hrs. x \$100/10hrs

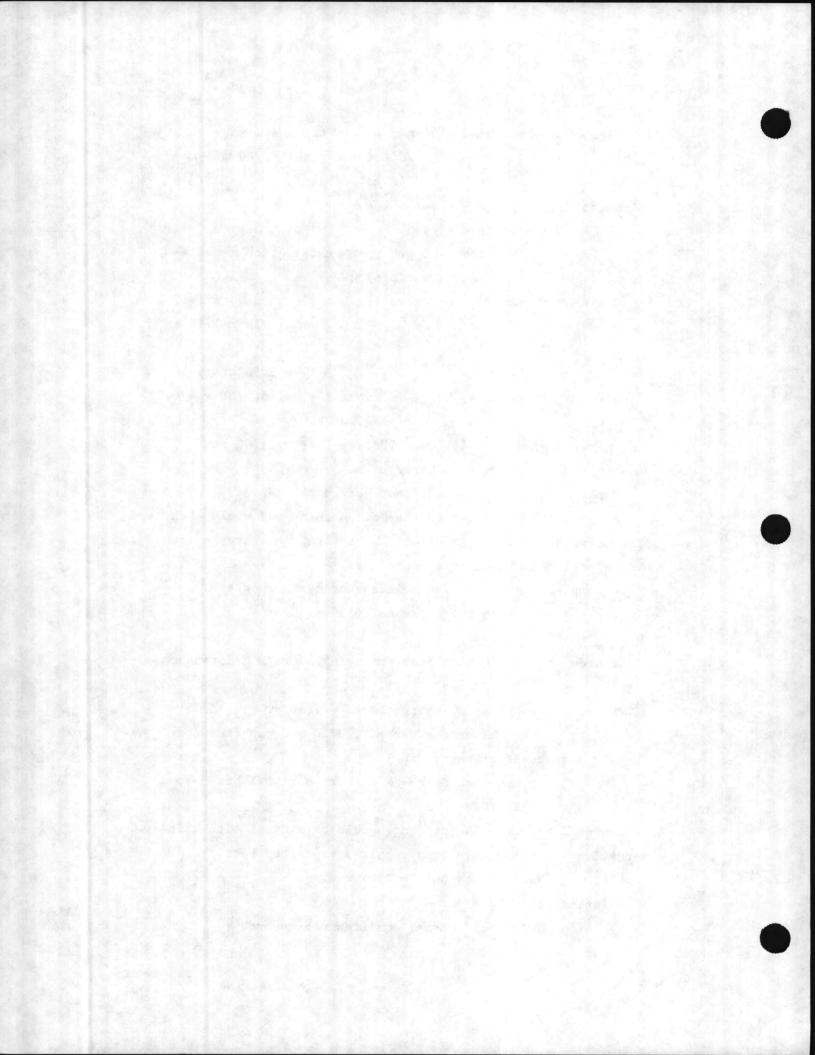
= \$26.60/yr

Syphon Jet Pumps - Maintenance would be minimal with this alternative amounting to a trap repair every other year.

Maintenance Cost = \$50/yr.

Existing Steam Ejectors

Reference: Actual maintenance records



Maintenance Cost = [(150 rebuilds/year x \$825/rebuild)
 + (1200 repairs/year x \$75/repair)]

= \$213.750/400 steam ejectors

= \$534/steam ejector-yr.

<u>Cost Estimate</u> - The items required to replace the existing steam ejectors are as follows:

Electric Sump Pumps

Item	Materials	Labor	Total
Submersible Sump	\$ 590	\$ 100	\$ 690
Pump			
Wiring & Conduit	38	79	117
(100 ft.)			

TOTAL \$807/steam ejector

Syphon Jet Pumps

Item	Materials	Labor	Total
Thermostatic Trap	\$ 436	\$ 32	\$ 468
and Steam Syphon			

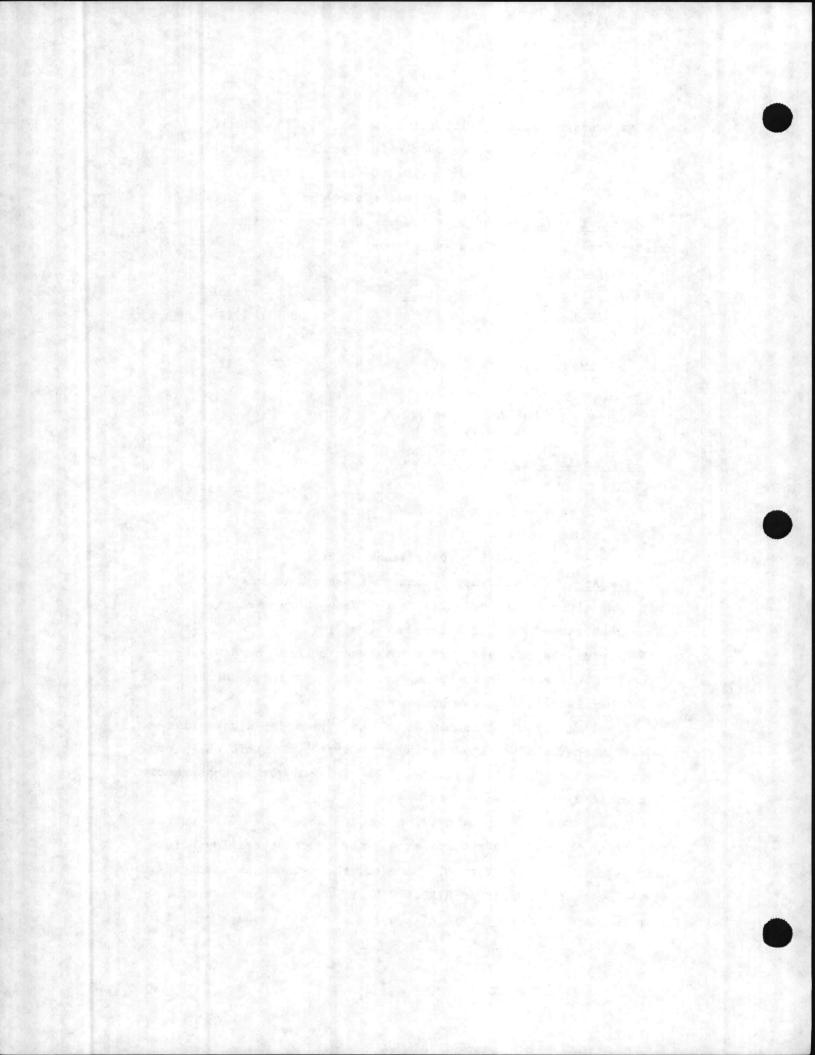
TOTAL \$599/steam ejector

<u>Summary</u> - The life-cycle cost analysis of the electric sump pump alternative indicates that a discounted savings to investment ratio (SIR) of 4.5 and cost savings of \$476/yr could be realized with a construction cost of \$807/steam ejector. This electric operating cost includes a demand charge of \$84.68 per kw or \$31.50 per sump pump.

The life-cycle cost analysis of the syphon jet alternative indicates that a discounted savings to investment ratio (SIR) of 7.8 and cost savings \$484 yr. could be realized with a construction cost of \$468/steam ejector.

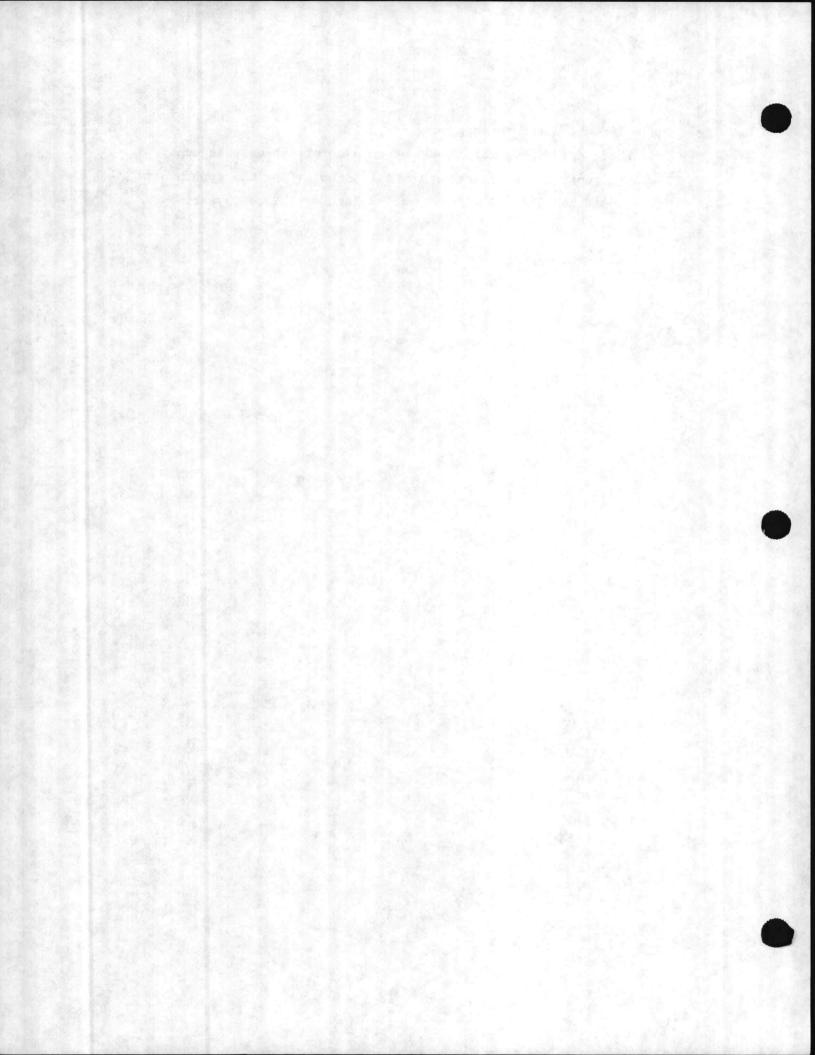
These ECOs do not qualify for funding under the ECIP program because the non-energy savings exceed the percentage allowed for this category by the program. However, the syphon jet alternative is very attractive with an SIR of 7.8 and a simple payback of 1.0 year in comparison to an SIR of 4.5 and a simple payback of 1.7

4-6



years for the electric sump pump.

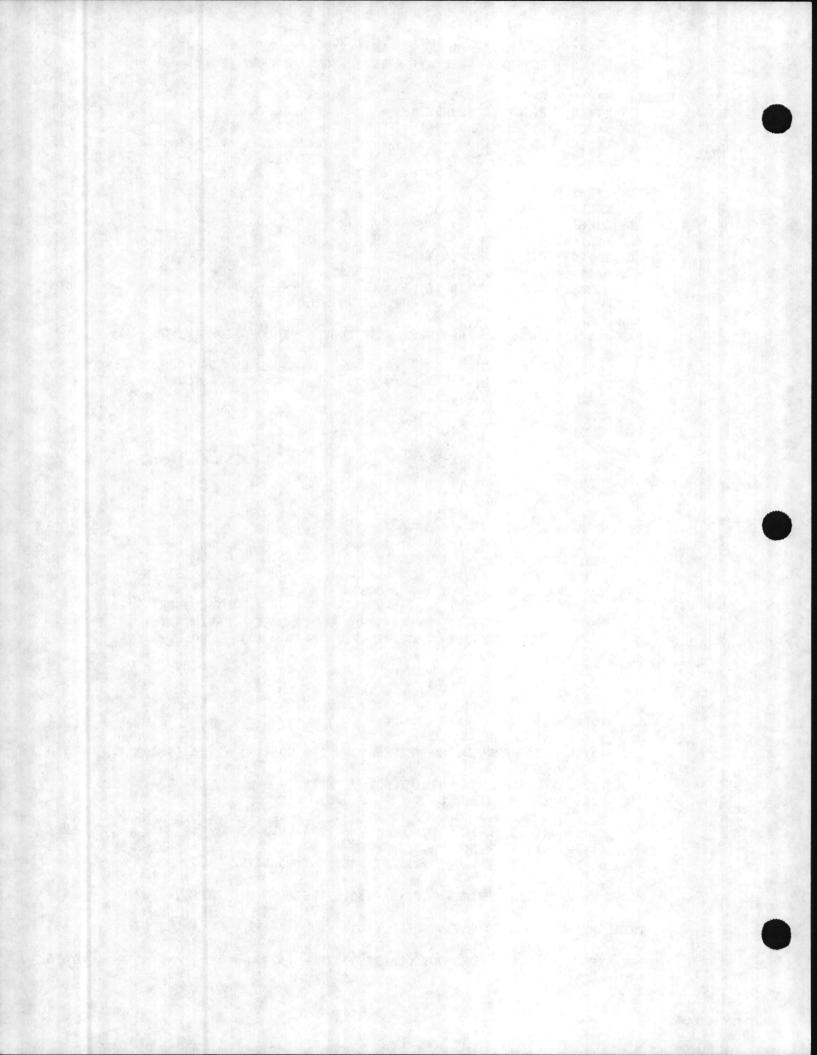
There are approximately 400 steam ejectors at Camp Lejeune. The total cost of installation for all manholes for the syphon jet pumps would be \$187,200 with a cost savings of \$193,600/year.



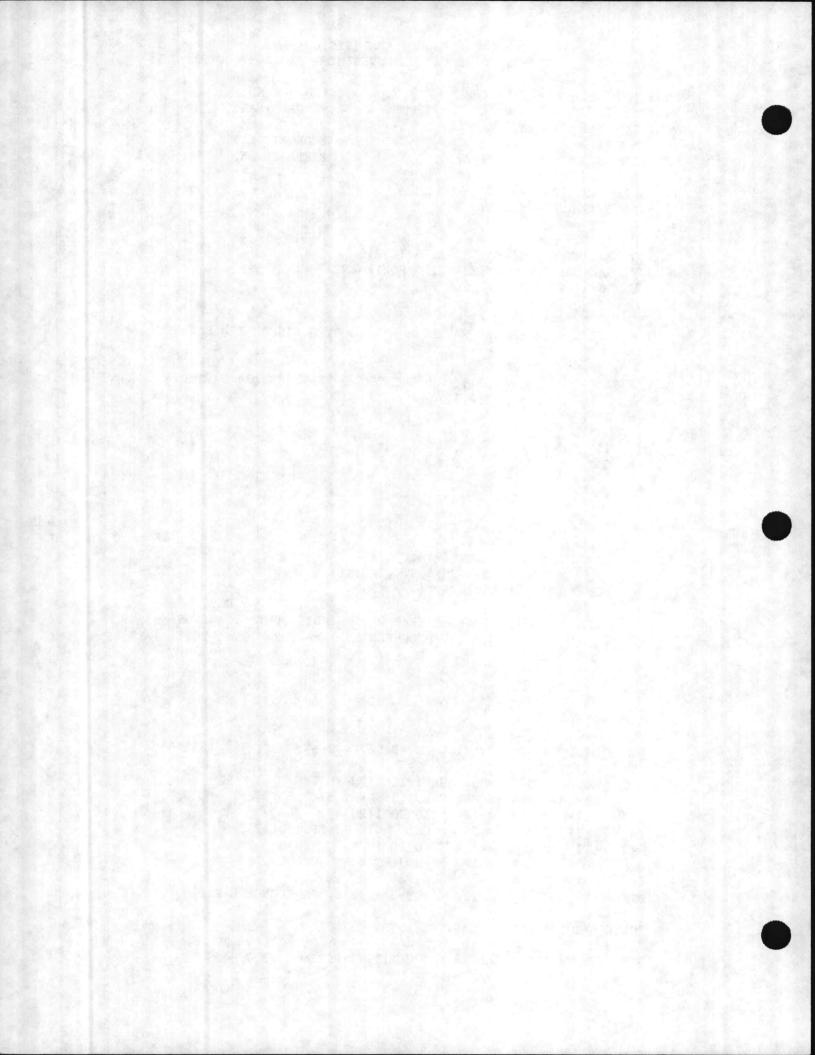
LOCATION: PROJECT TITLE: PORTION NAME:	CAMP LEJEUNE ELECTRIC SUMP PUMPS STEAM MANHOLES	PROJECT I FISCAL Y			1988
REGION NUMBER:	4	ECONOMIC	LIFE I	N YEARS:	15
ANALYSIS DATE:	JUNE 23 1987	PREPARED			SUNDE
1. INVESTMENT C	OST				
A. CONSTRU	CTION COST			\$	807
B. SIOH					44
C. DESIGN	COST				48
D. ENERGY	CREDIT CALC (1A+1B+1C)X.9				810
E. SALVAGE	VALUE OF EXISTING EQUIPMENT	and the second second			0
	NVESTMENT (1D-1E)			\$	810

2. ENERGY SAVINGS (+) / (-) ANALYSIS DATE ANNUAL SAVINGS, UNIT COST \$ DISCOUNTED SAVINGS

			COST	SAVINGS	ANNUAL	\$	DISCOUNT	DISCOUNTED
		EL		MBTU/YR(2)	SAVINGS (-		
		ELEC	8.15	0		0	0	0
		DIST	0	0		0	0	0
		RESID	0	0		0	0	0
	D.	NG	0	0		0	0	0
	E.	COAL	2.91	0		1	10.18	13
	F.	TOTAL	\$	0		1		13
3.	NON	ENERGY	SAVINGS (+) / COS	ST (-)				
	Α.		RECURRING (+/-)			\$		
			SCOUNT FACTOR (TA				7.61	
			SCOUNTED SAVING/			\$	3,620	
	В.	NON RE	CURRING SAVINGS	(+) / COST (-))			
							DISCOUNTED	
		ITEM	SAVING \$ (+)				SAVINGS (+)	
			COST \$ (-)(1)	OCCURRENCE(2)	FACTOR (3	3)	COST(-) ((4)
	а.		0	0		1	0	
	b.		0	0		1	0	
	c.		0	0		1	0	
	d.	TOTAL	0				0	
	c.	TOTAL	NON ENERGY DISCO	UNTED SAVINGS	(+),COST(-)	(3A2+3Bd4)	3,620
	D.	PROJEC	T NON ENERGY QUA	LIFICATION TE	ST			
			AX NON ENERGY CA				\$	4
			3D1 IS = > 3C					
		b. IF	3D1 IS < 3C	CALC SIR = (2F5+3D1)/	lF		ERR
		c. IF	3D1b IS = > 1	GO TO ITEM 4				
		d. IF	3D1b IS < 1	PROJECT DOES	NOT QUALI	FY		
4.	FIRS	T YEAR	DOLLAR SAVINGS [2F3+3A+(3B1d/	YRS ECONO	MIC	LIFE)] \$	477
5.	TOTA	L NET I	DISCOUNTED SAVING	S (2F5+3C)			\$	3,633
6.	SIR	(IF < 1	L PROJECT DOES NO	T QUALIFY) SI	R = (5/1F)) -		4.5



	1:	CAMP LEJEUNE SYPHON JET SUMP	DIMDC	PROJECT I	NO.		19	88
PROJECT	TITLE:	STPHUN JEI SUMP	FUMPS	FISCAL I	unit.			
PORTION	NAME:	STEAM MANHOLES 4		FCONOMIC	LTE	E IN YEARS:		15
REGION N	DATE:	JUNE 23 1987						
MALISI	DAIL.	JUNE 23 1907						
1. INVES		COST JCTION COST				\$	4	468
	SIOH	JULION COST						26
	DESIGN	COST						28
D.	ENERGY	CREDIT CALC (1A-	+1B+1C)X.9				1	470
E.	SALVAGE	E VALUE OF EXISTI	ING EQUIPMENT					(
F.	TOTAL 1	INVESTMENT (1D-1H	E)			\$	4	470
2. ENER	GY SAVI	NGS (+) / (-)						
AN	ALYSIS I	DATE ANNUAL SAVIN	NGS, UNIT COST	s \$ DISCO	UNTI	ED SAVINGS		
		COST	SAVINGS	ANNUAL	\$	DISCOUNT	DISCOUN	
		\$/MBTU(1)	MBTU/YR(2)	SAVINGS	(3)	FACTOR(4)	SAVINGS	(5)
	ELEC	8.15	0		0	0		
	DIST	0	0		0	0		1
	RESID		0		0	0		
	NG	0	0		0	0		
Ε.	COAL	2.91	0		U	· · · · · · · · · · · · · · · · · · ·		
F.	TOTAL	\$	0		0			
			1.16					
3 NON	ENERGY	SAVINGS (+) / CO	ST (-)					
3. NON A.	ENERGY ANNUAL	SAVINGS (+) / CO RECURRING (+/-)	ST (-)		\$			
3. NON A.	ANNUAL (1) DI	RECURRING (+/-) SCOUNT FACTOR (T	ABLE 1)			7.61		
Α.	ANNUAL (1) DI (2) DI	RECURRING (+/-) SCOUNT FACTOR (T SCOUNTED SAVING/	ABLE 1) COST (3AX3A1)		\$ \$	7.61		
Α.	ANNUAL (1) DI (2) DI	RECURRING (+/-) SCOUNT FACTOR (T	ABLE 1) COST (3AX3A1))	\$	7.61 3,681		
Α.	ANNUAL (1) DI (2) DI	RECURRING (+/-) SCOUNT FACTOR (T SCOUNTED SAVING/ CURRING SAVINGS	ABLE 1) COST (3AX3A1) (+) / COST (-)	\$	7.61 3,681 DISCOUNTED		
Α.	ANNUAL (1) DI (2) DI	RECURRING (+/-) SCOUNT FACTOR (T. SCOUNTED SAVING/ CURRING SAVINGS SAVING \$ (+)	ABLE 1) COST (3AX3A1) (+) / COST (- YEAR OF) DISCOUN	\$ C	7.61 3,681 DISCOUNTED SAVINGS (+)		
Α.	ANNUAL (1) DI (2) DI NON RE	RECURRING (+/-) SCOUNT FACTOR (T SCOUNTED SAVING/ CURRING SAVINGS	ABLE 1) COST (3AX3A1) (+) / COST (- YEAR OF) DISCOUN	\$ C	7.61 3,681 DISCOUNTED SAVINGS (+)		
Α.	ANNUAL (1) DI (2) DI NON RE	RECURRING (+/-) SCOUNT FACTOR (T. SCOUNTED SAVING/ CURRING SAVINGS SAVING \$ (+) COST \$ (-)(1)	ABLE 1) COST (3AX3A1) (+) / COST (- YEAR OF OCCURRENCE(2) 0) DISCOUN FACTOR	\$ [(3) 1	7.61 3,681 DISCOUNTED SAVINGS (+) COST(-) 0	(4)	
А. В.	ANNUAL (1) DI (2) DI NON RE	RECURRING (+/-) SCOUNT FACTOR (T. SCOUNTED SAVING/ CURRING SAVINGS SAVING \$ (+) COST \$ (-)(1) 0 0	ABLE 1) COST (3AX3A1) (+) / COST (- YEAR OF OCCURRENCE(2) 0 0) DISCOUN FACTOR	\$ (3) 1	7.61 3,681 DISCOUNTED SAVINGS (+) COST(-) 0 0	(4)	
А. В. а.	ANNUAL (1) DI (2) DI NON RE ITEM	RECURRING (+/-) SCOUNT FACTOR (T. SCOUNTED SAVING/ CURRING SAVINGS SAVING \$ (+) COST \$ (-)(1) 0 0 0	ABLE 1) COST (3AX3A1) (+) / COST (- YEAR OF OCCURRENCE(2) 0) DISCOUN FACTOR	\$ [(3) 1	7.61 3,681 DISCOUNTED SAVINGS (+) COST(-) 0 0	(4)	
A. B. a. b.	ANNUAL (1) DI (2) DI NON RE	RECURRING (+/-) SCOUNT FACTOR (T. SCOUNTED SAVING/ CURRING SAVINGS SAVING \$ (+) COST \$ (-)(1) 0 0	ABLE 1) COST (3AX3A1) (+) / COST (- YEAR OF OCCURRENCE(2) 0 0) DISCOUN FACTOR	\$ (3) 1	7.61 3,681 DISCOUNTED SAVINGS (+) COST(-) 0 0	(4)	
A. B. b. c. d.	ANNUAL (1) DI (2) DI NON RE ITEM	RECURRING (+/-) SCOUNT FACTOR (T. SCOUNTED SAVING/ CURRING SAVINGS SAVING \$ (+) COST \$ (-)(1) 0 0 0	ABLE 1) COST (3AX3A1) (+) / COST (- YEAR OF OCCURRENCE(2) 0 0 0 0) DISCOUNT FACTOR	\$ (3) 1 1 1	7.61 3,681 DISCOUNTED SAVINGS (+) COST(-) 0 0 0 0	(4)	,68
A. B. a. b. c. d. C. D.	ANNUAL (1) DI (2) DI NON RE ITEM TOTAL TOTAL PROJEC	RECURRING (+/-) SCOUNT FACTOR (T. SCOUNTED SAVING/ CURRING SAVINGS SAVING \$ (+) COST \$ (-)(1) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ABLE 1) COST (3AX3A1) (+) / COST (- YEAR OF OCCURRENCE(2) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0) DISCOUNT FACTOR (+),COST	\$ (3) 1 1 1	7.61 3,681 DISCOUNTED SAVINGS (+) COST(-) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	(4)	, 68
A. B. a. b. c. d. C. D.	ANNUAL (1) DI (2) DI NON RE ITEM TOTAL TOTAL PROJEC L) 25% M	RECURRING (+/-) SCOUNT FACTOR (T. SCOUNTED SAVING/ CURRING SAVINGS SAVING \$ (+) COST \$ (-)(1) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ABLE 1) COST (3AX3A1) (+) / COST (- YEAR OF OCCURRENCE(2) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0) DISCOUNT FACTOR (+),COST	\$ (3) 1 1 1	7.61 3,681 DISCOUNTED SAVINGS (+) COST(-) 0 0 0 0	(4)	, 68
A. B. a. b. c. d. C. D.	ANNUAL (1) DI (2) DI NON RE ITEM TOTAL TOTAL PROJEC () 25% M a. IF	RECURRING (+/-) SCOUNT FACTOR (T. SCOUNTED SAVING/ CURRING SAVINGS SAVING \$ (+) COST \$ (-)(1) 0 0 0 0 NON ENERGY DISCO T NON ENERGY QUA MAX NON ENERGY CA 3D1 IS = > 3C	ABLE 1) COST (3AX3A1) (+) / COST (- YEAR OF OCCURRENCE(2) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0) DISCOUNT FACTOR (+),COST ST)	\$ (3) 1 1 (-)	7.61 3,681 DISCOUNTED SAVINGS (+) COST(-) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	(4) -) 3,	
A. B. a. b. c. d. C. D.	ANNUAL (1) DI (2) DI NON RE ITEM TOTAL TOTAL PROJEC L) 25% M a. IF b. IF	RECURRING (+/-) SCOUNT FACTOR (T. SCOUNTED SAVING/ CURRING SAVINGS SAVING \$ (+) COST \$ (-)(1) 0 0 0 0 NON ENERGY DISCO T NON ENERGY DISCO T NON ENERGY QUA MAX NON ENERGY QUA 3D1 IS = > 3C 3D1 IS < 3C	ABLE 1) COST (3AX3A1) (+) / COST (- YEAR OF OCCURRENCE(2) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0) DISCOUNT FACTOR (+),COST ST)	\$ (3) 1 1 (-)	7.61 3,681 DISCOUNTED SAVINGS (+) COST(-) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	(4) -) 3,	
A. B. a. b. c. d. C. D.	ANNUAL (1) DI (2) DI NON RE ITEM TOTAL TOTAL PROJEC () 25% M a. IF b. IF c. IF	RECURRING (+/-) SCOUNT FACTOR (T. SCOUNTED SAVING/ CURRING SAVINGS SAVING \$ (+) COST \$ (-)(1) 0 0 0 0 NON ENERGY DISCO T NON ENERGY QUA MAX NON ENERGY CA 3D1 IS = > 3C	ABLE 1) COST (3AX3A1) (+) / COST (- YEAR OF OCCURRENCE(2) 0 0 0 0 0 0 0 0 0 0 0 0 0) DISCOUNT FACTOR (+),COST (+),COST (-) (2F5+3D1)	\$ (3) 1 1 (-) /1F	7.61 3,681 DISCOUNTED SAVINGS (+) COST(-) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	(4) -) 3,	
A. B. a. b. c. d. C. (1	ANNUAL (1) DI (2) DI NON RE ITEM TOTAL TOTAL PROJEC () 25% M a. IF b. IF c. IF d. IF	RECURRING $(+/-)$ SCOUNT FACTOR (T. SCOUNTED SAVING/ CURRING SAVINGS SAVING \$ (+) COST \$ (-)(1) 0 0 0 NON ENERGY DISCO T NON ENERGY DISCO T NON ENERGY QUA MAX NON ENERGY QUA MAX NON ENERGY CA 3D1 IS = > 3C 3D1 IS < 3C 3D1b IS = > 1	ABLE 1) COST (3AX3A1) (+) / COST (- YEAR OF OCCURRENCE(2) 0 0 0 0 0 0 0 0 0 0 0 0 0) DISCOUNT FACTOR (+),COST (+),COST (-) 2F5+3D1) NOT QUAL	\$ (3) 1 1 (-) /1F IFY	7.61 3,681 DISCOUNTED SAVINGS (+) COST(-) 0 0 0 0 (3A2+3Bd4 \$	(4) -) 3,	ERF
A. B. b. c. d. C. D. (1) 4. FIR:	ANNUAL (1) DI (2) DI NON RE ITEM TOTAL TOTAL PROJEC () 25% M a. IF b. IF c. IF d. IF ST YEAR	RECURRING $(+/-)$ SCOUNT FACTOR (T. SCOUNTED SAVING/ CURRING SAVINGS SAVING \$ (+) COST \$ (-)(1) 0 0 0 0 NON ENERGY DISCO T NON ENERGY DISCO T NON ENERGY QUA MAX NON ENERGY QUA MAX NON ENERGY CA 3D1 IS = > 3C 3D1 IS < 3C 3D1 IS = > 1 3D1b IS < 1	ABLE 1) COST (3AX3A1) (+) / COST (- YEAR OF OCCURRENCE(2) 0 0 0 0 0 0 0 0 0 0 0 0 0) DISCOUNT FACTOR (+),COST (+),COST (-) 2F5+3D1) NOT QUAL	\$ (3) 1 1 (-) /1F IFY	7.61 3,681 DISCOUNTED SAVINGS (+) COST(-) 0 0 0 0 (3A2+3Bd4 \$	(4) -) 3, -	, 68 ERF 48



4.3 UPGRADE PIPE INSULATION - (BSDS)

<u>Introduction</u> - This ECO discusses energy and cost savings which would be realized by upgrading pipe insulation on BSDS steam and condensate lines in many buildings at this installation.

<u>Existing Condition</u> - Heat losses from uninsulated or minimally insulated steam and condensate lines can be substantial. This loss of heat must continuously be offset by the addition of heat to maintain the steam or hot water system at its operating temperature. This heat loss occurs 24 hours per day during the months that the lines are in service. The magnitude of these losses depends on the temperature differential between the piping system and surroundings, on pipe size, quantity of existing insulation, type of existing insulation, and hours per year of service.

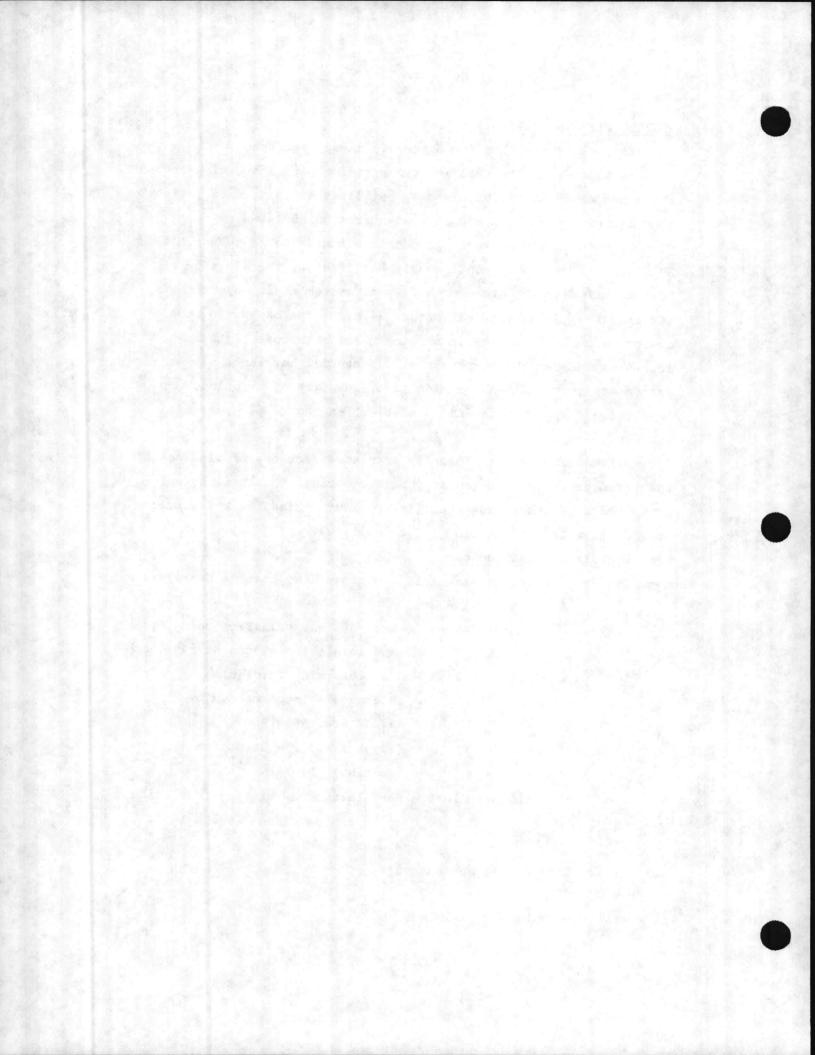
All uninsulated or minimally insulated sections of pipe can be insulated or upgraded to an appropriate optimum thickness by using preformed pipe insulation with jacket manufactured for the correct outside diameter of the line to be insulated.

Calculation Methodology

Energy Savings = (Existing heat loss - Optimum heat loss) x Hours/yr. x 1/10⁶ 1MBtu/1x106 Btu Where: Energy Savings = Rate of heat transfer from pipe

Where: Energy Savings = Rate of heat transfer from pipe and insulation system MBtu/yr. Optimum heat loss = Heat loss with insulation thickness as recommended by ASHRAE Std. 90A-1980 (Appendix E) see below for equation), Btu/hr Existing heat loss = Heat loss from existing insulation or bare pipe system (see below), Btu/hr

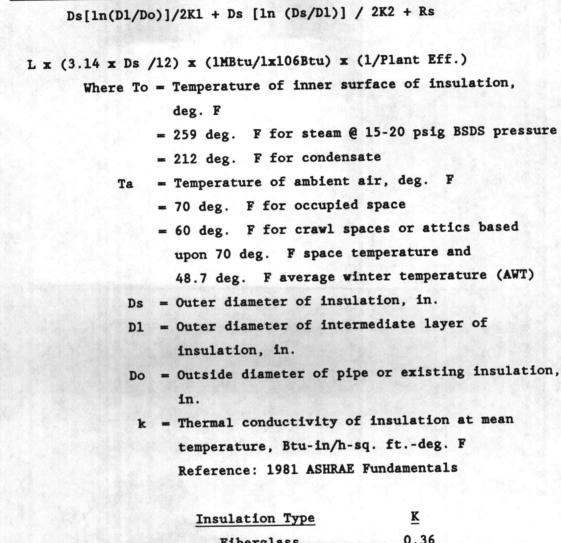
Reference: 1981 ASHRAE Fundamentals



Optimum Heat Loss=

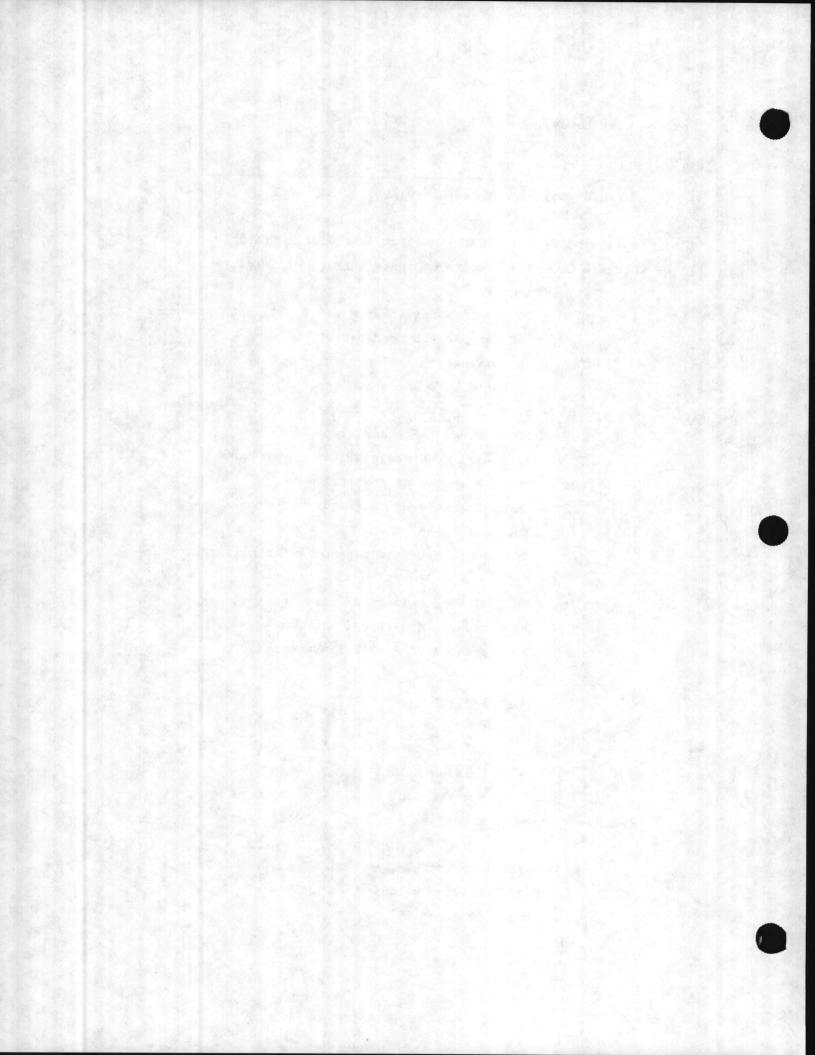
To - Ta

X



nsulation Type	<u>r</u>
Fiberglass	0.36
85% Magnesia	0.37
Calcium Silicate	0.40
Mineral Wool	0.27
Asbestos	0.62

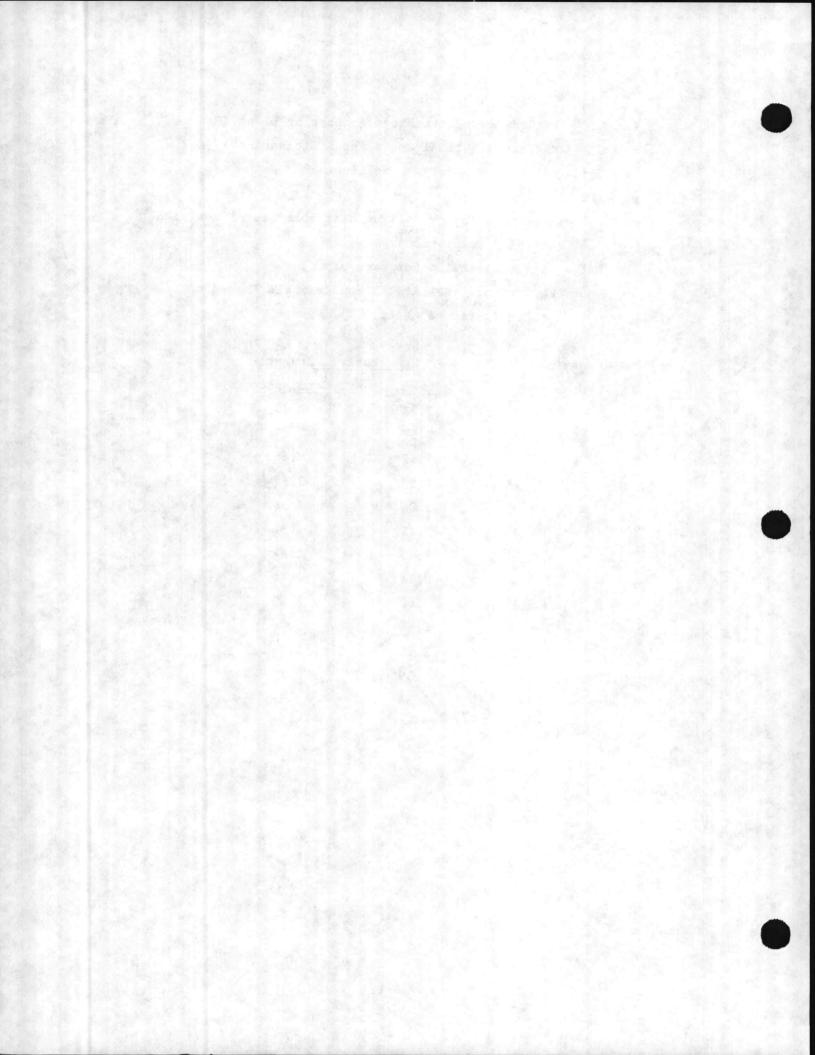
- Rs = Surface resistance, sq. ft. deg. F h/Btu Use 0.71 (wind velocity = 0 mph)
- L = Length of line



Existing Heat Loss

- = Same equation as optimum heat loss (for lines with existing insulation)
- = (see table below for bare pipes)
 Reference: 1981 ASHRAE Fundamentals (based on
 Mellon Institute tests)

Nominal Pipe	Heat Loss	Btu/hr
Diameter, in	Steam	Condensate
0.5	3.03	2.75
0.75	2.97	2.69
1.0	2.92	2.64
1.25	2.87	2.59
1.5	2.84	2.56
2.0	2.79	2.51
2.5	2.75	2.47
3.0	2.71	2.42
3.5	2.68	2.40
4.0	2.66	2.38
5.0	2.62	2.36
6.0	2.59	2.33
8.0	2.54	2.29
10.0	2.51	2.26
12.0	2.48	2.23
14.0	2.47	2.22
16.0	2.45	2.20
18.0	2.43	2.18
20.0	2.41	2.17
22.0	2.40	2.16
24.0	2.39	2.15



Calculation Example:

Given: 1. Steam service, To = 259 deg. F

- 2. Ta = 70 deg. F
- 3. Ds = 5.5" (nominal 4" pipe with 1/2" existing insulation)
- 4. Do = 4.5" (nominal 4" pipe)
- 5. k = 0.36 (fiberglass insulation)
- 6. L = 100 ft.
- 7. Plant Eff. = 0.73
- 8. Optimum insulation thickness = $2 \frac{1}{2}$ "
- 9. Hours = 4380/yr

Existing Heat Loss =

259-70

5.5 ln (5.5/4.5)/(2x0.36)+0.71

= 84.27 Btu/hr. sq.ft.

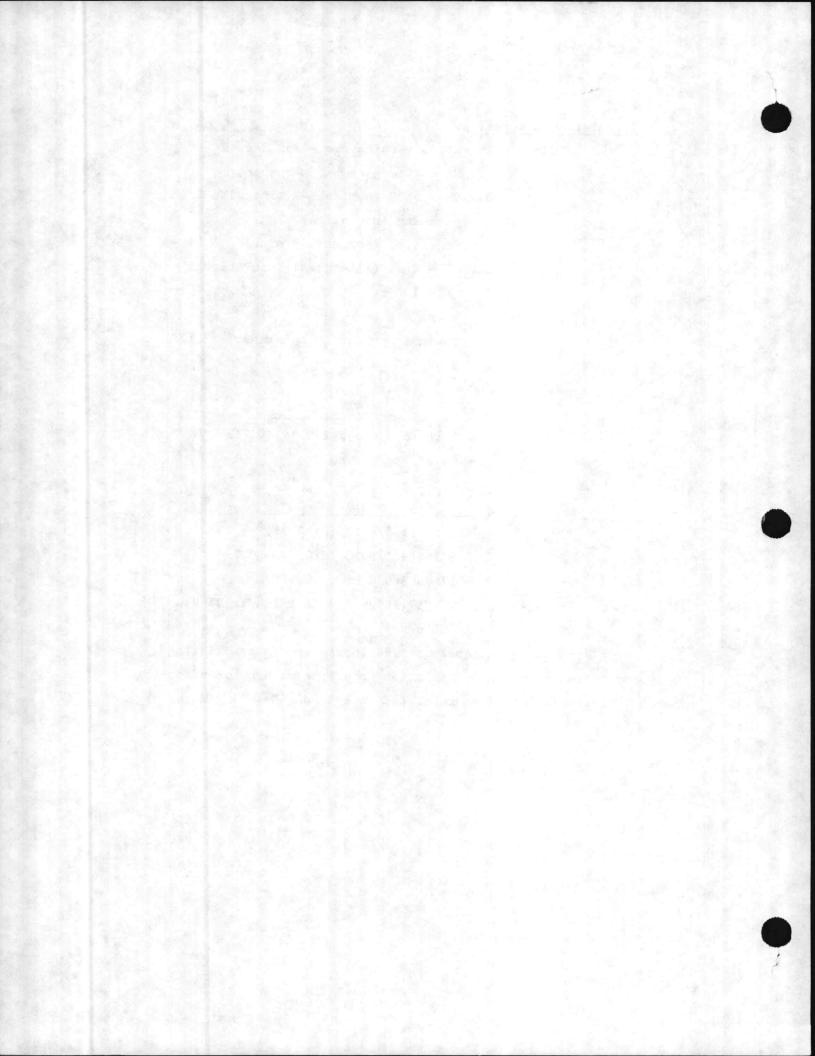
Optimum Heat Loss =

 $\frac{259-70}{9.5 \ln (5.5/4.5)/(2x \ 0.36) +}$ 9.5 ln (9.5/5.5)/(2x0.36)+ 0.71 = 17.88 Btu \neq hr. - sq.ft. Energy Savings = (84.27 - 17.88) x 4380 x 1MBtu/1x106 Btu

= 0.29 MBtu/yr.

<u>Cost Estimate</u> - The costs to add insulation to an existing line or to add additional insulation to a line with an insufficient amount of insulation is as tabulated in Appendix F.

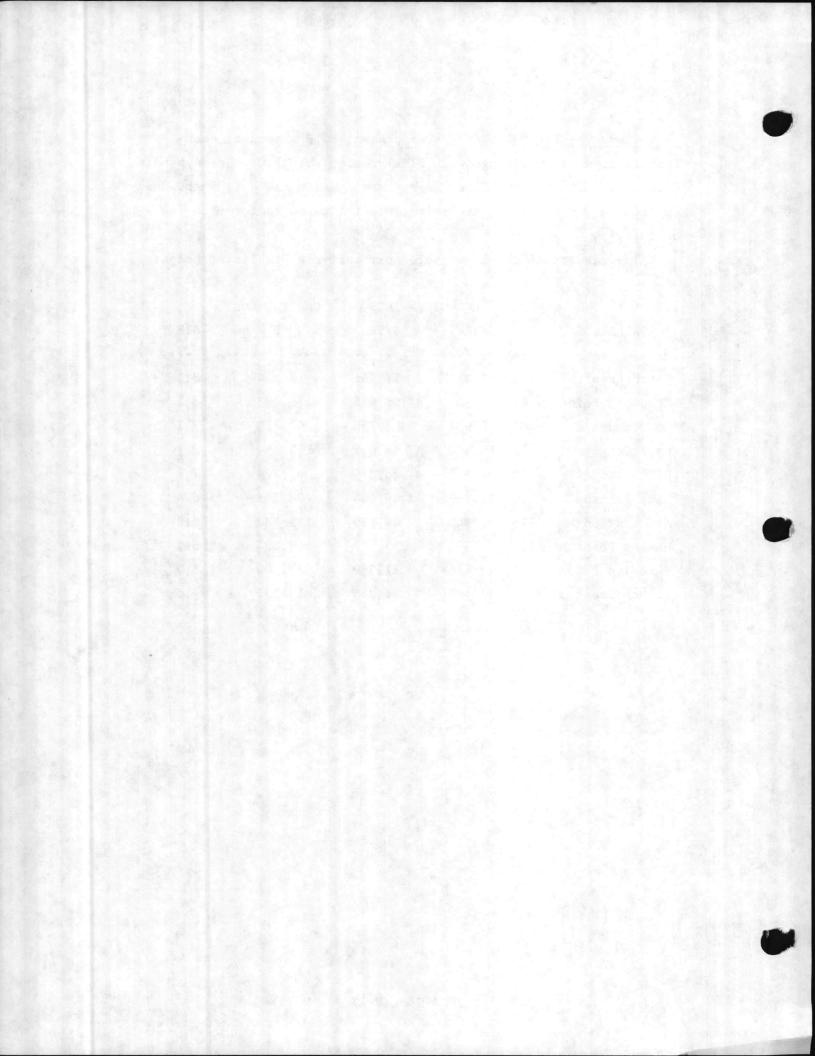




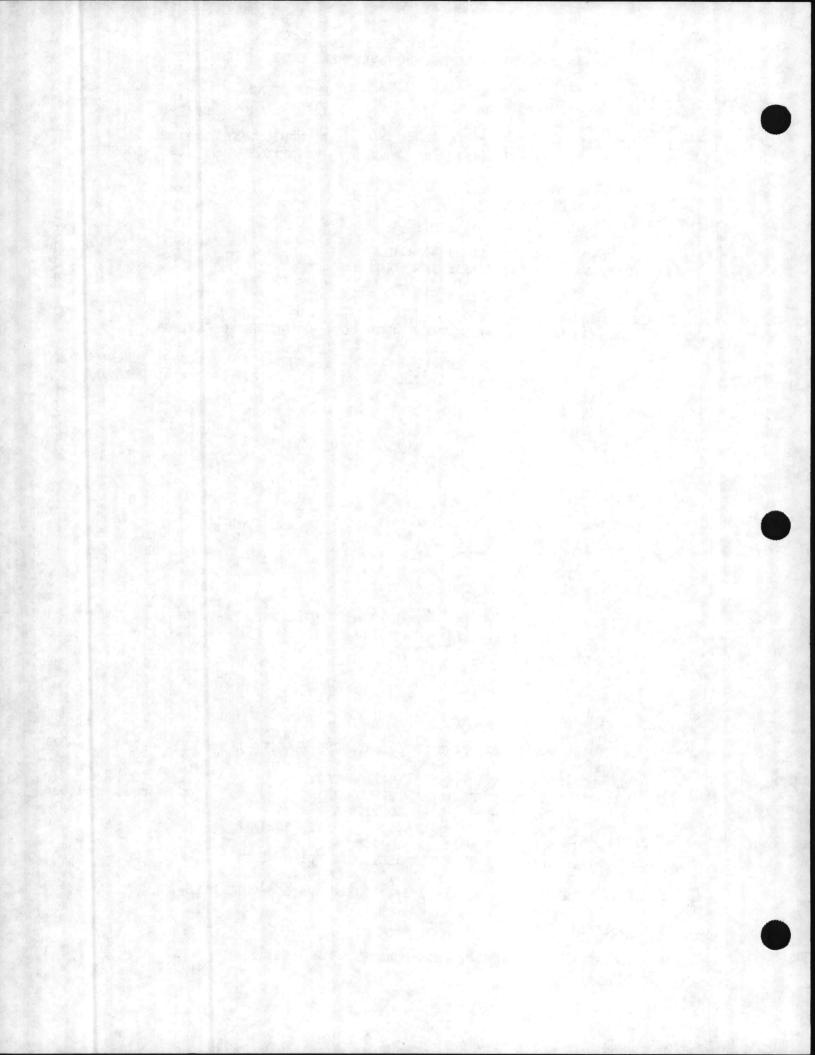
<u>Summary</u> - The following pages present ECIP sheets at each installation for buildings with SIRs greater than 1.0. See Appendix G for the individual building energy savings for all buildings. See Appendix H for the pipe insulation material takeoffs for each building.

The results of the life cycle cost analysis are listed below:

	ENERGY	SAVINGS	CAPITAL COST	
INSTALLATION	MBTU/YR	\$/YR	\$	SIR
Beach Area	3,938.427	11,461	18,944	8.1
Hospital Point	47,366.701	105,628	176,033	8.1
Courthouse Bay	7,817.901	22,750	42,770	7.2
Camp Geiger	27,855.980	81,061	153,254	7.1
Rifle Range	12,104.915	35,225	67,224	7.1
Camp Johnson	16,839.867	49,004	103,385	6.4
Air Station	15,178.842	44,170	101,880	5.8
Hadnot Point	113,487.252	253,077	598,027	5.7
Paradise Point	3,910.616	11,380	27,100	5.7
French Creek	2,818.575	6,285	18,735	4.5



LOCATION:	BEACH AREA		PROJECT NO. FISCAL YEAR		1988
	PIPE INSULATION		FISCAL ILAN	·	
PORTION NAME: REGION NUMBER:			ECONOMIC LI	FE IN YEARS:	25
ANALYSIS DATE:	.UINE 23 1987		PREPARED BY		LO SUNDE
ANALISIS DAIL.	CONT TO THE				
1. INVESTMENT C	OST				10 0//
A. CONSTRU	CTION COST			\$	18,944 1,042
B. SIOH					1,137
C. DESIGN	COST				19,010
D. ENERGY	CREDIT CALC (1A-	+1B+1C)X.9			0
E. SALVAGE	VALUE OF EXIST	ING EQUIPMENT		\$	
F. TOTAL I	NVESTMENT (1D-1)	E)			
2. ENERGY SAVIN ANALYSIS I	IGS (+) / (-) DATE ANNUAL SAVI	NGS, UNIT COST	S \$ DISCOUNT	TED SAVINGS	
	COST	SAVINGS	ANNUAL \$	DISCOUNT	DISCOUNTED
FUEL	\$/MBTU(1)	MBTU/YR(2)	SAVINGS (3)) FACTOR(4)	SAVINGS(5)
A. ELEC	8.15	0	0	0	0
B. DIST	0	0	0	0	0
C. RESID	0	0			0
D. NG	0	0			154,721
E. COAL	2.91	3,938	11,461	13.5	134,721
F. TOTAL	\$	3,938	11,461		154,721
A. ANNUAL (1) DI (2) DI	SAVINGS (+) / CC RECURRING (+/-) SCOUNT FACTOR (T SCOUNTED SAVING/ CURRING SAVINGS	CABLE 1) /COST (3AX3A1) (+) / COST (-)	\$ 22 9.08 \$ 203 DISCOUNTED	
ITEM	SAVING \$ (+)	YEAR OF	DISCOUNT	SAVINGS (+)	
	COST \$ (-)(1)	OCCURRENCE(2)	FACTOR (3)	COST(-)	(4)
			1	0	n an an Anna a An Anna an Anna a
a.	0	0			
b.	0	Ċ	A CONTRACTOR OF A CONTRACT OF		
c. d. TOTAL	0			C	
	NON ENERGY DISC	OUNTED SAVINGS	(+),COST(-)	(3A2+3Bd4) 203
(1) 25% M	CT NON ENERGY QU. MAX NON ENERGY C.	ALC (2F5 X .33	3)	() {	51,058
b. IF	3D1 IS = > 3C 3D1 IS < 3C 3D1b IS = > 1 3D1b IS < 1	CALC SIR = GO TO ITEM 4			0
4. FIRST YEAR	DOLLAR SAVINGS	[2F3+3A+(3B1d,	YRS ECONOM	IC LIFE)]	\$ 11,483
5. TOTAL NET	DISCOUNTED SAVIN	IGS (2F5+3C)			\$ 154,924
6 STR (TF <	1 PROJECT DOES N	OT QUALIFY) S	IR = (5/1F)	-	8.1



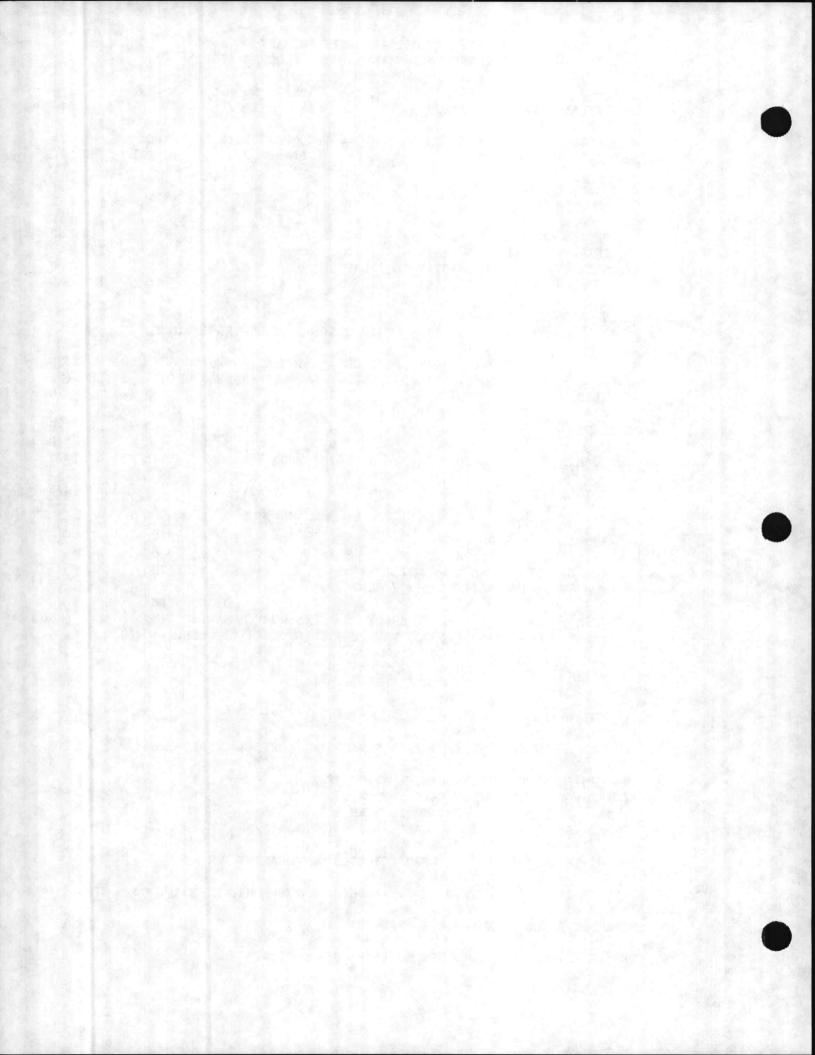
LO	CATION:	HOSPITAL POINT		PROJECT NO.		
		PIPE INSULATION	I	FISCAL YEAR	t:	1988
	RTION NAME:					
	GION NUMBER:			ECONOMIC LI	FE IN YEARS:	25
		JUNE 23 1987		PREPARED BY	ζ:	LO SUNDE
1.	INVESTMENT C	OST				
	A. CONSTRU	CTION COST			\$	
	B. SIOH					9,682
	C. DESIGN	COST				10,562
	D. ENERGY	CREDIT CALC (1A-	+1B+1C)X.9			176,649
		VALUE OF EXIST				0
		INVESTMENT (1D-1)			\$	176,649
	ANALYSIS I	DATE ANNUAL SAVIN	SAVINGS	ANNUAL \$	DISCOUNT	
	FUEL	\$/MBTU(1)	MBTU/YR(2)	SAVINGS (3)) FACTOR(4)	SAVINGS(5)
	A. ELEC	8.15	0	0	0	0
	B. DIST	0	0	0	0	0
	C. RESID	0	0	0	0	0
	D. NG	0	0		0	and the state of the second state of the secon
	E. COAL	2.23	47,367	105,628	13.5	1,425,975
	F. TOTAL	\$	47,367	105,628		1,425,975
3.	NON ENERGY	SAVINGS (+) / CO	ST (-)			
	A. ANNUAL	RECURRING (+/-)		Sec. S	\$ 22	
	(1) DIS	SCOUNT FACTOR (T.	ABLE 1)		9.08	
	(2) DIS	SCOUNTED SAVING/	COST (3AX3A1)		\$ 203	
	B. NON REC	CURRING SAVINGS	(+) / COST (-)		
					DISCOUNTED	
	ITEM	SAVING \$ (+)	YEAR OF	DISCOUNT	SAVINGS (+)	
					accm ()	113

	LICH	SAVING Q (T)	TEAK OF	DIDCOONI	DUATION (.)	100000	
		COST \$ (-)(1)	OCCURRENCE(2)	FACTOR (3)) COST(-)	(4)	
2	1.	0	0		L)	
		0	0	all and the second second	L ()	
		0	0		L ()	
	I. TOTAL	0			()	
	C. TOTAL	NON ENERGY DISC	OUNTED SAVINGS	(+),COST(-)) (3A2+3Bd4	+)	203
	D. PROJEC	T NON ENERGY QU	ALIFICATION TE	ST			
	(1) 25% M	AX NON ENERGY C	ALC (2F5 X .33)		\$	470,572
		3D1 IS = > 3C					
	b. IF	3D1 IS < 3C	CALC SIR = (2F5+3D1)/1	F		0
	c. IF	3D1b IS = > 1	GO TO ITEM 4				
	d. IF	3D1b IS < 1	PROJECT DOES	NOT QUALIF	Y		
. 1	FIRST YEAR	DOLLAR SAVINGS	[2F3+3A+(3B1d/	YRS ECONOM	IC LIFE)]	\$	105,650

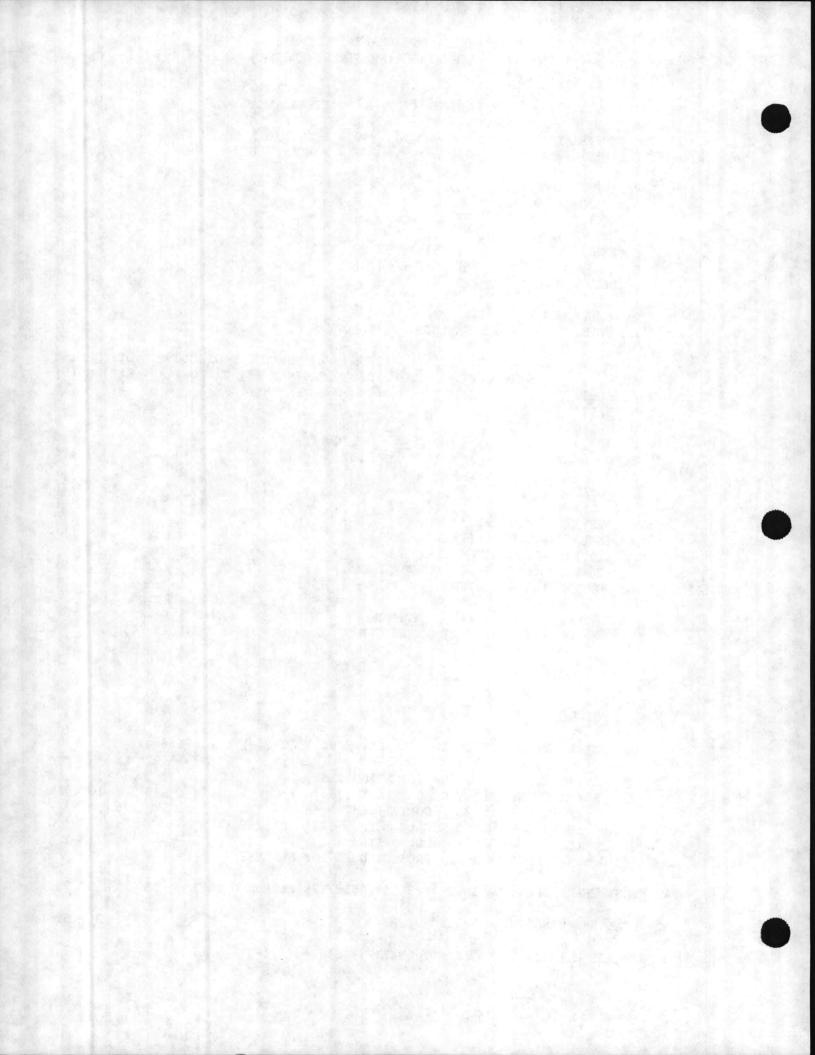
 5. TOTAL NET DISCOUNTED SAVINGS (2F5+3C)
 \$ 1,426,177

 6. SIR (IF < 1 PROJECT DOES NOT QUALIFY) SIR = (5/1F) =</td>
 8.1

4.



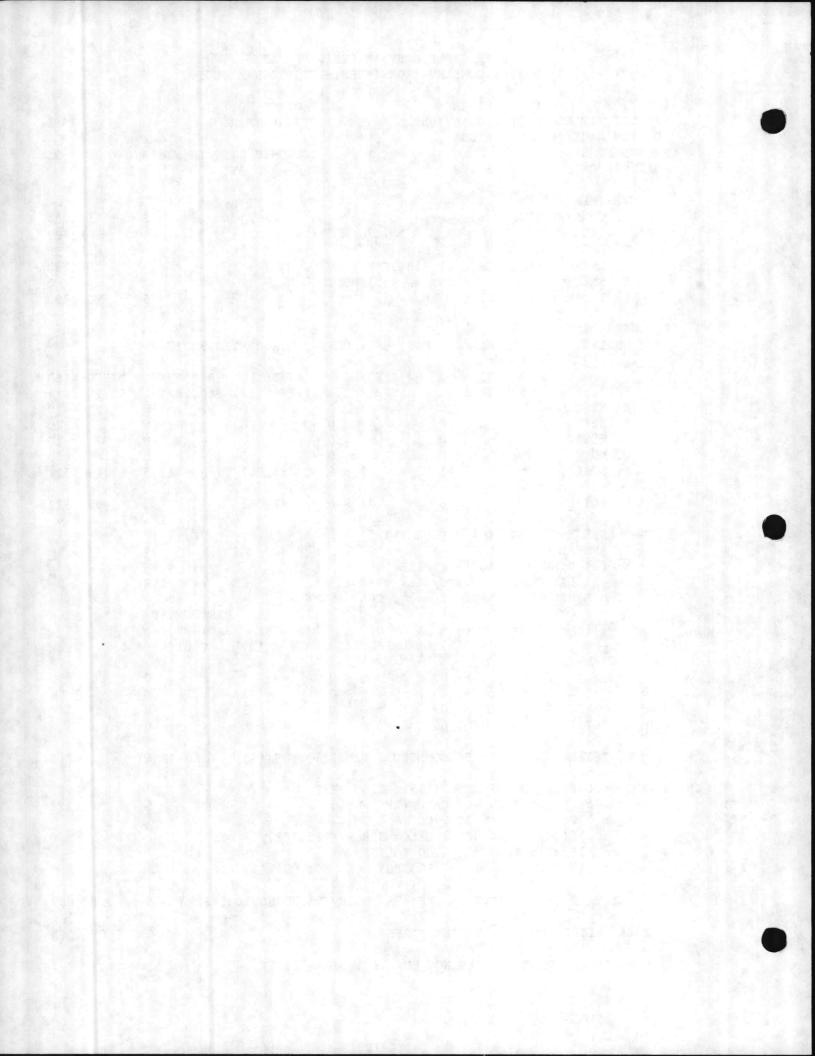
LOCATION:	COURT	HOUSE BAY		PROJECT NO.		1988
PROJECT TI	TLE: PIPE	INSULATION		FISCAL YEAR:		1900
	ME: MISC.			ECONOMIC LIF	TN VEARS.	25
REGION NUM	BER:	4		PREPARED BY:		LO SUNDE
ANALYSIS DA	ATE: JUNE	23 1907		IREIARED DI.		
1. INVESTM	ENT COST					
	NSTRUCTION	COST			\$	42,770
B. SI	ОН					2,352
	SIGN COST					2,566
D. EN	ERGY CREDIT	CALC (1A+	-1B+1C)X.9			42,920
E. SA	LVAGE VALUE	OF EXISTI	ING EQUIPMENT		71-91-34 G	0
F. TO	TAL INVESTM	ENT (1D-1H	2)		\$	42,920
2. ENERGY ANALY	SAVINGS (+) SIS DATE AN	/ (-) NUAL SAVIN	NGS, UNIT COST	S \$ DISCOUNTE	ED SAVINGS	
		000	SAVINGS		DISCOUNT	DISCOUNTED
		COST	MBTU/YR(2)	CANTNES (3)	FACTOR(4)	SAVINGS(5)
FUEL		8.15	$\frac{MBIU/IK(2)}{0}$	0 SAVINGS	0	0
A. EL	Contraction of the second second		0	0	õ	0
B. DI		0	0	0 0	Ő	0
C. RE		0	0		Ő	0
D. NG E CO	;)AL	2.91		22,750	200 Barris 1998	307,126
1. 00						207 106
F. TC	DTAL	\$	7,818	22,750		307,126
3 NON ENE	ERGY SAVINGS	s (+) / CO	ST (-)			
J. NON ENE	INUAL RECUR	(1) / (1) / (1)	51 ()	\$	22	
A. A.	L) DISCOUNT	FACTOR (T	ABLE 1)	and the bear	9.08	
()	2) DISCOUNT	ED SAVING/	COST (3AX3A1)	\$	203	
B. NO	ON RECURRING	G SAVINGS	(+) / COST (-)		
					DISCOUNTED	
Ľ	TEM SAVI	NG \$ (+)	YEAR OF	DISCOUNT	SAVINGS (+)	
	COST	\$ (-)(1)	OCCURRENCE(2)	FACTOR (3)	COST(-) ((4)
a.		0		1		
b.		0	0	1	0	
с.		0	0	1	0	
d. T	OTAL	0			0	
С. Т	OTAL NON EN					203
	OTAL NON EN	ERGY DISCO	OUNTED SAVINGS	(+),COST(-)	(3A2+3Bd4)	203
D. P.						
D. P. (1)	ROJECT NON	ENERGY QUA	LIFICATION TE	ST	(3A2+3Bd4) \$	101,352
(1) a	ROJECT NON 25% MAX NON . IF 3D1 IS	ENERGY QUA ENERGY CA - > 3C	ALIFICATION TE ALC (2F5 X .33 GO TO ITEM 4	ST)		101,352
(1) a	ROJECT NON 25% MAX NON . IF 3D1 IS	ENERGY QUA ENERGY CA - > 3C	ALIFICATION TE ALC (2F5 X .33 GO TO ITEM 4	ST)		
(1) a b	ROJECT NON 25% MAX NON . IF 3D1 IS . IF 3D1 IS . IF 3D1b I	ENERGY QUA ENERGY CA = > 3C < 3C S = > 1	ALIFICATION TE ALC (2F5 X .33 GO TO ITEM 4 CALC SIR - (GO TO ITEM 4	ST) 2F5+3D1)/1F		101,352
(1) a b	ROJECT NON 25% MAX NON . IF 3D1 IS . IF 3D1 IS . IF 3D1b I	ENERGY QUA ENERGY CA = > 3C < 3C S = > 1	ALIFICATION TE ALC (2F5 X .33 GO TO ITEM 4	ST) 2F5+3D1)/1F		101,352
(1) a b c d	ROJECT NON 25% MAX NON . IF 3D1 IS . IF 3D1 IS . IF 3D1b I . IF 3D1b I	ENERGY QUA ENERGY CA = > 3C < 3C S = > 1 S < 1	ALIFICATION TE ALC (2F5 X .33 GO TO ITEM 4 CALC SIR - (GO TO ITEM 4 PROJECT DOES	ST 2F5+3D1)/1F NOT QUALIFY	Ş	101,352 0
(1) a b c d 4. FIRST	ROJECT NON 25% MAX NON . IF 3D1 IS . IF 3D1 IS . IF 3D1b I . IF 3D1b I YEAR DOLLAR	ENERGY QUA ENERGY CA = > 3C < 3C S = > 1 S < 1 SAVINGS	ALIFICATION TE ALC (2F5 X .33 GO TO ITEM 4 CALC SIR - (GO TO ITEM 4 PROJECT DOES [2F3+3A+(3B1d/	ST 2F5+3D1)/1F NOT QUALIFY	\$: LIFE)] \$	101,352 0 22,772
(1) a b c d 4. FIRST	ROJECT NON 25% MAX NON . IF 3D1 IS . IF 3D1 IS . IF 3D1b I . IF 3D1b I	ENERGY QUA ENERGY CA = > 3C < 3C S = > 1 S < 1 SAVINGS	ALIFICATION TE ALC (2F5 X .33 GO TO ITEM 4 CALC SIR - (GO TO ITEM 4 PROJECT DOES [2F3+3A+(3B1d/	ST 2F5+3D1)/1F NOT QUALIFY	Ş	101,352 0



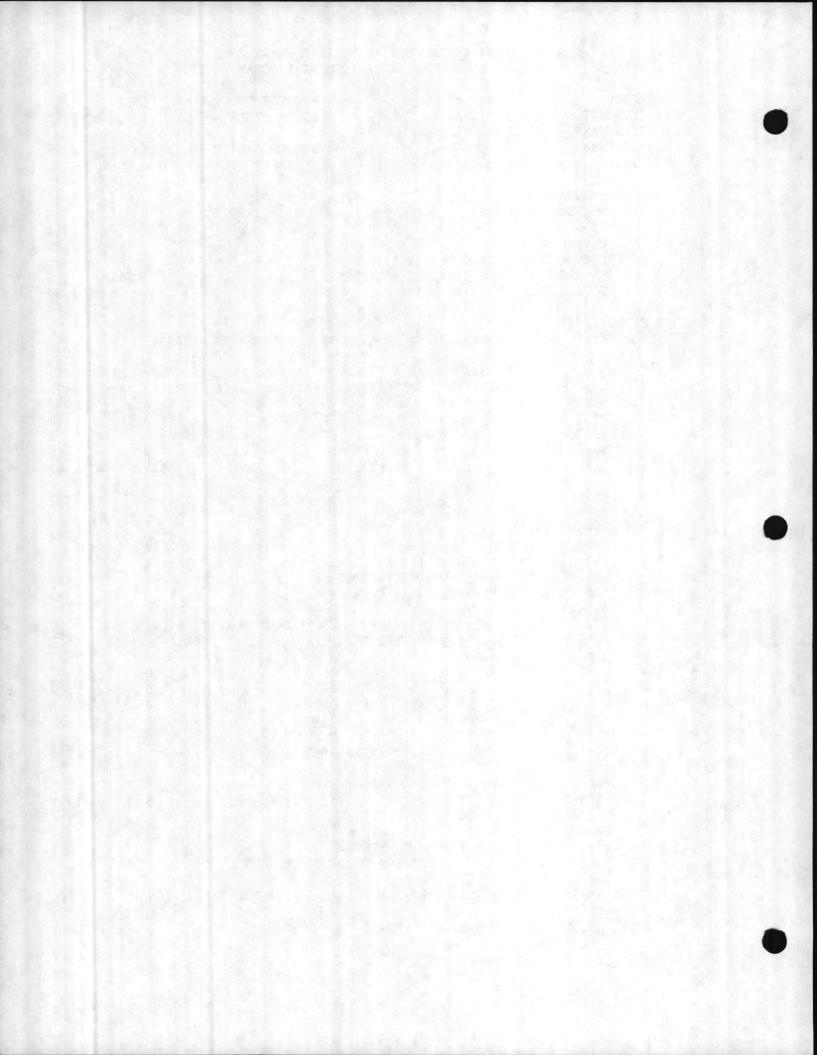
		CAMP GE			PROJECT NO	· () - (영향(요.	
PROJECT	TITLE:	PIPE IN	SULATIO	N ·	FISCAL YEAD		198
PORTION	NAME:	MISC. B	LDGS			and the second second	
REGION	NUMBER:		4		ECONOMIC L	IFE IN YEARS:	2
ANALYSI	S DATE:	JUNE 23	1987		PREPARED BY	Y:	
1. INVE	STMENT C	COST					
Α.	CONSTRU	JCTION CO	ST			\$	153,25
	SIOH						8,42
	DESIGN						9,19
				+1B+1C)X.9			153,79
				ING EQUIPMENT			
F.	TOTAL I	NVESTMEN	T (1D-1	E)		\$	153,79
		IGS (+) /					
AN	ALYSIS D	ATE ANNU	AL SAVI	NGS, UNIT COS	r \$ DISCOUNT	TED SAVINGS	
				A LUTNOS			
171	IFT	CU CU	ST	SAVINGS	ANNUAL Ş	DISCOUNT	
ru A	ELEC	\$/MB1		MBTU/YR(2)			
	DIST		0.15	0	A CARLES AND A LOUGH A DESCRIPTION	0	e dia Manis
	RESID		0	0	CONTRACTOR AND A STREET AND A STREET	방송 - 여러 영상 영상 이 가지 않는 것이 같다.	de ser a de la deserva de la des
	NG		0	0	0	0	
	COAL		2.91			13.5	
	CONL		2.91	27,050	81,001	15.5	1,094,32
F.	TOTAL		\$	27,856	81,061		1,094,32
3. NON	ENERGY S	AVINGS (+) / CO	ST (-)			
		RECURRIN			\$	\$ 22	
	(1) DIS	COUNT FA	CTOR (TA	ABLE 1)		9.08	
ъ	(2) DIS	COUNTED	SAVING/0	COST (3AX3A1)	Ę	\$ 203	
р.	NON REC	URRING S.	AVINGS	(+) / COST (-)			
	ITEM	CAUTNO	¢ (.)	WEAR OR	DIAGOTHI	DISCOUNTED	
	TICM	COST C	$\overline{\varphi}$ (+)	YEAR OF	DISCOUNT	SAVINGS (+)	
		CO21 \$	(-)(1) (DCCURRENCE(2)	FACTOR (3)	COST(-) (4)
а.			0	0	1	•	
b.			0	0	1	0	
c.			0	0	1	0	
d.	TOTAL		0	v	and share to	0	
u .			· · · ·			U U	
u.	TOTAL N	ON ENERG	Y DISCOU	UNTED SAVINGS	(+),COST(-)	(3A2+3Bd4)	203
	IUTAL N					医生物 网络马马马	
c.							
C. D.	PROJECT			LIFICATION TES			
C. D.	PROJECT	X NON ENI	ERGY CAI	LC (2F5 X .33)		Ş	361,126
C. D.	PROJECT) 25% MAI a. IF 31	X NON END D1 IS = >	ERGY CAI > 3C	LC (2F5 X .33) GO TO ITEM 4		\$	361,120
C. D.	PROJECT) 25% MAI a. IF 31 b. IF 31	X NON END D1 IS = > D1 IS <	ERGY CAI > 3C C 3C C	LC (2F5 X .33) GO TO ITEM 4 CALC SIR = (2		\$	361,126
C. D.	PROJECT) 25% MA a. IF 31 b. IF 31 c. IF 31	X NON END D1 IS = 2 D1 IS < D1 IS <	ERGY CAI > 3C C 3C C > 1 C	LC (2F5 X .33) GO TO ITEM 4	2F5+3D1)/1F	\$	

4. FIRST YEAR DOLLAR SAVINGS [2F3+3A+(3B1d/YRS ECONOMIC LIFE)] \$ 81,083
5. TOTAL NET DISCOUNTED SAVINGS (2F5+3C) \$ 1,094,525
6. SIR (IF < 1 PROJECT DOES NOT QUALIFY) SIR = (5/1F) = 7.1

4-18 (R-1)



	RIFLE RANGE PIPE INSULATIO	N	PROJECT NO. FISCAL YEAR		1988
PORTION NAME:					
REGION NUMBER:			ECONOMIC LI		
ANALYSIS DATE:	JUNE 23 1987		PREPARED BY		LO SUNDE
1. INVESTMENT C	OST				
A. CONSTRU	CTION COST			\$	67,224
B. SIOH				let an it is	3,697
C. DESIGN				and a set of the	4,033
	CREDIT CALC (1A				67,459
	VALUE OF EXIST				0
F. TOTAL I	NVESTMENT (1D-1	E)		\$	67,459
2. ENERGY SAVIN	GS (+) / (-)				
	ATE ANNUAL SAVI	NGS, UNIT COST	r \$ DISCOUNTE	ED SAVINGS	
	COST	SAVINGS	ANNUAL S	DISCOUNT	DISCOUNTED
FUEL	\$/MBTU(1)	MBTU/YR(2)	SAVINGS (3)	FACTOR(4)	SAVINGS(5)
A. ELEC	8.15	0		0	0
B. DIST	0	0	0	0	0
C. RESID	0	0	0	0	0
D. NG	0	0		0	0
E. COAL	2.91	12,105	35,225	13.5	475,542
F. TOTAL	\$	12,105	35,225		475,542
3. NON ENERGY S.	AVINCS (+) / CO	ST (-)			
S. NON ENERGI DA	RECURRING (+/-)	31 (-)	•		
A. ANNUAL					
			\$	22 9.08	
(1) DIS (2) DIS	COUNT FACTOR (T. COUNTED SAVING/	ABLE 1) COST (3AX3A1)	\$	9.08	
(1) DIS (2) DIS	COUNT FACTOR (T	ABLE 1) COST (3AX3A1)	\$	9.08 203	
(1) DIS (2) DIS B. NON REC	COUNT FACTOR (T. COUNTED SAVING/ URRING SAVINGS	ABLE 1) COST (3AX3A1) (+) / COST (-)	, , 	9.08 203 DISCOUNTED	
(1) DIS (2) DIS B. NON REC	COUNT FACTOR (T. COUNTED SAVING/	ABLE 1) COST (3AX3A1) (+) / COST (-) YEAR OF	\$ DISCOUNT S	9.08 203 DISCOUNTED AVINGS (+)	4)
(1) DIS (2) DIS B. NON REC ITEM	COUNT FACTOR (T. COUNTED SAVING/ URRING SAVINGS SAVING \$ (+) COST \$ (-)(1) (0	ABLE 1) COST (3AX3A1) (+) / COST (-) YEAR OF	\$ DISCOUNT S FACTOR (3)	9.08 203 DISCOUNTED AVINGS (+)	
(1) DIS (2) DIS B. NON REC ITEM a. b.	COUNT FACTOR (T. COUNTED SAVING/ URRING SAVINGS SAVING \$ (+) COST \$ (-)(1)	ABLE 1) COST (3AX3A1) (+) / COST (-) YEAR OF OCCURRENCE(2) 0 0	\$ DISCOUNT S FACTOR (3) 1 1	9.08 203 DISCOUNTED GAVINGS (+) COST(-) (0 0	
(1) DIS (2) DIS B. NON REC ITEM a. b. c.	COUNT FACTOR (T. COUNTED SAVING/ URRING SAVINGS SAVING \$ (+) COST \$ (-)(1) (0	ABLE 1) COST (3AX3A1) (+) / COST (-) YEAR OF OCCURRENCE(2) 0	\$ DISCOUNT S FACTOR (3) 1	9.08 203 DISCOUNTED AVINGS (+) COST(-) (0 0 0	
(1) DIS (2) DIS B. NON REC ITEM a. b.	COUNT FACTOR (T. COUNTED SAVING/ URRING SAVINGS SAVING \$ (+) COST \$ (-)(1) (0 0	ABLE 1) COST (3AX3A1) (+) / COST (-) YEAR OF OCCURRENCE(2) 0 0	\$ DISCOUNT S FACTOR (3) 1 1	9.08 203 DISCOUNTED GAVINGS (+) COST(-) (0 0	
(1) DIS (2) DIS B. NON RECU ITEM a. b. c. d. TOTAL	COUNT FACTOR (T. COUNTED SAVING/ URRING SAVINGS SAVING \$ (+) COST \$ (-)(1) (0 0	ABLE 1) COST (3AX3A1) (+) / COST (-) YEAR OF OCCURRENCE(2) 0 0 0 0	\$ DISCOUNT FACTOR (3) 1 1 1	9.08 203 DISCOUNTED GAVINGS (+) COST(-) (0 0 0 0	
(1) DIS (2) DIS B. NON RECT ITEM a. b. c. d. TOTAL C. TOTAL NO	COUNT FACTOR (T. COUNTED SAVING/ URRING SAVINGS SAVING \$ (+) COST \$ (-)(1) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ABLE 1) COST (3AX3A1) (+) / COST (-) YEAR OF OCCURRENCE(2) 0 0 0 0 0	\$ DISCOUNT S FACTOR (3) 1 1 1 1 (+),COST(-)	9.08 203 DISCOUNTED GAVINGS (+) COST(-) (0 0 0 0	
(1) DIS (2) DIS B. NON RECT ITEM a. b. c. d. TOTAL C. TOTAL NO D. PROJECT	COUNT FACTOR (T. COUNTED SAVING/ URRING SAVINGS SAVING \$ (+) COST \$ (-)(1) (0 0 0 0	ABLE 1) COST (3AX3A1) (+) / COST (-) YEAR OF OCCURRENCE(2) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$ DISCOUNT S FACTOR (3) 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	9.08 203 DISCOUNTED GAVINGS (+) COST(-) (0 0 0 0	203
(1) DIS (2) DIS B. NON RECT ITEM a. b. c. d. TOTAL C. TOTAL NO D. PROJECT (1) 25% MAJ a. IF 31	COUNT FACTOR (T. COUNTED SAVING/ URRING SAVINGS SAVING \$ (+) COST \$ (-)(1) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ABLE 1) COST (3AX3A1) (+) / COST (-) YEAR OF OCCURRENCE(2) 0 0 0 0 UNTED SAVINGS(LIFICATION TES LC (2F5 X .33) GO TO ITEM 4	\$ DISCOUNT S FACTOR (3) 1 1 1 1 1 1 1 5 T	9.08 203 DISCOUNTED AVINGS (+) COST(-) (0 0 0 0 0 (3A2+3Bd4)	
(1) DIS (2) DIS B. NON RECT ITEM a. b. c. d. TOTAL C. TOTAL NO D. PROJECT (1) 25% MAX a. IF 31 b. IF 31	COUNT FACTOR (T. COUNTED SAVING/ URRING SAVINGS SAVING \$ (+) COST \$ (-)(1) (0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ABLE 1) COST (3AX3A1) (+) / COST (-) YEAR OF OCCURRENCE(2) 0 0 0 0 0 0 0 0 0 0 0 0 0	\$ DISCOUNT S FACTOR (3) 1 1 1 1 1 1 1 5 T	9.08 203 DISCOUNTED AVINGS (+) COST(-) (0 0 0 0 0 (3A2+3Bd4)	203
(1) DIS (2) DIS B. NON RECT ITEM a. b. c. d. TOTAL C. TOTAL NO D. PROJECT (1) 25% MAX a. IF 31 b. IF 31 c. IF 31 c. IF 31	COUNT FACTOR (T. COUNTED SAVING/ URRING SAVINGS SAVING \$ (+) COST \$ (-)(1) (0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ABLE 1) COST (3AX3A1) (+) / COST (-) YEAR OF OCCURRENCE(2) 0 0 0 0 0 0 0 0 0 0 0 0 0	\$ DISCOUNT 5 FACTOR (3) 1 1 1 1 1 1 2 (+),COST(-) 5 T 2F5+3D1)/1F	9.08 203 DISCOUNTED AVINGS (+) COST(-) (0 0 0 0 0 (3A2+3Bd4)	203 156,929
(1) DIS (2) DIS B. NON RECT ITEM a. b. c. d. TOTAL C. TOTAL NO D. PROJECT (1) 25% MAX a. IF 31 b. IF 31 c. IF 31 c. IF 31	COUNT FACTOR (T. COUNTED SAVING/ URRING SAVINGS SAVING \$ (+) COST \$ (-)(1) (0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ABLE 1) COST (3AX3A1) (+) / COST (-) YEAR OF OCCURRENCE(2) 0 0 0 0 0 0 0 0 0 0 0 0 0	\$ DISCOUNT 5 FACTOR (3) 1 1 1 1 1 1 2 (+),COST(-) 5 T 2F5+3D1)/1F	9.08 203 DISCOUNTED AVINGS (+) COST(-) (0 0 0 0 0 (3A2+3Bd4)	203 156,929
(1) DIS (2) DIS B. NON RECT ITEM a. b. c. d. TOTAL C. TOTAL NO D. PROJECT (1) 25% MAX a. IF 31 b. IF 31 c. IF 31 c. IF 31	COUNT FACTOR (T. COUNTED SAVING/ URRING SAVINGS SAVING \$ (+) COST \$ (-)(1) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ABLE 1) COST (3AX3A1) (+) / COST (-) YEAR OF OCCURRENCE(2) 0 0 0 0 0 0 0 0 0 0 0 0 0	\$ DISCOUNT FACTOR (3) 1 1 1 1 (+),COST(-) 5 T (F5+3D1)/1F NOT QUALIFY	9.08 203 DISCOUNTED GAVINGS (+) COST(-) (0 0 0 (3A2+3Bd4) \$	203 156,929
(1) DIS (2) DIS B. NON REC ITEM a. b. c. d. TOTAL C. TOTAL NO D. PROJECT (1) 25% MAJ a. IF 31 b. IF 31 c. IF 31 d. IF 31	COUNT FACTOR (T. COUNTED SAVING/ URRING SAVINGS SAVING \$ (+) COST \$ (-)(1) (0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ABLE 1) COST (3AX3A1) (+) / COST (-) YEAR OF OCCURRENCE(2) 0 0 0 0 0 0 0 0 0 0 0 0 0	\$ DISCOUNT FACTOR (3) 1 1 1 1 (+),COST(-) 5 T (F5+3D1)/1F NOT QUALIFY	9.08 203 DISCOUNTED GAVINGS (+) COST(-) (0 0 0 (3A2+3Bd4) \$	203 156,929 0



LOCATION:	CAMP JOHNSON	PROJECT NO.		
PROJECT TITLE: PORTION NAME:	PIPE INSULATION MISC. BLDGS	FISCAL YEAR:		1988
REGION NUMBER:	4	ECONOMIC LIFE IN	VEARS:	25
ANALYSIS DATE:	JUNE 23 1987	PREPARED BY:	LO	SUNDE
1. INVESTMENT C	COST			
	CTION COST		S	103,385
B. SIOH			**	5,686
C. DESIGN	COST			6,203
D. ENERGY	CREDIT CALC (1A+1B+1C)X.9			103,747
E CATTLACE	TATUS OF SUTONING BOUTSNE			1

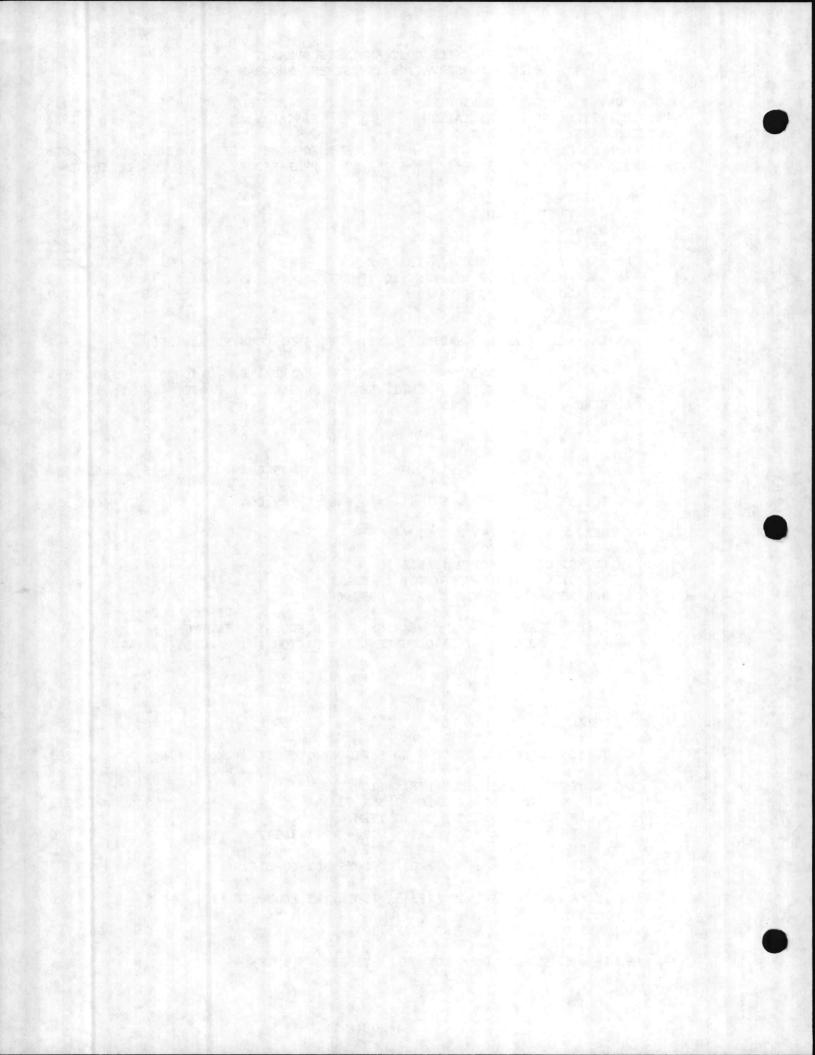
E. SALVAGE VALUE OF EXISTING EQUIPMENT F. TOTAL INVESTMENT (1D-1E) 103,747 Ŝ

0

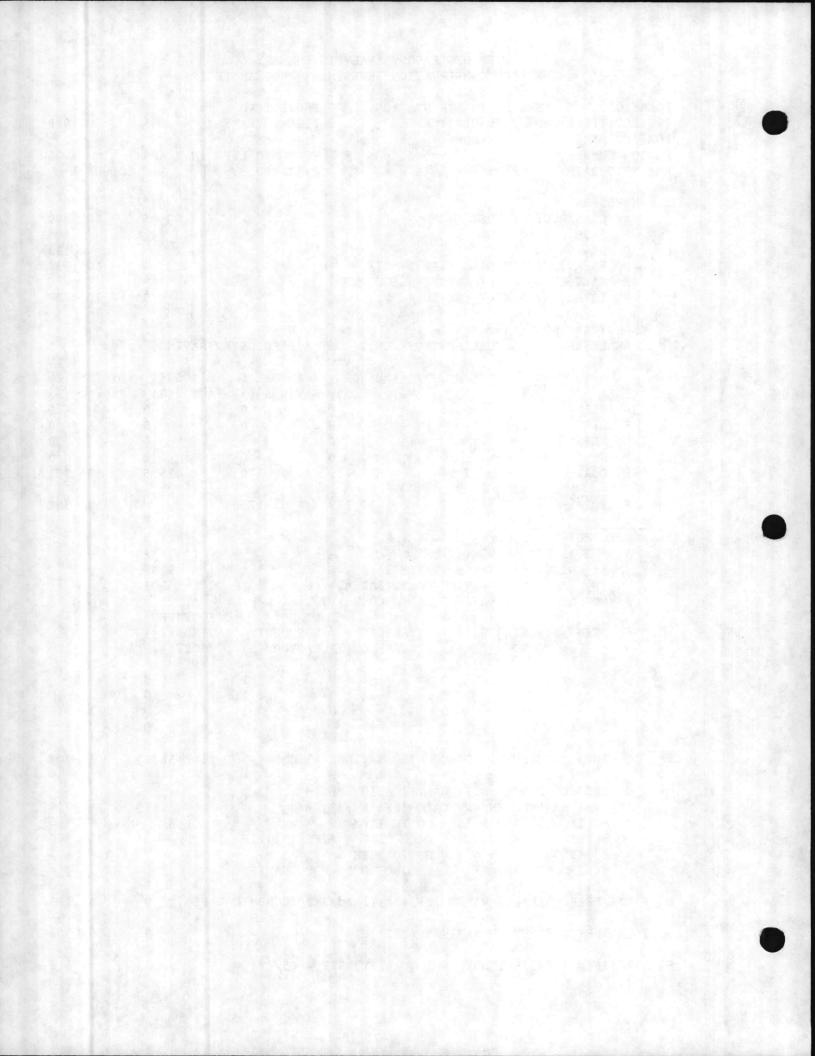
2. ENERGY SAVINGS (+) / (-) ANALYSIS DATE ANNUAL SAVINGS, UNIT COST \$ DISCOUNTED SAVINGS

6

			COST	SAVINGS	ANNUAL \$	DISCOUNT	DISCOUNTED
	FU	EL	\$/MBTU(1)				
	Α.	ELEC	8.15	0	0		Ó
	В.	DIST	0	0	0	0	0
	С.	RESID	0	0	0	0	0
	D.	NG	0	0	0		0
	Ε.	COAL	2.91,	16,840	49,004	0 13.5	661,554
	F.	TOTAL	\$	16,840	49,004		661,554
3.	NON	ENERGY SA	AVINGS (+) / COS	T (-)			
			RECURRING (+/-)		\$	22	
			COUNT FACTOR (TA			9.08	
	В.		COUNTED SAVING/C JRRING SAVINGS (203	
	S. G. all		, , , , , , , , , , , , , , , , , , ,	.,, ,		DISCOUNTED	
		ITEM	SAVING \$ (+)	YEAR OF		SAVINGS (+)	
			COST \$ (-)(1) 0			COST(-) (4)
	a.		0	0	1	0	
	Ъ.		0	0	1	0	
	с.		0	0	1	0	
•	d.	TOTAL	0			0	
	c.	TOTAL NO	ON ENERGY DISCOU	NTED SAVINGS((+),COST(-)	(3A2+3Bd4)	203
	D.	PROJECT	NON ENERGY QUAL	IFICATION TES	T		
			NON ENERGY CAL			Ś	218,313
	1.	a. IF 31	1 IS = > 3C G	O TO ITEM 4		*	210,515
			01 IS < 3C C		F5+3D1)/1F		0
			1b IS = > 1 G				LAR BUNDEN
		d. IF 31	01b IS < 1 P	ROJECT DOES N	OT QUALIFY		
4.	FIRST	T YEAR DO	OLLAR SAVINGS [2	F3+3A+(3B1d/Y	RS ECONOMIC	LIFE)] \$	49,026
5.	TOTAL	L NET DIS	COUNTED SAVINGS	(2F5+3C)		\$	661,757
5.	SIR	(IF < 1 H)	ROJECT DOES NOT	QUALIFY) SIR	= (5/1F) =		6.4



PROJECT T	ITLE:	NEW RIVER AIR S PIPE INSULATION MISC. BLDGS		PROJECT NO. FISCAL YEAR		198
REGION NU				ECONOMIC LI	FE IN YEARS:	2
ANALYSIS	DATE:	JUNE 23 1987		PREPARED BY	•	LO SUNDE
L. INVEST						
		JCTION COST			\$	101,88
B.S						5,60
	ESIGN		10.10.0			6,11
		CREDIT CALC (1A-				102,23
		E VALUE OF EXIST INVESTMENT (1D-1)			\$	102,23
ENERGY	SAUTA	NGS (+) / (-)				
		DATE ANNUAL SAVI		r \$ DISCOUNT	ED SAVINGS	
		COST	SAVINGS	ANNUAL \$	DISCOUNT	DISCOUNTE
FUEL			MBTU/YR(2)	SAVINGS (3)	FACTOR(4)	SAVINGS (5
A. E		8.15	0	0	0	
B. D		0	0	0	0	
	ESID	0	0	0	0	
D. N		0	0	0 0 44,170	0	
E. C	OAL	2.91	15,179	44,170	13.5	596,30
F. T	OTAL	\$	15,179	44,170		596,30
((B. N	1) DIS 2) DIS	RECURRING (+/-) SCOUNT FACTOR (TA COUNTED SAVING/C CURRING SAVINGS (SAVING \$ (+) COST \$ (-)(1) (ABLE 1) COST (3AX3A1) (+) / COST (-) YEAR OF	DISCOUNT	9.08 203 DISCOUNTED SAVINGS (+)	4)
	;	0	0			
a. b		0	0	1	0	
b. с.		0	0	1	0	
	OTAL	0	0	1	0 0	
С. Т	OTAL N	ION ENERGY DISCOU	UNTED SAVINGS	(+),COST(-)	(3A2+3Bd4)	20
D. P.	ROJECI	NON ENERGY QUAL	LIFICATION TES	T		
		X NON ENERGY CAN 3D1 IS $- > 3C$		Re. Asie	\$	196,77
с	. IF 3	D1 IS < 3C	GO TO ITEM 4			
. FIRST	YEAR D	OLLAR SAVINGS [2	2F3+3A+(3B1d/)	RS ECONOMIC	LIFE)] \$	44,19
. TOTAL	NET DI	SCOUNTED SAVINGS	5 (2F5+3C)		\$	596,50



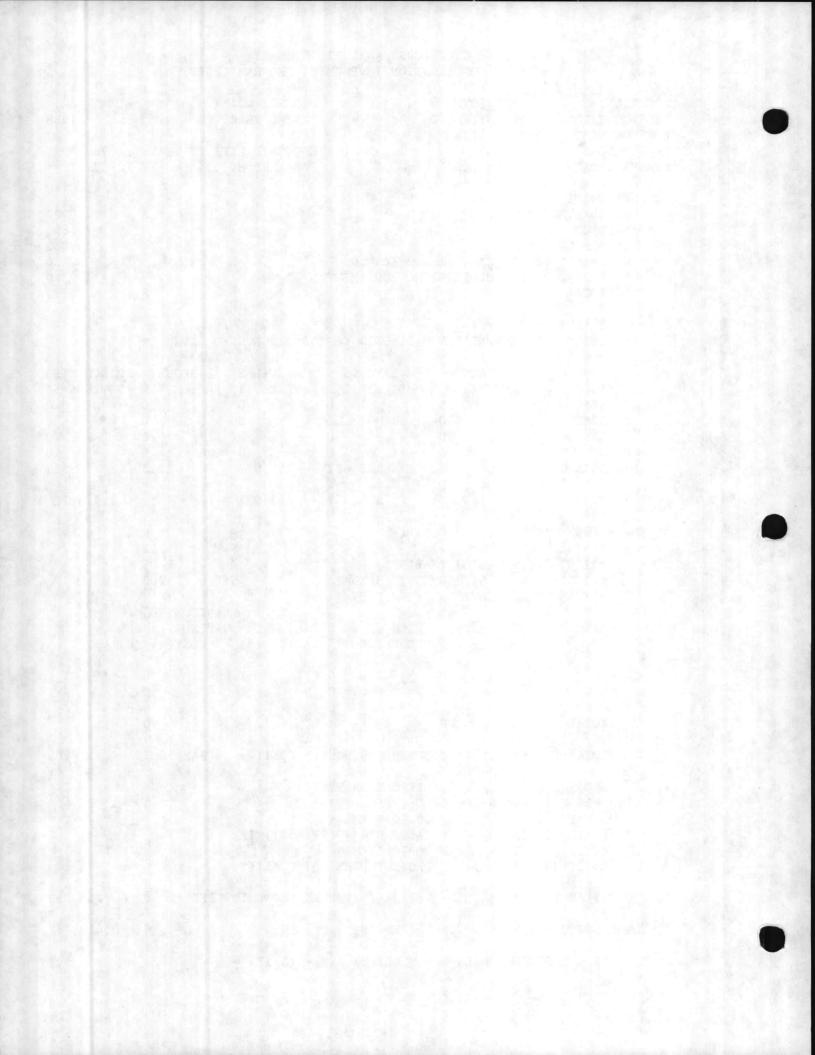
LOCATION:	HADNOT POINT	PROJECT NO.		
PROJECT TITLE:	PIPE INSULATION	FISCAL YEAR:		1988
PORTION NAME:	MISC. BLDGS			
REGION NUMBER:	4	ECONOMIC LIFE IN	YEARS:	25
ANALYSIS DATE:	JUNE 23 1987	PREPARED BY:	LO	SUNDE
1. INVESTMENT C	COST			
A. CONSTRU	CTION COST		\$	598,027
B. SIOH				32,891
C. DESIGN	COST		6.5	35,882
D. ENERGY	CREDIT CALC (1A+1B+1C)X.9			600,120
	VALUE OF EXISTING EQUIPMENT			0
F. TOTAL I	NVESTMENT (1D-1E)		\$	600,120

2. ENERGY SAVINGS (+) / (-)
ANALYSIS DATE ANNUAL SAVINGS, UNIT COST \$ DISCOUNTED SAVINGS

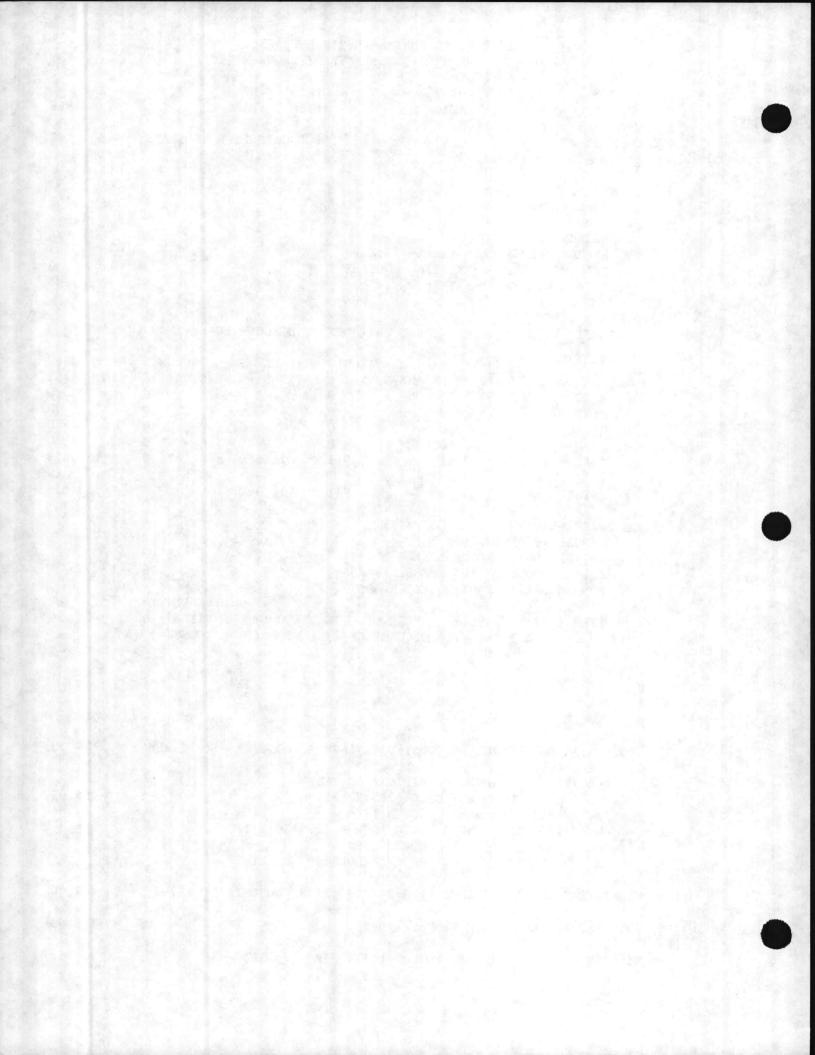
5

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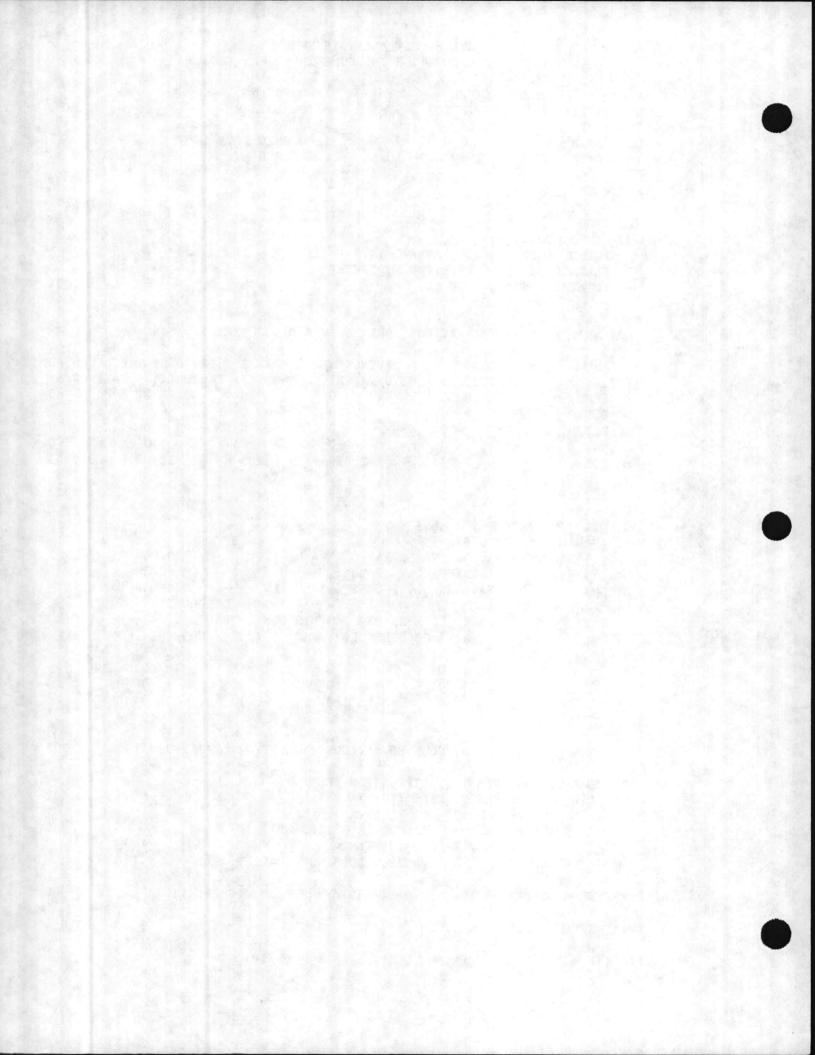
			COST				DISCOUNT	
	FU	EL	\$/MBTU(1)	MBT	U/YR(2)	SAVINGS (3)) FACTOR(4)	SAVINGS(5)
	Α.	ELEC		5	0			0
	В.	DIST		0	0	0	0	0
		RESID		0	0	0	0	0
	D.	NG		0	0	0		0
	E.	COAL	2.2	3	113,487	253,077	13.5	3,416,534
	F.	TOTAL	Carlo a serie da la	\$	113,487	253,077		3,416,534
3.	NON	ENERGY	SAVINGS (+) /	COST (-)			
			RECURRING (+/			5	\$ 22	
		(1) DI	SCOUNT FACTOR	(TABLE	1)		9.08	
			SCOUNTED SAVING				\$ 203	
	Ъ.	NON NL	OURTING DAVING	5 (+) /	0051 (-,		DISCOUNTED	
		TTEM	SAVING \$ (+)	VEAD	OF			
		11111	COST \$ (-)(1		PENCE(2)	EACTOR (3)	SAVINGS (+)	4.5
			0001 0 (-)(1) 00000	LENCE (2)	FACIOR (3)	0031(-) ((4)
	a.			0	0	1	. 0	
	b.			0	0	1	0	
	c.			0	0	1	0	
	d.	TOTAL		0			0	
	c.	TOTAL I	NON ENERGY DIS	COUNTED	SAVINGS	(+),COST(-)	(3A2+3Bd4)	203
	-	-	-					
			T NON ENERGY QU				and the second	
	(1		AX NON ENERGY				Ş	1,127,456
		a. IF	3D1 IS = > 3C	GO TO	ITEM 4			
		D. 1F .	3D1 IS < 3C 3D1b IS = > 1	CALC	SIR = (2)	(F5+3D1)/IF		0
		d. IF :	3D1b IS = > 1 $3D1b IS < 1$	PROJE	TT DOES N	NOT QUALIFY		
4.	FIRS	T YEAR I	DOLLAR SAVINGS	[2F3+3/	A+(3B1d/)	RS ECONOMIC	LIFE)] \$	253,099
٥.	TOTA	L NET D	ISCOUNTED SAVIN	NGS (2F	5+3C)		\$	3,416,737
5.	SIR	(IF < 1	PROJECT DOES 1	NOT QUAL	LIFY) SIF	a = (5/1F) =		5.7



	TITLE:	PARADISE PIPE INSU	ULATION		PROJECT FISCAL Y			1988
PORTION	NAME:	MISC. BL	DGS					
REGION	NUMBER:		4				IN YEARS:	
ANALYSI	S DATE:	JUNE 23	1987		PREPAREI	D BY:	1	LO SUNDE
	STMENT C							27 100
		JCTION COS	Г				\$	27,100 1,491
	SIOH							
	DESIGN							1,626 27,195
				-1B+1C)X.9				27,19.
		E VALUE OF		ING EQUIPMENT			\$	27,19
г.	IOIAL I		(10-11	.,			Sec. 1	
2. ENER AN	GY SAVIN ALYSIS I	NGS (+) / DATE ANNUA	(-) L SAVIN	NGS, UNIT COST	C \$ DISC	OUNTEI	SAVINGS	
		COS	т	SAVINGS	ANNUA	L\$	DISCOUNT	DISCOUNTEI
FU	JEL	\$/MBTU	(1)	MBTU/YR(2)	SAVINGS	(3) I	FACTOR(4)	SAVINGS(5)
	ELEC	47	8.15	0		0	0	
	DIST		0	0		0	0	
	RESID		0	0		0	0	
	NG		0	0		0	0	
	COAL		2.91	3,911	11,	380	13.5	153,62
F.	TOTAL		\$	3,911	11,	380		153,62
Α.	(1) DI	RECURRING SCOUNT FAC	TOR (T	ABLE 1) COST (3AX3A1)		\$ \$	22 9.08 203	
				(+) / COST (-		13 10		
Β.					and the second	D	ISCOUNTED	
В.						-		
В.	ITEM	SAVING \$	(+)	YEAR OF	DISCOUN	T SA	AVINGS (+)	
В.	ITEM	SAVING \$ COST \$ ((+) (-)(1)	YEAR OF OCCURRENCE(2)	DISCOUN	(3)		4)
В. а.	ITEM	SAVING \$ COST \$ ((+) (-)(1) 0	OCCURRENCE(2)	DISCOUN FACTOR	(3)	COST(-) (0	4)
	ITEM	SAVING \$ COST \$ ((-)(1)	OCCURRENCE(2)	FACTOR	(3) 1 1	COST(-) (0 0	4)
а.		SAVING \$ COST \$ ((-)(1) 0	OCCURRENCE(2)	FACTOR	(3)	COST(-) (0 0 0	4)
a. b.	ITEM TOTAL	SAVING \$ COST \$ ((-)(1) 0 0	OCCURRENCE(2) 0 0	FACTOR	(3) 1 1	COST(-) (0 0	4)
a. b. c. d.	TOTAL	COST \$ ((-)(1) 0 0 0 0	OCCURRENCE(2) 0 0	FACTOR	(3) 1 1 1	COST(-) (0 0 0 0	
a. b. c. d. C. D	TOTAL . TOTAL . PROJEC	COST \$ (NON ENERGY T NON ENEF	(-)(1) 0 0 0 0 0 0 0 0 0 0 0 8 0 0 0 0 0 0 0	OCCURRENCE(2) 0 0 0 0 0 UNTED SAVINGS LIFICATION TE	FACTOR (+),COST	(3) 1 1 1	COST(-) (0 0 0 0	20
a. b. c. d. C. D	TOTAL . TOTAL . PROJEC 1) 25% M	COST \$ (NON ENERGY T NON ENER AX NON ENE	(-)(1) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	OCCURRENCE(2) 0 0 0 0 UNTED SAVINGS LIFICATION TE LC (2F5 X .33	FACTOR (+),COST	(3) 1 1 1	COST(-) (0 0 0 0 0 (3A2+3Bd4)	20
a. b. c. d. C. D	TOTAL . TOTAL . PROJEC 1) 25% M a. IF	COST \$ (NON ENERGY T NON ENER AX NON ENER 3D1 IS - >	(-)(1) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	OCCURRENCE(2) 0 0 0 UNTED SAVINGS LIFICATION TE LC (2F5 X .33 GO TO ITEM 4	FACTOR (+),COST ST)	(3) 1 1 1 2(-)	COST(-) (0 0 0 0 0 (3A2+3Bd4)	20 50,69
a. b. c. d. C. D	TOTAL . TOTAL . PROJEC 1) 25% M a. IF b. IF	COST \$ (NON ENERGY T NON ENER AX NON ENER 3D1 IS = > 3D1 IS <	(-)(1) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	OCCURRENCE(2) 0 0 0 UNTED SAVINGS LIFICATION TE LC (2F5 X .33 GO TO ITEM 4 CALC SIR = (FACTOR (+),COST ST)	(3) 1 1 1 2(-)	COST(-) (0 0 0 0 0 (3A2+3Bd4)	20 50,69
a. b. c. d. C. D	TOTAL . TOTAL . PROJEC 1) 25% M a. IF b. IF c. IF	COST \$ (NON ENERGY T NON ENER AX NON ENER 3D1 IS = > 3D1 IS < 3D1 IS =	(-)(1) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	OCCURRENCE(2) 0 0 0 UNTED SAVINGS LIFICATION TE LC (2F5 X .33 GO TO ITEM 4	FACTOR (+),COST (ST) 2F5+3D1)	(3) 1 1 1 (-) (-)	COST(-) (0 0 0 0 0 (3A2+3Bd4)	20 50,69
a. b. c. d. C. D. (:	TOTAL . TOTAL . PROJEC 1) 25% M a. IF b. IF c. IF d. IF	COST \$ (NON ENERGY T NON ENER AX NON ENER 3D1 IS = 2 3D1 IS < 3D1 IS = 3 3D1 IS = 3 3D1 IS = 3 3D1 IS <	(-)(1) 0 0 0 0 0 0 0 0 0 0 0 0 0	OCCURRENCE(2) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	FACTOR (+),COST ST) 2F5+3D1) NOT QUAI	(3) 1 1 1 (-) /1F LIFY	COST(-) (0 0 0 0 (3A2+3Bd4) \$	20 50,69
a. b. c. d. C. D (1 4. FIR	TOTAL . TOTAL . PROJEC 1) 25% M a. IF b. IF c. IF d. IF ST YEAR	COST \$ (NON ENERGY T NON ENER AX NON ENER 3D1 IS = > 3D1 IS < 3D1b IS = 3D1b IS < DOLLAR SAV	(-)(1) 0 0 0 0 0 0 0 0 0 0 0 0 0	OCCURRENCE(2) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	FACTOR (+),COST ST) 2F5+3D1) NOT QUAI	(3) 1 1 1 (-) /1F LIFY	COST(-) (0 0 0 0 (3A2+3Bd4) \$	



A DECOMONIC LIFE IN YEARS: 25 REGION NUMBER: 4 ANALYSIS DATE: JUNE 23 1987ECONOMIC LIFE IN YEARS: 25 REGION NUMBER: 4 PREPARED BY: LO SUNDE1. INVESTMENT COST A. CONSTRUCTION COST\$18,73: 1,03C. DESIGN COST D. ENERGY CREDIT CALC (1A+1B+1C)X.9 D. ENERGY CREDIT CALC (1A+1B+1C)X.9 D. ENERGY CREDIT CALC (1A+1B+1C)X.9 D. ENERGY CREDIT CALC (1A+1B+1C)X.9 D. ENERGY SAVINGS (+) / (-) ANALYSIS DATE ANNUAL SAVINGS, UNIT COST \$ DISCOUNTED SAVINGS2. ENERGY SAVINGS (+) / (-) ANALYSIS DATE ANNUAL SAVINGS, UNIT COST \$ DISCOUNTED SAVINGSFUEL \$ (METU(1) METU/YR(2) SAVINGS (3) FACTOR(4) D. SAVINGS (3) FACTOR(4) SAVINGS (5) FACTOR(4) SAVINGS (5) FACTOR(4) SAVINGS (5) FACTOR(4) SAVINGS (5) FACTOR(4) SAVINGS (5) FACTOR(4) SAVINGS (5) FACTOR(3) COST (-) A. ELEC B. DIST C. CRESID D. 0000000000000000000000000000000001. DISCOUNT FACTOR (TABLE 1) COST \$ (-)9.08 (2) DISCOUNT FACTOR (TABLE 1) SAVINGS (+) COST \$ (-)(1) OCCURRENCE(2) FACTOR (3) COST(-)101. TEM COST \$ (-)(1) OCCURRENCE(2) FACTOR (3) COST(-)1001. TEM SAVING \$ (+) YEAR OF COST \$ (-)(2)1001. TOTAL00100001. TOTAL00000001. TOTAL00<	LOCATION	1:	FRENCH CREEK		PROJECT NO.		1988
REGION NUMBER:4ECONOMIC LIFE IN YEARS:22ANALYSIS DATE:JUNE 23 1987PREPARED BY:LO SUNDE1. INVESTMENT COST\$18,733A. CONSTRUCTION COST\$18,733B. SIOH1,032C. DESIGN COST1,132D. ENERGY CREDIT CALC (1A+1B+1C)X.918,800F. TOTAL INVESTMENT (1D-1E)\$SALVAGE VALUE OF EXISTING EQUIPMENT\$F. TOTAL INVESTMENT (1D-1E)\$SALEC8.150OCSTSAVINGS ANUAL \$PUEL\$/METU(1)MALYSIS DATE ANNUAL SAVINGS, UNIT COST \$DISCOUNTED SAVINGSFUEL\$/METU(1)MALYSIS DATE0O. C. RESID0O. C. RESID0O. C. RESID0O. O. O.A. ANNUAL RECURRING (+/-)A. ANNUAL RECURRING (+/-)S. OST \$ (-)(1) OCCURRENCE(2) FACTOR (3)COST \$ (-)(1) OCCURRENCE(2) FACTOR (3)COST \$ (-)(1) OCCURRENCE(2) FACTOR (3)C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+), COST (-)A. O. O. 1O. O. 1O. 0C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+), COST (-)A. TOTALO. O. 1D. PROJECT NON ENERGY QUALIFICATION TEST(1) 25% MAX NON ENERGY QUALUFICATION TEST(1) 25% MAX NON ENERGY QUALC (2F5 X.33)A. IF 3DI I				N	FISCAL YEAR	• • • • • • • • • • • • • • • • • • •	1900
ANALYS IS DATE:JUNE 23 1987PREPARED BY:LO SUNDE1. INVESTMENT COST A. CONSTRUCTION COST B. SIOH C. DESIGN COST\$18,733 1,033 1,122 18,8011. INVESTMENT COST B. SALVAGE VALUE OF EXISTING EQUIPMENT F. TOTAL INVESTMENT (1D-1E)\$18,801 1,033 1,1222. ENERGY CREDIT CALC (1A+1B+1C)X.9 E. SALVAGE VALUE OF EXISTING EQUIPMENT F. TOTAL INVESTMENT (1D-1E)\$18,801 1,033 1,1222. ENERGY SAVINGS (+) / (-) ANALYSIS DATE ANNUAL SAVINGS, UNIT COST \$ DISCOUNTED SAVINGSDISCOUNTE SAVINGS (3) FACTOR(4) SAVINGS(5)DISCOUNT SAVINGS(5) A ELEC8.15 O007. FUEL FUEL S. (ABTU)\$SAVINGS MBTU/YR(2) SAVINGS (3) FACTOR(4) SAVINGS(5)DISCOUNT SAVINGS(5) A ELEC8.15 O000. D0000000. RECUR CORL D. NG000000. RECUR CORL (CALL (2) DISCOUNT FACTOR (TABLE 1) COST \$ (-)\$22221.1 DISCOUNT FACTOR (TABLE 1) COST \$ (-)9.08 (2) DISCOUNTED SAVINGS(+) / COST (-)DISCOUNTED DISCOUNTED SAVINGS (+) / COST (-)1. TEM SAVING \$ (+) / COST (-) COST \$ (-)(1) OCCURRENCE(2) FACTOR (3) COST (-) (4)20a. 0010c. 10 TAL000c. 10 TAL010c. 10 TAL010c. 10 TAL010c. 11 SDID IS < > CCALC SIR - (2F5+3D1)/1F c. IF SDID IS <>1FROJECT TONE ENERGY QUALIFICATION TEST <b< td=""><td></td><td></td><td></td><td></td><td>ECONOMIC IT</td><td>FE TN VEADS.</td><td>25</td></b<>					ECONOMIC IT	FE TN VEADS.	25
1. INVESTMENT COST A. CONSTRUCTION COST S. SION S. SION C. DESIGN COST D. ENERGY CREDIT CALC (1A+1B+1C)X.9 E. SALVAGE VALUE OF EXISTING EQUIPMENT F. TOTAL INVESTMENT (1D-1E) 2. ENERGY SAVINGS (+) / (-) ANALYSIS DATE ANNUAL SAVINGS, UNIT COST \$ DISCOUNTED SAVINGS COST SAVINGS ANNUAL \$ DISCOUNT DISCOUNTED FUEL \$/MBTU(1) MBTU/YR(2) SAVINGS (3) FACTOR(4) B. DIST O COST SAVINGS ANNUAL \$ DISCOUNT DISCOUNTED FUEL \$/MBTU(1) MBTU/YR(2) SAVINGS (3) FACTOR(4) B. DIST O COST COST SAVINGS ANNUAL \$ DISCOUNT DISCOUNTED FUEL \$/MBTU(1) MBTU/YR(2) SAVINGS (3) FACTOR(4) B. DIST O COST C. RESID O D. NG C. RESID O C. CALL 2.23 2.819 6.285 13.5 84.85 3. NON ENERGY SAVINGS (+) / COST (-) A. ANNUAL RECURRING (+/-) COST \$ (-) (1) OCCURRENCE(2) FACTOR (3) COST (-) (4) A. O C. TOTAL A. O C. TOTAL O C. TOTAL NON ENERGY SAVINGS (+) YEAR OF DISCOUNTED ITEM SAVING \$ (+) YEAR OF DISCOUNTED ITEM SAVING \$ (+) YEAR OF DISCOUNTED ITEM SAVING \$ (+) YEAR OF COST \$ (-) (1) OCCURRENCE(2) FACTOR (3) C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+), COST(-) (A) TOTAL O C. TOTAL NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X. 33) (A) IF 3DI IS < 3C CALC SIR - (2F5+3DI)/1F C. IF 3DID IS < 1 PROJECT NON ENERGY CALC (2F5 X. 33) (A) IF 3DI IS < 3C CALC SIR - (2F5+3DI)/1F C. IF 3DID IS < 1 FOOLER DOES NOT QUALIFY 4. FIRST YEAR DOLLAR SAVINGS (2F5+3C) SAVING \$ (5) (C) TOTAL NET DISCOUNTED SAVINGS (2F5+3C) (C) STAL NET DISCOUNTED SAVINGS (2F5	REGION N	NUMBER:	TIME 22 1007				
A. CONSTRUCTION COST B. SIOH SIGH C. DESIGN COST D. ENERGY CREDIT CALC (1A+1B+1C)X.9 E. SALVAGE VALUE OF EXISTING EQUIPMENT F. TOTAL INVESTMENT (1D-1E) 2. ENERGY SAVINGS (+) / (-) ANALYSIS DATE ANNUAL SAVINGS, UNIT COST \$ DISCOUNTED SAVINGS COST SAVINGS ANNUAL \$ DISCOUNT DISCOUNTED SAVINGS (+) / (-) ANALYSIS DATE ANNUAL SAVINGS, UNIT COST \$ DISCOUNTED SAVINGS COST SAVINGS ANNUAL \$ DISCOUNT DISCOUNTED FUEL \$/METU(1) METU/YR(2) SAVINGS (1) FACTOR(4) SAVINGS (5) A. ELEC 8.15 0 0 0 0 D. NG 0 0 0 0 0 C. RESID 0 0 0 0 0 0 D. NG 0 0 0 0 0 0 E. COAL 2.23 2,819 6,285 13.5 84,85 F. TOTAL \$ 2,819 6,285 84,85 3. NON ENERGY SAVINGS (+) / COST (-) A. ANNUAL RECURRING (+/-) \$ 22 (1) DISCOUNTE FACTOR (TABLE 1) 9.08 (2) DISCOUNTED SAVINGS (+) / COST (-) DISCOUNTED ITEM SAVING \$ (+) YEAR OF DISCOUNT SAVINGS (+) COST \$ (-)(1) OCCURRENCE(2) FACTOR (3) COST(-) (4) a. 0 0 1 0 c. 0 0 1 0 c. 0 0 1 0 c. 10 0 1 0 c. 0 0 1 0 c. 10 0 1 0 c. 117 DISCOUNTED SAVINGS (+), COST(-) (3A243B44) 20 D. PROJECT NON ENERGY DISCOUNTED SAVINGS (+), COST(-) (3A243B44) 20 D. PROJECT NON ENERGY UALLFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X. 33) a. IF 3DI IS -> 3 C CALC SIR - (2F5+3DI)/1F c. IF 3DIL IS -> 1 GO TO ITEM 4 b. IF 3DI IS < 1 FOO ITEM 4 d. IF 3DIL IS < 1 FOO ITEM 4 d. IF ADIL IS < 1 FOO ITEM A	ANALYSIS	5 DATE:	JUNE 23 1987		FREFARED BI		LO SONDE
b. STOH b. STOH c. DESIGN COST c. TOTAL NON ENERGY DISCOUNTED SAVINGS c. TOTAL COST c. TOTAL COST c. TOTAL NON ENERGY DISCOUNTED SAVINGS c. TOTAL NON ENERGY CALC (2F5 X. J3) c. IF JDIL IS -> J CO TIEM 4 c. IF JDIL IS -> J CO TO TIEM 4 c. IF JDIL IS -> J CO TO TIEM 4 c. IF JDIL IS -> J CO TO TIEM 4 c. TOTAL NOL ENERGY CALC (2F5 X. J3) c. TOTAL NOL ENERGY CALC SIST - (2F5+3DI)/JF c. IF JDIL IS -> J CO TO TIEM 4 c. IF JDIL IS -> J CO TO TIEM 4 c. IF JDIL IS -> J CO TO TIEM 4 c. TOTAL NOL ENERGY CALC SIST - (2F5+3DI)/JF c. TOTAL NOL ENERGY SAVINGS (2F5+3C) c. TOTAL NET DISCOUNTED SAVINGS (2F5+3C) c. DESIGN C. DES DESIGN C. DES DISCUM C. LIFE)] \$ c. TOTAL NET DISCOUNTED SAVINGS (2F5+3C) c. DESIGN C. DESIGN C. DESIGN C. DESIGN C. LIFE)] \$ c. TOTAL NET DISCOUNTED SAVINGS (2F5+3C) c. DESIGN C. DESIGN C							10 705
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F. TOTAL \$ 2,819 6,285 84,855 3. NON ENERGY SAVINGS (+) / COST (-) A. ANNUAL RECURRING (+/-) \$ 22 (1) DISCOUNT FACTOR (TABLE 1) 9.08 9.08 (2) DISCOUNTED SAVINGS (+) / COST (-) 9.08 203 B. NON RECURRING SAVINGS (+) / COST (-) DISCOUNTED SAVINGS (+) 203 ITEM SAVING \$ (+) YEAR OF DISCOUNTED SAVINGS (+) COST \$ (-)(1) OCCURRENCE(2) FACTOR (3) COST(-) (4) \$ \$ a. 0 0 1 0 c. 10 10 0 0 28,000 d. 17 3D1 IS -> 3C CO TO ITEM 4 28,000 28,000 a. IF 3D1 IS -> 3C CO TO ITEM 4 28,000 b. IF 3D1 IS < 3C	D.	NG	0	-	-		
3. NON ENERGY SAVINGS (+) / COST (-) A. ANNUAL RECURRING (+/-) \$ 22 (1) DISCOUNT FACTOR (TABLE 1) 9.08 (2) DISCOUNTED SAVING/COST (3AX3A1) \$ 203 B. NON RECURRING SAVINGS (+) / COST (-) ITEM SAVING \$ (+) YEAR OF DISCOUNT SAVINGS (+) COST \$ (-)(1) OCCURRENCE(2) FACTOR (3) COST(-) (4) a. 0 0 1 0 b. 0 0 1 0 c. 0 0 1 0 c. 0 0 1 0 c. TOTAL 0 0 0 1 0 c. TOTAL NON ENERGY DISCOUNTED SAVINGS(+), COST(-) (3A2+3Bd4) 20 D. PROJECT NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X .33) a. IF 3D1 IS -> 3C GO TO ITEM 4 b. IF 3D1 IS -> 3C GO TO ITEM 4 d. IF 3D1 IS -> 1 GO TO ITEM 4 d. IF 3D1 IS -> 1 GO TO ITEM 4 d. IF 3D1 IS < 1 PROJECT DOES NOT QUALIFY 4. FIRST YEAR DOLLAR SAVINGS [2F3+3A+(3B1d/YRS ECONOMIC LIFE)] \$ 6,30 5. TOTAL NET DISCOUNTED SAVINGS (2F5+3C) \$ 85,05	Ε.	COAL	2.23	2,819	6,285	13.5	84,85
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(2) DISCOUNTED SAVING/COST (3AX3A1) $\$$ 203 B. NON RECURRING SAVINGS (+) / COST (-) ITEM SAVING $\$$ (+) YEAR OF DISCOUNT SAVINCS (+) COST $\$$ (-)(1) OCCURRENCE(2) FACTOR (3) COST(-) (4) a. 0 0 1 0 b. 0 0 1 0 c. 0 0 1 0 c. 0 0 1 0 c. 0 0 1 0 c. TOTAL 0 0 0 1 0 c. TOTAL 0 0 2 1 0 D. PROJECT NON ENERGY DISCOUNTED SAVINGS(+),COST(-) (3A2+3Bd4) 20 D. PROJECT NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X .33) $\$$ 28,00 a. IF 3D1 IS = > 3C GO TO ITEM 4 b. IF 3D1 IS < 3C CALC SIR = (2F5+3D1)/1F c. IF 3D1 IS < 3C CALC SIR = (2F5+3D1)/1F c. IF 3D1 IS < 1 PROJECT DOES NOT QUALIFY 4. FIRST YEAR DOLLAR SAVINGS [2F3+3A+(3B1d/YRS ECONOMIC LIFE)] $\$$ 6,30 5. TOTAL NET DISCOUNTED SAVINGS (2F5+3C) $\$$ 85,05	Α.				Ş		
B. NON RECURRING SAVINGS (+) / COST (-) ITEM SAVING \$ (+) YEAR OF DISCOUNT SAVINGS (+) COST \$ (-)(1) OCCURRENCE(2) FACTOR (3) COST(-) (4) a. 0 0 1 0 b. 0 0 1 0 c. TOTAL NON ENERGY DISCOUNTED SAVINGS(+), COST(-) (3A2+3Bd4) 20 D. PROJECT NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X .33) \$ 28,00 a. IF 3D1 IS = > 3C GO TO ITEM 4 b. IF 3D1 IS < 3C CALC SIR = (2F5+3D1)/1F c. IF 3D1b IS < 1 PROJECT DOES NOT QUALIFY 4. FIRST YEAR DOLLAR SAVINGS [2F3+3A+(3B1d/YRS ECONOMIC LIFE)] \$ 6,30 5. TOTAL NET DISCOUNTED SAVINGS (2F5+3C) \$ 85,05		(1) DIS	SCOUNT FACTOR (T	ABLE I)			
DISCOUNTEDITEM SAVING \$ (+) YEAR OFDISCOUNTSAVINGS (+) COST (-) (4)a.0010b.0010c.0010d.TOTAL0010c.00100d.TOTAL0010c.00100d.TOTAL0010c.TOTAL0010d.TOTAL NON ENERGY DISCOUNTED SAVINGS (+), COST (-)(3A2+3Bd4)20D.PROJECT NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X .33)\$28,00a.IF 3D1 IS = > 3CGO TO ITEM 4\$28,00b.IF 3D1 IS < 3C	Section 20				Contraction and the second sec	203	
ITEMSAVING \$ (+)YEAR OF COST \$ (-)(1) OCCURRENCE(2)DISCOUNT FACTOR (3)SAVINGS (+) COST(-)(4)a.0010b.0010c.0010d.TOTAL001D.PROJECT NON ENERGY DISCOUNTED SAVINGS(+),COST(-)(3A2+3Bd4)20D.PROJECT NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X .33)\$28,00a.IF 3D1 IS -> 3CGO TO ITEM 4\$b.IF 3D1 IS < 3C	В.	NON REC	CURRING SAVINGS	(+) / COST (-)	DISCOUNTED	
COST \$ (-)(1) OCCURRENCE(2) FACTOR (3) $COST(-)$ (4) a. 0 0 1 0 b. 0 0 1 0 c. 0 0 1 0 c. 0 0 1 0 c. 0 0 1 0 d. TOTAL 0 0 1 0 c. TOTAL 0 0 1 0 c. TOTAL 0 0 0 1 0 c. TOTAL 0 0 0 1 0 0 20 c. TOTAL NON ENERGY DISCOUNTED SAVINGS(+),COST(-) (3A2+3Bd4) 20 20 20 25 28,00 20<		-		WEAD OF			
a. 0 0 1 0 b. 0 0 1 0 c. 0 0 1 0 d. TOTAL 0 0 1 0 c. TOTAL NON ENERGY DISCOUNTED SAVINGS(+),COST(-) (3A2+3Bd4) 20 D. PROJECT NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X .33) \$ 28,000 a. IF 3D1 IS = > 3C GO TO ITEM 4 \$ 28,000 b. IF 3D1 IS < 3C		TTEM	SAVING 5 (+)	ILAR OF	DISCOUNT FACTOR (2)	SAVINGS (+)	(1.)
b. 0 0 1 0 c. 0 0 1 0 d. TOTAL 0 0 1 0 c. TOTAL 0 0 1 0 0 c. TOTAL 0 0 0 1 0 0 c. TOTAL 0 0 0 0 0 0 0 c. TOTAL NON ENERGY DISCOUNTED SAVINGS(+), COST(-) (3A2+3Bd4) 20 20 D. PROJECT NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X .33) \$ 28,00 a. IF 3D1 IS = > 3C GO TO ITEM 4 5 1 SC CALC SIR = (2F5+3D1)/1F 28,00 c. IF 3D1b IS < 1			cost \$ (-)(1)	OCCURRENCE(2)	FACIOR (3)	COSI(-)	(4)
 c. 0 0 1 0 d. TOTAL 0 0 c. TOTAL NON ENERGY DISCOUNTED SAVINGS(+), COST(-) (3A2+3Bd4) 20 D. PROJECT NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X .33) \$ 28,00 a. IF 3D1 IS = > 3C GO TO ITEM 4 b. IF 3D1 IS < 3C CALC SIR = (2F5+3D1)/1F c. IF 3D1b IS < 1 GO TO ITEM 4 d. IF 3D1b IS < 1 PROJECT DOES NOT QUALIFY 4. FIRST YEAR DOLLAR SAVINGS [2F3+3A+(3B1d/YRS ECONOMIC LIFE)] \$ 6,30 5. TOTAL NET DISCOUNTED SAVINGS (2F5+3C) \$ 85,05 	a.		0			0	
 d. TOTAL d. TOTAL d. TOTAL d. TOTAL d. TOTAL d. TOTAL NON ENERGY DISCOUNTED SAVINGS(+), COST(-) (3A2+3Bd4) 20 D. PROJECT NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X .33) a. IF 3D1 IS = > 3C GO TO ITEM 4 b. IF 3D1 IS < 3C CALC SIR = (2F5+3D1)/1F c. IF 3D1b IS < 1 PROJECT DOES NOT QUALIFY 4. FIRST YEAR DOLLAR SAVINGS [2F3+3A+(3B1d/YRS ECONOMIC LIFE)] \$ 6,30 5. TOTAL NET DISCOUNTED SAVINGS (2F5+3C) \$ 85,05 	b.		0				
 C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+), COST(-) (3A2+3Bd4) D. PROJECT NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X .33) a. IF 3D1 IS = > 3C GO TO ITEM 4 b. IF 3D1 IS < 3C CALC SIR = (2F5+3D1)/1F c. IF 3D1b IS < 1 PROJECT DOES NOT QUALIFY 4. FIRST YEAR DOLLAR SAVINGS [2F3+3A+(3B1d/YRS ECONOMIC LIFE)] \$ 6,30 5. TOTAL NET DISCOUNTED SAVINGS (2F5+3C) \$ 85,05 	с.		0	0	1		
 D. PROJECT NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X .33) a. IF 3D1 IS = > 3C GO TO ITEM 4 b. IF 3D1 IS < 3C CALC SIR = (2F5+3D1)/1F c. IF 3D1b IS = > 1 GO TO ITEM 4 d. IF 3D1b IS < 1 PROJECT DOES NOT QUALIFY 4. FIRST YEAR DOLLAR SAVINGS [2F3+3A+(3B1d/YRS ECONOMIC LIFE)] \$ 6,30 5. TOTAL NET DISCOUNTED SAVINGS (2F5+3C) \$ 85,05 	d.	TOTAL	0			0	
 (1) 25% MAX NON ENERGY CALC (2F5 X .33) a. IF 3D1 IS = > 3C GO TO ITEM 4 b. IF 3D1 IS < 3C CALC SIR = (2F5+3D1)/1F c. IF 3D1b IS = > 1 GO TO ITEM 4 d. IF 3D1b IS < 1 PROJECT DOES NOT QUALIFY 4. FIRST YEAR DOLLAR SAVINGS [2F3+3A+(3B1d/YRS ECONOMIC LIFE)] \$ 6,30 5. TOTAL NET DISCOUNTED SAVINGS (2F5+3C) \$ 85,05 	C.	TOTAL I	NON ENERGY DISCO	OUNTED SAVINGS	(+),COST(-)	(3A2+3Bd4) 203
 (1) 25% MAX NON ENERGY CALC (2F5 X .33) a. IF 3D1 IS = > 3C GO TO ITEM 4 b. IF 3D1 IS < 3C CALC SIR = (2F5+3D1)/1F c. IF 3D1b IS = > 1 GO TO ITEM 4 d. IF 3D1b IS < 1 PROJECT DOES NOT QUALIFY 4. FIRST YEAR DOLLAR SAVINGS [2F3+3A+(3B1d/YRS ECONOMIC LIFE)] \$ 6,30 5. TOTAL NET DISCOUNTED SAVINGS (2F5+3C) \$ 85,05 	D.	PROJEC	T NON ENERGY OUA	LIFICATION TE	ST		
 a. IF 3D1 IS = > 3C GO TO ITEM 4 b. IF 3D1 IS < 3C CALC SIR = (2F5+3D1)/1F c. IF 3D1b IS = > 1 GO TO ITEM 4 d. IF 3D1b IS < 1 PROJECT DOES NOT QUALIFY 4. FIRST YEAR DOLLAR SAVINGS [2F3+3A+(3B1d/YRS ECONOMIC LIFE)] \$ 6,30 5. TOTAL NET DISCOUNTED SAVINGS (2F5+3C) \$ 85,05 						\$	28,00
 b. IF 3D1 IS < 3C CALC SIR = (2F5+3D1)/1F c. IF 3D1b IS = > 1 GO TO ITEM 4 d. IF 3D1b IS < 1 PROJECT DOES NOT QUALIFY 4. FIRST YEAR DOLLAR SAVINGS [2F3+3A+(3B1d/YRS ECONOMIC LIFE)] \$ 6,30 5. TOTAL NET DISCOUNTED SAVINGS (2F5+3C) \$ 85,05 	1.900						
 c. IF 3D1b IS = > 1 GO TO ITEM 4 d. IF 3D1b IS < 1 PROJECT DOES NOT QUALIFY 4. FIRST YEAR DOLLAR SAVINGS [2F3+3A+(3B1d/YRS ECONOMIC LIFE)] \$ 6,30 5. TOTAL NET DISCOUNTED SAVINGS (2F5+3C) \$ 85,05 					2F5+3D1)/1F		
d. IF 3D1b IS < 1PROJECT DOES NOT QUALIFY4. FIRST YEAR DOLLAR SAVINGS [2F3+3A+(3B1d/YRS ECONOMIC LIFE)]\$ 6,305. TOTAL NET DISCOUNTED SAVINGS (2F5+3C)\$ 85,05		c. IF	3D1b IS $= > 1$	GO TO ITEM 4			
5. TOTAL NET DISCOUNTED SAVINGS (2F5+3C) \$ 85,05		d. IF	3D1b IS < 1	PROJECT DOES	NOT QUALIFY		
	4. FIRS	T YEAR	DOLLAR SAVINGS	[2F3+3A+(3B1d/	YRS ECONOMI	C LIFE)] \$	6,30
	5. TOTA	L NET D	ISCOUNTED SAVING	GS (2F5+3C)		\$	85,05
	- And States of Control of Contro						



4.4 NIGHT SETBACK

<u>Introduction</u> - This ECO discusses energy and cost savings which would be realized by installing night setback temperature controls in many buildings at this installation. These controls would be stand-alone controls that are compatible with the existing Energy Management Control System (EMCS) which is controlled by a Hewlett Packard (HP) 1000 computer.

Existing Condition - Many buildings at this installation are heated to maintain a constant temperature regardless of whether they are occupied or not.

Substantial amounts of energy can be saved by maintaining a lower space temperature during unoccupied hours. This applies only to facilities that do not operate 24 hours per day. This can be accomplished by sending a signal from the a time clock to a new steam shutoff valve to close during unoccupied hours and to open prior to morning startup to bring the building back up to temperature. A new space temperature sensor would be installed in a north perimeter zone in the buildings to override the time clock to avoid the possibilty of pipe freezing. The standard setback amount to be used is 10 degrees F.

<u>Calculation Methodology</u> - Following is the methodology used to calculate energy savings from night setback of building steam or hot water systems.

Reference: CR82.030 "Standardized EMCS Energy Savings

Calculations." pg. 50

Energy Savings =

 BTT x AZ x SD x (168-H) xWKWx
 1 MBtux
 1

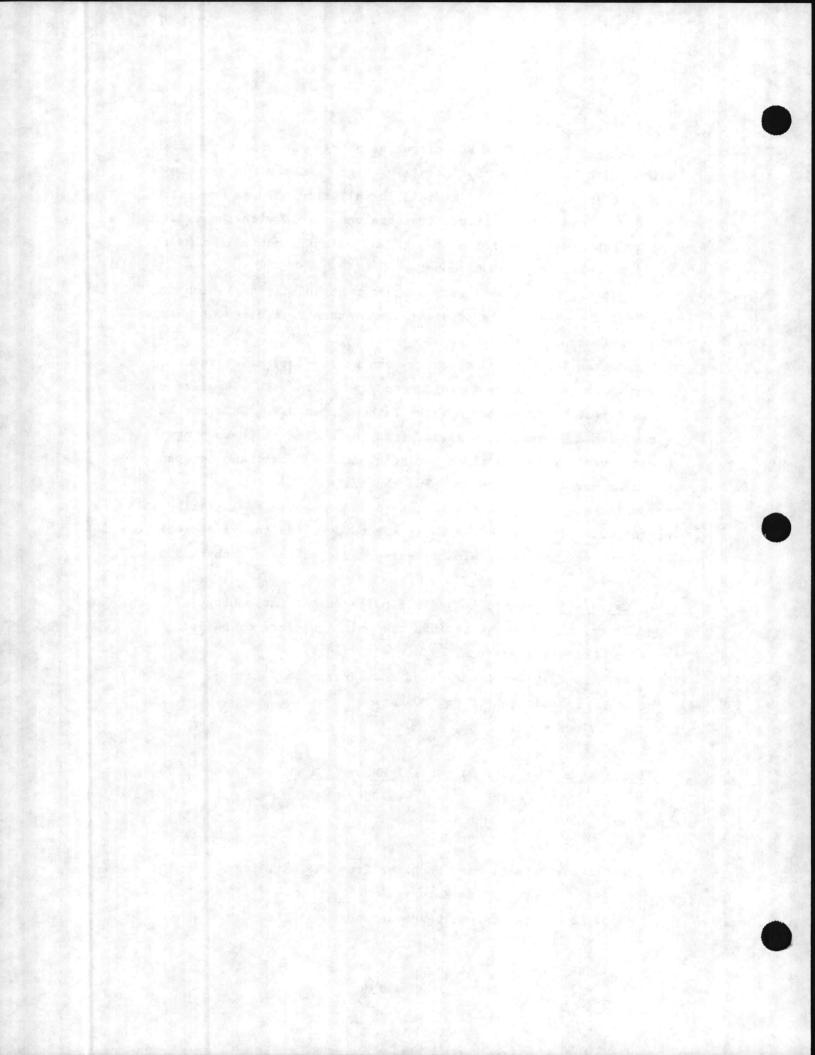
 HEFF
 1x106BTu
 Plant Eff.

Where:

Enery Savings = Rate of heat transfer from the building boundary in MBtu/yr

AZ = Area of zone being served in sq. ft.

4-25



- BTT = Building thermal transmission in Btu/hr. deg. F. sq. ft. (see below)
 - H = Hours of operation per week during which the normal setpoint applies.
- HEFF = Heating efficiency of the distribution system and heating equipment (use 0.90 per REFERENCE).
 - SD = Thermostat setback for unoccupied periods during the heating season in deg. F. (use 10)
 - WKW = Length of winter heating season in weeks per year (see below)
- Plant Eff. = Efficiency of the steam generating plant (See Section 3.2 "Fuel Costs and Efficiencies")

BTT = (Uo x AW)+(Ix1.08 Btu/cfm-deg. F - hr))/AF

Where: AW = Total Area of exterior surfaces in sq. ft.

AF = Total floor area of the building in sq. ft.

Uo = Combined U-factor for all exterior surfaces (wall, windows, doors, roof) in Btu/sq. ft.hr. deg. F.

I = Total infiltration for building in cfm

Uo = Uwall Awall + Uwindow Awindow + Udoor Adoor + Uroof Aroof AW

Where: Uwall, window, roof = Values in Section 3.3

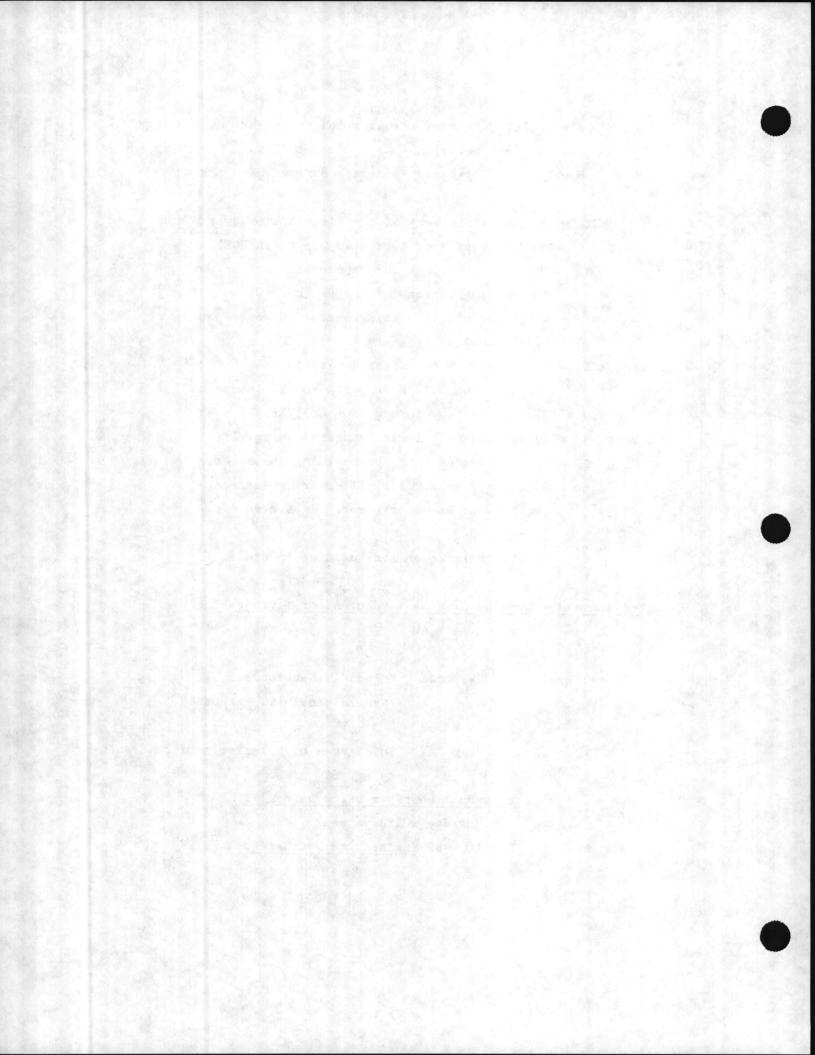
"General Analysis Methods."

Udoor = 0.3

AW = Total area of exterior surfaces

in sq. ft.

Total annual hours/yr below 55 deg. F WKW = 24 hrs/day x 7 days week NAVFAC P-89 Engineering Weather Data Reference:



Temp. Range	Annual Total
deg.F	Hours
50/54	684
45/49	636
40/44	578
35/39	425
30/34	302
25/29	152
20/24	51
15/19	14
10/14	2
Total	2844 hr./yr.

```
WKW = \frac{2844 \text{ hr./yr.}}{}
```

24hr/day x 7 day/wk.

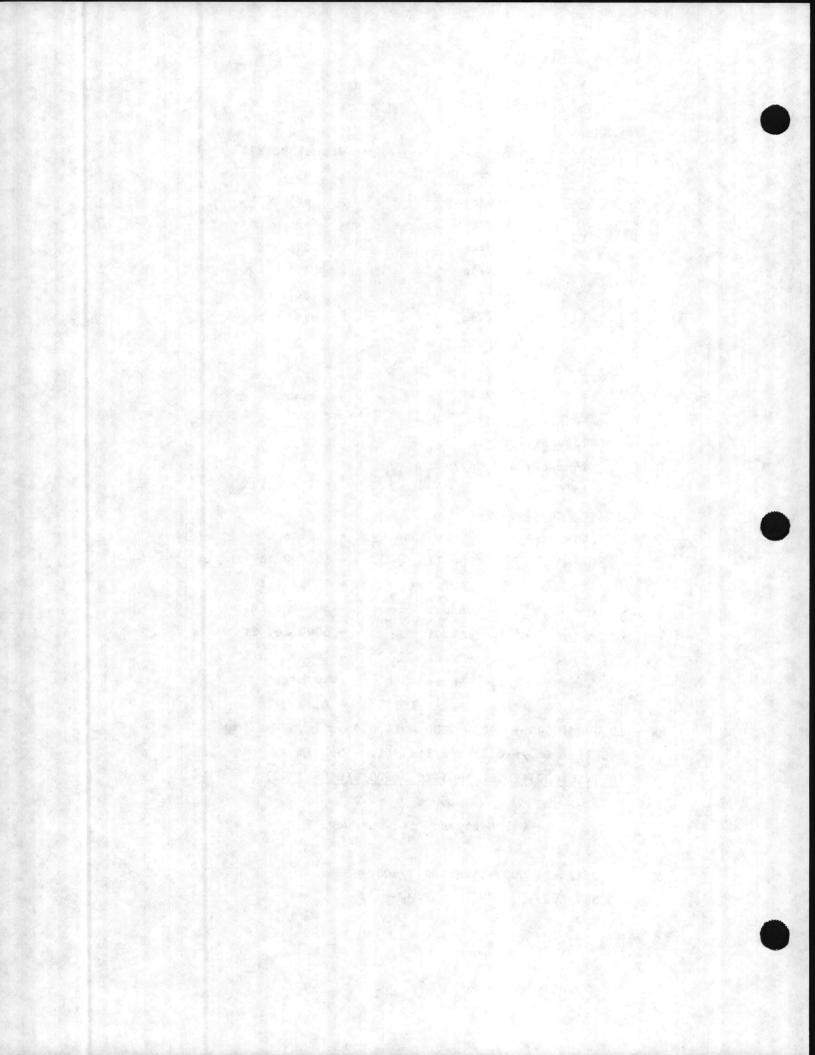
```
= 16.9 wks./yr.
```

```
Calculation Example:
```

Structure Type = Office Given: 1. = 10,000 sq. ft. Awall 2. = 500 sq. ft. Awindow 3. = 500 sq. ft. Adoor 4. = 3000 sq. ft. 5. Aroof = 200 lin. ft. Crack 6. = 40/week7. Hours = 0.73 Plant Eff. 8. AW = 10,000 + 500 + 500 + 3000 = 14,000 sq ft.I = 200 lin. ft. x 0.25 cfm/lin. ft. = 50 cfm $U_0 = (0.1x10,000) + (0.62x500) + (0.3x500) + (0.09x3000)$ 14000

= 0.124 Btu/sq. ft.- hr-deg. F

BTT = [(0.124x14,000)+(50x1.08)]/3000 = 0.597 Btu/sq. ft. - hr-deg. F



Energy Savings =

0.597x3000x10x(168-40)x16.9 x 1 MBtu/1x106 Btu x 1/0.73

0.90

= 58.97 MBtu/yr

<u>Cost Estimate</u> - The items and associated costs required to accomplish night setback are as follows:

Hot Water Heat (Steam/HW Converter)

Item	<u>Materials</u>	Labor	Total
Space temperature sensor	119	17	136
Outside air	119	17	136
temperature ser	nsor		
Time clock	470	35	505
(digital)			
Motorized steam	414	92	506
valve			
Pneumatic valve	204	44	248
controller			
EP transducer	239	44	283

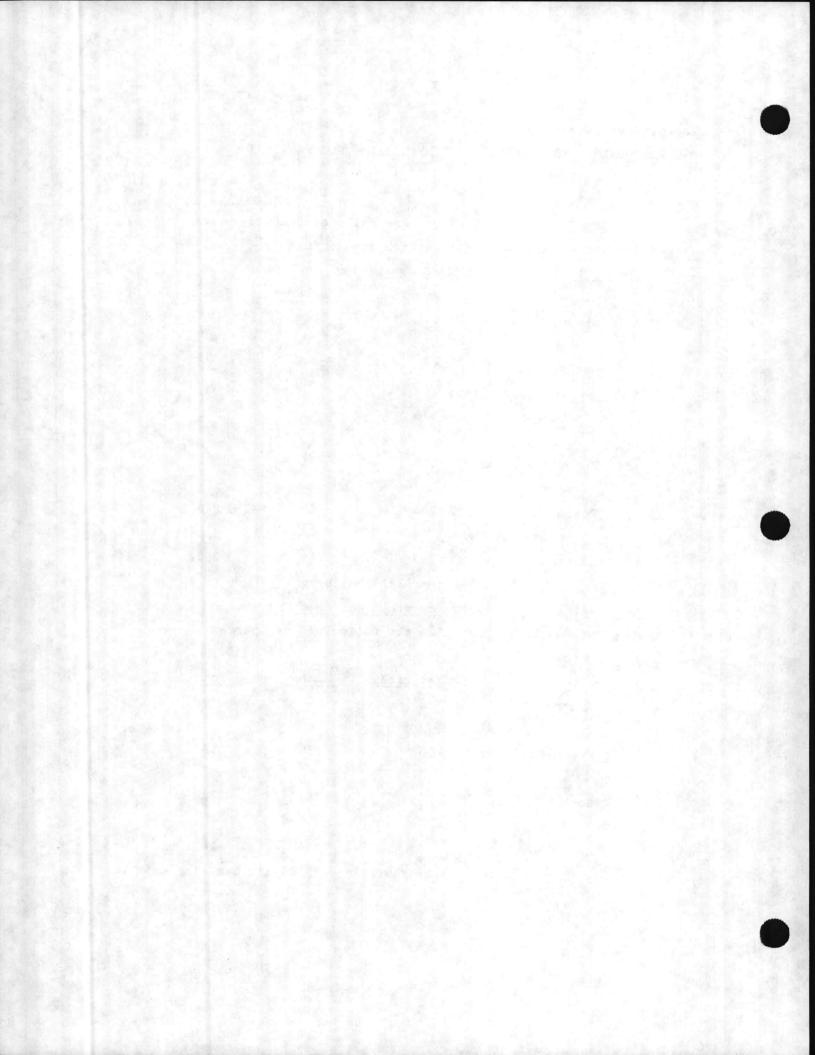
Total Cost = \$1814/building

Steam Heat (AHU, radiator, or steam unit heater)

Same as for Hot Water Heat plus the following cost per air handling unit:

Item	Materials	Labor	Total
Control relay- start/stop	25	44	69
Pneumatic damper actuator	133	30	163
Control relay- damper	25	44	69
EP valve	72	30	102

Total = \$1814/building + \$403/air handling unit



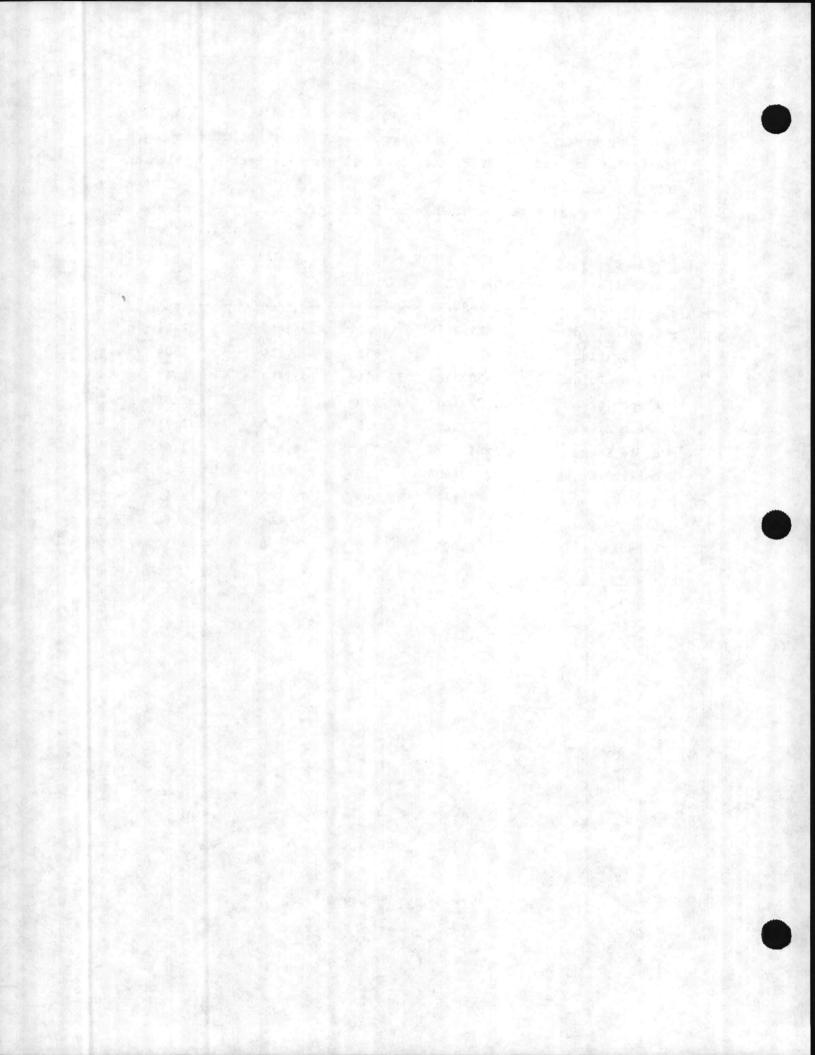
<u>Summary</u> - The following pages present individual building energy savings and cost estimates for all buildings at each installation, and the ECIP sheets for all night setback ECOs with an SIR greater than 1.0.

	ENERGY SA	VINGS	CAPITAL COST		
INSTALLATION	MBTU/YR	\$/YR	\$	SIR	
Hospital Point	1,829.814	4,080	5,442	2.06	
Air Station	219.512	638	1,814	4.04	
Hadnot Point	16,830.220	37,531	103,798	3.67	
French Creek	1,027.128	2,290	11,286	2.06	
Beach Area	312.322	908	5,240	1.76	
Rifle Range	245.997	715	4,434	1.64	
Courthouse Bay	270.440	786	5,442	1.47	
Camp Johnson	788.140	2,293	19,147	1.22	
Camp Geiger	199.335	580	5,442	1.08	
Paradise Point	0.000	0	0	0	

The results of the life-cycle analysis are listed below:



4-29

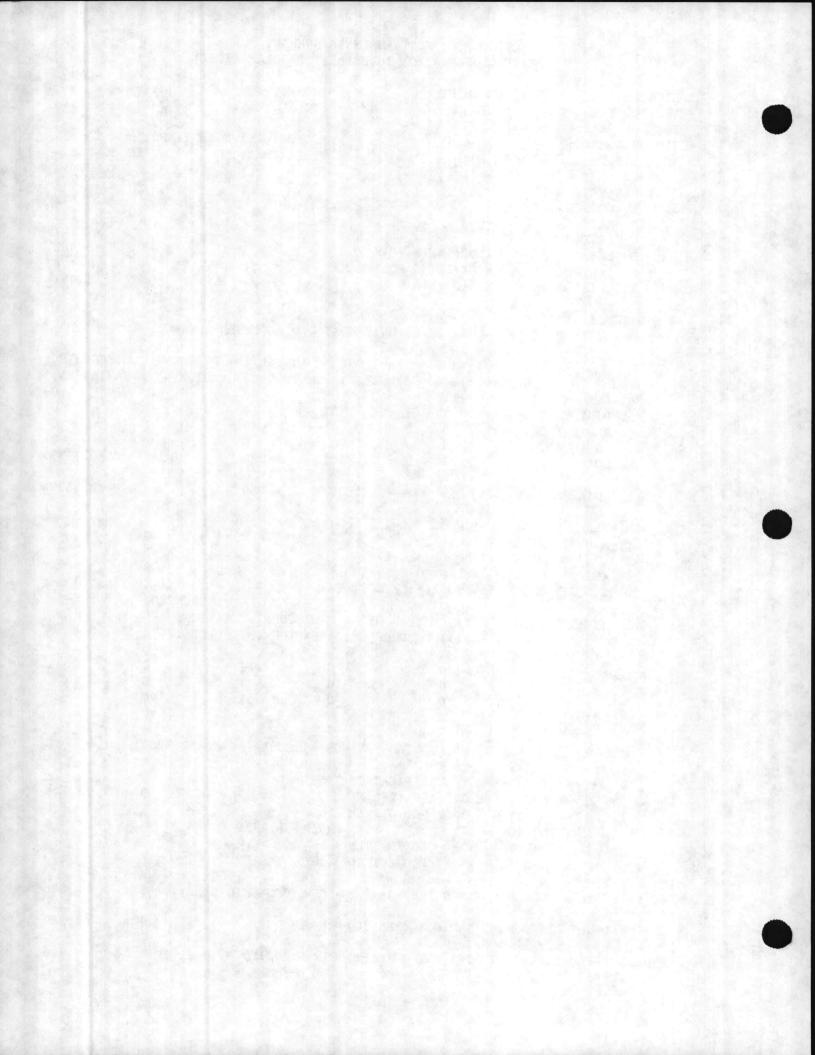


	ENERGY CONSERVA	TION INVESTME.	NI PROGRAM (EOII)	
LOCATION:	HOSPITAL POINT		PROJECT NO.		
PROJECT TITLE:	NIGHT SETBACK		FISCAL YEAR:		1988
PORTION NAME:					전 문화가 있는 것
REGION NUMBER:	4		ECONOMIC LIF		15
ANALYSIS DATE:	JUNE 23 1987		PREPARED BY:	I	LO SUNDE
1. INVESTMENT C	OST				
A. CONSTRU				\$	5,442
B. SIOH	OTION CODI				299
C. DESIGN	COST				327
D ENERGY	CREDIT CALC (1A+	1B+1C)X.9			5,461
E. SALVAGE	VALUE OF EXISTI	NG EQUIPMENT			0
F. TOTAL I	NVESTMENT (1D-1E	5)		\$	5,461
2. ENERGY SAVIN ANALYSIS D	GS (+) / (-) ATE ANNUAL SAVIN	IGS, UNIT COST	r \$ DISCOUNTH	ED SAVINGS	
	COST	SAVINGS	ANNUAL \$	DISCOUNT	DISCOUNTED
FUEL	\$/MBTU(1)	MBTU/YR(2)	SAVINGS (3)	FACTOR(4)	SAVINGS(5)
A. ELEC	8.15	0	0	0	0
B. DIST	0	0	0	0	0
C. RESID	0	0	0	0	0
D. NG	0	0		0	0
E. COAL	2.23	1,830	4,080	10.18	41,539
F. TOTAL	\$	1,830	4,080		41,539
3 NON ENERCY	SAVINGS (+) / COS	ST (-)			
	RECURRING (+/-)		\$	0	
	SCOUNT FACTOR (T.	ABLE 1)		7.61	
(2) DIS	SCOUNTED SAVING/	COST (3AX3A1)	\$	0	
B NON REC	CURRING SAVINGS	(+) / COST (-)		
D. NON REA		••••		DISCOUNTED	
ITEM	SAVING \$ (+)	YEAR OF		SAVINGS (+)	
	COST \$ (-)(1)	OCCURRENCE(2)	FACTOR (3)	COST(-) ((4)
9	0	0	1	0	
a. b.	0	0		0	
с.	0	0	1	0	
d. TOTAL	0			0	
C. TOTAL	NON ENERGY DISCO	UNTED SAVINGS	(+),COST(-)	(3A2+3Bd4)) 0
D. PROJEC	T NON ENERGY QUA AX NON ENERGY CA	LIFICATION IE	3)	\$	13,708
(1) 23% M	3D1 IS = > 3C	GO TO ITEM 4			
a. IF	3D1 IS < 3C		(2F5+3D1)/1F		0
D. IF	3D1b IS $= > 1$	GO TO ITEM 4			
c. IF d. IF	3D1b IS < 1	PROJECT DOES	NOT QUALIFY		
				C LIFE)] \$	4,080
4. FIRST YEAR	DOLLAR SAVINGS	[2F3+3A+(3DId)	IND ECONOMIC		

6. SIR (IF < 1 PROJECT DOES NOT QUALIFY) SIR = (5/1F) = 7.6

41,539

5. TOTAL NET DISCOUNTED SAVINGS (2F5+3C)

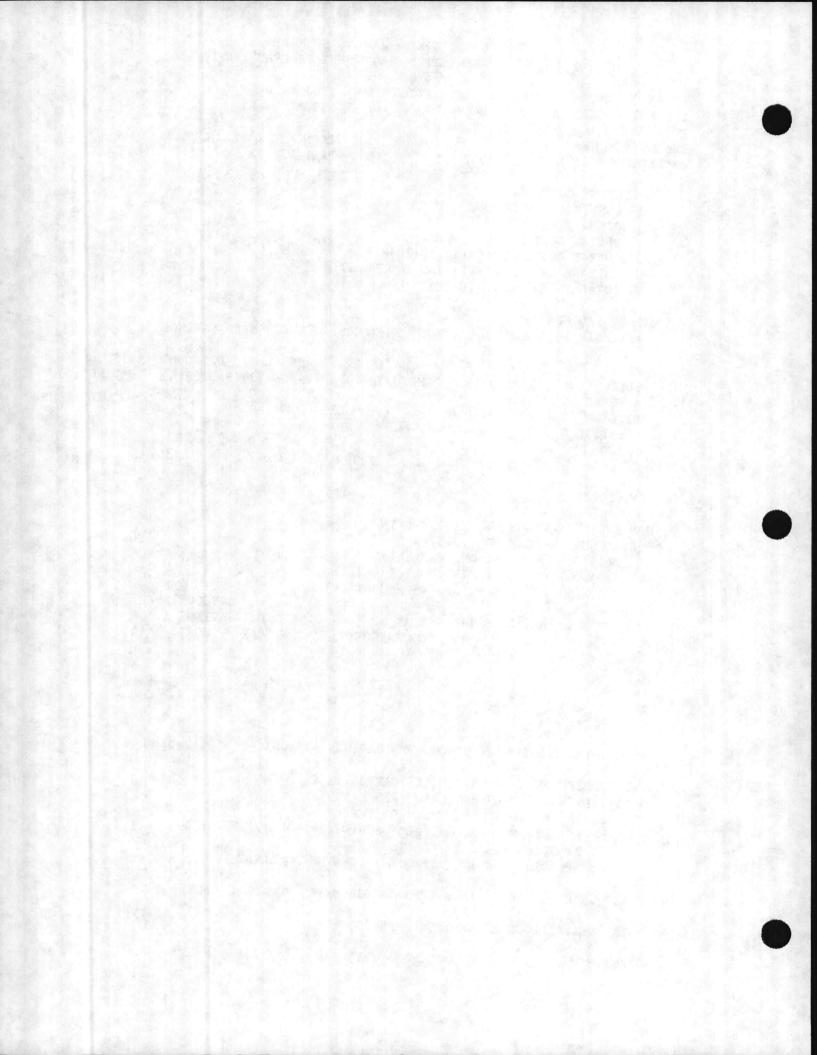


LOCATION: NEW RIVER AIR STATION PROJECT TITLE: NIGHT SETBACK	PROJECT NO. FISCAL YEAR:		1988
PORTION NAME: MISC. BLDGS REGION NUMBER: 4 ANALYSIS DATE: JUNE 23 1987	ECONOMIC LIFE IN PREPARED BY:	N YEARS: LO	15 SUNDE
1. INVESTMENT COST A. CONSTRUCTION COST B. SIOH C. DESIGN COST		\$	19,752 1,086 1,185 19,821
D. ENERGY CREDIT CALC (1A+1B+1C)X.9 E. SALVAGE VALUE OF EXISTING EQUIPMENT	r	\$	19,821 19,821

F. TOTAL INVESTMENT (1D-1E)

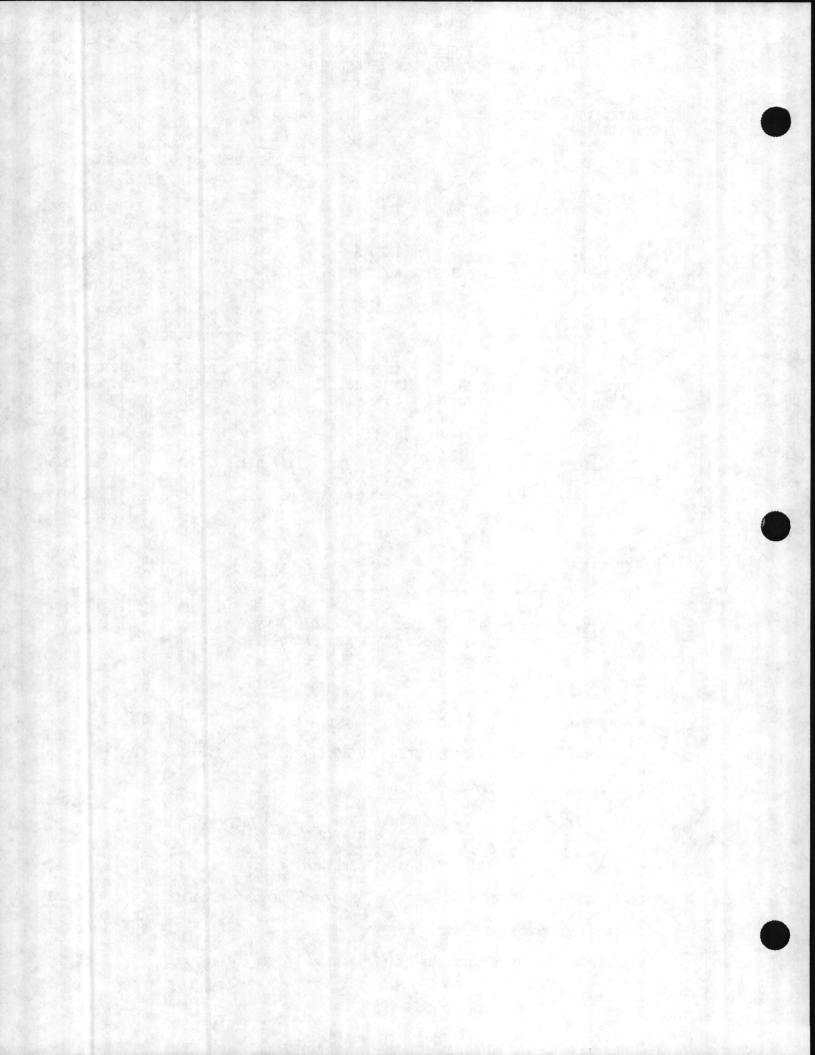
3

		COST	SAVINGS	ANNUAL	\$	DISCOUNT	DISCOUNTED	
	FUEL		MBTU/YR(2)	SAVINGS	(3)	FACTOR(4)	SAVINGS()	
	A. ELEC		0		0		Checklor States and States	
	B. DIST		0		0	0	0	
	C. RESI		0		0	0	0	
	D. NG	0			-			
	E. COAL	2.91	1,734	5,0)47	10.18	51,379	
	F. TOTA	۱L \$	1,734	5,0)47		51,379	
3.	NON ENERG	GY SAVINGS (+) / CO	OST (-)			0		
	A ANNI	JAL RECURRING (+/-)		\$	7.61		
	(1)	DISCOUNT FACTOR (TABLE 1)					
	(2)	DISCOUNTED SAVING	/COST (3AX3A1)		\$	0		
	B. NON	RECURRING SAVINGS	(+) / COST (-)		DISCOUNTED		
					-	DISCOUNTED		
	ITE	M SAVING \$ (+) COST \$ (-)(1)	YEAR OF OCCURRENCE(2)	FACTOR	r (3)	COST(-)	(4)	
		0)	1	0		
	а.	0 0		5	1	0		
	b.	Ő		5	1	0		
	c. d. TOT					0		
		AL NON ENERGY DISC	COUNTED SAVING	S(+),COST	:(-)	(3A2+3Bd4	.)	0
		JECT NON ENERGY QU						
	D. PRC	S MAX NON ENERGY	CALC (2F5 X .3	3)		Ş	; 16,95	5
		TT 201 TC > 2C	CO TO ITEM 4					
	a.	$\frac{11}{15} \frac{301}{15} \frac{15}{20} \frac{30}{15}$	CALC SIR =	(2F5+3D1))/1F			0
	D.	IF 3D1 IS = > 3C IF 3D1 IS $< 3C$ IF 3D1b IS = > 1	GO TO ITEM 4					
	с. d.	IF 3D1b IS < 1	PROJECT DOES	NOT QUAL	LIFY			
4		EAR DOLLAR SAVINGS					\$ 5,04	۶
							\$ 51,37	79
		ET DISCOUNTED SAVI		a state -			in the state	6
6	. SIR (IF	< 1 PROJECT DOES	NOT QUALIFY) S	SIR = (5/	1F)		2.	.6

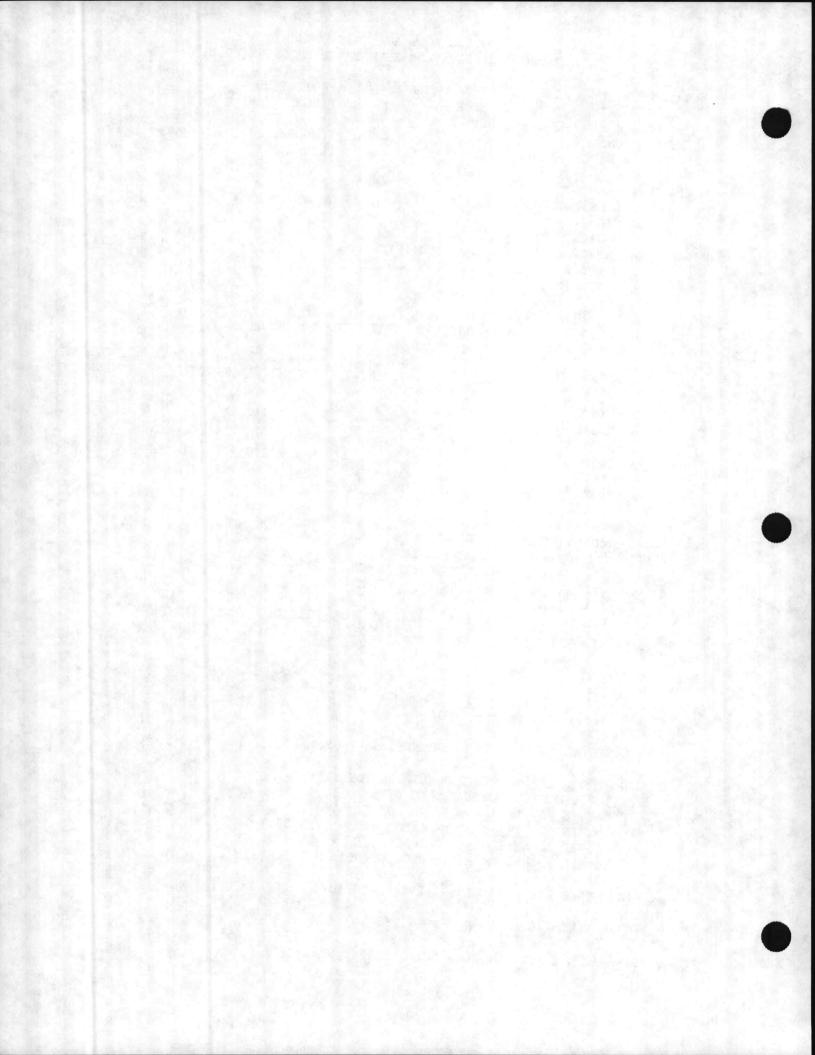


LOCATION:	HADNOT POINT	PROJECT 1	NO.		
PROJECT TITLE:	NIGHT SETBACK	FISCAL Y	EAR:		1988
PORTION NAME:	MISC. BLDGS				
REGION NUMBER:	4	ECONOMIC	LIFE	IN YEARS:	15
ANALYSIS DATE:	JUNE 23 1987	PREPARED	BY:	LO	SUNDE
1. INVESTMENT (COST				
A. CONSTRU	JCTION COST			\$	103,798
B. SIOH					5,709
C. DESIGN	COST				6,228
D. ENERGY	CREDIT CALC (1A+1B+1C)X.9				104,161
	VALUE OF EXISTING EQUIPMEN	r			0
	INVESTMENT (1D-1E)			\$	104,161

	FIL	EL	COST	SAVINGS MBTU/YR(2)	ANNUAL \$	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
		ELEC	8.15		0	0	0
		DIST	0.15	0	Ő	0	Ō
		RESID	0	0	0	0	0
		NG	ő	Ő	Ő		0
		COAL	2.23	16,830	37,531	10.18	382,070
	F.	TOTAL	\$	16,830	37,531		382,070
3.	NON	ENERGY	SAVINGS (+) / C	OST (-)			
	Α.	ANNUAL	RECURRING (+/-)	\$	\$ 0	
		(1) DI	SCOUNT FACTOR (TABLE 1)		7.61	
	R	(2) DI	SCOUNTED SAVING CURRING SAVINGS	/COST (3AX3A1)	,	ş 0	
	Б.	NON RE	CORKING DAVINGD	(1) / 0001 (DISCOUNTED	
		TTEM	SAVING \$ (+)	YEAR OF	DISCOUNT	SAVINGS (+)	
		IIIII	COST \$ (-)(1)	OCCURRENCE(2)	FACTOR (3)		(4)
	а.		0	0	1	0	
	b.		0	0	1	0	
	c.		0	0	1	0	
	d.	TOTAL	0			0	
	C.	TOTAL	NON ENERGY DISC	OUNTED SAVINGS	(+),COST(-)	(3A2+3Bd4)	0
	D	DDOIEC	T NON ENERGY QU	ATTETCATTON TE	ст		
			AX NON ENERGY C			\$	126,083
	(1		3D1 IS = > 3C				120,000
		a. IF	3D1 IS < 3C	CALC STR = $($	255+301)/15		0
			3D1b IS = > 1		2131301)/11		
		d. IF	3D1b IS < 1	PROJECT DOES	NOT QUALIFY		
4.	FIRS	T YEAR	DOLLAR SAVINGS	[2F3+3A+(3B1d/	YRS ECONOMI	C LIFE)] \$	37,531
5.	TOTA	L NET D	ISCOUNTED SAVIN	GS (2F5+3C)		\$	382,070
6.	SIR	(IF < 1	PROJECT DOES N	OT QUALIFY) SI	R = (5/1F)	-	3.7

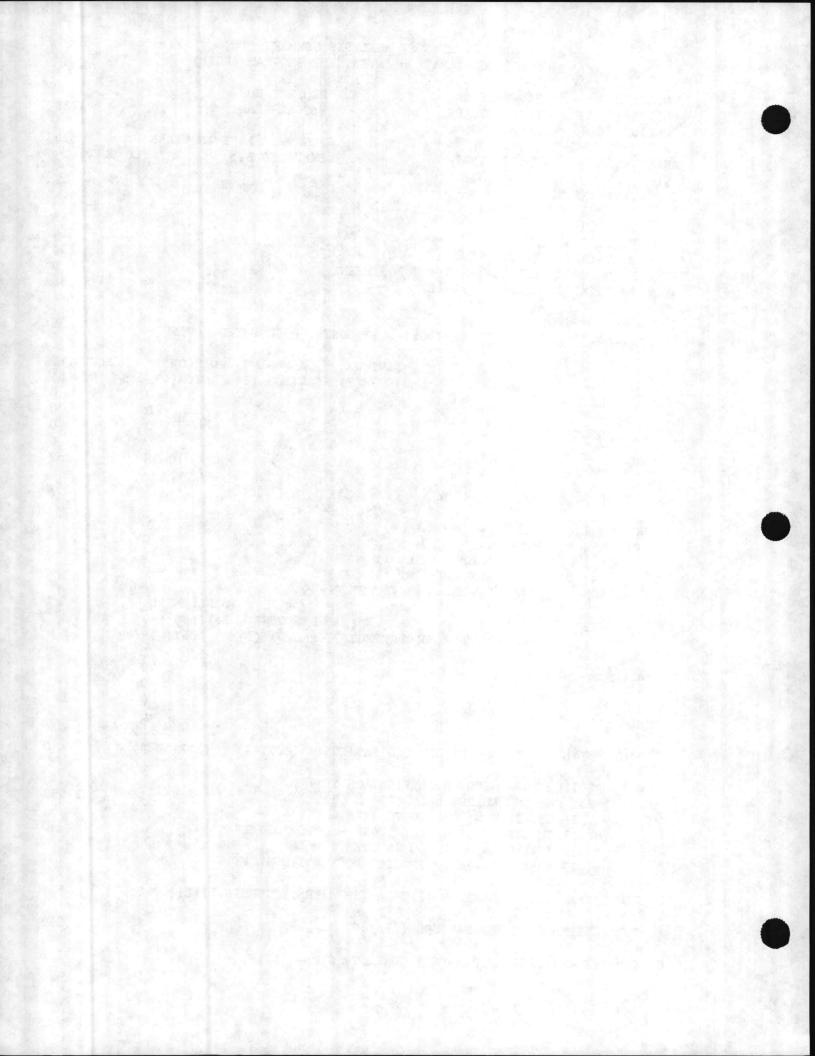


	ENERGI COLLE				
	FRENCH CREEK	I	ROJECT NO.		
OCATION:	NTCHT SETBACK	I	ISCAL YEAR:		1988
ROJECT TITLE:	NIGHT SETBACK				
ORTION NAME:	MISC. BLDGS	1	CONOMIC LIF	E IN YEARS:	15
EGION NUMBER:			PREPARED BY:	I	LO SUNDE
NALYSIS DATE:	JUNE 23 1987				
. INVESTMENT C	TROST				11 006
. INVESTMENT C	ICTION COST			Ş	11,286
	UTION OUDI				621
B. SIOH	200T				677
C. DESIGN	COST	10.1CVV 0			11,326
D. ENERGY	CREDIT CALC (1A+	NO FOUT DWENT			0
E. SALVAGE	VALUE OF EXISTI	NG EQUIPHENI		\$	11,326
F. TOTAL	INVESTMENT (1D-1E	.)			
. ENERGY SAVI	NGS (+) / (-)				
ANALYSIS	NGS (+) / (-) DATE ANNUAL SAVIN	IGS, UNIT COST	\$ DISCOUNT	ED SAVINGS	
			ANNUAL S	DISCOUNT	DISCOUNTED
	COST	SAVINGS	SAVINCS (3)	FACTOR(4)	SAVINGS(5)
FUEL	\$/MBTU(1)	MBTU/YR(2)	A 1	0	•
A. ELEC	8.15	0		Ő	C
B. DIST	0	0		Ő	(
C. RESID	0	0		•	(
D. NG	0	0	0		23,317
E. COAL	2.23	1,027	2,290	10.10	
F. TOTAL	ş	1,027	2,290		23,31
(1) D	RECURRING (+/-) ISCOUNT FACTOR (T ISCOUNTED SAVING/	COST (3AX3A1)		7.61 \$ 0	
B. NON R	ECURRING SAVINGS	(+) / 0001 ('	DISCOUNTED	
		WEAD OF	DISCOUNT		
ITEM	SAVING \$ (+) COST \$ (-)(1)	OCCURRENCE(2)	FACTOR (3)	COST(-)	(4)
) 1		
а.	0)
b.	0			AND SALES OF THE SALES	
c.	0) 1	Ċ	
d. TOTAL			Star Partie	1010.00.1	
C. TOTAL	NON ENERGY DISC	OUNTED SAVING	S(+),COST(-)	(3A2+3Bd4	+)
D PPOTE	CT NON ENERGY QU	ALIFICATION T	EST		\$ 7,6
(1) 25%	MAX NON ENERGY C	ALC (ZFS X .S	3)	Charles and the	\$ 7,6
TT	2 2D1 TC -> 3C	GO TO ITEM 4		P	
ь TI	3D1 TS < 3C	CALC SIR =	(213+301)/1		
	2 2D11 TC - > 1	GO TO ITEM 4	 The second s		
d T	F 3D1b IS < 1	PROJECT DOES	NOT QUALIF	Y	
					\$ 2,2
4 FIRST YEAD	R DOLLAR SAVINGS	[2F3+3A+(3B1d	YRS ECONOM	IC LIFE)]	ş 2,2
					s 23,3
5. TOTAL NET	DISCOUNTED SAVIN	NGS (2F5+3C)			\$ 23,3
			TD (E (1E)	<u>C</u>	2
6. SIR (IF <	1 PROJECT DOES 1	NOT QUALIFY)	SIK = (3/1F)		



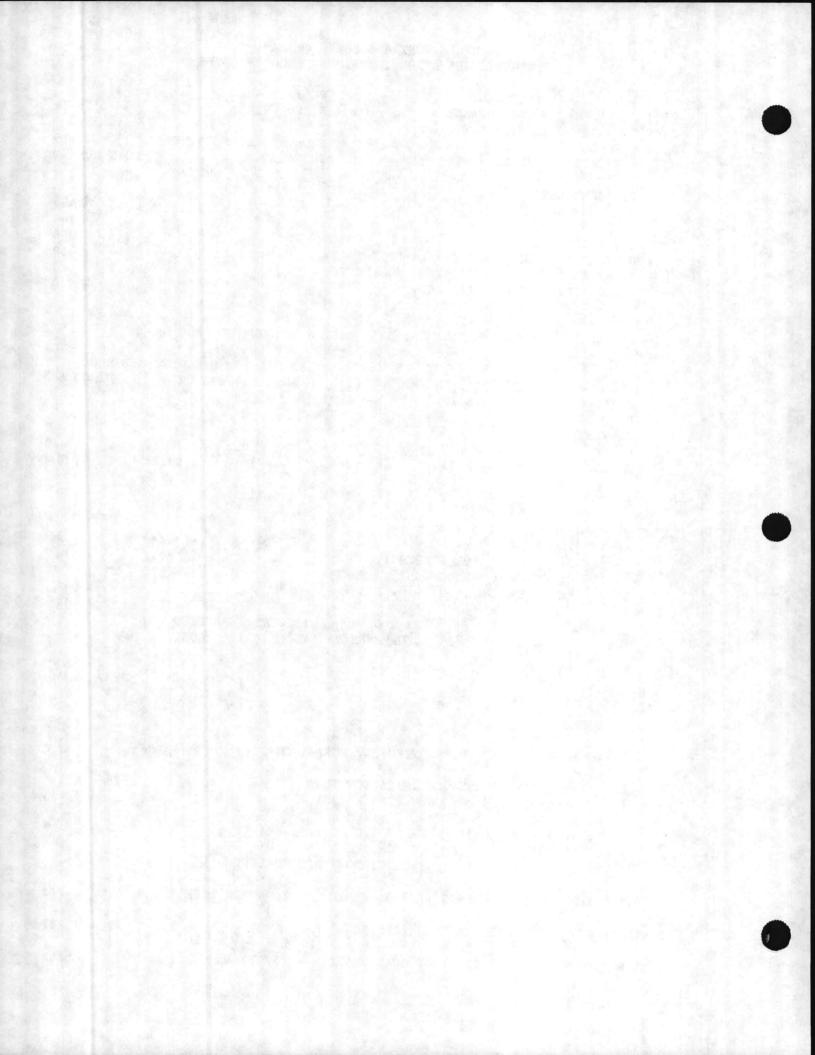
LOCATION: BEACH AREA PROJECT TITLE: NIGHT SETBACK	PROJECT NO. FISCAL YEAR:		1988
PORTION NAME: MISC. BLDGS	ECONOMIC LIFE IN	YEARS:	15
REGION NUMBER: 4 ANALYSIS DATE: JUNE 23 1987	PREPARED BY:		SUNDE
1. INVESTMENT COST		\$	5,240
A. CONSTRUCTION COST		•	288
B. SIOH			314
C. DESIGN COST D. ENERGY CREDIT CALC (1A+1B+1C)X.9			5,258
E. SALVAGE VALUE OF EXISTING EQUIPMEN	т		0
F. TOTAL INVESTMENT (1D-1E)		\$	5,258

	COST	SAVINGS		\$	DISCOUNT	DISCOUNTED SAVINGS(5)
FUEL		MBTU/YR(2)	SAVINGS	0	FACTOR(4)	•
A. ELEC	8.15	0		0	ŏ	Ő
B. DIST	0	0		0	õ	Ő
C. RESID	0	0		0	0	0
D. NG	0	-		909		
E. COAL	2.91	312		909	10.10	
F. TOTAL	\$	312		909		9,252
3. NON ENERGY	SAVINGS (+) / CO	ST (-)			94 L	
A. ANNUAL	RECURRING (+/-)			\$		
(1) DI	SCOUNT FACTOR (T	ABLE 1)		5	7.61	
(2) DI	SCOUNTED SAVING/	COST (3AX3A1)		\$	0	
B. NON RE	CURRING SAVINGS	(+) / COST (-)		Sector S. B. S.	
					DISCOUNTED	
ITEM	SAVING \$ (+) COST \$ (-)(1)	YEAR OF OCCURRENCE(2)	DISCOUN		SAVINGS (+) COST(-) ((4)
а.	0	0		1	0	
а. b.	0	C)	1	0	
р. с.	0	C)	1	0	
d. TOTAL					0	
C. TOTAL	NON ENERGY DISCO	OUNTED SAVINGS	S(+),COST	r(-)	(3A2+3Bd4)) 0
(1) 25%	CT NON ENERGY QUA MAX NON ENERGY CA	ALC (2F5 X .33	EST 3)		\$	3,053
a. IF	3D1 IS = > 3C 3D1 IS < 3C	GO TO TIEM 4	285+301	1/1F		0
b. 1F	3D1 IS < 3C 3D1b IS = > 1	CO TO ITEM 4	(2151501)	,,		
C. IF	3D1b IS < 1	PROJECT DOES	NOT QUAL	LIFY		
4. FIRST YEAR	DOLLAR SAVINGS	[2F3+3A+(3B1d,	YRS ECO	NOMI	C LIFE)] \$	
5. TOTAL NET	DISCOUNTED SAVIN	GS (2F5+3C)			\$	9,252
6. SIR (IF <	1 PROJECT DOES N	OT QUALIFY) S	IR = (5/	1F) -	-	1.8



PROJECT TITLE:	RIFLE RANGE NIGHT SETBACK	PROJECT NO. FISCAL YEAR:	1988
REGION NUMBER:	MISC. BLDGS 4 JUNE 23 1987	ECONOMIC LIFE IN PREPARED BY:	15 SUNDE
1. INVESTMENT CO A. CONSTRUC B. SIOH	CTION COST		\$ 4,434 244 266
E. SALVAGE	COST CREDIT CALC (1A+1B+1C)X VALUE OF EXISTING EQUI VVESTMENT (1D-1E)	.9 Pment	\$ 4,450 0 4,450

			COST	SAVINGS	ANNUAL \$	DISCOUNT	DISCOUNTED
		EL	\$/MBTU(1)	MBTU/YR(2)	SAVINGS (3)	FACIOR(4)	0
		ELEC	8.15			0	ő
	В.	DIST	0	0	0	0	ő
		RESID	0	0	0		0
	D.	NG	0	0	0	0	a state which is the second
	E.	COAL	2.91	246	716	10.18	7,207
	F.	TOTAL	\$	246	716		7,287
3.	NON	ENERGY S	SAVINGS (+) / CO	ST (-)			
	Α.	ANNUAL	RECURRING (+/-)		\$		
		(1) DIS	SCOUNT FACTOR (T.	ABLE 1)		7.61	
		(2) DI	SCOUNTED SAVING/ CURRING SAVINGS	COST (3AX3A1)	\$. 0	
	В.	NON REG	SURRING SAVINGS	(+) / 0051 (-	·	DISCOUNTED	
			SAVING \$ (+)	VEAD OF		SAVINGS (+)	
		ITEM	COST \$ (-)(1)	OCCURRENCE(2)	FACTOR (3)		(4)
	а.		0	0	1	0	
	а. b.		0	0	1	0	
			0	0	1	0	
	c. d.	TOTAL	Ő	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1		0	
	c.	TOTAL	NON ENERGY DISCO	OUNTED SAVINGS	(+),COST(-)	(3A2+3Bd4) 0
	D.	PROJEC	T NON ENERGY QUA	LIFICATION TH	ST		2,405
	(1	L) 25% M	AX NON ENERGY CA	ALC (2F5 X .33	3)	\$	2,405
		a. IF	3D1 IS = > 3C	GO TO ITEM 4			0
		b. IF	3D1 IS < 3C	CALC SIR = $($	(2F5+3D1)/1F		Ŭ
		c. IF	3D1b IS = > 1	GO TO ITEM 4			
		d. IF	3D1b IS < 1	PROJECT DOES	NOT QUALIFY		
4.	FIR	ST YEAR	DOLLAR SAVINGS	[2F3+3A+(3B1d,	YRS ECONOMI	C LIFE)] \$	716
5.	TOT	AL NET I	ISCOUNTED SAVING	GS (2F5+3C)		\$	7,287
6	SIR	(IF < 1	PROJECT DOES NO	OT QUALIFY) S	IR = (5/1F)	-	1.6



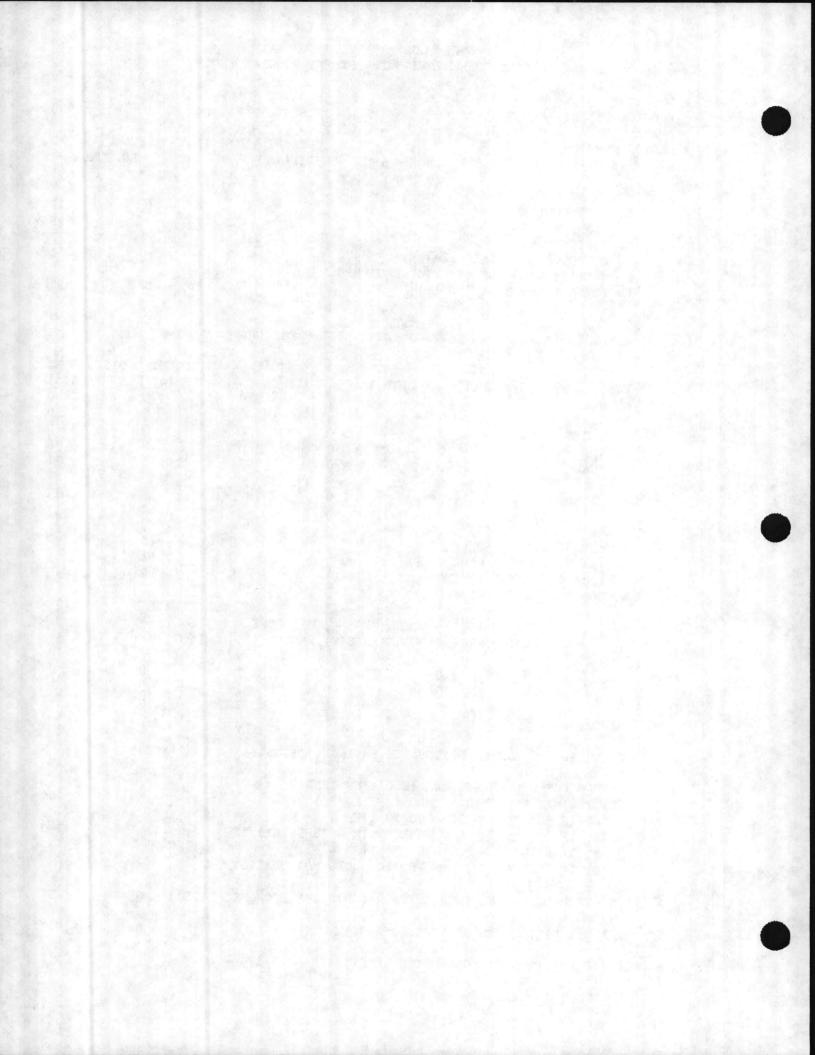
LIFE CYCLE COST ANALYSIS SUMMARY ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

LOCATION: COURTHOUSE BAY PROJECT TITLE: NIGHT SETBACK	PROJECT NO. FISCAL YEAR:	1988
PORTION NAME:MISC. BLDGSREGION NUMBER:4ANALYSIS DATE:JUNE 23 1987	ECONOMIC LIFE IN YEARS: PREPARED BY:	15 LO SUNDE
1. INVESTMENT COST A. CONSTRUCTION COST B. SIOH	\$	5,442 299
C. DESIGN COST D. ENERGY CREDIT CALC (1A+1B+1C)X.9 E. SALVAGE VALUE OF EXISTING EQUIPMENT		327 5,461 0

5,461

- F. TOTAL INVESTMENT (1D-1E)
- 2. ENERGY SAVINGS (+) / (-) ANALYSIS DATE ANNUAL SAVINGS, UNIT COST \$ DISCOUNTED SAVINGS

			COST	SAVINGS	ANNUAL \$	DISCOUNT	DISCOUNTED
		EL			SAVINGS (3) FACTOR(4)	SAVINGS(5)
		ELEC	8.15	0	0		0 0
		DIST	0	0	C		ő
		RESID	0	0			0
		NG	0	0 270	787		
	Ε.	COAL	2.91	270	/8/	10.10	0,011
	F.	TOTAL	\$	270	787	1	8,011
3.	NON	ENERGY S	SAVINGS (+) / COS	ST (-)			
	Α.	ANNUAL	RECURRING (+/-)			\$ 0	
		(1) DIS	SCOUNT FACTOR (TA	ABLE 1)		7.61	
		(2) DI	SCOUNTED SAVING/0	COST (3AX3A1)		\$ 0	
	В.	NON RE	CURRING SAVINGS	(+) / COST (-)		
					an a	DISCOUNTED	
		ITEM	SAVING \$ (+) COST \$ (-)(1)	YEAR OF OCCURRENCE(2)	DISCOUNT FACTOR (3)	SAVINGS (+)) COST(-)	
	-		0	0	Section Section	1 0	
	a. b.		0	0		1 0	
	р. с.		Ő	0		1 0	
	d.	TOTAL	Ő			0	
	c.	TOTAL	NON ENERGY DISCO	UNTED SAVINGS	(+),COST(-) (3A2+3Bd4	.) 0
	D.	PROJEC	T NON ENERGY QUA	LIFICATION TE	ST		
	(1) 25% M	AX NON ENERGY CA	LC (2F5 X .33)	Ş	2,644
		a. IF	3D1 IS = > 3C 3D1 IS < 3C	GO TO TTEM 4	285+301)/1	F	0
		b. 1F	3D1 IS < 3C 3D1b IS = > 1	CALC SIR = (213+301//1	•	영화 영화 영화
		d. IF	3D1b IS = > 1 3D1b IS < 1	PROJECT DOES	NOT QUALIF	Y	
4.	FIRS	ST YEAR	DOLLAR SAVINGS [2F3+3A+(3B1d)	YRS ECONOM	IC LIFE)]	; 787
			ISCOUNTED SAVING				\$ 8,011
			PROJECT DOES NO		IR - (5/1F)	-	1.5



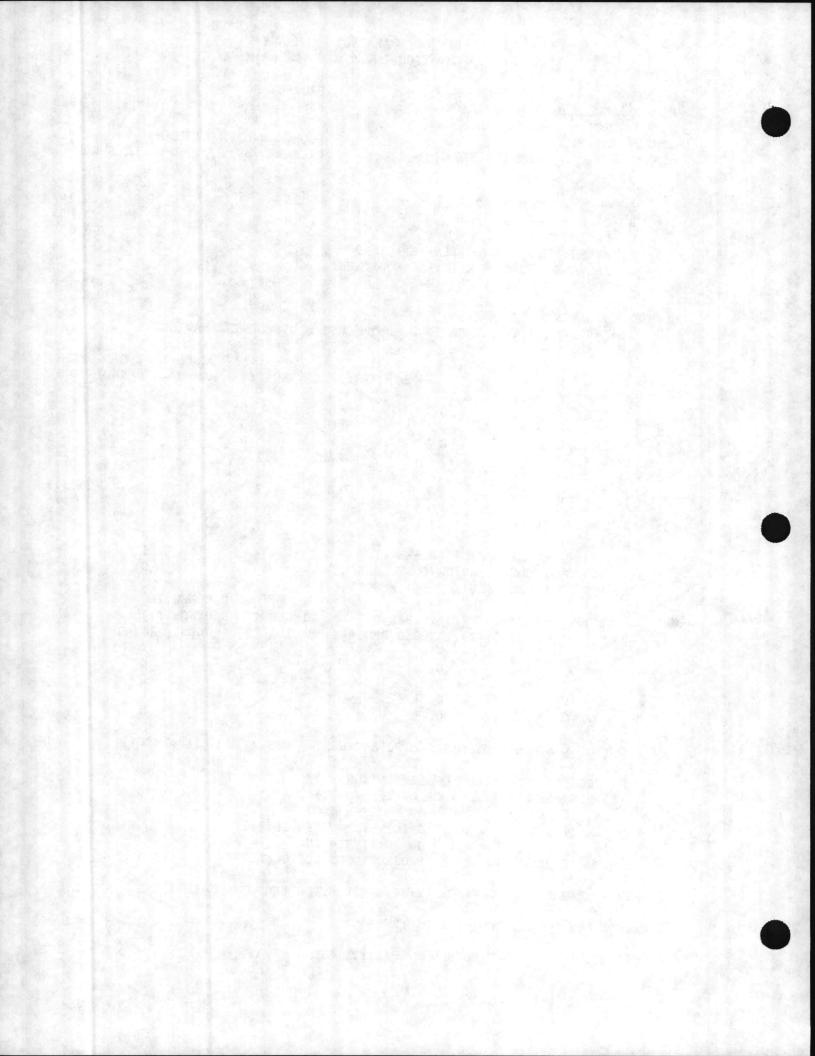
LIFE CYCLE COST ANALYSIS SUMMARY ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

PRO	ATION: CAMP JOHNSON JECT TITLE: NIGHT SETBACK	PROJECT NO. FISCAL YEAR:		1988
REG	TION NAME: MISC. BLDGS ION NUMBER: 4 LYSIS DATE: JUNE 23 1987	ECONOMIC LIFE I PREPARED BY:		15 SUNDE
1.	INVESTMENT COST A. CONSTRUCTION COST B. SIOH C. DESIGN COST D. ENERGY CREDIT CALC (1A+1B+1C)X.9		Ş	19,147 1,053 1,149 19,214
	E. SALVAGE VALUE OF EXISTING EQUIPMEN F. TOTAL INVESTMENT (1D-1E)	NT	\$	19,214
2.	ENERGY SAVINGS (+) / (-)			

ANALYSIS DATE ANNUAL SAVINGS, UNIT COST \$ DISCOUNTED SAVINGS

3

			COST	SAVINGS	ANNUAL	\$ DI	SCOUNT I	ISCOUNTED
	नाम	T	\$/MBTU(1)	MBTU/YR(2)	SAVINGS ((3) FAC	TOR(4) S	SAVINGS(5)
	A	ELEC	8.15	0		0	0	0
		DIST	0	0		0	0	0
		RESID	Ŭ,	0		0	0	0
		NG	Ő	0		0	0	0
		COAL	2.91		2,29	93	10.18	23,348
	E.	COAL	2.71					
	F.	TOTAL	\$	788	2,29	93		23,348
2	NON F	NERGY S	AVINGS (+) / CO	ST (-)				
	A	ANNUAL	RECURRING (+/-)	and the state		\$	0	
		(1) DTS	COUNT FACTOR (T	ABLE 1)			7.61	
		(2) DTS	SCOUNTED SAVING/	COST (3AX3A1)		\$	0	
	P	NON PE	CURRING SAVINGS	(+) / COST (-)			
	Б.	NON KLY	Jonatino Diritinos		Call and	DIS	COUNTED	
		ITEM	SAVING \$ (+)	YEAR OF	DISCOUNT	SAV	INGS (+)	
		LIEM	COST \$ (-)(1)	OCCURRENCE(2)	FACTOR (3)	COST(-) (4)
			0031 \$ (-)(1)	00001111102(2)				
			0	0	r	1	0	
	a.		0			ī	0	
	b.		0	0		1	0	
	c.	TOTAT	0			1.5	0	
	d.	TOTAL						
	c.	TOTAL	NON ENERGY DISCO	OUNTED SAVINGS	S(+),COST(-) (3A2+3Bd4)	0
	P	PROTEC	T NON ENERGY QUA	ALTEICATION TH	ST			
	D.	1 254 M	AX NON ENERGY CA	LC (2F5 X .33	3)		\$	7,705
	(1) 236 H	3D1 IS = > 3C	GO TO ITEM 4				
		a. IF	3D1 IS < 3C	CALC STR =	(2F5+3D1)/	'1F		0
		D. IF	3D1b IS = > 1	CO TO TTEM 4				
		C. IF	3D1b IS < 1	PROIFCT DOFS	NOT QUALT	FY		
		a. 1r	SDID 12 < 1	TROJECT DOLD	NOT QUILL			
4.	FIRS	T YEAR	DOLLAR SAVINGS	[2F3+3A+(3B1d,	YRS ECONO	MIC LI	FE)] \$	2,293
5.	TOTA	L NET D	ISCOUNTED SAVIN	GS (2F5+3C)			\$	23,348
6.	SIR	(IF < 1	PROJECT DOES N	OT QUALIFY) S	IR = (5/1H)	F) -		1.2



LIFE CYCLE COST ANALYSIS SUMMARY ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

LOCATION:	CAMP GEIGER	PROJECT NO.		
PROJECT TITLE:	NIGHT SETBACK	FISCAL YEAR:		1988
PORTION NAME:	MISC. BLDGS			
REGION NUMBER:	4	ECONOMIC LIFE	IN YEARS:	15
ANALYSIS DATE:	JUNE 23 1987	PREPARED BY:	LO	SUNDE
1. INVESTMENT C	00°T			
	CTION COST		\$	5,442
B. SIOH	OTION CODI			299
C. DESIGN	COST			327
	CREDIT CALC (1A+1B+1C)X.9			5,461
	VALUE OF EXISTING EQUIPMENT	1		0
	NVESTMENT (1D-1E)		\$	5,461
2. ENERGY SAVIN	IGS (+) / (-)			

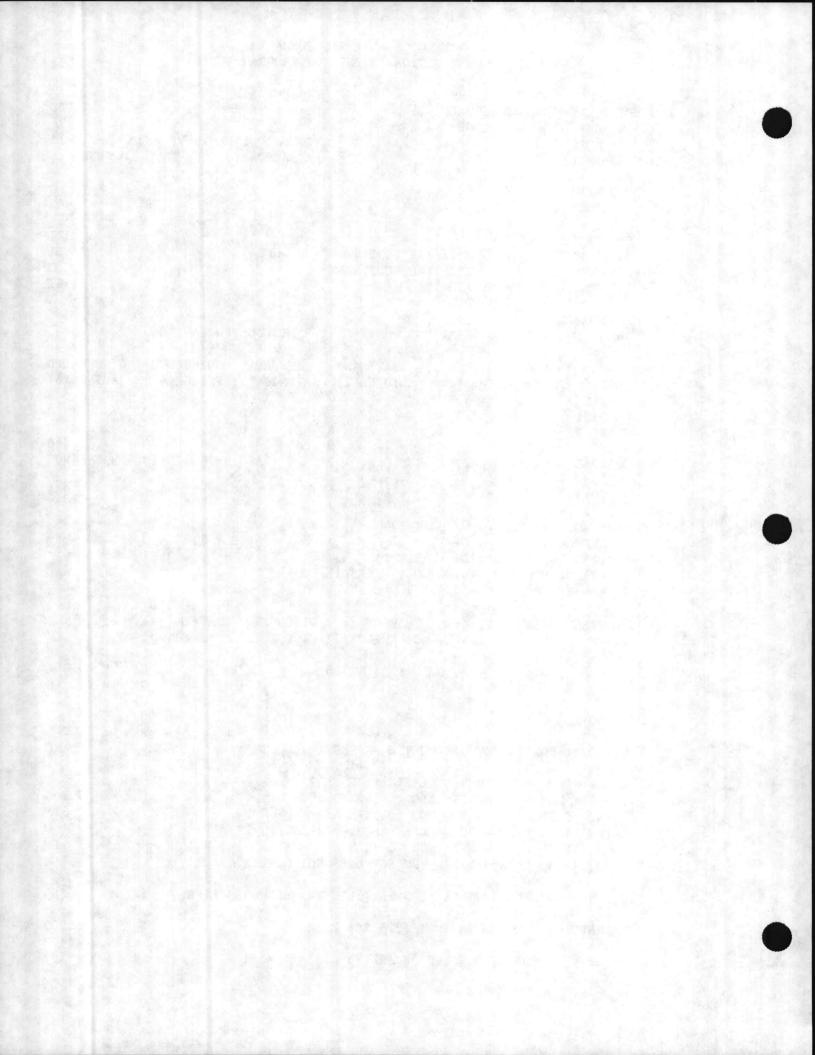
ANALYSIS DATE ANNUAL SAVINGS, UNIT COST \$ DISCOUNTED SAVINGS

3

5

6

			COST	SAVINGS	ANNUAL \$	DISCOUNT	DISCOUNTED
		EL		MBTU/YR(2)			
		ELEC	8.15	0	0	0	0
		DIST	0	0		0	a state of the second sec
		RESID	0	0	0	0	0
		NG	0	0		0 10.18	
	Ε.	COAL	2.91	199	580	10.18	5,905
	F.	TOTAL	\$	199	580		5,905
	NON H	ENERGY SA	AVINGS (+) / CO	ST (-)			
			RECURRING (+/-)		\$		
		(1) DIS	COUNT FACTOR (T.	ABLE 1)		7.61	
		(2) DIS	COUNTED SAVING/	COST (3AX3A1)	\$	0	
	В.	NON RECT	URRING SAVINGS	(+) / COST (-)		
						DISCOUNTED	
		ITEM	SAVING \$ (+)	YEAR OF	DISCOUNT	SAVINGS (+)	
			COST \$ (-)(1)	OCCURRENCE(2)	FACTOR (3)	COST(-) (4)
	а.		0	0	1	0	
	b.		0	0	1	0	
	c.		0	0	1	0	
	d.	TOTAL	0			0	
	c.	TOTAL N	ON ENERGY DISCO	UNTED SAVINGS	(+),COST(-)	(3A2+3Bd4)	0
	D.	PROJECT	NON ENERGY QUA	LIFICATION TE	ST		
) 25% MA	X NON ENERGY CA	LC (2F5 X .33		\$	1,949
		a. 1F 3	D1 IS = $> 3C$	GO TO TIEM 4	2E5 . 2D1 \ /1E		0
		b. 1F 3	DI IS < 3C	CALC SIR = (2F5+5D1)/1F		U.S.
		c. 1F 3	D1 IS < 3C D1b IS = > 1 D1b IS < 1	GO TO TIEM 4	NOT OUNT TEV		
		d. 1F 3	DID IS < 1	PROJECT DOES	NOI QUALIFI		
¥.	FIRS	T YEAR D	OLLAR SAVINGS [2F3+3A+(3B1d/	YRS ECONOMIC	\$ LIFE)]	580
5.	TOTA	L NET DI	SCOUNTED SAVING	SS (2F5+3C)		\$	5,905
5.	SIR	(IF < 1	PROJECT DOES NO	T QUALIFY) SI	R = (5/1F) -		1.1

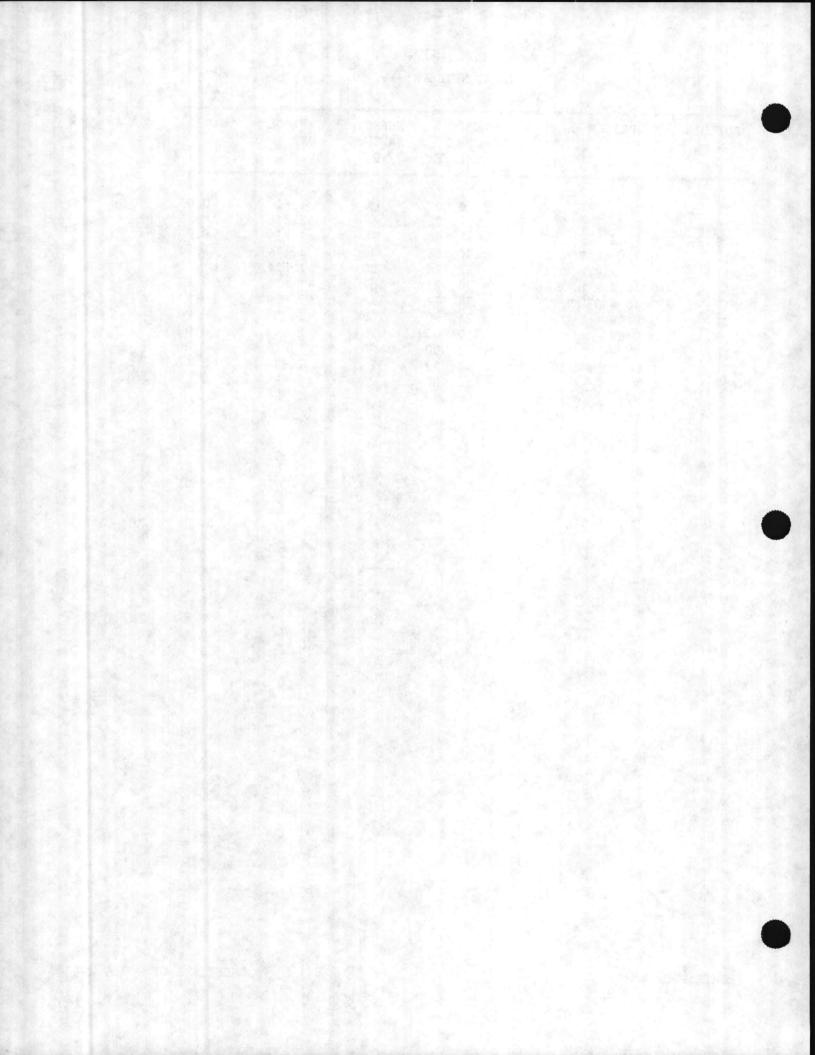


HOSPITAL POINT

NIGHT SETBACK:

BUILDING NO.	STRUCTURE TYPE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
	OFFICE	0.000	0	1,814	0.00
H14 H15A	OFFICE	1,554.782	3,467	1,814	19.38
H16	OFFICE	0.000	0	1,814	0.00
H17	OCC. WAREHOUSE	137.516	306	1,814	1.71
H17N	OCC. WAREHOUSE	137.516	306	1,814	1.71
H18	OCC. WAREHOUSE	70.422	157	1,814	0.87
H19	OCC. WAREHOUSE	74.772	166	1,814	0.93
H21	OFFICE	76.150	169	1,814	0.94
H23	OFFICE	0.000	0	1,814	0.00
H24	OFFICE	0.000	0	1,814	0.00
H36	OCC. WAREHOUSE	54.789	122	1,814	0.68
H39	OFFICE	10.407	23	1,814	0.12



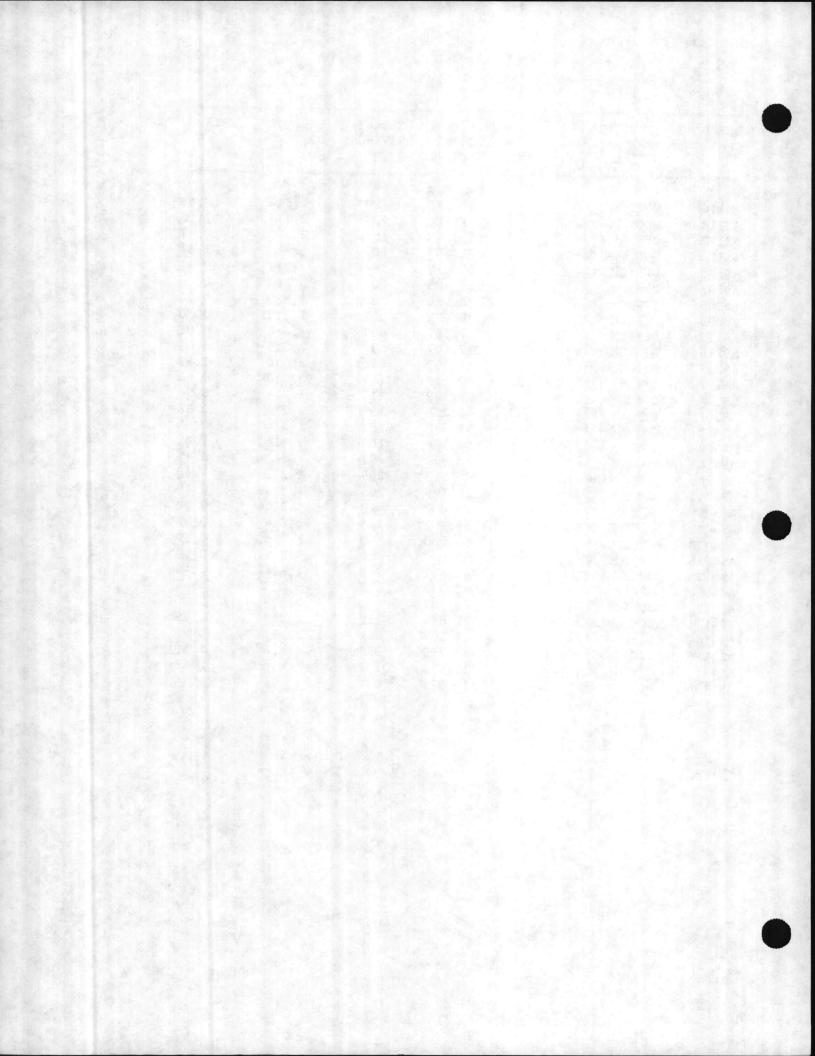


AIR STATION NIGHT SETBACK:

BUILDING NO.	STRUCTURE TYPE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
	OFFICE	32.336	94	1,814	0.59
AS114	OFFICE	102.814	299	2,217	1.55
AS118	OCC. WAREHOUSE	64.569	187	2,217	0.97
AS122	OFFICE	71.207	207	1,814	1.31
AS124	OCC. WAREHOUSE	64.614	188	2,217	0.97
AS130	OFFICE	69.405	201	3,023	0.70
AS202	OFFICE	36.786	107	3,829	0.3
AS205	OFFICE	38.425	111	1,814	0.70
AS208	OFFICE	217.607	633	1,814	4.0
AS215	OFFICE	217.607	633	1,814	4.0
AS216	OFFICE	217.607	633	2,620	2.7
AS217	OFFICE	50.219	146	2,620	0.6
AS232	OFFICE	38.129	110	1,814	0.7
AS236	OFFICE	45.259	131	2,217	0.6
AS302	OFFICE	51.754	150	1,814	0.9
AS312	OFFICE	57.198	166	1,814	1.0
AS320	OFFICE OFFICE	33.532	97	1,814	0.6
AS414	OCC. WAREHOUSE	305.526	889	2,217	4.6
AS424	OFFICE	22.199	64	1,814	0.4
AS425	OFFICE	0.000	0	1,814	0.0
AS502	OFFICE	53.702	156	1,814	0.9
AS4012	OFFICE	0.000	0	1,814	0.0
AS4030	OFFICE	0.000	õ	1,814	0.0
AS4035 AS4110	OCC. WAREHOUSE	243.531	708	1,814	4.4
AS4110 AS4120	OFFICE	40.332	117	3,023	0.4
AS4120 AS4122	OFFICE	25.309	73	2,217	0.3
AS4122 AS4141	OCC. WAREHOUSE	51.816	150	2,217	0.7
AS4141 AS4145	OFFICE	18.897	54	2,217	0.2
AS4145 AS4146	OCC. WAREHOUSE	81.790	238	1,814	1.5
AS4146 AS4157	OFFICE	37.153	108	1,814	0.6
AS4157 AS4158	OCC. WAREHOUSE	219.512	638	1,814	4.0

SHEET 1 OF 1

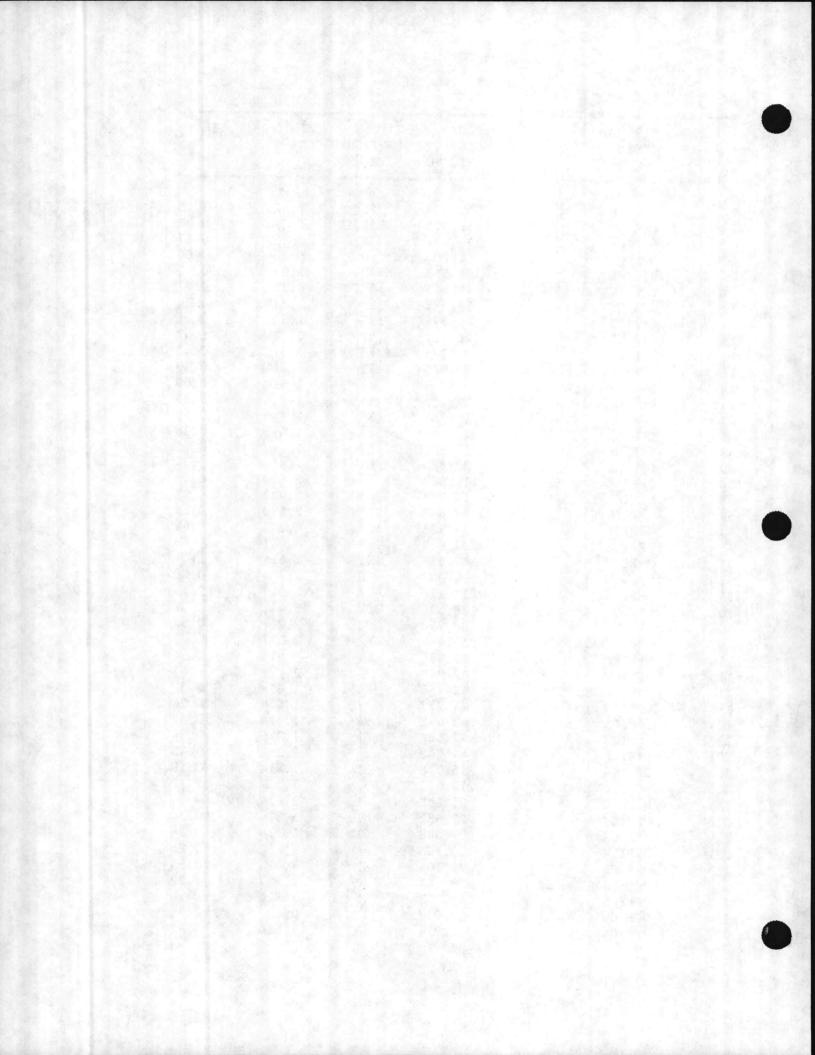
DATE: 06/23/87



NIGHT SETBACK:

BUILDING NO.	STRUCTURE TYPE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
	AND AL	100.904	225	1,814	1.25
1	OFFICE	59.015	131	1,814	0.73
2	OFFICE	17.487	38	2,217	0.17
4	OFFICE	0.000	0	5,844	0.00
6 8	OFFICE OFFICE	138.598	309	5,844	0.53
。 11	OCC. WAREHOUSE	40.053	89	4,232	0.21
13	OFFICE	27.688	61	1,814	0.34
13	OFFICE	60.674	135	1,814	0.75
15	OFFICE	126.321	281	1,814	1.57
16	OFFICE	32.995	73	1,814	0.41
17	OFFICE	32.020	71	1,814	0.39
18	OFFICE	0.000	0	1,814	0.00
25	OFFICE	31.282	69	1,814	0.39
27	OFFICE	15.781	35	1,814	0.19
41	OFFICE	31.221	69	1,814	0.38
43	OFFICE	12.538	27	1,814	0.15
50	OFFICE	27.688	61	1,814	0.34
54	OFFICE	114.447	255	2,620	0.98
58	OFFICE	110.207	245	3,023	0.82
59	OFFICE	99.842	222	2,620	0.86
63	OFFICE	79.723	177	4,232	0.42
65	OFFICE	104.909	233	5,441	0.43
66	OFFICE	87.558	195	1,814	1.09
67	OFFICE	0.000	0	1,814	0.00
84	OFFICE	214.298	477	2,217	2.1
102	OFFICE	138.598	309	5,441	0.5
106	OFFICE	86.740	193	2,217	0.8
107	OCC. WAREHOUSE	218.481	487	2,217	2.2
114	OFFICE	27.688	61	1,814	0.34
115	OFFICE	42.248	94	2,217	0.4
117	OCC. WAREHOUSE	42.156	94	1,814	0.5
119	OFFICE	21.255	47	1,814	0.2
123	OFFICE	42.472	94	1,814	0.5
127	OFFICE	27.688	61	1,814	0.3
201	OFFICE	42.248	94	2,217	0.4
203	OFFICE	15.738	35	1,814	0.1
206	OCC. WAREHOUSE	218.481	487	2,217	2.2
214	OFFICE	27.688	61	1,814	0.3
216	OFFICE	27.688	61	1,814	0.3
219	OFFICE	27.688	61	1,814	0.3
221	OFFICE	20.736	46	1,814	0.2
223	OFFICE	28.104	62	1,814	0.3
226	OCC. WAREHOUSE	218.481	487	2,217	2.2
233	OFFICE	15.781	35	1,814	0.1
300	OFFICE	32.077	71	2,217	0.3
302	OFFICE	17.924	39	1,814	0.2

DATE: 06/23/87



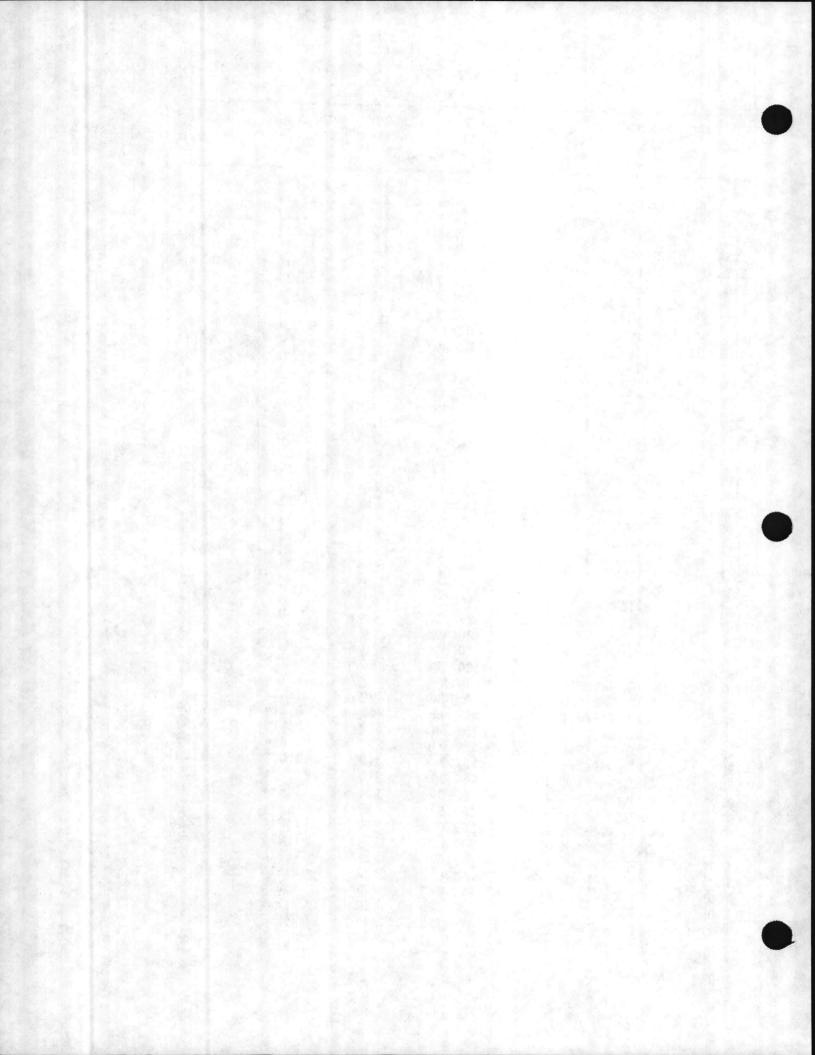
NIGHT	SETBACK:
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BUILDING NO.	STRUCTURE TYPE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
	1. 网络盐山	07 699	61	1,814	0.34
304	OFFICE	27.688	487	2,217	2.22
307	OCC. WAREHOUSE	218.481 86.753	193	2,217	0.88
314	OFFICE	27.688	61	1,814	0.34
315	OFFICE		61	1,814	0.34
317	OFFICE	27.688	57	1,814	0.32
320	OFFICE	25.837 27.688	61	1,814	0.34
400	OFFICE	42.248	94	2,217	0.43
401	OFFICE	15.738	35	1,814	0.19
403	OFFICE		0	2,217	0.00
408	OFFICE	0.000	0	1,814	0.00
412	OFFICE	0.000	51	1,814	0.28
416	OFFICE	23.077	309	5,844	0.53
417	OFFICE	138.598	61	1,814	0.34
419	OFFICE	27.688	0	1,814	0.00
420	OFFICE	0.000	0	5,844	0.00
422	OFFICE	0.000	62	1,814	0.35
423	OFFICE	28.104	487	2,217	2.22
424	OCC. WAREHOUSE	218.481	274	2,217	1.25
500	OCC. WAREHOUSE	123.212		1,814	0.34
501	OFFICE	27.688	61 0	5,844	0.0
502	OFFICE	0.000		1,814	0.94
508	OFFICE	76.173	169	2,217	2.2
509	OCC. WAREHOUSE	218.481	487	1,814	0.3
516	OFFICE	29.515	65	1,814	0.2
518	OFFICE	17.924	39	1,814	0.2
520	OFFICE	20.736	46	1,814	0.3
526	OFFICE	29.515	65		0.7
751	OFFICE	120.495	268	3,426	0.0
898	OFFICE	0.000	0	1,814	1.6
900	OFFICE	128.581	286	1,814	4.2
901	OCC. WAREHOUSE	644.504	1,437	3,426	5.8
902	OCC. WAREHOUSE	569.090	1,269	2,217	7.0
904	OCC. WAREHOUSE	569.090	1,269	1,814	3.5
905	OFFICE	282.505	629	1,814	7.0
907	OCC. WAREHOUSE	569.090	1,269	1,814	1.1
908	OCC. WAREHOUSE	152.766	340	3,023	5.5
909	OCC. WAREHOUSE	444.268	990	1,814	0.7
910	OCC. WAREHOUSE	62.062	138	1,814	3.1
914	OFFICE	282.505		1,814	7.0
915	OCC. WAREHOUSE	569.090		1,814	6.0
916	OCC. WAREHOUSE	531.007		1,814	
1002	OFFICE	5.674		1,814	0.
1002	UNOCC. WAREHOUSE	55.052		1,814	0.
1004	OFFICE	113.743	253	1,814	1.4
1005	OFFICE	27.849		2,217	0.:
1011	OCC. WAREHOUSE	626.192	1,396	2,217	6.

DATE: 06/23/87

SHEET 2 OF 4

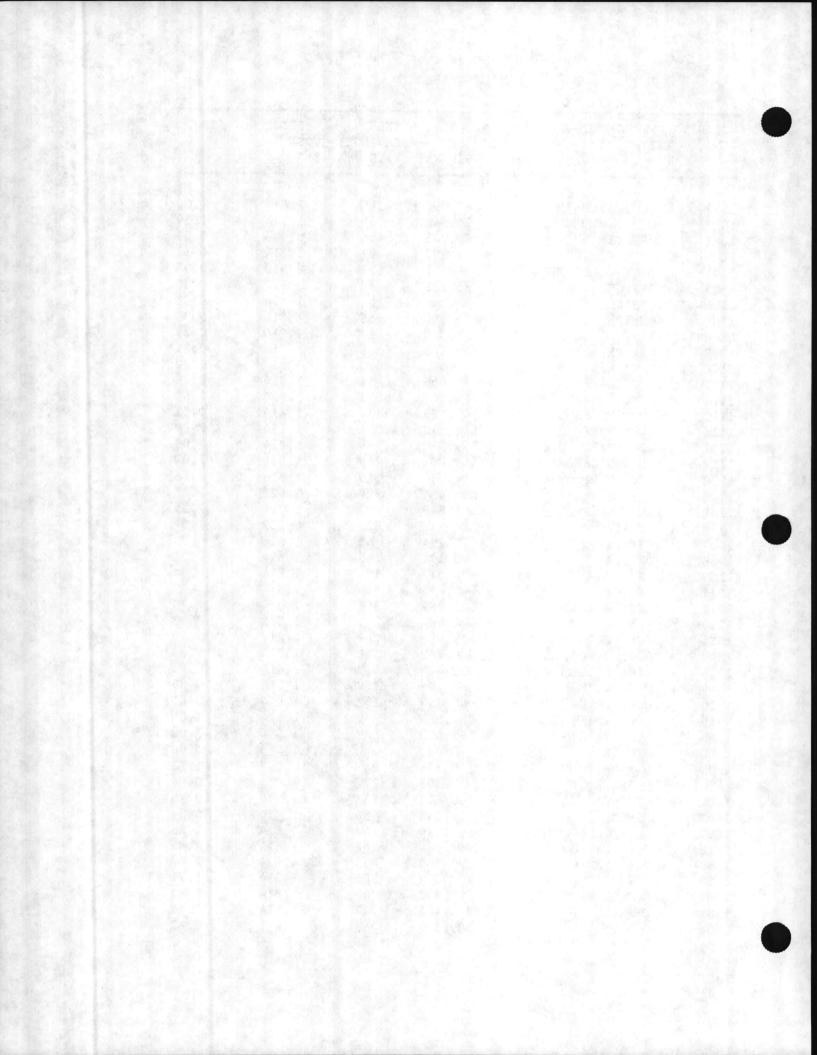
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BUILDING NO.	STRUCTURE TYPE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
	Service .				
1012	OCC. WAREHOUSE	569.090	1,269	1,814	7.09
1015	OCC. WAREHOUSE	95.946	213	1,814	1.19
1041	OFFICE	200.083	446	5,038	0.89
1100	OFFICE	14.192	31	1,814	0.17
1101	OCC. WAREHOUSE	278.818	621	6,650	0.94
1103	OFFICE	35.132	78	2,620	0.30
1104	OFFICE	25.348	56	1,814	0.31
1105	OFFICE	25.348	56	1,814	0.31
1106	OFFICE	25.348	56	1,814	0.31
1107	OFFICE	25.348	56	1,814	0.31
1108	OFFICE	282.505	629	1,814	3.52
1111	OFFICE	21.055	46	1,814	0.26
1114	UNOCC. WAREHOUSE	240.887	537	1,814	3.00
1115	OCC. WAREHOUSE	49.475	110	1,814	0.61
1116	OCC. WAREHOUSE	626.192	1,396	1,814	7.80
1117	OCC. WAREHOUSE	569.090	1,269	1,814	7.09
1118	OCC. WAREHOUSE	569.090	1,269	1,814	7.09
1120	OCC. WAREHOUSE	141.564	315	1,814	1.76
1200	OFFICE	145.455	324	2,620	1.25
1201	OCC. WAREHOUSE	581.818	1,297	1,814	7.25
1202	OFFICE	284.132	633	4,232	1.51
1207	OFFICE	20.194	45	1,814	0.25
1208	OFFICE	20.194	45	1,814	0.25
1209	OFFICE	76.317	170	1,814	0.95
1211	OFFICE	263.989	588	1,814	3.29
1212	OCC. WAREHOUSE	626.192	1,396	1,814	7.80
1220	OFFICE	74.404	165	1,814	0.93
1301	OCC. WAREHOUSE	569.090	1,269	2,217	5.80
1302	OCC. WAREHOUSE	80.782	180	1,814	1.00
1304	OCC. WAREHOUSE	52.468	117	1,814	0.6
1309	OCC. WAREHOUSE	68.194	152	1,814	0.8
1310	OCC. WAREHOUSE	68.194	152	1,814	0.8
1316	OCC. WAREHOUSE	569.090	1,269	1,814	7.0
1317	OCC. WAREHOUSE	569.090	1,269	1,814	7.0
1400	OFFICE	0.000	0	1,814	0.0
1400	OFFICE	110.798	247	2,217	1.1
1401	OFFICE	77.308	172	1,814	0.9
1403	OFFICE	60.610	135	1,814	0.7
1404	OFFICE	25.348	56	1,814	0.3
1407	OCC. WAREHOUSE	68.194	152	1,814	0.8
1409	OCC. WAREHOUSE	68.194	152	1,814	0.8
1410	OCC. WAREHOUSE	199.540	444	1,814	2.4
1500	OFFICE	137.324	306	1,814	1.7
1500	OCC. WAREHOUSE	693.913	1,547	1,814	8.6
1601	OFFICE	335.403	747	1,814	4.1
1601	OFFICE	209.555	467	5,441	0.8

DATE: 07/20/87

SHEET 3 OF 4

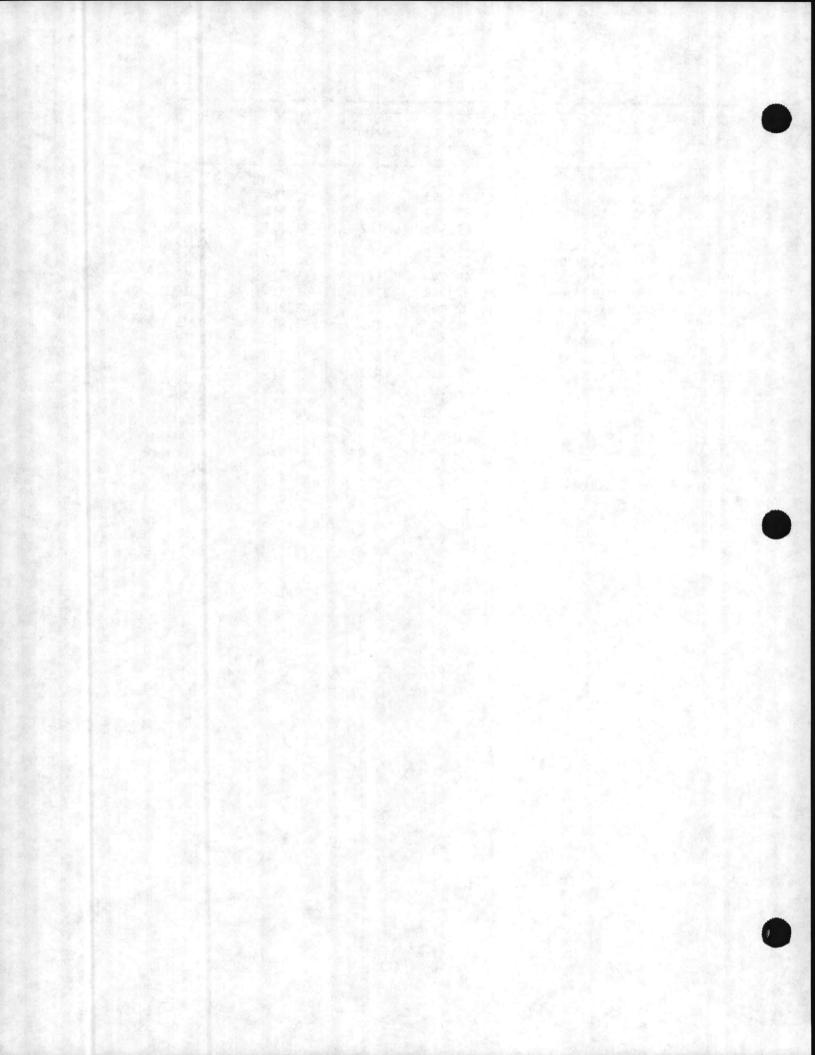


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•	BUILDING NO.	STR TYP
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	1610	OCC

BUILDING NO.	STRUCTURE TYPE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
and the second					
1607	OCC. WAREHOUSE	71.093	158	1,814	0.88
1610	OCC. WAREHOUSE	67.579	150	1,814	0.84
1611	OCC. WAREHOUSE	81.667	182	2,217	0.83
1612	OCC. WAREHOUSE	79.422	177	1,814	0.99
1613	OCC. WAREHOUSE	22.658	50	1,814	0.28
1706	UNOCC. WAREHOUSE	49.944	111	1,814	0.62
1707	OCC. WAREHOUSE	92.964	207	1,814	1.15
1750	OCC. WAREHOUSE	102.029	227	2,217	1.04
1755	OCC. WAREHOUSE	74.002	165	2,217	0.75
1771	OCC. WAREHOUSE	174.667	389	1,814	2.17
1775	OCC. WAREHOUSE	548.916	1,224	1,814	6.84
1780	OCC. WAREHOUSE	205.054	457	1,814	2.55
HP255	OFFICE	0.000	0	1,814	0.00
HP265	OFFICE	0.000	0	1,814	0.00
HP275	OFFICE	0.000	0	1,814	0.00
HP285	OFFICE	0.000	0	1,814	0.00
HP295	OFFICE	0.000	0	1,814	0.00
HP405	OFFICE	0.000	0	1,814	0.00
HP1016	OCC. WAREHOUSE	54.814	122	1,814	0.68

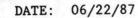


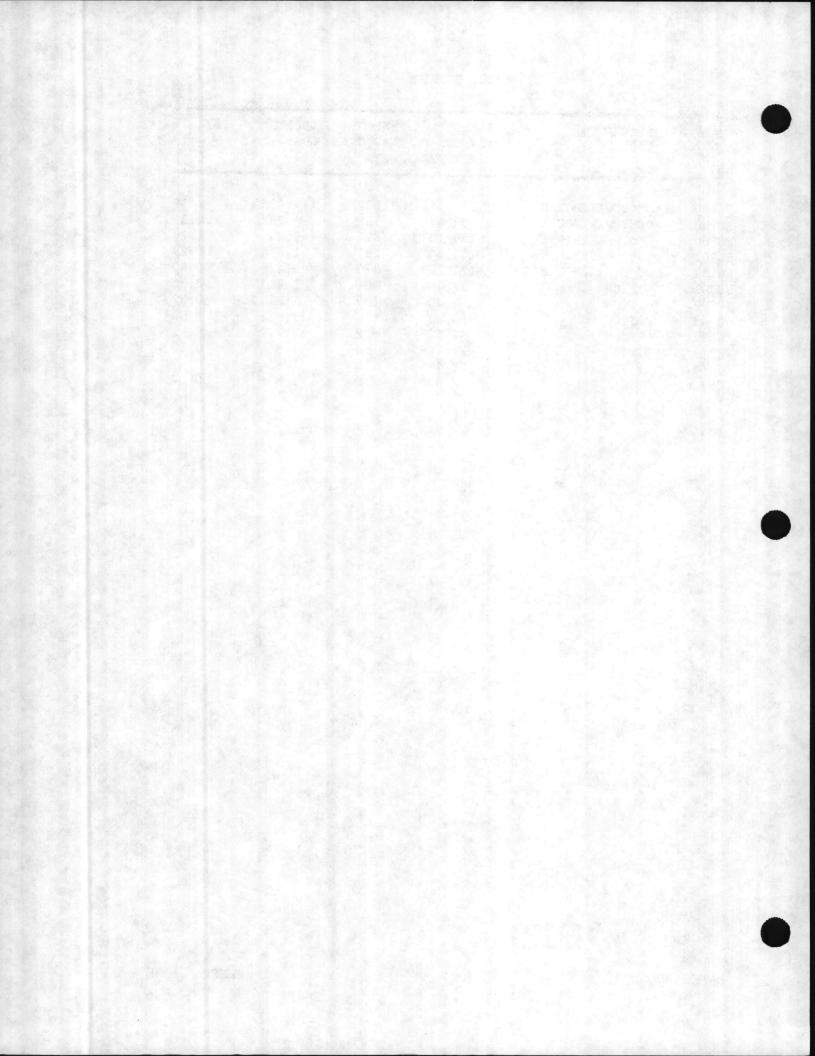


FRENCH CREEK NIGHT SETBACK:

BUILDING NO.	STRUCTURE TYPE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
FC100	OCC. WAREHOUSE	673.547	1,502	4,635	3.28
FC190	OCC. WAREHOUSE	59.479	132	4,232	0.31
FC200	OCC. WAREHOUSE	169.137	377	3,023	1.26
FC241	OCC. WAREHOUSE	103.841	231	1,814	1.29
FC251	OCC. WAREHOUSE	121.267	270	3,426	0.80
FC301	OFFICE	27.494	61	1,814	0.34
FC302	OFFICE	42.300	94	1,814	0.52
FC303	OFFICE	80.603	179	1,814	1.00
FC312	OFFICE	41.659	92	2,217	0.42
FC313	OFFICE	24.226	54	1,814	0.30
FC364	OFFICE	38.449	85	1,814	0.47
FC573	OFFICE	0.000	0	1,814	0.00







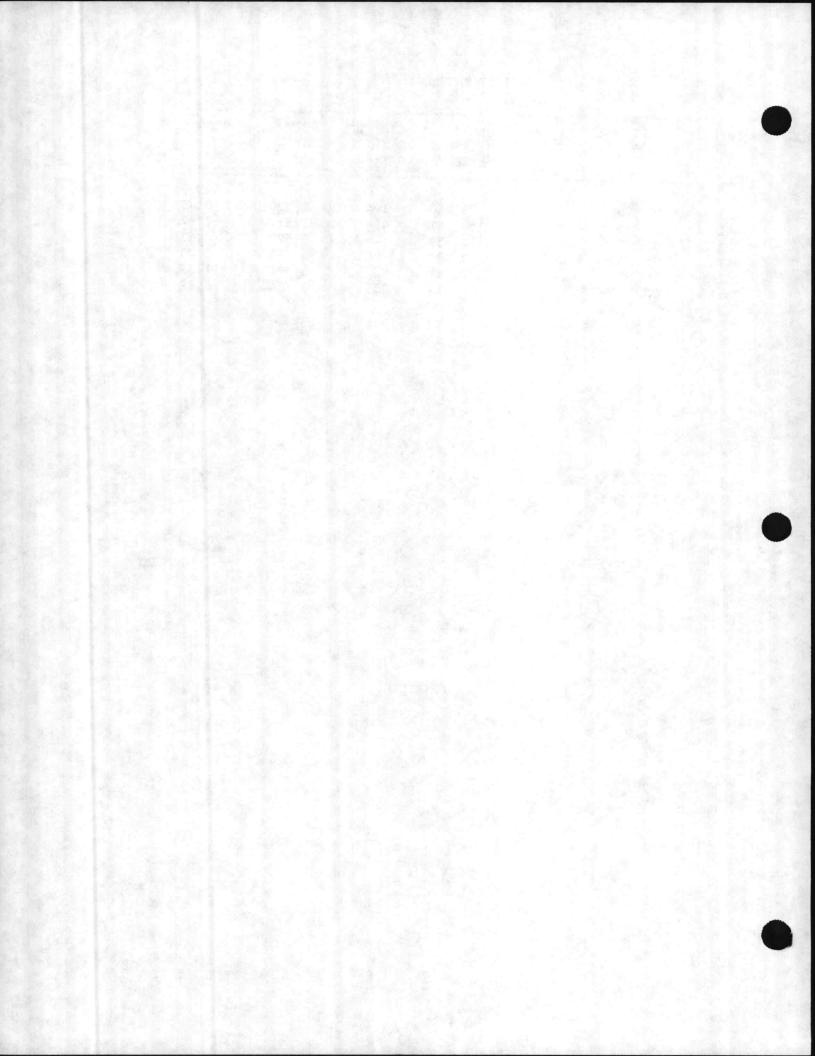
BEACH AREA

NIGHT SETBACK:

BUILDING NO.	STRUCTURE TYPE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
BA101	OFFICE	35.760	104	2,620	0.45
BA101 BA102	OFFICE	156.161	454	1,814	2.87
BA102 BA103	OFFICE	49.639	144	2,620	0.63
BA104	OFFICE	0.000	0	4,232	0.00
BA104 BA105	OFFICE	156.161	454	3,426	1.52
BA128	OCC. WAREHOUSE	47.214	137	1,814	0.87



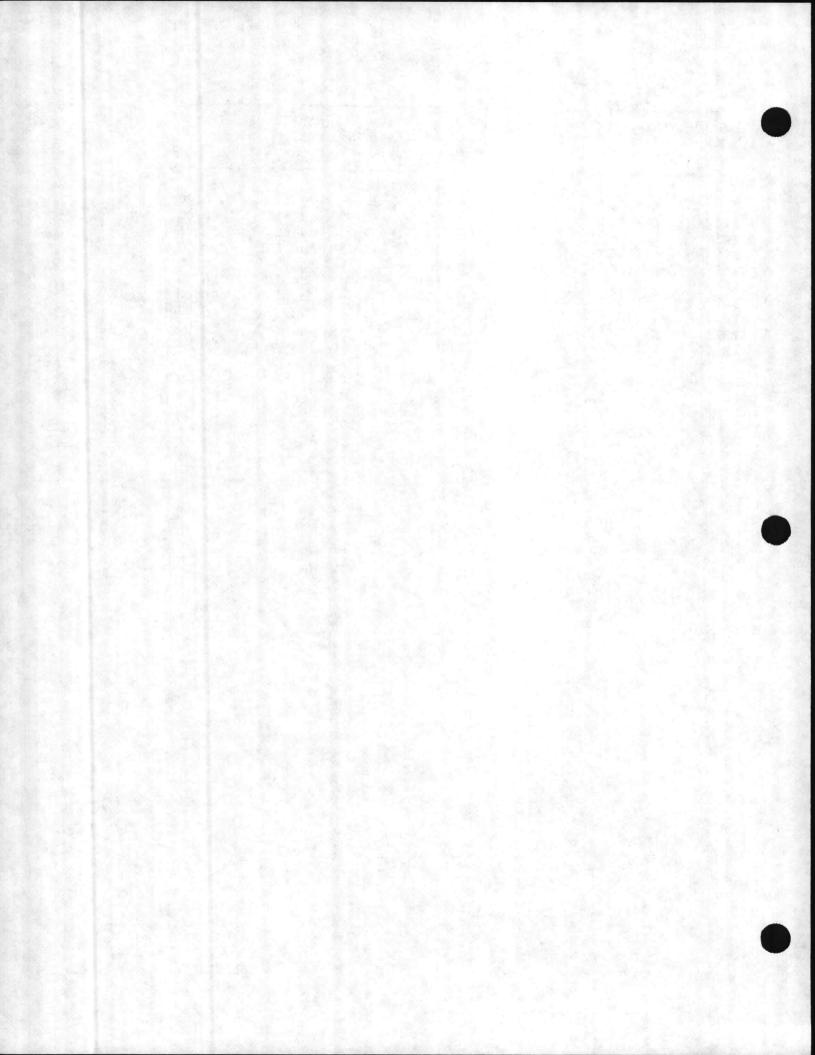
DATE: 06/22/87



RIFLE RANGE NIGHT SETBACK:

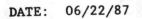
BUILDING NO.	STRUCTURE TYPE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
RR1	OFFICE	0.000	0	1,814	0.00
RR2	OFFICE	0.000	0	1,814	0.00
RR3	OFFICE	83.214	242	2,620	1.06
RR4	OFFICE	0.000	0	1,814	0.00
RR5	OFFICE	0.000	0	1,814	0.00
RR8	OFFICE	41.550	120	1,814	0.76
RR9	OFFICE	0.000	0	1,814	0.00
RR10	OFFICE	15.738	45	2,217	0.23
RR11	OFFICE	162.783	473	1,814	3.00
RR12	OFFICE	39.562	115	1,814	0.72

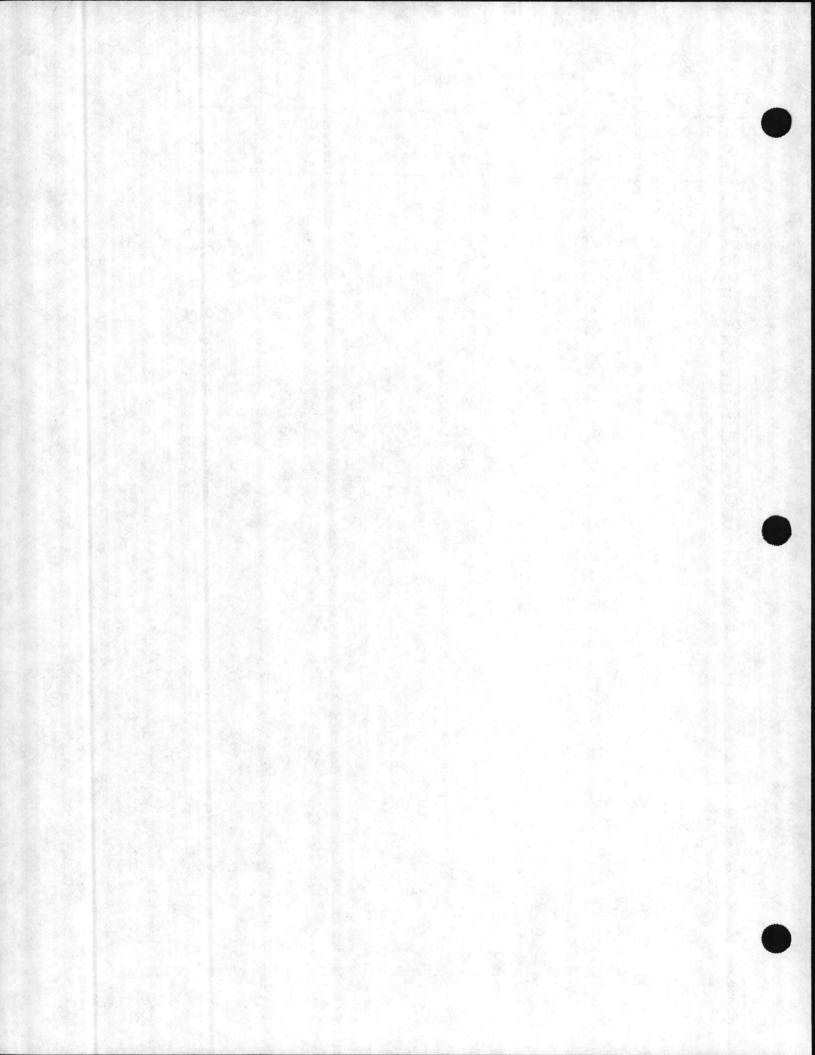
DATE: 06/22/87



COURTHOUSE BAY NIGHT SETBACK:

BUILDING NO.	STRUCTURE TYPE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
BB2	OFFICE	26.343	76	1,814	0.48
BB5	OFFICE	22.233	64	1,814	0.40
BB8	OFFICE	0.000	0	1,814	0.00
BB10	OFFICE	20.355	59	1,814	0.37
BB11	OFFICE	0.000	0	7,456	0.00
BB12	OFFICE	0.000	0	7,859	0.00
BB13	OFFICE	0.000	0	7,859	0.00
BB14	OFFICE	0.000	0	7,456	0.00
BB15	OFFICE	13.885	40	1,814	0.2
BB16	OFFICE	13.885	40	1,814	0.2
BB27	OFFICE	23.610	68	1,814	0.4
BB28	OFFICE	50.015	145	1,814	0.9
BB45	OFFICE	0.000	0	1,814	0.0
BB50	OFFICE	72.628	211	1,814	1.3
BB51	OCC. WAREHOUSE	138.662	403	1,814	2.5
BB52	OFFICE	59.150	172	1,814	1.0
BB54	OFFICE	47.292	137	1,814	0.8
BB72	OFFICE	0.000	0	1,814	0.0
BB269	OFFICE	0.000	0	1,814	0.0





CAMP JOHNSON NIGHT SETBACK:

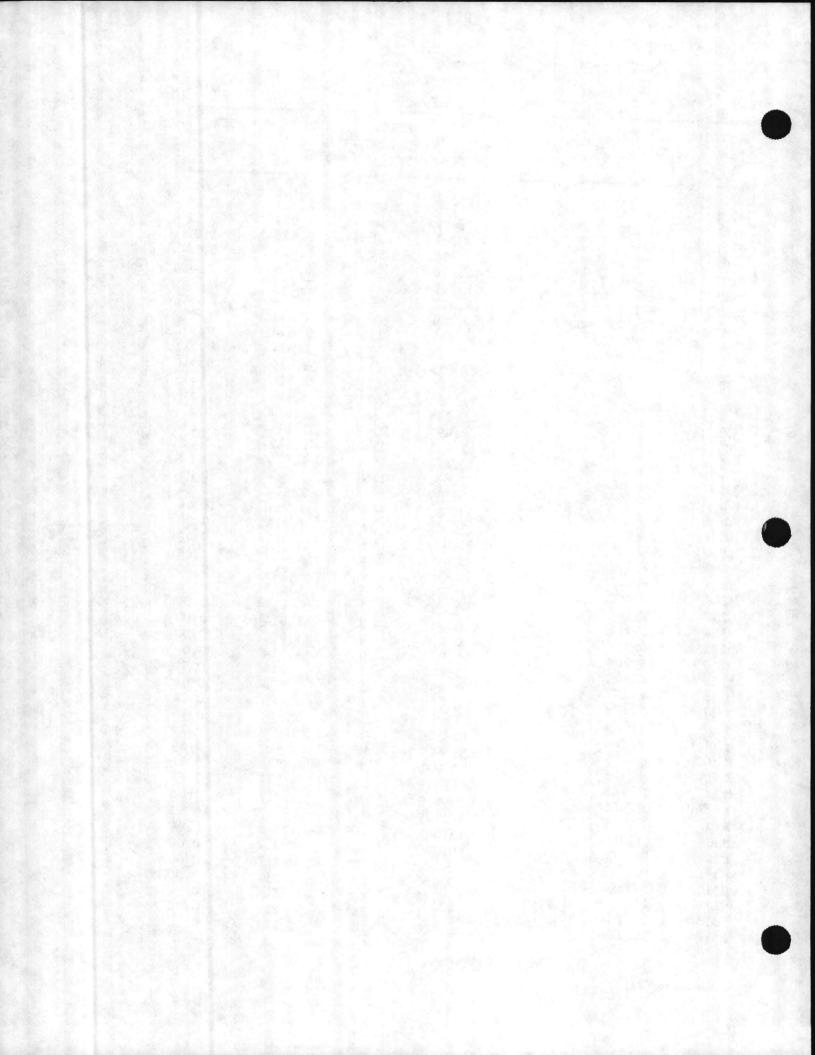
BUILDING NO.	STRUCTURE TYPE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
	Contraction of the second s				0.56
M90	OFFICE	37.156	108	2,217	0.56
M100	OFFICE	17.422	50	1,814	1.01
M100	OFFICE	79.701	231	2,620	0.34
M101	OFFICE	18.754	54	1,814	0.34
M102	OFFICE	15.218	44	1,814	0.28
M104	OFFICE	57.799	168	3,023	0.85
M105	OFFICE	19.475	56	1,814	0.35
M112	OCC. WAREHOUSE	50.503	146	2,217	0.70
M116	OFFICE	38.234	111	1,814	0.51
M123	OFFICE	27.885	81	1,814	0.51
M124	OFFICE	27.885	81	1,814	0.51
M125	OFFICE	27.885	81	1,814	0.51
M126	OFFICE	27.885	81	1,814	0.51
M127	OFFICE	27.885	81	1,814	
M128	OFFICE	87.495	254	1,814	1.61
M129	OFFICE	87.755	255	2,217	0.92
M130	OFFICE	50.438	146	1,814	1.05
M131	OFFICE	57.098	166	1,814	1.02
M132	OFFICE	67.512	196	1,814	
M134	OCC. WAREHOUSE	97.392	283	2,217	1.40
M178	OFFICE	11.023	32	1,814	0.20
M201	OFFICE	23.737	69	1,814	0.4
M201	OFFICE	79.701	231	1,814	1.4
M202	OFFICE	0.000	0	1,814	0.0
M206	OFFICE	0.000	0	1,814	0.0
M207	OFFICE	0.000	0	1,814	0.0
M208	OFFICE	0.000	0	1,814	0.0
M209	OFFICE	0.000	0	1,814	0.0
M210	OFFICE	0.000	0	1,814	0.0
M210 M215	OFFICE	27.885	81	1,814	0.5
M215 M216	OFFICE	27.885	81	1,814	0.5
M210 M231	OFFICE	0.000	0	2,620	0.0
M237	OFFICE	8.766	25	1,814	0.1
M240	OFFICE	61.156	177	2,620	
M301	OCC. WAREHOUSE	30.478		1,814	0.5
M302	OFFICE	13.091		1,814	0.2
M303	OFFICE	45.389		2,217	0.6
M305	OFFICE	0.000		2,217	0.0
M305	OFFICE	35.705		2,217	0.5
M308	OFFICE	13.091		1,814	0.3
M309	OFFICE	0.000		2,217	0.0
M309 M311	OFFICE	0.000		2,217	0.0
M313	OFFICE	0.000		2,217	0.0
M313 M314	OCC. WAREHOUSE	30.478		1,814	0.
M314 M315	OFFICE	13.091		1,814	0.1
M316	OFFICE	0.000) 0	2,217	0.



DATE: 06/22/87

SHEET 1 OF 3

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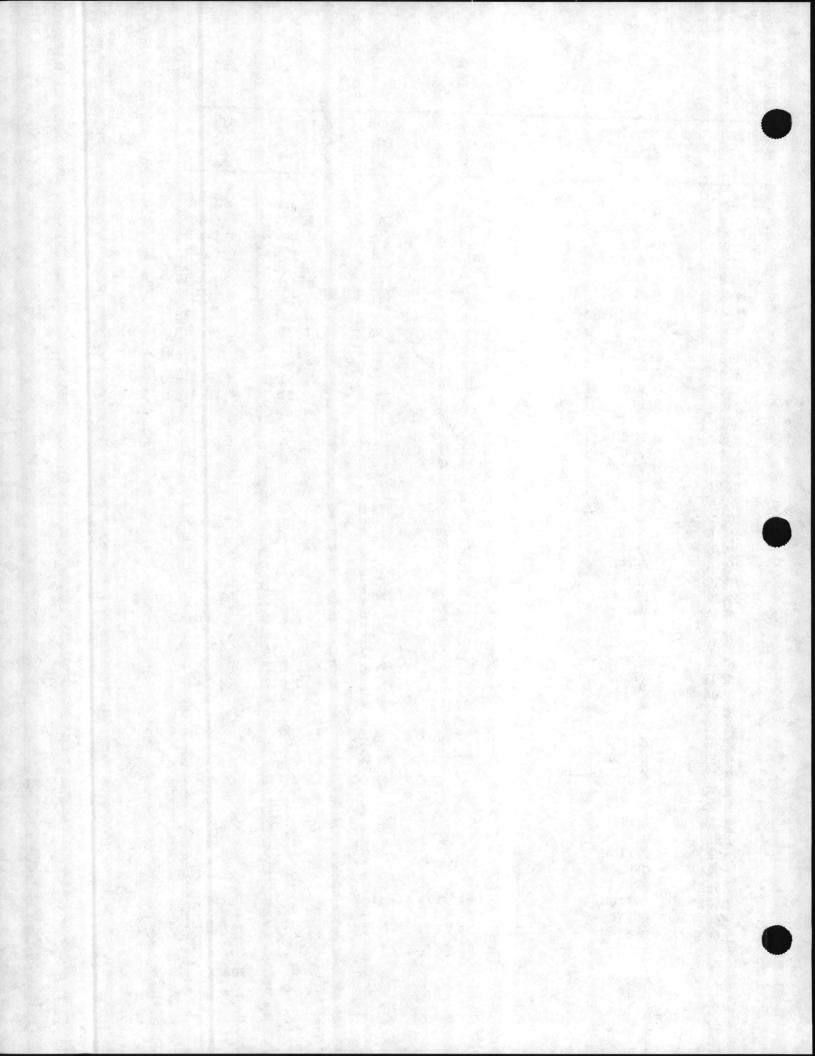


CAMP JOHNSON NIGHT SETBACK:

BUILDING NO.	STRUCTURE TYPE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
			See Ball		
M318	OFFICE	0.000	0	2,217	0.00
M319	OCC. WAREHOUSE	30.478	88	1,814	0.56
M321	OFFICE	45.389	132	2,217	0.68
M323	OFFICE	27.885	81	2,620	0.35
M324	OFFICE	115.743	336	3,023	1.28
M326	OFFICE	39.538	115	1,814	0.72
M327	OFFICE	39.538	115	2,620	0.50
M401	OFFICE	13.091	38	1,814	0.24
M401 M402	OFFICE	13.091	38	1,814	0.24
M402 M403	OFFICE	45.389	132	2,217	0.68
M405	OFFICE	27.885	81	1,814	0.51
M405 M406	OFFICE	27.885	81	1,814	0.51
M408 M407	OFFICE	26.616	77	2,217	0.40
M407	OFFICE	12.984	37	1,814	0.23
	OFFICE	45.389	132	2,217	0.68
M409	OFFICE	27.885	81	1,814	0.51
M411	OFFICE	27.885	81	1,814	0.51
M412	OFFICE	26.616	77	1,814	0.49
M413	OFFICE	13.091	38	1,814	0.24
M414	OCC. WAREHOUSE	30.478	88	1,814	0.5
M415	OFFICE	0.000	0	2,217	0.0
M416	OFFICE	26.616	77	2,217	0.4
M418	OFFICE	13.091	38	1,814	0.2
M419	OFFICE	45.389	132	2,217	0.6
M420	OFFICE	45.389	132	2,217	0.6
M422	OFFICE	115.743	336	1,814	2.1
M424	OFFICE	0.000	0	1,814	0.0
M441	OCC. WAREHOUSE	30.478	88	1,814	0.5
M501		13.091	38	1,814	0.2
M502	OFFICE	0.000	0	2,217	0.0
M503	OFFICE	0.000	0	2,217	0.0
M504	OFFICE OCC. WAREHOUSE	30.478	88	1,814	0.5
M506		0.000	0	2,217	0.0
M507	OFFICE	0.000	0	2,217	0.0
M509	OFFICE	0.000	0	1,814	0.0
M511	OFFICE	30.478	88	1,814	0.5
M512	OCC. WAREHOUSE	13.091	38	1,814	0.2
M513	OFFICE	0.000	0	2,217	0.0
M514	OFFICE	0.000	0	6,247	0.0
M516	OFFICE	0.000	and the second	2,217	0.0
M518	OFFICE	13.091		1,814	0.3
M520	OFFICE	0.000		2,217	0.0
M521	OFFICE	0.000		2,217	0.0
M522	OFFICE	13.091		1,814	0.
M601	OFFICE	13.091		1,814	0.1
M602	OFFICE	13.091		1,814	0.3
M603	OFFICE	13.091	and the second	Called and All and All and All	

DATE: 06/22/87

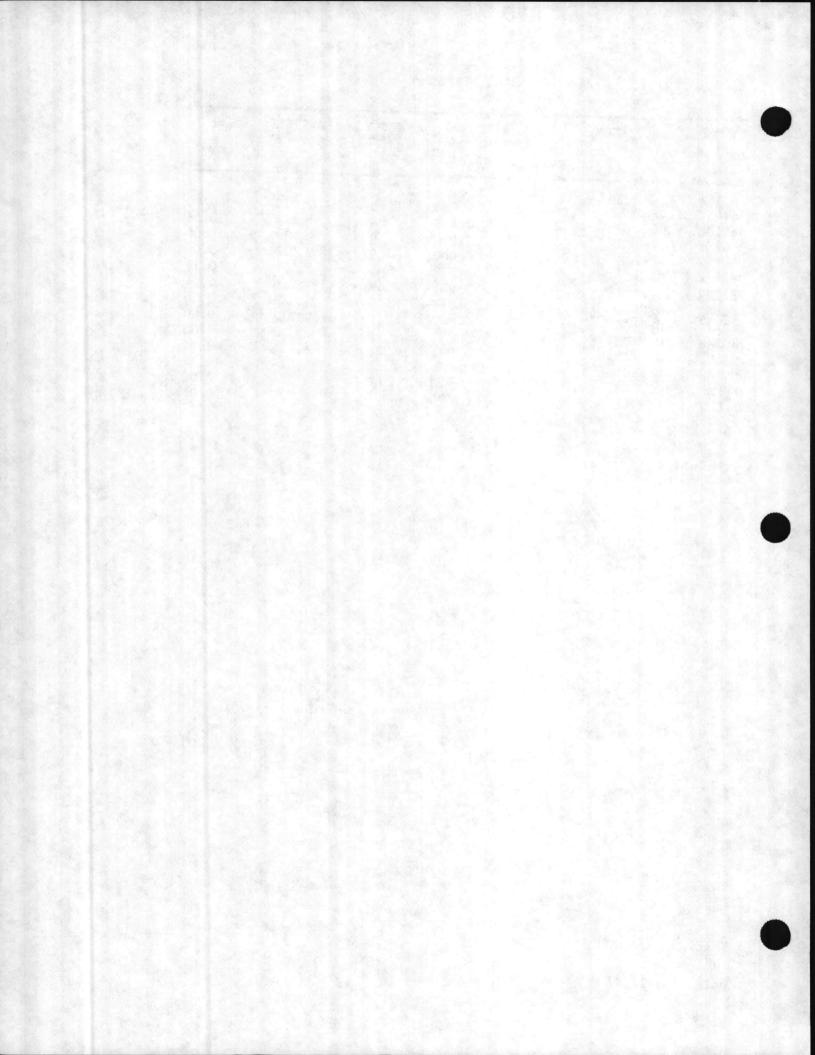
SHEET 2 OF 3



M604 OFFICE 0.000 0 1,21 M606 OCC. WAREHOUSE 30.478 88 1,814 0 M607 OFFICE 0.000 0 2,217 0 M609 OFFICE 0.000 0 2,217 0 M611 OFFICE 0.000 0 2,217 0 M611 OFFICE 51.379 149 2,217 0 M612 OFFICE 13.091 38 1,814 0 M613 OFFICE 0.000 0 2,217 0 M614 OFFICE 0.000 0 2,217 0 M616 OFFICE 13.091 38 1,814 0 M616 OFFICE 0.000 0 2,217 0 M619 OFFICE 13.091 38 1,814 0 M620 OFFICE 13.089 38 1,814 0 M621 OFFICE 0.000 0 2,217 0	BUILDING NO.	STRUCTURE TYPE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
M604 OFFICE 0.000 1,814 0 M606 OCC. WAREHOUSE 30.478 88 1,814 0 M607 OFFICE 0.000 0 2,217 0 M609 OFFICE 0.000 0 2,217 0 M611 OFFICE 0.000 0 2,217 0 M611 OFFICE 51.379 149 2,217 0 M612 OFFICE 13.091 38 1,814 0 M613 OFFICE 0.000 0 2,217 0 M614 OFFICE 13.091 38 1,814 0 M616 OFFICE 0.000 0 2,217 0 M616 OFFICE 13.091 38 1,814 0 M619 OFFICE 13.091 38 1,814 0 M620 OFFICE 13.089 38 1,814 0 M621 OFFICE 0.000 0 2,217 0 M621 OFFICE 0.000 0 2,217			0.000	0	2,217	0.00
M606 OCC. WAREHOUSE D0.000 0 2,217 0 M607 OFFICE 0.000 0 2,217 0 M609 OFFICE 0.000 0 2,217 0 M611 OFFICE 51.379 149 2,217 0 M612 OFFICE 13.091 38 1,814 0 M613 OFFICE 13.091 38 1,814 0 M614 OFFICE 0.000 0 2,217 0 M616 OFFICE 13.091 38 1,814 0 M616 OFFICE 13.091 38 1,814 0 M619 OFFICE 13.091 38 1,814 0 M620 OFFICE 13.089 38 1,814 0 M621 OFFICE 0.000 0 2,217 0 M621 OFFICE 0.000 0 2,217 0				88		0.56
M607 OFFICE 0.000 0 2,217 0 M609 OFFICE 0.000 0 2,217 0 M611 OFFICE 51.379 149 2,217 0 M612 OFFICE 13.091 38 1,814 0 M613 OFFICE 13.091 38 1,814 0 M614 OFFICE 0.000 0 2,217 0 M616 OFFICE 13.091 38 1,814 0 M619 OFFICE 13.091 38 1,814 0 M620 OFFICE 13.089 38 1,814 0 M621 OFFICE 0.000 0 2,217 0						0.00
M609 OFFICE 0.000 2,217 0 M611 OFFICE 51.379 149 2,217 0 M612 OFFICE 13.091 38 1,814 0 M613 OFFICE 13.091 38 1,814 0 M614 OFFICE 0.000 0 2,217 0 M616 OFFICE 0.000 0 2,217 0 M619 OFFICE 13.091 38 1,814 0 M620 OFFICE 13.089 38 1,814 0 M621 OFFICE 0.000 0 2,217 0	And the second se			0	and the second	0.0
M611 OFFICE J1.071 38 1,814 0 M612 OFFICE 13.091 38 1,814 0 M613 OFFICE 13.091 38 1,814 0 M614 OFFICE 0.000 0 2,217 0 M616 OFFICE 0.000 0 2,217 0 M619 OFFICE 13.091 38 1,814 0 M620 OFFICE 13.089 38 1,814 0 M621 OFFICE 0.000 0 2,217 0	STATISTICS AND A STATISTICS			149		0.7
M612 OFFICE 13.091 38 1,814 0 M613 OFFICE 13.091 38 1,814 0 M614 OFFICE 0.000 0 2,217 0 M616 OFFICE 0.000 0 2,217 0 M619 OFFICE 13.091 38 1,814 0 M620 OFFICE 13.089 38 1,814 0 M621 OFFICE 0.000 0 2,217 0				-		0.2
M613 OFFICE 13.091 0 2,217 0 M614 OFFICE 0.000 0 2,217 0 M616 OFFICE 0.000 0 2,217 0 M619 OFFICE 13.091 38 1,814 0 M620 OFFICE 13.089 38 1,814 0 M621 OFFICE 0.000 0 2,217 0	the second s					0.2
M614 OFFICE 0.000 0 2,217 0 M616 OFFICE 0.000 0 2,217 0 M619 OFFICE 13.091 38 1,814 0 M620 OFFICE 13.089 38 1,814 0 M621 OFFICE 0.000 0 2,217 0	Allow and the second second					0.0
M616 OFFICE 0.000 38 1,814 0 M619 OFFICE 13.091 38 1,814 0 M620 OFFICE 13.089 38 1,814 0 M621 OFFICE 0.000 0 2,217 0			•••••			0.0
M619 OFFICE 13.089 38 1,814 0 M620 OFFICE 13.089 38 1,814 0 M621 OFFICE 0.000 0 2,217 0	The second s			•		0.2
M620 OFFICE 13.000 0 2,217 0 M621 OFFICE 0.000 0 2,217 0					· · · · · · · · · · · · · · · · · · ·	0.2
M621 OFFICE 0.000 0 2.217 0						0.0
	M621 M622	OFFICE OFFICE				0.0

CAMP JOHNSON NIGHT SETBACK:

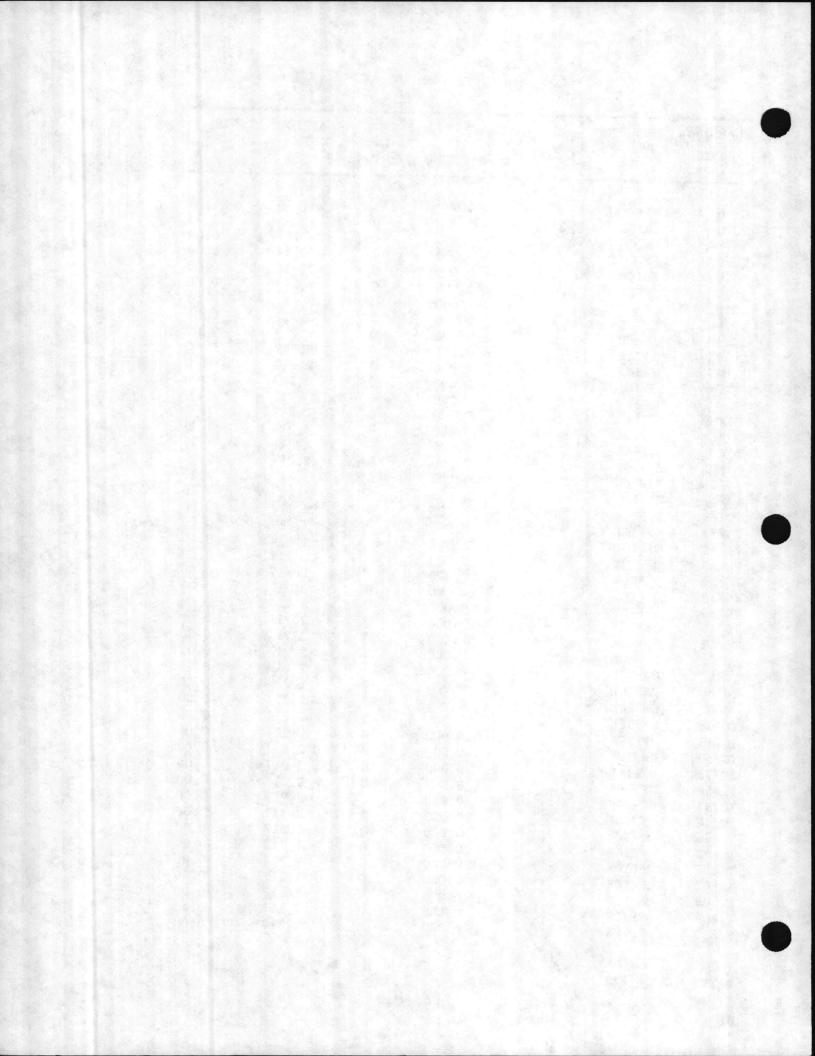




CAMP GEIGER NIGHT SETBACK:

BUILDING NO.	STRUCTURE TYPE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
			165	1,814	1.04
G770	HOSPITAL	56.922	.0	1,814	0.00
TC701	OFFICE	0.000		2,217	0.00
TC704	OFFICE	0.000	0	2,217	0.00
TC705	OFFICE	0.000		2,217	0.00
TC706	OFFICE	0.000	0	2,217	0.00
TC707	OFFICE	0.000	0	2,217	0.00
TC708	OFFICE	0.000	0	2,217	0.00
TC709	OFFICE	0.000	0		0.00
TC710	OFFICE	0.000	0	2,217	0.00
TC711	OFFICE	0.000	0	2,217	0.00
TC712	OFFICE	0.000	0	2,217	0.00
TC714	OFFICE	0.000	0	2,217	0.00
TC715	OFFICE	0.000	0	2,217	0.00
TC716	OFFICE	0.000	0	2,217	0.00
TC717	OFFICE	0.000	0	2,217	0.00
TC718	OFFICE	0.000	0	2,217	0.00
TC719	OFFICE	0.000	0	2,217	0.0
TC726	OFFICE	0.000	0	2,217	0.0
TC727	OFFICE	0.000	0	2,217	
TC728	OFFICE	0.000	0	2,217	0.0
TC729	OFFICE	0.000	0	2,217	0.0
TC735	OFFICE	23.602	68	1,814	0.4
TC736	OFFICE	0.000	0	2,217	0.0
TC737	OFFICE	0.000	0	2,217	0.0
TC738	OFFICE	0.000	0	2,217	0.0
TC739	OFFICE	0.000	0	2,217	0.0
TC740	OFFICE	0.000	0	2,217	0.0
TC741	OFFICE	0.000	0	2,217	0.0
TC742	OFFICE	0.000	0	2,217	0.0
TC743	OFFICE	0.000	0	2,217	0.0
TC744	OFFICE	0.000	0	2,217	0.0
TC745	OFFICE	0.000	0	2,217	0.0
TC748	OFFICE	0.000	0	2,217	0.0
TC749	OFFICE	0.000	0	2,217	0.0
TC750	OFFICE	0.000	0	2,217	0.0
TC751	OFFICE	0.000	0	2,217	0.0
TC752	OFFICE	0.000	0	2,217	0.0
TC753	OFFICE	0.000	0	2,217	0.0
TC754	OFFICE	0.000	0	2,217	0.0
TC804	OFFICE	0.000	0	2,217	0.0
TC804 TC805	OFFICE	0.000	0	2,217	0.0
TC805	OFFICE	0.000	0	2,217	0.
TC808	OFFICE	0.000	0	2,217	0.
TC808	OFFICE	0.000	0	2,217	0.
TC808 TC809	OFFICE	0.000		2,217	0.
TC810	OFFICE	0.000		2,217	0.

DATE: 06/24/87

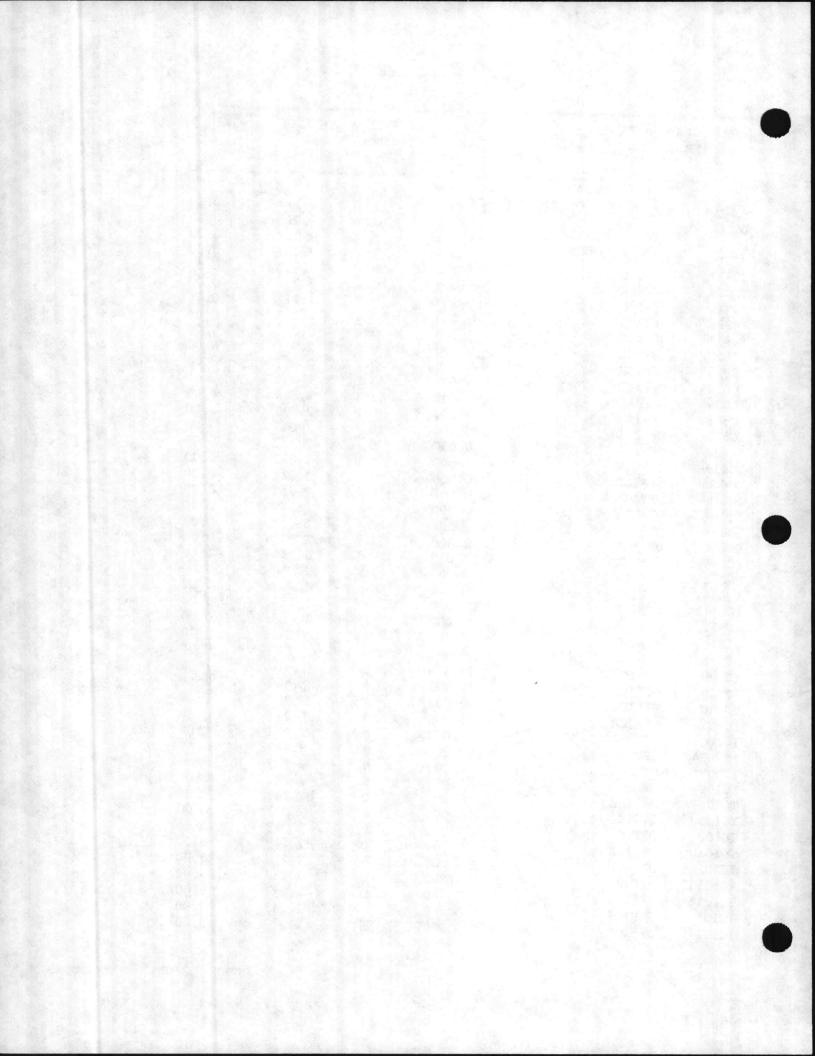


BUILDING NO.	STRUCTURE TYPE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
		0.000	0	2,217	0.00
TC812	OFFICE	0.000	0	2,217	0.00
TC814	OFFICE	0.000	0	2,217	0.00
TC815	OFFICE	0.000	0	2,217	0.00
TC816	OFFICE	0.000	0	2,217	0.00
TC817	OFFICE	0.000	0	2,217	0.00
TC818	OFFICE	0.000	0	2,217	0.00
TC819	OFFICE	0.000	0	2,217	0.00
TC826	OFFICE	0.000	Ō	2,217	0.00
TC827	OFFICE	0.000	0	2,217	0.00
TC828	OFFICE	0.000	0	2,217	0.00
TC829	OFFICE	23.602	68	1,814	0.43
TC832	OFFICE	23.602	68	1,814	0.43
TC834	OFFICE	0.000	0	2,217	0.00
TC836	OFFICE	0.000	Ō	2,217	0.00
TC837	OFFICE	0.000	0	2,217	0.00
TC838	OFFICE	0.000	0	2,217	0.00
TC839	OFFICE	0.000	0	2,217	0.00
TC840	OFFICE	0.000	0	2,217	0.00
TC841	OFFICE	0.000	0	2,217	0.00
TC842	OFFICE	0.000	0	2,217	0.0
TC844	OFFICE	0.000	õ	2,217	0.0
TC845	OFFICE	87.037	253	1,814	1.6
TC846	OFFICE	0.000	0	2,217	0.0
TC848	OFFICE	0.000	0	2,217	0.0
TC850	OFFICE	0.000	0	2,217	0.0
TC851	OFFICE	0.000	0	2,217	0.0
TC853	OFFICE	0.000	0	2,217	0.0
TC854	OFFICE	0.000	0	2,217	0.0
TC855	OFFICE	55.376	161	1,814	1.0
TC900	OFFICE	37.425	108	2,620	0.4
TC910	OFFICE	0.000	0	2,217	0.0
TC950	OFFICE	0.000	0	2,217	0.0
TC951	OFFICE	0.000	0	2,217	0.0
TC1003	OFFICE	0.000	Ő	2,217	0.0
TC1004	OFFICE	0.000	Ő	2,217	0.0
TC1005	OFFICE	0.000	Ő	2,217	0.0
TC1006	OFFICE	0.000	Ő	2,217	0.0
TC1007	OFFICE	0.000	Ő	2,217	0.0
TC1008	OFFICE	0.000	0	2,217	0.0
TC1009	OFFICE	0.000	0	2,217	0.0
TC1010	OFFICE	0.000	Ő	2,217	0.0
TC1012	OFFICE	0.000		2,217	0.0
TC1013	OFFICE	0.000		2,217	0.0
TC1015	OFFICE	0.000		2,217	0.0
TC1016	OFFICE	0.000		2,217	0.0
TC1017	OFFICE	0.000			

CAMP GEIGER NIGHT SETBACK:

DATE: 06/24/87

SHEET 2 OF 4

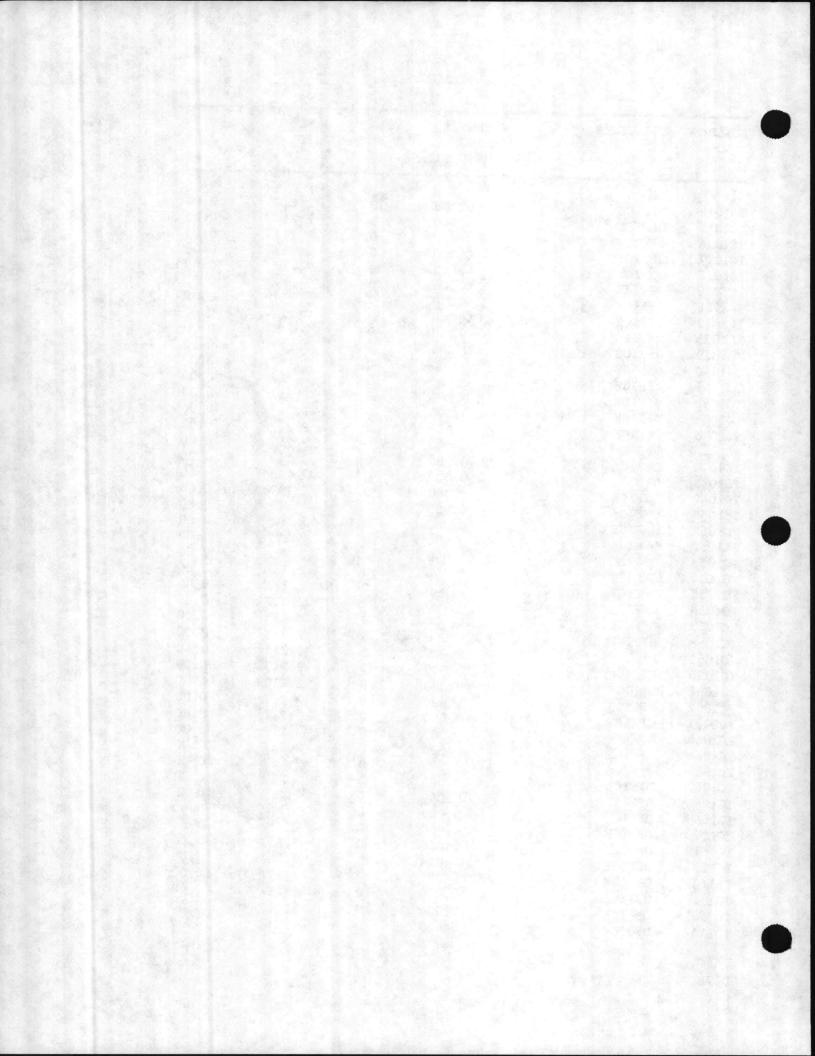


CAMP GEIGER NIGHT SETBACK:

BUILDING NO.	STRUCTURE TYPE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
TC1018	OFFICE	0.000	0	2,217	0.00
TC1019	OFFICE	0.000	0	2,217	0.00
TC1026	OFFICE	0.000	0	2,217	0.00
TC1027	OFFICE	0.000	0	2,217	0.00
TC1028	OFFICE	0.000	0	2,217	0.00
TC1029	OFFICE	0.000	0	2,217	0.00
TC1036	OFFICE	0.000	0	2,217	0.00
TC1037	OFFICE	0.000	0	2,217	0.00
TC1038	OFFICE	0.000	0	2,217	0.00
TC1039	OFFICE	0.000	0	2,217	0.00
TC1040	OFFICE	0.000	0	2,217	0.00
TC1040	OFFICE	0.000	0	2,217	0.00
TC1042	OFFICE	0.000	0	2,217	0.00
TC1044	OFFICE	0.000	0	2,217	0.00
TC1044	OFFICE	0.000	0	2,217	0.00
TC1045	OFFICE	0.000	0	2,217	0.0
TC1040	OFFICE	0.000	0	2,217	0.0
TC1047	OFFICE	0.000	0	2,217	0.0
TC1048	OFFICE	0.000	0	2,217	0.0
TC1049	OFFICE	0.000	0	2,217	0.0
	OFFICE	0.000	0	2,217	0.0
TC1051	OFFICE	0.000	0	2,217	0.0
TC1052	OFFICE	0.000	0	2,217	0.0
TC1053		0.000	0	2,217	0.0
TC1054	OFFICE	0.000	0	2,217	0.0
TC1055	OFFICE	0.000	0	2,217	0.0
TC1056	OFFICE	0.000	0	2,217	0.0
TC1057	OFFICE	0.000	0	2,217	0.0
TC1058	OFFICE	0.000	0	2,217	0.0
TC1059	OFFICE	0.000	0	2,217	0.0
TC1060	OFFICE	0.000	0	2,217	0.0
TC1061	OFFICE	0.000	Ő	2,217	0.0
TC1062	OFFICE	0.000	Ő	2,217	0.0
TC1063	OFFICE		õ	2,217	0.0
TC1064	OFFICE	0.000	Ő	2,217	0.0
TC1065	OFFICE	0.000	0	2,217	0.0
TC1066	OFFICE	0.000	0 0	2,217	0.0
TC1067	OFFICE	0.000	0	2,217	0.0
TC1068	OFFICE	0.000		2,217	0.0
TC1069	OFFICE	0.000		2,217	0.0
TC1110	OFFICE	0.000		2,217	0.
TC1119	OFFICE	0.000		2,217	0.
TC1131	OFFICE	0.000		2,217	0.
TC1132	OFFICE	0.000	The second s	2,217	0.0
TC1140	OFFICE	0.000			0.0
TC1141	OFFICE	0.000		2,217	0.
TC1142	OFFICE	0.000	0	2,217	0.

DATE: 06/24/87

SHEET 3 OF 4



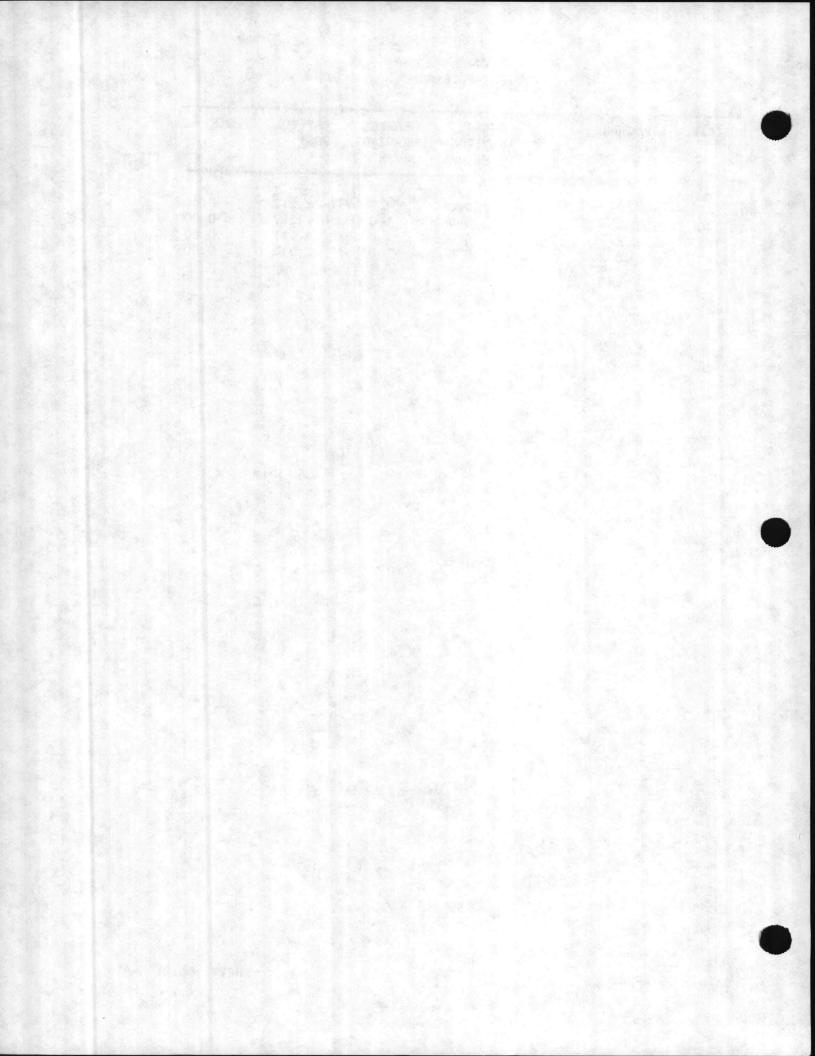
BUILDING NO.	STRUCTURE TYPE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
ma11/2	OFFICE	0.000	0	2,217	0.00
TC1143	OFFICE	0.000	0	2,217	0.00
TC1160 TC1161	OFFICE	0.000	0	2,217	0.00
TC1162	OFFICE	0.000	0	2,217	0.00

NIGHT SETBACK:

CAMP GEIGER



SHEET 4 OF 4

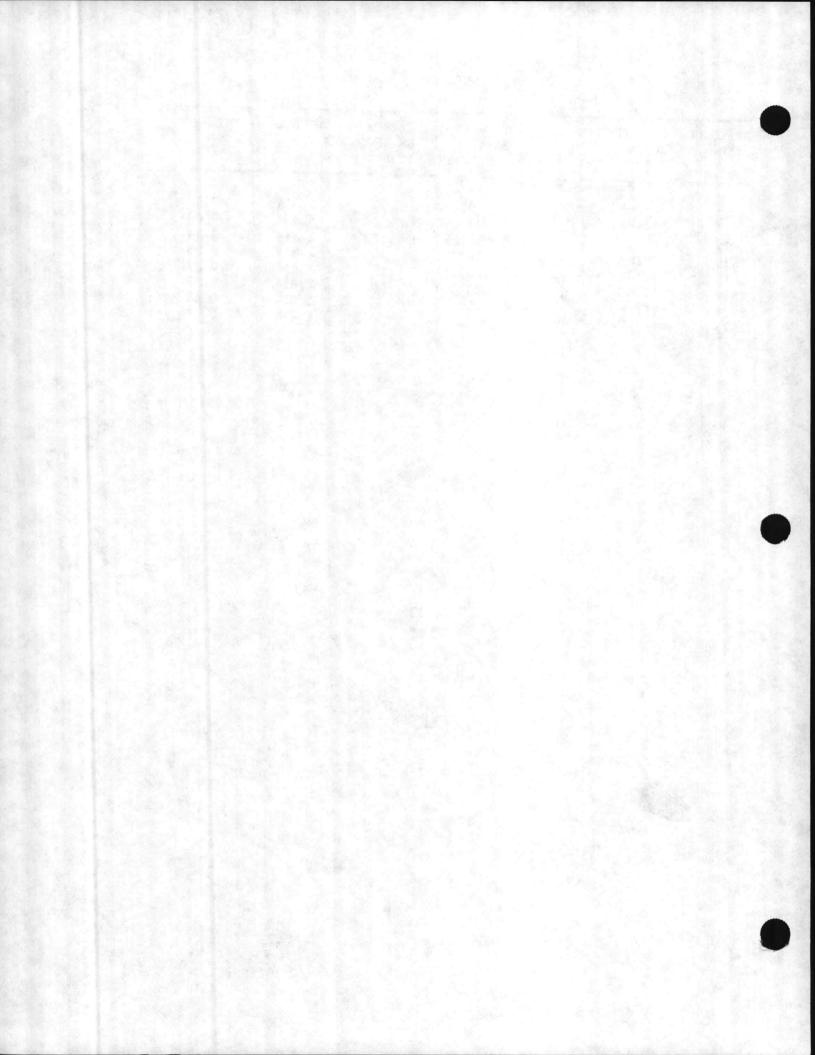


PARADISE POINT

NIGHT SETBACK:

BUILDING NO.	STRUCTURE TYPE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
		0.000	0	1,814	0.00
2600	OFFICE	0.000	Ő	5,441	0.00
2603	OFFICE	45.590	132	1,814	0.84
2624	OFFICE	15.704	45	1,814	0.28
2625	OFFICE	20.364	59	1,814	0.37
2626	OFFICE	20.364	59	1,814	0.37
2627	OFFICE	22.406	65	1,814	0.41
2628 2629	OFFICE OCC. WAREHOUSE	33.144	96	1,814	0.61





4.5 OUTSIDE AIR LIMIT SHUTOFF

<u>Introduction</u> - This ECO discusses energy and cost savings which would realized by installing steam supply shutoff controls in many of the buildings at this installation. These controls would be stand-alone controls that are compatible with the existing Energy Management Control System (EMCS) which is controlled by a Hewlett Packard (HP) 1000 computer.

<u>Existing Condition</u> - The heating season lasts for approximately 6 months. The building steam supply is manually shut off during the non-heating season but there are periods of mild temperatures during the heating season when the steam is not shut off.

Substantial amounts of energy can be saved by reducing the number of hours of operation of auxiliary equipment. Reducing the hours the steam system is active also results in savings by eliminating the heat loss from the piping and related equipment. Both savings can be realized by installing an automatic steam shut off valve to turn off the steam supply for comfort heating and by installing controls to shut off the auxiliary equipment, primarily hot water pumps, whenever the outside temperature exceeds 65 deg. F.

<u>Calculation Methodology</u> - Following is the methodology used to calculate energy savings from outside air limit shutoff.

Reference: CR 82.030 "Standardized EMCS Energy Savings

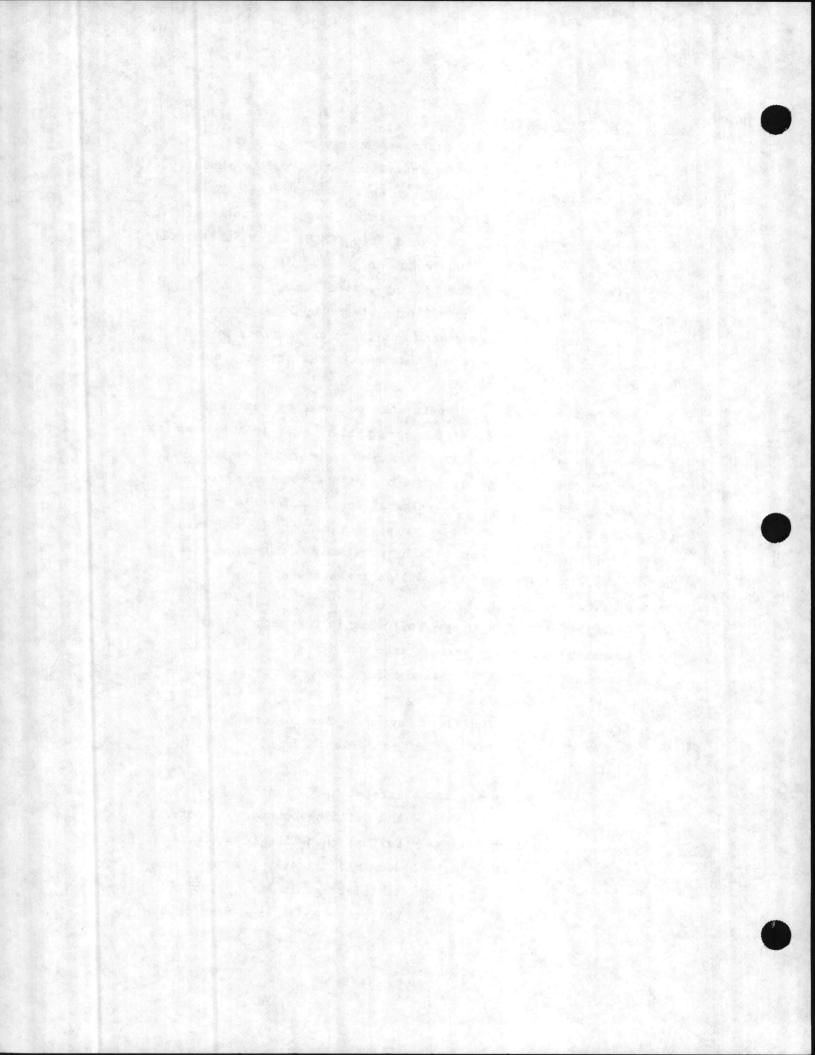
Calculation." pg. 47

Energy Savings = Auxiliary Savings + System Loss Savings x 1 MBtu/1x10 x 1/Plant Eff.

Where:

Energy Savings = Rate of heat transfer from the building boundary in MBtu/yr Auxiliary Savings = Savings resulting from shutting down electrically powered auxiliary equipment, primarily hot water pumps (see next page)

4-57 (R-1)



System Loss Savings = Savings in Btu/hr resulting from an elimination of heat losses from the steam piping and equipment. See Section 4.3 "Upgrade Pipe Insulation"

Plant Eff. = Efficiency of the steam generating plant (See Section 3.2 "Fuel Costs and Efficiencies")

Auxiliary Savings = HPxLx(0.746 kw/hp) x HW x 3412 Btu/kw-hr Where:

HP = Motor nameplate horsepower (total of continuously running pumps) (see below)

HW = Hours in winter outside temperature is above winter limits (65 deg. F) in hours per year (see below)

L = Load factor, use 0.8 per Reference

BHP = BHP/motor eff.

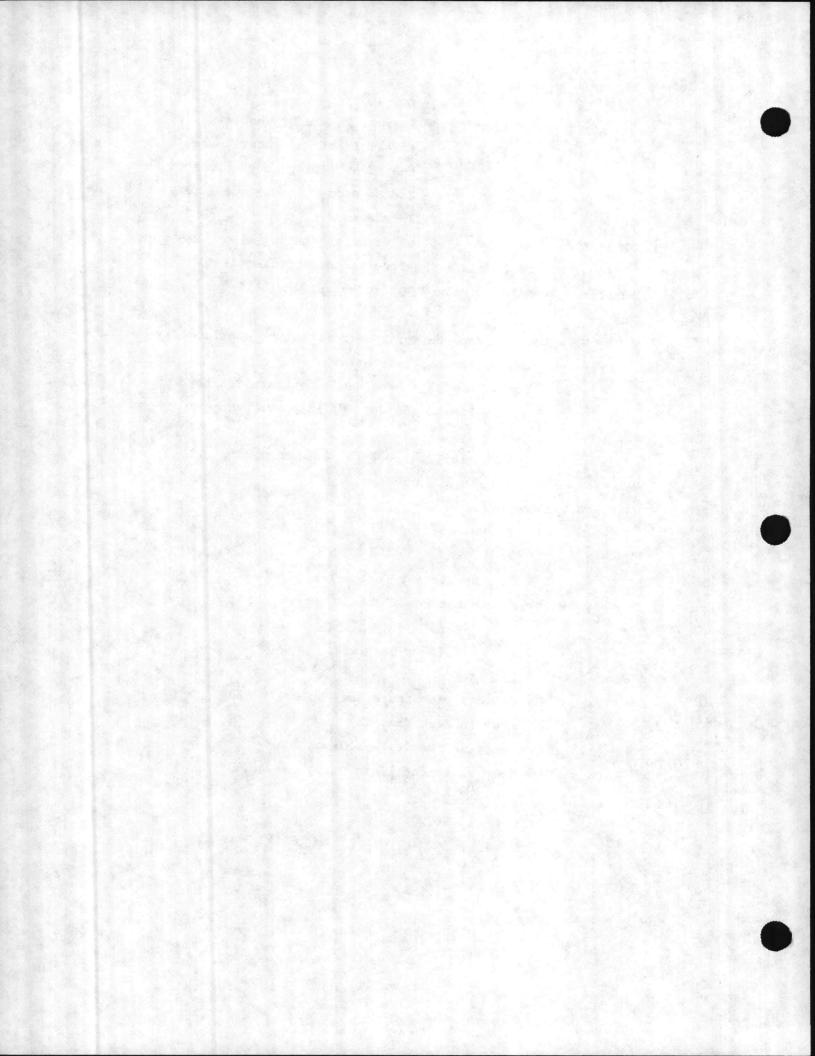
Where:

BHP = Pump horsepower (see below) Motor eff. = Motor efficiency (use 0.75) <u>GPM x H x Sp. gr.</u> BHP = 3960 x pump eff.

Where:

GPM = Gallons per minute (see below) H = Head in feet (use 25) Sp.gr. = Specific gravity = 1.0 Pump eff = Pump efficiency (use 0.75) ______

GPM = 60WCT



Where:

Q = BTT x AZ x (Td - To) BTT = Building thermal transmission in Btu/hr-deg. F sq. ft. (see Section 4.4, "Night Setback") AZ = Area of zone being served in sq. ft. To = Design outdoor temperature = 23 deg. F Td = Indoor Design Temp. (see Section 3.3, "General Analysis Methods") W = Density, lb/gal. = 8.33

C = Specific heat of water, Btu/lb-deg. F = 1.0

T = Water temperature differential, deg. F (Use 20)

HW = Hours in winter outside temperature is above

65 deg. F

Reference: NAVFAC P-89 Engineering Weather Data

Month	<u>Hours/yr</u>
Nov.	138
Dec.	57
Jan.	31
Feb.	34
March	83
April	274
	617 hours/yr

Calculation Example:

Given: 1. HP = 5

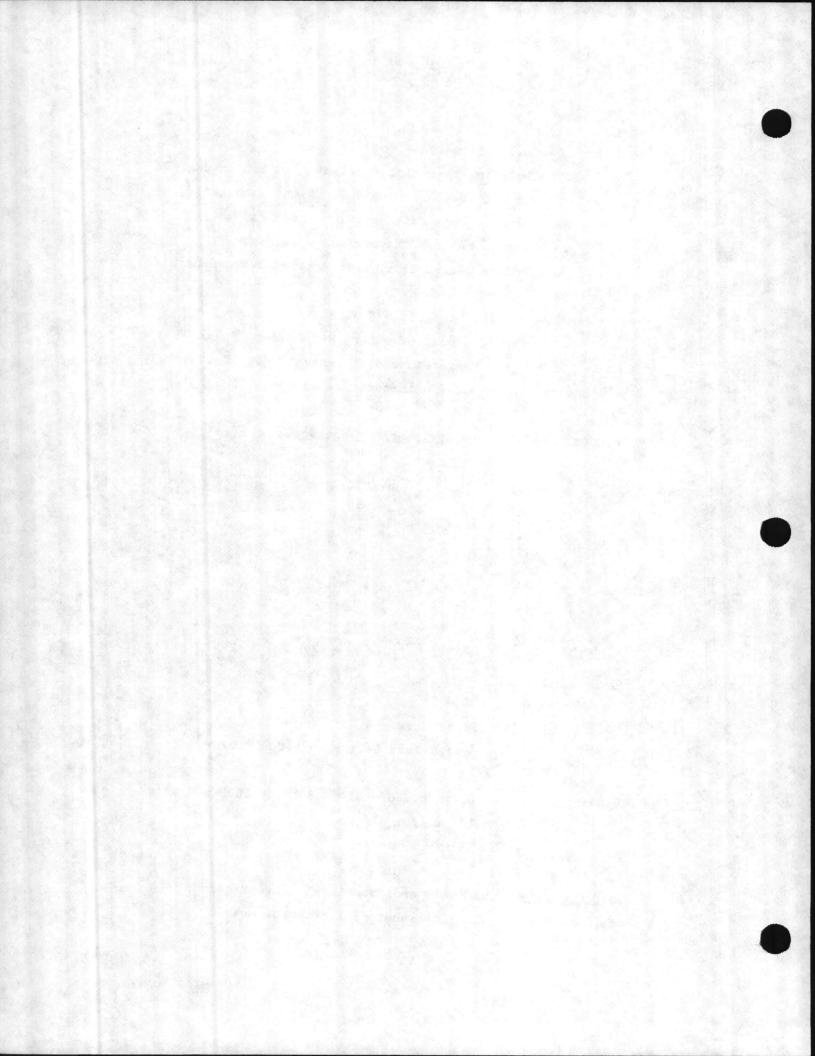
- 2. Plant Eff. = 0.73
- 3. System Loss Savings = 5,000 Btu/hr.

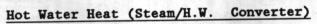
Energy Savings = [(5 x 0.8 x 0.746 x 617 x 3412) + 5000 x 617] x 1/1 x 10 x 1/0.73 = 12.83 MBtu/yr

<u>Cost Estimate</u> - The items and associated costs required to accomplish outside air limit shutoff are as follows:



4-59 ^(R-1)





Item	Materials	Labor	Total
Outside air	119	17	136
temperature s	ensor		
Motorized steam	valve 414	92	506
Pneumatic valve	204	44	248
controller			
EP transducer	239	44	283
. 건. 성격하게 많은 것 수 <u>.</u>	1 0 01179 /h.	d1 dime	

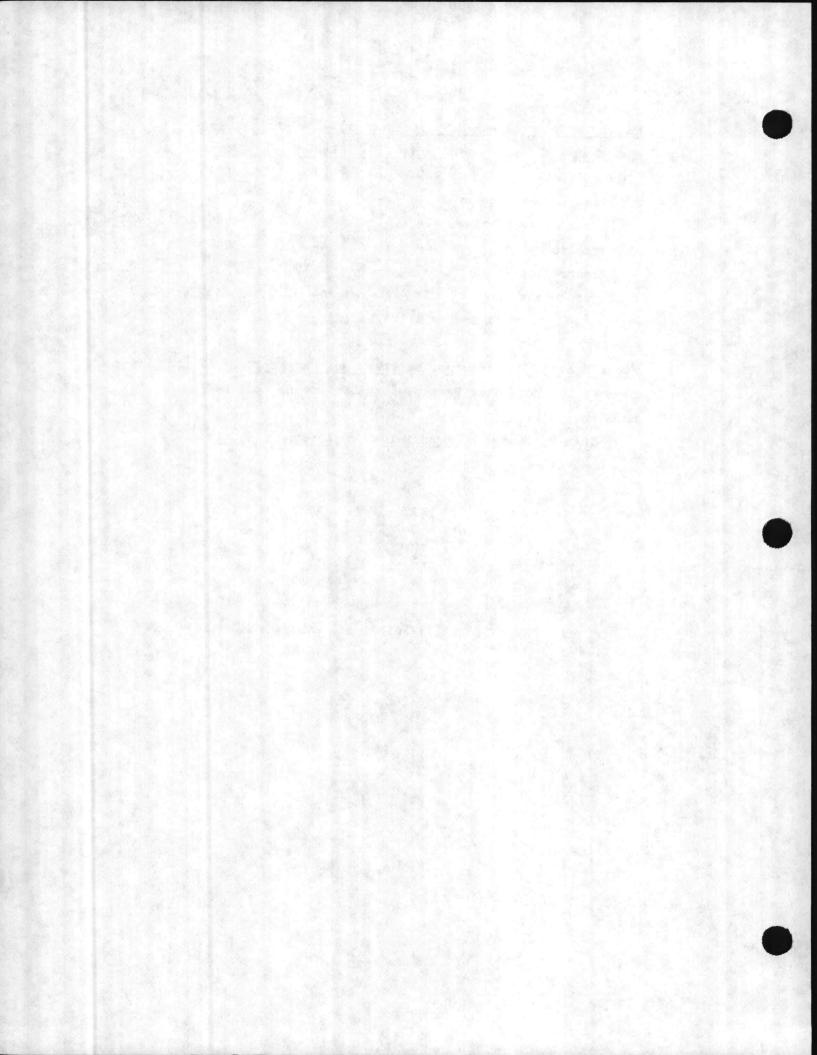
Total Cost = \$1173/building

Steam Heat (AHU, radiator, or steam unit heater)

Same as for Hot Water Heat plus the following cost per air handling unit:

Item	Materials	Labor	Total	
Control relay-	25	44	69	
start/stop				
Pneumatic damper	133	30	163	
actuator				
Control relay-	25	44	69	
damper				
EP valve	72	30	102	

Total = \$1173/building + \$403/air handling unit

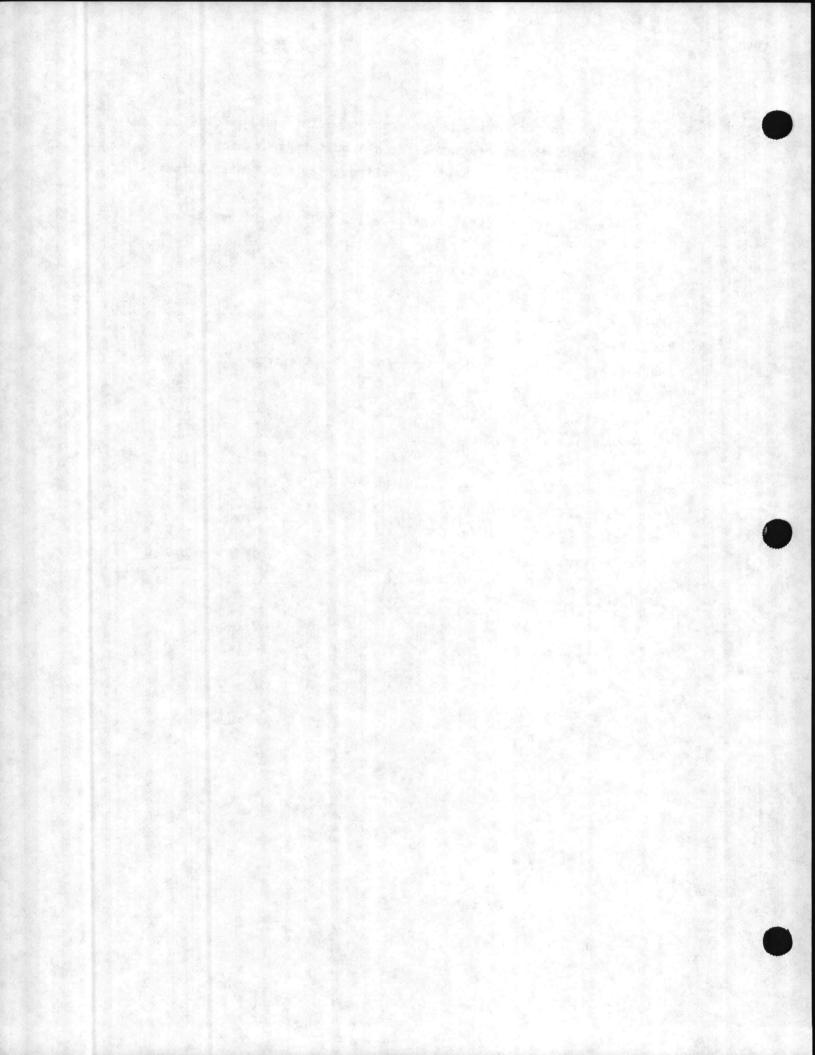


<u>Summary</u> - The following pages present individual building energy savings and cost estimates for all buildings at each installation and the ECIP sheets for all outside air limit shutoff ECOs with an SIR greater than 1.0.

	ENERGY S	AVINGS	CAPITAL COST	
INSTALLATION	MBTU/YR	\$/YR	\$	SIR
Rifle Range	534.086	1,553	7,038	2.24
Beach Area	290.458	845	4,764	1.80
Hadnot Point	1,065.864	2,378	16,055	1.50
French Creek	72.327	162	1,173	1.40
Air Station	368.914	1,074	8,650	1.26
Hospital Point	58.325	130	1,173	1.12
Camp Johnson	133.971	390	3,555	1.11
Courthouse Bay	0	0	0	0.00
Camp Geiger	0	0	0	0.00
Paradise Point	0	0	0	0.00

The results of the life-cycle cost analysis are listed below:



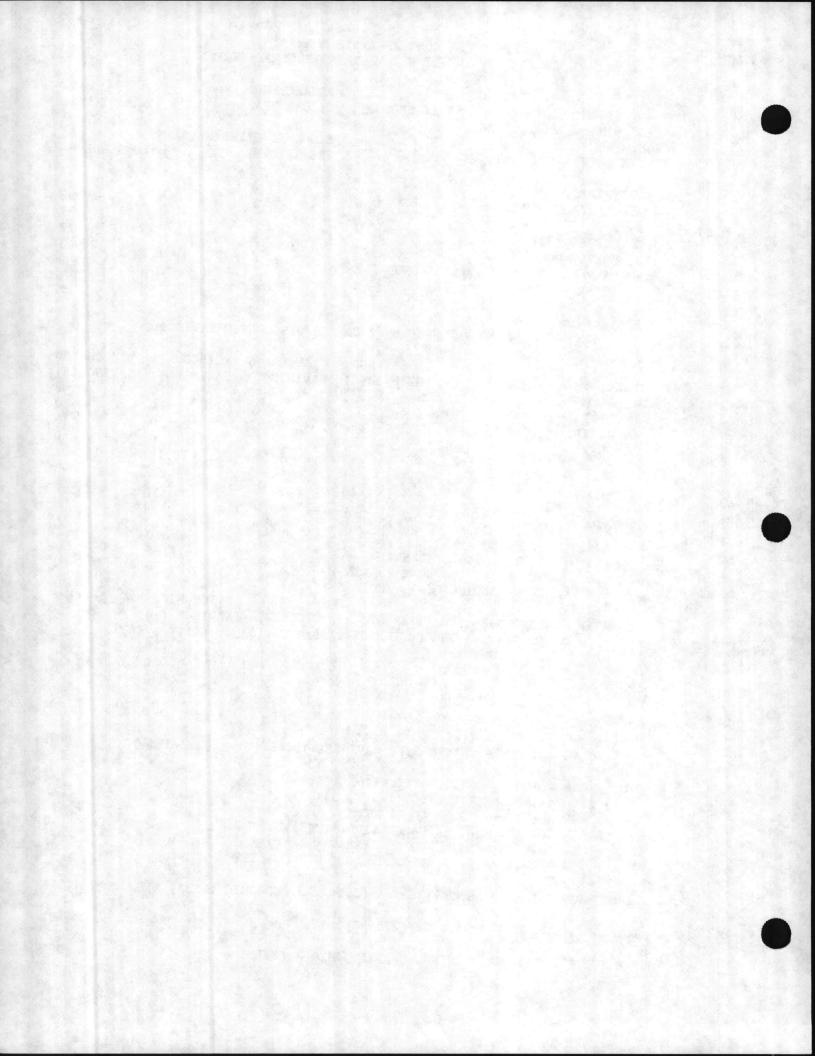


LOCATION: PROJECT TITLE:	RIFLE RANGE OUTSIDE AIR LIMIT SHUTOFF	PROJECT N FISCAL YE		1988
PORTION NAME: REGION NUMBER: ANALYSIS DATE:	MISC. BLDGS 4 JUNE 23 1987	ECONOMIC PREPARED	YEARS: LO	15 SUNDE
B. SIOH C DESIGN	JCTION COST		\$	7,038 387 422 7,063
D. ENERGY E. SALVAG	CREDIT CALC (1A+1B+1C)X.9 E VALUE OF EXISTING EQUIPMEN INVESTMENT (1D-1E)	NT	\$	0 7,063

2. ENERGY SAVINGS (+) / (-) ANALYSIS DATE ANNUAL SAVINGS, UNIT COST \$ DISCOUNTED SAVINGS

3

	COST	SAVINGS	ANNUAL	\$ D	ISCOUNT	DISCOU	
FUEL	COST \$/MBTU(1)	MBTU/YR(2)	SAVINGS ((3) FA	CTOR(4)	SAVING	
A. ELEC	8.15	0		0			0
	0	0		0	0		0
B. DIST	Ő	0		0	0		0
C. RESID	0	0		0	0	364 3	0
D. NG E. COAL	2.91	534	1,5	54	10.18	1:	5,822
F. TOTAL	\$	534	1,5	54		1	5,822
. NON ENERGY SA	VINGS (+) / CO	ST (-)			0		
A ANNUAL R	ECURRING (+/-)			\$	7.61		
(1) DISC	COUNT FACTOR (T	ABLE 1)		•	7.01		
(2) DISC	OINTED SAVING/	COST (3AX3A1)		\$	U		
B. NON RECU	RRING SAVINGS	(+) / COST (-	.)	DT	SCOUNTED		
					VINCS (+)		
ITEM	SAVING \$ (+) COST \$ (-)(1)	YEAR OF OCCURRENCE(2)	FACTOR (3)	COST(-)	(4)	
	0)	1	0		
a.	0		C	1	0		
b.	0		D	1	0		
c. d. TOTAL	0				0		
	ON ENERGY DISC	OUNTED SAVING	S(+),COST	(-)	(3A2+3Bd4)	0
	NON ENERGY QU X NON ENERGY C	ATC CULS Y S	51		\$		5,221
(1) 25% MA	X NON ENERGIO	GO TO ITEM 4					
a. IF 3	D1 15 - 30	CALC SIR =	(2F5+3D1)	/1F			0
D. IF J	$\frac{11}{15} = 50$	GO TO ITEM 4					
d IF 3	X NON ENERGY C D1 IS $= > 3C$ D1 IS $< 3C$ D1b IS $= > 1$ D1b IS < 1	PROJECT DOES	NOT QUAL	IFY			
4. FIRST YEAR I					LIFE)] \$;	1,554
							15,822
5. TOTAL NET DI							
6. SIR (IF < 1	PROJECT DOES 1	NOT QUALIFY)	SIR = (5/1)	F) =			2.2

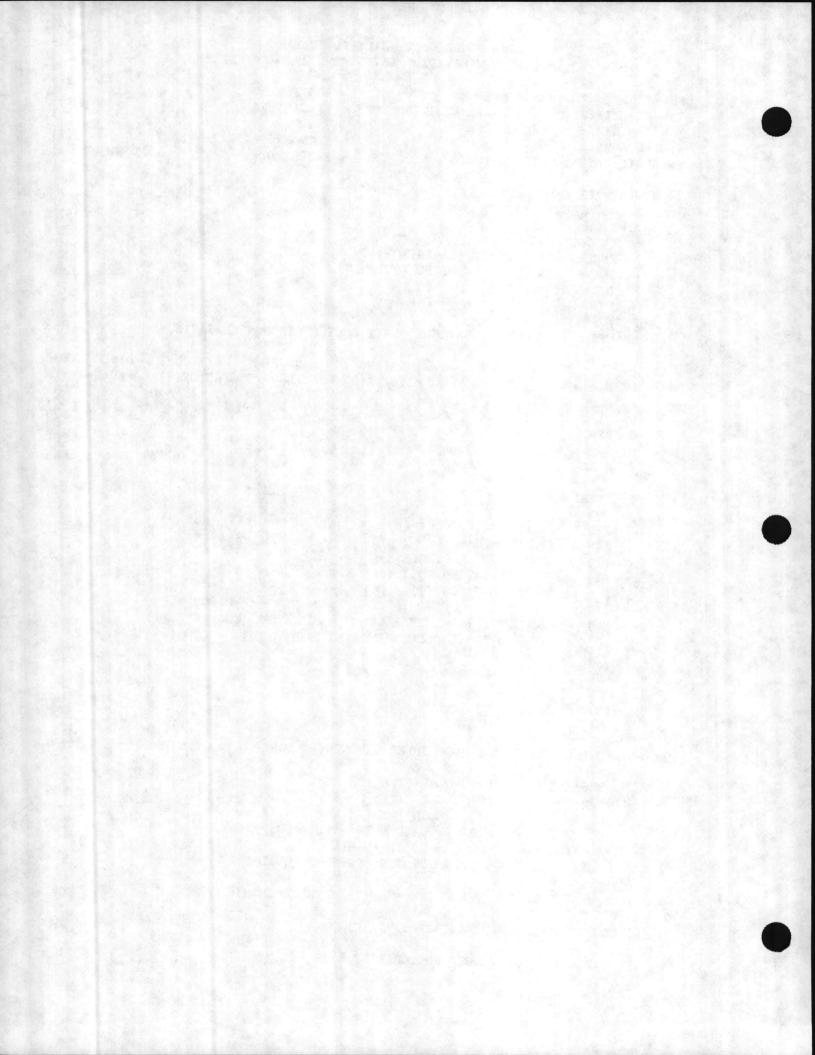


LOCATION: BEACH AREA PROJECT TITLE: OUTSIDE AIR LIMIT SHUTOFF	PROJECT NO. FISCAL YEAR:	1988
PORTION NAME: MISC. BLDGS REGION NUMBER: 4 ANALYSIS DATE: JUNE 23 1987	ECONOMIC LIFE IN YEARS: PREPARED BY: LO	15 SUNDE
1. INVESTMENT COST A. CONSTRUCTION COST B. SIOH C. DESIGN COST	\$	4,764 262 286 4,781
D. ENERGY CREDIT CALC (1A+1B+1C)X.9 E. SALVAGE VALUE OF EXISTING EQUIPME F. TOTAL INVESTMENT (1D-1E)	ent \$	0 4,781

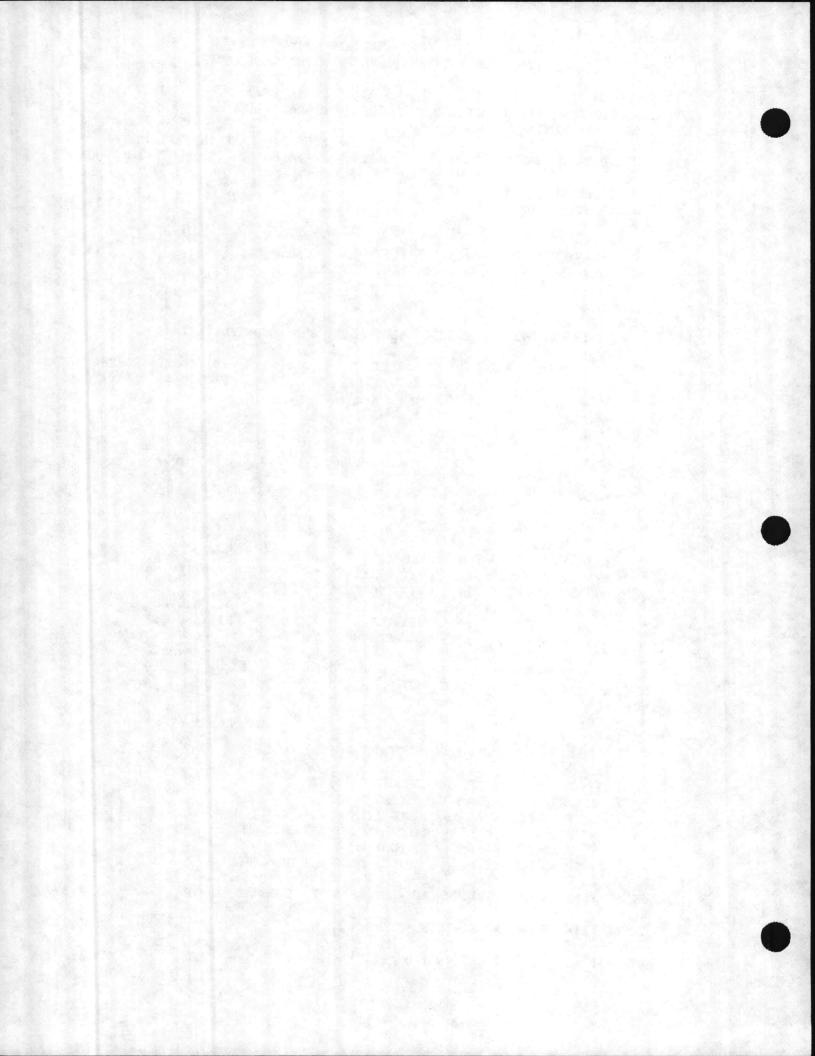
2. ENERGY SAVINGS (+) / (-)
ANALYSIS DATE ANNUAL SAVINGS, UNIT COST \$ DISCOUNTED SAVINGS

3

	COST	SAVINGS	ANNUAL	\$	DISCOUNT	DISCOUNTED
FUEL	\$/MBTU(1)	MBTU/YR(2)	SAVINGS	(3)	FACTOR(4)	SAVINGS(5)
A. ELEC	8.15	0		0	0	•
B. DIST	0	0		0	0	0
C. RESID	0	0		0	0	0
D. NG	0	0		0	0	0
E. COAL	2.91	290	8	45	10.18	8,604
F. TOTAL	\$	290	8	45		8,604
NON ENERGY S	AVINGS (+) / CO	ST (-)				
A ANNUAL	RECURRING (+/-)			\$	0	
(1) DTS	COUNT FACTOR (T.	ABLE 1)			7.61	
(2) DIS	COUNTED SAVING/	COST (3AX3A1)	`	\$	0	
B. NON REC	URRING SAVINGS	(+) / 0031 (-	,	1	DISCOUNTED	
とこでで かどり 生命的ない	SAVING \$ (+)	VEAD OF	DISCOUNT		SAVINGS (+)	
ITEM	COST \$ (-)(1)	OCCURRENCE(2)	FACTOR (3)	COST(-)	(4)
States and	0	C)	1	0	
a.	Ő	()	1	0	
b.	0	(1	0	
c. d. TOTAL	0				0	
	NON ENERGY DISCO	UNTED SAVING	S(+),COST	(-)	(3A2+3Bd4) 0
D. PROJEC	T NON ENERGY QUA	ALIFICATION T	EST		s	2,839
	AX NON ENERGY CA 3D1 IS = > 3C	CO TO TTEM A				
a. IF	3D1 IS = > 3C 3D1 IS < 3C 3D1b IS = > 1	CALC STR =	(2F5+3D1)	/1F		0
b. IF	3DI 15 < 30	CO TO ITEM 4	(210.0000)			
c. IF	3D1b IS < 1	PROJECT DOES	NOT QUAL	IFY		
						0/5
4. FIRST YEAR	DOLLAR SAVINGS	[2F3+3A+(3B1d	YRS ECON	OMIC	C LIFE)] \$	845
	ISCOUNTED SAVIN				ę	8,604
			TD _ (5/1	F) -	-	1.8
6. SIR (IF < 1	PROJECT DOES N	OT QUALIFY) S	IK = (3/1)			



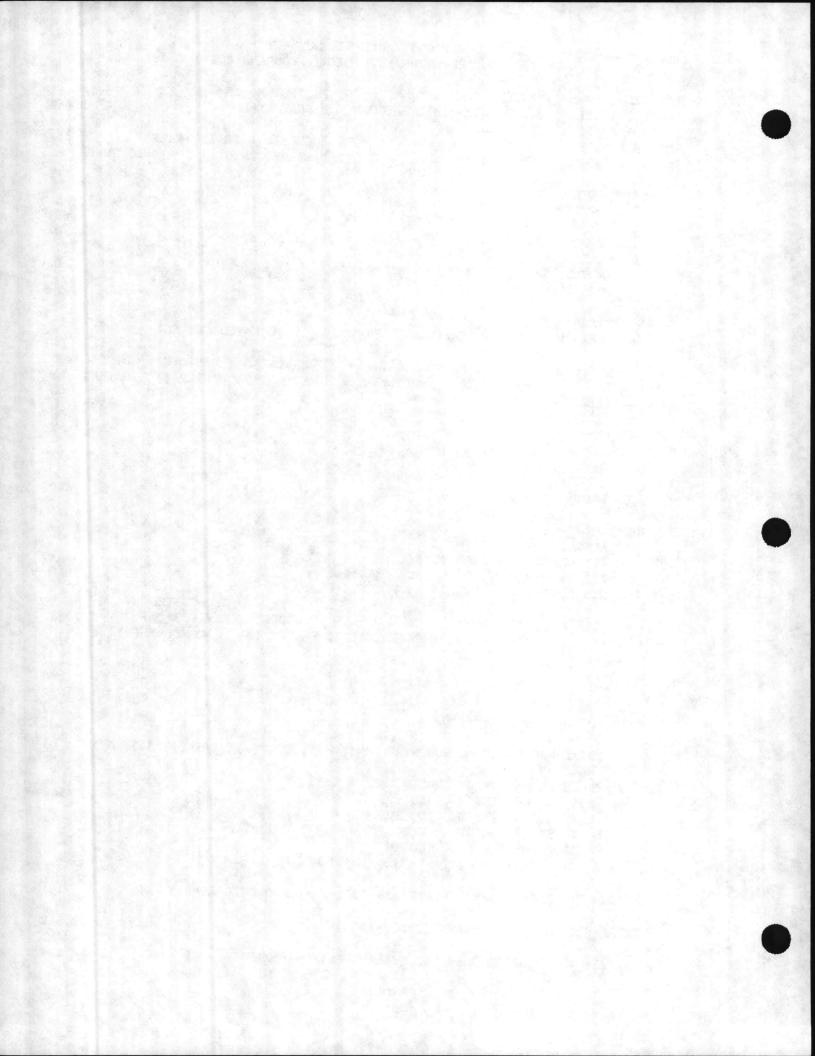
LOCATION		HADNOT POINT		PROJECT NO.		1988
ROJECT 1	CITLE:	OUTSIDE AIR LIN	MIT SHUTOFF	FISCAL YEAR:		1900
		MISC. BLDGS		ECONOMIC LIF	E IN YEARS:	15
REGION NU	DATE .	4 JUNE 23 1987		PREPARED BY:]	LO SUNDE
MALISIS	DAID.	00ML 25 1707				
L. INVEST					\$	16,055
		ICTION COST			1 A A	883
	SIOH DESIGN	COST				963
C. 1	ENEDCY	CREDIT CALC (1A	+1B+1C)X.9			16,111
D. 1 F	SATVACE	VALUE OF EXIST	ING EOUIPMENT			0
F. 1	TOTAL]	INVESTMENT (1D-1	E)		\$	16,111
- ENERC	V SAUTA	NGS (+) / (-)				
ANA	LYSIS I	DATE ANNUAL SAVI	NGS, UNIT COS	r \$ discounti	ED SAVINGS	
		COST	SAVINGS	ANNUAL \$	DISCOUNT	DISCOUNTED
FUE	L		MBTU/YR(2)			SAVINGS(5)
	ELEC	8.15		0		C C
	DIST	0	0	U	0	
	RESID			0		
	NG COAL	0 2.23		2,377		
	TOTAL	\$		2,377		24,197
			NOT (_)	to generate the shake		
3. NON E	ANDITIAT	SAVINGS (+) / CO RECURRING (+/-))31 (-)	\$	0	
Α.	(1) DT	SCOUNT FACTOR (1	CABLE 1)		7.61	
	(2) DI	SCOUNTED SAVING	/COST (3AX3A1)	\$	0	
В.	NON RE	CURRING SAVINGS	(+) / COST (-)	DICCOUNTED	
					DISCOUNTED SAVINGS (+)	
	ITEM	SAVING \$ (+) COST \$ (-)(1)	OCCURRENCE(2)			(4)
а.		0	C) 1	0	
b.		0	C) 1	0	
с.		0	C) 1	0	
d.	TOTAL	0			0	
C.	TOTAL	NON ENERGY DISC	OUNTED SAVINGS	S(+),COST(-)	(3A2+3Bd4))
D.	PROJEC	T NON ENERGY QU	ALIFICATION TH	EST		
(1)) 25% M	AX NON ENERGY C.	ALC (2F5 X .33	3)	\$	7,98
	a. IF	3D1 IS = > 3C	GO TO ITEM 4	(2E5+2D1) /1E		
	b. IF	3D1 IS < 3C	CALC SIR = $($	(2F5+5D1)/1F		
		3D1b IS = > 1 3D1b IS < 1	PROJECT DOES	NOT QUALIFY		
				ATT C FCONONT	C LIFE)] \$	2,37
4. FIRS	T YEAR	DOLLAR SAVINGS	[2F3+3A+(3B1d)	YRS ECONOMIC	, FILP)] Å	2,57
		DOLLAR SAVINGS		YRS ECONOMIC		
5. TOTA	L NET I	DISCOUNTED SAVIN	GS (2F5+3C)		\$	24,19
5. TOTA	L NET I		GS (2F5+3C)		\$	



		FRENCH CREEK OUTSIDE AIR LIMIT SHUTOFF	PROJECT NO. FISCAL YEAR:		1988
R	EGION NUMBER:	MISC. BLDGS 4 JUNE 23 1987	ECONOMIC LIFE IN PREPARED BY:	YEARS: LO	15 SUNDE
1	A. CONSTRUC			\$	1,173
	B. SIOH	20.0 m			70
	C. DESIGN	CREDIT CALC (1A+1B+1C)X.9			1,177
	D. ENERGY	VALUE OF EXISTING EQUIPMEN	T		0
	E. SALVAGE	NVESTMENT (1D-1E)		\$	1,177

2. ENERGY SAVINGS (+) / (-) ANALYSIS DATE ANNUAL SAVINGS, UNIT COST \$ DISCOUNTED SAVINGS

	COST		ANNUAL \$	DISCOUNT	DISCOUNTED
FUEL	\$/MBTU(1)	MBTU/YR(2)		FACTOR(4)	SAVINGS(5)
A. ELEC	8.15	0	0	0	0
B. DIST	0	0	0	0	0
C. RESID	0	0	0	0	0
D. NG	0	0	0	0	
E. COAL	2.23	72	161	10.18	1,042
F. TOTAL	\$	72	161		1,642
3. NON ENERGY SA	VINGS (+) / CO	ST (-)			
A ANNIIAL F	ECURRING (+/-)		\$		
(1) DISC	COUNT FACTOR (T	ABLE 1)		7.61	
(1) DISC (2) DISC	COUNTED SAVING/	COST (3AX3A1)	\$	0	
B NON RECI	JRRING SAVINGS	(+) / COST (-)		
D. NON ILLO	Sector States and Sector	War and and in		DISCOUNTED	
ITEM	SAVING \$ (+) COST \$ (-)(1)	YEAR OF	DISCOUNT FACTOR (3)	SAVINGS (+) COST(-)	
	COST \$ (-)(1)	OCCURRENCE(2)	FACIOR (3)	0001()	
	0	C	1	0	
a. b.	0	C) 1	0	
	0	() 1	0	
c. d. TOTAL	0			0	
	ON ENERGY DISCO	NINTED SAVINGS	S(+), COST(-)	(3A2+3Bd4) 0
	the state of the second				
D. PROJECT	NON ENERGY QUA	ALIFICATION TH	EST		542
(1) 25% MA	X NON ENERGY CA	ALC (2F5 X .3)	3)	\$	J4Z
9 TF 3	D1 TS = > 3C	GO TO ITEM 4			0
b. IF 3	D1 IS < 3C	CALC SIR =	(2F5+3D1)/1F		·
C TF 3	D1b $TS = > 1$	GO TO ITEM 4			
d. IF 3	D1b IS < 1	PROJECT DOES	NOT QUALIFY		
4. FIRST YEAR I	OLLAR SAVINGS	[2F3+3A+(3B1d	YRS ECONOMI	C LIFE)]	ş 161
5. TOTAL NET DI					\$ 1,642
6. SIR (IF < 1			IR = (5/1F)	<u>-</u>	1.4

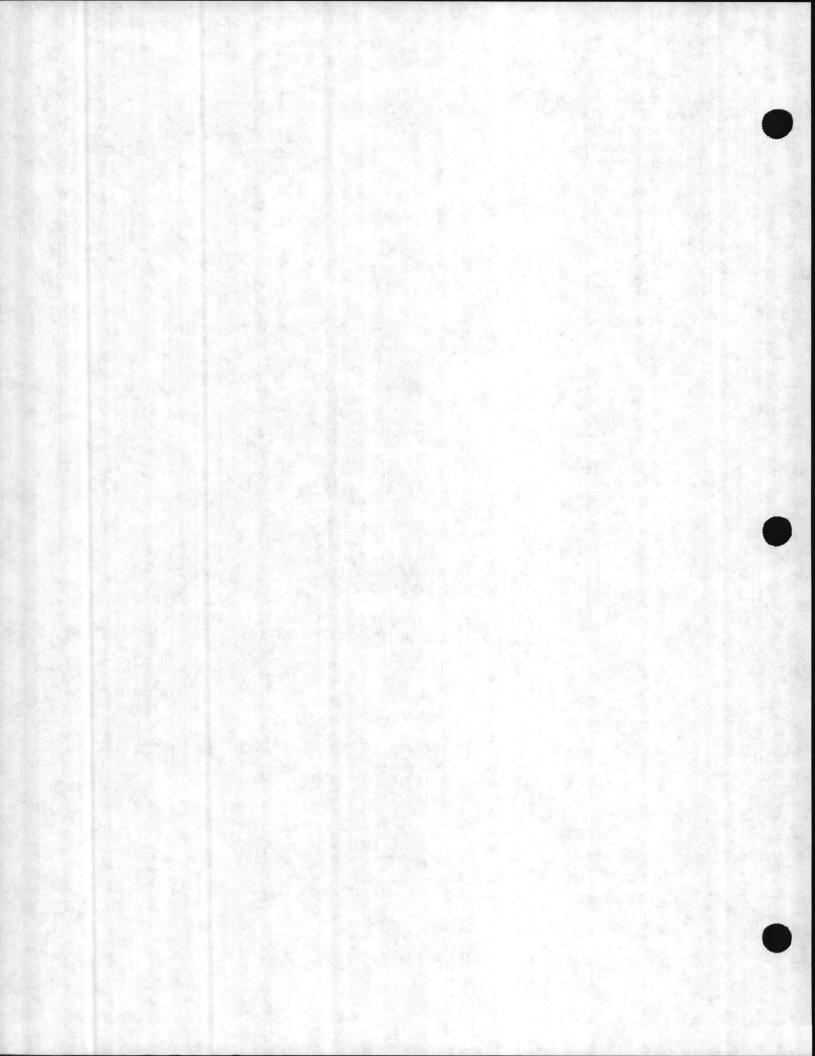


LOCATION: NE PROJECT TITLE: OU	W RIVER AIR STATION JTSIDE AIR LIMIT SHUTOFF	PROJECT NO. FISCAL YEAR:		1988
PORTION NAME: MI REGION NUMBER:	ISC. BLDGS 4 JNE 23 1987	ECONOMIC LIFE IN PREPARED BY:	I YEARS: LO	15 SUNDE
1. INVESTMENT COS A. CONSTRUCT B. SIOH	ION COST		\$	8,650 476 519
E. SALVAGE V.	ST EDIT CALC (1A+1B+1C)X.9 ALUE OF EXISTING EQUIPMEN	т	\$	8,680 0 8,680

F. TOTAL INVESTMENT (1D-1E)

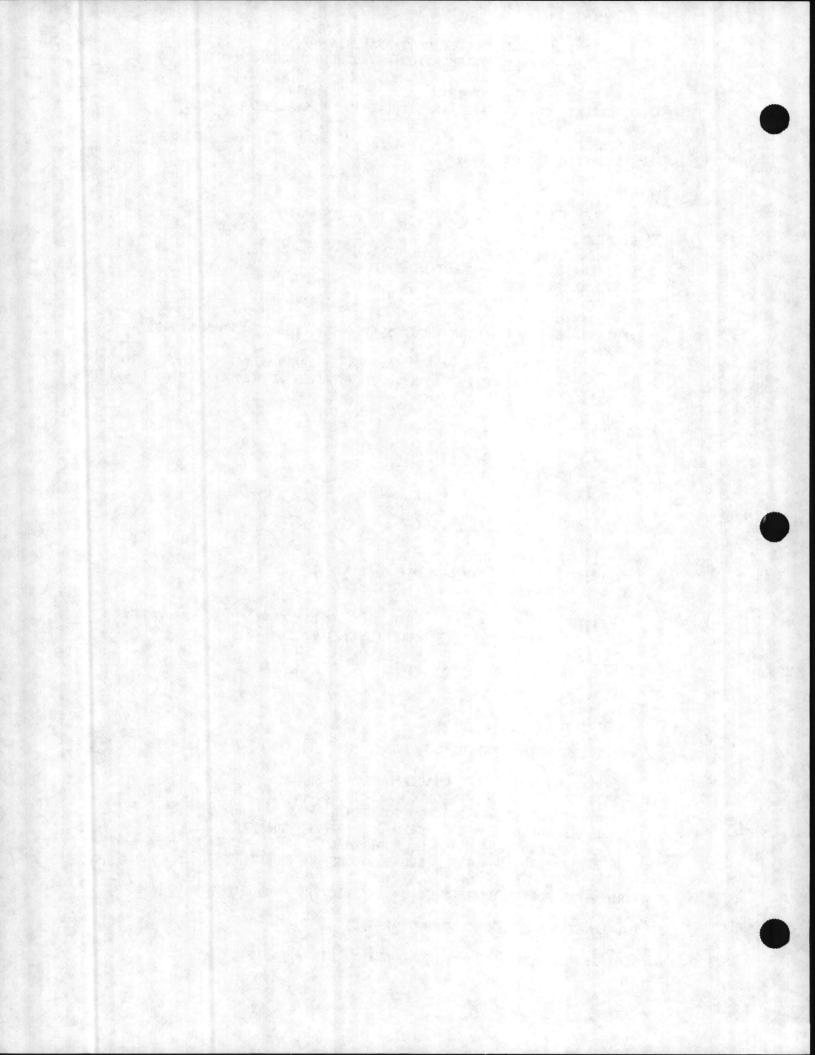
2. ENERGY SAVINGS (+) / (-)
ANALYSIS DATE ANNUAL SAVINGS, UNIT COST \$ DISCOUNTED SAVINGS

	COST	SAVINGS	ANNUAL \$	DISCOUNT	DISCOUNTED
	\$/MBTU(1)	MBTIL/YR(2)	SAVINGS (3)	FACTOR(4)	SAVINGS(5)
FUEL	\$/fB10(1) 8.15	0	0	0	0
A. ELEC	0.15	0	0	0	0
B. DIST	Ő	0	0	0	0
C. RESID	0	0	0	0	0
D. NG	2.91		1,074	10.18	10,929
E. COAL	2.71	이 이상 문제한			1.73 - 2.16
F. TOTAL	\$	369	1,074		10,929
3. NON ENERGY SA	VINGS (+) / COS	ST (-)	Ş	. 0	
A. ANNUAL R	ECURRING (+/-)	11	4	7.61	
(1) DISC	COUNT FACTOR (TA	ABLE 1)	ş		
(2) DISC	COUNTED SAVING/	COST (JAXJAI)	and the second	,	
B. NON RECU	JRRING SAVINGS	(+) / COST (-)	DISCOUNTED	
		WEAD OF	DISCOUNT		
ITEM	SAVING \$ (+) COST \$ (-)(1)	OCCURRENCE(2)	FACTOR (3)	COST(-)	(4)
	0	0	1	0	
a.	0		1	0	
Ъ.	0	C) 1	0	
C.	0		1.1	0	
d. TOTAL	20 T				
C. TOTAL N	ON ENERGY DISCO	UNTED SAVINGS	S(+),COST(-)	(3A2+3Bd4	.) 0
D. PROJECT	NON ENERGY QUA X NON ENERGY CA	LIFICATION THALC (2F5 X .33	EST 3)	Ş	3,606
	-1	CO TO TTEM /			
a. IF 3 b. TF 3	D1 IS $= > 3C$ D1 IS $< 3C$ D1b IS $= > 1$ D1b IS < 1	CALC SIR =	(2F5+3D1)/1F	the state of the state	0
c IF 3	D1b IS = > 1	GO TO ITEM 4			
d TF 3	D1b IS < 1	PROJECT DOES	NOT QUALIFY	1. S. M. P. M.	
					1.07/
4. FIRST YEAR D	OLLAR SAVINGS	[2F3+3A+(3B1d	/YRS ECONOMI	C LIFE)]	\$ 1,074
5. TOTAL NET DI	SCOUNTED SAVIN	GS (2F5+3C)		Berlin R.S.	\$ 10,929
6. SIR (IF < 1	PROJECT DOES N	OT QUALIFY) S	IR = (5/1F)		1.3



LOCATION: PROJECT TITLE:	HOSPITAL POINT OUTSIDE AIR LIM	IT SHUTOFF	PROJECT NO. FISCAL YEAR	::	1988
PORTION NAME:	MISC. BLDGS				15
REGION NUMBER:	4			FE IN YEARS:	LO SUNDE
ANALYSIS DATE:	JUNE 23 1987		PREPARED BY		LO BONDE
1. INVESTMENT	COST			\$	1,173
	UCTION COST			Υ.	65
B. SIOH					70
C. DESIGN	COST	18+1018 9			1,177
D. ENERGY	CREDIT CALC (1A+ E VALUE OF EXISTI	NG FOUL PMENT			0
F. TOTAL	INVESTMENT (1D-1E	2)		\$	1,177
2. ENERGY SAVI	NGS (+) / (-) DATE ANNUAL SAVIN		S DISCOUN	TED SAVINGS	
ANALYSIS					DICCOUNTER
	COST	SAVINGS	ANNUAL \$	DISCOUNT	SAVINGS(5)
FUEL	\$/MBTU(1)	MBTU/YR(2)	SAVINGS (3) FACTOR(4)	Contraction of the second second
A. ELEC	8.15	0		0	
B. DIST	0	0		0	
C. RESID	0	0			
D. NG E. COAL		58		We shall a second a second of the second s	1,32
F. TOTAL		58	130	1	1,32
3. NON ENERGY	SAVINGS (+) / CO	ST (-)		\$ 0	
A. ANNUAL	L RECURRING (+/-)	ADTE 1)		7.61	
(1) D.	ISCOUNT FACTOR (T ISCOUNTED SAVING/	COST (3AX3A1)		\$ 0	
(2) D.	ECURRING SAVINGS	(+) / COST (-)	A State of the second	
D. NON KI				DISCOUNTED	
ITEM	SAVING \$ (+)	YEAR OF	DISCOUNT	SAVINGS (+)	
	COST \$ (-)(1)	OCCURRENCE(2)	FACTOR (3)) COST(-)	(4)
	0	()	1 ()
a. b.	0	(1 ()
с.	0	()	1 (
d. TOTAL	. 0			()
C. TOTAL	NON ENERGY DISCO	OUNTED SAVING	S(+),COST(-) (3A2+3Bd4	4)
D. PROJE (1) 25%	CT NON ENERGY QUA MAX NON ENERGY CA	ALIFICATION T ALC (2F5 X .3	EST 3)		ş 43
a. IF	3D1 IS = > 3C	GO TO ITEM 4			
b. IF	3D1 IS < 3C	CALC SIR -	(2F5+3D1)/1	F	
c. IF	3D1b IS = > 1	GO TO ITEM 4	NOT OTALLE	N7	
d. IH	3D1b 13 < 1	PROJECT DOES	NOT QUALIF	Y	
4. FIRST YEAR	R DOLLAR SAVINGS	[2F3+3A+(3B1d	YRS ECONOM	IC LIFE)]	\$ 1
5. TOTAL NET	DISCOUNTED SAVIN	GS (2F5+3C)			\$ 1,3
					an and the second
6. SIR (IF <	1 PROJECT DOES N	OT QUALIFY) S	IR = (5/1F)		1

4-67



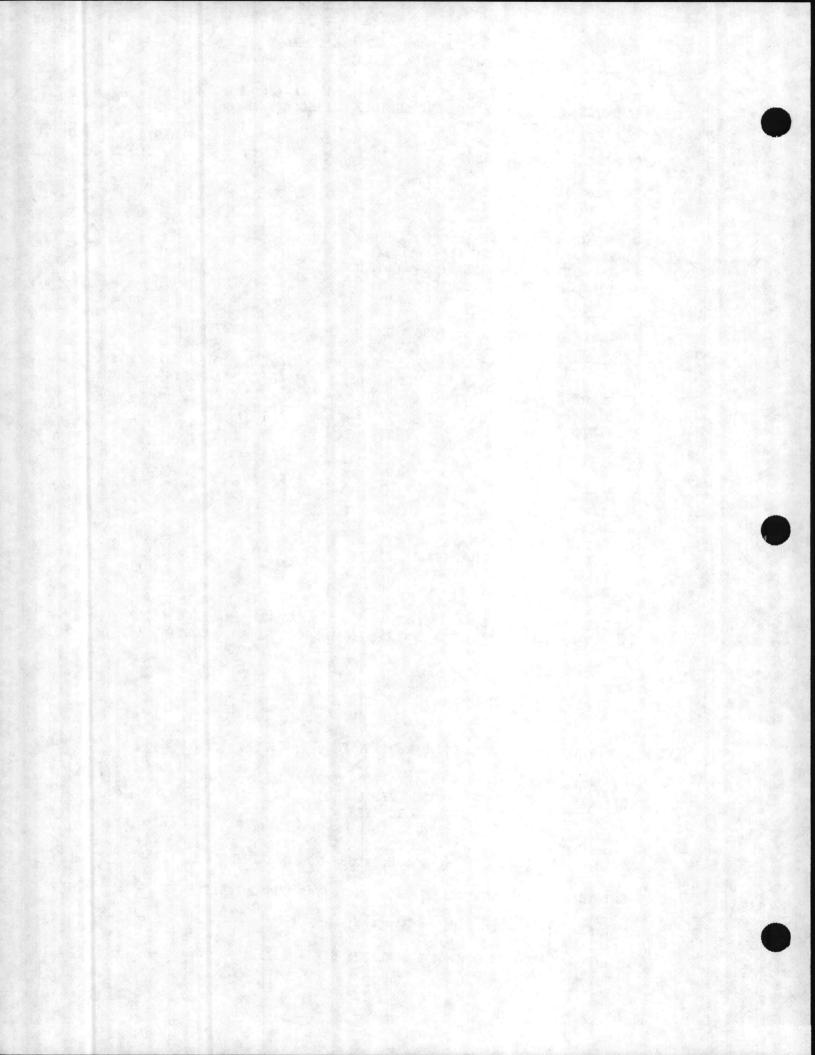
LOCATION: CAMP JOHNSON PROJECT TITLE: OUTSIDE AIR LIMIT SHUTOFF	PROJECT NO. FISCAL YEAR:		1988
PORTION NAME: MISC. BLDGS REGION NUMBER: 4 ANALYSIS DATE: JUNE 23 1987	ECONOMIC LIFE IN Y PREPARED BY:	EARS: LO	15 SUNDE
1. INVESTMENT COST A. CONSTRUCTION COST B. SIOH		\$	3,555 196 213
C. DESIGN COST D. ENERGY CREDIT CALC (1A+1B+1C)X.9 E. SALVAGE VALUE OF EXISTING EQUIPMEN	Τ	ŝ	3,567 0 3,567

F. TOTAL INVESTMENT (1D-1E)

3

2. ENERGY SAVINGS (+) / (-)
ANALYSIS DATE ANNUAL SAVINGS, UNIT COST \$ DISCOUNTED SAVINGS

	COST	SAVINGS	ANNUAL \$	DISCOUNT	DISCOUNTED
THIFT	¢ /MBTU(1)	MBTU/YR(2)	SAVINGS (3)	FACTOR(4)	SAVINGS(5)
FUEL	8.15	0	0	0	0
A. ELEC	0.15	0		0	0
B. DIST	0	0		0	0
C. RESID	0	0		0	
D. NG E. COAL	2.91	134		10.18	3,969
E. COAL		and the second			
F. TOTAL	\$	134	390		3,969
. NON ENERGY S	AVINGS (+) / CO	ST (-)		ş 0	
A. ANNUAL	RECURRING (+/-)			7.61	
(1) DIS	COUNT FACTOR (T	ABLE 1)		\$ 0	
(2) DIS	COUNTED SAVING/	COST (JAXJAI)		Ş U	
B. NON REC	URRING SAVINGS	(+) / COST (-)	DISCOUNTED	
		WELD OF	DISCOUNT		
ITEM	SAVING \$ (+) COST \$ (-)(1)	OCCURRENCE(2)	FACTOR (3)	COST(-)	(4)
	0	C) 1		
a. b.	0	() 1	. 0	
	0	() 1	. 0	
c. d. TOTAL	0			0	
C. TOTAL N	NON ENERGY DISCO	DUNTED SAVINGS	S(+),COST(-)	(3A2+3Bd4	.) 0
D PROJECT	NON ENERGY QUA	ALIFICATION T	EST		
(1) 25% M	X NON ENERGY CA	ALC (2F5 X .3)	3)	Ş	1,310
A TE	3D1 TS = > 3C	GO TO ITEM 4			0
b TF	3D1 IS < 3C	CALC SIR =	(2F5+3D1)/11	5	U
C IF	(0) 0 0 = 2 1	GO TO TIMI 4			
d. IF	3D1b IS < 1	PROJECT DOES	NOT QUALIFY	Y	
	DOLLAR SAVINGS				\$ 390
	ISCOUNTED SAVIN				\$ 3,969
	PROJECT DOES N		IR = (5/1F)	-	1.1

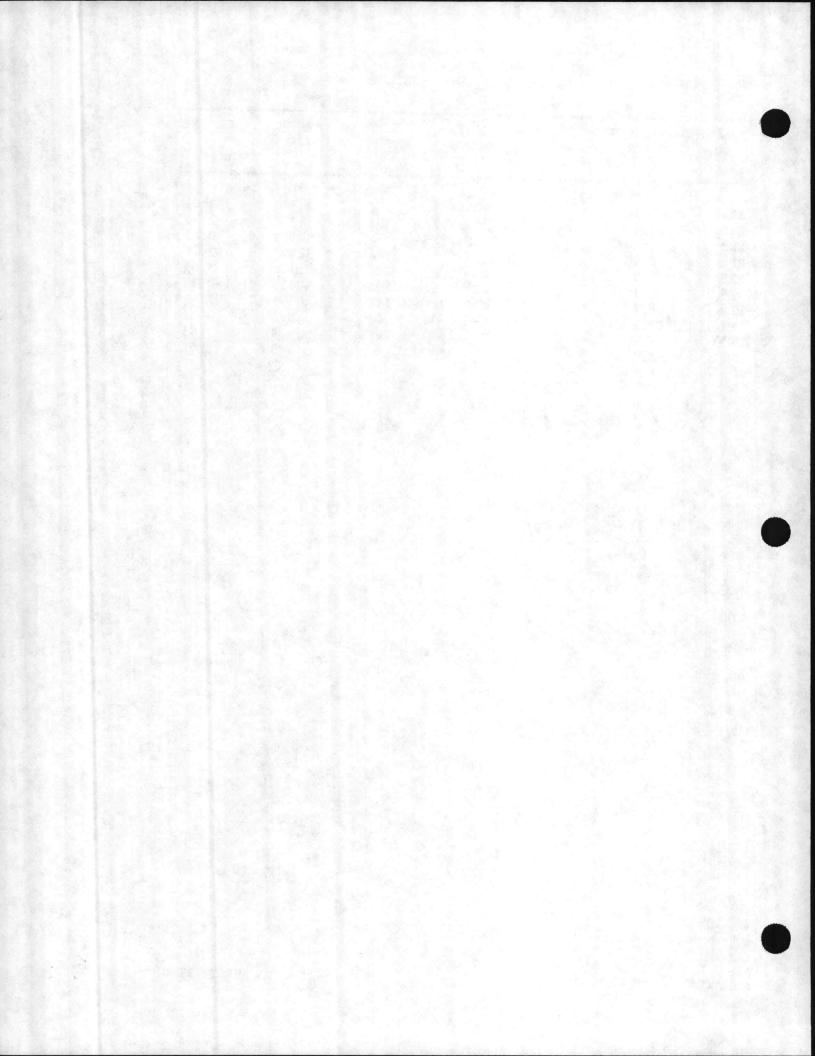


RIFLE RANGE OUTSIDE AIR LIMIT SHUTOFF:

BUILDING NO.	STRUCTURE TYPE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
RR1	OFFICE	105.654	307	1,173	3.01
RR2	OFFICE	103.797	302	1,173	2.95
RR3	OFFICE	25.711	74	1,979	0.43
	OFFICE	97.647	284	1,173	2.78
RR4	OFFICE	105.878	308	1,173	3.01
RR5	OFFICE	34,635	100	1,173	0.98
RR8	OFFICE	49,622	144	1,173	1.41
RR9	OFFICE	14.689	42	1,576	0.31
RR10	OFFICE	71.488	208	1,173	2.0
RR11 RR12	OFFICE	23.784	69	1,173	0.6

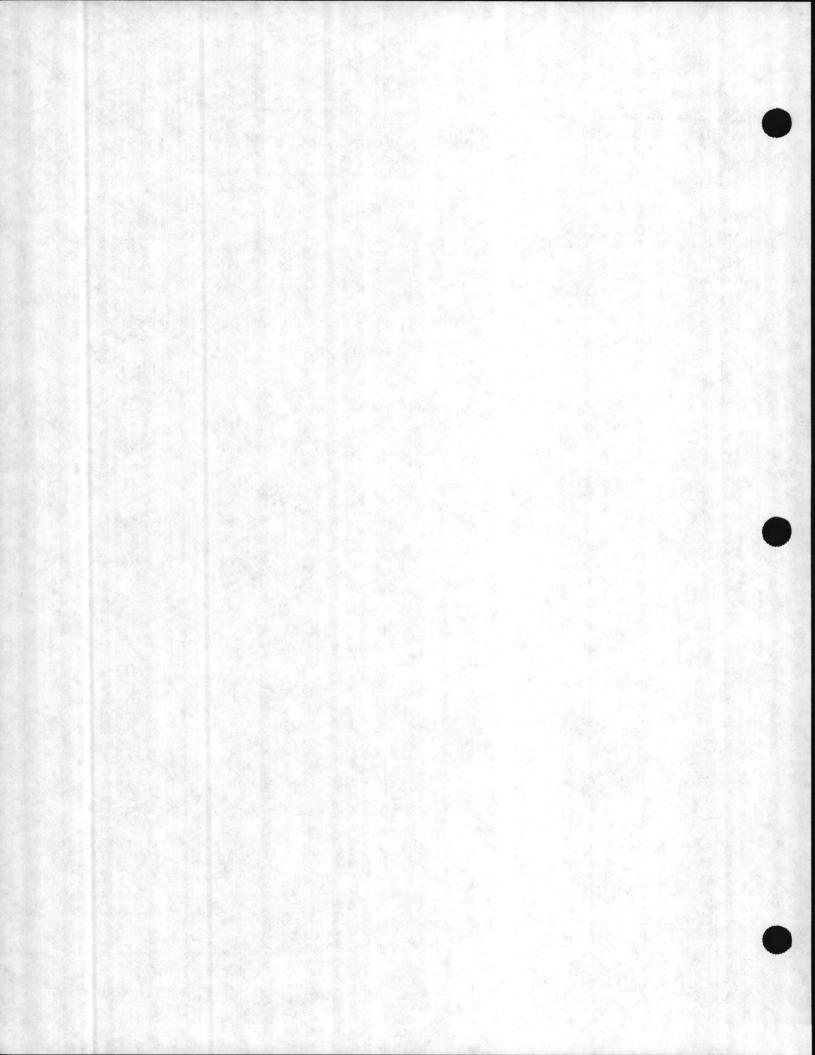


DATE: 06/22/87



BEACH AREA OUTSIDE AIR LIMIT SHUTOFF:

BUILDING NO.	STRUCTURE TYPE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
	0000	5.636	16	1,979	0.09
BA101	OFFICE	40.901	119	1,173	1.16
BA102	OFFICE	22.113	64	1,979	0.37
BA103	OFFICE	249.557	726	3,591	2.3
BA104	OFFICE	24.707	71	2,785	0.29
BA105 BA128	OCC. WAREHOUSE	0.095	0	1,173	0.0

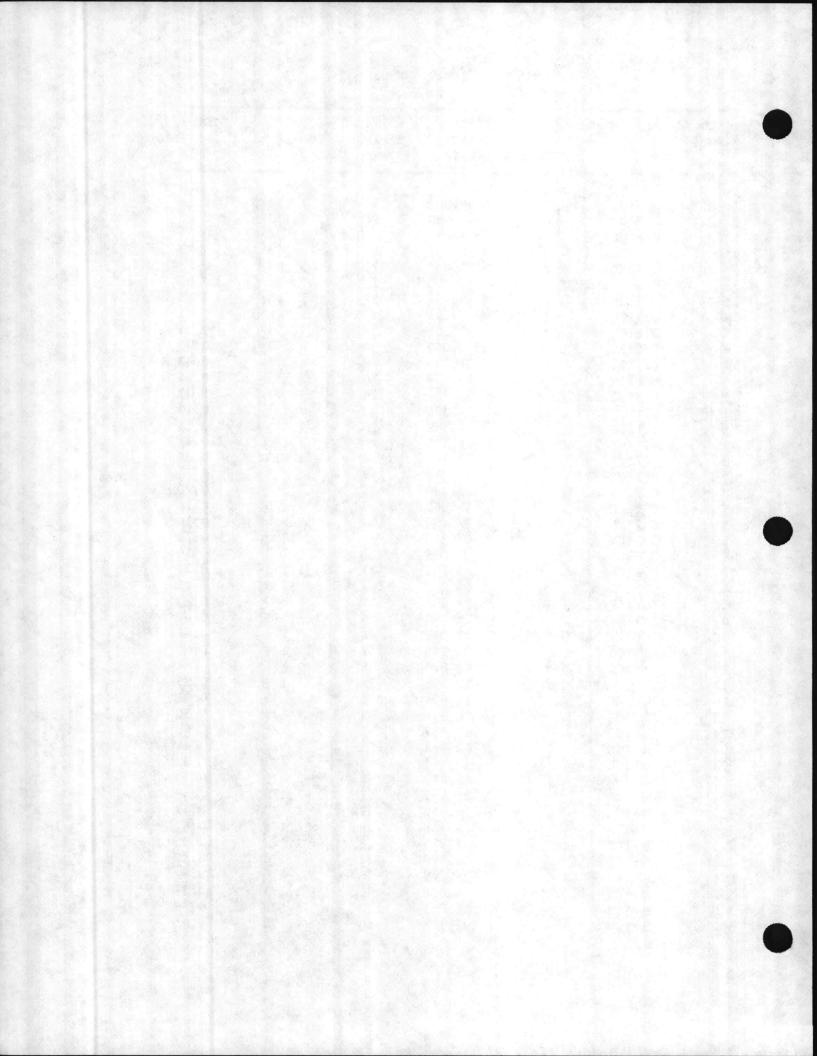


HADNOT POINT OUTSIDE AIR LIMIT SHUTOFF:

BUILDING NO.	STRUCTURE TYPE	ENERGY SAVINGS	ENERGY SAVINGS	CAPITOL COST	SIR
		MBTU/YR	\$/YR	\$	
1	OFFICE	114.009	254	1,173	2.1
2	OFFICE	43.080	96	1,173	0.8
4	OFFICE	2.090	4	1,576	0.0
6	OFFICE	54.001	120	5,203	0.2
8	OFFICE	53.838	120	5,203	0.2
11	OCC. WAREHOUSE	5.670	12	3,591	0.0
13	OFFICE	39.146	87	1,173	0.7
14	OFFICE	1.549	4	1,173	0.0
15	OFFICE	38.205	87	1,173	0.7
16	OFFICE	2.062	4	1,173	0.0
17	OFFICE	22.024	49	1,173	0.4
18	OFFICE	13.549	30	1,173	0.2
25	OFFICE	55.707	124	1,173	1.0
27	OFFICE	21.095	47	1,173	0.4
41	OFFICE	7.589	17	1,173	0.1
41 43	OFFICE	11.332	25	1,173	0.1
43 50	OFFICE	2.583	6	1,173	0.0
		63.738	142	1,979	0.
54	OFFICE	21.680	48	2,382	0.
58	OFFICE	47.862	106	1,979	0.
59	OFFICE	57.199	108	3,591	0.
63	OFFICE	63.243	141	4,800	0.
65	OFFICE	4.623	141	1,173	0.
66	OFFICE	16.109	37	1,173	0.
67	OFFICE	64.018	142	1,576	0.
84	OFFICE	53.092	118	4,800	0.
102	OFFICE		66	1,576	0.
106	OFFICE	29.644		Cardenal Contractor and Cardina and Cardina and Cardina	0.
107	OCC. WAREHOUSE	29.917	66	1,576	0.
114	OFFICE	23.542	52	1,173	
115	OFFICE	42.870	95	1,576	0.
117	OCC. WAREHOUSE	12.175	27	1,173	0.
119	OFFICE	16.516	36	1,173	0.
123	OFFICE	26.044	58	1,173	0.
127	OFFICE	24.157	53	1,173	0.
201	OFFICE	42.862	95	1,576	0.
203	OFFICE	19.445	43	1,173	0.
206	OCC. WAREHOUSE	30.649	68	1,576	0.
214	OFFICE	25.867	57	1,173	0.
216	OFFICE	25.640	57	1,173	0.
219	OFFICE	24.568	54	1,173	0.
221	OFFICE	2.926	6	1,173	0.
223	OFFICE	32.392	72	1,173	0.
226	OCC. WAREHOUSE	29.279	65	1,576	0.
233	OFFICE	14.026	31	1,173	0.
300	OFFICE	46.031	102	1,576	0.
302	OFFICE	22.788	50	1,173	0.

DATE: 06/23/87

SHEET 1 OF 4

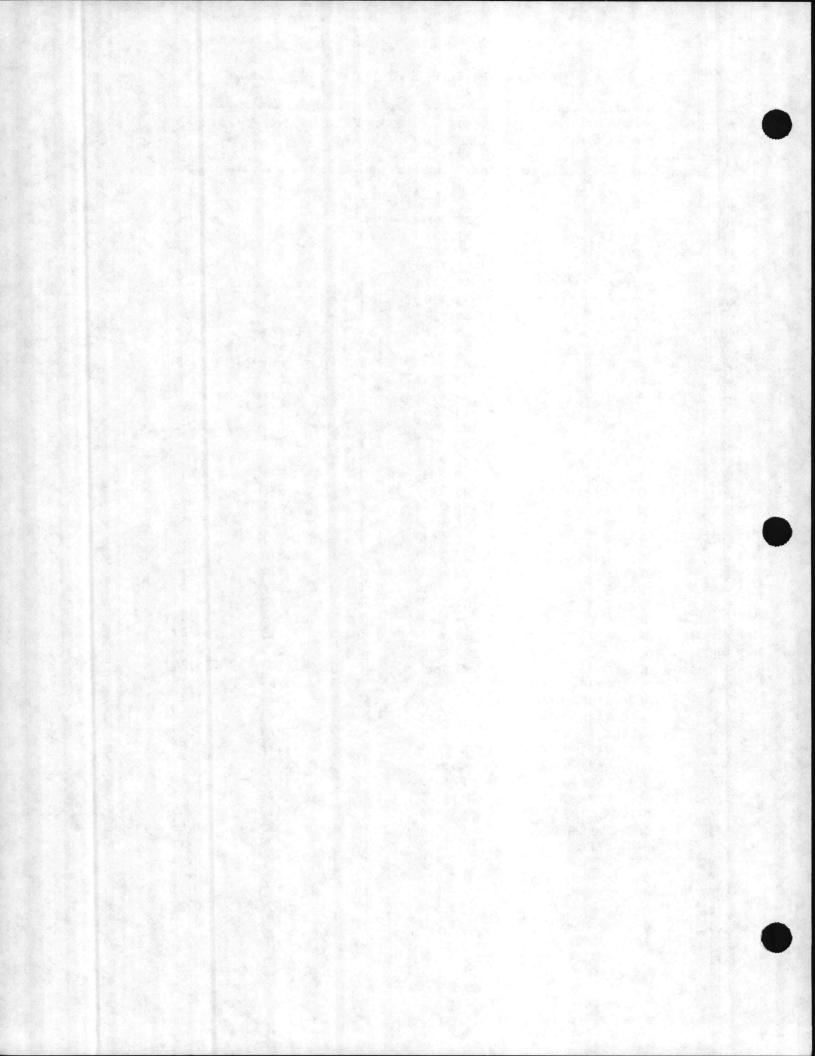


OUTSIDE AIR LIMIT SHUTOFF:

BUILDING NO.	STRUCTURE TYPE	ENERGY SAVINGS	ENERGY SAVINGS	CAPITOL COST	SIR
		MBTU/YR	\$/YR	\$	
304	OFFICE	30.966	69	1,173	0.5
307	OCC. WAREHOUSE	28.748	64	1,576	0.4
314	OFFICE	31.621	70	1,576	0.4
315	OFFICE	24.623	54	1,173	0.4
317	OFFICE	27.778	61	1,173	0.5
320	OFFICE	37.677	84	1,173	0.7
400	OFFICE	33.179	73	1,173	0.6
401	OFFICE	45.024	100	1,576	0.6
403	OFFICE	15.471	34	1,173	0.2
408	OFFICE	48.792	108	1,576	0.7
412	OFFICE	81.958	182	1,173	1.5
416	OFFICE	28.285	63	1,173	0.5
417	OFFICE	46.846	104	5,203	0.2
419	OFFICE	19.594	43	1,173	0.3
420	OFFICE	105.048	234	1,173	2.0
422	OFFICE	52.773	117	5,203	0.2
423	OFFICE	31.285	69	1,173	0.6
424	OCC. WAREHOUSE	30.183	67	1,576	0.4
500	OCC. WAREHOUSE	43.723	97	1,576	0.6
501	OFFICE	18.768	41	1,173	0.3
502	OFFICE	66.285	147	5,203	0.2
508	OFFICE	30.722	69	1,173	0.6
509	OCC. WAREHOUSE	32.508	72	1,576	0.4
516	OFFICE	22.928	51	1,173	0.4
518	OFFICE	7.395	16	1,173	0.1
520	OFFICE	14.893	33	1,173	0.2
526	OFFICE	18.697	41	1,173	0.3
751	OFFICE	85.477	190	2,785	0.6
898	OFFICE	3.386	8	1,173	0.0
900	OFFICE	12.737	28	1,173	0.3
901	OCC. WAREHOUSE	23.839	53	2,785	0.3
902	OCC. WAREHOUSE	84.885	189	1,576	1.3
904	OCC. WAREHOUSE	6.468	14	1,173	0.3
905	OFFICE	41.534	92	1,173	0.1
907	OCC. WAREHOUSE	36.267	80	1,173	0.0
908	OCC. WAREHOUSE	43.932	97	2,382	0.4
909	OCC. WAREHOUSE	87.560	195	1,173	1.
910	OCC. WAREHOUSE	13.321	29	1,173	0.1
914	OFFICE	25.876	57	1,173	0.4
915	OCC. WAREHOUSE	96.464	215	1,173	1.
916	OCC. WAREHOUSE	3.212	15	1,173	0.
1002	OFFICE	0.860	1	1,173	0.
1002	UNOCC. WAREHOUSE	2.495	5	1,173	0.
1004	OFFICE	4.928	12	1,173	0.
1005	OFFICE	19.052	42	1,576	0.
1011	OCC. WAREHOUSE	14.307	31	1,576	0.

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SHEET 2 OF 4

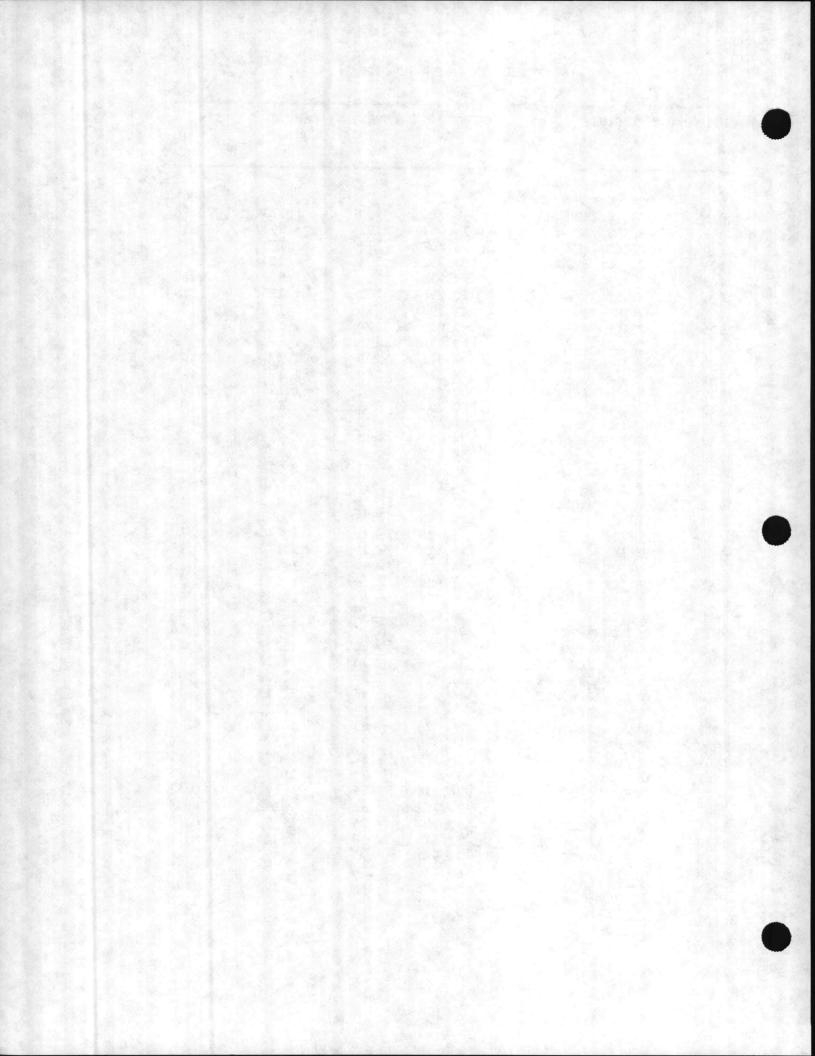


OUTSIDE AIR LIMIT SHUTOFF:

BUILDING NO.	STRUCTURE TYPE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
1010		0 720	4	1,173	0.0
1012	OCC. WAREHOUSE	2.732 8.710	6 20	1,173	0.1
1015	OCC. WAREHOUSE	76.957	171	4,397	0.3
1041	OFFICE	6.207	13	1,173	0.1
1100	OFFICE		198	6,009	0.3
1101	OCC. WAREHOUSE	88.932	198	1,979	0.5
1103	OFFICE	49.936	22	1,173	0.1
1104	OFFICE	10.297	24	1,173	0.2
1105	OFFICE	11.198	24	1,173	0.1
1106	OFFICE	9.017	15	1,173	0.1
1107	OFFICE	6.925			2.0
1108	OFFICE	107.372	239	1,173	0.1
1111	OFFICE	8.810	19	1,173	0.0
1114	UNOCC. WAREHOUSE	0.816	1	1,173	
1115	OCC. WAREHOUSE	0.753	1	1,173	0.0
1116	OCC. WAREHOUSE	4.436	19	1,173	0.1
1117	OCC. WAREHOUSE	4.253	18	1,173	0.1
1118	OCC. WAREHOUSE	50.875	113	1,173	0.9
1120	OCC. WAREHOUSE	22.871	51	1,173	0.4
1200	OFFICE	56.657	126	1,979	0.6
1201	OCC. WAREHOUSE	61.347	136	1,173	1.1
1202	OFFICE	150.505	335	3,591	0.9
1207	OFFICE	9.723	21	1,173	0.1
1208	OFFICE	9.519	21	1,173	0.1
1209	OFFICE	28.142	64	1,173	0.
1211	OFFICE	11.929	26	1,173	0.1
1212	OCC. WAREHOUSE	4.721	20	1,173	0.
1220	OFFICE	18.822	41	1,173	0.1
1301	OCC. WAREHOUSE	79.598	177	1,576	1.
1302	OCC. WAREHOUSE	3.591	8	1,173	0.
1304	OCC. WAREHOUSE	13.546	30	1,173	0.
1309	OCC. WAREHOUSE	17.830	39	1,173	0.
1310	OCC. WAREHOUSE	16.369	36	1,173	0.
1316	OCC. WAREHOUSE	4.717	19	1,173	0.
1317	OCC. WAREHOUSE	33.728	83	1,173	0.
1400	OFFICE	10.396	23	1,173	0.
1401	OFFICE	36.785	82	1,576	0.
1403	OFFICE	34.276	76	1,173	0.
1404	OFFICE	26.514	59	1,173	0.
1407	OFFICE	25.752	57	1,173	0.
1409	OCC. WAREHOUSE	15.705	35	1,173	0.
1410	OCC. WAREHOUSE	13.815	30	1,173	0.
1450	OCC. WAREHOUSE	8.967	23	1,173	0.
1500	OFFICE	60.480	134	1,173	1.
1502	OCC. WAREHOUSE	66.795	148	1,173	1.
1601	OFFICE	64.641	144	1,173	, 1.
1606	OFFICE	36.230	80	4,800	0.

DATE: 07/20/87

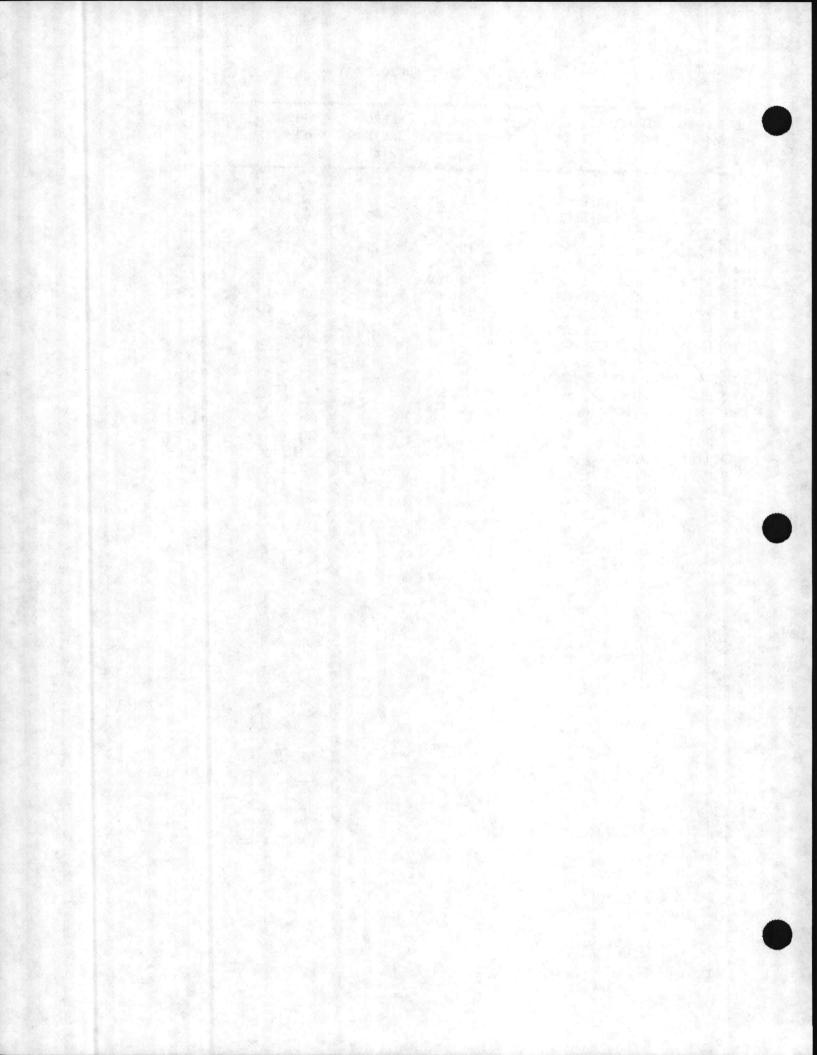
3 OF 4 SHEET



OUTSIDE AIR LIMIT SHUTOFF:

BUILDING NO.	STRUCTURE TYPE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
					0.14
1607	OCC. WAREHOUSE	9.704	21	1,173	0.18
1610	OCC. WAREHOUSE	10.730	23	1,173	0.20
1611	OCC. WAREHOUSE	12.766	28	1,576	0.1
1612	OCC. WAREHOUSE	10.113	22	1,173	0.19
1613	OCC. WAREHOUSE	0.554	1	1,173	0.0
1706	UNOCC. WAREHOUSE	2.169	4	1,173	0.0
1707	OCC. WAREHOUSE	15.207	33	1,173	0.2
1750	OCC. WAREHOUSE	10.485	23	1,576	0.1
1755	OCC. WAREHOUSE	8.747	19	1,576	0.1
1771	OCC. WAREHOUSE	3.687	10	1,173	0.0
1775	OCC. WAREHOUSE	3.387	15	1,173	0.1
1780	OCC. WAREHOUSE	2.183	7	1,173	0.0
HP255	OFFICE	2.533	7	1,173	0.0
HP265	OFFICE	2.618	7	1,173	0.0
HP275	OFFICE	2.497	7	1,173	0.0
HP285	OFFICE	2.784	8	1,173	0.0
HP295	OFFICE	2.533	7	1,173	0.0
HP405	OFFICE	3.807	10	1,173	0.0
HP1016	OCC. WAREHOUSE	14.054	31	1,173	0.2

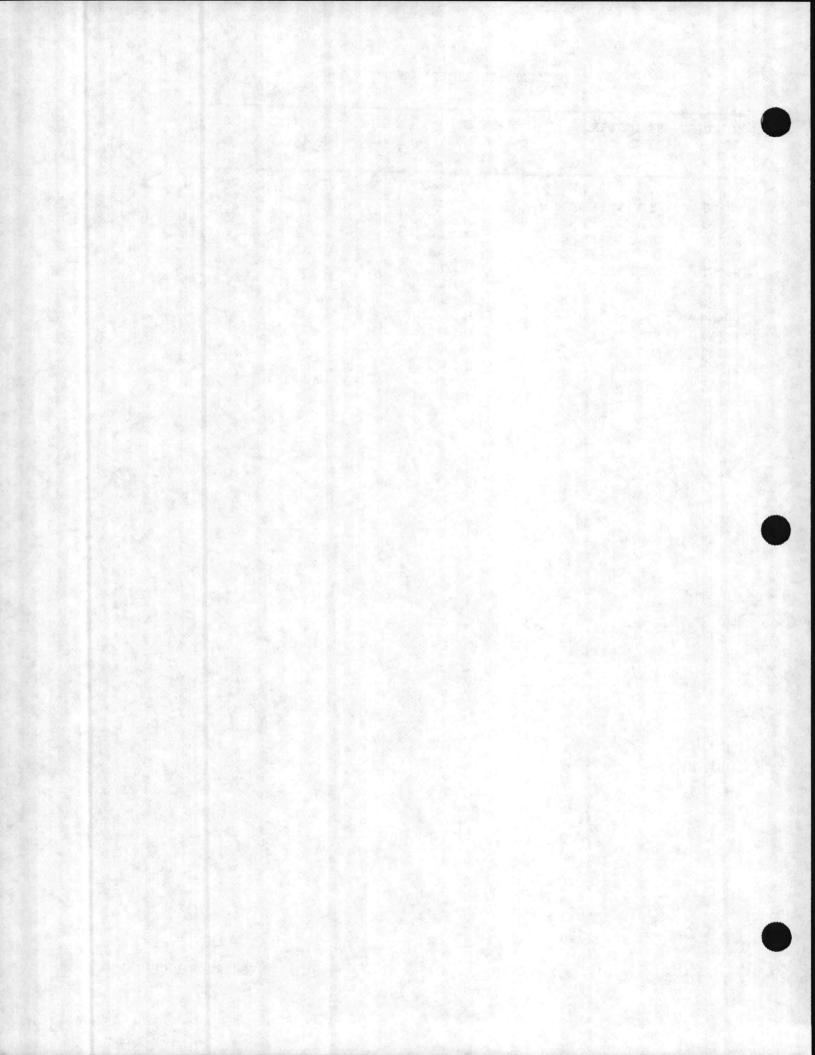




FRENCH CREEK OUTSIDE AIR LIMIT SHUTOFF:

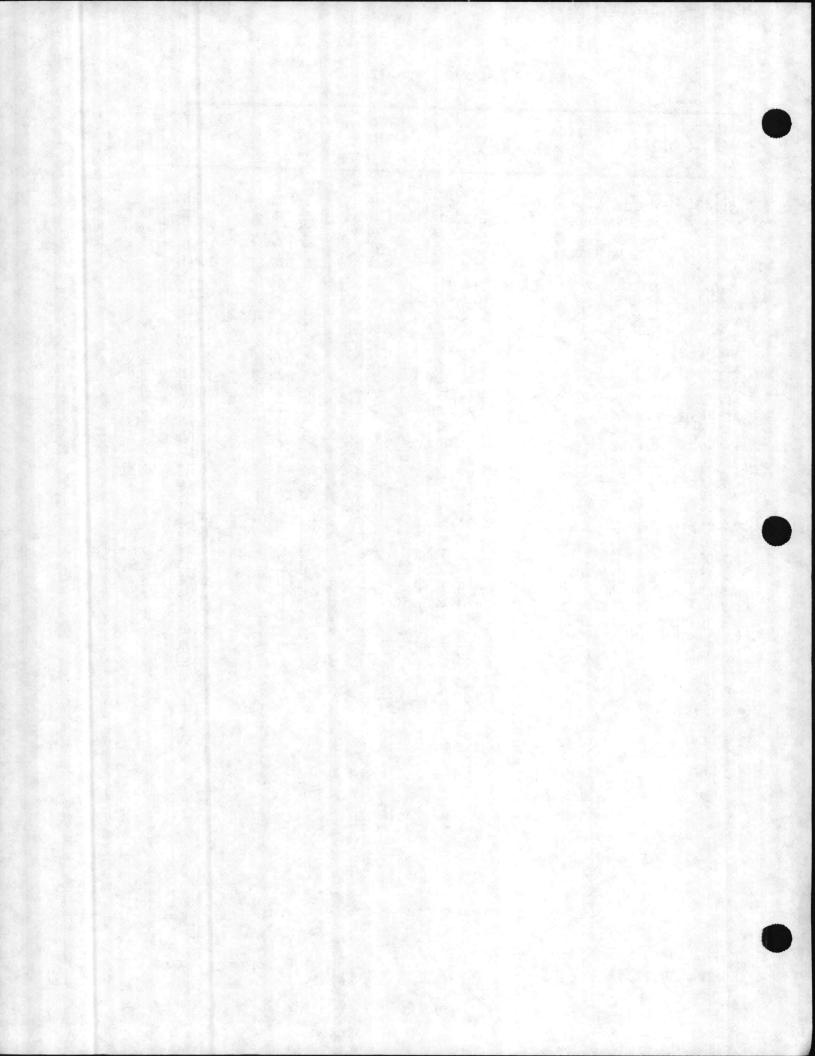
BUILDING NO.	STRUCTURE TYPE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
FC100	OCC. WAREHOUSE	77.924	173	3,994	0.44
FC190	OCC. WAREHOUSE	17.728	39	3,591	0.11
FC200	OCC. WAREHOUSE	38.664	86	2,382	0.3
FC241	OCC. WAREHOUSE	1.847	5	1,173	0.0
FC251	OCC. WAREHOUSE	39.265	87	2,785	0.3
FC301	OFFICE	23.726	52	1,173	0.4
FC302	OFFICE	38.360	85	1,173	0.7
FC303	OFFICE	72.327	162	1,173	1.4
FC312	OFFICE	16.422	36	1,576	0.2
FC312	OFFICE	3.313	7	1,173	0.0
FC364	OFFICE	4.825	11	1,173	0.0
FC573	OFFICE	4.157	11	1,173	0.0





AIR STATION OUTSIDE AIR LIMIT SHUTOFF:

BUILDING NO.	STRUCTURE TYPE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
		13.437	39	1,173	0.38
AS114	OFFICE	15.492	45	1,576	0.32
AS118	OCC. WAREHOUSE	27.276	79	1,576	0.57
AS122	OFFICE	31.923	92	1,173	0.90
AS124	OCC. WAREHOUSE	51.217	149	1,576	1.08
AS130	OFFICE	66.119	192	2,382	0.9
AS202	OFFICE	23.428	68	3,188	0.24
AS205	OFFICE	2.210	6	1,173	0.0
AS208	OFFICE	62.139	180	1,173	1.7
AS215	OFFICE	59.747	173	1,173	1.7
AS216	OFFICE	60.382	175	1,979	1.0
AS217	OFFICE	18.478	53	1,979	0.3
AS232	OFFICE	24.731	71	1,173	0.7
AS236	OFFICE	29.180	84	1,576	0.6
AS302	OFFICE	1.878	6	1,173	0.0
AS312	OFFICE	1.209	4	1,173	0.0
AS320	OFFICE	21.094	61	1,173	0.6
AS414	OFFICE	97.664	284	1,576	2.0
AS424	OCC. WAREHOUSE	4.997	14	1,173	0.1
AS425	OFFICE	37.765	109	1,173	1.0
AS502	OFFICE	13.361	39	1,173	0.3
AS4012	OFFICE	6.497	20	1,173	0.1
AS4030	OFFICE	2.331	8	1,173	0.0
AS4035	OFFICE OCC. WAREHOUSE	8.313	24	1,173	0.2
AS4110		4.324	12	2,382	0.0
AS4120	OFFICE	4.120	11	1,576	0.0
AS4122	OFFICE	4.120	12	1,576	0.0
AS4141	OCC. WAREHOUSE	2.714	7	1,576	0.0
AS4145	OFFICE	3.682	11	1,173	0.1
AS4146	OCC. WAREHOUSE	5.954	17	1,173	0.1
AS4157 AS4158	OFFICE OCC. WAREHOUSE	13.033	40	1,173	0.4



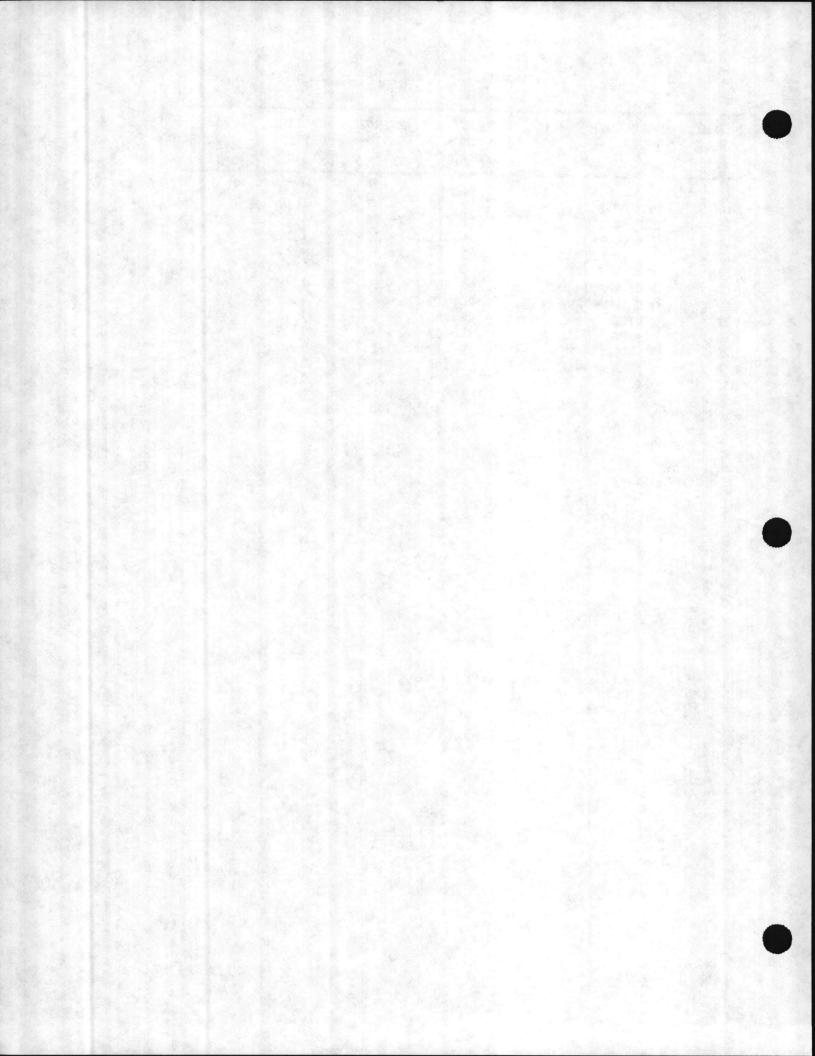
HOSPITAL POINT

OUTSIDE AIR LIMIT SHUTOFF:

H14 OFFICE 1,122 1,160 3,172 H15A OFFICE 711,213 1,586 4,800 3,173 H16 OFFICE 6.811 15 1,173 0,173 H17 OCC. WAREHOUSE 43,307 96 1,173 0,173 H17 OCC. WAREHOUSE 58,325 130 1,173 1,173 H18 OCC. WAREHOUSE 22,605 50 1,173 0,173 H19 OCC. WAREHOUSE 20,379 45 1,173 0,173 H21 OFFICE 31,205 69 1,173 0,173 0,173 H23 OFFICE 14,637 35 1,173 0,173 H24 OFFICE 9,419 23 1,173 0,173 H36 OCC. WAREHOUSE 5,106 11 1,173 0	BUILDING NO.	STRUCTURE TYPE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
H15A OFFICE 711.213 1,586 4,800 3. H16 OFFICE 6.811 15 1,173 0. H17 OCC. WAREHOUSE 43.307 96 1,173 0. H17 OCC. WAREHOUSE 58.325 130 1,173 1. H18 OCC. WAREHOUSE 22.605 50 1,173 0. H19 OCC. WAREHOUSE 20.379 45 1,173 0. H21 OFFICE 31.205 69 1,173 0. H23 OFFICE 14.637 35 1,173 0. H24 OFFICE 9.419 23 1,173 0. H36 OCC. WAREHOUSE 5.106 11 1,173 0.	u1/.	OFFICE	2.722	7	1,173	0.06
H16 OFFICE 6.811 15 1,173 0. H17 OCC. WAREHOUSE 43.307 96 1,173 0. H17 OCC. WAREHOUSE 58.325 130 1,173 1. H18 OCC. WAREHOUSE 22.605 50 1,173 0. H19 OCC. WAREHOUSE 20.379 45 1,173 0. H21 OFFICE 31.205 69 1,173 0. H23 OFFICE 14.637 35 1,173 0. H24 OFFICE 9.419 23 1,173 0. H36 OCC. WAREHOUSE 5.106 11 1,173 0.			711.213	1,586	4,800	3.35
H17 OCC. WAREHOUSE 43.307 96 1,173 0. H17N OCC. WAREHOUSE 58.325 130 1,173 1. H18 OCC. WAREHOUSE 22.605 50 1,173 0. H19 OCC. WAREHOUSE 20.379 45 1,173 0. H21 OFFICE 31.205 69 1,173 0. H23 OFFICE 14.637 35 1,173 0. H24 OFFICE 9.419 23 1,173 0. H36 OCC. WAREHOUSE 5.106 11 1,173 0.					1,173	0.13
H17N OCC. WAREHOUSE 58.325 130 1,173 1. H18 OCC. WAREHOUSE 22.605 50 1,173 0. H19 OCC. WAREHOUSE 20.379 45 1,173 0. H21 OFFICE 31.205 69 1,173 0. H23 OFFICE 14.637 35 1,173 0. H24 OFFICE 9.419 23 1,173 0. H36 OCC. WAREHOUSE 5.106 11 1,173 0.				96	1,173	0.83
H17R OGC. WAREHOUSE 22.605 50 1,173 0. H18 OCC. WAREHOUSE 20.379 45 1,173 0. H19 OCC. WAREHOUSE 20.379 45 1,173 0. H21 OFFICE 31.205 69 1,173 0. H23 OFFICE 14.637 35 1,173 0. H24 OFFICE 9.419 23 1,173 0. H36 OCC. WAREHOUSE 5.106 11 1,173 0.			58.325	130	1,173	1.12
H19 OCC. WAREHOUSE 20.379 45 1,173 0. H19 OFFICE 31.205 69 1,173 0. H21 OFFICE 14.637 35 1,173 0. H23 OFFICE 14.637 35 1,173 0. H24 OFFICE 9.419 23 1,173 0. H36 OCC. WAREHOUSE 5.106 11 1,173 0.				50	1,173	0.43
H21OFFICE31.205691,1730H23OFFICE14.637351,1730H24OFFICE9.419231,1730H36OCC.WAREHOUSE5.106111,1730			20.379	45	1,173	0.39
H21 OFFICE 14.637 35 1,173 0 H23 OFFICE 9.419 23 1,173 0 H24 OFFICE 9.419 23 1,173 0 H36 OCC. WAREHOUSE 5.106 11 1,173 0			31,205	69	1,173	0.60
H24 OFFICE 9.419 23 1,173 0 H36 OCC. WAREHOUSE 5.106 11 1,173 0				35	1,173	0.30
H36 OCC. WAREHOUSE 5.106 11 1,173 0				23	1,173	0.20
1,55 000. ##12:0000				11	1,173	0.09
				3		0.03



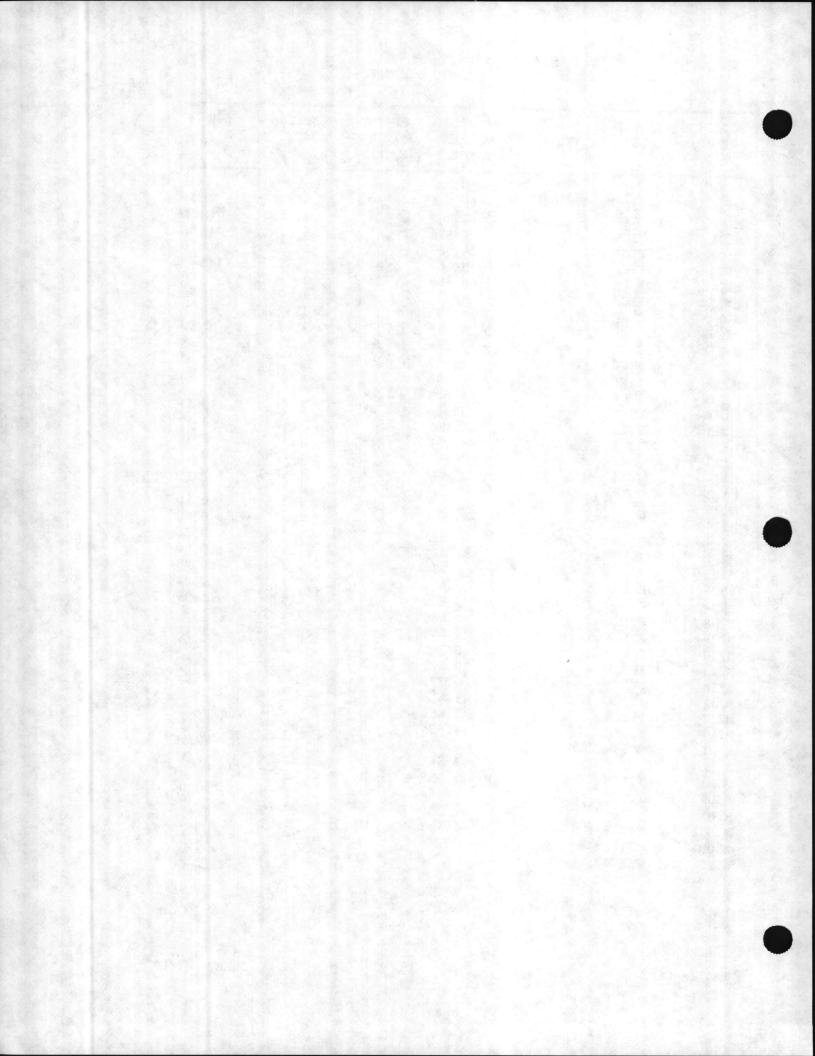
DATE: 06/23/87

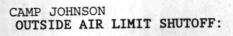


CAMP JOHNSON OUTSIDE AIR LIMIT SHUTOFF:

BUILDING NO.	STRUCTURE TYPE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
and the second				1 576	0.34
M90	OFFICE	16.314	47	1,576 1,173	0.50
M100	OFFICE	17.708	51	1,173	0.69
M101	OFFICE	41.194	119	1,173	0.70
M102	OFFICE	24.583	71	1,173	0.09
M103	OFFICE	3.163	9	2,382	0.60
M104	OFFICE	43.398	126	1,173	0.52
M105	OFFICE	18.461	53	1,175	0.38
M112	OCC. WAREHOUSE	18.055	52	1,173	0.03
M116	OFFICE	1.079	3		0.21
M123	OFFICE	7.676	22	1,173	0.24
M124	OFFICE	8.553	24	1,173	0.14
M125	OFFICE	5.245	15	1,173	0.1
M126	OFFICE	6.651	19	1,173	0.10
M127	OFFICE	7.374	21	1,173	
M128	OFFICE	15.002	44	1,173	0.4
M129	OFFICE	44.570	129	1,576	0.9
M130	OFFICE	5.932	17	1,173	0.1
M131	OFFICE	2.407	7	1,173	0.0
M132	OFFICE	26.851	78	1,173	0.7
M134	OCC. WAREHOUSE	6.951	20	1,576	0.1
M178	OFFICE	9.469	27	1,173	0.2
M201	OFFICE	10.023	29	1,173	0.2
M202	OFFICE	31.813	92	1,173	0.9
M205	OFFICE	8.934	25	1,173	0.2
M206	OFFICE	8.454	24	1,173	0.2
M207	OFFICE	6.690	19	1,173	0.1
M208	OFFICE	7.666	22	1,173	0.2
M209	OFFICE	9.013	26	1,173	0.2
M210	OFFICE	6.500	18	1,173	0.1
M215	OFFICE	18.621	54	1,173	0.5
M216	OFFICE	9.339	27	1,173	0.2
M231	OFFICE	11.419	33	1,979	0.1
M237	OFFICE	7.866	23	1,173	0.2
M240	OFFICE	11.835	34	1,979	0.1
M301	OCC. WAREHOUSE	6.778	19	1,173	0.1
M301 M302	OFFICE	6.531	19	1,173	0.1
	OFFICE	28.955	84	1,576	0.0
M303	OFFICE	2.754	8	1,576	0.0
M305		1.359	3	1,576	0.0
M307	OFFICE	3.731	10	1,173	0.3
M308	OFFICE	23.060	67	1,576	0.4
M309	OFFICE	21.756	63	1,576	0.4
M311	OFFICE	0.934	2	1,576	0.
M313	OFFICE	6.370	18	1,173	0.
M314	OCC. WAREHOUSE	6.543		1,173	0.1
M315	OFFICE	1.551		1,576	0.
M316	OFFICE	1.551	ALL STREET, ST	1,0,0	

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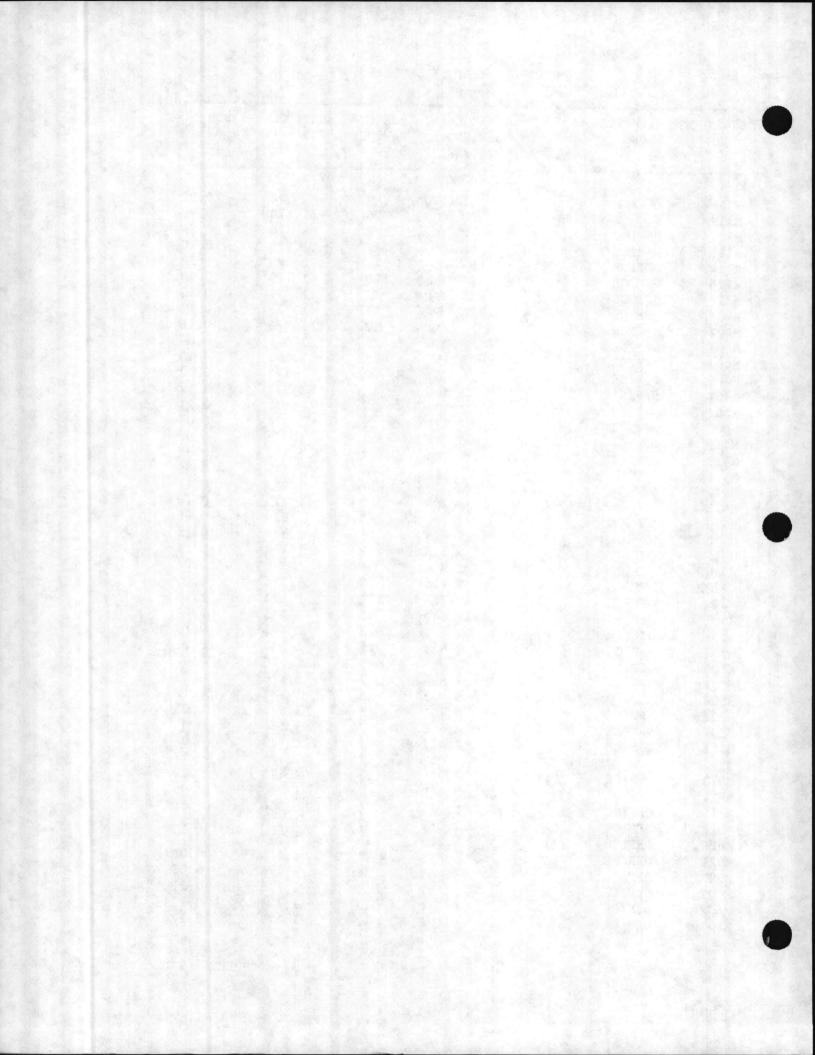




BUILDING NO.	STRUCTURE TYPE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
		1 007	_	1 576	0.0
M318	OFFICE	1.027	2	1,576 1,173	0.2
M319	OCC. WAREHOUSE	9.099	26 6	1,175	0.04
M321	OFFICE	2.202 5.957	17	1,979	0.1
M323	OFFICE		274	2,382	1.3
M324	OFFICE	94.413	100	1,173	0.9
M326	OFFICE	34.484	74	1,979	0.4
M327	OFFICE	25.740	17	1,173	0.1
M401	OFFICE	6.184	17	1,173	0.1
M402	OFFICE	5.939	6	1,576	0.0
M403	OFFICE	2.248		1,173	0.1
M405	OFFICE	5.451	15 2	1,173	0.0
M406	OFFICE	0.664			0.1
M407	OFFICE	5.841	16	1,576	0.1
M408	OFFICE	7.502	21	1,173	0.2
M409	OFFICE	2.929	8	1,576	0.0
M411	OFFICE	0.815	2	1,173	0.0
M412	OFFICE	0.734	2	1,173	0.0
M413	OFFICE	1.938	6	1,173	
M414	OFFICE	6.183	17	1,173	0.1
M415	OCC. WAREHOUSE	5.709	16	1,173	0.1
M416	OFFICE	2.941	8	1,576	0.0
M418	OFFICE	6.474	18	1,576	0.1
M419	OFFICE	5.595	16	1,173	0.1
M420	OFFICE	2.944	8	1,576	0.0
M422	OFFICE	2.906	8	1,576	0.0
M424	OFFICE	39.558	116	1,173	1.1
M441	OFFICE	12.640	43	1,173	0.4
M501	OCC. WAREHOUSE	4.624	13	1,173	0.1
M502	OFFICE	7.615	22	1,173	0.1
M503	OFFICE	3.323	9	1,576	0.0
M504	OFFICE	2.654	7	1,576	0.
M506	OCC. WAREHOUSE	5.773	16	1,173	0.
M507	OFFICE	2.754	8	1,576	0.
M509	OFFICE	2.466	7	1,576	0.
M511	OFFICE	1.422	4	1,173	0.
M512	OCC. WAREHOUSE	6.052	17	1,173	0.
M513	OFFICE	7.935	23	1,173	0.
M514	OFFICE	2.439	7	1,576	0.
M516	OFFICE	2.214	6	5,606	0.
M518	OFFICE	2.669	7	1,576	0.
M520	OFFICE	5.303	15	1,173	0.
M521	OFFICE	3.871	11	1,576	0.
M522	OFFICE	3.061	8	1,576	0.
M601	OFFICE	7.531	21	1,173	0.
M602	OFFICE	4.541	13	1,173	0.
M602 M603	OFFICE	6.102	17	1,173	0.

DATE: 06/22/87

SHEET 2 OF 3



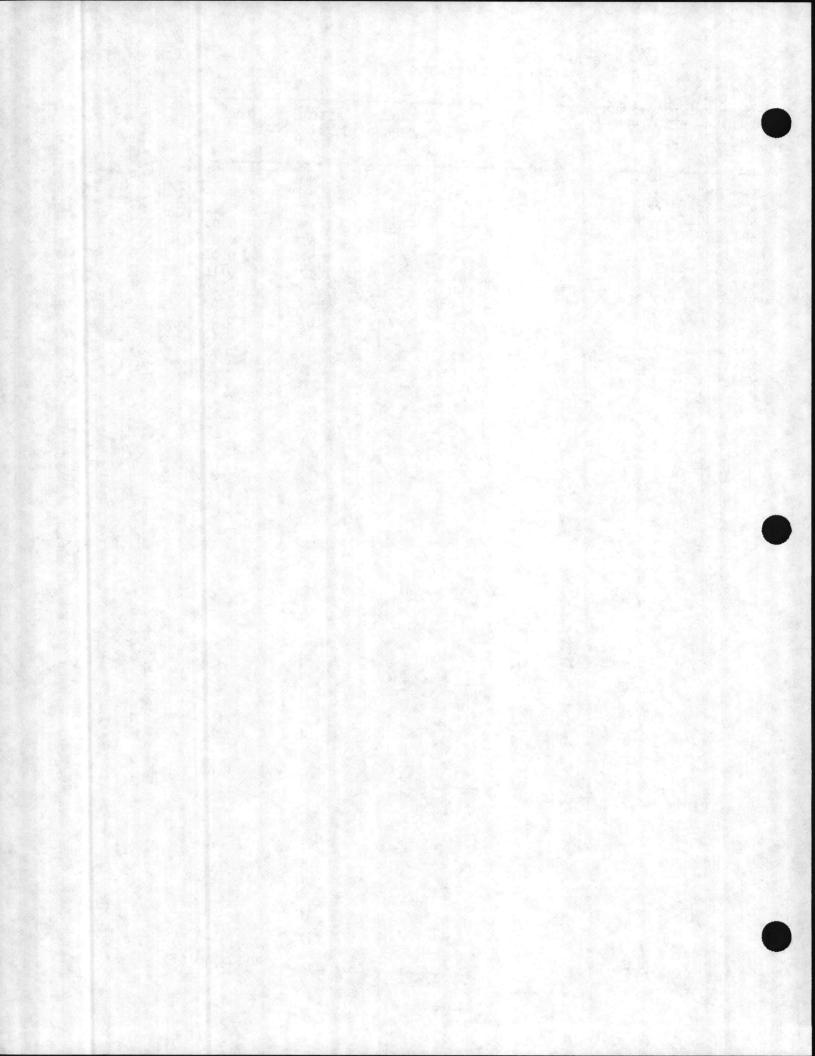
UILDING NO.	STRUCTURE TYPE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
	OFFICE	2.317	6	1,576	0.04
M604	OCC. WAREHOUSE	8.238	23	1,173	0.23
M606	OFFICE	2.308	6	1,576	0.04
M607	OFFICE	2.803	8	1,576	0.05
M609	OFFICE	3.679	10	1,576	0.0
M611		6.661	19	1,173	0.1
M612	OFFICE	7.341	21	1,173	0.20
M613	OFFICE	2.700	7	1,576	0.0
M614	OFFICE	2.207	6	1,576	0.0
M616	OFFICE	6.598	19	1,173	0.1
M619	OFFICE	6.482	18	1,173	0.1
M620	OFFICE	3.345	9	1,576	0.0
M621 M622	OFFICE OFFICE	2.785	8	1,576	0.0

CAMP JOHNSON OUTSIDE AIR LIMIT SHUTOFF:



DATE: 06/22/87

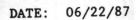
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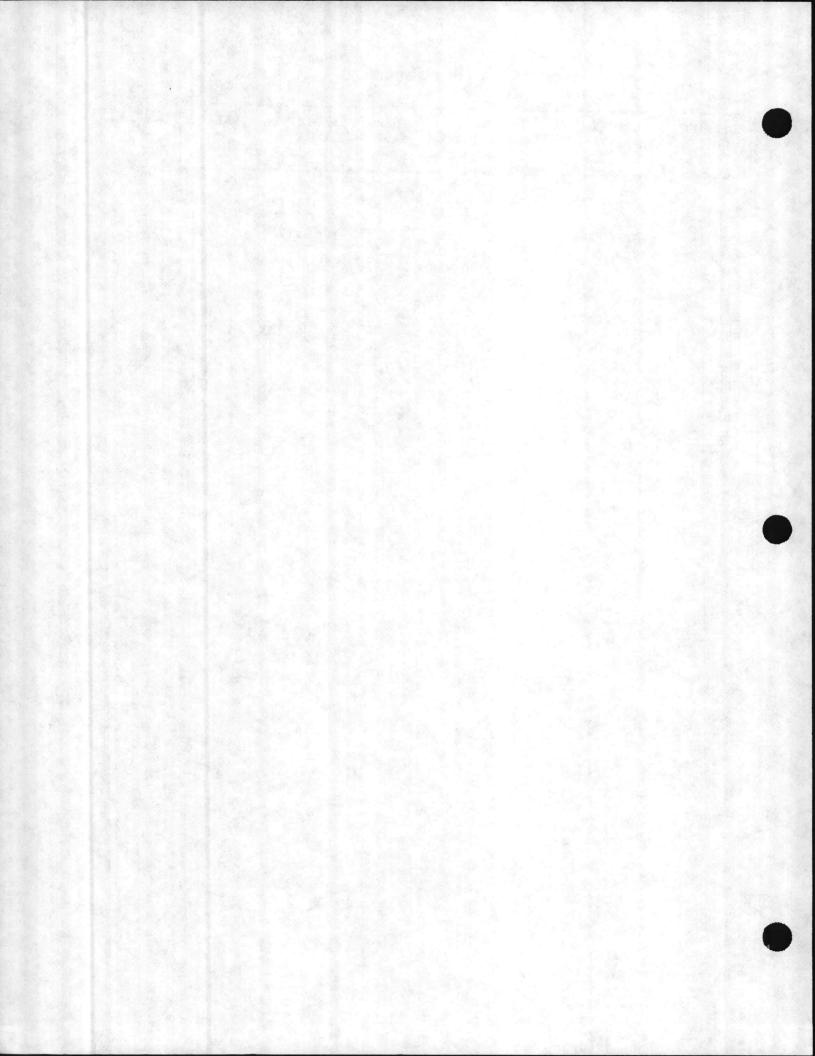


COURTHOUSE BAY

OUTSIDE AIR LIMIT SHUTOFF:

BUILDING NO.	STRUCTURE TYPE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
		1 000		1,173	0.05
BB2	OFFICE	1.832	5	1,173	0.78
BB5	OFFICE	27.500	80	the second se	0.2
BB8	OFFICE	9.357	27	1,173	0.4
BB10	OFFICE	17.235	50	1,173	
BB11	OFFICE	60.928	177	6,815	0.2
BB12	OFFICE	61.347	178	7,218	0.2
BB13	OFFICE	60.543	176	7,218	0.2
BB14	OFFICE	60.674	176	6,815	0.2
BB15	OFFICE	11.935	34	1,173	0.3
BB16	OFFICE	8.502	24	1,173	0.2
BB27	OFFICE	12.861	37	1,173	0.3
BB28	OFFICE	22.150	64	1,173	0.6
BB45	OFFICE	2.316	7	1,173	0.0
BB50	OFFICE	3.790	12	1,173	0.1
BB51	OCC. WAREHOUSE	33.077	96	1,173	0.9
BB52	OFFICE	22.920	66	1,173	0.6
	OFFICE	17.852	51	1,173	0.5
BB54	OFFICE	3.990	11	1,173	0.1
BB72 BB269	OFFICE	4.235	14	1,173	0.1

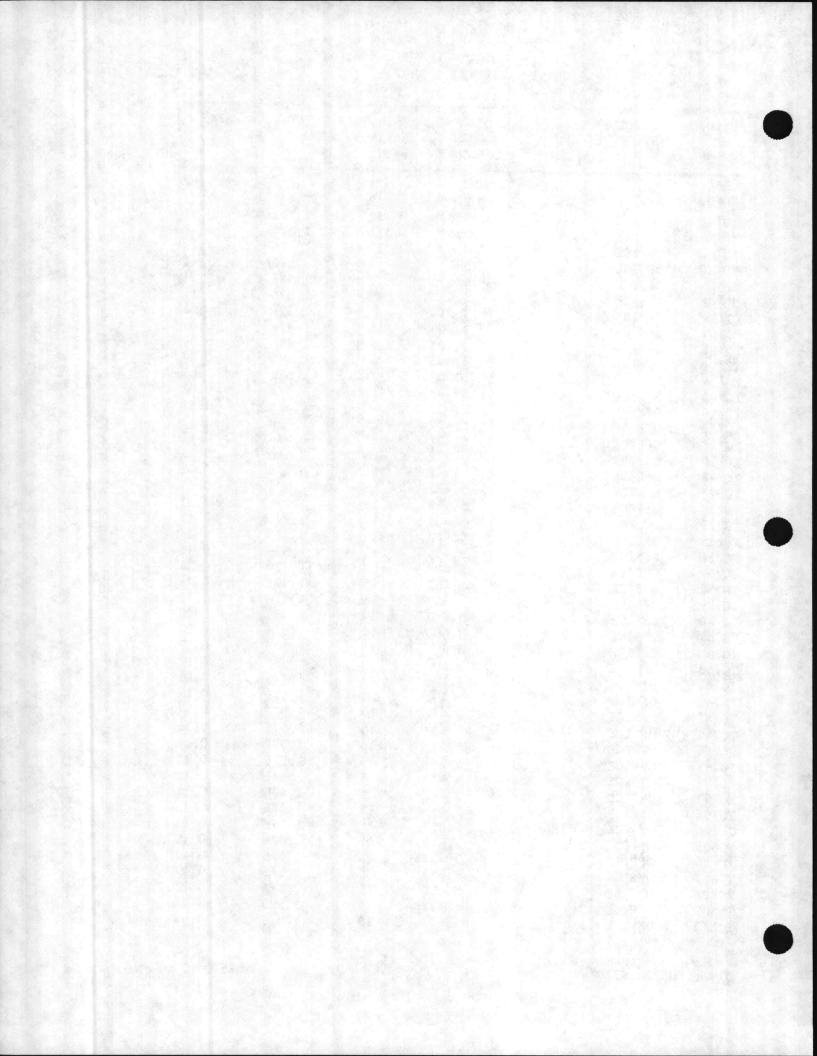




	CA	MP GEI	GER
OUTSIDE	AIR	LIMIT	SHUTOFF:

BUILDING NO.	STRUCTURE TYPE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
		0.060	0	1,173	0.0
G770	HOSPITAL	2.969	9	1,173	0.3
TC701	OFFICE	10.875	32 15	1,576	0.1
TC704	OFFICE	5.432		1,576	0.1
TC705	OFFICE	5.432	15		0.1
TC706	OFFICE	5.432	15	1,576 1,576	0.1
TC707	OFFICE	5.432	15		0.1
TC708	OFFICE	5.432	15	1,576	0.0
TC709	OFFICE	4.214	12	1,576	0.0
TC710	OFFICE	3.603	10	1,576	0.0
TC711	OFFICE	3.603	10	1,576	
TC712	OFFICE	3.603	10	1,576	0.0
TC714	OFFICE	3.603	10	1,576	0.0
TC715	OFFICE	3.603	10	1,576	0.0
TC716	OFFICE	5.432	15	1,576	0.1
TC717	OFFICE	5.432	15	1,576	0.1
TC718	OFFICE	5.432	15	1,576	0.1
TC719	OFFICE	5.432	15	1,576	0.1
TC726	OFFICE	5.432	15	1,576	0.1
TC727	OFFICE	5.432	15	1,576	0.1
TC728	OFFICE	5.432	15	1,576	0.1
TC729	OFFICE	5.432	15	1,576	0.1
TC735	OFFICE	4.942	14	1,173	0.1
TC736	OFFICE	5.432	15	1,576	0.1
TC737	OFFICE	5.432	15	1,576	0.3
TC738	OFFICE	5.432	15	1,576	0.3
TC739	OFFICE	5.432	15	1,576	0.1
TC740	OFFICE	3.603	10	1,576	0.0
TC741	OFFICE	3.603	10	1,576	0.0
TC742	OFFICE	3.603	10	1,576	0.0
TC743	OFFICE	3.603	10	1,576	0.
TC744	OFFICE	3.603	10	1,576	0.0
TC745	OFFICE	5.432	15	1,576	0.
TC748	OFFICE	5.432	15	1,576	0.
TC749	OFFICE	5.432	15	1,576	0.
TC750	OFFICE	5.432	15	1,576	0.
TC751	OFFICE	5.432	15	1,576	0.
TC752	OFFICE	5.432	15	1,576	0.
TC753	OFFICE	5.432	15	1,576	0.
	OFFICE	5.432	15	1,576	0.
TC754	OFFICE	5.432	15	1,576	0.
TC804	OFFICE	5.432	15	1,576	0.
TC805		5.432	15	1,576	0.
TC806	OFFICE	5.432	15	1,576	0.
TC807	OFFICE	5.432	15	1,576	0.
TC808	OFFICE	5.432	15	1,576	0.
TC809 TC810	OFFICE OFFICE	3.603	10	1,576	0.

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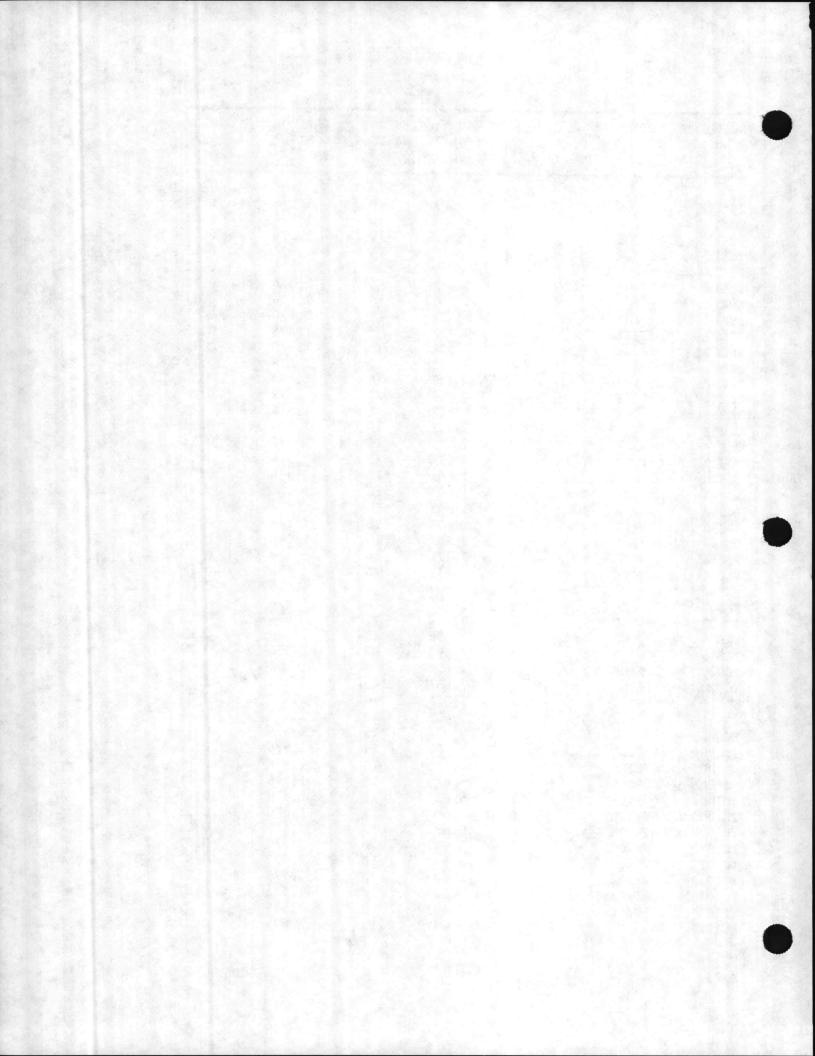


CAMP GEIGER OUTSIDE AIR LIMIT SHUTOFF:

BUILDING NO.	STRUCTURE TYPE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
		2 (02	10	1,576	0.0
TC812	OFFICE	3.603	10	1,576	0.0
TC814	OFFICE	3.603	10 10	1,576	0.0
TC815	OFFICE	3.603		1,576	0.1
TC816	OFFICE	5.432	15		0.1
TC817	OFFICE	5.432	15	1,576	0.1
TC818	OFFICE	5.432	15	1,576	0.1
TC819	OFFICE	5.432	15	1,576	
TC826	OFFICE	5.432	15	1,576	0.1
TC827	OFFICE	5.432	15	1,576	0.1
TC828	OFFICE	5.432	15	1,576	0.1
TC829	OFFICE	5.432	15	1,576	0.1
TC832	OFFICE	4.942	14	1,173	0.1
TC834	OFFICE	4.942	14	1,173	0.1
TC836	OFFICE	5.432	15	1,576	0.1
TC837	OFFICE	5.432	15	1,576	0.1
TC838	OFFICE	5.432	15	1,576	0.1
TC839	OFFICE	5.432	15	1,576	0.1
TC840	OFFICE	3.603	10	1,576	0.0
TC841	OFFICE	3.603	10	1,576	0.0
TC842	OFFICE	3.603	10	1,576	0.0
TC844	OFFICE	3.603	10	1,576	0.0
TC845	OFFICE	3.603	10	1,576	0.0
TC846	OFFICE	8.371	24	1,173	0.2
TC848	OFFICE	5.432	15	1,576	0.1
TC850	OFFICE	1.554	4	1,576	0.0
TC851	OFFICE	1.554	4	1,576	0.0
TC853	OFFICE	5.432	15	1,576	0.1
TC854	OFFICE	5.432	15	1,576	0.1
TC855	OFFICE	36.895	107	1,576	0.1
TC900	OFFICE	0.000	0	1,173	0.0
TC910	OFFICE	57.031	165	1,979	0.9
TC950	OFFICE	1.554	4	1,576	0.0
TC951	OFFICE	5.432	15	1,576	0.1
TC1003	OFFICE	5.432	15	1,576	0.1
TC1003	OFFICE	5.432	15	1,576	0.1
TC1004	OFFICE	5.432	15	1,576	0.1
		5.432	15	1,576	0.1
TC1006	OFFICE	5.432	15	1,576	0.1
TC1007	OFFICE	5.432	15	1,576	0.1
TC1008	OFFICE	5.432	15	1,576	0.
TC1009	OFFICE		10	1,576	0.
TC1010	OFFICE	3.603	10	1,576	0.
TC1012	OFFICE	3.603	10	1,576	0.
TC1013	OFFICE	3.603			0.
TC1015	OFFICE	3.603	10	1,576	
TC1016	OFFICE	3.603	10	1,576	0.
TC1017	OFFICE	5.432	15	1,576	0.

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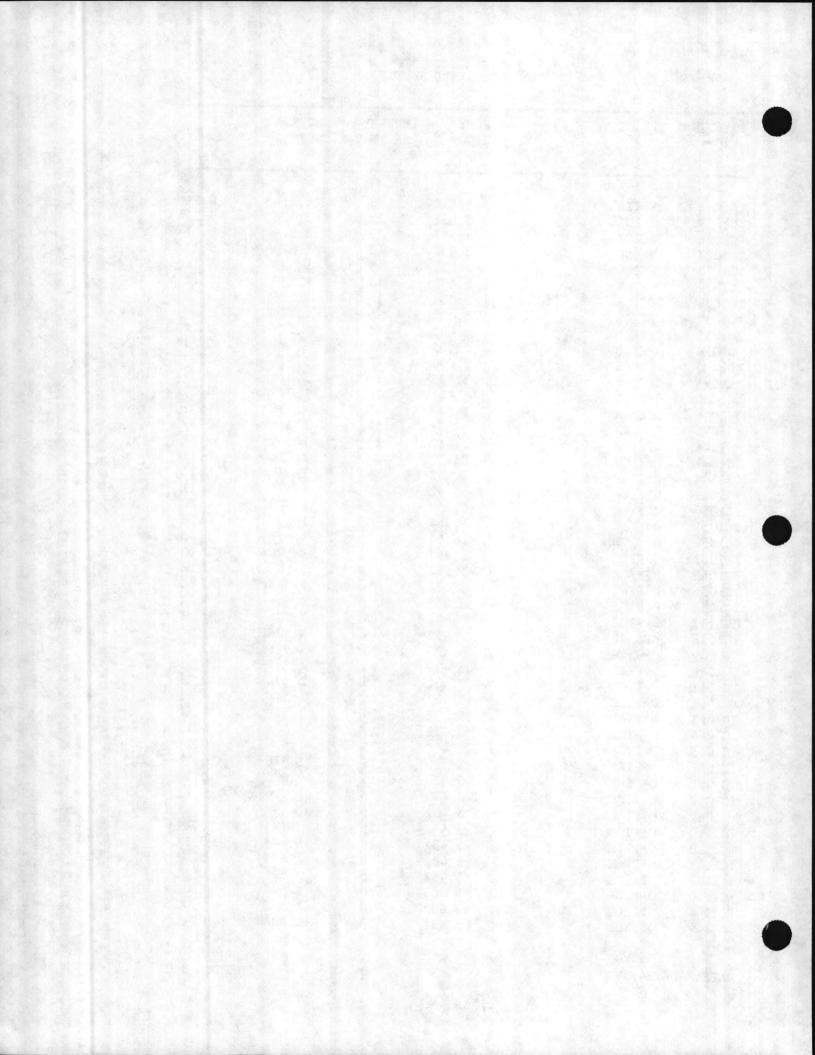


	CAMP GEIGER			
OUTSIDE	AIR	LIMIT	SHUTOFF:	

BUILDING NO.	STRUCTURE TYPE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
		5.432	15	1,576	0.11
TC1018	OFFICE	5.432	15	1,576	0.11
TC1019	OFFICE	5.432	15	1,576	0.11
TC1026	OFFICE	5.432	15	1,576	0.11
TC1027	OFFICE	5.432	15	1,576	0.11
TC1028	OFFICE	5.432	15	1,576	0.11
TC1029	OFFICE	5.432	15	1,576	0.11
TC1036	OFFICE		15	1,576	0.11
TC1037	OFFICE	5.432	15	1,576	0.11
TC1038	OFFICE	5.432	15	1,576	0.11
TC1039	OFFICE	5.432		1,576	0.07
TC1040	OFFICE	3.603	10		0.0
TC1041	OFFICE	3.603	10	1,576	0.0
TC1042	OFFICE	3.603	10	1,576	0.0
TC1044	OFFICE	3.603	10	1,576	0.0
TC1045	OFFICE	3.603	10	1,576	0.1
TC1046	OFFICE	5.432	15	1,576	
TC1047	OFFICE	5.432	15	1,576	0.1
TC1048	OFFICE	5.432	15	1,576	0.1
TC1049	OFFICE	5.432	15	1,576	0.1
TC1050	OFFICE	1.554	4	1,576	0.0
TC1051	OFFICE	1.554	4	1,576	0.0
TC1052	OFFICE	1.554	4	1,576	0.0
TC1053	OFFICE	1.554	4	1,576	0.0
TC1054	OFFICE	1.554	4	1,576	0.0
TC1055	OFFICE	5.432	15	1,576	0.1
TC1056	OFFICE	5.432	15	1,576	0.1
TC1057	OFFICE	5.432	15	1,576	0.1
TC1058	OFFICE	5.432	15	1,576	0.1
TC1059	OFFICE	5.432	15	1,576	0.1
TC1060	OFFICE	5.432	15	1,576	0.1
TC1061	OFFICE	5.432	15	1,576	0.1
TC1062	OFFICE	5.432	15	1,576	0.1
TC1063	OFFICE	5.432	15	1,576	0.1
TC1064	OFFICE	5.432	15	1,576	0.1
TC1065	OFFICE	5.432	15	1,576	0.1
TC1066	OFFICE	5.432	15	1,576	0.1
TC1067	OFFICE	5.432	15	1,576	0.1
TC1068	OFFICE	5.432	15	1,576	0.1
TC1069	OFFICE	5.432	15	1,576	0.1
TC1110	OFFICE	5.432	15	1,576	0.1
TC1119	OFFICE	5.432	15	1,576	0.1
TC1131	OFFICE	5.432	15	1,576	0.1
TC1131	OFFICE	5.432	15	1,576	0.1
TC1140	OFFICE	3.603	10	1,576	0.0
	OFFICE	3.603	10	1,576	0.0
TC1141 TC1142	OFFICE	5.432	15	1,576	0.1

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SHEET 3 OF 4

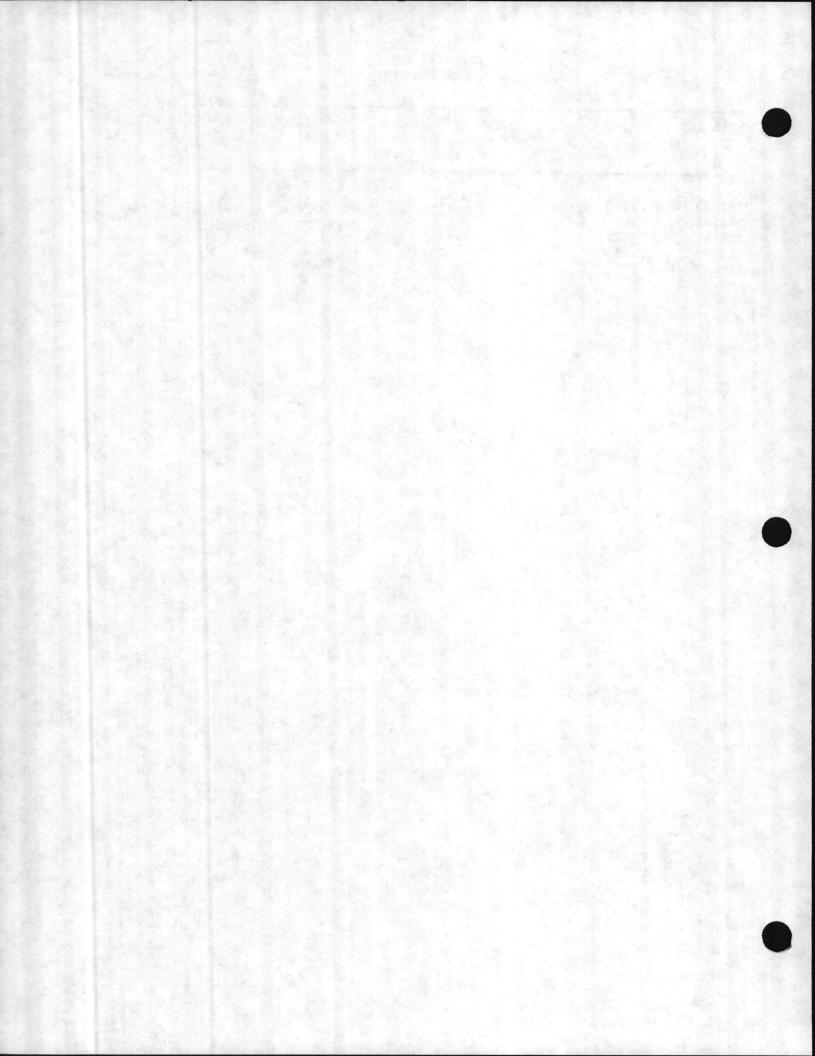


	CAMP GEIGER				
OUTSIDE	AIR	LIMIT	SHUTOFF:		

BUILDING NO.	STRUCTURE TYPE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
тс1143	OFFICE	5,432	15	1,576	0.11
TC1160	OFFICE	5.432	15	1,576	0.11
TC1161	OFFICE	5.432	15	1,576	0.11
TC1162	OFFICE	5,432	15	1,576	0.11



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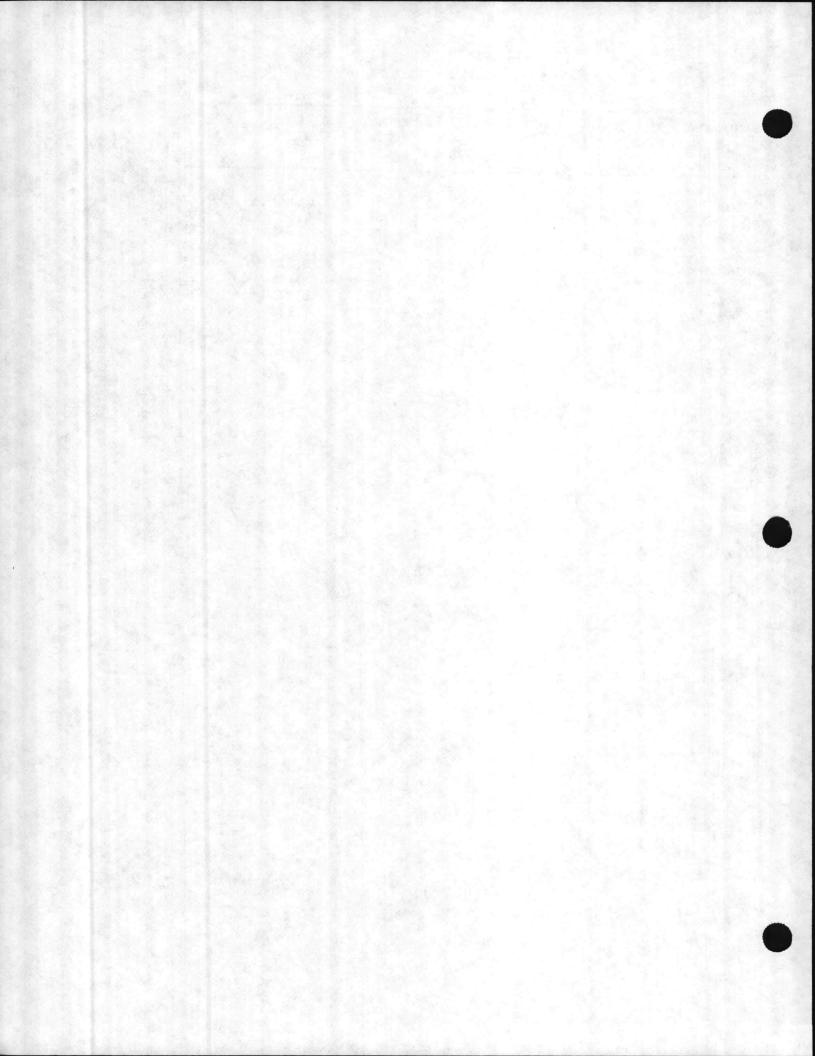


PARADISE POINT

OUTSIDE AIR LIMIT SHUTOFF:

BUILDING NO.	STRUCTURE TYPE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
2600	OFFICE	12.558	36	1,173	0.3
2600	OFFICE	20.285	59	4,800	0.1
2603	OFFICE	25.599	74	1,173	0.7
2625	OFFICE	11.668	33	1,173	0.3
2626	OFFICE	8.239	23	1,173	0.2
2627	OFFICE	12.417	36	1,173	0.3
2628	OFFICE	10.681	31	1,173	0.3
2629	OCC. WAREHOUSE	6.821	19	1,173	0.1





4.6 HOT WATER OUTSIDE AIR RESET

<u>Introduction</u> - The ECO discusses energy and cost savings which would be realized by installing outside air reset controls on existing building hot water heating systems. These controls would be stand-alone controls which are compatible with the existing Energy Management Control System (EMCS) which is controlled by a Hewlett Packard (HP) 1000 computer.

<u>Existing Condition</u> - Many buildings at this installation which are heated with hot water are provided with hot water at a temperature required only during the most extreme weather conditions. Hot water outside air reset controls change the hot water temperature supplied to the building to match the actual heating load. The typical control package consists of an outside air temperature sensor, a hot water supply temperature sensor and a temperature controller. At the coldest times of the year, the temperature. However, as outside air temperature rises, the temperature controller will begin to modulate, reducing the hot water supply temperature provided to the building. Since hot water distribution losses within the heating system are directly dependent on the hot water supply temperatures.

<u>Calculation Methodology</u> - Following is the methodology used to calculate energy savings from hot water outside air reset control systems.

Reference: CR 82.030 "Standardized EMCS Energy Savings Calculations" pg. 56

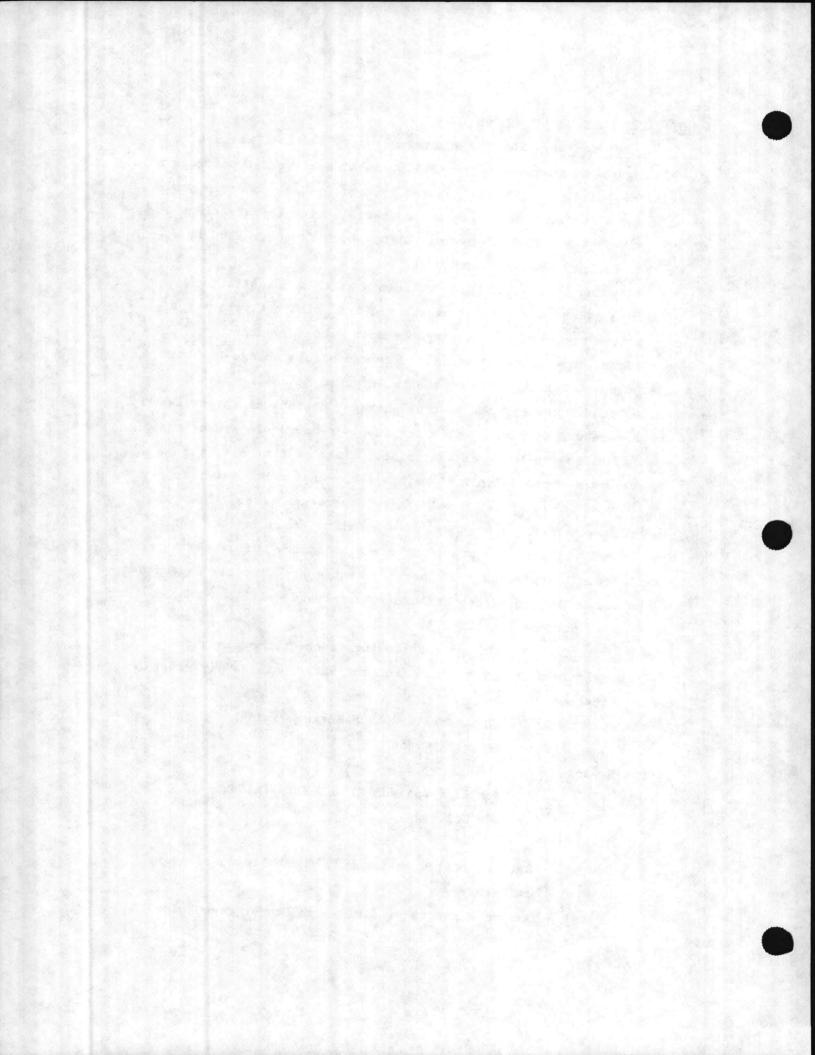
Energy Savings =

(HFLH x EI x Cap./HEFF) x 1 MBtu/1x106x 1/Plant Eff.

Where:

Energy Savings = Rate of heat transfer from the building boundary in MBtu/yr

Cap = Maximum capacity of devices in Btu/hr (see below).



EI = Efficiency increase expressed as a decimal, use 0.01 per REFERENCE)

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HEFF = Heating efficiency of the system (use 0.90 per
REFERENCE)
```

Plant Eff. = Efficiency of the steam generating plant (See Section 3.2" Fuel Costs and Efficiencies).

Cap =

BTT x AZ x (Td - To)

Where:

- BTT = Building thermal transmission in Btu/hr.- deg. F sq. ft. (See Section 4.4., "Night Setback")
- AZ = Area of zone being served in sq. ft.
- To = Design outdoor temperature = 23 deg. F
- Td = Indoor design temperature (See Section 3.3,

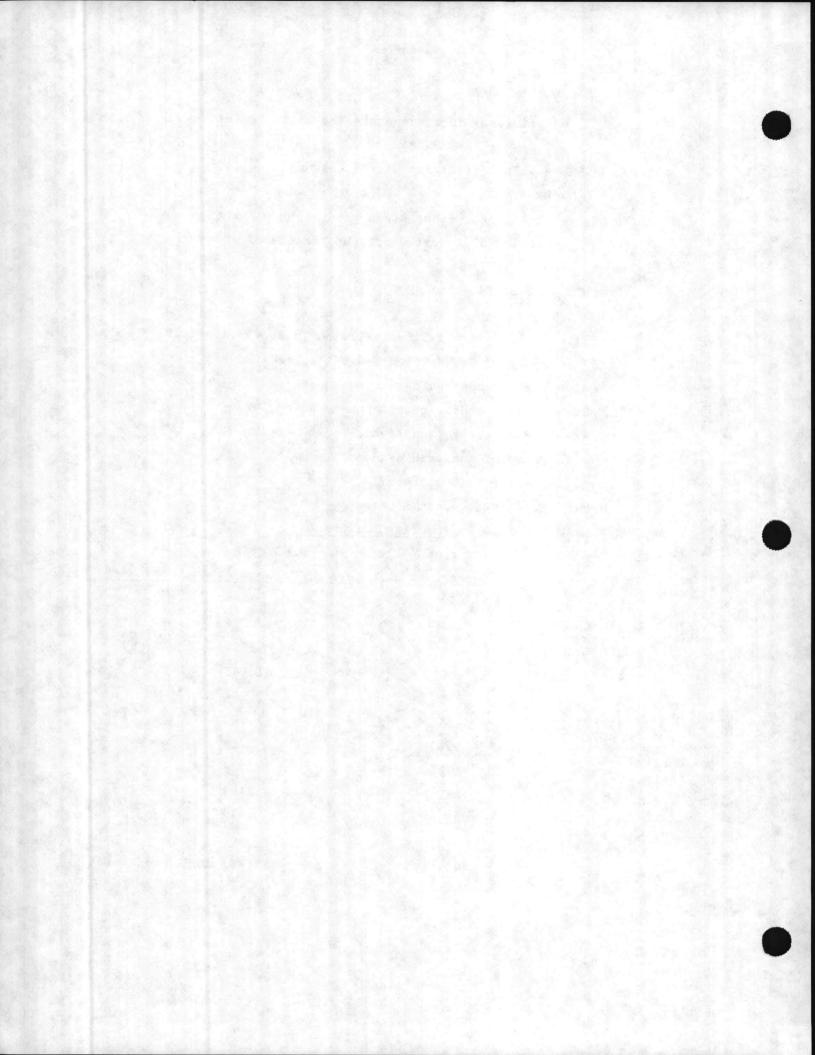
"General Analysis Methods")

HFLH = Annual hours/yr below 65 deg. F

65 deg. F - heating design temp.

REFERENCE: NAVFAC P-89 Engineering Weather Data

Mean deg. F	Hrs of	Degree hrs
In Range	Occurrence	Hrs of Occur.x (65 deg-mean deg. F)
62	868	2604
57	752	6016
52	684	8892
47	636	11,448
42	578	13,294
37	425	11,900
32	302	9966
27	152	5776
22	51	2193
17	14	672
12	2	106
	4464	72,867 deg. F - hrs



 $HFLH = \frac{72,867}{65 - 23} = 1735 \text{ hrs/yr}.$

Calculation Example:

Given: BTT = 0.597 Btu/sq. ft. - hr-deg. F AZ = 3000 sq. ft. Td = 65 deg. F Plant Eff. = 0.73 Cap = 0.597 x 3000 x (65-23) = 75,222 Btu/hr

Energy Savings = (1735 x 0.01 x 55,222/0.9) x 1/1x106 x 1/0.73 = 1.39 MBtu/yr

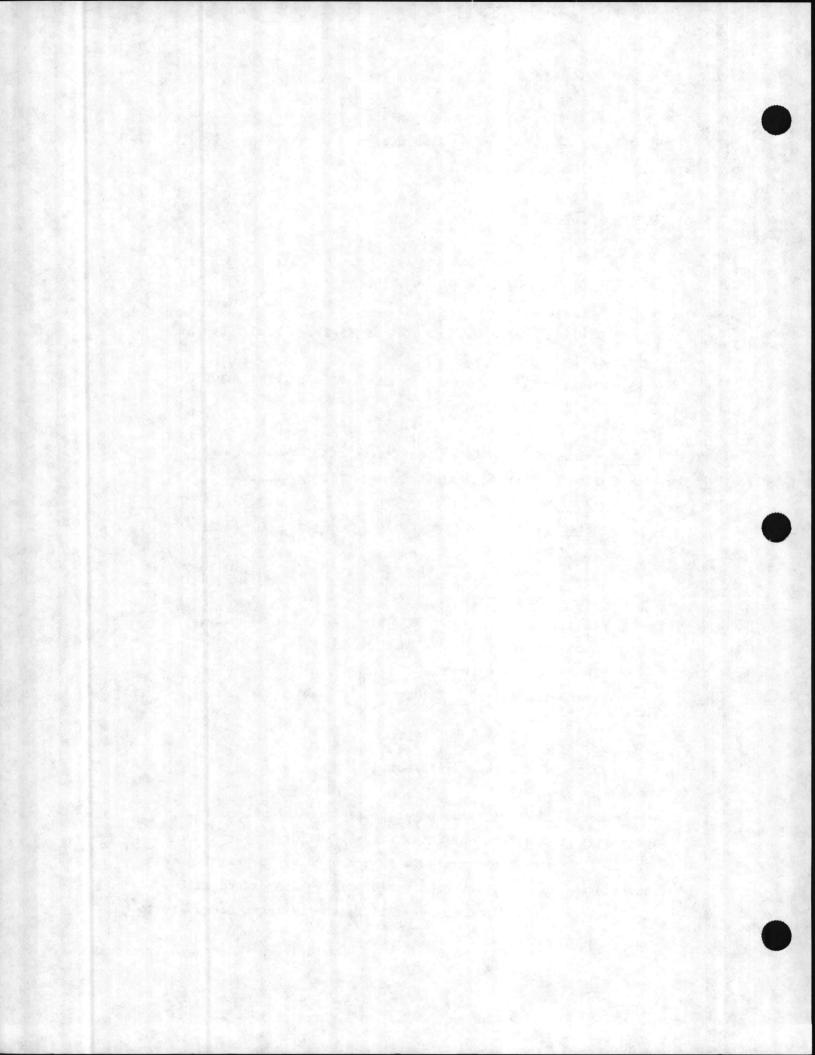
<u>Cost Estimate</u> - The items and associated costs required to accomplish hot water outside air reset is as follows:

Steam/HW converter

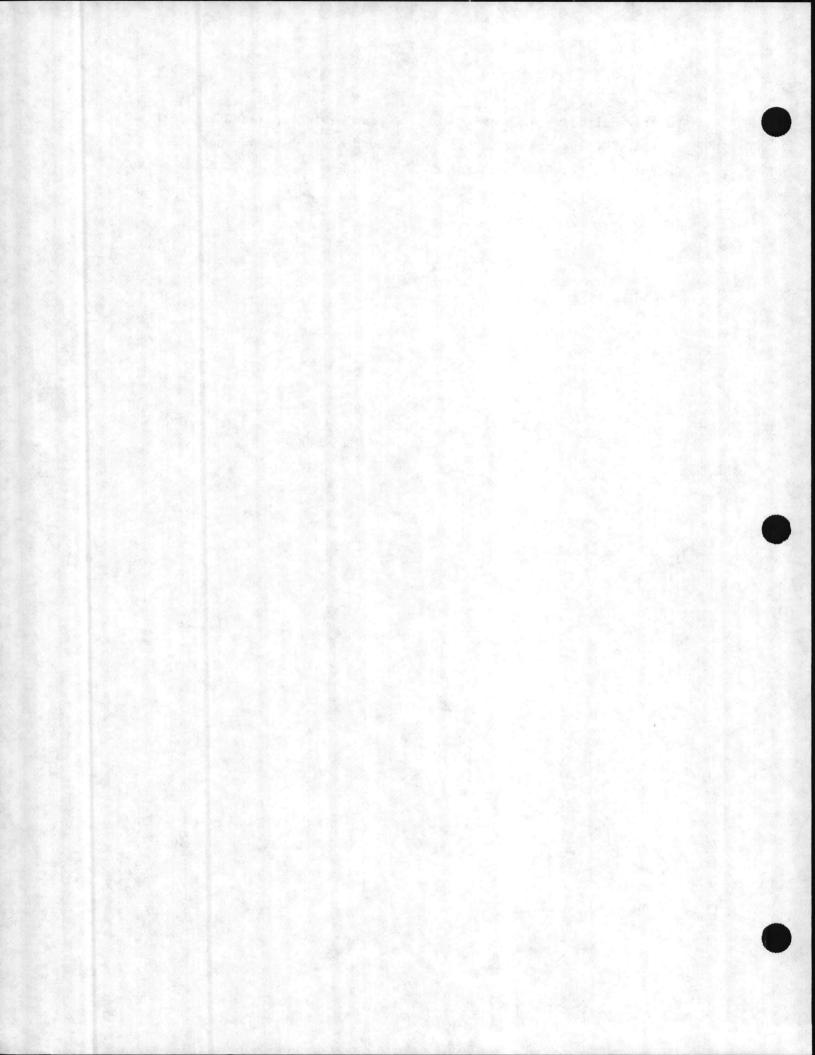
Item	<u>Materials</u>	Labor	Total
Water temperature	105	24	129
sensor			100
Thermowell	31	133	164
Outside air	119	17	136
temperature se	nsor		
Pneumatic valve	204	44	248
controller			
EP transducer	239	44	283
Total =	\$960/building	3	

<u>Summary</u> - The following pages present individual building energy savings and cost estimates for all buildings.

The life-cycle cost analysis indicates that no building has a discounted savings to investment ratio (SIR) which exceeds 1.0 indicating that this ECO does not satisfy the criteria necessary to



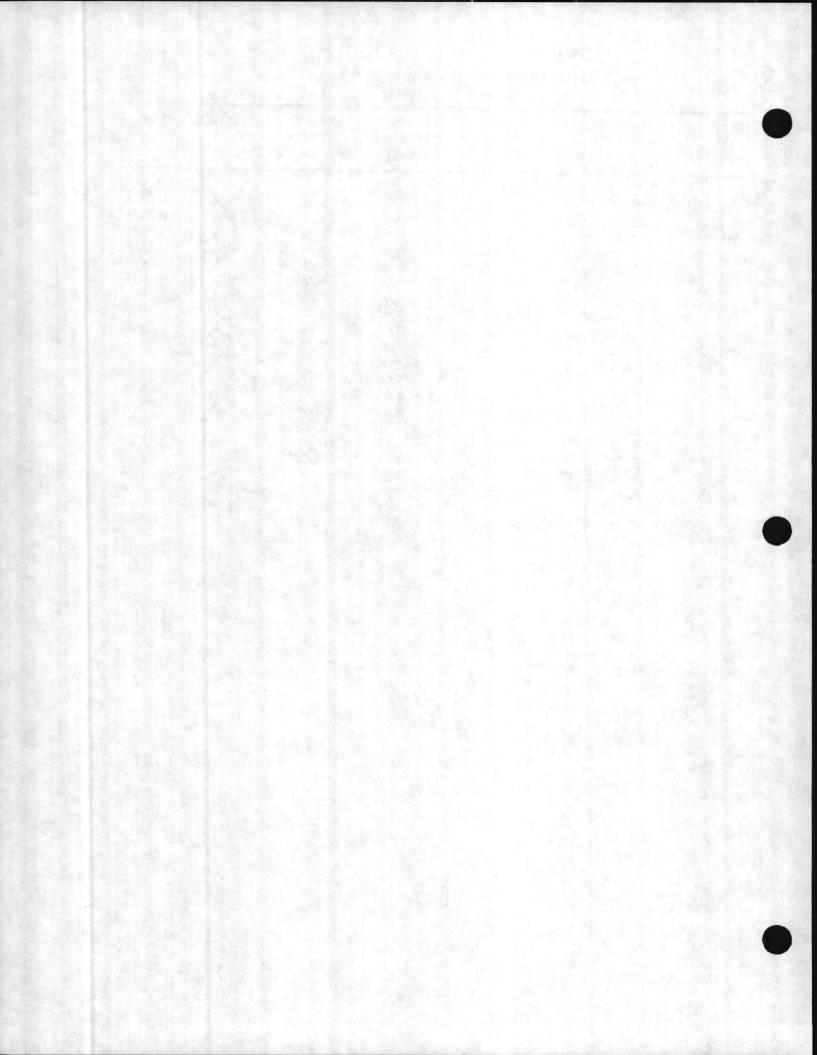
be cost effective. However, this ECO can be incorporated with other control ECOs at a minimal cost and become a viable opportunity. See Section 4.7 "Combined Control ECO."



AIR STATION

HOT WATER OUTSIDE AIR RESET:

BUILDING NO.	STRUCTURE TYPE	HEAT SOURCE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
			NT / A	N /A	N/A	N/A
AS114	OFFICE	ST	N/A	N/A	N/A	N/A
AS118	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
AS122	OFFICE	ST	N/A	N/A	N/A	N/A
AS124	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
AS130	OFFICE	ST	N/A	N/A	N/A	N/A
AS202	OFFICE	ST	N/A	N/A	N/A	N/A
AS205	OFFICE	ST	N/A	N/A	N/A	N/A
AS208	OFFICE	ST	N/A	N/A	•	N/A
AS215	OFFICE	ST	N/A	N/A	N/A	N/A
AS216	OFFICE	ST	N/A	N/A	N/A	N/A
AS217	OFFICE	ST	N/A	N/A	N/A	N/A
AS232	OFFICE	ST	N/A	N/A	N/A	· · · · · · · · · · · · · · · · · · ·
AS236	OFFICE	ST	N/A	N/A	N/A	N/A
AS302	OFFICE	ST	N/A	N/A	N/A	N/A
AS312	OFFICE	HW	2.159	6	960	0.0
AS320	OFFICE	HW	2.387	6	960	0.0
AS414	OFFICE	ST	N/A	N/A	N/A	N/A
AS424	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
AS425	OFFICE	ST	N/A	N/A	N/A	N//
AS502	OFFICE	ST	N/A	N/A	N/A	N//
AS4012	OFFICE	HW	2.552	7	960	0.0
AS4030	OFFICE	HW	3.900	11	960	0.
AS4035	OFFICE	HW	3.602	10	960	0.1
AS4110	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/.
AS4120	OFFICE	ST	N/A	N/A	N/A	N/.
AS4122	OFFICE	ST	N/A	N/A	N/A	N/.
AS4141	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/.
AS4145	OFFICE	ST	N/A	N/A	N/A	N/.
AS4146	OCC. WAREHOUSE	HW	3.185	9	960	0.
AS4140 AS4157	OFFICE	HW	1.550	4	960	0.
AS4157 AS4158	OCC. WAREHOUSE	HW	8.550	24	960	0.

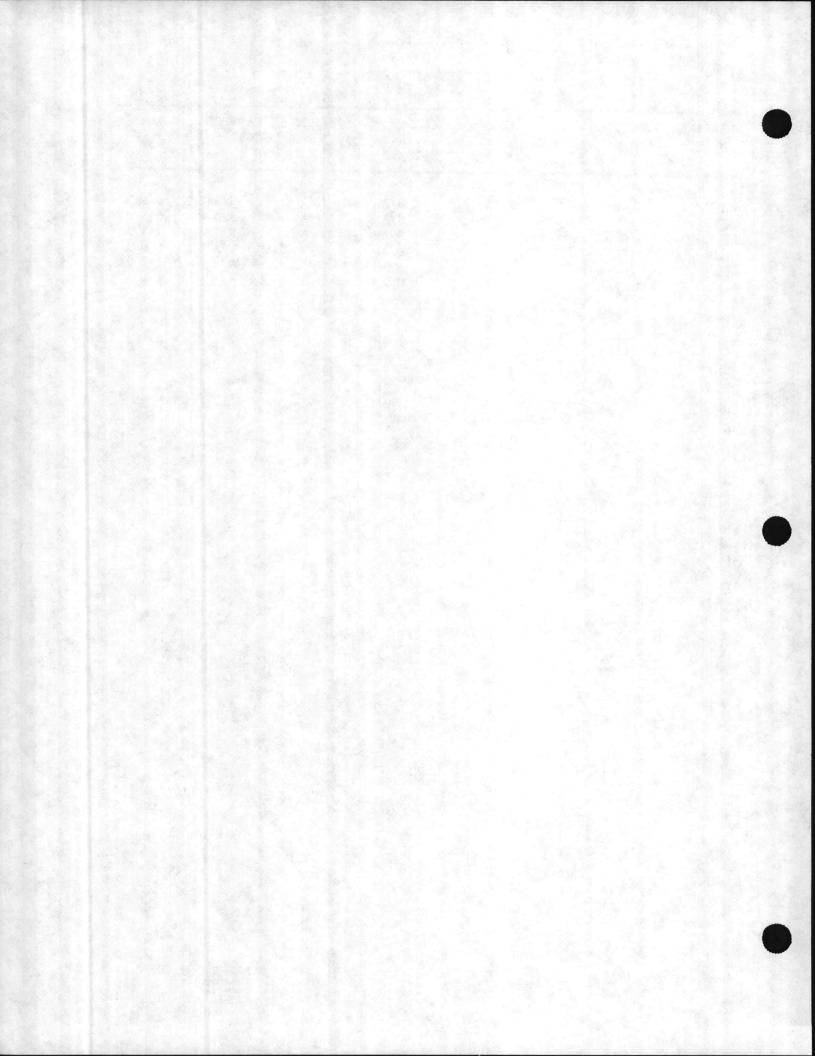


BEACH AREA

HOT WATER	OUTSIDE	AIR	RESET:
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BUILDING NO.	STRUCTURE TYPE	HEAT SOURCE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
BA101	OFFICE	ST	N/A	N/A	N/A	N/#
BA102	OFFICE	ST	N/A	N/A	N/A	N//
BA103	OFFICE	ST	N/A	N/A	N/A	N//
BA104	OFFICE	ST	N/A	N/A	N/A	N//
BA105	OFFICE	ST	N/A	N/A	N/A	N//
BA128	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N//

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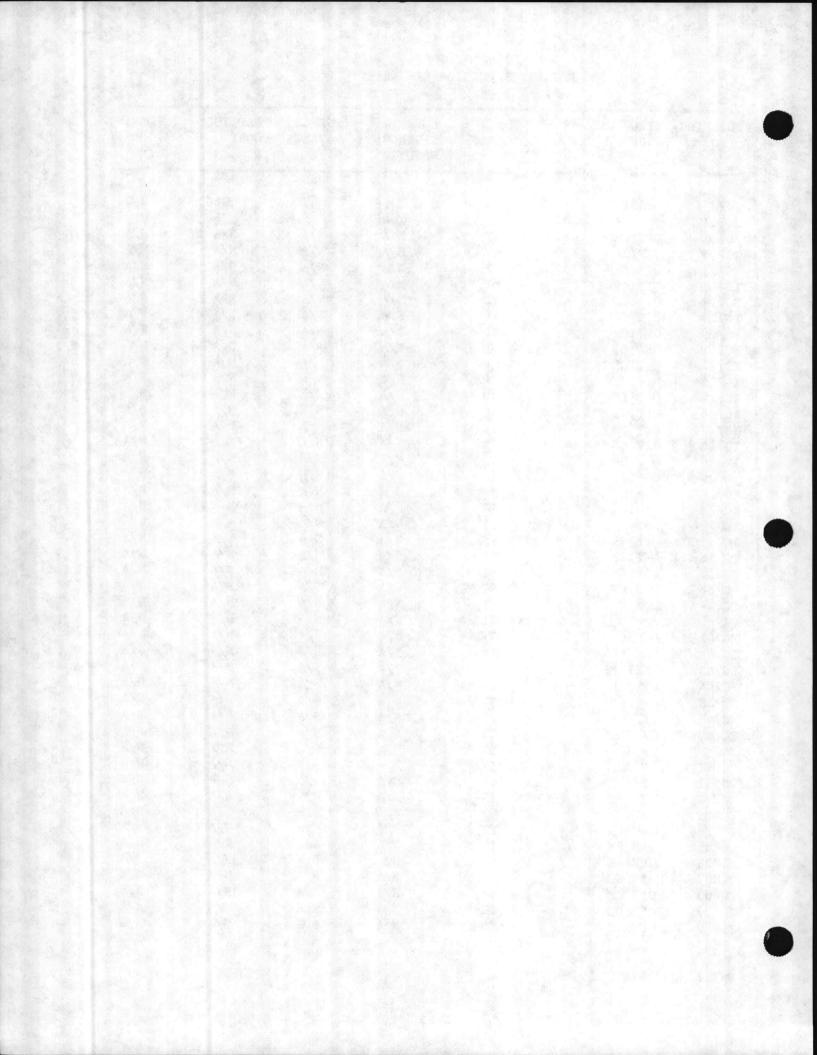


CAMP GEIGER HOT WATER OUTSIDE AIR RESET:

BUILDING NO.	STRUCTURE TYPE	HEAT SOURCE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
			0 596	7	960	0.0
G770	HOSPITAL	HW	2.586 2.004	5	960	0.0
TC701	OFFICE	HW			N/A	N/A
TC704	OFFICE	ST	N/A	N/A		N/A
TC705	OFFICE	ST	N/A	N/A	N/A	N/A
TC706	OFFICE	ST	N/A	N/A	N/A	N/A
TC707	OFFICE	ST	N/A	N/A	N/A	N/A
TC708	OFFICE	ST	N/A	N/A	N/A	N/A
TC709	OFFICE	ST	N/A	N/A	N/A	N/A
TC710	OFFICE	ST	N/A	N/A	N/A	
TC711	OFFICE	ST	N/A	N/A	N/A	N/A
TC712	OFFICE	ST	N/A	N/A	N/A	N/A
TC714	OFFICE	ST	N/A	N/A	N/A	N/A
TC715	OFFICE	ST	N/A	N/A	N/A	N/A
TC716	OFFICE	ST	N/A	N/A	N/A	N/A
TC717	OFFICE	ST	N/A	N/A	N/A	N/A
TC718	OFFICE	ST	N/A	N/A	N/A	N/A
TC719	OFFICE	ST	N/A	N/A	N/A	N/A
TC726	OFFICE	ST	N/A	N/A	N/A	N/A
TC727	OFFICE	ST	N/A	N/A	N/A	N/A
TC728	OFFICE	ST	N/A	N/A	N/A	N/A
TC729	OFFICE	ST	N/A	N/A	N/A	N/A
TC735	OFFICE	ST	N/A	N/A	N/A	N/A
TC736	OFFICE	ST	N/A	N/A	N/A	N/A
TC737	OFFICE	ST	N/A	N/A	N/A	N/A
TC738	OFFICE	ST	N/A	N/A	N/A	N/A
TC739	OFFICE	ST	N/A	N/A	N/A	N/A
TC740	OFFICE	ST	N/A	N/A	N/A	N/A
TC741	OFFICE	ST	N/A	N/A	N/A	N/A
TC742	OFFICE	ST	N/A	N/A	N/A	N/A
TC743	OFFICE	ST	N/A	N/A	N/A	N/A
TC744	OFFICE	ST	N/A	N/A	N/A	N/A
TC745	OFFICE	ST	N/A	N/A	N/A	N/A
TC748	OFFICE	ST	N/A	N/A	N/A	N/A
TC749	OFFICE	ST	N/A	N/A	N/A	N/A
TC750	OFFICE	ST	N/A	N/A	N/A	N/A
TC751	OFFICE	ST	N/A	N/A	N/A	N/A
TC752	OFFICE	ST	N/A	N/A	N/A	N/A
TC753	OFFICE	ST	N/A	N/A	N/A	N/A
TC754	OFFICE	ST	N/A	N/A	N/A	N/A
TC804	OFFICE	ST	N/A	N/A	N/A	N/A
TC805	OFFICE	ST	N/A	N/A	N/A	N/A
TC806	OFFICE	ST	N/A	N/A	N/A	N/A
TC807	OFFICE	ST	N/A	N/A	N/A	N/A
TC808	OFFICE	ST	N/A	N/A	N/A	N/A
TC809	OFFICE	ST	N/A	N/A	N/A	N/A
TC810	OFFICE	ST	N/A	N/A	N/A	N/A

DATE: 06/24/87

SHEET 1 OF 4



CAMP GEIGER

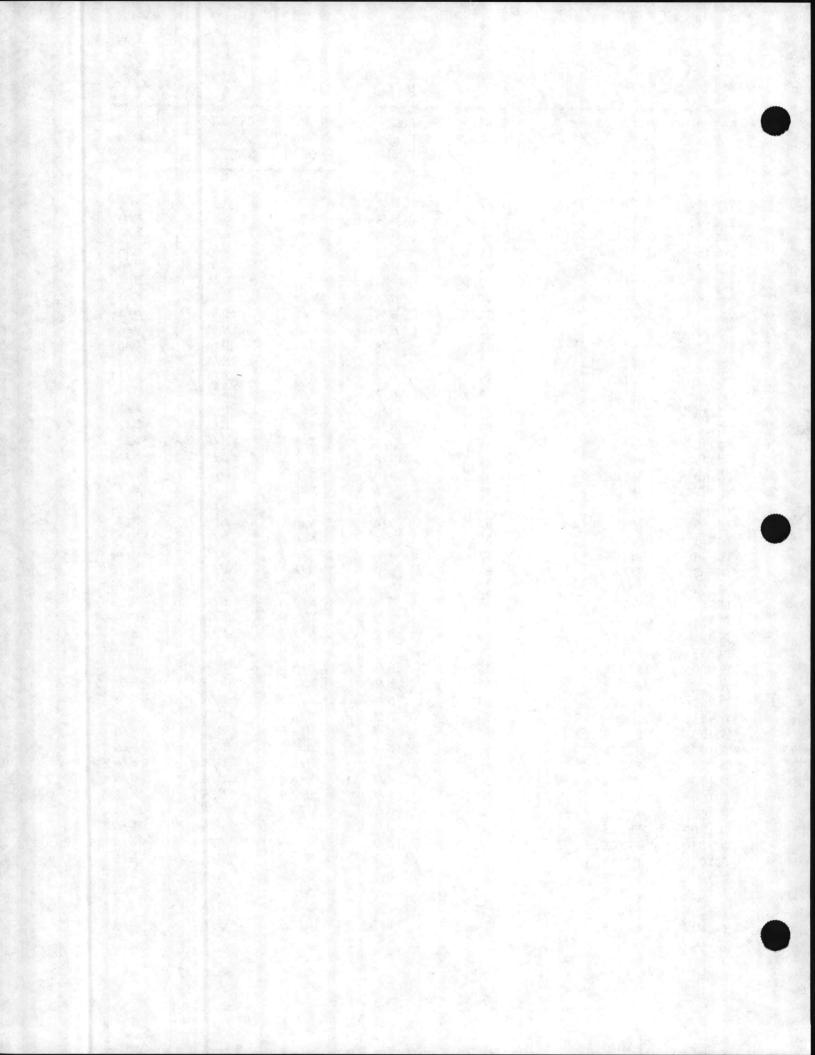
HOT WATER OUTSIDE AIR RESET:

BUILDING NO.	STRUCTURE TYPE	HEAT SOURCE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
TC812	OFFICE	ST	N/A	N/A	N/A	N//
TC814	OFFICE	ST	N/A	N/A	N/A	N//
TC815	OFFICE	ST	N/A	N/A	N/A	N//
TC816	OFFICE	ST	N/A	N/A	N/A	N//
TC817	OFFICE	ST	N/A	N/A	N/A	N//
TC818	OFFICE	ST	N/A	N/A	N/A	N//
TC819	OFFICE	ST	N/A	N/A	N/A	N/.
TC826	OFFICE	ST	N/A	N/A	N/A	N/.
TC827	OFFICE	ST	N/A	N/A	N/A	N/.
TC828	OFFICE	ST	N/A	N/A	N/A	N/.
TC829	OFFICE	ST	N/A	N/A	N/A	N/
TC832	OFFICE	ST	N/A	N/A	N/A	N/
TC834	OFFICE	ST	N/A	N/A	N/A	N/
TC836	OFFICE	ST	N/A	N/A	N/A	N/
TC837	OFFICE	ST	N/A	N/A	N/A	N/
TC838	OFFICE	ST	N/A	N/A	N/A	N/
TC839	OFFICE	ST	N/A	N/A	N/A	N/
TC840	OFFICE	ST	N/A	N/A	N/A	N/
TC841	OFFICE	ST	N/A	N/A	N/A	N/
TC841	OFFICE	ST	N/A	N/A	N/A	N/
TC844	OFFICE	ST	N/A	N/A	N/A	N/
TC845	OFFICE	ST	N/A	N/A	N/A	N/
		ST	N/A	N/A	N/A	N/
TC846	OFFICE	ST	N/A	N/A	N/A	N/
TC848	OFFICE	ST	N/A	N/A	N/A	N/
TC850	OFFICE	ST		N/A	N/A	N/
TC851	OFFICE	ST	N/A	N/A	N/A	N/
TC853	OFFICE		N/A		N/A	N/
TC854	OFFICE	ST	N/A	N/A	N/A	N/
TC855	OFFICE	ST	N/A	N/A		N/
TC900	OFFICE	ST	N/A	N/A	N/A	
TC910	OFFICE	ST	N/A	N/A	N/A	N/
TC950	OFFICE	ST	N/A	N/A	N/A	N/
TC951	OFFICE	ST	N/A	N/A	N/A	N/
TC1003	OFFICE	ST	N/A	N/A	N/A	N/
TC1004	OFFICE	ST	N/A	N/A	N/A	N,
TC1005	OFFICE	ST	N/A	N/A	N/A	N,
TC1006	OFFICE	ST	N/A	N/A	N/A	N,
TC1007	OFFICE	ST	N/A	N/A	N/A	N,
TC1008	OFFICE	ST	N/A	N/A	N/A	N,
TC1009	OFFICE	ST	N/A	N/A	N/A	N,
TC1010	OFFICE	ST	N/A	N/A	N/A	N,
TC1012	OFFICE	ST	N/A	N/A	N/A	N
TC1013	OFFICE	ST	N/A	N/A	N/A	N,
TC1015	OFFICE	ST	N/A	N/A	N/A	N,
TC1016	OFFICE	ST	N/A	N/A	N/A	N,
TC1017	OFFICE	ST	N/A	N/A	N/A	N,

DATE: 06/24/87

SHEET 2 OF 4





CAPITOL SIR HEAT ENERGY ENERGY BUILDING STRUCTURE COST SAVINGS SAVINGS SOURCE TYPE NO. \$/YR \$ MBTU/YR N/A N/A ST N/A N/A OFFICE TC1018 N/A N/A ST N/A OFFICE N/A TC1019 N/A N/A N/A ST N/A TC1026 OFFICE N/A N/A N/A ST N/A OFFICE TC1027 N/A N/A N/A ST N/A TC1028 OFFICE N/A ST N/A N/A N/A TC1029 OFFICE N/A N/A N/A N/A ST TC1036 OFFICE N/A N/A N/A ST N/A OFFICE TC1037 N/A N/A N/A OFFICE ST N/A TC1038 N/A N/A ST N/A N/A TC1039 OFFICE N/A ST N/A N/A N/A TC1040 OFFICE N/A N/A N/A N/A ST TC1041 OFFICE N/A N/A N/A ST N/A TC1042 OFFICE N/A N/A N/A ST N/A TC1044 OFFICE N/A N/A N/A ST N/A OFFICE TC1045 N/A N/A N/A ST N/A TC1046 OFFICE N/A N/A N/A ST N/A OFFICE TC1047 N/A N/A N/A ST N/A TC1048 OFFICE N/A N/A N/A ST N/A TC1049 OFFICE N/A N/A N/A ST N/A OFFICE TC1050 N/A N/A N/A ST N/A TC1051 OFFICE N/A N/A N/A ST N/A OFFICE TC1052 N/A N/A N/A ST N/A TC1053 OFFICE N/A N/A N/A TC1054 OFFICE ST N/A N/A N/A N/A ST N/A TC1055 OFFICE N/A N/A N/A N/A ST TC1056 OFFICE N/A N/A N/A N/A ST TC1057 OFFICE N/A N/A N/A ST N/A TC1058 OFFICE N/A N/A N/A N/A ST OFFICE TC1059 N/A N/A N/A ST N/A **TC1060** OFFICE N/A N/A N/A N/A ST TC1061 OFFICE N/A N/A N/A N/A ST OFFICE TC1062 N/A N/A ST N/A N/A TC1063 OFFICE N/A N/A N/A ST N/A TC1064 OFFICE N/A N/A N/A ST N/A OFFICE TC1065 N/A N/A N/A ST N/A TC1066 OFFICE N/A N/A N/A N/A ST TC1067 OFFICE N/A N/A N/A N/A TC1068 OFFICE ST N/A N/A N/A N/A ST TC1069 OFFICE N/A N/A N/A ST N/A TC1110 OFFICE N/A N/A N/A ST N/A TC1119 OFFICE N/A N/A N/A N/A ST TC1131 OFFICE N/A N/A N/A ST N/A TC1132 OFFICE N/A N/A N/A ST N/A OFFICE TC1140 N/A N/A N/A N/A ST OFFICE TC1141 N/A N/A N/A ST N/A

CAMP GEIGER

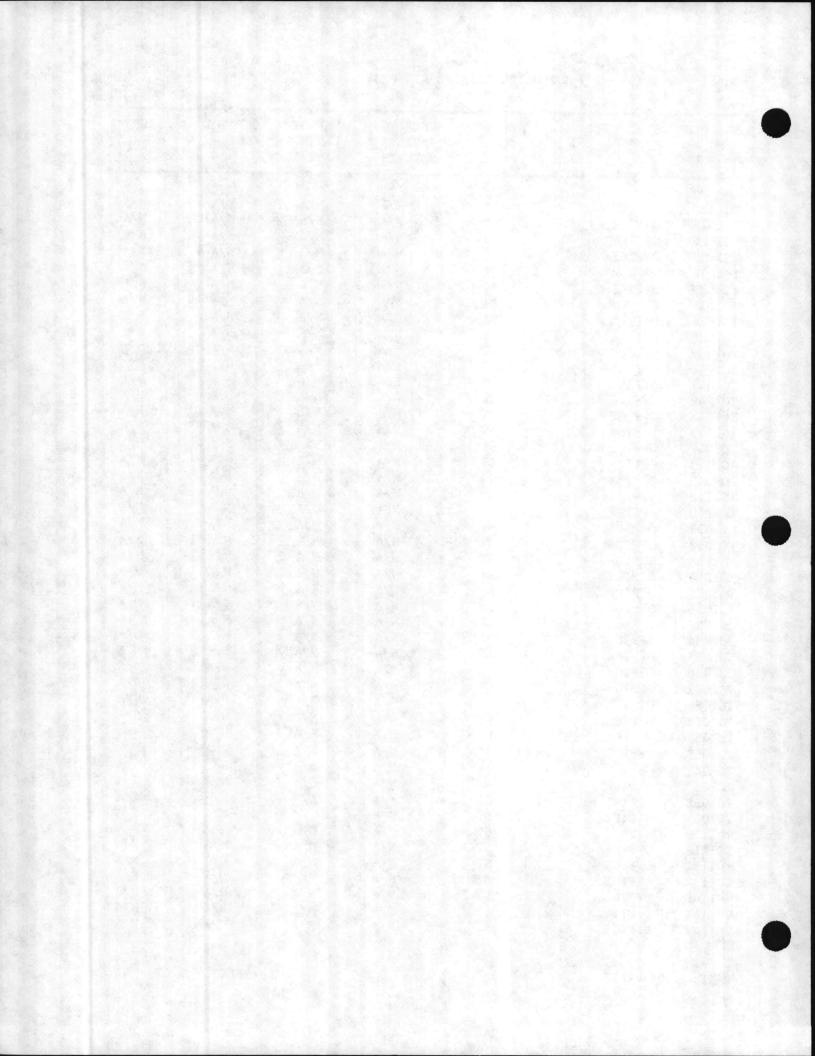
HOT WATER OUTSIDE AIR RESET:

06/24/87 DATE:

OFFICE

TC1142

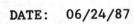
3 OF 4 SHEET

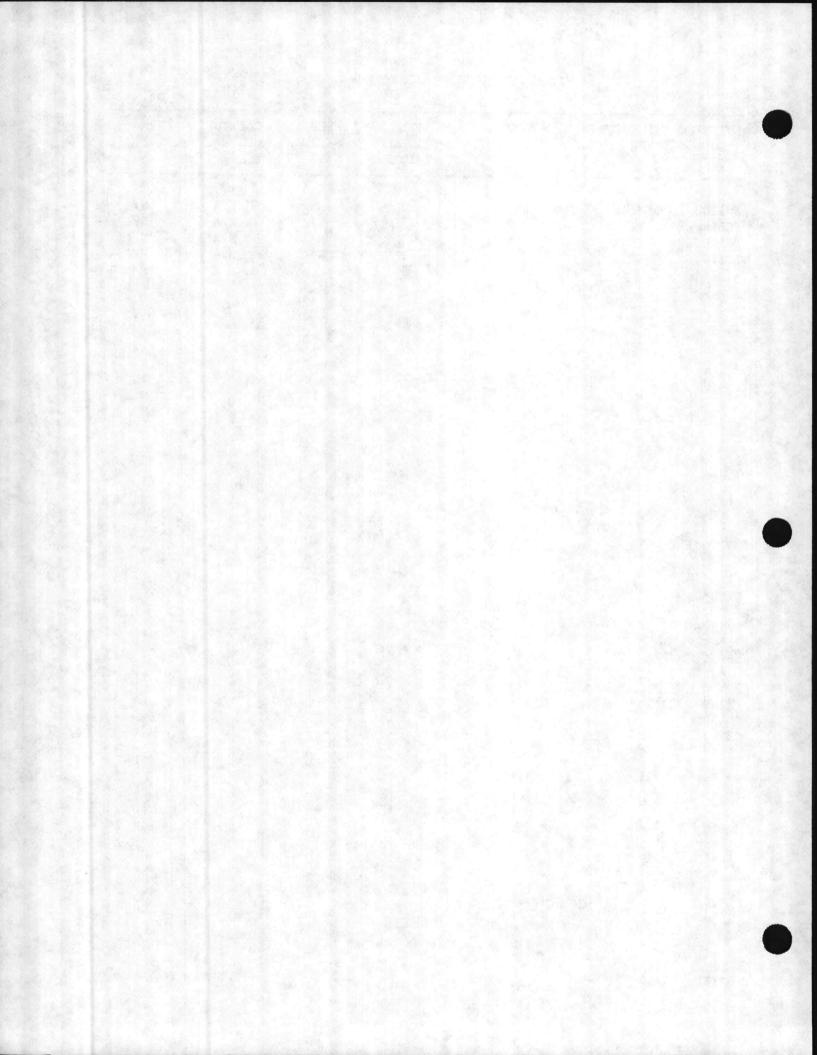


UOT		CAMP G	EIGE	R
HOT	WATER	OUTSIDE	AIR	RESET:

STRUCTURE TYPE	HEAT SOURCE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
OFFICE	ST	N/A	N/A	N/A	N/A
OFFICE	ST	N/A	N/A	N/A	N/A
OFFICE	ST	N/A	N/A	N/A	N/A
OFFICE	ST	N/A	N/A	N/A	N/A
	TYPE OFFICE OFFICE OFFICE	TYPE SOURCE OFFICE ST OFFICE ST OFFICE ST	TYPESOURCESAVINGS MBTU/YROFFICESTN/AOFFICESTN/AOFFICESTN/A	OFFICE ST N/A N/A OFFICE ST N/A N/A OFFICE ST N/A N/A	OFFICE ST N/A N/A N/A OFFICE ST N/A N/A N/A OFFICE ST N/A N/A N/A OFFICE ST N/A N/A N/A







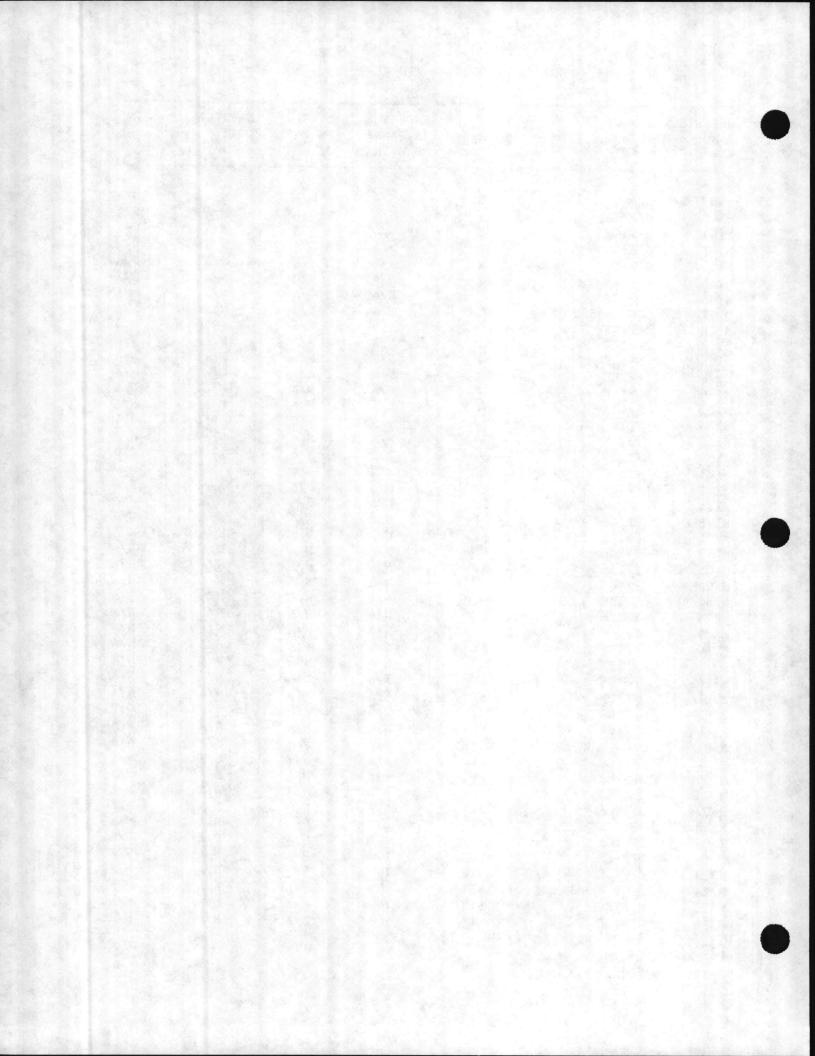
CAMP JOHNSON

HOT WATER OUTSIDE AIR RESET:

BUILDING NO.	STRUCTURE TYPE	HEAT SOURCE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
1.30						
M90	OFFICE	ST	N/A	N/A	N/A	N/A
M100	OFFICE	ST	N/A	N/A	N/A	N/A
M101	OFFICE	ST	N/A	N/A	N/A	N/A
M102	OFFICE	ST	N/A	N/A	N/A	N/A
M103	OFFICE	ST	N/A	N/A	N/A	N/A
M104	OFFICE	ST	N/A	N/A	N/A	N/A
M105	OFFICE	ST	N/A	N/A	N/A	N/A
M112	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
M116	OFFICE	HW	1.595	4	960	0.0
M123	OFFICE	ST	N/A	N/A	N/A	N/A
M124	OFFICE	ST	N/A	N/A	N/A	N/A
M125	OFFICE	ST	N/A	N/A	N/A	N/A
M126	OFFICE	ST	N/A	N/A	N/A	N/A
M127	OFFICE	ST	N/A	N/A	N/A	N/A
M128	OFFICE	HW	3.651	10	960	0.1
M129	OFFICE	ST	N/A	N/A	N/A	N/A
M130	OFFICE	HW	2.104	6	960	0.0
M131	OFFICE	HW	2.382	6	960	0.0
M132	OFFICE	ST	N/A	N/A	N/A	N/A
M134	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
M178	OFFICE	ST	N/A	N/A	N/A	N/A
M201	OFFICE	ST	N/A	N/A	N/A	N/A
M202	OFFICE	ST	N/A	N/A	N/A	N/A
M205	OFFICE	ST	N/A	N/A	N/A	N/A
M206	OFFICE	ST	N/A	N/A	N/A	N/A
M207	OFFICE	ST	N/A	N/A	N/A	N/A
M208	OFFICE	ST	N/A	N/A	N/A	N/A
M209	OFFICE	ST	N/A	N/A	N/A	N/A
M210	OFFICE	ST	N/A	N/A	N/A	N/A
M215	OFFICE	ST	N/A	N/A	N/A	N/A
M216	OFFICE	ST	N/A	N/A	N/A	N/A
M231	OFFICE	ST	N/A	N/A	N/A	N/A
M237	OFFICE	HW	0.365	1	960	0.0
M240	OFFICE	ST	N/A	N/A	N/A	N/A
M301	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
M302	OFFICE	ST	N/A	N/A	N/A	N/A
M303	OFFICE	ST	N/A	N/A	N/A	N/A
M305	OFFICE	ST	N/A	N/A	N/A	N//
M307	OFFICE	ST	N/A	N/A	N/A	N//
M308	OFFICE	ST	N/A	N/A	N/A	N//
M309	OFFICE	ST	N/A	N/A	N/A	N//
M309 M311	OFFICE	ST	N/A	N/A	N/A	N//
M313	OFFICE	ST	N/A	N/A	N/A	N/4
	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N//
M314		ST	N/A	N/A	N/A	N//
M315	OFFICE OFFICE	ST	N/A	N/A	N/A	N//

DATE: 06/22/87

SHEET 1 OF 3

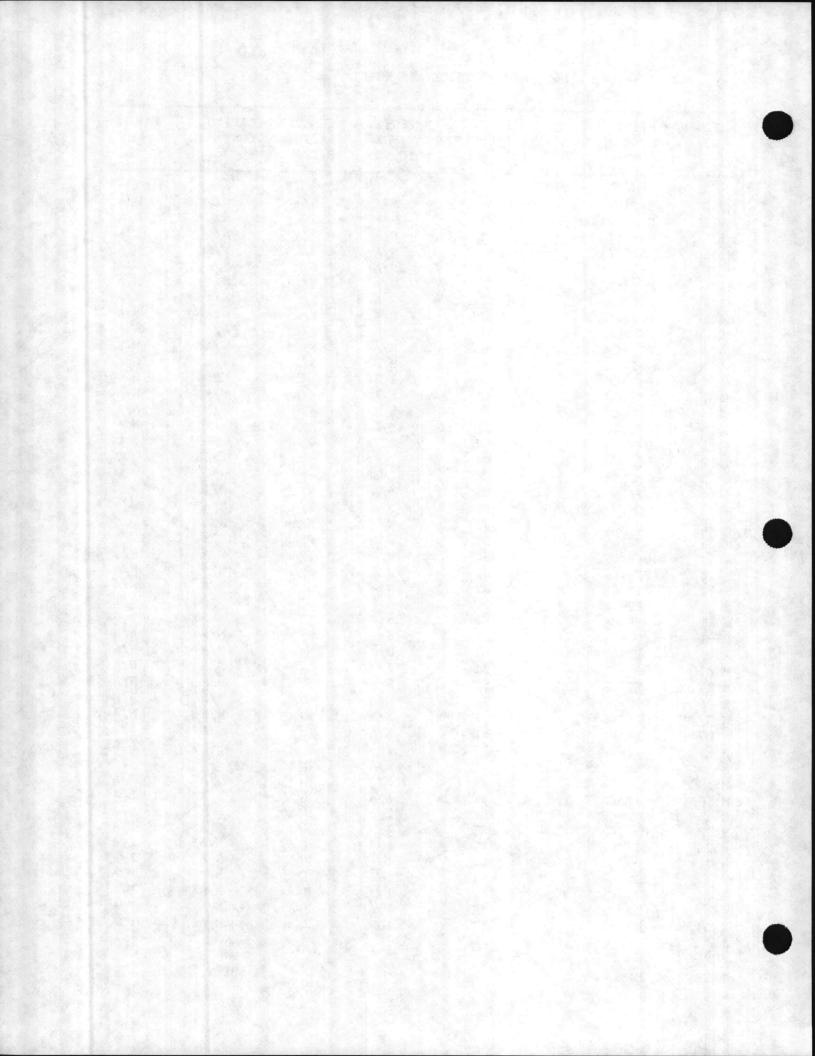


CAMP JOHNSON

BUILDING NO.	STRUCTURE TYPE	HEAT SOURCE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
			NT / A	N /A	N/A	N/A
M318	OFFICE	ST	N/A	N/A	N/A	N/A
M319	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
M321	OFFICE	ST	N/A	N/A	N/A	N/A
M323	OFFICE	ST	N/A	N/A	N/A	N/A
M324	OFFICE	ST	N/A	N/A	N/A N/A	N/A
M326	OFFICE	ST	N/A	N/A	N/A	N/A
M327	OFFICE	ST	N/A	N/A		N/A
M401	OFFICE	ST	N/A	N/A	N/A	N/A
M402	OFFICE	ST	N/A	N/A	N/A	N/A
M403	OFFICE	ST	N/A	N/A	N/A	
M405	OFFICE	ST	N/A	N/A	N/A	N/A
M406	OFFICE	HW	1.163	3	960	0.04
M407	OFFICE	ST	N/A	N/A	N/A	N/A
M408	OFFICE	ST	N/A	N/A	N/A	N/A
M409	OFFICE	ST	N/A	N/A	N/A	N/A
M411	OFFICE	HW	1.163	3	960	0.04
M412	OFFICE	HW	1.163	3	960	0.04
M413	OFFICE	HW	1.110	3	960	0.03
M414	OFFICE	ST	N/A	N/A	N/A	N/A
M415	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
M416	OFFICE	ST	N/A	N/A	N/A	N/A
M418	OFFICE	ST	N/A	N/A	N/A	N/A
M419	OFFICE	ST	N/A	N/A	N/A	N/A
M420	OFFICE	ST	N/A	N/A	N/A	N/A
M422	OFFICE	ST	N/A	N/A	N/A	N/A
M424	OFFICE	HW	4.830	14	960	0.16
M441	OFFICE	HW	18.247	53	960	0.63
M501	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
M502	OFFICE	ST	N/A	N/A	N/A	N/A
M503	OFFICE	ST	N/A	N/A	N/A	N/A
M504	OFFICE	ST	N/A	N/A	N/A	N/A
M506	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
M507	OFFICE	ST	N/A	N/A	N/A	N/A
M509	OFFICE	ST	N/A	N/A	N/A	N/A
M511	OFFICE	HW	1.490	4	960	0.0
M512	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
M513	OFFICE	ST	N/A	N/A	N/A	N/A
M514	OFFICE	ST	N/A	N/A	N/A	N/A
	OFFICE	ST	N/A	N/A	N/A	N/A
M516 M518	OFFICE	ST	N/A	N/A	N/A	N/A
M518 M520	OFFICE	ST	N/A	N/A	N/A	N/A
M520 M521	OFFICE	ST	N/A	N/A	N/A	N/A
	OFFICE	ST	N/A	N/A	N/A	N/A
M522		ST	N/A	N/A	N/A	N/A
M601	OFFICE	ST	N/A	N/A	N/A	N/A
M602	OFFICE OFFICE	ST	N/A	N/A	N/A	N/A

DATE: 06/22/87

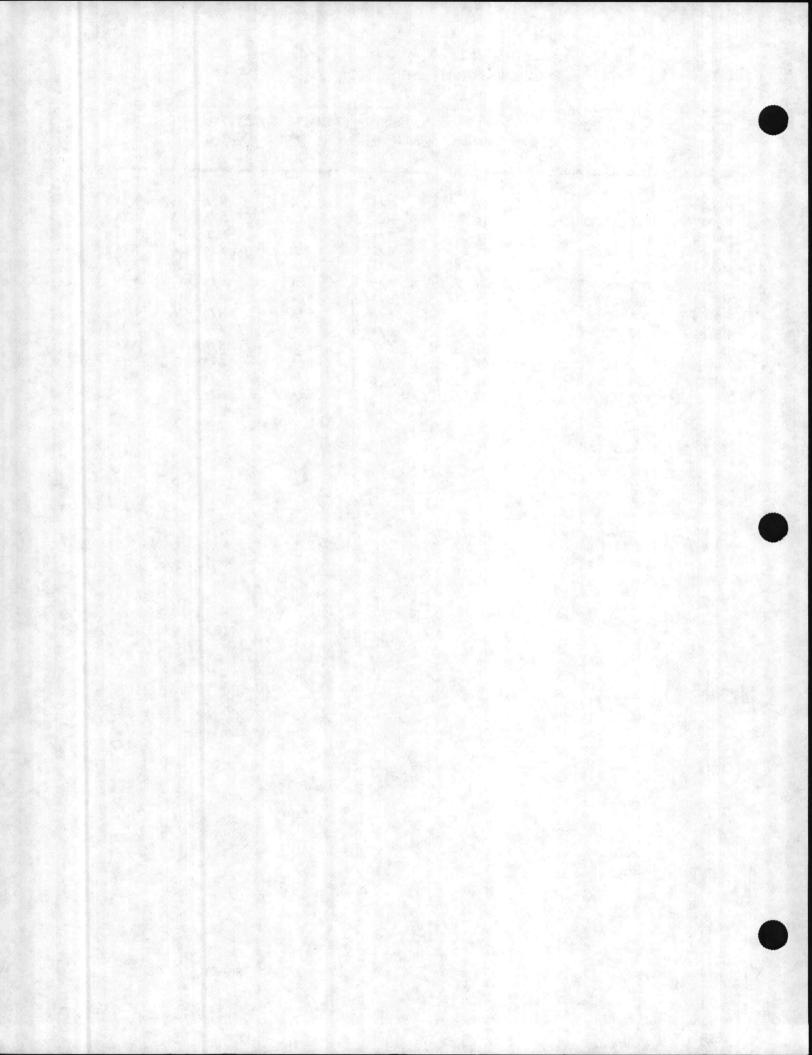
SHEET 2 OF 3



CAMP JOHNSON

HOT WATER OUTSIDE AIR RESET:

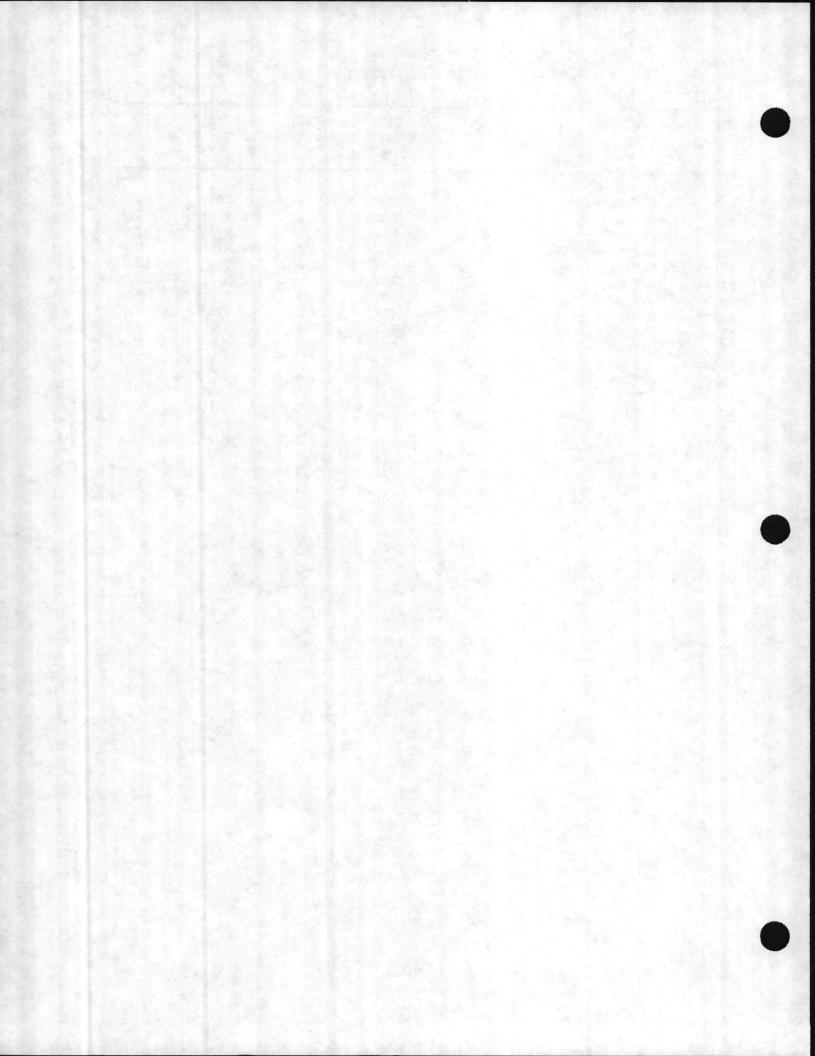
BUILDING NO.	STRUCTURE TYPE	HEAT SOURCE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
M604	OFFICE	ST	N/A	N/A	N/A	N/A
M606	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
M607	OFFICE	ST	N/A	N/A	N/A	N/A
M609	OFFICE	ST	N/A	N/A	N/A	N/A
M611	OFFICE	ST	N/A	N/A	N/A	N/A
M612	OFFICE	ST	N/A	N/A	N/A	N/A
M613	OFFICE	ST	N/A	N/A	N/A	N/A
M614	OFFICE	ST	N/A	N/A	N/A	N/A
M616	OFFICE	ST	N/A	N/A	N/A	N/A
M619	OFFICE	ST	N/A	N/A	N/A	N/A
M620	OFFICE	ST	N/A	N/A	N/A	N//
M621	OFFICE	ST	N/A	N/A	N/A	N//
M622	OFFICE	ST	N/A	N/A	N/A	N//



COURTHOUSE BAY

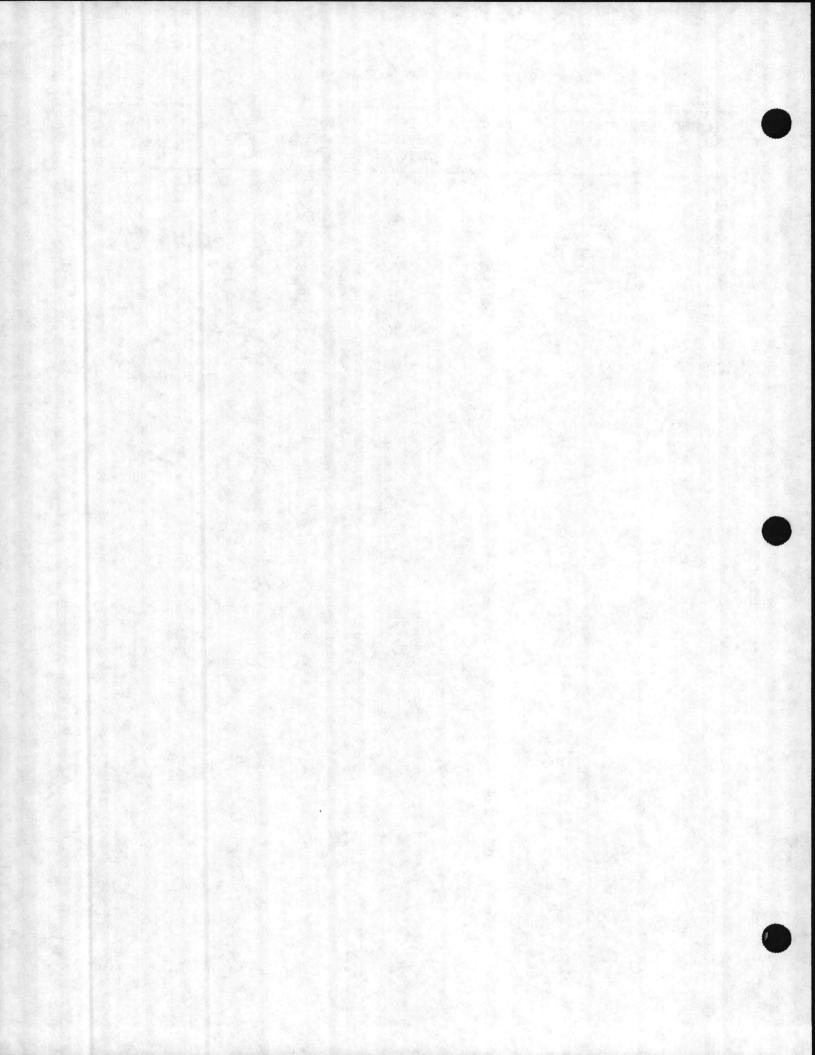
HOT WATER OUTSIDE AIR RESET:

BUILDING NO.	STRUCTURE TYPE	HEAT SOURCE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
			1 / 00	,	0/0	0.0/
BB2	OFFICE	HW	1.408	4	960	0.04
BB5	OFFICE	ST	N/A	N/A	N/A	N/A
BB8	OFFICE	ST	N/A	N/A	N/A	N/A
BB10	OFFICE	ST	N/A	N/A	N/A	N/A
BB11	OFFICE	ST	N/A	N/A	N/A	N/A
BB12	OFFICE	ST	N/A	N/A	N/A	N/A
BB13	OFFICE	ST	N/A	N/A	N/A	N/A
BB14	OFFICE	ST	N/A	N/A	N/A	N/A
BB15	OFFICE	ST	N/A	N/A	N/A	N/A
BB16	OFFICE	ST	N/A	N/A	N/A	N/A
BB27	OFFICE	ST	N/A	N/A	N/A	N/A
BB28	OFFICE	ST	N/A	N/A	N/A	N/A
BB45	OFFICE	HW	2.898	8	960	0.1
BB50	OFFICE	HW	3.030	8	960	0.1
BB51	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
BB52	OFFICE	ST	N/A	N/A	N/A	N/A
BB54	OFFICE	ST	N/A	N/A	N/A	N/A
BB72	OFFICE	ST	N/A	N/A	N/A	N/A
BB269	OFFICE	HW	5.026	14	960	0.1



FRENCH CREEK HOT WATER OUTSIDE AIR RESET:

					and the same same same same same same same sam	
BUILDING NO.	STRUCTURE TYPE	HEAT SOURCE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
FC100	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
FC190	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
FC200	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
FC241	OCC. WAREHOUSE	HW	4.044	9	960	0.09
FC251	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
FC301	OFFICE	ST	N/A	N/A	N/A	N/A
FC302	OFFICE	ST	N/A	N/A	N/A	N/A
FC303	OFFICE	HW	3.831	8	960	0.09
FC312	OFFICE	ST	N/A	N/A	N/A	N/A
FC313	OFFICE	HW	1.011	2	960	0.0
FC364	OFFICE	HW	1.604	3	960	0.0
FC573	OFFICE	HW	4.652	10	960	0.10

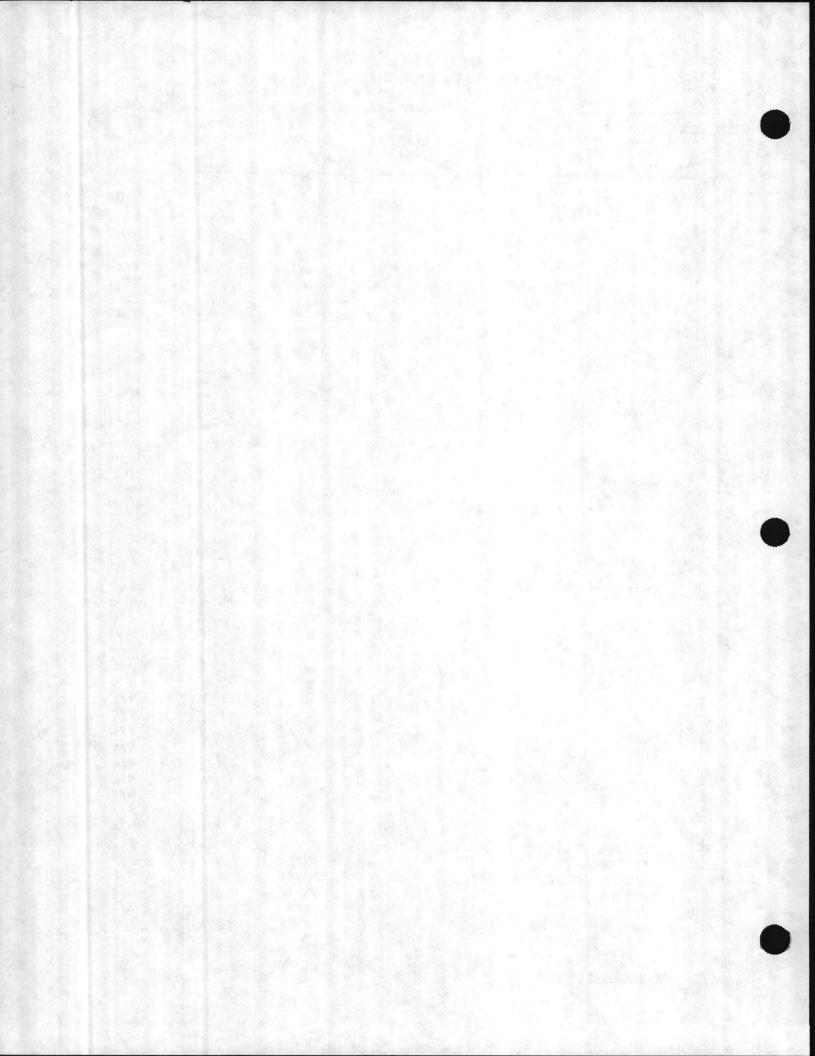


HADNOT POINT HOT WATER OUTSIDE AIR RESET:

BUILDING NO.	STRUCTURE TYPE	HEAT SOURCE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
	OFFICE	ST	N/A	N/A	N/A	N/A
1	OFFICE	ST	N/A	N/A	N/A	N/A
2	OFFICE OFFICE	ST	N/A	N/A	N/A	N/A
4		ST	N/A	N/A	N/A	N/A
6	OFFICE OFFICE	ST	N/A	N/A	N/A	N/A
8	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
11		ST	N/A	N/A	N/A	N/A
13	OFFICE	HW	2.532	5	960	0.05
14	OFFICE	HW	5.271	11	960	0.12
15	OFFICE	ST	N/A	N/A	N/A	N/A
16	OFFICE	ST	N/A	N/A	N/A	N/A
17	OFFICE	ST	N/A	N/A	N/A	N/A
18	OFFICE OFFICE	ST	N/A	N/A	N/A	N/A
25		ST	N/A	N/A	N/A	N/A
27	OFFICE OFFICE	HW	1.302	2	960	0.0
41	OFFICE	ST	N/A	N/A	N/A	N/A
43	OFFICE	HW	1.155	2	960	0.0
50	OFFICE	ST	N/A	N/A	N/A	N/A
54	OFFICE	ST	N/A	N/A	N/A	N/A
58		ST	N/A	N/A	N/A	N/A
59	OFFICE	ST	N/A	N/A	N/A	N/A
63	OFFICE	ST	N/A	N/A	N/A	N/A
65	OFFICE	HW	3.654	8	960	0.0
66	OFFICE	HW	4.599	10	960	0.1
67	OFFICE	ST	N/A	N/A	N/A	N/A
84	OFFICE	ST	N/A	N/A	N/A	N/A
102	OFFICE	ST	N/A	N/A	N/A	N/A
106	OFFICE	ST	N/A	N/A	N/A	N/A
107	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
114	OFFICE	ST	N/A	N/A	N/A	N/A
115	OFFICE	ST	N/A	N/A	N/A	N/A
117	OCC. WAREHOUSE		N/A	N/A	N/A	N/A
119	OFFICE	ST ST		N/A	N/A	N/A
123	OFFICE		N/A	N/A	N/A	N/A
127	OFFICE	ST	N/A	N/A	N/A	N/A
201	OFFICE	ST	N/A	N/A	N/A	N/A
203	OFFICE	ST	N/A	N/A	N/A	N/A
206	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
214	OFFICE	ST	N/A	N/A	N/A	N/A
216	OFFICE	ST ST	N/A N/A	N/A	N/A	N/A
219	OFFICE	HW	0.865	1	960	0.0
221	OFFICE	HW	N/A	N/A	N/A	N/A
223	OFFICE			N/A	N/A	N/A
226	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
233	OFFICE	ST	N/A	N/A	N/A	N/A
300	OFFICE	ST	N/A	N/A	N/A	N/A
302	OFFICE	ST	N/A	N/A	M/A	



SHEET 1 OF 4

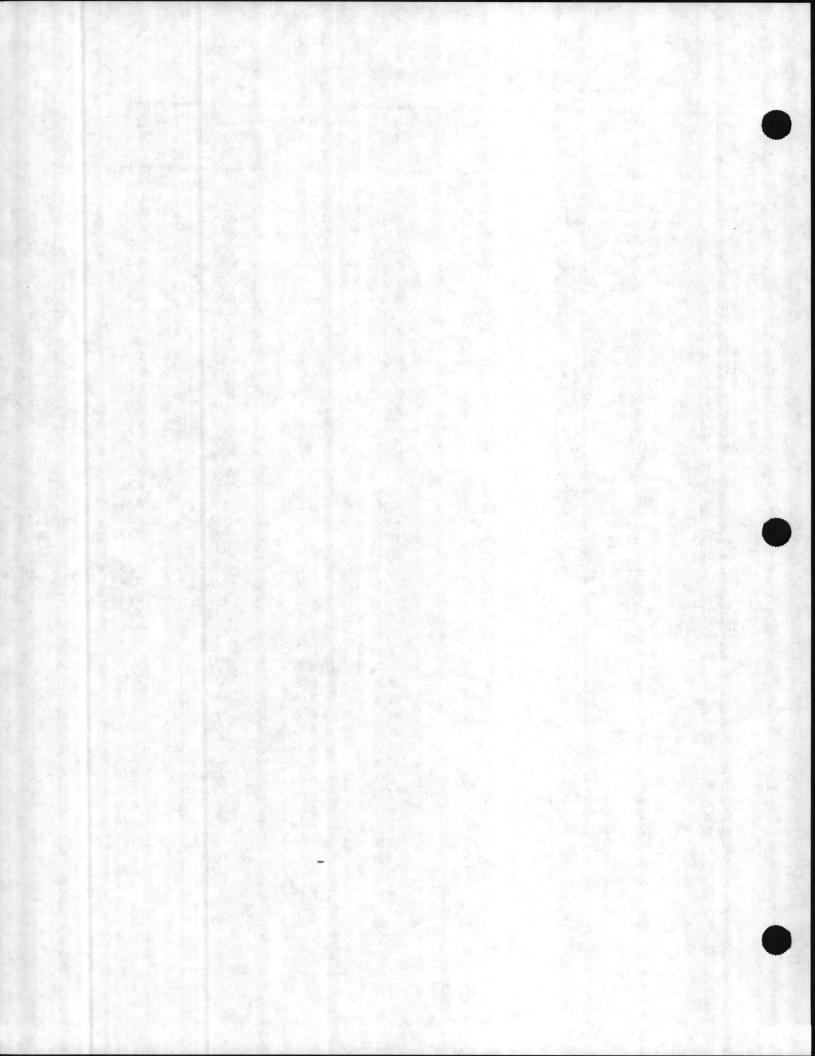


HADNOT POINT HOT WATER OUTSIDE AIR RESET:

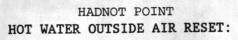
BUILDING NO.	STRUCTURE TYPE	HEAT SOURCE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
a second			N /A	N/A	N/A	N/A
304	OFFICE	ST	N/A N/A	N/A	N/A	N/A
307	OCC. WAREHOUSE	ST ST	N/A	N/A	N/A	N/A
314	OFFICE		N/A	N/A	N/A	N/A
315	OFFICE	ST	N/A	N/A	N/A	N/A
317	OFFICE	ST	N/A	N/A	N/A	N/A
320	OFFICE	ST	N/A	N/A	N/A	N/A
400	OFFICE	ST	N/A	N/A	N/A	N/A
401	OFFICE	ST	N/A	N/A	N/A	N/A
403	OFFICE	ST	N/A	N/A	N/A	N/A
408	OFFICE	ST		N/A	N/A	N/A
412	OFFICE	ST	N/A	N/A	N/A	N/A
416	OFFICE	ST	N/A		N/A	N/A
417	OFFICE	ST	N/A	N/A	N/A	N/A
419	OFFICE	ST	N/A	N/A	N/A	N/A
420	OFFICE	ST	N/A	N/A	N/A	N/A
422	OFFICE	ST	N/A	N/A	N/A	N/A
423	OFFICE	ST	N/A	N/A		N/A
424	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
500	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
501	OFFICE	ST	N/A	N/A	N/A	N/A
502	OFFICE	ST	N/A	N/A	N/A 960	0.0
508	OFFICE	HW	3.620	8		N/A
509	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
516	OFFICE	ST	N/A	N/A	N/A	
518	OFFICE	ST	N/A	N/A	N/A	N/A
520	OFFICE	ST	N/A	N/A	N/A	N/A
526	OFFICE	ST	N/A	N/A	N/A	N/A
751	OFFICE	ST	N/A	N/A	N/A	N/A
898	OFFICE	HW	3.401	7	960	0.0
900	OFFICE	ST	N/A	N/A	N/A	N/A
901	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N//
902	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/4
904	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/4
905	OFFICE	ST	N/A	N/A	N/A	N//
907	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/.
908	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/.
909	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/.
910	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/.
914	OFFICE	ST	N/A	N/A	N/A	N/.
915	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/.
916	OCC. WAREHOUSE	HW	20.683	46	960	0.
1002	OFFICE	ST	N/A	N/A	N/A	N/
1004	UNOCC. WAREHOUSE	ST	N/A	N/A	N/A	N/
1005	OFFICE	HW	4.746	10	960	0.
1006	OFFICE	HW	1.276	2	960	0.
1011	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/

DATE: 06/23/87

SHEET 2 OF 4



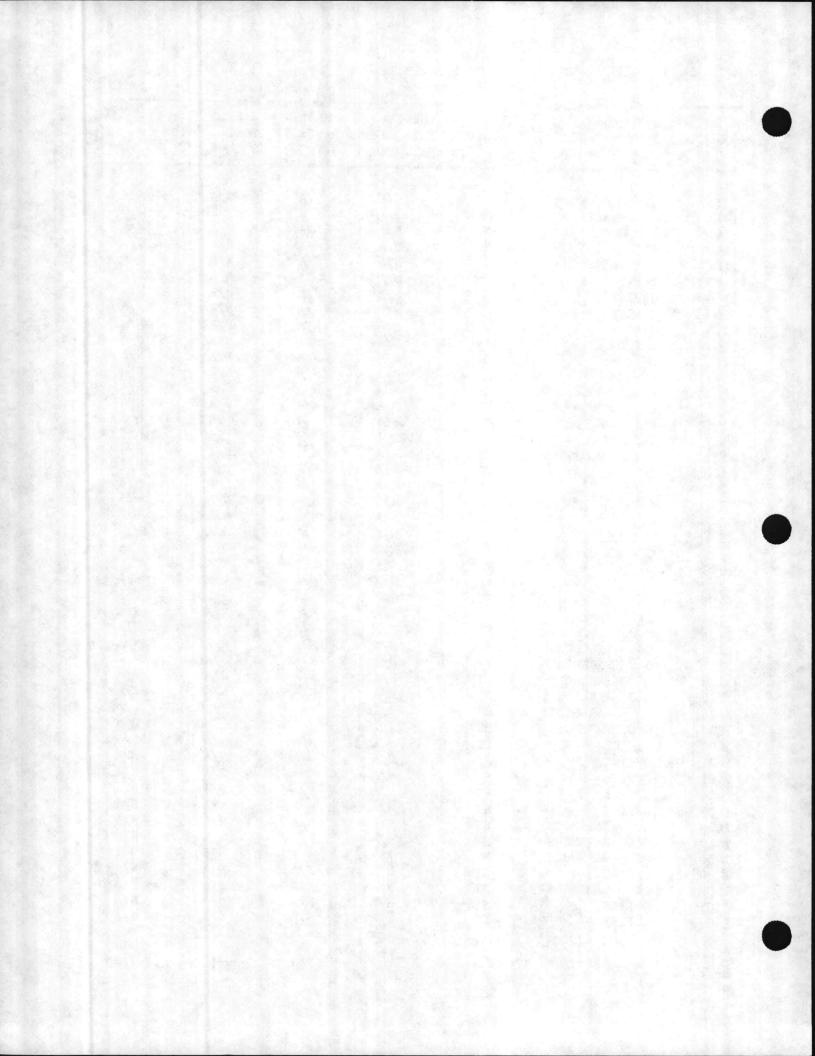
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BUILDING NO.	STRUCTURE TYPE	HEAT SOURCE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
201					N7./4	NT /A
1012	OCC. WAREHOUSE	ST	N/A	N/A	N/A 960	N/A 0.08
1015	OCC. WAREHOUSE	HW	3.737	8		N/A
1041	OFFICE	ST	N/A	N/A	N/A	N/A
1100	OFFICE	ST	N/A	N/A	N/A	N/A
1101	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
1103	OFFICE	ST	N/A	N/A	N/A	N/A
1104	OFFICE	ST	N/A	N/A	N/A	
1105	OFFICE	ST	N/A	N/A	N/A	N/A
1106	OFFICE	ST	N/A	N/A	N/A	N/A
1107	OFFICE	ST	N/A	N/A	N/A	N/A
1108	OFFICE	ST	N/A	N/A	N/A	N/A
1111	OFFICE	ST	N/A	N/A	N/A	N/A
1114	UNOCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
1115	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
1116	OCC. WAREHOUSE	HW	24.390	54	960	0.5
1117	OCC. WAREHOUSE	HW	22.166	49	960	0.5
1118	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
1120	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
1200	OFFICE	ST	N/A	N/A	N/A	N/A
1201	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
1202	OFFICE	ST	N/A	N/A	N/A	N/A
1207	OFFICE	ST	N/A	N/A	N/A	N/A
1208	OFFICE	ST	N/A	N/A	N/A	N/A
1209	OFFICE	HW	3.497	7	960	0.0
1211	OFFICE	ST	N/A	N/A	N/A	N/A
1212	OCC. WAREHOUSE	HW	24.390	54	960	0.5
1220	OFFICE	ST	N/A	N/A	N/A	N/A
1301	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
1302	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
1304	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
1309	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
1310	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
1316	OCC. WAREHOUSE	HW	22.166	49	960	0.5
1317	OCC. WAREHOUSE	HW	22.166	49	960	0.5
1400	OFFICE	ST	N/A	N/A	N/A	N/A
1400	OFFICE	ST	N/A	N/A	N/A	N/A
1401	OFFICE	ST	N/A	N/A	N/A	N/A
1403	OFFICE	ST	N/A	N/A	N/A	N//
	OFFICE	ST	N/A	N/A	N/A	N//
1407 1409	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N//
	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N//
1410	OCC. WAREHOUSE	HW	7.772	17	960	0.1
1450		ST	N/A	N/A	N/A	N//
1500	OFFICE	SI	N/A	N/A	N/A	N//
1502	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
1601	OFFICE	SI	N/A	N/A	N/A	N/#
1606	OFFICE	51	М/А	n/n		

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SHEET 3 OF 4

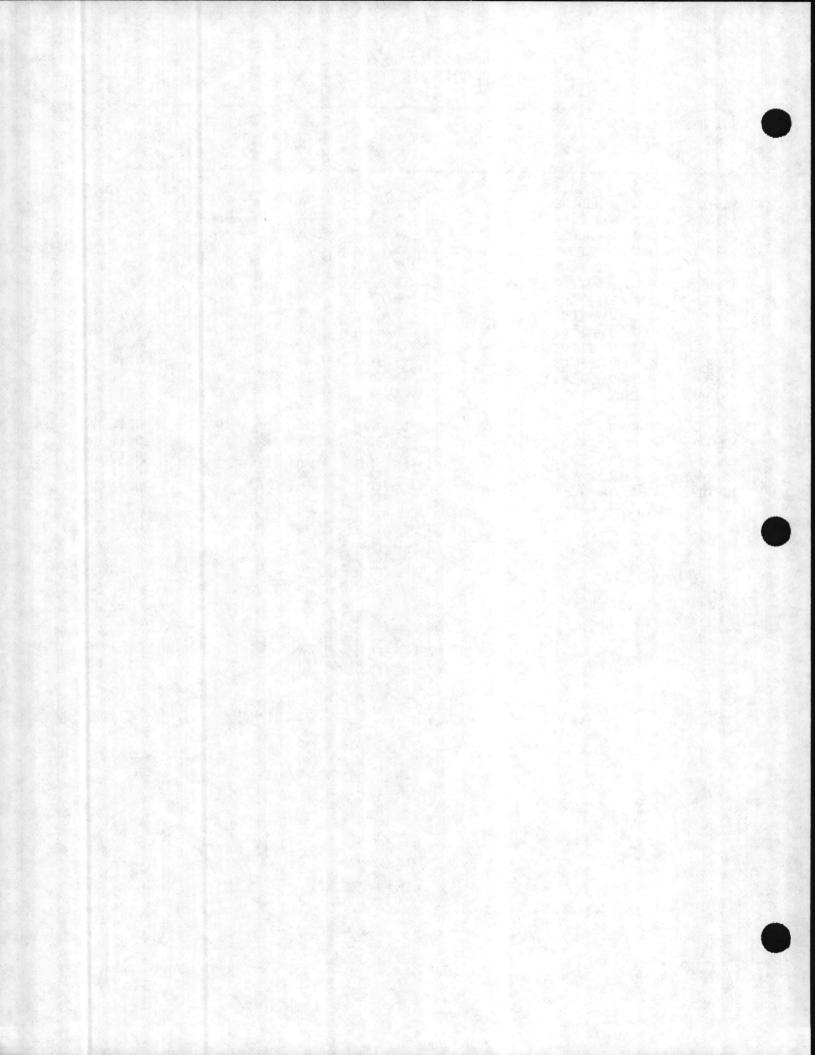


HADNOT POINT HOT WATER OUTSIDE AIR RESET:

BUILDING NO.	STRUCTURE TYPE	HEAT SOURCE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
				NT / 1	N7 / A	N7./A
1607	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
1610	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
1611	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
1612	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
1613	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
1706	UNOCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
1707	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
1750	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
1755	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
1771	OCC. WAREHOUSE	HW	6.803	15	960	0.1
1775	OCC. WAREHOUSE	HW	21.380	47	960	0.5
1780	OCC. WAREHOUSE	HW	7.987	17	960	0.1
HP255	OFFICE	HW	5.026	11	960	0.1
HP265	OFFICE	HW	5.026	11	960	0.1
HP275	OFFICE	HW	5.026	11	960	0.1
HP285	OFFICE	HW	5.026	11	960	0.1
HP295	OFFICE	HW	5.026	11	960	0.1
HP405	OFFICE	HW	5.026	11	960	0.1
HP1016	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A

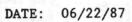


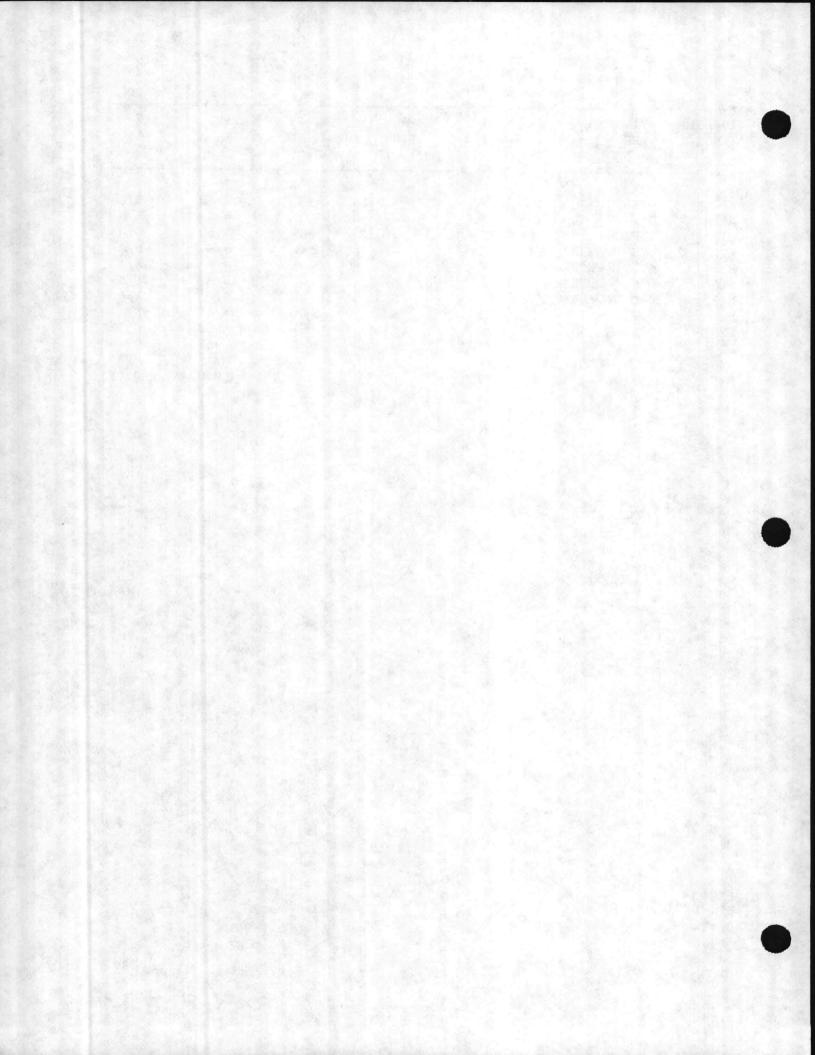
DATE: 06/23/87



HOSPITAL POINT HOT WATER OUTSIDE AIR RESET:

BUILDING NO.	STRUCTURE TYPE	HEAT SOURCE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
H14	OFFICE	HW	4,264	9	960	0.10
H15A	OFFICE	ST	N/A	N/A	N/A	N/A
H16	OFFICE	HW	1.332	2	960	0.03
H17	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
H17N	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
H18	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
H19	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
H21	OFFICE	ST	N/A	N/A	N/A	N/A
H23	OFFICE	HW	6.055	13	960	0.14
H24	OFFICE	HW	6.055	13	960	0.14
H36	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/A
Н39	OFFICE	HW	0.434	0	960	0.01



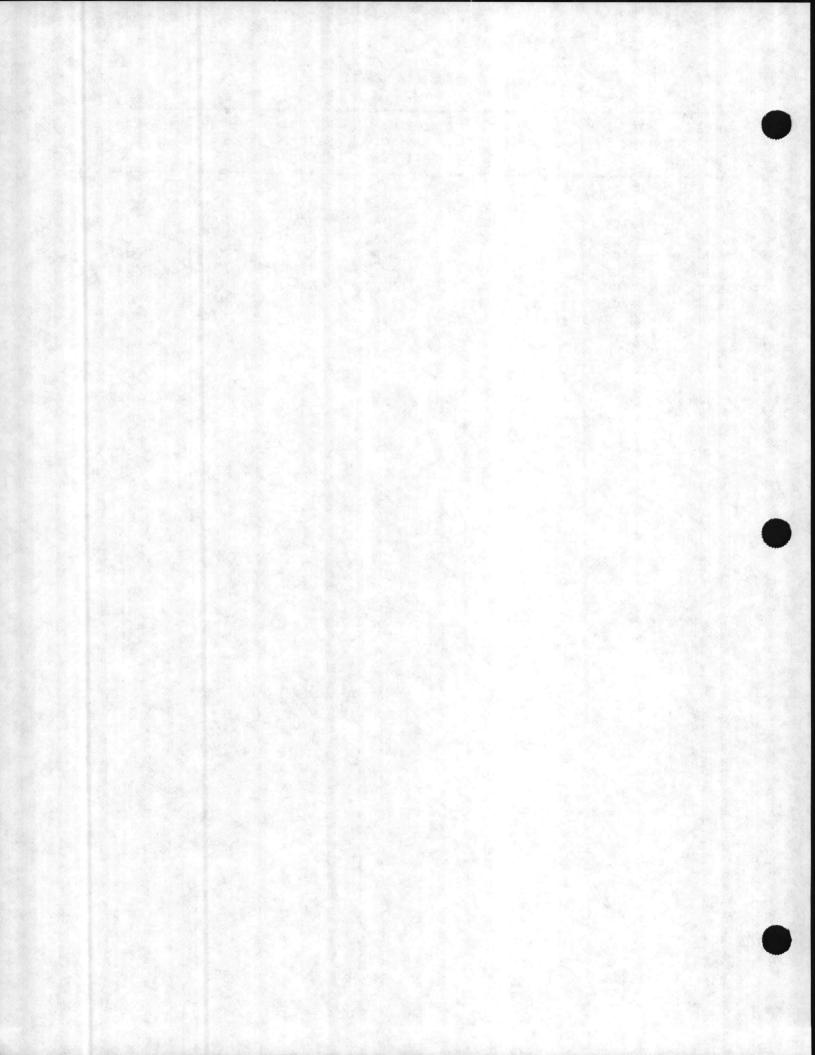


PARADISE POINT

BUILDING NO.	STRUCTURE TYPE	HEAT SOURCE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
2600	OFFICE	ST	N/A	N/A	N/A	N/#
2603	OFFICE	ST	N/A	N/A	N/A	N/A
2624	OFFICE	ST	N/A	N/A	N/A	N//
2625	OFFICE	ST	N/A	N/A	N/A	N//
2626	OFFICE	ST	N/A	N/A	N/A	N//
2627	OFFICE	ST	N/A	N/A	N/A	N//
2628	OFFICE	ST	N/A	N/A	N/A	N/
2629	OCC. WAREHOUSE	ST	N/A	N/A	N/A	N/

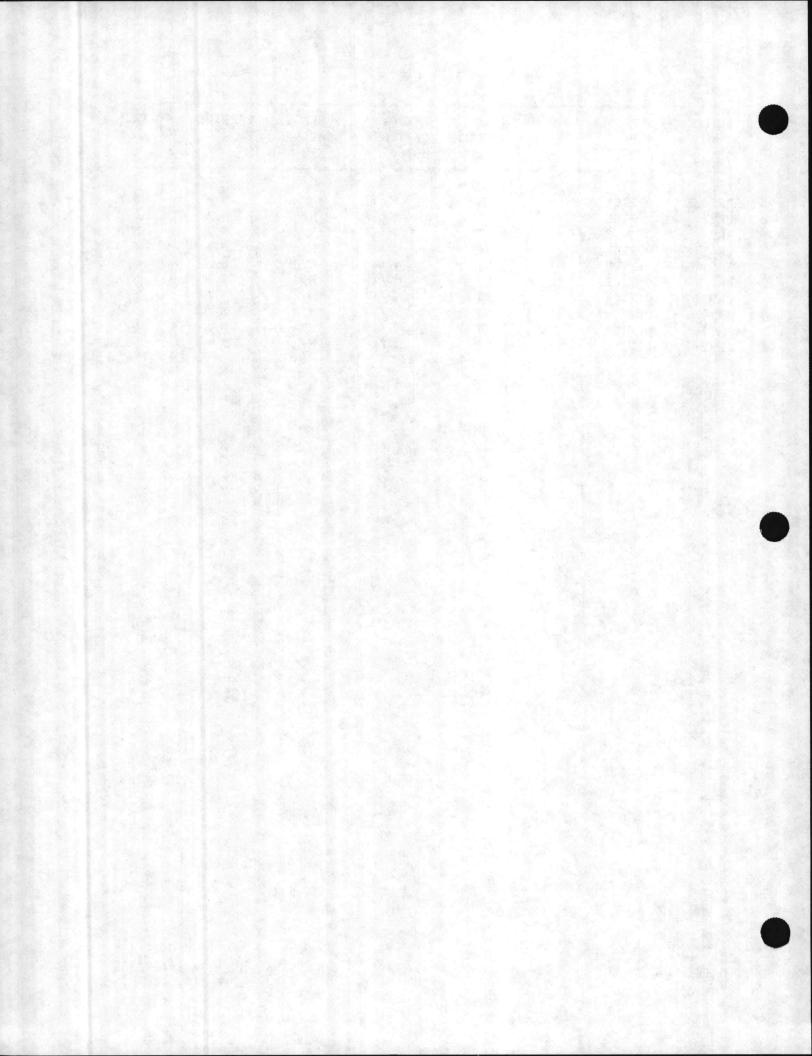
HOT WATER OUTSIDE AIR RESET:





RIFLE RANGE HOT WATER OUTSIDE AIR RESET:

BUILDING NO.	STRUCTURE TYPE	HEAT SOURCE	ENERGY SAVINGS MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
RR1	OFFICE	ST	N/A	N/A	N/A	N/#
RR2	OFFICE	ST	N/A	N/A	N/A	N//
RR3	OFFICE	ST	N/A	N/A	N/A	N//
RR4	OFFICE	ST	N/A	N/A	N/A	N/.
RR5	OFFICE	ST	N/A	N/A	N/A	N/.
RR8	OFFICE	ST	N/A	N/A	N/A	N/.
RR9	OFFICE	ST	N/A	N/A	N/A	N/.
RR10	OFFICE	ST	N/A	N/A	N/A	N/
RR11	OFFICE	ST	N/A	N/A	N/A	N/
RR12	OFFICE	ST	N/A	N/A	N/A	N/

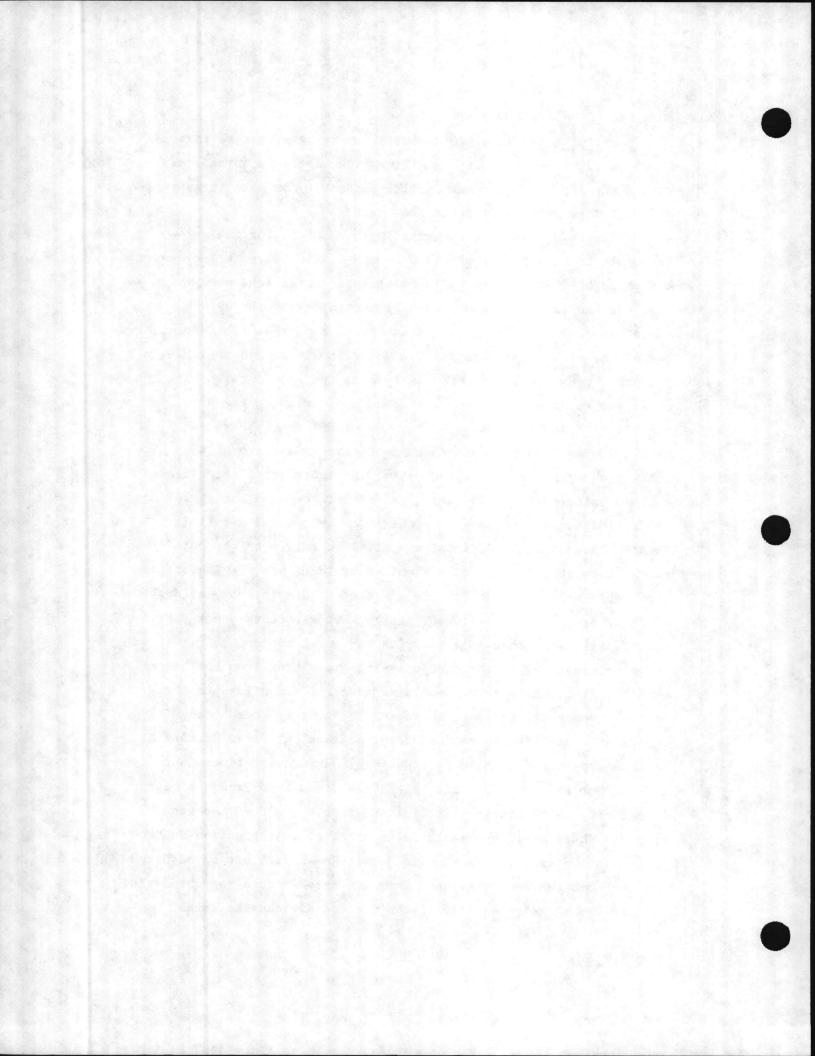


4.7 COMBINED CONTROL ECO

<u>Introduction</u> - This ECO discusses energy and cost savings which would be realized by installing night setback, outside air limit shutoff, and hot water outside air reset controls in many of the buildings at this installation.

Existing Condition - The existing conditions for these controls to be a viable opportunity are as discussed in Sections 4.4 through 4.6. The cost of combining the three control systems does not exceed the cost of a single control system by a large amount due to the duplication of equipment required. Therefore, if one of the three opportunities was not economically justifiable, but the other two were, this opportunity could be incorporated with the other two for a minimal or no extra cost, increasing the SIR.

Calculation Methodology - The individual energy savings methodologies have been presented in Sections 4.4 through 4.6. To analyze the three as one opportunity, the interactive effects have to be considered to avoid taking credit for the same energy savings twice. Night Setback does not interact with Outside Air Limit Shutoff because Night Setback is applicable only when the outside temperature is below 65 deg. F while Outside Air Limit Shutoff is applicable only when the outside air temperature is above 65 deg. F. Therefore, no duplication of energy savings occurs. Hot Water Outside Air Reset does interact with the other two control opportunities. Since the energy savings resulting from Hot Water Outside Air Reset is based upon a reduced radiation loss to the occupied space, it would be increased by Night Setback because of the lower unoccupied space temperatures. But Hot Water Outside Air Reset energy savings would be reduced by Outside Air limit Shutoff because Hot Water Outside Air Reset takes credit for reduced heat loss during which Outside Air Limit Shutoff shuts down the stem supply. Therefore, the result is an offsetting interaction so the energy savings for Hot Water Outside Air Reset will not be adjusted and the combined energy savings from the three control opportunities will be the additive savings of the three individual measures.



Calculation Example

Given: 1. Hot Water Outside Air Reset energy savings = 1.0 MBtu/yr

- 2. Night Setback energy savings = 10.0 MBtu/yr
- 3. Outside Air Limit Shutoff energy savings

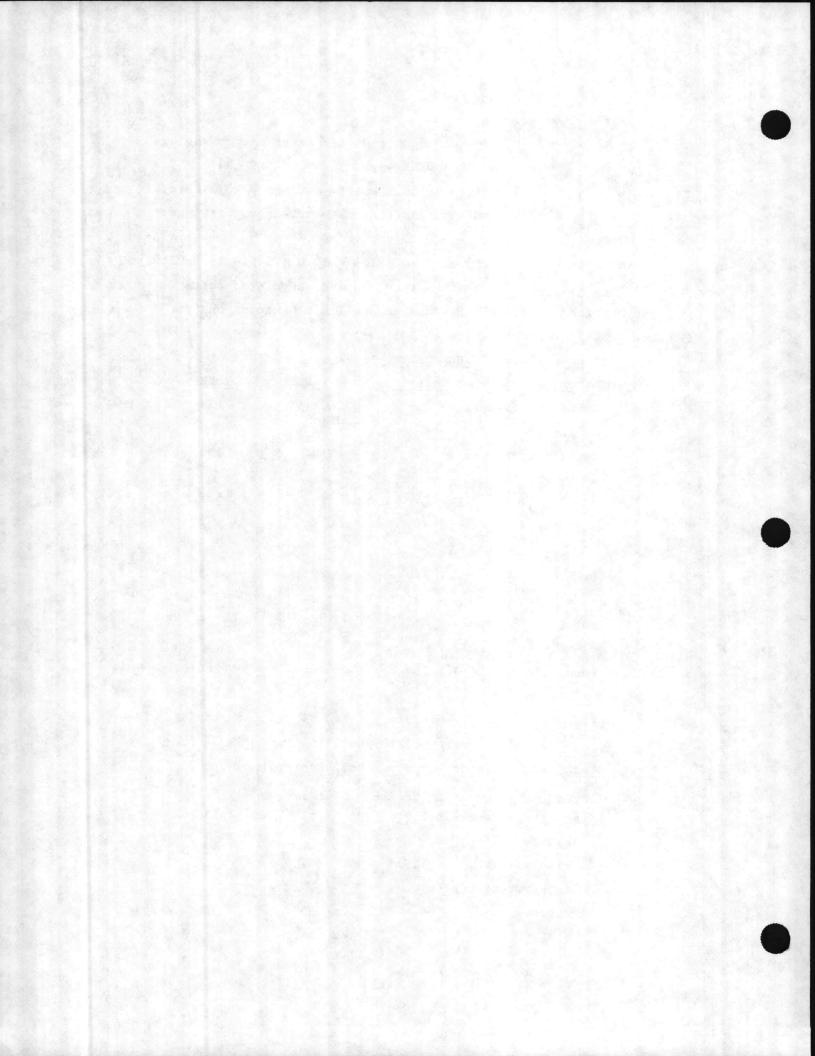
= 3.0 MBtu/yr

Total Combined Energy Savings = 1.0 + 10.0 + 3.0 = 14.0 MBtu/yr <u>Cost Estimate</u> - The items required and associated costs to accomplish Night Setback, Outside Air Limit Shutoff, and Hot Water Outside Air Reset are as follows:

Hot Water Heat (Steam/HW converter)

Item	Materials	Labor	Total
Space temperature	119	17	136
sensor			
Water temperature	105	24	129
sensor			
Thermowell	31	133	164
Outside air	119	17	136
temperature sen	isor		
Time clock	470	35	505
(digital)			
Motorized steam	414	92	506
valve			
Pneumatic valve	204	44	248
controller			
EP Transducer	239	44	283
Total co	ost = \$2107/b	uilding	
Steam Heat (AHU, radiator	r, or steam u	nit heater)	
Item	Materials	Labor	Total
Space temperature	119	17	136
sensor			
Outside air	119	17	136

505



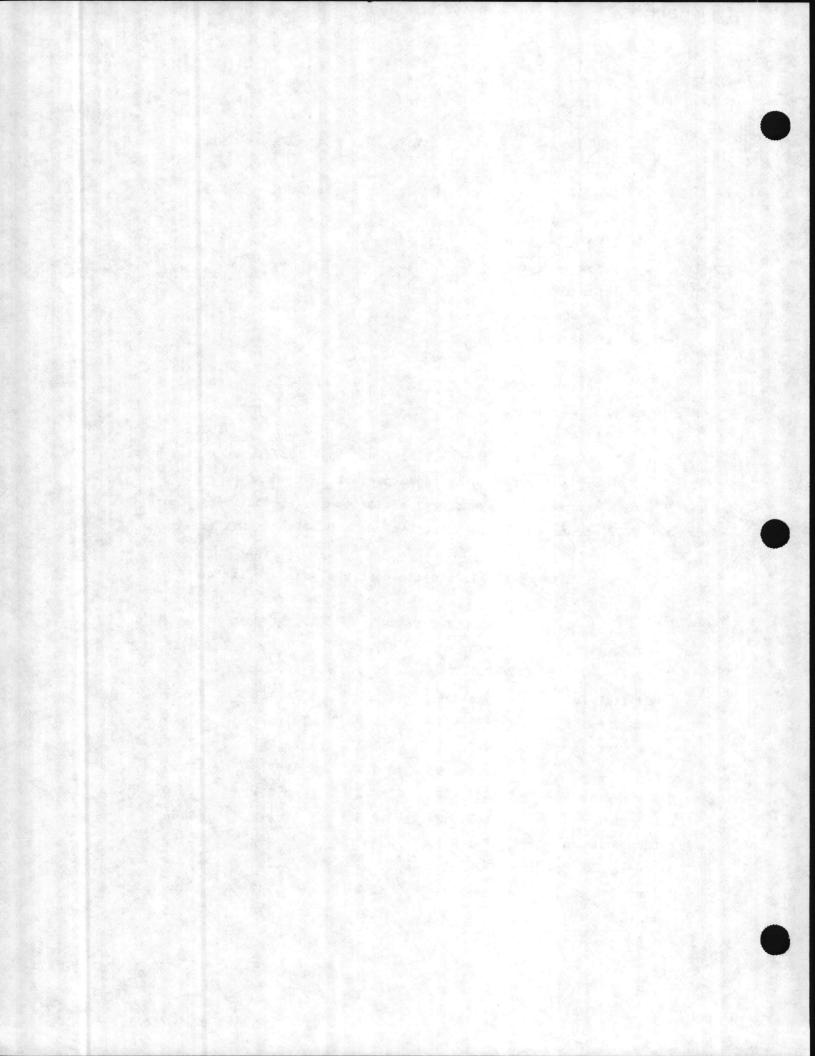
(digital)			
Motorized steam	414	92	506
valve			
Pneumatic valve	204	44	248
controller			
EP transducer	239	44	283
For each AHU:			
Control relay-	25	44	69
start/stop			
Pneumatic damper	133	30	163
actuator			
Control relay-	25	44	69
damper			
EP valve	72	30	102

Total Cost = \$1814/building+ 403/air handling unit <u>Summary</u> - The following pages present individual building energy savings and cost estimates for all buildings, and the ECIP sheet for all Combined Control ECOs with an SIR greater

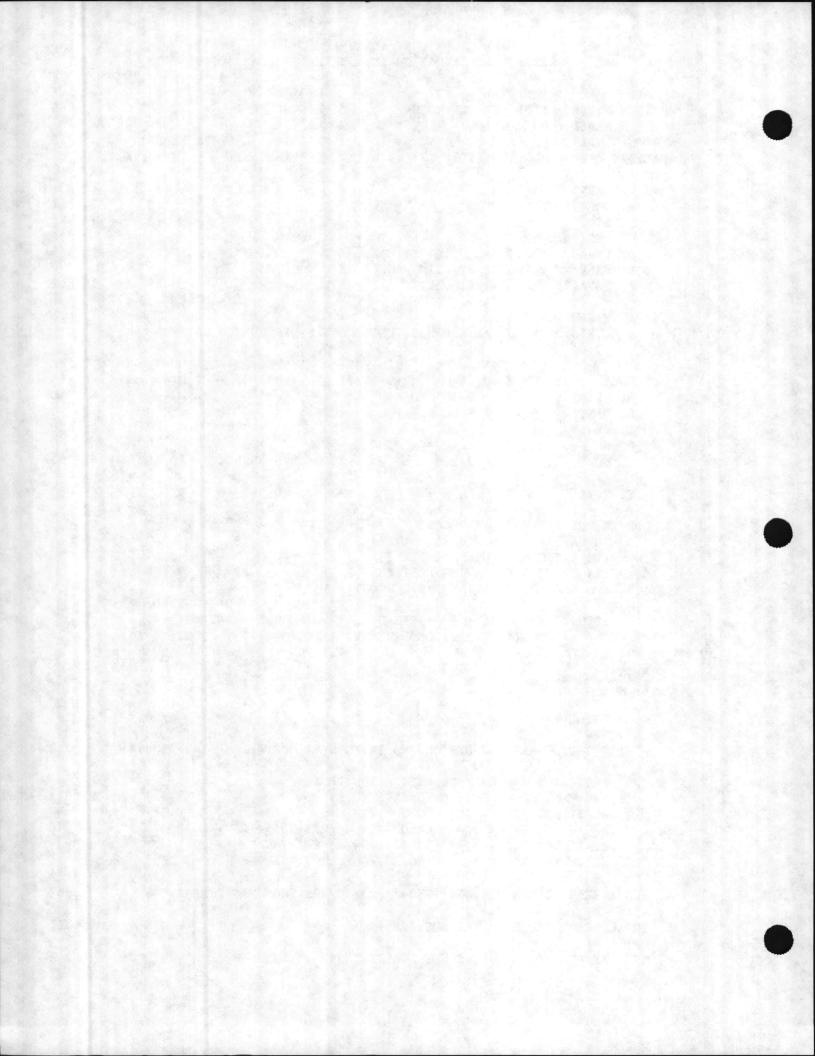
than 1.0.

The results of the life-cycle cost analysis are listed below:

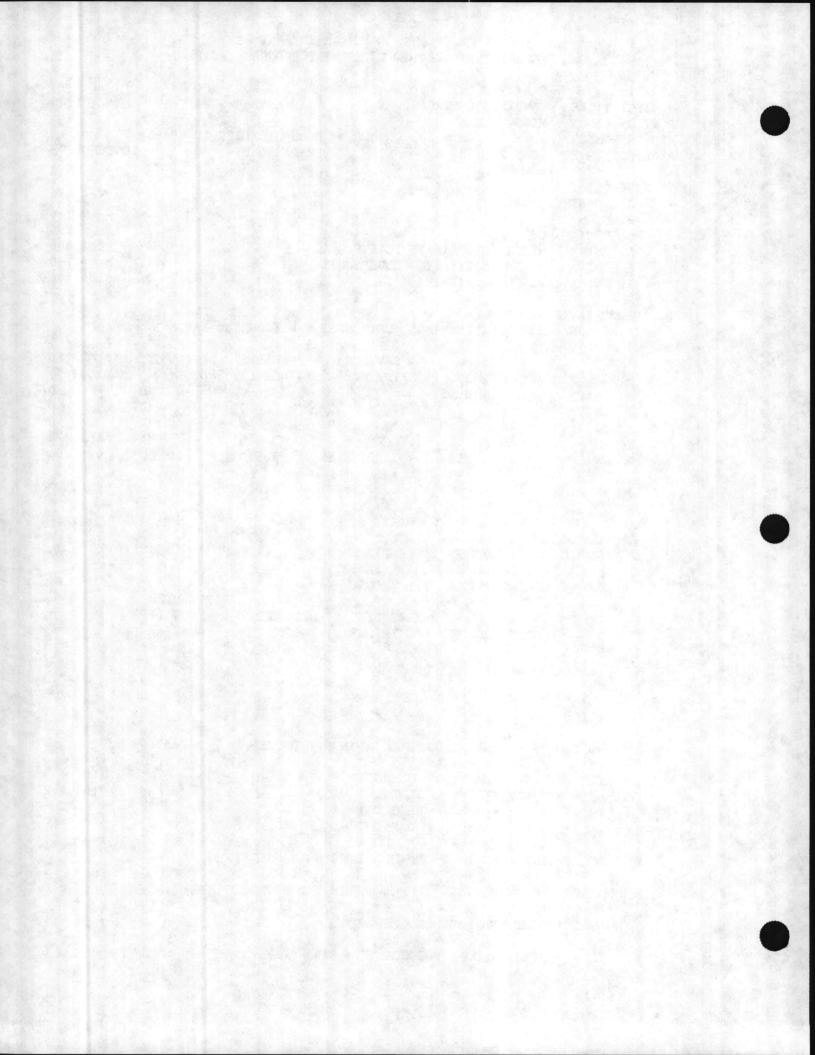
	ENERGY SA	VINGS	CAPITAL COST	
INSTALLATION	MBTU/YR	\$/YR	\$	SIR
Hospital Point	2,938.196	6,552	14,511	4.58
Hadnot Point	21,887.406	48,809	162,590	3.05
Air Station	2,447.371	7,122	26,989	2.68
Rifle Range	881.979	2,567	12,113	2.15
Beach Area	627.487	1,826	8,831	2.10
French Creek	1,467.057	3,272	17,112	1.94
Camp Johnson	1,191.241	3,467	21,949	1.60
Courthouse Bay	470.566	1,369	9,363	1.48
Camp Geiger	189.864	553	4,434	1.26
Paradise Point	71.189	207	1,814	1.16



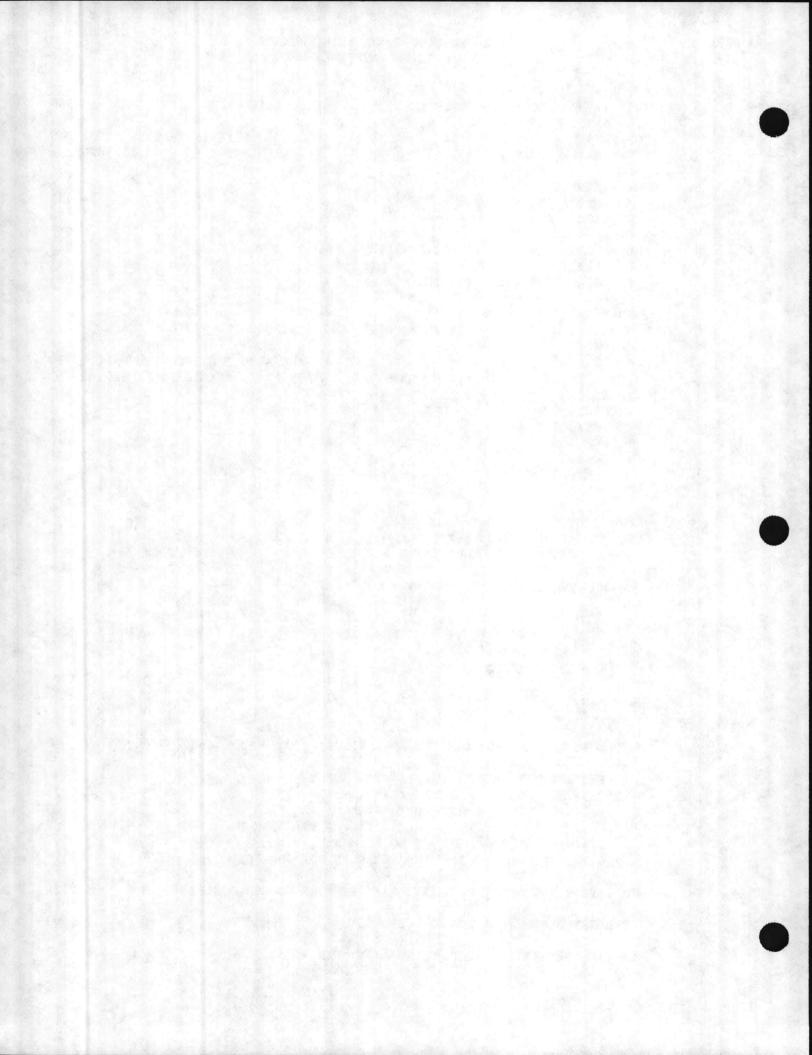
LOC	ATION: JECT TITI	HOSPITAL POIN LE: COMBINED CONT	T ROLS	PROJECT NO. FISCAL YEAR:		1988
POR	TION NAME	E: MISC. BLDGS				
REG	ION NUMBE	ER: 4 TE: JUNE 23 1987		ECONOMIC LIF	'E IN YEARS:	15
ANA	LYSIS DAT	TE: JUNE 23 1987		PREPARED BY:		LO SUNDE
1.		T COST				
		STRUCTION COST			\$	14,511
	B. SIO					798
		IGN COST				871
		RGY CREDIT CALC (1				14,562
		AGE VALUE OF EXIS				0
	F. TOTA	AL INVESTMENT (1D-	1E)		\$	14,562
2.		AVINGS (+) / (-) IS DATE ANNUAL SAV	INGS, UNIT COS	r \$ DISCOUNTE	D SAVINGS	
		COST	SAVINGS	ANNUAL S	DISCOUNT	DISCOUNTED
	FUEL	COST \$/MBTU(1)	MBTU/YR(2)	SAVINGS (3)	FACTOR(4)	SAVINGS(5)
	A. ELE	8.15	0	Ó	0	0
	B. DIST	с С) 0	0	0	0
	C. RES			0	0	0
	D. NG	C) 0	0	0	0
	E. COAL		2,938	6,552	10.18	66,701
	F. TOTA	AL \$	2,938	6,552		66,701
-	NON ENER					
з.		GY SAVINGS (+) / C		•	0	
		JAL RECURRING (+/-		\$	7.61	
		DISCOUNT FACTOR (DISCOUNTED SAVING		\$	7.01	
		RECURRING SAVINGS			0	
	D. NON	RECORKING SAVING	5 (+) / 0051 (-		DISCOUNTED	
	TTE	M SAVING \$ (+)	VEAD OF			
	IIE		OCCURRENCE(2)			4)
	а.	(0 0	1	0	
	b.	() 0	1	0	
	с.	() 0	1	0	
	d. TOT	AL ()		0	
	C. TOT	AL NON ENERGY DISC	COUNTED SAVINGS	(+),COST(-)	(3A2+3Bd4)	0
	D. PRO	JECT NON ENERGY QU	JALIFICATION TE	ST		
	(1) 25	* MAX NON ENERGY (IF 3D1 IS = > 3C	CALC (2F5 X .33		\$	22,011
		IF 3D1 IS $< 3C$		2F5+3D1)/1F		0
	с.	IF 3D1b IS $= > 1$	GO TO ITEM 4			
		IF 3D1b IS < 1		NOT QUALIFY		
4.	FIRST YE	AR DOLLAR SAVINGS	[2F3+3A+(3B1d/	YRS ECONOMIC	LIFE)] \$	6,552
5.	TOTAL NE	T DISCOUNTED SAVIN	NGS (2F5+3C)		\$	66,701



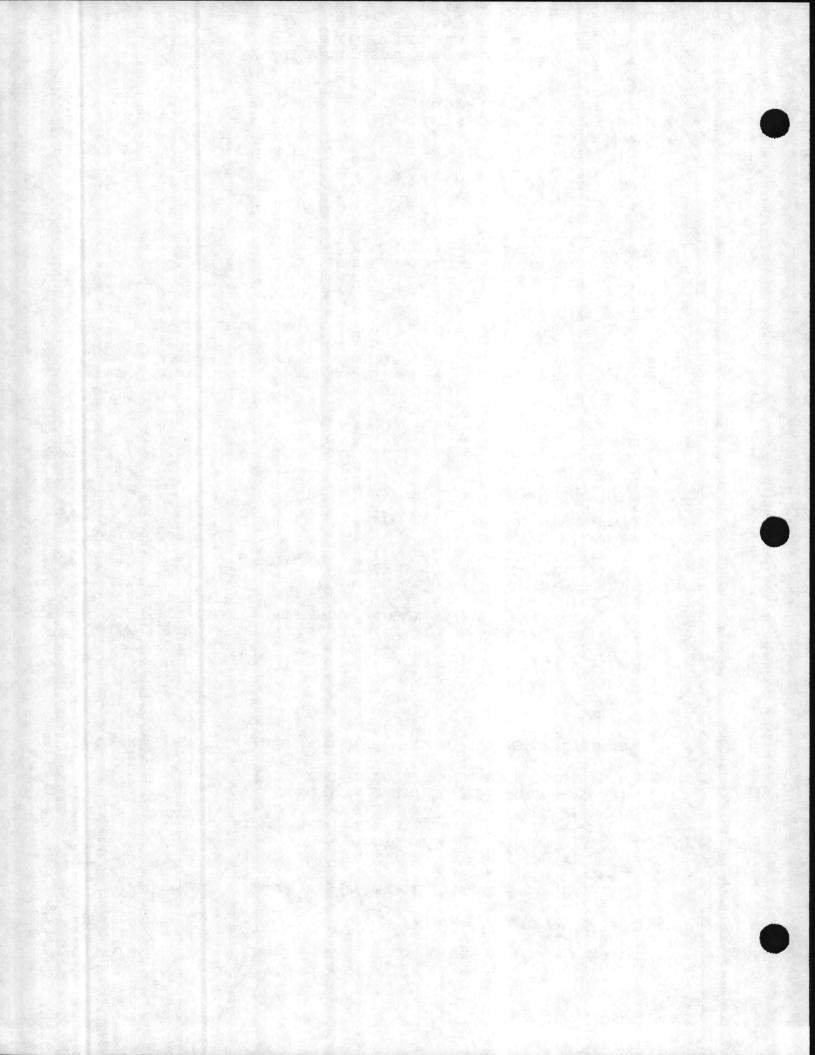
LOCATION:	HADNOT POINT		PROJECT NO.		
	COMBINED CONTRO	OLS	FISCAL YEAR	:	1988
PORTION NAME:					
REGION NUMBER:				FE IN YEARS:	
ANALYSIS DATE:	JUNE 23 1987		PREPARED BY		LO SUNDE
1. INVESTMENT (\$	165,925
	JCTION COST			Υ	9,126
B. SIOH	0007				9,956
C. DESIGN		10.10.8 0			166,506
D. ENERGY	CREDIT CALC (1A-	FIB+IC)X.9			100,500
	E VALUE OF EXIST			\$	
F. TOTAL	INVESTMENT (1D-11	£)		Ş	100,500
2. ENERGY SAVIN	NCS(+)/(-)				
ANALYSIS I	DATE ANNUAL SAVI	NGS, UNIT COST	C \$ DISCOUNT	ED SAVINGS	
	COST	SAVINGS	ANNITAT S	DISCOUNT	DISCOUNTED
FILT	\$/MBTU(1)	MRTII/VP(2)	SAVINGS (3)	FACTOR(4)	SAVINGS(5)
	\$/MBI0(1) 8.15			0	
A. ELEC	0.15	0	0		0
B. DIST		0			0
C. RESID	-		0		
D. NG	0 2.23			10.18	
E. COAL	2.23	21,000	40,010	10.10	
F. TOTAL	\$	21,888	48,810		496,884
(2) DI	SCOUNT FACTOR (T SCOUNTED SAVING/ CURRING SAVINGS SAVING \$ (+)	COST (3AX3A1) (+) / COST (- YEAR OF) DISCOUNT	DISCOUNTED SAVINGS (+)	
	COST \$ (-)(1)	OCCURRENCE(2)	FACTOR (3)	COST(-)	(4)
а.	0	0	1	0	
b.	0	0		0	
c.	0	0	1	0	
d. TOTAL	0			0	
C. TOTAL	NON ENERGY DISCO	UNTED SAVINGS	(+),COST(-)	(3A2+3Bd4)) (
D	T NON ENERGY OUR	TTETCATION TE	יכיד		
(1) 25% M	CT NON ENERGY QUA	LC (2F5 X .33		\$	163,973
	3D1 IS = > 3C		2512011/15		
	3D1 IS < 3C		2134301)/11		Sector and
c. IF	3D1b IS = > 1 3D1b IS < 1	GO TO TIEM 4	NOT OUALTEY		
d. 1F	3DID 15 < 1	PROJECT DOES	NOI QUALIFI		
4. FIRST YEAR	DOLLAR SAVINGS	[2F3+3A+(3B1d/	YRS ECONOMI	C LIFE)] \$	48,81
5. TOTAL NET I	DISCOUNTED SAVING	GS (2F5+3C)		\$	496,884
6. SIR (IF < 1	1 PROJECT DOES NO	OT QUALIFY) SI	IR = (5/1F)	-	3.(



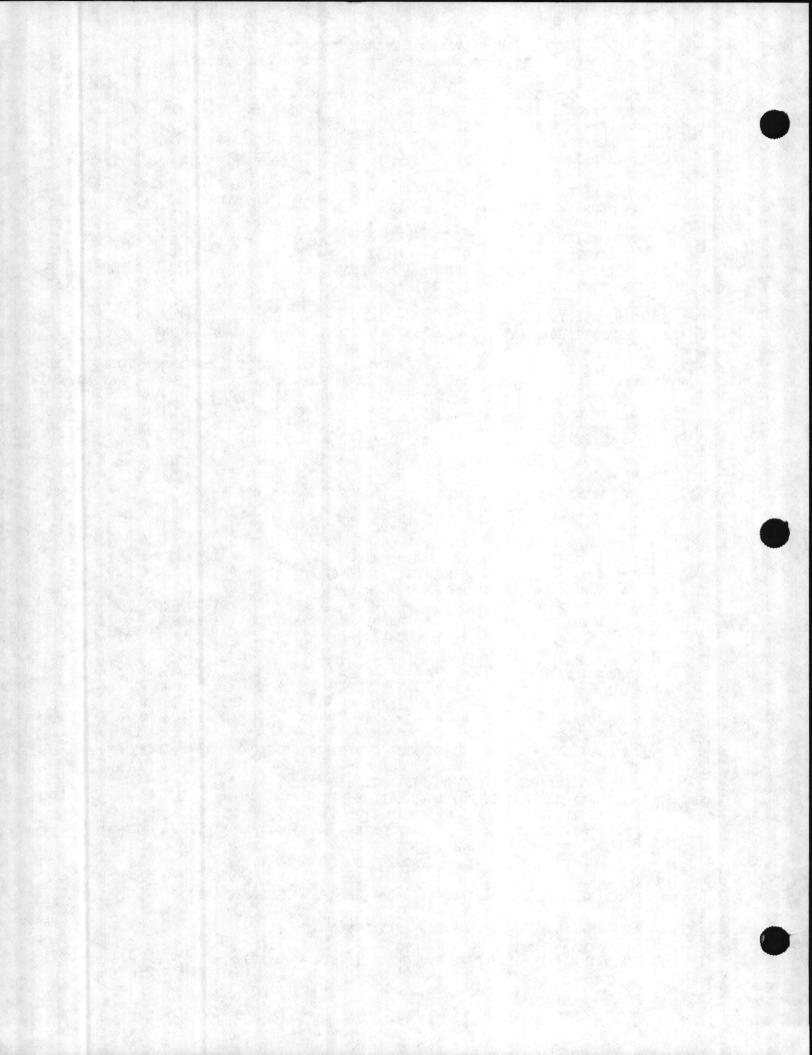
LOCA	TION: ECT TITLE	NEW RIVER : COMBINED	AIR ST CONTROL	ATION S	PROJECT N FISCAL YE			1988
		MISC. BLD			RONOVIC	THE TH	VEADC.	15
	ON NUMBER	: : JUNE 23 1	4 987		PREPARED			15 LO SUNDE
1. 1	INVESTMENT	COST						
		RUCTION COST					\$	26,989
	B. SIOH							1,484
	C. DESIG	N COST						1,619
	D. ENERG	Y CREDIT CAL	C (1A+1	B+1C)X.9				27,083
	E. SALVA	GE VALUE OF	EXISTIN	IG EQUIPMENT				0
	F. TOTAL	. INVESTMENT	(1D-1E)				\$	27,083
2. H	ENERGY SAV	INGS (+) / (DATE ANNUAL	-)	S UNIT COS	r ŝ DISCOU	NTED SA	VINGS	
	ANALIDID							
	FUEL	COST \$ /MBTU(1)	SAVINGS MBTU/YR(2)	ANNUAL SAVINGS (S DIS	OR(4)	DISCOUNTED SAVINGS(5)
	A. ELEC		8.15	0		0	0	0
	B. DIST		0	0		0	0	0
	C. RESIL		0	0		0	0	0
	D. NG		0	0		0	0	0
	E. COAL		2.91	2,447	7,12	2	10.18	72,500
	F. TOTAL		\$	2,447	7,12	2		72,500
2 1	NON ENERGS	CANTNES (1)	1 000					
5. 1		SAVINGS (+) L RECURRING		. (-)		\$	0	
		ISCOUNT FACT		RIE 1)		Y	7.61	
		ISCOUNTED SA				\$	0	
		ECURRING SAV				Section.		
				· · · · · · ·	and the second	DISCO	UNTED	
	ITEM	SAVING \$	(+)	YEAR OF	DISCOUNT	SAVIN	NGS (+)	
				CCURRENCE(2)				4)
	a.		0	0		1	0	
	Ь.		0	0		1	0	
	с.		0	0		1	0	
	d. TOTAL		0				0	
	C. TOTAL	L NON ENERGY	DISCOU	NTED SAVINGS	(+),COST(-) (34	A2+3Bd4)	0
		AND NON DUDDO			ст			
	D. PROJI	SCT NON ENERG	Y QUAL	IFICATION TE	51			
	(1) 25%	MAX NON ENER	GY CAL	C (2F5 X .33			\$	23,925
	(1) 25% a. I	MAX NON ENER F 3D1 IS = >	GY CAL	C (2F5 X .33 O TO ITEM 4)	F	Ş	State Law Add
	(1) 25% a. II b. II	MAX NON ENER F 3D1 IS $=$ > F 3D1 IS $<$ 3	CALC 3C G	C (2F5 X .33 O TO ITEM 4 ALC SIR = ()	.F	\$	Bine Level and
	(1) 25% a. I b. I c. I	MAX NON ENER F 3D1 IS = >	CALC CALC CALC CALC CALC CALC CALC CALC	C (2F5 X .33 D TO ITEM 4 ALC SIR = (D TO ITEM 4) 2F5+3D1)/1		Ş	State Law Add
4.	(1) 25% a. II b. II c. II d. II	MAX NON ENER F 3D1 IS = > F 3D1 IS < 3 F 3D1 IS < 3 F 3D1b IS = >	GY CALC 3C GO 3C CALC 3C CALC 3C CALC 3C CALC 3C CALC 3C GO 3C CALC 3C GO 3C	C (2F5 X .33 O TO ITEM 4 ALC SIR = (O TO ITEM 4 ROJECT DOES) 2F5+3D1)/J NOT QUALII	Y		0
	(1) 25% a. II b. II c. II d. II FIRST YEA	MAX NON ENER F 3D1 IS $=$ > F 3D1 IS $<$ 3 F 3D1b IS $=$ > F 3D1b IS $<$ 1	CGY CALL 3C G 3C C 1 G 1 G 1 P 1 NGS [2	C (2F5 X .33 O TO ITEM 4 ALC SIR = (O TO ITEM 4 ROJECT DOES F3+3A+(3B1d/) 2F5+3D1)/J NOT QUALII	Y		23,925 0 7,122 72,500



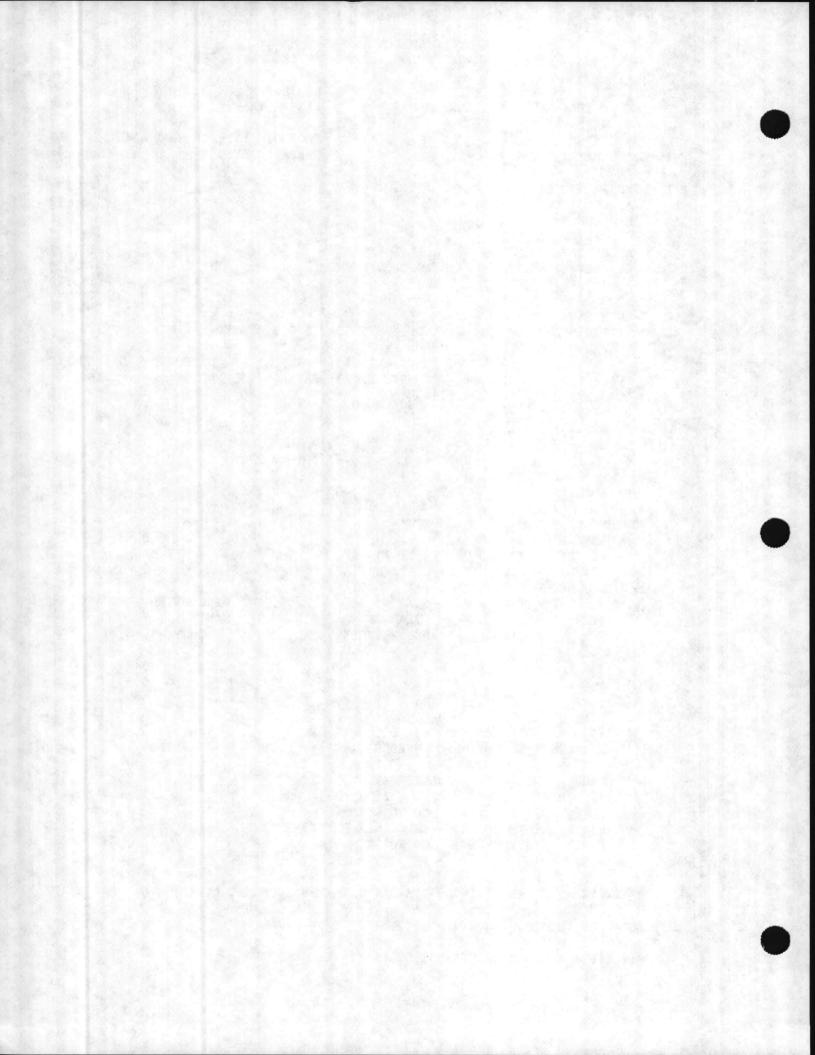
	RIFLE RANGE		PROJECT NO.		1988
	COMBINED CONTRO	DLS	FISCAL YEAR	·	1900
PORTION NAME:			FCONOMIC IT	FE IN YEARS:	15
REGION NUMBER:	JUNE 23 1987			:	
ANALISIS DAIL:	JUNE 23 1987		IKEIAKED DI		20 001.02
1. INVESTMENT (ć	12,113
	JCTION COST			\$	666
B. SIOH	000				727
C. DESIGN	CREDIT CALC (1A-	18+1C)8 9			12,155
	E VALUE OF EXIST				0
	INVESTMENT (1D-1)			\$	12,155
2. ENERGY SAVIN	NGS (+) / (-) DATE ANNUAL SAVII	NGS. UNIT COS	T S DISCOUNT	ED SAVINGS	
ANALISIS					
THILT		SAVINGS MBTU/YR(2)	ANNUAL \$	DISCOUNT FACTOR(4)	DISCOUNTED SAVINGS(5)
FUEL A. ELEC		MBIU/IR(2)			SAVINGS(S)
B. DIST		0			(
C. RESID			0		(
D. NG	Ő	0	0	0	
E. COAL	2.91	882	2,567	10.18	26,128
F. TOTAL	\$	882	2,567		26,128
	SAVINGS (+) / CO			0	
	RECURRING (+/-) SCOUNT FACTOR (T			7.61	
	SCOUNTED SAVING/			3 0	
B NON RE	CURRING SAVINGS	(+) / COST (-)	No de como de calencial	
D. NON AL	oonaano birrinop	(.,, , (DISCOUNTED	
ITEM	SAVING \$ (+)	YEAR OF	DISCOUNT	SAVINGS (+)	
	COST \$ (-)(1)	OCCURRENCE(2)	FACTOR (3)	COST(-) ((4)
а.	0	0	1	0	
а. b.	0	0		0	
c.	0	0	1	0	
d. TOTAL	0			0	
C. TOTAL	NON ENERGY DISCO	UNTED SAVINGS	(+),COST(-)	(3A2+3Bd4))
D. PROJEC	T NON ENERGY QUA	LIFICATION TH	ST		
(1) 25% M	AX NON ENERGY CA	LC (2F5 X .33	3)	\$	8,62
	3D1 IS = > 3C				
b. IF	3D1 IS < 3C	CALC SIR = ((2F5+3D1)/1F		
	3D1b IS = > 1				
d. IF	3D1b IS < 1	PROJECT DOES	NOT QUALIFY		
4. FIRST YEAR	DOLLAR SAVINGS [[2F3+3A+(3B1d)	YRS ECONOMI	C LIFE)] \$	2,56
5. TOTAL NET I	SISCOUNTED SAVING	GS (2F5+3C)		\$	26,12
6 CTD (TE / 1	PROJECT DOES NO	OT OTALTEY) S	R = (5/1F)		2.



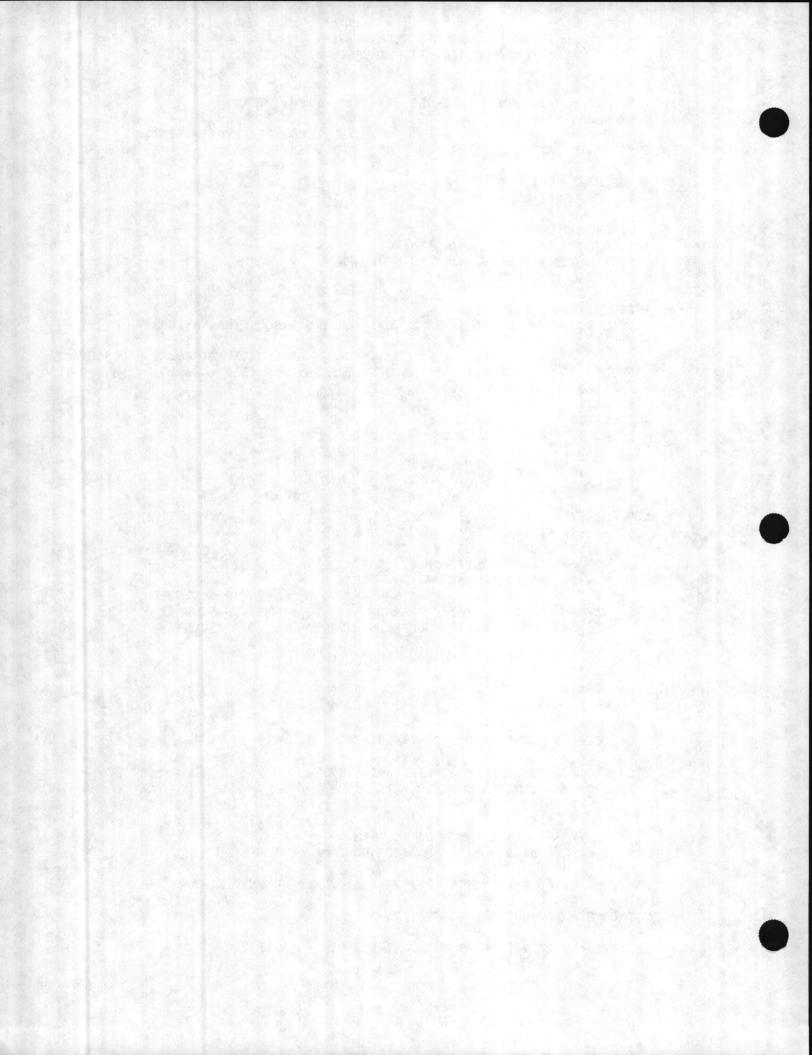
		BEACH AREA COMBINED CONTRO	OLS	PROJECT NO FISCAL YEA		1988
PORTIC	ON NAME:	MISC. BLDGS				
	N NUMBER:				IFE IN YEARS:	
ANALYS	SIS DATE:	JUNE 23 1987		PREPARED B	SY:	LO SUNDE
	VESTMENT C					
		JCTION COST			\$	
	B. SIOH					486 530
	C. DESIGN		10.1019 0			8,862
		CREDIT CALC (1A- E VALUE OF EXIST				0,002
		INVESTMENT (1D-1)			\$	8,862
2. EN	ERGY SAVIN	NGS (+) / (-)				
e spe	ANALYSIS I	DATE ANNUAL SAVI	NGS, UNIT COS	r ș discour	TED SAVINGS	
	FUEL	COST	SAVINGS MBTU/YR(2)	ANNUAL SAVINCE	DISCOUNT	DISCOUNTED SAVINGS(5)
	FUEL A. ELEC	\$/MBIU(1) 8.15	MB10/1R(2)		$) FACIOR(4) \\ 0 0$	O SAVINGS (J)
	B. DIST	0.15	Ő	i i i i i i i i i i i i i i i i i i i		0
	C. RESID		0) 0	0
	D. NG	0	0) 0	0
	E. COAL	2.91	627	1,826	5 10.18	18,589
	F. TOTAL	\$	627	1,826	5	18,589
3 NO	N ENEDOV	SAVINGS (+) / CO	ST (-)			
		RECURRING (+/-)			\$ 0	
		SCOUNT FACTOR (T.			7.61	
	(2) DI	SCOUNTED SAVING/	COST (3AX3A1)		\$ 0	
	B. NON REG	CURRING SAVINGS	(+) / COST (-		DISCOUNTED	
	ITEM	SAVING \$ (+)	VEAR OF			
	IIII	COST \$ (-)(1)				
а.		0	0			
b.		0	0		L 0	
с.		0	0		L 0	
d.	TOTAL	0			0	
	C. TOTAL	NON ENERGY DISCO	UNTED SAVINGS	(+),COST(-)) (3A2+3Bd4) 0
		T NON ENERGY QUA				
		AX NON ENERGY CA 3D1 IS = > 3C)	\$	6,134
	b. IF	3D1 IS < 3C 3D1b IS = > 1	CALC SIR = (2F5+3D1)/1	F	0
	c. IF	3D1b IS $= > 1$ 3D1b IS < 1	GO TO ITEM 4 PROJECT DOES	NOT OUALIF	Y	
4						1 004
4. F1	KST YEAR	DOLLAR SAVINGS [ZE2+2H+(2BIG)	IKS ECONOM.		
5. TO	TAL NET D	ISCOUNTED SAVING	S (2F5+3C)		\$	18,589
6. SI	R (IF < 1)	PROJECT DOES NO	T QUALIFY) SI	R = (5/1F)	두 이 상태에서	2.1



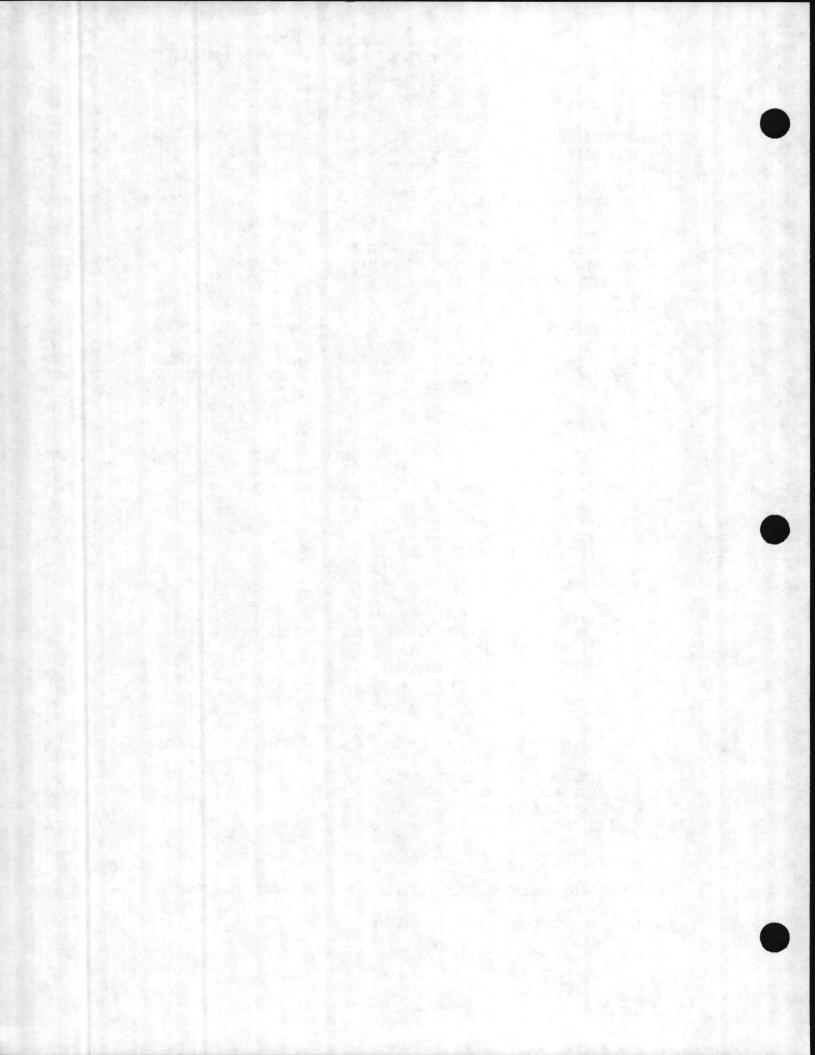
LOC	CATION: DIECT TITLE:	FRENCH CREEK COMBINED CONTRO	OLS	PROJECT NO. FISCAL YEAR:		1988
		MISC. BLDGS	The state of the second			
	GION NUMBER:			ECONOMIC LI	FE IN YEARS:	15
		JUNE 23 1987				
ANT	LISIS DAIL.	50NE 25 1907		Indinado Di		
1.	INVESTMENT (
		JCTION COST			\$	17,112
	B. SIOH					941
	C. DESIGN					1,027
	D. ENERGY	CREDIT CALC (1A-	+1B+1C)X.9			17,172
	E. SALVAGE	E VALUE OF EXIST	ING EQUIPMENT			0
	F. TOTAL	INVESTMENT (1D-1)	E)		\$	17,172
2	ENERGY SAVI	NGS (+) / (-)				
	ANALYSIS I	DATE ANNUAL SAVI	NGS, UNIT COST	r \$ DISCOUNT	ED SAVINGS	
		COST	SAVINGS	ANNUAL S	DISCOUNT	DISCOUNTED
	FUEL		MBTU/YR(2)			
	A. ELEC	8.15	11110/ IR(2) 0		0	0
	B. DIST	0.15	0	Contraction of the second	Ő	Ő
	C. RESID	Ő	0		Ő	0
	D. NG	0	Ő			0
	E. COAL	2.23		3,272		
	F. TOTAL	\$	1,467	3,272		33,304
2	NON ENERCY	SAVINGS (+) / CO	ST (-)			
٦.		RECURRING (+/-)		\$	0	
		SCOUNT FACTOR (T		Y	7.61	
		SCOUNTED SAVING/		c	0	
		CURRING SAVINGS			v	
	D. NON KE	CORKING SAVINGS	(1) / 0051 (-		DISCOUNTED	
	TTEM	SAVING \$ (+)	VEAD OF			
	IIEM	COST \$ (-)(1)				4)
		0051 \$ (-)(1)	OCCORRENCE(2)	FACIOR (J)	0051(-) (+)
	а.	0	0	1	0	
	b.	0	0		0	
	c.	0	0		0	
	d. TOTAL	0			0	
	C TOTAL	NON ENERGY DISCO	UNTED SAVINGS	(+) COST $(-)$	(3A2+3Bd4)	0
					(511215201)	
		T NON ENERGY QUA				10.000
		AX NON ENERGY CA)	\$	10,990
		3D1 IS = > 3C		0EE . 201 \ /1E		0
		3D1 IS < 3C		2F5+3D1)/1F		U
		3D1b IS $= > 1$		NOT OUNT TEV		
	a. 1r	3D1b IS < 1	PROJECT DOES	NOI QUALIFI		
				THE RECONOUT	TTEENI C	2 272
4.	FIRST YEAR	DOLLAR SAVINGS [2F3+3A+(3B1d/	IRS ECONOMIC	LIFE)] \$	5,272
				YRS ECONOMIC		
5.	TOTAL NET D	DOLLAR SAVINGS [ISCOUNTED SAVING PROJECT DOES NO	S (2F5+3C)		\$	3,272 33,304 1.9



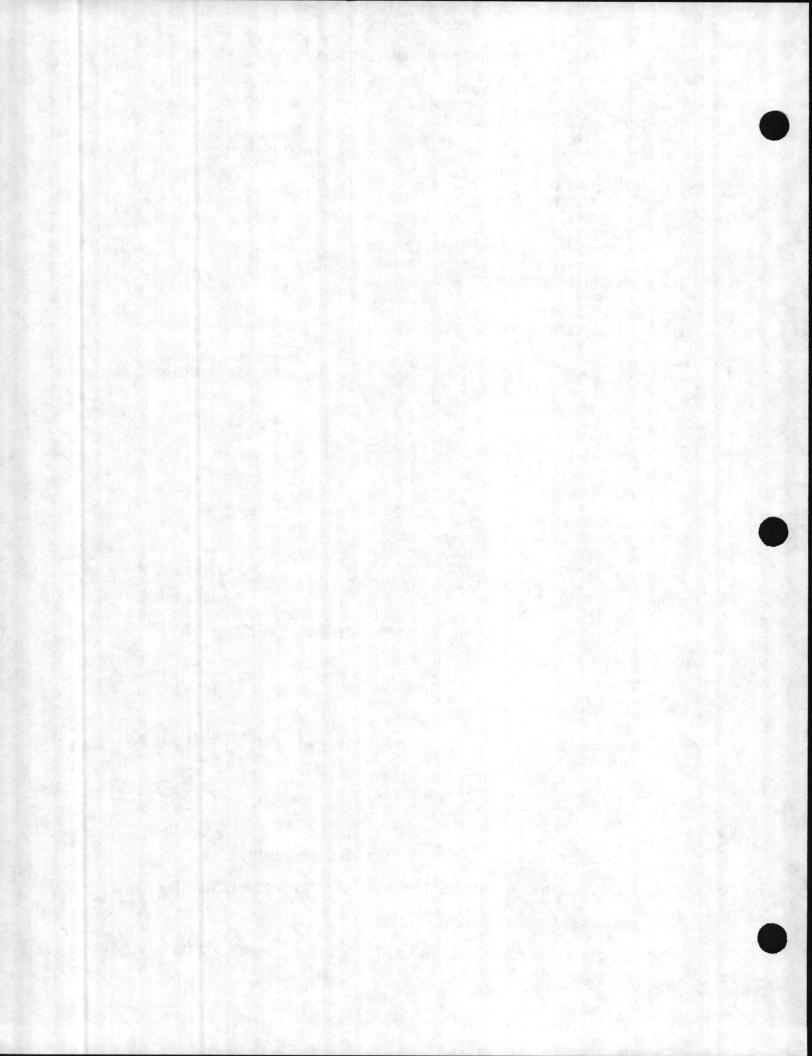
			ENERGI CONSERVA	ATION INVESTME	INI PROGRA	M (EC	(IP)	
LOC	ATIO	N :	CAMP JOHNSON		PROJECT N	ю.		
PRO	JECT	TITLE:	CAMP JOHNSON COMBINED CONTRO MISC. BLDGS	DLS	FISCAL YE			1988
TOR	TTON	MAIL.	MIDO. DLDGD		ECONOMIC	LIFE	IN YEARS:	15
ANA	LYSIS	S DATE:	4 JUNE 23 1987		PREPARED			LO SUNDE
					1.11.1.1.1.1.1			
1.	INVE	STMENT (COST					
			JCTION COST				\$	21,949
		SIOH						1,207
		DESIGN						1,317
			CREDIT CALC (1A-					22,026
			E VALUE OF EXIST				487 C A	0
	F.	TOTAL 1	INVESTMENT (1D-1)	Ξ)			\$	22,026
2.			NGS (+) / (-) DATE ANNUAL SAVIN	NGS, UNIT COST	r \$ DISCOU	JNTED	SAVINGS	
		FT		SAVINGS				
		EL ELEC	\$/MBIU(1) 8.15	MBTU/YR(2) 0		$\begin{pmatrix} 3 \end{pmatrix} \mathbf{F}$	0 0 0 0 0	SAVINGS(5)
		DIST	0.15	0		0	0	0
		RESID		0		0	Ő	0
		NG	0	0		0	0	0
		COAL	2.91	1,191	3,40	57	10.18	35,289
	F.	TOTAL	\$	1,191	3,40	67		35,289
3.			SAVINGS (+) / CO			(Land)		
			RECURRING (+/-)			\$	0	
			SCOUNT FACTOR (TA			•	7.61	
	D		SCOUNTED SAVING/CURRING SAVINGS			\$	0	
	ь.	NON RE	SURKING SAVINGS	(+) / COSI (-	,	DTO	SCOUNTED	
		ITEM	SAVING \$ (+)	YEAR OF	DISCOUNT		VINGS (+)	
		100	COST \$ (-)(1)					4)
	a.		0	0		1	0	
	b.		0	0		1	0	
	c.		0	0		1	0	
	d.	TOTAL	0				0	
	c.	TOTAL 1	NON ENERGY DISCO	UNTED SAVINGS	(+),COST(-	-)	(3A2+3Bd4)	0
	D.	PROJEC	I NON ENERGY QUAL	LIFICATION TE	ST			
			AX NON ENERGY CAL				ŝ	11,645
				GO TO ITEM 4				all and the state
		b. IF	3D1 IS < 3C (CALC SIR = (2F5+3D1)/1	LF		0
		c. IF	3D1b IS = > 1	GO TO ITEM 4				
		d. IF	3D1b IS < 1	PROJECT DOES 1	NOT QUALIE	FY		
4.	FIRS	T YEAR I	DOLLAR SAVINGS [:	2F3+3A+(3B1d/	TRS ECONON	AIC LI	[FE)] \$	3,467
5	TOTA	I. NET D	ISCOUNTED SAVING	S (2F5+3C)			\$	35,289
5.	TOTA	L HEI D.	ESCOULED BAVING	(215150)			Ŷ	55,209
6.	SIR	(IF < 1	PROJECT DOES NOT	r qualify) si	R = (5/1F)) -		1.6



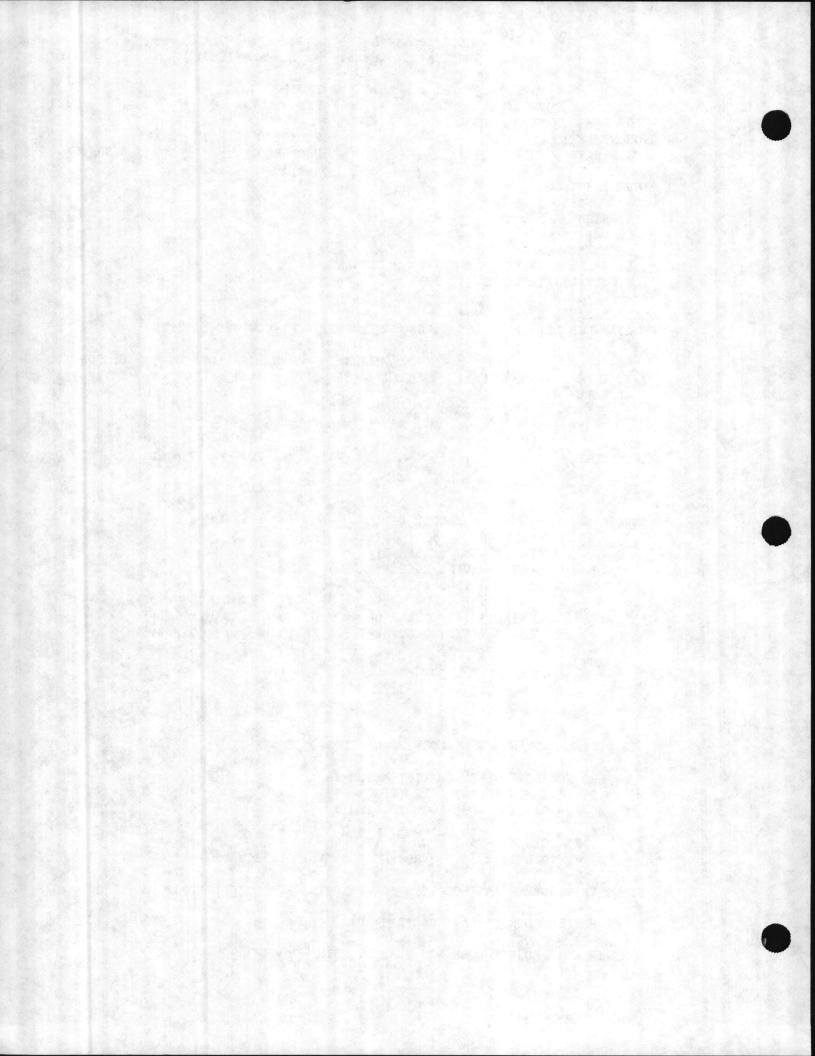
B. SIOH C. DESIGN COST D. ENERGY CREDIT CALC (1A+1B+1C)X.9 P. SALVAGE VALUE OF EXISTING EQUIPMENT F. TOTAL INVESTMENT (1D-1E) S. ENERGY SAVINGS (+) / (-) ANALYSIS DATE ANNUAL SAVINGS, UNIT COST \$ DISCOUNTED SAVINGS COST SAVINGS ANNUAL \$ DISCOUNT DISCOUNT FUEL \$/MBTU(1) MBTU/YR(2) SAVINGS (3) FACTOR(4) SAVINGS A. ELEC 8.15 0 0 0 B. DIST 0 0 0 0 0 C. RESID 0 0 0 0 0 C. RESID 0 0 0 0 0 E. COAL 2.91 471 1,369 10.18 13, F. TOTAL \$ 471 1,369 10.18 13, G. NON ENERGY SAVINGS (+) / COST (-) A. ANNUAL RECURRING (+/-) \$ 0 (1) DISCOUNT FACTOR (TABLE 1) 7.61 (2) DISCOUNTED SAVING/COST (3AX3A1) \$ 0 B. NON RECURRING SAVING/COST (-) ITEM SAVING \$ (+) YEAR OF DISCOUNT SAVINGS (+) COST \$ (-)(1) OCCURRENCE(2) FACTOR (3) COST(-) (4) a. 0 0 1 0 c. 0 0 1 0 c. 0 0 1 0 c. 10 0 0 1 0 c. 10 0 0 1 0 c. 0 0 1 0 c. 10 0 0 0 1 0 c. 10 0 0 0 0 0 c. 10 0 0 0 c. 10 0 0 0 0 c. 10 0 0 c. 10 0 0 0 0 c. 10 0 0 0 0 c. 10 0	PORTION NAME .	COURTHOUSE BAY COMBINED CONTRO		PROJECT NO. FISCAL YEAR:		198
NALYSIS DATE: JUNE 23 1987 PREPARED BY: LO SUNDE 1. INVESTMENT COST A. CONSTRUCTION COST A. CONSTRUCTION COST D. ENERGY CREDIT CALC (1A+1B+1C)X.9 D. ENERGY CREDIT CALC (1A+1B+1C)X.9 D. ENERGY CREDIT CALC (1A+1B+1C)X.9 D. ENERGY CREDIT CALC (1A+1B+1C)X.9 D. ENERGY SAULAGE OF EXISTING EQUIPHENT F. TOTAL INVESTMENT (1D-1E) S. 9, 2. ENERGY SAVINGS (+) / (-) ANALYSIS DATE ANNUAL SAVINGS, UNIT COST \$ DISCOUNTED SAVINGS A. ELEC COST SAVINGS ANNUAL \$ DISCOUNT DISCOUNT FUEL \$/METU(1) METU/YR(2) SAVINGS (3) FACTOR (4) SAVINGS A. ELEC A. ELEC A. ELEC COST SAVINGS ANNUAL \$ DISCOUNT DISCOUNT FUEL \$/METU(1) METU/YR(2) SAVINGS (3) FACTOR (4) SAVINGS A. ELEC A. ELEC A. ELEC A. ELEC A. ELEC COST SAVINGS (+) / COST C. RESID O D. NC O C. RESID O C. RESID O D. NC A. ANNUAL RECURRING (+/-) (1) DISCOUNT FACTOR (TABLE 1) T. COST \$ (-)(1) OCCURRENCE (2) FACTOR (3) COST(-) (4) A. O D. NON RECURRING SAVINGS (+) / COST (-) DISCOUNTED ITEM SAVING \$ (+) YEAR OF DISCOUNT SAVINGS (+) COST \$ (-)(1) OCCURRENCE (2) FACTOR (3) C. TOTAL NON ENERGY DISCOUNTED SAVINGS (+), COST(-) (3A2+3Bd4) D. PROJECT NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X.33) A. IF 3DI IS -> 3C C. TOTAL NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X.33) A. IF 3DI IS -> 3C C. TOTAL NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X.33) A. IF 3DI IS -> 3C C. TOTAL NON ENERGY CALC (2F5 X.33) A. IF 3DI IS -> 3C C. TOTAL NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X.33) A. IF 3DI IS -> 3C C. TOTAL NON ENERGY CALC (2F5 X.33) A. IF 3DI IS -> 3C C. TOTAL NON ENERGY CALC (2F5 X.33) A. IF 3DI IS -> 3C C. TOTAL NON ENERGY CALC (2F5 X.33) A. IF 3DI IS -> 1 C. TOTAL SON ENERGY CALC (2F5 X.33) A. IF 3DI IS -> 3C C. TOTAL NON ENERGY CALC (2F5 X.33) A. IF 3DI IS -> 3C C. TOTAL NON ENERGY CALC (2F5 X.33) A. IF 3DI IS -> 3C C. TOTAL NON ENERGY CALC (2F5 X.33) A. IF 3DI IS -> 3C C. TOTAL SON ENERGY CALC (2F5 X.35) A. IF 3DI IS -> 3C C. TOTA	ORITON MAIL.	MISC. BLDGS				
1. INVESTMENT COST A. CONSTRUCTION COST S. SION C. DESIGN COST D. ENERGY CREDIT CALC (1A+1B+1C)X.9 F. SALVAGE VALUE OF EXISTING EQUIPMENT F. TOTAL INVESTMENT (1D-1E) S. SALVAGE VALUE OF EXISTING EQUIPMENT F. TOTAL INVESTMENT (1D-1E) 2. ENERGY SAVINGS (+) / (-) ANALYSIS DATE ANNUAL SAVINGS, UNIT COST § DISCOUNT DISCOUNT FUEL \$/METU(1) METU/YR(2) SAVINGS (3) FACTOR(4) SAVINGS A. ELEC 8.15 0 0 0 0 0 C. RESID 0 0 0 0 0 C. RESID 0 0 0 0 0 D. NG 0 0 0 0 E. COAL 2.91 471 1,369 10.18 13, F. TOTAL \$ 471 1,369 10.18 13, F. TOTAL \$ 471 1,369 10.18 13, F. TOTAL \$ 0 1 0 (1) DISCOUNTED SAVINGS (+) / COST (-) A. ANNUAL RECURRING (+/-) \$ 0 (1) DISCOUNTED SAVINGS (+) / COST (-) B. NON REURGY SAVINGS (+) / COST (-) ITEM SAVING \$ (+) YEAR OF DISCOUNT SAVINGS (+) COST \$ (-)(1) OCURRENCE(2) FACTOR (3) COST(-) (4) a. 0 0 1 0 C. TOTAL 0 0 1 0 C. TOTAL 0 0 1 0 C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+),COST(-) (3A2+3Bd4) D. PROJECT NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (275 X .33) \$ 4, a. IF 3D1 IS < 3C CALC SIR - (2F5+3D1)/1F c. IF 3D1b IS < 1 FROJECT DOES NOT QUALIFY 4. FIRST YEAR DOLLAR SAVINGS [2F3+3A+(3B1d/YES ECONOMIC LIFE)] \$ 1,	REGION NUMBER:	4				
A. CONSTRUCTION COST \$ 9, b. SIOH C. DESIGN COST D. ENERGY CREDIT CALC (1A+1B+1C)X.9 9, E. SALVAGE VALUE OF EXISTING EQUIPMENT F. TOTAL INVESTMENT (1D-1E) \$ 9, 2. ENERGY SAVINGS (+) / (-) ANALYSIS DATE ANNUAL SAVINGS, UNIT COST \$ DISCOUNTED SAVINGS COST SAVINGS ANNUAL \$ DISCOUNT DISCOUNT FUEL \$/MBTU(1) MBTU/YR(2) SAVINGS (3) FACTOR(4) SAVINGS A. ELEC 8.15 0 0 0 0 B. DIST 0 0 0 0 0 C. RESID 0 0 0 0 0 D. NG 0 0 0 0 E. COAL 2.91 471 1,369 10.18 13, F. TOTAL \$ 471 1,369 10.18 13, F. TOTAL \$ 471 1,369 13, 3. NON ENERGY SAVINGS (+) / COST (-) A. ANUAL RECURRING (+/-) \$ 0 (1) DISCOUNT FACTOR (TABLE 1) 7.61 (2) DISCOUNTED SAVINGS (+) / COST (-) DISCOUNTED SAVINGS (+) / COST (-) ITEM SAVING \$ (+) YEAR OF DISCOUNT SAVINGS (+) COST \$ (-)(1) OCCURRENCE(2) FACTOR (3) COST(-) (4) a. 0 0 1 0 C. TOTAL 0 0 0 1 0 C. TOTAL 0 0 0 1 0 C. TOTAL 0 0 0 1 0 A. TOTAL 0 4 0 0 1 0 A. TOTAL 0 4 0 0 1 0 C. TOTAL 0 5 (-)(1) COST(-) (3A2+3Bd4) D. PROJECT NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X .33) \$ 4, a. IF 3DI IS -> 3 C GO TO ITEM 4 b. IF 3DI IS < 3C CALC SIR - (2F5+3D1)/IF c. IF 3DIL IS < 3C CALC SIR - (2F5+3D1)/IF c. IF 3DIL IS < 1 PROJECT DOES NOT QUALIFY 4. FIRST YEAR DOLLAR SAVINGS [2F3+3A+(3BId/YRS ECONOMIC LIFE)] \$ 1,	NALYSIS DATE:	JUNE 23 1987	1	PREPARED BY:		LO SUNDE
B. SIOH C. DESIGN COST D. ENERGY CREDIT CALC (1A+1B+1C)X.9 F. SALVAGE VALUE OF EXISTINC EQUIPMENT F. TUTAL INVESTMENT (1D-1E) S ANALYSIS DATE ANNUAL SAVINGS, UNIT COST \$ DISCOUNTED SAVINGS COST SAVINGS ANNUAL \$ DISCOUNT DISCOUNT FUEL \$/MBTU(1) MBTU/YR(2) SAVINGS (3) FACTOR(4) SAVINGS A. ELEC 8.15 0 0 0 0 B. DIST 0 0 0 0 0 C. RESID 0 0 0 0 0 D. NG 0 0 0 0 E. COAL 2.91 471 1,369 10.18 13, F. TUTAL \$ 0.10 0 D. NON ENERGY SAVINGS (+) / COST (-) A. ANNUAL RECURRING (+/-) \$ 0 (1) DISCOUNT FACTOR (TABLE 1) 7.61 (2) DISCOUNT FACTOR (TABLE 1) 7.61 (2) DISCOUNT FOR SAVINGS (+) / COST (-) ITEM SAVING \$ (+) YEAR OF DISCOUNTED SAVINGS (+) COST \$ (-)(1) OCCURRENCE(2) FACTOR (3) COST(-) (4) A. O 0 1 0 C. TOTAL 0 0 1 0 C. TOTAL NON ENERGY DISCOUNTED SAVINGS (+), COST (-) (3A2+3Bd4) D. PROJECT NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X.33) \$ 4, a. IF 3DI IS -> 3C CO TO ITEM 4 b. IF 3DI IS -> 3C CO TO ITEM 4 b. IF 3DI IS -> 1 GO TO ITEM 4 d. IF 3DI IS -> 1 GO TO ITEM 4						
C. DESIGN COST D. ENERGY CREDIT CALC (1A+1B+1C)X.9 P. SALVAGE VALUE OF EXISTINC EQUIPMENT F. TOTAL INVESTMENT (1D-1E) S COST SAVINGS ANNUAL \$ DISCOUNTED SAVINGS COST SAVINGS ANNUAL \$ DISCOUNT DISCOUNT FUEL \$/MBTU(1) MBTU/YR(2) SAVINGS (3) FACTOR(4) SAVINGS A. ELEC 8.15 0 0 0 0 B. DIST 0 0 0 0 0 C. RESID 0 0 0 0 0 D. NG 0 0 0 0 0 E. COAL 2.91 471 1,369 10.18 13, F. TOTAL \$ 471 1,369 10.18 13, F. TOTAL \$ 471 1,369 10.18 13, G. NON ENERGY SAVINGS (+) / COST (-) A. ANNUAL RECURRING (+/-) \$ 0 (1) DISCOUNT FACTOR (TABLE 1) 7.61 (2) DISCOUNTED SAVING/COST (3AY3A1) \$ 0 B. NON RECURRING SAVINGS (+) / COST (-) DISCOUNTED ITEM SAVING \$ (+) YEAR OF DISCOUNT SAVINGS (+) COST \$ (-)(1) OCCURRENCE(2) FACTOR (3) COST(-) (4) a. 0 0 1 0 C. TOTAL NON ENERGY DISCOUNTED SAVINGS (+), COST(-) (3A2+3Bd4) D. PROJECT NON ENERGY DISCOUNTED SAVINGS (+), COST(-) (3A2+3Bd4) D. PROJECT NON ENERGY CALC (2F5 X .33) \$ 4, a. IF 3DI IS -> 3.C CO TO ITEM 4 b. IF 3DI IS -> 3.C CO TO TEM 4 b. IF 3DI IS -> 3.C COTO TIEM 4 b. IF 3DI IS -> 1. GO TO ITEM 4 b. IF 3DI IS -> 1. GO TO ITEM 4 b. IF 3DI IS -> 1. GO TO ITEM 4 b. IF 3DI IS -> 1. GO TO ITEM 4 b. IF 3DI IS -> 1. GO TO ITEM 4 b. IF 3DI IS -> 1. GO TO ITEM 4 b. IF 3DI IS -> 1. GO TO ITEM 4 b. IF 3DI IS -> 1. GO TO ITEM 4 b. IF 3DI IS -> 1. GO TO ITEM 4 b. IF 3DI IS -> 1. GO TO ITEM 4 b. IF 3DI IS -> 1. GO TO ITEM 4 b. IF 3DI IS -> 1. GO TO ITEM 4 c. IF 3DI IS -> 1. GO TO ITEM 4 b. IF 3DI IS -> 1. GO TO ITEM 4 c. IF 3DI IS -> 1. GO TO ITEM 4 c. IF SDI IS -> 1. GO TO ITEM 4 c. IF SDI IS -> 1. GO T		CTION COST			Ş	9,36
D. ENERGY CREDIT CALC (1A+1B+1C)X.99,E. SALVAGE VALUE OF EXISTING EQUIPHENTF. TOTAL INVESTMENT (1D-1E)\$ 9,F. TOTAL INVESTMENT (1D-1E)\$ 9,ANALYSIS DATE ANNUAL SAVINGS, UNIT COST \$ DISCOUNTED SAVINGSCOST SAVINGS ANNUAL \$ DISCOUNT DISCOUNFUEL \$/MBTU(1)MBTU/YR(2) SAVINGS (3) FACTOR(4)A. ELEC 8.1500B. DIST00COLCRESID0D. NG00D. NG00D. NG00COL2.914714. ANNUAL RECURRING (+/-)\$ 0A. ANNUAL RECURRING SAVINC/COST (-)DISCOUNTEDA. ANNUAL RECURRING SAVINC/COST (-)DISCOUNTEDITEM SAVINC \$ (+) YEAR OF DISCOUNT SAVINGS (+)COST \$ (-)(1) OCCURRENCE(2) FACTOR (3) COST(-) (4)a. 00b. 00c. 00c. 10 0c. 10 0c. 10 0c. 10 0c. 10 0c. 10 10 0c. 10 10 0c. 10 0c. 10 10 0c. 11 20 0c. 12 10 0c. 14 20 0c. 15 20 0c. 16 20 0						51
E. SALVAGE VALUE OF EXISTING EQUIPMENT F. TOTAL INVESTMENT (1D-1E) § 9, E. ENERGY SAVINGS (+) / (-) ANALYSIS DATE ANNUAL SAVINGS, UNIT COST \$ DISCOUNTED SAVINGS COST SAVINGS ANNUAL \$ DISCOUNT DISCOUNT FUEL \$/MBTU(1) MBTU/YR(2) SAVINGS (3) FACTOR(4) SAVINGS A. ELEC 8.15 0 0 0 B. DIST 0 0 0 0 0 C. RESID 0 0 0 0 0 D. NG 0 0 0 0 E. COAL 2.91 471 1,369 10.18 13, F. TOTAL \$ 471 1,369 10.18 13, G. NON ENERGY SAVINGS (+) / COST (-) A. ANNUAL RECURRING (+/-) \$ 0 (1) DISCOUNTED SAVING/COST (3AX3A1) \$ 0 B. NON RECURRING SAVINGS (+) / COST (-) ITEM SAVING \$ (+) YEAR OF DISCOUNT SAVINGS (+) COST \$ (-)(1) OCCURRENCE(2) FACTOR (3) COST(-) (4) a. 0 0 1 0 C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+),COST(-) (3A2+3Bd4) D. PROJECT NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X.33) \$ 4, a. 1F 3D1 IS = > 3C GO TO ITEM 4 b. IF 3D1 IS < 1 FOUECT DOES NOT QUALIFY 4. FIRST YEAR DOLLAR SAVINGS [2F3+3A+(3BId/YRS ECONOMIC LIFE)] \$ 1,						56
F. TOTAL INVESTMENT (ID-IE) § 9, C. ENERGY SAVINGS (+) / (-) ANALYSIS DATE ANNUAL SAVINGS, UNIT COST \$ DISCOUNTED SAVINGS COST SAVINGS ANNUAL \$ DISCOUNT DISCOUNT FUEL \$/MBTU(1) MBTU/YR(2) SAVINGS (3) FACTOR(4) SAVINGS A. ELEC 8.15 0 0 0 0 C. RESID 0 0 0 0 0 C. RESID 0 0 0 0 0 E. COAL 2.91 471 1,369 10.18 13, F. TOTAL \$ 471 1,369 10.18 13, F. TOTAL \$ 471 1,369 10.18 13, G. NON ENERGY SAVINGS (+) / COST (-) A. ANNUAL RECURRING (+/-) \$ 0 (1) DISCOUNT FACTOR (TABLE 1) 7.61 (2) DISCOUNTED SAVINGS (+) / COST (-) ITEM SAVING \$ (+) YEAR OF DISCOUNT SAVINGS (+) COST \$ (-)(1) OCCURRENCE(2) FACTOR (3) COST(-) (4) a. 0 0 1 0 b. 0 0 1 0 c. TOTAL NON ENERGY DISCOUNTED SAVINGS(+), COST (-) (3A2+3Bd4) D. PROJECT NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X .33) \$ 4, a. IF 3DI IS -> 3C GO TO ITEM 4 b. IF 3DI IS -> 1 GO TO ITEM 4 c. IF 3DI IS -> 1 GO TO ITEM 4 A. FIRST YEAR DOLLAR SAVINGS [2F3+3A+(3BId/YRS ECONOMIC LIFE)] \$ 1,		Contraction of the second s				9,39
2. ENERGY SAVINGS (+) / (-) ANALYSIS DATE ANNUAL SAVINGS, UNIT COST \$ DISCOUNTED SAVINGS COST SAVINGS ANNUAL \$ DISCOUNT DISCOUNT FUEL \$/MBTU(1) MBTU/YR(2) SAVINGS (3) FACTOR(4) SAVINGS A. ELEC 8.15 0 0 0 0 B. DIST 0 0 0 0 0 0 C. RESID 0 0 0 0 0 0 D. NG 0 0 0 0 0 0 E. COAL 2.91 471 1,369 10.18 13, F. TOTAL \$ 471 1,369 10.18 13, F. TOTAL \$ 471 1,369 10.18 13, G. NON ENERGY SAVINGS (+) / COST (-) A. ANNUAL RECURRING (+/-) \$ 0 (1) DISCOUNT FACTOR (TABLE 1) 7.61 (2) DISCOUNT FACTOR (TABLE 1) 7.61 (2) DISCOUNT FACTOR (TABLE 1) 7.61 (2) DISCOUNTED SAVINGS (+) / COST (-) ITEM SAVING \$ (+) YEAR OF DISCOUNT SAVINGS (+) COST \$ (-)(1) OCCURRENCE(2) FACTOR (3) COST(-) (4) a. 0 0 1 0 b. 0 1 0 c. 0 0 1 0 c. 0 0 1 0 c. TOTAL NON ENERGY DISCOUNTED SAVINGS(+),COST(-) (3A2+3Bd4) D. PROJECT NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X.33) \$ 4, a. IF 3D1 IS -> 3C CO TO ITEM 4 b. IF 3D1 IS -> 3C CO TO ITEM 4 b. IF 3D1 IS < 1 PROJECT DOES NOT QUALIFY 4. FIRST YEAR DOLLAR SAVINGS [2F3+3A+(3B1d/YRS ECONOMIC LIFE)] \$ 1,						
ANALYSIS DATE ANNUAL SAVINGS, UNIT COST \$ DISCOUNTED SAVINGS COST SAVINGS ANNUAL \$ DISCOUNT DISCOUNT FUEL \$/MBTU(1) MBTU/YR(2) SAVINGS (3) FACTOR(4) SAVINGS A. ELEC 8.15 0 0 0 0 B. DIST 0 0 0 0 0 C. RESID 0 0 0 0 0 D. NG 0 0 0 0 0 E. COAL 2.91 471 1,369 10.18 13, F. TOTAL \$ 471 1,369 10.18 13, F. TOTAL \$ 471 1,369 10.18 13, F. TOTAL \$ 0.11 1,369 10.18 13, F. TOTAL \$ 0.11 1,369 10.18 13, F. TOTAL \$ 0.11 1,369 10,18 13, S. NON ENERGY SAVINGS (+) / COST (-) A. ANNUAL RECURRING (+/-) \$ 0 (1) DISCOUNTED SAVINGC (51 (3AX3A1) \$ 0 B. NON RECURRING SAVINGS (+) / COST (-) ITEM SAVING \$ (+) YEAR OF DISCOUNTED SAVINGS (+) COST \$ (-)(1) OCCURRENCE(2) FACTOR (3) COST(-) (4) a. 0 0 1 0 b. 0 0 1 0 c. 0 0 1 0 c. 0 0 1 0 c. 10 0 0 1 0 d. TOTAL 0 0 0 1 0 c. 17 3DL IS -> 3C GO TO ITEM 4 b. IF 3DL IS < 3C CALC SIR - (2F5+3DL)/1F c. IF 3DL IS < 1 FOOJECT DOES NOT QUALIFY 4. FIRST YEAR DOLLAR SAVINGS [2F3+3A+(3BLd/YRS ECONOMIC LIFE)] \$ 1,	F. TOTAL I	NVESTMENT (1D-1	E)		Ş	9,35
COST SAVINGS ANNUAL \$ DISCOUNT DISCOUNT FUEL \$/MBTU(1) MBTU/YR(2) SAVINGS (3) FACTOR(4) SAVINGS A. ELEC 8.15 0 0 0 0 B. DIST 0 0 0 0 0 C. RESID 0 0 0 0 0 D. NG 0 0 0 0 0 E. COAL 2.91 471 1,369 10.18 13, F. TOTAL \$ 471 1,369 13, 3. NON ENERGY SAVINGS (+) / COST (-) A. ANNUAL RECURRING (+/-) \$ 0 0 A. ANNUAL RECURRING SAVINGS (+) / COST (-) A. ANNUAL RECURRING SAVINGS (+) / COST (-) DISCOUNT FACTOR (TABLE 1) 7.61 (2) DISCOUNT FACTOR (TABLE 1) 7.61 0 0 0 ITEM SAVING \$ (+) / COST (-) DISCOUNTED SAVINGS (+) / COST (-) ITEM SAVING \$ (+) / COST (-) DISCOUNTED SAVINGS (+) / COST (-) 0 a. 0 0 1 0 0 0 <td< td=""><td>2. ENERGY SAVIN ANALYSIS D</td><td>IGS (+) / (-) DATE ANNUAL SAVI</td><td>NGS, UNIT COS</td><td>T \$ DISCOUNTE</td><td>ED SAVINGS</td><td></td></td<>	2. ENERGY SAVIN ANALYSIS D	IGS (+) / (-) DATE ANNUAL SAVI	NGS, UNIT COS	T \$ DISCOUNTE	ED SAVINGS	
FUEL \$/MBTU(1) MBTU/YR(2) SAVINGS (3) FACTOR(4) SAVINGS A. ELEC 8.15 0 0 0 B. DIST 0 0 0 0 C. RESID 0 0 0 0 D. NG 0 0 0 0 E. COAL 2.91 471 1,369 10.18 13, F. TOTAL \$ 471 1,369 13, 3. NON ENERGY SAVINGS (+) / COST (-) \$ 0 0 13, A. ANNUAL RECURRING (+/-) \$ \$ 0 0 13, 3. NON ENERGY SAVINGS (+) / COST (-) \$ 0 0 13, A. ANNUAL RECURRING SAVING/COST (3AX3A1) \$ 0 0 11, (2) DISCOUNTED SAVING/COST (3AX3A1) \$ 0 0 0 0 ITEM SAVING \$ (+) YEAR OF DISCOUNT SAVINGS (+), COST(-) (4) a. 0 0 1 0 0 0 0 0 c. 0 0 1						DISCOUNT
A. ELEC 8.15 0 0 0 0 B. DIST 0 0 0 0 0 C. RESID 0 0 0 0 0 E. COAL 2.91 471 1,369 10.18 13, F. TOTAL \$ 471 1,369 10.18 13, F. TOTAL \$ 471 1,369 13, S. NON ENERGY SAVINGS (+) / COST (-) A. ANNUAL RECURRING (+/-) \$ 0 (1) DISCOUNT FACTOR (TABLE 1) 7.61 (2) DISCOUNT FACTOR (TABLE 1) 7.61 (2) DISCOUNT FACTOR (COST (3AX3A1) \$ 0 B. NON RECURRING SAVINGS (+) / COST (-) ITEM SAVING \$ (+) YEAR OF DISCOUNT SAVINGS (+) COST \$ (-)(1) OCCURRENCE(2) FACTOR (3) COST(-) (4) a. 0 0 1 0 b. 0 0 1 0 c. 0 0 1 0 c. TOTAL 0 0 0 1 0 c. TOTAL 0 0 4 0 c. TOTAL 0 4 0 c. TOTAL NON ENERGY DISCOUNTED SAVINGS(+),COST(-) (3A2+3Bd4) D. PROJECT NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X .33) \$ 4, a. IF 3D1 IS -> 3C GO TO ITEM 4 b. IF 3D1 IS -> 1 GO TO ITEM 4 d. IF 3D1 IS < 1 PROJECT DOES NOT QUALIFY 4. FIRST YEAR DOLLAR SAVINGS [2F3+3A+(3B1d/YRS ECONOMIC LIFE)] \$ 1,	FUET	CUST ¢/MRTU(1)	METI /VP (2)	SAVINCE (2)	FACTOR(4)	
B. DIST 0 0 0 0 0 0 C. RESID 0 0 0 0 0 D. NG 0 0 0 0 0 E. COAL 2.91 471 1,369 10.18 13, F. TOTAL \$ 471 1,369 10.18 13, F. TOTAL \$ 471 1,369 13, A. ANNUAL RECURRING (+/-) \$ 0 (1) DISCOUNT FACTOR (TABLE 1) 7.61 (2) DISCOUNT FACTOR (TABLE 1) 7.61 (2) DISCOUNTED SAVING/COST (3AX3A1) \$ 0 B. NON RECURRING SAVINGS (+) / COST (-) ITEM SAVING \$ (+) YEAR OF DISCOUNT SAVINGS (+) COST \$ (-)(1) OCCURRENCE(2) FACTOR (3) COST(-) (4) a. 0 0 1 0 b. 0 0 1 0 c. 0 0 1 0 c. TOTAL 0 0 1 0 c. TOTAL 0 0 4 0 c. TOTAL 0 4 0 c. TOTAL 0 4 0 c. TOTAL 0 4 0 c. TOTAL NON ENERGY DISCOUNTED SAVINGS(+),COST(-) (3A2+3Bd4) D. PROJECT NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X .33) \$ 4, a. IF 3D1 IS = > 3C CALC SIR - (2F5+3D1)/1F c. IF 3D1 IS < 1 FOJECT DOES NOT QUALIFY 4. FIRST YEAR DOLLAR SAVINGS [2F3+3A+(3B1d/YRS ECONOMIC LIFE)] \$ 1,						BRATHOD(.
C. RESID 0 0 0 0 0 0 D. NG 0 0 0 0 E. COAL 2.91 471 1,369 10.18 13, F. TOTAL \$ 471 1,369 10.18 13, F. TOTAL \$ 071 1,369 13, A. ANNUAL RECURRING $(+/-)$ A. ANNUAL RECURRING $(+/-)$ A. ANNUAL RECURRING $(+/-)$ (1) DISCOUNT FACTOR (TABLE 1) 7.61 (2) DISCOUNTED SAVING/COST (3AX3A1) \$ 0 B. NON RECURRING SAVINGS $(+)$ / COST (-) ITEM SAVING \$ (+) YEAR OF DISCOUNT SAVINGS (+) COST \$ (-)(1) OCCURRENCE(2) FACTOR (3) COST(-) (4) a. 0 0 1 0 b. 0 0 1 0 c. 0 0 1 0 c. 0 0 1 0 c. 10TAL 0 0 0 1 0 C. TOTAL NON ENERGY DISCOUNTED SAVINGS (+), COST(-) (3A2+3Bd4) D. PROJECT NON ENERGY CALC (2F5 X .33) \$ 4, a. IF 3D1 IS = > 3C GO TO ITEM 4 b. IF 3D1 IS = > 1 GO TO ITEM 4 d. IF 3D1 IS < 1 PROJECT DOES NOT QUALIFY 4. FIRST YEAR DOLLAR SAVINGS [2F3+3A+(3B1d/YRS ECONOMIC LIFE)] \$ 1,				and the second		
D. NG 0 0 0 0 0 0 E. COAL 2.91 471 1,369 10.18 13, F. TOTAL \$ 471 1,369 10.18 13, F. TOTAL \$ 471 1,369 10.18 13, F. TOTAL \$ 471 1,369 13, S. NON ENERGY SAVINGS (+) / COST (-) A. ANNUAL RECURRING (+/-) \$ 0 0 13, A. ANNUAL RECURRING (+/-) \$ \$ 0 13, \$ 0 13, A. ANNUAL RECURRING (+/-) \$ \$ 0 \$ 0 13, A. ANNUAL RECURRING SAVINGS (+) / COST (-) \$ \$ 0 \$ 0 0 B. NON RECURRING SAVINGS (+) / COST (-) \$ \$ 0 0 1550UNT SAVINGS (+) 0 a. \$ \$ 0 0 1 0 0 b. \$ 0 0 1 0 0 0 0 0 a. \$ 0 0 1 <				The second s		
E. COAL 2.91 471 1,369 10.18 13, F. TOTAL \$ 471 1,369 10.18 13, F. TOTAL \$ 471 1,369 13, A. ANNUAL RECURRING $(+) / COST (-)$ A. ANNUAL RECURRING $(+/-)$ \$ 0 (1) DISCOUNT FACTOR (TABLE 1) 7.61 (2) DISCOUNTED SAVING/COST (3AX3A1) \$ 0 B. NON RECURRING SAVINGS $(+) / COST (-)$ ITEM SAVING \$ (+) YEAR OF DISCOUNT SAVINGS (+) COST \$ (-)(1) OCCURRENCE(2) FACTOR (3) COST(-) (4) a. 0 0 1 0 b. 0 0 1 0 c. 0 0 1 0 c. 10TAL 0 0 1 0 c. TOTAL 0 0 1 0 c. TOTAL 0 0 4 0 c. TOTAL 0 4 0 c. TOTAL 0 4 0 c. TOTAL 0 4 0 c. TOTAL NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X .33) \$ 4, a. IF 3D1 IS -> 3C GO TO ITEM 4 b. IF 3D1 IS -> 1 GO TO ITEM 4 d. IF 3D1 IS -> 1 GO TO ITEM 4 d. IF 3D1 IS -> 1 GO TO ITEM 4 d. IF 3D1 IS < 1 PROJECT DOES NOT QUALIFY 4. FIRST YEAR DOLLAR SAVINGS [2F3+3A+(3B1d/YRS ECONOMIC LIFE)] \$ 1,		THE REPORT OF A REAL PROPERTY OF			and the second	
 NON ENERGY SAVINGS (+) / COST (-) A. ANNUAL RECURRING (+/-) (1) DISCOUNT FACTOR (TABLE 1) (2) DISCOUNT FACTOR (TABLE 1) (3) DISCOUNTED SAVING/COST (3AX3A1) (4) DISCOUNTED SAVINGS (+) / COST (-) B. NON RECURRING SAVINGS (+) / COST (-) DISCOUNTED TEM SAVINGS (+) / COST (-) DISCOUNTED TEM SAVINGS (+) / COST (-) (3) DISCOUNTED TEM SAVINGS (+) / COST (-) (4) (4) O (5) O (6) O (7) O (7)			No. of Concession, and the Concession of the Con			13,94
NON ENERGY SAVINGS (+) / COST (-) A. ANNUAL RECURRING (+/-) \$ 0 (1) DISCOUNT FACTOR (TABLE 1) 7.61 (2) DISCOUNT FACTOR (TABLE 1) 7.61 (2) DISCOUNTED SAVINGS (3AX3A1) \$ 0 B. NON RECURRING SAVINGS (+) / COST (-) ITEM SAVING \$ (+) YEAR OF DISCOUNT SAVINGS (+) COST \$ (-)(1) OCCURRENCE(2) FACTOR (3) COST(-) (4) a. 0 0 1 0 b. 0 0 1 0 b. 0 0 1 0 c. 0 0 1 0 c. 0 0 1 0 c. 10TAL 0 0 c. TOTAL NON ENERGY DISCOUNTED SAVINGS (+), COST(-) (3A2+3Bd4) b. PROJECT NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X .33) \$ 4, a. IF 3D1 IS -> 3C GO TO ITEM 4 b. IF 3D1 IS -> 3C GO TO ITEM 4 b. IF 3D1 IS -> 1 GO TO ITEM 4 d. IF 3D1 DISCOUNTES [2F3+3A+(3B1d/YRS ECONOMIC LIFE)] \$ 1,	F. TOTAL	S	471	1,369		13,9
A. ANNUAL RECURRING $(+/-)$ (1) DISCOUNT FACTOR (TABLE 1) (2) DISCOUNTED SAVING/COST (3AX3A1) B. NON RECURRING SAVINGS $(+)$ / COST (-) ITEM SAVING \$ (+) YEAR OF DISCOUNT SAVINGS (+) COST \$ (-)(1) OCCURRENCE(2) FACTOR (3) COST (-) (4) a. 0 0 1 0 b. 0 0 1 0 c. 0 0 1 4 0 0 c. 1 TOTAL 0 C. TOTAL NON ENERGY DISCOUNTED SAVINGS (+), COST (-) (3A2+3Bd4) D. PROJECT NON ENERGY CALC (2F5 X .33) a. IF 3D1 IS = > 3C GO TO ITEM 4 b. IF 3D1 IS < 3C CALC SIR = (2F5+3D1)/1F c. IF 3D1 DIS < 3C CALC SIR = (2F5+3D1)/1F c. IF 3D1 DIS < 1 PROJECT DOES NOT QUALIFY 4. FIRST YEAR DOLLAR SAVINGS [2F3+3A+(3B1d/YRS ECONOMIC LIFE)] \$ 1,						
(1) DISCOUNT FACTOR (TABLE 1) (2) DISCOUNTED SAVING/COST (JAXJA1) B. NON RECURRING SAVINGS (+) / COST (-) ITEM SAVING \$ (+) YEAR OF DISCOUNT SAVINGS (+) COST \$ (-)(1) OCCURRENCE(2) FACTOR (3) COST(-) (4) a. 0 0 1 0 b. 0 0 1 0 b. 0 0 1 0 c. 0 0 1 0 c. 0 0 1 0 c. 107AL 0 0 0 1 0 c. TOTAL 0 0 0 1 4 c. TOTAL 0 0 0 1 0 c. TOTAL NON ENERGY DISCOUNTED SAVINGS(+), COST(-) (JA2+3Bd4) D. PROJECT NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X .33) a. IF 3D1 IS -> 3C CO TO ITEM 4 b. IF 3D1 IS -> 3C CALC SIR - (2F5+3D1)/1F c. IF 3D1b IS -> 1 GO TO ITEM 4 d. IF 3D1b IS -> 1 GO TO ITEM 4 4. FIRST YEAR DOLLAR SAVINGS [2F3+3A+(3B1d/YRS ECONOMIC LIFE)] \$ 1,	. NON ENERGY S	SAVINGS (+) / CO)ST (-)			
(2) DISCOUNTED SAVING/COST (3AX3A1) $\$ 0$ B. NON RECURRING SAVINGS (+) / COST (-) ITEM SAVING $\$ (+)$ YEAR OF DISCOUNT SAVINGS (+) COST $\$ (-)(1)$ OCCURRENCE(2) FACTOR (3) COST(-) (4) a. 0 0 1 0 b. 0 0 1 0 c. 0 0 1 0 c. 0 0 1 0 c. 0 0 1 0 c. TOTAL 0 0 0 1 4 d. TOTAL 0 0 0 1 4 b. 0 0 0 1 0 c. TOTAL NON ENERGY DISCOUNTED SAVINGS(+),COST(-) (3A2+3Bd4) D. PROJECT NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X .33) \$ a. IF 3D1 IS -> 3C GO TO ITEM 4 b. IF 3D1 IS < 3C CALC SIR - (2F5+3D1)/1F c. IF 3D1 IS < > 1 GO TO ITEM 4 d. IF 3D1 IS < 1 PROJECT DOES NOT QUALIFY 4. FIRST YEAR DOLLAR SAVINGS [2F3+3A+(3B1d/YRS ECONOMIC LIFE)] \$ 1,				\$	•	
B. NON RECURRING SAVINGS (+) / COST (-) ITEM SAVING \$ (+) YEAR OF DISCOUNT SAVINGS (+) COST \$ (-)(1) OCCURRENCE(2) FACTOR (3) COST(-) (4) a. 0 0 1 0 b. 0 0 1 0 c. 0 0 1 0 c. 0 0 1 0 d. TOTAL 0 0 0 1 0 c. TOTAL NON ENERGY DISCOUNTED SAVINGS(+), COST(-) (3A2+3Bd4) D. PROJECT NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X .33) \$ 4, a. IF 3D1 IS -> 3C GO TO ITEM 4 b. IF 3D1 IS <> 3C CALC SIR - (2F5+3D1)/1F c. IF 3D1b IS <> 1 GO TO ITEM 4 d. IF 3D1b IS <1 PROJECT DOES NOT QUALIFY 4. FIRST YEAR DOLLAR SAVINGS [2F3+3A+(3B1d/YRS ECONOMIC LIFE)] \$ 1,						
DISCOUNTEDITEM SAVING \$ (+) YEAR OF DISCOUNT SAVINGS (+) COST \$ (-)(1) OCCURRENCE(2) FACTOR (3) COST(-) (4)a.0010b.0010c.0010c.0010d. TOTAL0010c. TOTAL NON ENERGY DISCOUNTED SAVINGS(+), COST(-)(3A2+3Bd4)D. PROJECT NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X .33)\$4,a. IF 3D1 IS -> 3CGO TO ITEM 4\$4,b. IF 3D1 IS < 3C		SCOUNTED SAVING/			0	
ITEM SAVING \$ (+) YEAR OF DISCOUNT SAVINGS (+) COST \$ (-)(1) OCCURRENCE(2) FACTOR (3) COST(-) (4) a. 0 0 1 0 b. 0 0 1 0 c. 0 0 0 1 4 c. 0 0 0 0 0 c. TOTAL NON ENERGY DISCOUNTED SAVINGS(+), COST(-) (3A2+3Bd4) D. PROJECT NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X .33) \$ a. IF 3D1 IS -> 3C GO TO ITEM 4 b. IF 3D1 IS -> 3C GO TO ITEM 4 b. IF 3D1 IS -> 1 GO TO ITEM 4 d. IF 3D1b IS -> 1 GO TO ITEM 4 d. IF 3D1b IS < 1 PROJECT DOES NOT QUALIFY 4. FIRST YEAR DOLLAR SAVINGS [2F3+3A+(3B1d/YRS ECONOMIC LIFE)] \$ 1,		TIRRING SAVINGS	(+) / COST (-			
COST \$ (-)(1) OCCURRENCE(2) FACTOR (3) $COST(-)$ (4) a. 0 0 1 0 b. 0 0 1 0 c. 0 0 1 0 c. 0 0 1 0 c. 0 0 1 0 d. TOTAL 0 0 1 c. TOTAL 0 0 0 c. TOTAL NON ENERGY DISCOUNTED SAVINGS(+),COST(-) (3A2+3Bd4) D. PROJECT NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X .33) \$ 4, a. IF 3D1 IS < 3C		CURRING SAVINGS	(+) / COST (-		DISCOUNTED	
b. 0 0 1 0 c. 0 0 1 0 d. TOTAL 0 0 1 0 c. TOTAL 0 0 1 0 c. TOTAL 0 0 0 0 c. TOTAL 0 0 0 0 c. TOTAL NON ENERGY DISCOUNTED SAVINGS(+), COST(-) (3A2+3Bd4) D. PROJECT NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X .33) \$ 4, a. IF 3D1 IS -> 3C GO TO ITEM 4 \$ 4, b. IF 3D1 IS < 3C	B. NON REC			1		
b. 0 0 1 0 c. 0 0 1 0 d. TOTAL 0 0 1 0 c. TOTAL 0 0 1 0 c. TOTAL 0 0 0 0 c. TOTAL 0 0 0 0 c. TOTAL NON ENERGY DISCOUNTED SAVINGS(+), COST(-) (3A2+3Bd4) D. PROJECT NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X .33) \$ 4, a. IF 3D1 IS -> 3C GO TO ITEM 4 \$ 4, b. IF 3D1 IS < 3C	B. NON REC	SAVING \$ (+)	YEAR OF	DISCOUNT S	SAVINGS (+)	(4)
 c. 0 0 1 0 d. TOTAL 0 O. TOTAL 0 C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+), COST(-) (3A2+3Bd4) D. PROJECT NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X .33) a. IF 3D1 IS = > 3C GO TO ITEM 4 b. IF 3D1 IS < 3C CALC SIR = (2F5+3D1)/1F c. IF 3D1b IS < > 1 GO TO ITEM 4 d. IF 3D1b IS < 1 PROJECT DOES NOT QUALIFY 4. FIRST YEAR DOLLAR SAVINGS [2F3+3A+(3B1d/YRS ECONOMIC LIFE)] \$ 1, 	B. NON REC	SAVING \$ (+)	YEAR OF OCCURRENCE(2)	DISCOUNT S FACTOR (3)	SAVINGS (+) COST(-) ((4)
 d. TOTAL 0 0 0 C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+),COST(-) (3A2+3Bd4) D. PROJECT NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X .33) a. IF 3D1 IS = > 3C GO TO ITEM 4 b. IF 3D1 IS < 3C CALC SIR = (2F5+3D1)/1F c. IF 3D1b IS = > 1 GO TO ITEM 4 d. IF 3D1b IS < 1 PROJECT DOES NOT QUALIFY 4. FIRST YEAR DOLLAR SAVINGS [2F3+3A+(3B1d/YRS ECONOMIC LIFE)] \$ 1, 	B. NON REC ITEM a.	SAVING \$ (+)	YEAR OF OCCURRENCE(2) 0	DISCOUNT S FACTOR (3)	SAVINGS (+) COST(-) (O	(4)
 D. PROJECT NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X .33) a. IF 3D1 IS = > 3C GO TO ITEM 4 b. IF 3D1 IS < 3C CALC SIR = (2F5+3D1)/1F c. IF 3D1b IS = > 1 GO TO ITEM 4 d. IF 3D1b IS < 1 PROJECT DOES NOT QUALIFY 4. FIRST YEAR DOLLAR SAVINGS [2F3+3A+(3B1d/YRS ECONOMIC LIFE)] \$ 1, 	B. NON REC ITEM a. b.	SAVING \$ (+)	YEAR OF OCCURRENCE(2) 0 0	DISCOUNT FACTOR (3)	SAVINGS (+) COST(-) (0 0	(4)
<pre>(1) 25% MAX NON ENERGY CALC (2F5 X .33)</pre>	B. NON REC ITEM a. b. c.	SAVING \$ (+) COST \$ (-)(1) 0 0 0	YEAR OF OCCURRENCE(2) 0 0	DISCOUNT FACTOR (3)	SAVINGS (+) COST(-) (0 0 0	(4)
<pre>(1) 25% MAX NON ENERGY CALC (2F5 X .33)</pre>	B. NON REC ITEM a. b. c. d. TOTAL	SAVING \$ (+) COST \$ (-)(1) 0 0 0 0	YEAR OF OCCURRENCE(2) 0 0 0 0	DISCOUNT FACTOR (3)	SAVINGS (+) COST(-) (0 0 0 0	
 b. IF 3D1 IS < 3C CALC SIR = (2F5+3D1)/1F c. IF 3D1b IS = > 1 GO TO ITEM 4 d. IF 3D1b IS < 1 PROJECT DOES NOT QUALIFY 4. FIRST YEAR DOLLAR SAVINGS [2F3+3A+(3B1d/YRS ECONOMIC LIFE)] \$ 1, 	B. NON REC ITEM a. b. c. d. TOTAL C. TOTAL N	SAVING \$ (+) COST \$ (-)(1) 0 0 0 0 0 0 0 0 0 0	YEAR OF OCCURRENCE(2) 0 0 0 0 0 0 0	DISCOUNT 5 FACTOR (3)	SAVINGS (+) COST(-) (0 0 0 0	
 c. IF 3D1b IS = > 1 GO TO ITEM 4 d. IF 3D1b IS < 1 PROJECT DOES NOT QUALIFY 4. FIRST YEAR DOLLAR SAVINGS [2F3+3A+(3B1d/YRS ECONOMIC LIFE)] \$ 1, 	B. NON REC ITEM a. b. c. d. TOTAL C. TOTAL D. PROJECT (1) 25% MA	SAVING \$ (+) COST \$ (-)(1) 0 0 0 0 NON ENERGY DISCO T NON ENERGY QUA AX NON ENERGY CA	YEAR OF OCCURRENCE(2) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	DISCOUNT 5 FACTOR (3) 1 1 1 (+),COST(-) ST	SAVINGS (+) COST(-) (0 0 0 0 0 (3A2+3Bd4)	
 d. IF 3D1b IS < 1 PROJECT DOES NOT QUALIFY 4. FIRST YEAR DOLLAR SAVINGS [2F3+3A+(3B1d/YRS ECONOMIC LIFE)] \$ 1, 	B. NON REC ITEM a. b. c. d. TOTAL C. TOTAL D. PROJECT (1) 25% MA a. IF 3	SAVING \$ (+) COST \$ (-)(1) 0 0 0 0 NON ENERGY DISCO T NON ENERGY QUA AX NON ENERGY QUA AX NON ENERGY CA 3D1 IS = > 3C	YEAR OF OCCURRENCE(2) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	<pre> DISCOUNT S FACTOR (3) 1 1 (+),COST(-) ST)</pre>	SAVINGS (+) COST(-) (0 0 0 0 0 (3A2+3Bd4)	
	B. NON REC ITEM a. b. c. d. TOTAL C. TOTAL C. TOTAL D. PROJECT (1) 25% MA a. IF 3 b. IF 3	SAVING \$ (+) COST \$ (-)(1) 0 0 0 0 0 0 0 0 0 0 0 0 0	YEAR OF OCCURRENCE(2) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	<pre> DISCOUNT S FACTOR (3) 1 1 (+),COST(-) ST)</pre>	SAVINGS (+) COST(-) (0 0 0 0 0 (3A2+3Bd4)	
	B. NON REC ITEM a. b. c. d. TOTAL C. TOTAL C. TOTAL D. PROJECT (1) 25% MA a. IF 3 b. IF 3 c. IF 3	SAVING \$ (+) COST \$ (-)(1) 0 0 0 0 0 NON ENERGY DISCO T NON ENERGY QUA AX NON ENERGY QUA AX NON ENERGY CA 3D1 IS $- > 3C$ 3D1 IS $- > 3C$ 3D1 IS $- > 1$	YEAR OF OCCURRENCE(2) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	DISCOUNT 5 FACTOR (3) 1 1 1 (+),COST(-) ST) 2F5+3D1)/1F	SAVINGS (+) COST(-) (0 0 0 0 0 (3A2+3Bd4)	
D. TOTAL NET DISCOUNTED SAVINGS (2F5+3C) \$ 13,	 B. NON RECLITEM a. b. c. d. TOTAL C. TOTAL N D. PROJECT (1) 25% MA a. IF 2 b. IF 2 d. IF 2 	SAVING \$ (+) COST \$ (-)(1) 0 0 0 0 0 0 0 0 0 0 0 0 0	YEAR OF OCCURRENCE(2) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	DISCOUNT 5 FACTOR (3) 1 1 1 (+),COST(-) ST) 2F5+3D1)/1F NOT QUALIFY	SAVINGS (+) COST(-) (0 0 0 0 (3A2+3Bd4) \$	4,6
	 B. NON RECLITEM a. b. c. d. TOTAL C. TOTAL M D. PROJECT (1) 25% MA a. IF 3 b. IF 3 c. IF 3 d. IF 3 	SAVING \$ (+) COST \$ (-)(1) 0 0 0 0 0 0 0 0 0 0 0 0 0	YEAR OF OCCURRENCE(2) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	DISCOUNT 5 FACTOR (3) 1 1 1 (+),COST(-) ST) 2F5+3D1)/1F NOT QUALIFY	SAVINGS (+) COST(-) (0 0 0 (3A2+3Bd4) \$ LIFE)] \$	4,6



LOCATION:			PROJECT NO.		1000
	COMBINED CONTRO	DLS	FISCAL YEAR:		1988
PORTION NAME:	MISC. BLDGS		C		15
REGION NUMBER:	4		ECONOMIC LIF	E IN YEARS:	LO CUNDE
ANALYSIS DATE:	JUNE 23 1987		PREPARED BY:		LO SUNDE
1. INVESTMENT C					1 1 24
	JCTION COST			\$	4,434 244
B. SIOH					266
C. DESIGN		10.1018 0			4,450
	CREDIT CALC (1A-				0
	INVESTMENT (1D-1)			\$	4,450
F. IUIAL	INVESTMENT (ID-II	5)			
2. ENERGY SAVIN	NGS (+) / (-)			D CANTNER	
ANALYSIS I	DATE ANNUAL SAVIN				
	COST	SAVINGS	ANNUAL \$	DISCOUNT	DISCOUNTED
	\$/MBTU(1)	MBTU/YR(2)	SAVINGS (3)	FACTOR(4)	SAVINGS(5)
A. ELEC	8.15			0	0
B. DIST		0		and the loss of th	0
C. RESID	0	0			õ
D. NG E. COAL	2.91		553		5,624
F. TOTAL	\$	190	553		5,624
	SAVINGS (+) / CO			0	
	RECURRING (+/-)		\$	0 7.61	
(1) DI	SCOUNT FACTOR (T	ABLE 1)			
(2) DI	SCOUNTED SAVING/	COST (JAXJAI)	\$	U	
B. NON RE	CURRING SAVINGS	(+) / COSI (-	,	DISCOUNTED	
TTEN	SAVING \$ (+)	VEAR OF			
ITEM	COST \$ (-)(1)	OCCURRENCE(2)	FACTOR (3)	COST(-)	(4)
а.	0	C	1	0	
b.	0	C) 1	0	
с.	0	C) 1	0	
d. TOTAL	0			0	
C. TOTAL	NON ENERGY DISCO	OUNTED SAVINGS	S(+),COST(-)	(3A2+3Bd4))
D. PROJEC	T NON ENERGY QUA	LIFICATION TH	EST		
(1) 25% M	IAX NON ENERGY CA	ALC (2F5 X .33	3)	\$	1,85
a. IF	3D1 IS = > 3C	GO TO ITEM 4	(0D5 (2D1) /1E		1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1
	3D1 IS < 3C		(2F5+3D1)/1F		
c. IF d. IF	3D1b IS $= > 1$ 3D1b IS < 1	PROJECT DOES	NOT QUALIFY		
	DOLLAR SAVINGS			C LIFE)] \$	55
				\$	5,62
	DISCOUNTED SAVING				영상 영화 가지
6. SIR (IF < 3	1 PROJECT DOES NO	OT QUALIFY) S	IR = (5/1F) =	•	1.3



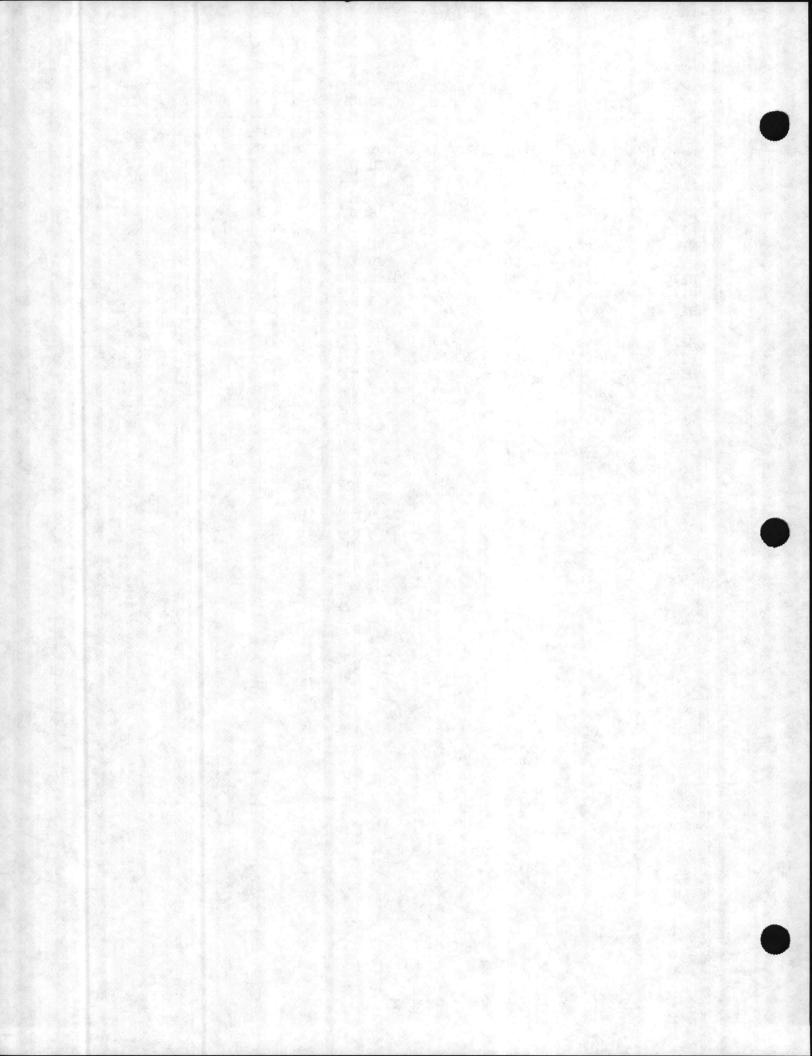
	PARADISE POINT		PROJECT NO.		1000
ORTION NAME:	COMBINED CONTRA	OLS	FISCAL YEAR:		1988
EGION NUMBER:			ECONOMIC LIF	TE TN VEARS	15
	JUNE 23 1987		PREPARED BY:		
NALISIS DAIL.	JONE 25 1907	Dates of 1	Indinado Di.		20 001.02
. INVESTMENT					1 01/
	UCTION COST			\$	1,814
B. SIOH					100
C. DESIGN		10.10.0			
	CREDIT CALC (1A				1,82
	E VALUE OF EXIST INVESTMENT (1D-1			s	1,82
F. IOIAL	INVESIMENT (ID-I	E)		*	1,02
. ENERGY SAVI	NGS (+) / (-)			D CANTNOC	
ANALYSIS	DATE ANNUAL SAVI	NGS, UNIT COS	T Ş DISCOUNT	CD SAVINGS	
		SAVINGS			DISCOUNTER
FUEL		MBTU/YR(2)			SAVINGS(5)
A. ELEC	8.15			0	a ganta dan sa
B. DIST	0	0		0	
C. RESID		0		0	
D. NG	0	0		0 10.18	2,10
E. COAL	2.91	71	207	10.18	2,10
F. TOTAL	\$	71	207		2,10
	SAVINGS (+) / CO		ŝ	0	
A. ANNUAL (1) DI	SAVINGS (+) / CO RECURRING (+/-) SCOUNT FACTOR (T SCOUNTED SAVING/	ABLE 1)	\$ \$	0 7.61 0	
A. ANNUAL (1) DI (2) DI	RECURRING (+/-) SCOUNT FACTOR (1	CABLE 1) COST (3AX3A1)	\$	7.61	
A. ANNUAL (1) DI (2) DI	RECURRING (+/-) SCOUNT FACTOR (I SCOUNTED SAVING/ CURRING SAVINGS	CABLE 1) COST (3AX3A1) (+) / COST (-	\$	7.61 0 DISCOUNTED	
A. ANNUAL (1) DI (2) DI	RECURRING (+/-) SCOUNT FACTOR (I SCOUNTED SAVING/ CURRING SAVINGS SAVING \$ (+)	CABLE 1) COST (3AX3A1) (+) / COST (- YEAR OF	\$) DISCOUNT	7.61 0 DISCOUNTED SAVINGS (+)	
A. ANNUAL (1) DI (2) DI B. NON RE	RECURRING (+/-) SCOUNT FACTOR (I SCOUNTED SAVING/ CURRING SAVINGS	CABLE 1) COST (3AX3A1) (+) / COST (- YEAR OF	\$) DISCOUNT	7.61 0 DISCOUNTED SAVINGS (+)	4)
A. ANNUAL (1) DI (2) DI B. NON RE ITEM	RECURRING (+/-) SCOUNT FACTOR (I SCOUNTED SAVING/ CURRING SAVINGS SAVING \$ (+)	CABLE 1) COST (3AX3A1) (+) / COST (- YEAR OF	\$) DISCOUNT FACTOR (3)	7.61 0 DISCOUNTED SAVINGS (+)	4)
A. ANNUAL (1) DI (2) DI B. NON RE ITEM a.	RECURRING (+/-) SCOUNT FACTOR (T SCOUNTED SAVING/ CURRING SAVINGS SAVING \$ (+) COST \$ (-)(1)	CABLE 1) COST (3AX3A1) (+) / COST (- YEAR OF OCCURRENCE(2)	\$) DISCOUNT FACTOR (3) 1	7.61 O DISCOUNTED SAVINGS (+) COST(-) (4)
A. ANNUAL (1) DI (2) DI B. NON RE ITEM	RECURRING (+/-) SCOUNT FACTOR (T SCOUNTED SAVING/ CURRING SAVINGS SAVING \$ (+) COST \$ (-)(1)	CABLE 1) COST (3AX3A1) (+) / COST (- YEAR OF OCCURRENCE(2) 0	\$) DISCOUNT FACTOR (3) 1 1	7.61 O DISCOUNTED SAVINGS (+) COST(-) (0	4)
A. ANNUAL (1) DI (2) DI B. NON RE ITEM a. b.	RECURRING (+/-) SCOUNT FACTOR (T SCOUNTED SAVING/ CURRING SAVINGS SAVING \$ (+) COST \$ (-)(1) 0 0	CABLE 1) COST (3AX3A1) (+) / COST (- YEAR OF OCCURRENCE(2) 0 0	\$) DISCOUNT FACTOR (3) 1 1	7.61 O DISCOUNTED SAVINGS (+) COST(-) (0 0	4)
A. ANNUAL (1) DI (2) DI B. NON RE ITEM a. b. c. d. TOTAL	RECURRING (+/-) SCOUNT FACTOR (T SCOUNTED SAVING/ CURRING SAVINGS SAVING \$ (+) COST \$ (-)(1) 0 0 0	CABLE 1) COST (3AX3A1) (+) / COST (- YEAR OF OCCURRENCE(2) 0 0 0 0 0	\$) DISCOUNT FACTOR (3) 1 1 1	7.61 0 DISCOUNTED SAVINGS (+) COST(-) (0 0 0 0	
A. ANNUAL (1) DI (2) DI B. NON RE ITEM a. b. c. d. TOTAL C. TOTAL	RECURRING (+/-) SCOUNT FACTOR (T SCOUNTED SAVING/ CURRING SAVINGS SAVING \$ (+) COST \$ (-)(1) 0 0 0 0 0 0 0 0 0	CABLE 1) COST (3AX3A1) (+) / COST (- YEAR OF OCCURRENCE(2) 0 0 0 0 0 0 0 0 0 0 0 0 0	\$) DISCOUNT FACTOR (3) 1 1 1 1 (+),COST(-)	7.61 0 DISCOUNTED SAVINGS (+) COST(-) (0 0 0 0	
A. ANNUAL (1) DI (2) DI B. NON RE ITEM a. b. c. d. TOTAL C. TOTAL D. PROJEC	RECURRING (+/-) SCOUNT FACTOR (T SCOUNTED SAVING/ CURRING SAVINGS SAVING \$ (+) COST \$ (-)(1) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	CABLE 1) COST (3AX3A1) (+) / COST (- YEAR OF OCCURRENCE(2) 0 0 0 0 0 0 0 0 0 0 0 0 0	\$) DISCOUNT FACTOR (3) 1 1 1 1 5 (+),COST(-) ST	7.61 0 DISCOUNTED SAVINGS (+) COST(-) (0 0 0 0 0 0 (3A2+3Bd4)	
A. ANNUAL (1) DI (2) DI B. NON RE ITEM a. b. c. d. TOTAL C. TOTAL D. PROJEC (1) 25% M	RECURRING (+/-) SCOUNT FACTOR (T SCOUNTED SAVING/ CURRING SAVINGS SAVING \$ (+) COST \$ (-)(1) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	CABLE 1) COST (3AX3A1) (+) / COST (- YEAR OF OCCURRENCE(2) 0 0 0 0 0 0 0 0 0 0 0 0 0	\$) DISCOUNT FACTOR (3) 1 1 1 1 5 (+),COST(-) ST	7.61 0 DISCOUNTED SAVINGS (+) COST(-) (0 0 0 0	
A. ANNUAL (1) DI (2) DI B. NON RE ITEM a. b. c. d. TOTAL C. TOTAL D. PROJEC (1) 25% M a. IF	RECURRING (+/-) SCOUNT FACTOR (T SCOUNTED SAVING/ CURRING SAVINGS SAVING \$ (+) COST \$ (-)(1) 0 0 0 0 NON ENERGY DISCO T NON ENERGY QUA AX NON ENERGY CA 3D1 IS - > 3C	CABLE 1) COST (3AX3A1) (+) / COST (- YEAR OF OCCURRENCE(2) 0 0 0 0 0 0 0 0 0 0 0 0 0	\$) DISCOUNT FACTOR (3) 1 1 1 (+),COST(-) ST ()	7.61 0 DISCOUNTED SAVINGS (+) COST(-) (0 0 0 0 0 0 (3A2+3Bd4)	69
A. ANNUAL (1) DI (2) DI B. NON RE ITEM a. b. c. d. TOTAL C. TOTAL C. TOTAL D. PROJEC (1) 25% M a. IF b. IF	RECURRING (+/-) SCOUNT FACTOR (T SCOUNTED SAVING/ CURRING SAVINGS SAVING \$ (+) COST \$ (-)(1) 0 0 0 0 NON ENERGY DISCO T NON ENERGY QUA AX NON ENERGY QUA AX NON ENERGY CA 3D1 IS = > 3C 3D1 IS < 3C	CABLE 1) COST (3AX3A1) (+) / COST (- YEAR OF OCCURRENCE(2) 0 0 0 0 0 0 0 0 0 0 0 0 0	\$) DISCOUNT FACTOR (3) 1 1 1 (+),COST(-) ST ()	7.61 0 DISCOUNTED SAVINGS (+) COST(-) (0 0 0 0 0 0 (3A2+3Bd4)	69
A. ANNUAL (1) DI (2) DI B. NON RE ITEM a. b. c. d. TOTAL C. TOTAL C. TOTAL D. PROJEC (1) 25% M a. IF b. IF c. IF	RECURRING (+/-) SCOUNT FACTOR (T SCOUNTED SAVING/ CURRING SAVINGS SAVING \$ (+) COST \$ (-)(1) 0 0 0 0 NON ENERGY DISCO T NON ENERGY QUA AX NON ENERGY CA 3D1 IS - > 3C	CABLE 1) COST (3AX3A1) (+) / COST (- YEAR OF OCCURRENCE(2) 0 0 0 0 0 0 0 0 0 0 0 0 0	\$) DISCOUNT FACTOR (3) 1 1 1 (+),COST(-) ST) 2F5+3D1)/1F	7.61 0 DISCOUNTED SAVINGS (+) COST(-) (0 0 0 0 0 0 (3A2+3Bd4)	69
A. ANNUAL (1) DI (2) DI B. NON RE ITEM a. b. c. d. TOTAL C. TOTAL C. TOTAL D. PROJEC (1) 25% M a. IF b. IF c. IF d. IF	RECURRING $(+/-)$ SCOUNT FACTOR (T SCOUNTED SAVING/ CURRING SAVINGS SAVING \$ (+) COST \$ (-)(1) 0 0 0 0 NON ENERGY DISCO T NON ENERGY DISCO T NON ENERGY QUA AX NON ENERGY QUA AX NON ENERGY QUA AX NON ENERGY CA 3D1 IS = > 3C 3D1 IS = > 1 3D1b IS = 1	ABLE 1) COST (3AX3A1) (+) / COST (- YEAR OF OCCURRENCE(2) 0 0 0 0 0 0 0 0 0 0 0 0 0	\$) DISCOUNT FACTOR (3) 1 1 1 1 (+),COST(-) (-) (-) (-) (-) (-) (-) (-) (-) (-)	7.61 0 DISCOUNTED SAVINGS (+) COST(-) (0 0 0 0 (3A2+3Bd4) \$	69
A. ANNUAL (1) DI (2) DI B. NON RE ITEM a. b. c. d. TOTAL C. TOTAL C. TOTAL D. PROJEC (1) 25% M a. IF b. IF c. IF d. IF	RECURRING $(+/-)$ SCOUNT FACTOR (T SCOUNTED SAVING/ CURRING SAVINGS SAVING \$ (+) COST \$ (-)(1) 0 0 0 0 NON ENERGY DISCO T NON ENERGY QUA AX NON ENERGY QUA AX NON ENERGY CA 3D1 IS = > 3C 3D1 IS < 3C 3D1 IS = > 1	ABLE 1) COST (3AX3A1) (+) / COST (- YEAR OF OCCURRENCE(2) 0 0 0 0 0 0 0 0 0 0 0 0 0	\$) DISCOUNT FACTOR (3) 1 1 1 1 (+),COST(-) (-) (-) (-) (-) (-) (-) (-) (-) (-)	7.61 0 DISCOUNTED SAVINGS (+) COST(-) (0 0 0 0 (3A2+3Bd4) \$	69 20
A. ANNUAL (1) DI (2) DI B. NON RE ITEM a. b. c. d. TOTAL C. TOTAL C. TOTAL D. PROJEC (1) 25% M a. IF b. IF c. IF d. IF 4. FIRST YEAR	RECURRING $(+/-)$ SCOUNT FACTOR (T SCOUNTED SAVING/ CURRING SAVINGS SAVING \$ (+) COST \$ (-)(1) 0 0 0 0 NON ENERGY DISCO T NON ENERGY DISCO T NON ENERGY QUA AX NON ENERGY QUA AX NON ENERGY QUA AX NON ENERGY CA 3D1 IS = > 3C 3D1 IS = > 1 3D1b IS = 1	ABLE 1) (COST (3AX3A1) (+) / COST (- YEAR OF OCCURRENCE(2) 0 0 0 0 0 0 0 0 0 0 0 0 0	\$) DISCOUNT FACTOR (3) 1 1 1 1 (+),COST(-) (-) (-) (-) (-) (-) (-) (-) (-) (-)	7.61 0 DISCOUNTED SAVINGS (+) COST(-) (0 0 0 0 (3A2+3Bd4) \$	69



COMBINED CONTROLS ECO HOSPITAL POINT

BUILDIN		SAVINGS		TOTAL	ENERGY SAVING	CAPITOL	CTD
NO.	NS	OALS	HW	MBTU/YR	\$/YR	\$	SIR
H14	0.000	2.722	4.264	6.986	16	2107	0.08
H15A	1554.782	711.213		2265.999	5053	5441	9.42
H16	0.000	6.811		8.143	18	2107	0.09
H17	137.516	43.307	N/A	180.823	403	1814	2.26
H17N	137.516	58.325	and the second	195.841	437	1814	2.44
H18	70.422	22.605	N/A	93.027	207	1814	1.16
H19	74.772	20.379	N/A	95.151	212	1814	1.19
H21	76.150	31.205	N/A	107.355	239	1814	1.34
H23	0.000	14.637	6.055	20.692	46	2107	0.22
H24	0.000	9.419	6.055	14.474	32	2107	0.15
H36	54.789	5.106	N/A	59.895	134	1814	0.75
H39	10.407	1.675	0.434	12.516	28	2107	0.14

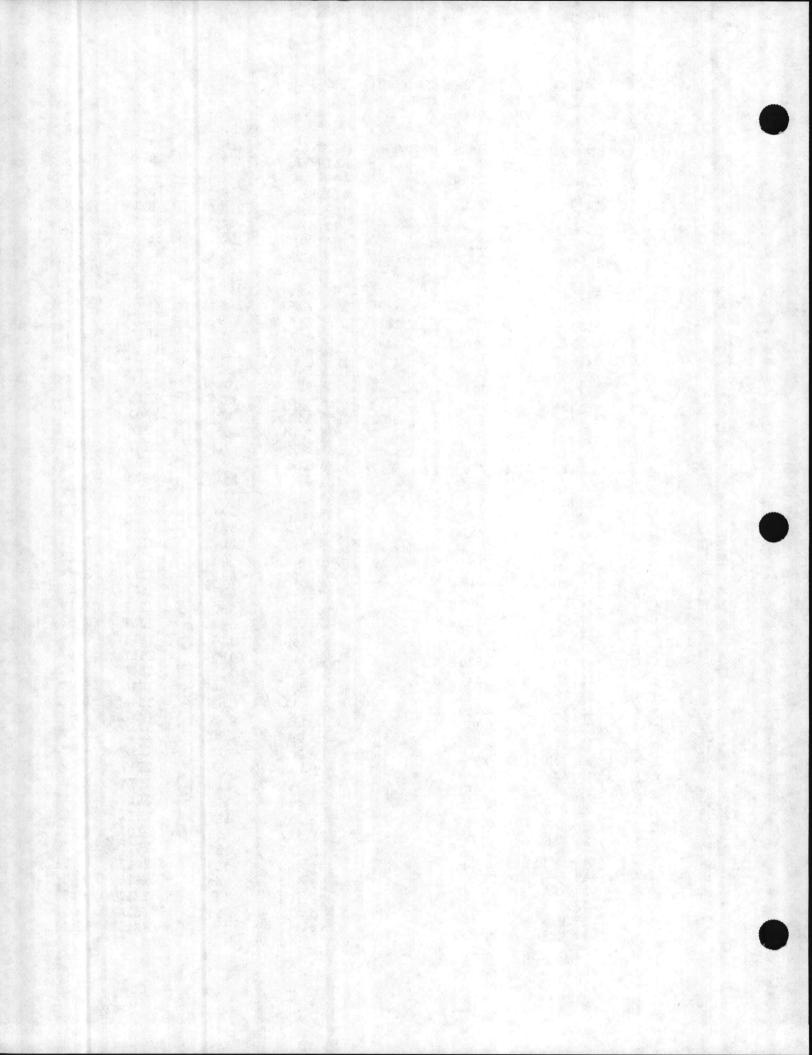
NS = Night Setback OALS = Outside Air Limit Shutoff HW = Hot Water Outside Air Reset



COMBINED CONTROLS ECO HADNOT POINT

BLDG. E NO.	BUILDING ENERG	Y SAVINGS OALS	(MBTU/YR) HW	TOTAL MBTU/YR	ENERGY SAVING \$/YR	CAPITOL COST \$	SIR
					479	1814	2.68
1		114.009		214.913 102.095	228	1814	1.27
2		43.080		102.095	44	2217	0.20
4		2.090		54.001	120	5844	0.21
6	0.000	54.001		192.436	429	5844	0.74
8	138.598	53.838		45.723	102	4232	0.24
11	40.053	5.670			149	1814	0.83
13	27.688	39.146	0 500	66.834	144	2107	0.70
14	60.674	1.549	2.532	64.755		2107	1.82
15	126.321	38.205	5.271	169.797	78	1814	0.44
16	32.995	2.062		35.057	121	1814	0.67
17	32.020	22.024		54.044		1814	0.17
18	0.000	13.549		13.549	30	1814	1.08
25	31.282	55.707		86.989	194	1814	0.46
27	15.781	21.095		36.876	82	2107	0.43
41	31.221	7.589	1.302	40.112	89	1814	0.30
43	12.538	11.332		23.870	53	2107	0.34
50	27.688	2.583	1.155	31.426	70	2620	1.54
54	114.447	63.738		178.185	397		0.99
58	110.207	21.680		131.887	294	3023	1.28
59	99.842	47.862		147.704	329	2620	0.73
63	79.723	57.199		136.922	305	4232	0.73
65	104.909	63.243		168.152	375	5441	
66	87.558	4.623	3.654	95.835	214	2107	1.03
67	0.000	16.109	4.599	20.708	46	2107	0.22
84	214.298	64.018		278.316	621	2217	2.84
102	138.598	53.092		191.690	427	5441	0.80
106	86.753	29.644		116.397	260	2217	1.19
107	218.481	29.917		248.398	554	2217	2.53
114		23.542		51.230	114	1814	0.64
115		42.870		85.118	190	2217	0.87
117		12.175		54.331	121	1814	0.68
119		16.516		37.771	84	1814	0.47
123	42.472	26.044		68.516	153	1814	0.85
123		24.157		51.845	116	1814	0.65
201		42.862		85.110	190	2217	0.87
201		19.445		35.183	78	1814	0.44
203		30.649		249.130	556	2217	2.54
		25.867		53.555	119	1814	0.67
214		25.640		53.328	119	1814	0.67
216		24.568		52.256	117	1814	0.65
219		24.500	0.865	24.527	55	2107	0.26
221			0.005	60.496	135	1814	0.75
223		32.392		247.760	553	2217	2.53
226		29.279		29.807	66	1814	0.37
233		14.026		78.108	174	2217	0.80
300		46.031		40.712	91	1814	0.51
302		22.788		58.654	131	1814	0.73
304	27.688	30.966		50.054	101	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	





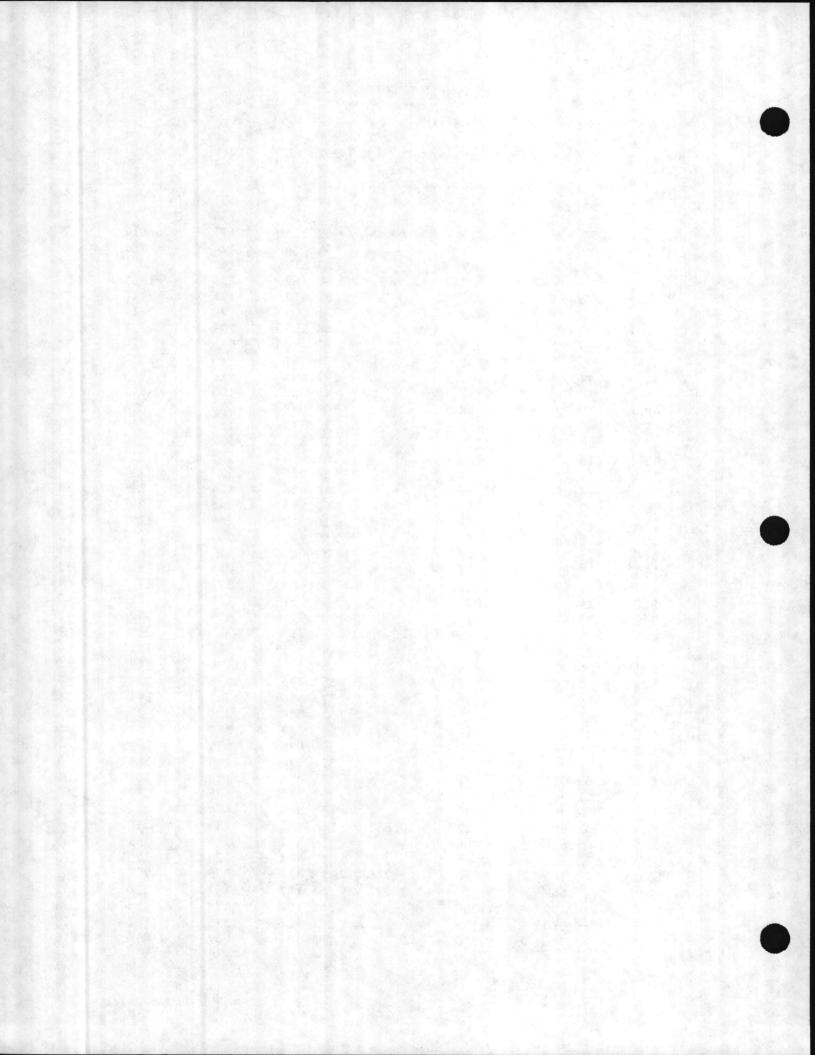
COMBINED CONTROLS ECO HADNOT POINT

DG.	BUILDING ENE NS	RGY SAVINGS OALS	(MBTU/YR) HW	TOTAL MBTU/YR	ENERGY SAVING \$/YR	CAPITOL COST \$	SIR
 	си						
 307	218.481	28.748		247.229	551	2217	2.52
314	86.753	31.621		118.374	264	2217	1.21
315	27.688	24.623		52.311	117	1814	0.65
317	27.688	27.778		55.466	124	1814	0.69
320	25.837	37.677		63.514	142	1814	0.79
400		33.179		60.867	136	1814	
401		45.024		87.272	195	2217	0.89
403	15.738	15.471		31.209	70	1814	0.39
408		48.792		48.792	109	2217	0.50
412		81.958		81.958	183	1814	1.02
416		28.285		51.362	115	1814	0.64
417		46.846		185.444	414	5844	0.72
419		19.594		47.282	105	1814	0.59
420		105.048		105.048	234	1814	1.31
422		52.773		52.773	118	5844	0.20
423		31.280		59.384	132	1814	0.74
424		30.183		248.664	555	2217	2.54
500		43.723		166.935	372	2217	1.70
501		18.768		46.456	104	1814	0.58
502		66.285		66.285	148	5844	0.26
508		30.722	3.620	110.515		2107	1.19
509		32.508		250.989		2217	2.56
516		22.928		52.443	117	1814	0.65
518		7.395		25.319	56	1814	0.32
520		14.893		35.629	79	1814	0.44
526		18.697		48.212	108	1814	0.60
751				205.972	459	3426	1.36
898		3.386	3.401	6.787	15	2107	0.07
900		12.737	STATISTICS.	141.318	315	1814	1.76
901		23.839		668.343		3426	4.41
902		84.885		653.975	1458	2217	6.67
904		6.468		575.558	1283	1814	7.18
905		41.534		324.039	723	1814	4.04
907		36.267		605.357	1350	1814	7.55
908		43.932		196.698	439	3023	1.47
909		87.560		531.828	1186	1814	6.63
910		13.321		75.383	168	1814	0.94
914		25.876		308.381	688	1814	3.85
915		96.464		665.554	1484	1814	8.30
916		3.212	20.683	554.902	1237	2107	5.96
1002		0.860	20.005	6.534	15	1814	0.08
1002		2.495		57.547	128	1814	0.72
1004		4.928	4.746	123.417	275	2107	1.33
1005		19.052	1.276	48.177	107	2107	0.52
1011		14.307	1.270	640.499	1428	2217	6.54
		2.732		571.822	1275	1814	7.13
1012		8.710	3.737	108.393	242	2107	1.16





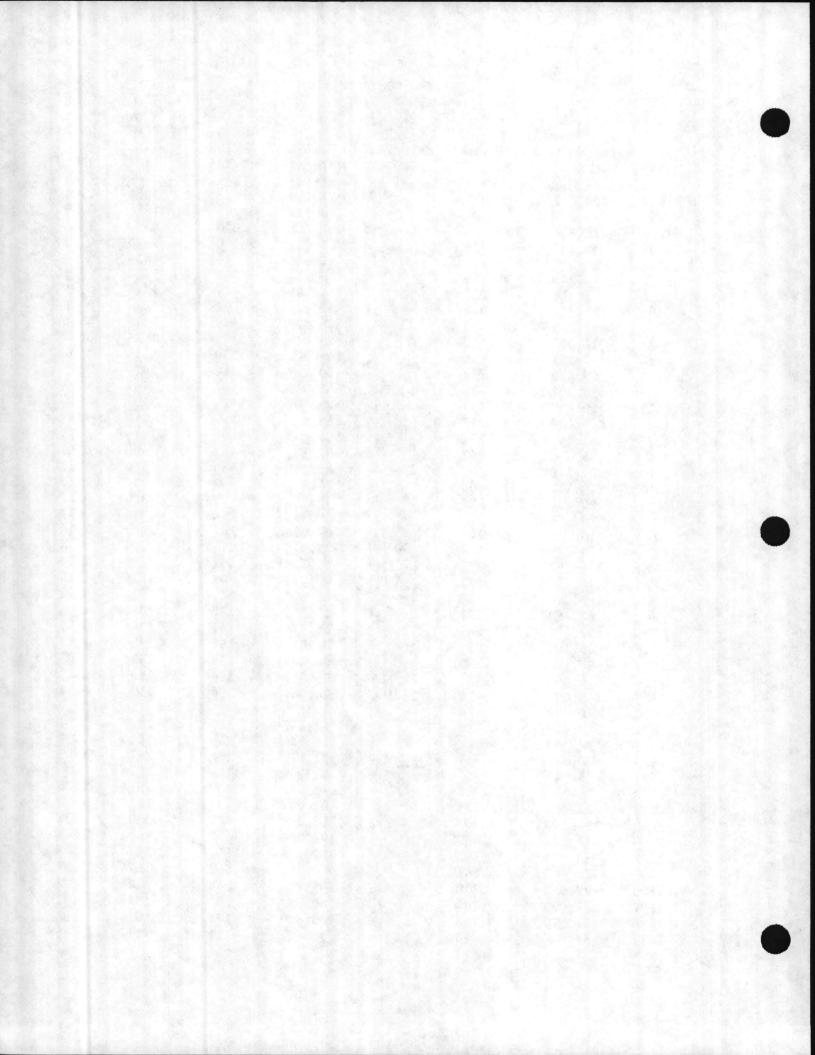




COMBINED CONTROLS ECO HADNOT POINT

BLDG. NO.	BUILDING ENE NS	RGY SAVINGS OALS	(MBTU/YR) HW	TOTAL MBTU/YR	ENERGY SAVING \$/YR	CAPITOL COST \$	SIR
		76 057		277.040	618	5038	1.24
1041	200.083			20.399	45	1814	0.25
1100	14.192	6.207		367.750	820	6650	1.25
1101	278.818	88.932		85.068	190	2620	0.73
1103	35.132	49.936 10.297		35.645	79	1814	0.44
1104		11.198		36.546	81	1814	0.46
1105	25.348	9.017		34.365	77	1814	0.43
1106	25.348	6.925		32.273	72	1814	0.40
1107	25.348	107.372		389.877	869	1814	4.86
1108	282.505	8.810		29.865	67	1814	0.37
1111	21.055	0.816		241.703	539	1814	3.01
1114		0.753		50.228	112	1814	0.63
1115	49.475	4.436	24.390	655.018	1461	2107	7.03
1116		4.253	22.166	595.509	1328	2107	6.39
1117		50.875	22.100	619.965	1383	1814	7.73
1118		22.871		164.435	367	1814	2.05
1120		56.657		202.112	451	2620	1.75
1200		61.347		643.165	1434	1814	8.02
1201		150.505		434.637	969	4232	2.32
1202		9.723		29.917	67	1814	0.37
1207		9.723		29.713	66	1814	0.37
1208		28.142	3.497	107.956		2107	1.16
1209		11.929	5.457	275.918	615	1814	3.44
1211 1212		4.721	24.390	655.303	1461	2107	7.04
1212		18.822	24.370	93.226	208	1814	1.16
1301		79.598		648.688	1447	2217	6.62
1301		3.591	til salet at ya	84.373	188	1814	1.05
1302		13.546		66.014	147	1814	0.82
1304		17.830		86.024	192	1814	1.07
1309		16.369		84.563	189	1814	1.05
1316		4.717	22.166	595.973	1329	2107	6.40
1317		33.728	22.166	624.984	1394	2107	6.71
1400		10.396	22.100	10.396	23	1814	0.13
1400		36.785		147.583	329	2217	1.51
1403		34.276		111.584	249	1814	1.39
140.		26.514		87.124	194	1814	1.09
140		25.752		51.100	114	1814	0.64
140		15.705		83.899	187	1814	1.05
141		13.815		82.009	183	1814	1.02
145		8.967	7.772	216.279	482	2107	2.32
150		60.480		197.804	441	1814	2.47
150		66.795		760.708	1696	1814	9.49
160		64.641		400.044	892	1814	4.99
160		36.230		245.785	548	5441	1.02
160		9.704		80.797	180	1814	1.01
161		10.730		78.309	175	1814	0.98
161		12.766		94.433	211	2217	0.96

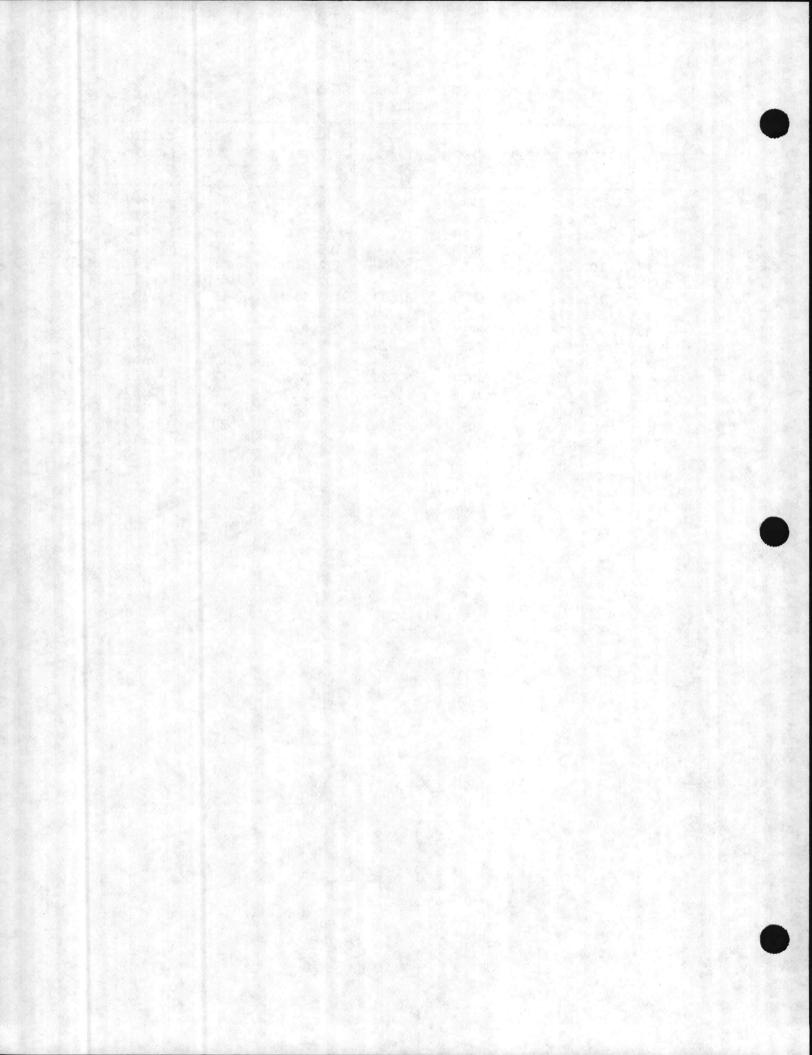




COMBINED CONTROLS ECO HADNOT POINT

BLDG.	BUILDING ENERG			TOTAL	ENERGY SAVING	CAPITOL	GTD
NO.	NS	OALS	HW	MBTU/YR	\$/YR	\$	SIR
1612	79.422	10.113		89.535	200	1814	1.12
1613	22.658	0.554		23.212	52	1814	0.29
1706	49.944	2.169		52.113	116	1814	0.65
1707	92.964	15.207		108.171	241	1814	1.35
1750	102.029	10.485		112.514	251	2217	1.15
1755	74.002	8.747		82.749	185	2217	0.84
1771	174.667	3.687	6.803	185.157	413	2107	1.99
1775	548.916	3.387	21.380	573.683	1279	2107	6.16
1780	205.054	2.183	7.987	215.224	480	2107	2.31
HP25		2.533	5.026	7.559	17	2107	0.08
HP26		2.618	5.026	7.644	17	2107	0.08
HP27		2.497	5.026	7.523	17	2107	0.08
HP28		2.784	5.026	7.810	17	2107	0.08
HP29		2.533	5.026	7.559	17	2107	0.08
HP40		3.807	5.026	8.833	20	2107	0.09
HP101		14.054		68.868	154	1814	0.86



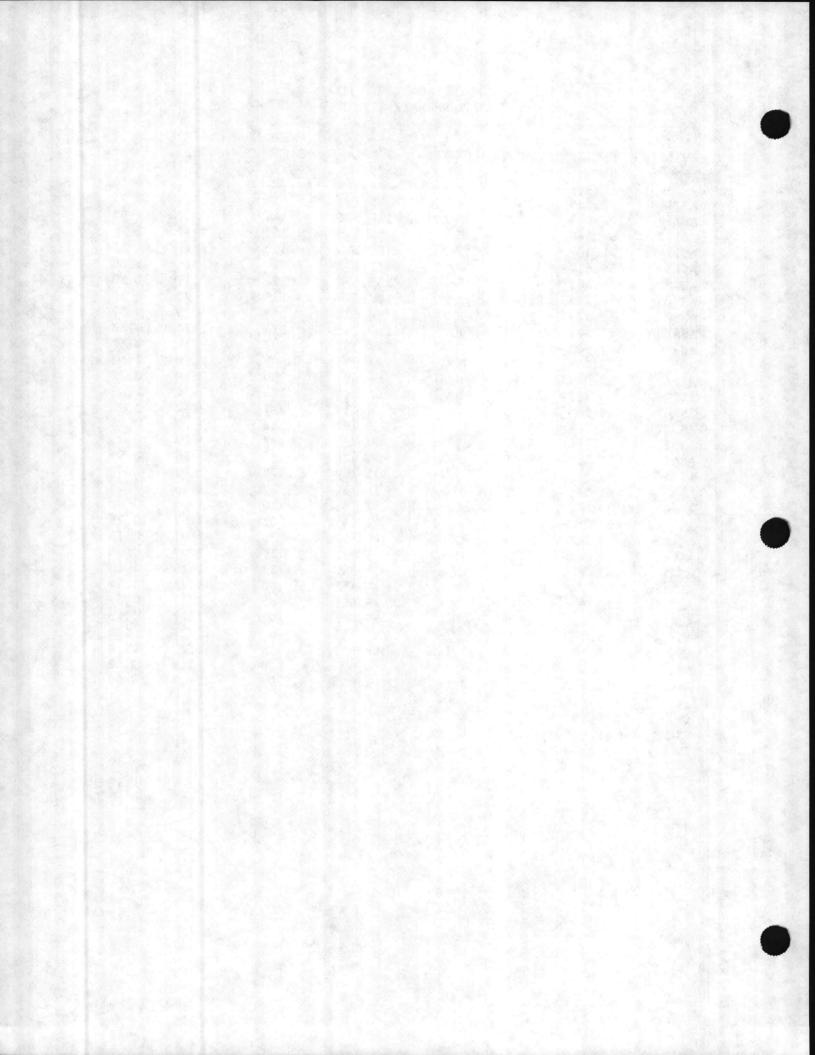


COMBINED CONTROLS ECO NEW RIVER AIR STATION

BUILDING NO.	ENERGY NS	SAVINGS OALS	(MBTU/YR) HW	TOTAL MBTU/YR	ENERGY SAVING \$/YR	CAPITOL COST \$	SIR
AS114	32.336	13.437	N/A	45.773	133	1814	0.74
AS118	102.814			118.306	344	2217	1.57
AS122	64.569	27.276	the second se	91.845	267	2217	1.22
AS124	71.207	31.923		103.130	300	2217	1.37
AS130	64.614			115.831	337	1814	1.89
AS202	69.405	66.119		135.524	394	2217	1.80
AS205	36.786			60.214	175	3023	0.59
AS208	38.425			40.635	118	3829	0.31
AS215	217.607			279.746	814	1814	4.56
AS216	217.607			277.354	807	1814	4.51
AS210	217.607			277.989	809	2620	3.13
AS232	50.219			68.697	200	2620	0.77
AS236	38.129			62.860	183	1814	1.02
AS302	45.259			74.439	217	2217	0.99
AS312	51.754			55.791	162	2107	0.78
AS320	57.198			60.794	177	2107	0.85
AS414	33.532			54.626	159	1814	0.89
AS424	305.526			403.190	1173	2217	5.37
AS425	22.199			27.196	79	1814	0.44
AS502	0.000			37.765	110	1814	0.62
AS4012	53.702		and the second se	69.615	203	2107	0.98
AS4030	0.000			10.397	30	2107	0.14
AS4035	0.000			5.933	17	2107	0.08
AS4110	243.531			251.844	733	1814	4.10
AS4120	40.332			44.656	130	3023	0.44
AS4122	25.309			29.429	85	2217	0.39
AS4122	51.816			56.005	163	2217	0.75
AS4141 AS4145	18.897		the second state of the se	21.611	63	2217	0.29
AS4145 AS4146	81.790			88.657	258	2107	1.24
AS4140 AS4157	37.153			44.657	130	2107	0.62
AS4157	219.512			241.095	702	2107	3.38

NS - Night Setback OALS - Outside Air Limit Shutoff

HW = Hot Water Outside Air Reset

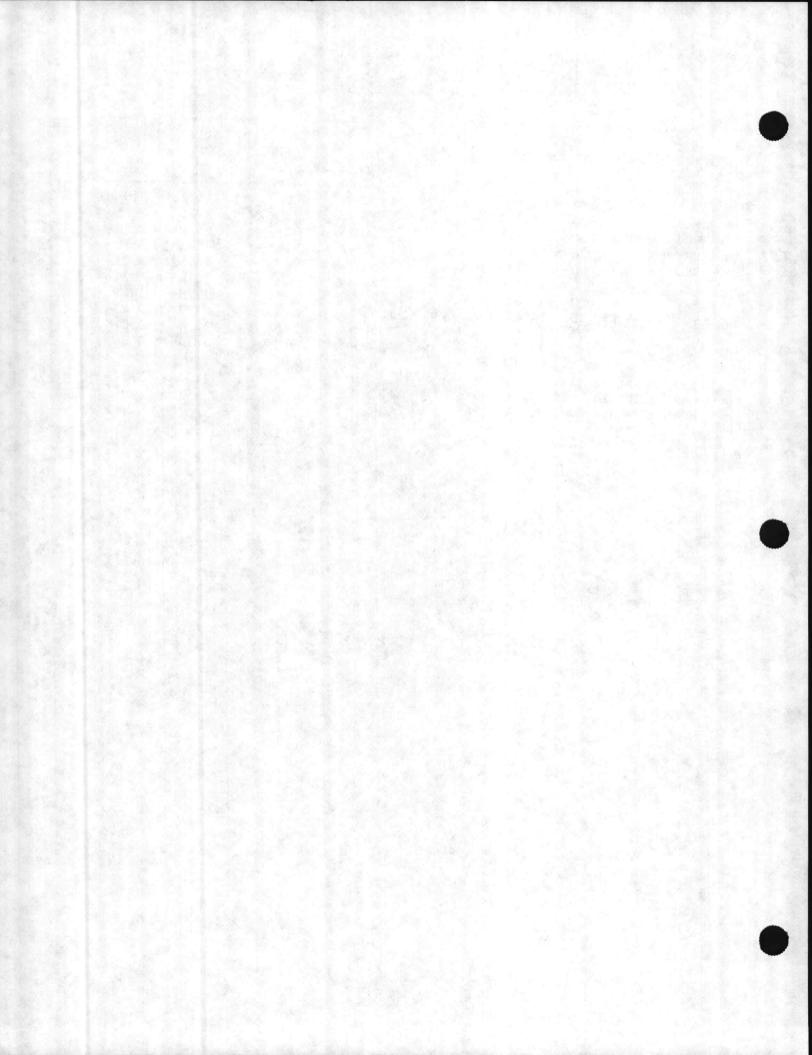


COMBINED CONTROLS ECO RIFLE RANGE

BUILDING NO.	ENERGY NS	SAVINGS OALS	(MBTU/YR) HW	TOTAL MBTU/YR	ENERGY SAVING \$/YR	CAPITOL COST \$	SIR
 RR1	0.000	105.654	N/A	105.654	307	1173	3.01
	0.000			103.797	302	1173	2.95
RR2	83.214	the second s		108.925	317	2620	1.23
RR3	0.000	And a second second second		97.647	284	1173	2.78
RR4			Construction of the second	105.878	308	1173	3.01
RR5	0.000	Read and the second states of the	State Contraction of the second second second second	76.185	222	1814	1.24
RR8	41.550			49.622	144	1173	1.41
RR9	0.000			30.427	89	2217	0.41
RR10	15.738			234.271	682	1814	3.81
RR11 RR12	162.783 39.562		and the second	63.346	184	1814	0.35

NS = Night Setback OALS = Outside Air Limit Shutoff HW = Hot Water Outside Air Reset

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COMBINED CONTROLS ECO BEACH AREA

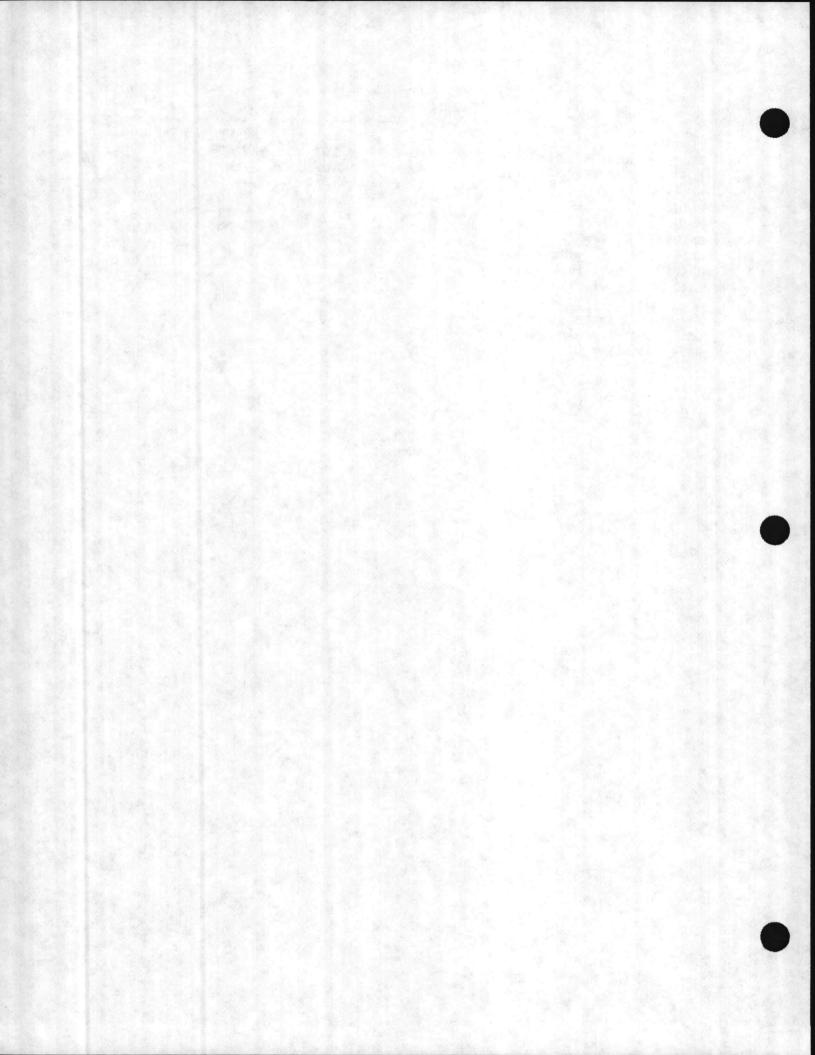
BLDG. NO.	BUILDING ENER NS	RGY SAVINGS OALS	(MBTU/YR) HW	TOTAL MBTU/YR	ENERGY SAVINGS \$/YR	CAPITOL COST \$	SIR
BA101	35.760	5.636		41.396	120	2620	0.47
BA102	156.161	40.901		197.062	573	1814	3.21
BA103	49.639	22.113		71.752	209	2620	0.81
BA104	0	249.557		249.557	726	3591	2.05
BA105	156.161	24.707		180.868	526	3426	1.56
BA128	47.214	0.095		47.309	138	1814	0.77

NS = Night Setback

OALS = Outside Air Limit Shutoff

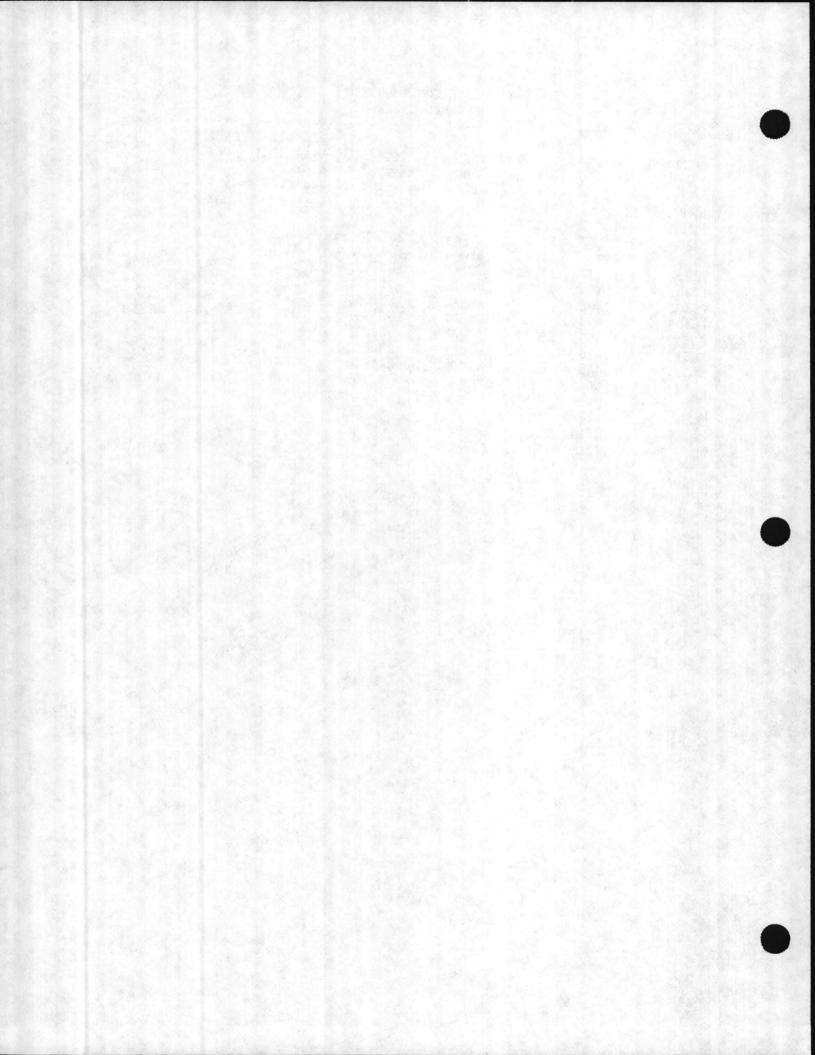
HW = Hot Water Outside Air Reset





			FRENCH	I CREEK			
BUILDING NO.	ENERGY NS	SAVINGS (OALS	MBTU/YR) HW	TOTAL MBTU/YR	ENERGY SAVING \$/YR	CAPITOL COST \$	SIR
FC100 FC190 FC200 FC241 FC251 FC301 FC302 FC303 FC312 FC313 FC364	673.547 59.479 169.137 103.841 121.267 27.494 42.300 80.603 41.659 24.226 38.449 0.000	1.847 39.265 23.726 38.360 72.327 16.422 3.313 4.825	1.011 1.604	751.471 77.207 207.801 109.732 160.532 51.220 80.660 156.861 58.081 28.550 44.878 8.809	1676 172 463 245 358 114 180 350 130 64 100 20	4635 4232 3023 2107 3426 1814 1814 2107 2217 2107 2107 2107 2107	3.67 0.41 1.56 1.18 1.06 0.64 1.01 1.68 0.59 0.36 0.48 0.10

COMBINED CONTROLS ECO



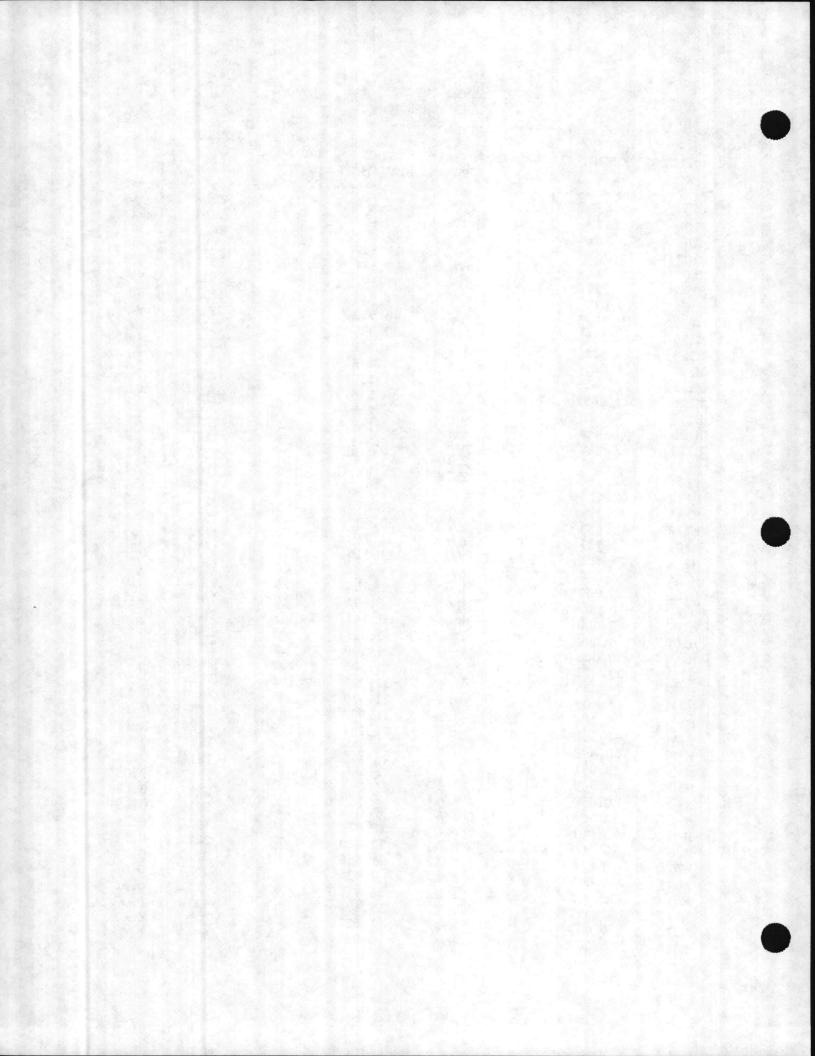
COMBINED CONTROLS ECO CAMP JOHNSON

I

BUILDING	ENERGY	SAVINGS	(MBTU/YR)	TOTAL	ENERGY SAVING	CAPITOL COST \$	SIR
NO.	NS	OALS	HW	MBTU/YR	\$/YR		
		16.314	N/A	53.470	156	2217	0.71
M90	37.156	17.708	N/A	35.130	102	1814	0.57
100	17.422	41.194		120.895	352	2620	1.36
M101	79.701	24.583		43.337	126	1814	0.71
M102	18.754	3.163		18.381	54	1814	0.30
M103	15.218			101.197	295	3023	0.99
M104	57.799	43.398		37.936	110	1814	0.62
M105	19.475	18.461		68.558	200	2217	0.92
M112	50.503	18.055		40.908	119	2107	0.57
M116	38.234	1.079		35.561	104	1814	0.58
M123	27.885	7.676		36.438	106	1814	0.59
M124	27.885	8.553		33.130	96	1814	0.54
M125	27.885	5.245		34.536	101	1814	0.57
M126	27.885	6.651		35.259	101	1814	0.58
M127	27.885	7.374			309	2107	1.49
M128	87.495	15.002		106.148	385	2217	1.76
M129	87.755	44.570		132.325	170	2107	0.82
M130	50.438	5.932		58.474	180	2107	0.87
M131	57.098	2.40		61.887	275	1814	1.54
M132	67.512	26.85		94.363	304	2217	1.39
M134	97.392	6.95		104.343		1814	0.34
M178	11.023	9.46		20.492	60	1814	0.55
M201	23.737	10.02		33.760	98	1814	1.82
M202	79.701	31.81		111.514	325	1814	0.15
M205	0.000			8.934	26	1814	0.14
M206	0.000		4 N/A	8.454	25		0.11
M207	0.000		0 N/A	6.690	19	1814	0.12
M208	0.000		6 N/A	7.666	22	1814	0.12
M209	0.000		.3 N/A	9.013	26	1814	0.11
M210	0.000			6.500	19	1814	0.76
M215	27.885	and the second		46.506	135	1814	
M216	27.885	the second s		37.224	108	1814	0.60
M231	0.000			11.419	33	2620	0.13
M231 M237	8.766		the second se	16.997	49	2106	0.24
	61.156			72.991	212	2620	0.8
M240	30.478			37.256	108	1814	0.6
M301	13.09			19.625	57	1814	0.3
M302	45.389			77.344	225	2217	1.0
M303	0.000		54 N/A	2.754	8	2217	0.0
M305	35.70	A TOP AND THE COMPANY OF A DATA		37.064	108	2217	0.4
M307				16.822	49	1814	0.2
M308	13.09			23.060	67	2217	0.3
M309	0.00			21.756	63	2217	0.2
M311	0.00			0.934		2217	0.0
M313	0.00			36.848		1814	0.6
M314	30.47			19.634		1814	0.3
M315	13.09	and the second sec		1.551		2217	0.0
M316 M318	0.00			1.027		2217	0.0





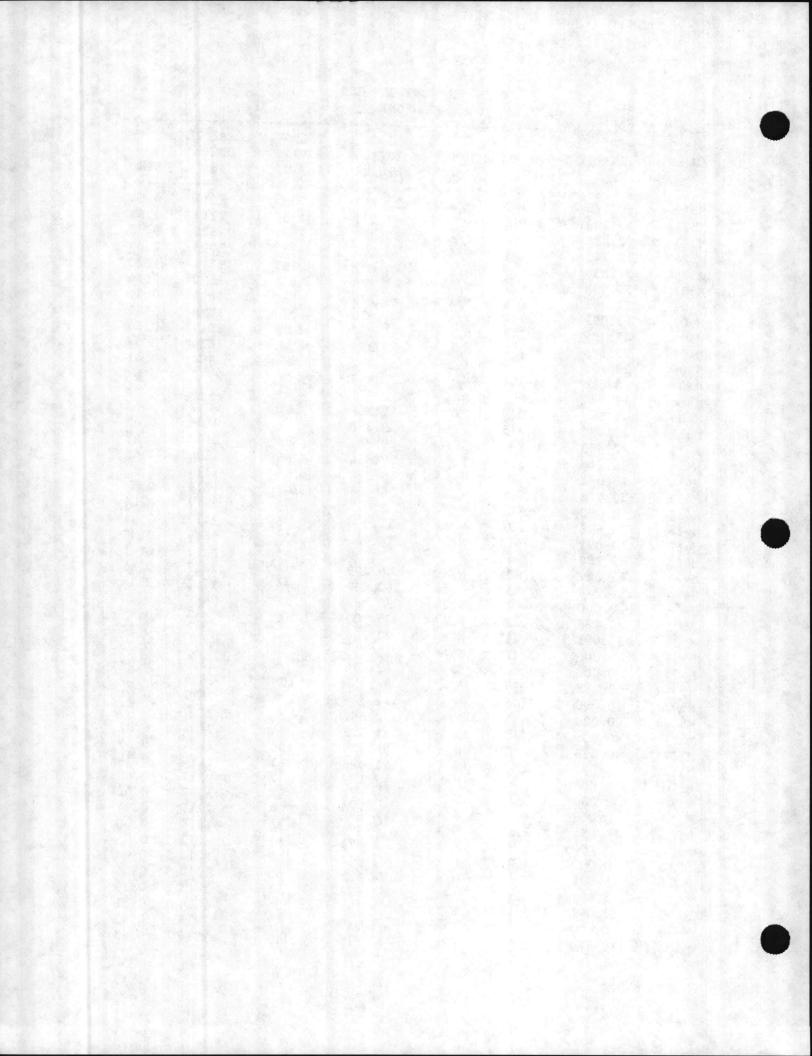


COMBINED CONTROLS ECO CAMP JOHNSON

				TOTAL	ENERGY SAVING	CAPITOL COST	
BUILDING NO.	ENERGY NS	SAVINGS OALS	(MBTU/YR) HW	MBTU/YR	\$/YR	\$	SIR
м319	30.478	9.099	N/A	39.577	115	1814	0.64
M321	45.389	2.202		47.591	138	2217	0.63
	27.885	5.957		33.842	98	2620	0.38
1323	115.743	94.413		210.156	612	3023	2.05
M324		34.484		74.022	215	1814	1.20
1326	39.538	25.740		65.278	190	2620	0.74
M327	39.538	6.184		19.275	56	1814	0.31
M401	13.091	5.939		19.030	55	1814	0.31
M402	13.091			47.637	139	2217	0.64
M403	45.389	2.248		33.336	97	1814	0.54
M405	27.885	5.451		29.712	86	2106	0.41
M406	27.885	0.664		32.457	94	2217	0.43
M407	26.616	5.841		20.486	60	1814	0.34
M408	12.984	7.502		48.318	141	2217	0.65
M409	45.389	2.929			87	2106	0.42
M411	27.885	0.815		29.863	87	2106	0.42
M412	27.885	0.734		29.782	86	2106	0.42
M413	26.616	1.938		29.664	56	1814	0.31
M414	13.091	6.183		19.274		1814	0.56
M415	30.478	5.70		36.187	105	2217	0.04
M416	0.000	2.94		2.941	9	2217	0.4
M418	26.616	6.47		33.090	96		0.3
M419	13.091	5.59		18.686	54	1814	0.6
M420	45.389	2.94		48.333	141	2217	0.6
M422	45.389	2.90		48.295	141	2217	2.2
M424	115.743	39.55	8 4.830	160.131	466	2106	
M441	0.000	12.64	0 18.247	30.887	90	2106	0.4
M501	30.478		4 N/A	35.102	102	1814	0.5
M502	13.091		5 N/A	20.706	60	1814	0.3
M503	0.000			3.323	10	2217	0.0
M504	0.000			2.654	8	2217	0.0
M506	30.478			36.251	105	1814	0.5
M507	0.000			2.754	8	2217	0.0
M509	0.000			2.466	7	2217	0.0
M511	0.000			1.422	4	2106	0.0
M512	30.478			36.530	106	1814	0.5
	13.091			21.026	61	1814	0.3
M513	0.000			2.439	7	2217	0.0
M514	0.000			2.214	6	6247	0.0
M516	0.000	Contraction of the second second second		2.669	8	2217	0.0
M518				18.394	54	1814	0.3
M520	13.091			3.871	11	2217	0.0
M521	0.000			3.061	9	2217	0.0
M522	0.000			20.622	60	1814	0.3
M601	13.091			17.632	51	1814	0.3
M602	13.091			19.193	56	1814	0.3
M603	13.093			2.317	7	2217	0.0
M604	0.00			38.716	113	1814	0.
M606	30.47	8 8.2	38 N/A	30.710	115	2021	





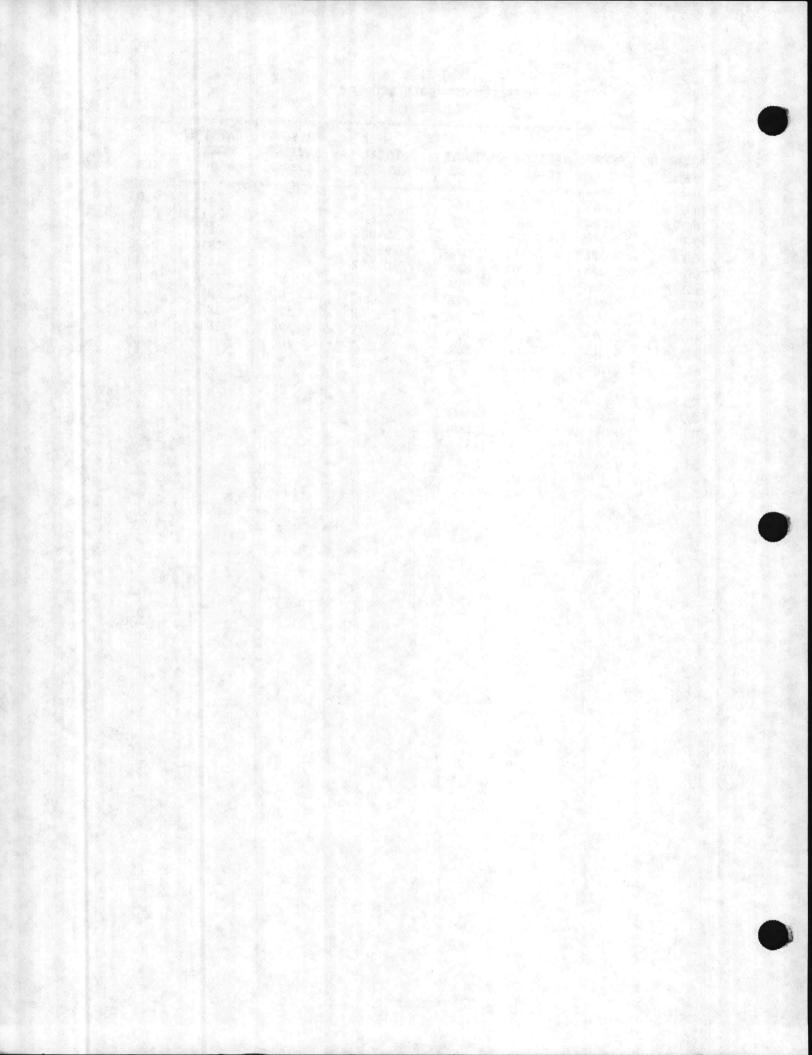


COMBINED CONTROLS ECO CAMP JOHNSON

BUILDING NO.	ENERGY NS	SAVINGS OALS	(MBTU/YR) HW	TOTAL MBTU/YR	ENERGY SAVING \$/YR	CAPITOL COST \$	SIR
	0.000	2.308	N/A	2.308	7	2217	0.03
M607	0.000	2.803	·	2.803	8	2217	0.04
M609	0.000	3.679	1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.	55.058	160	2217	0.73
M611	51.379			19.752	57	1814	0.32
M612	13.091	6.661		20.432	59	1814	0.33
M613	13.091	7.341	· · · · · · · · · · · · · · · · · · ·	2.700	8	2217	0.04
M614	0.000	2.700		2.207	6	2217	0.03
M616	0.000	2.207		19.689	57	1814	0.32
M619	13.091	6.598		19.571	57	1814	0.32
M620	13.089	6.482	· · · · · · · · · · · · · · · · · · ·		10	2217	0.05
M621 M622	0.000	3.345	CARLES THE THE SECOND SECOND SECOND	3.345 2.785	8	2217	0.04



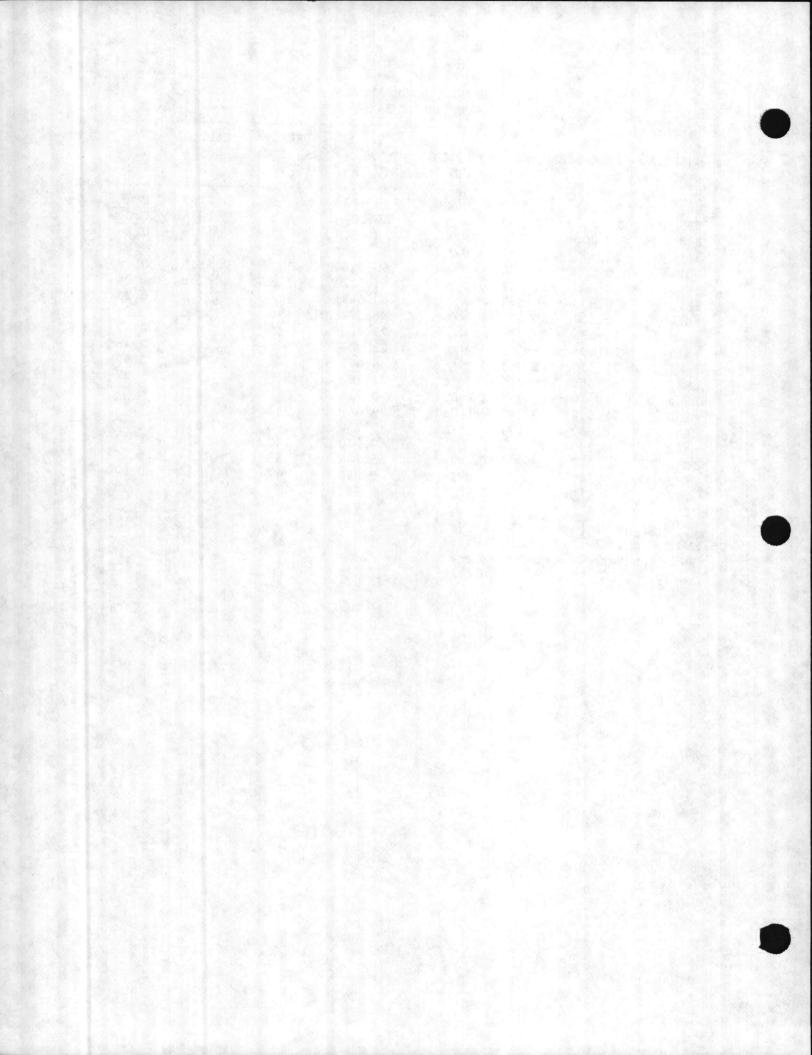




COMBINED CONTROLS ECO COURTHOUSE BAY

BUILDING	ENEDCY	SAVINGS (MBTU/YR)	TOTAL	ENERGY SAVING	CAPITOL COST	
NO.	NS	OALS	HW	MBTU/YR	\$/YR	\$	SIR
	26.343	1.832	1.408	29.583	86	2107	0.41
BB2	22.233	27.500	N/A	49.733	145	1814	0.81
BB5	0.000		N/A	9.357	27	1173	0.26
BB8	20.355		N/A	37.590	109	1814	0.61
BB10			N/A	60.928	177	6815	0.29
BB11	0.000		N/A	61.347	178	7218	0.28
BB12	0.000			60.543	176	7218	0.28
BB13	0.000		N/A	60.674	176	6815	0.29
BB14	0.000		N/A	25.820	75	1814	0.42
BB15	13.885		N/A		65	1814	0.36
BB16	13.885		N/A	22.387	106	1814	0.59
BB27	23.610	states and the second sec	N/A	36.471		1814	1.17
BB28	50.015		N/A	72.165	210		0.07
BB45	0	2.316	2.898	5.214	15	2107	1.11
BB50	72.628	3.790	3.030	79.448	231	2107	
BB51	138.662	33.077	N/A	171.739	500	1814	2.80
BB52	59.150	22.920	N/A	82.070	239	1814	1.34
BB54	47.292		N/A	65.144	190	1814	1.06
BB72	C		N/A	3.990	12	1814	0.07
BB269	C		5.026	9.261	27	2107	0.13



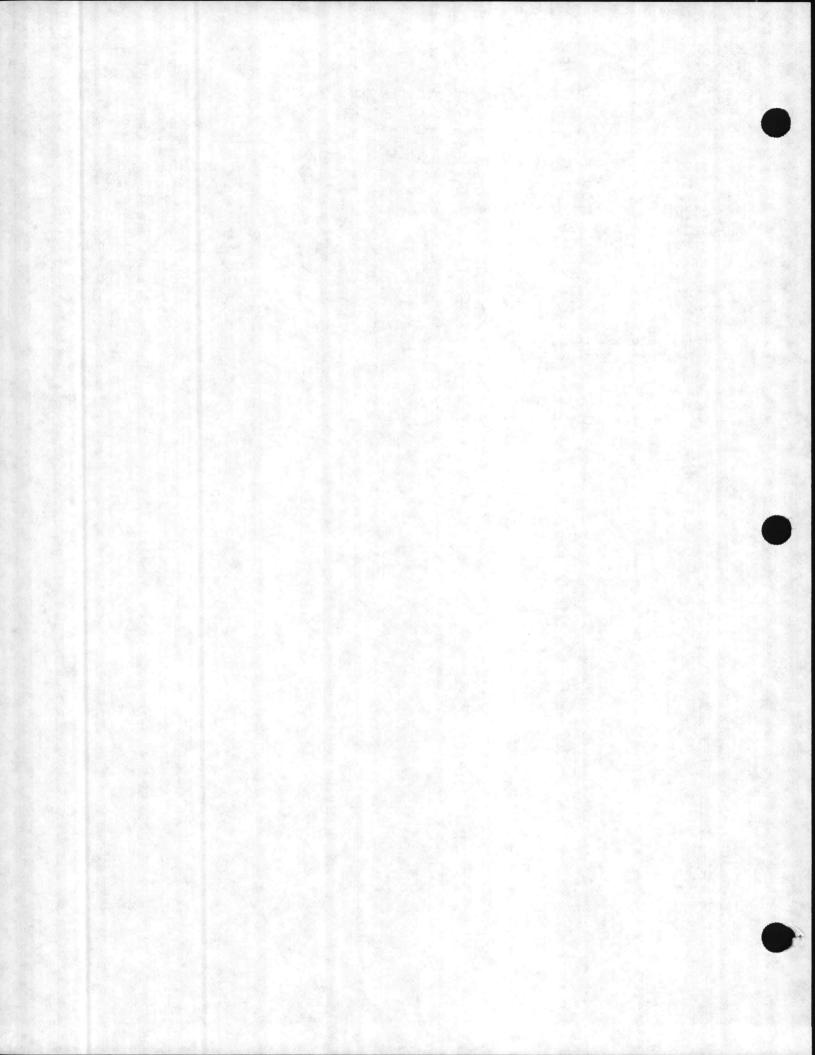


COMBINED CONTROLS ECO CAMP GEIGER

		The second s					
BLDG.* NO.	BUILDING ENI	ERGY SAVINGS OALS	(MBTU/YR) HW	TOTAL MBTU/YR	ENERGY SAVING \$/YR	CAPITOL COST \$	SIR
			2.586	62.477	182	2107	0.88
G770	56.922	2.969	2.500	28.544	83	1814	0.46
TC735	23.602	4.942		28.544	83	1814	0.46
TC832	23.602	4.942		C. There T. C. Herberger and M. S.	83	1814	0.46
TC834	23.602	4.942		28.544		1814	1.55
TC846	87.037	8.371		95.408	278	1814	0.90
TC900	55.376	0.000		55.376	161		
TC910	37.425	57.031		94.456	275	2620	1.06

*Remaining buildings not listed due to low energy potential.



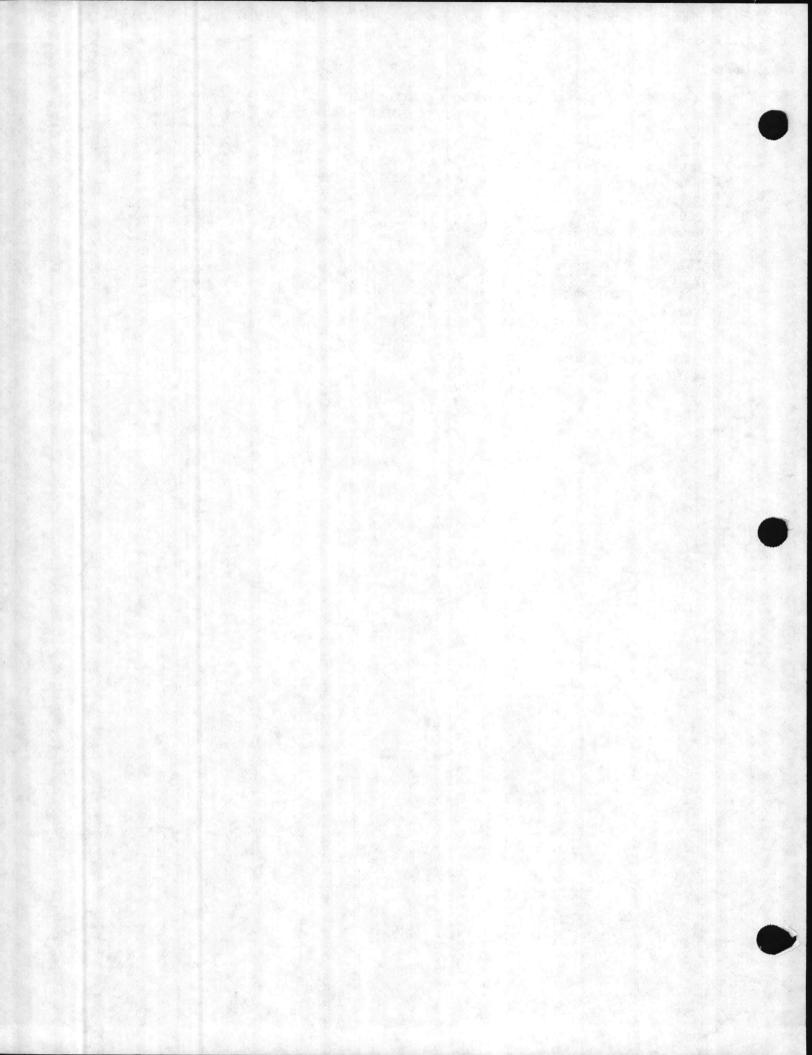


BUILDING NO.	ENERGY NS	SAVINGS (1 OALS	MBTU/YR) HW	TOTAL MBTU/YR	ENERGY SAVING \$/YR	CAPITOL COST \$	SIR
		12.558	N/A	12.558	36	1173	0.35
2600	0.000		N/A	20.285	59	4800	0.14
2603	0.000	and the second second second second second		71.189	207	1814	1.16
2624	45.590		N/A		80	1814	0.45
2625	15.704	11.778	N/A	27.372		1814	0.47
2626	20.364	8.239	N/A	28.603	83		
2627	20.364	and the second se	N/A	32.781	95	1814	0.53
	22.406		N/A	33.087	96	1814	0.54
2628 2629	33.144		N/A	39.965	116	1814	0.65

COMBINED CONTROLS ECO PARADISE POINT







TAB PLACEMENT HERE

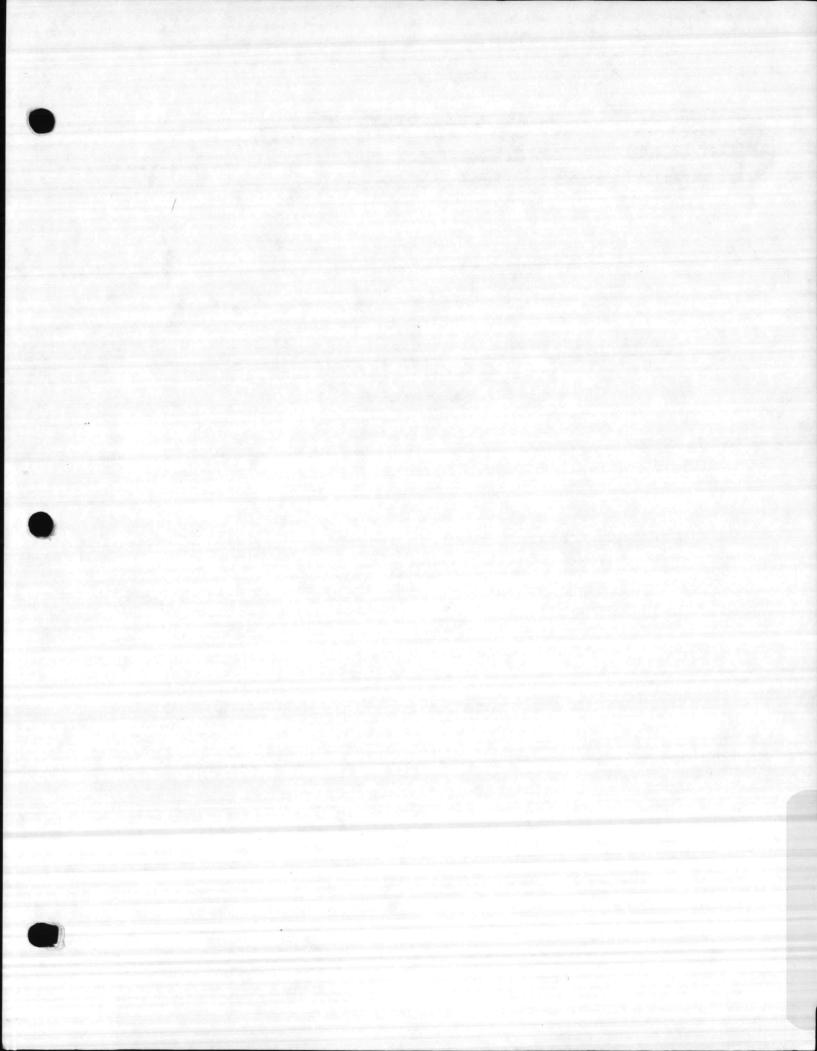
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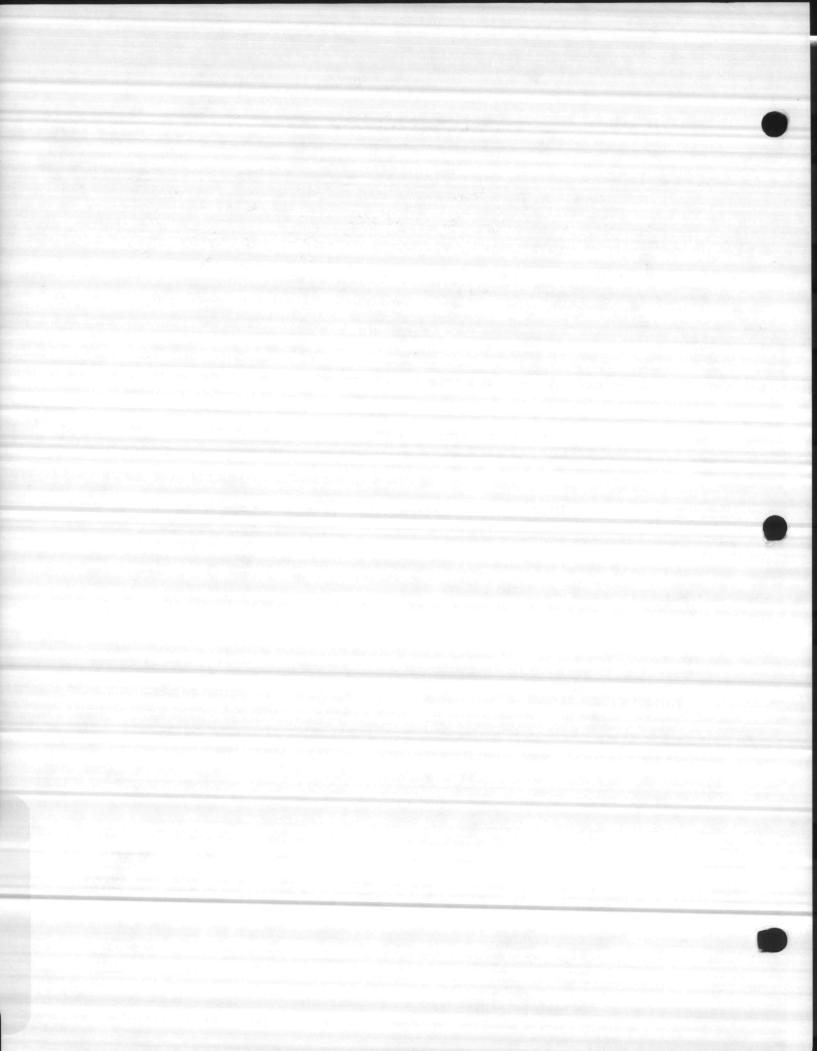
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5.0 ECO ANALYSIS RESULTS

5.1 ECO RANKING

The individual ECOs with Savings-to-Investment Ratios (SIRs) greater than 1.0 have been ranked from largest to smallest in Table 5.1-1, ECO Rankings. Information about the quantity and dollar value of the individual ECO savings is included which is used to compute the individual ECOs SIR.

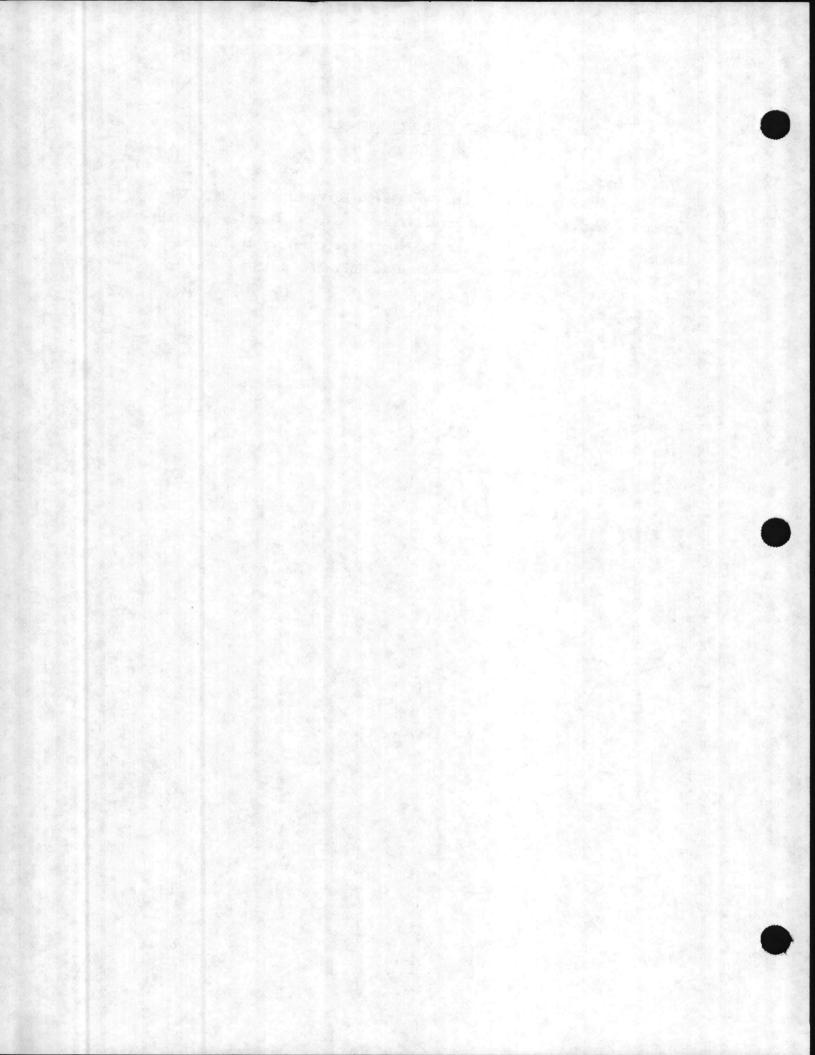


TABLE 5.1-1 ECO RANKINGS

ECO	BLDG. NO.	ENERGY SAV MBTU/YR.	/INGS \$/YR	CAPITOL COST \$	SIR
SYPHON JET SUMP	PUMP	0.000	193,600	187,200	7.80
TOTAL		0.000	193,600	187,200	7.80
PIPE INSULATION					
BEACH AREA	(SEE TABLE 5.1-2)	3 020 / 07	11 461	10 0//	0.15
HOSPITAL POINT		3,938.427	11,461	18,944	8.15
COURTHOUSE BAY	,	47,366.701 7,817.901	105,628	176,033	8.07
CAMP GEIGER	(SEE TABLE 5.1-5)	27,855.980	22,750	42,770	7.15
RIFLE RANGE	(SEE TABLE 5.1-6)	and manager a consideration of the character	81,061	153,254	7.11
CAMP JOHNSON	(SEE TABLE 5.1-7)	12,104.915	35,225	67,224	7.05
AIR STATION	(SEE TABLE 5.1-7) (SEE TABLE 5.1-8)	16,839.867	49,004	103,385	6.37
HADNOT POINT		15,178.842	44,170	101,880	5.83
PARADISE POINT	(SEE TABLE 5.1-9)	113,487.252	253,077	598,027	5.69
FRENCH CREEK			11,380	27,100	5.65
FRENCH OKEEK	(SEE TABLE 5.1-11)	2,818.575	6,285	18,735	4.50
TOTAL		251,319.076	620,041	1,307,352	6.38
COMBINED CONTROL	S				
HOSPITAL POINT	(SEE TABLE 5.1-12)	2,938.196	6,552	14,511	4.58
HADNOT POINT	(SEE TABLE 5.1-12)		48,810	165,925	2.98
AIR STATION	(SEE TABLE 5.1-12)		7,122	26,989	2.68
BEACH AREA	(SEE TABLE 5.1-12)		1,826	8,831	2.10
RIFLE RANGE	(SEE TABLE 5.1-12)		2,567	12,113	2.15
FRENCH CREEK	(SEE TABLE 5.1-12)		3,272	17,405	1.91
CAMP JOHNSON	(SEE TABLE 5.1-12)	1,191.241	3,467	21,949	1.60
COURTHOUSE BAY	(SEE TABLE 5.1-12)		1,369	9,363	1.48
CAMP GEIGER	(SEE TABLE 5.1-12)		553	4,434	1.26
PARADISE POINT	(SEE TABLE 5.1-12)	71.189	207	1,814	1.16
	(/1.109	207	1,014	1.10
TOTAL		32,172.356	75,745	283,334	2.72

5-2 (R-1)

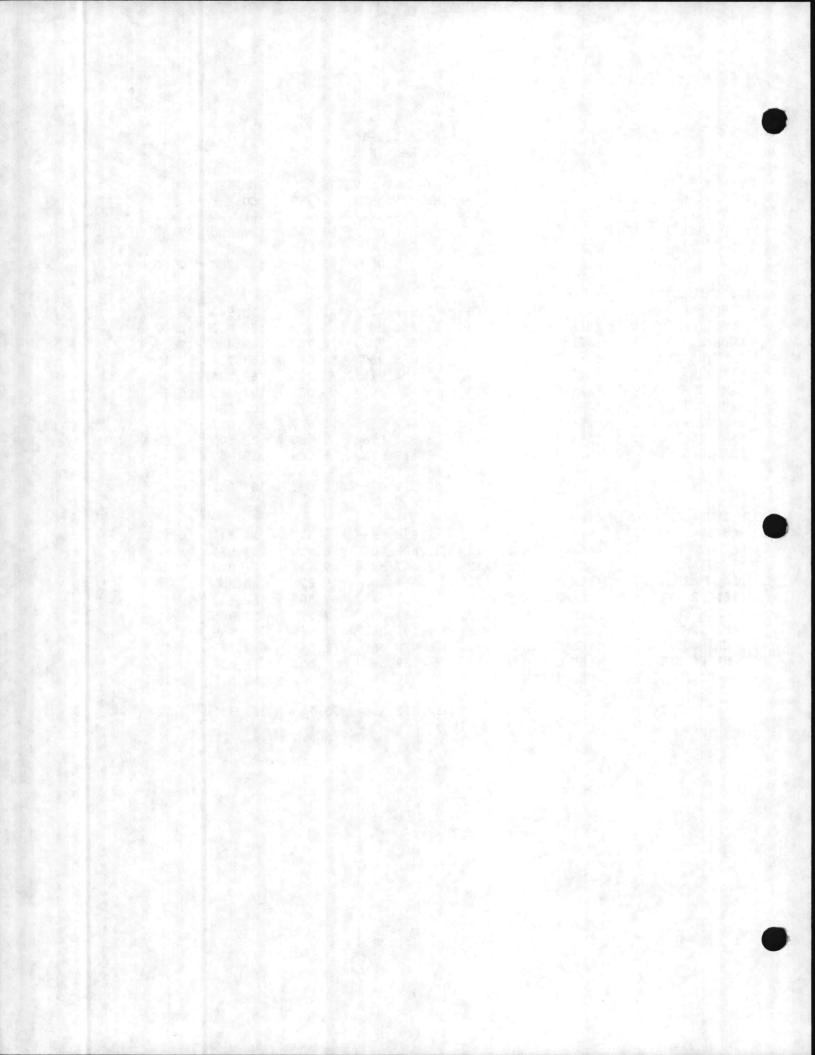


TABLE 5.1-2 ECO RANKING - BEACH AREA PIPE INSULATION

ENERGY SAVINGS					Section 14	
	BLDG.	MBTU/YR	\$/YR	CAPITAL COST	SIR	_
-	BA104	1,500.462	4366	5337	13.17	
	BA101	41.655	121	166	12.18	
	BA105	1,353.908	3939	5822	11.34	
	BA105 BA128	2.591	7	13	9.58	
	BA120 BA102	742.874	2161	4802	7.55	
	BA102 BA103	296.937	864	2804	5.16	
	TOTAL	3938.427	11461	18944	8.147	





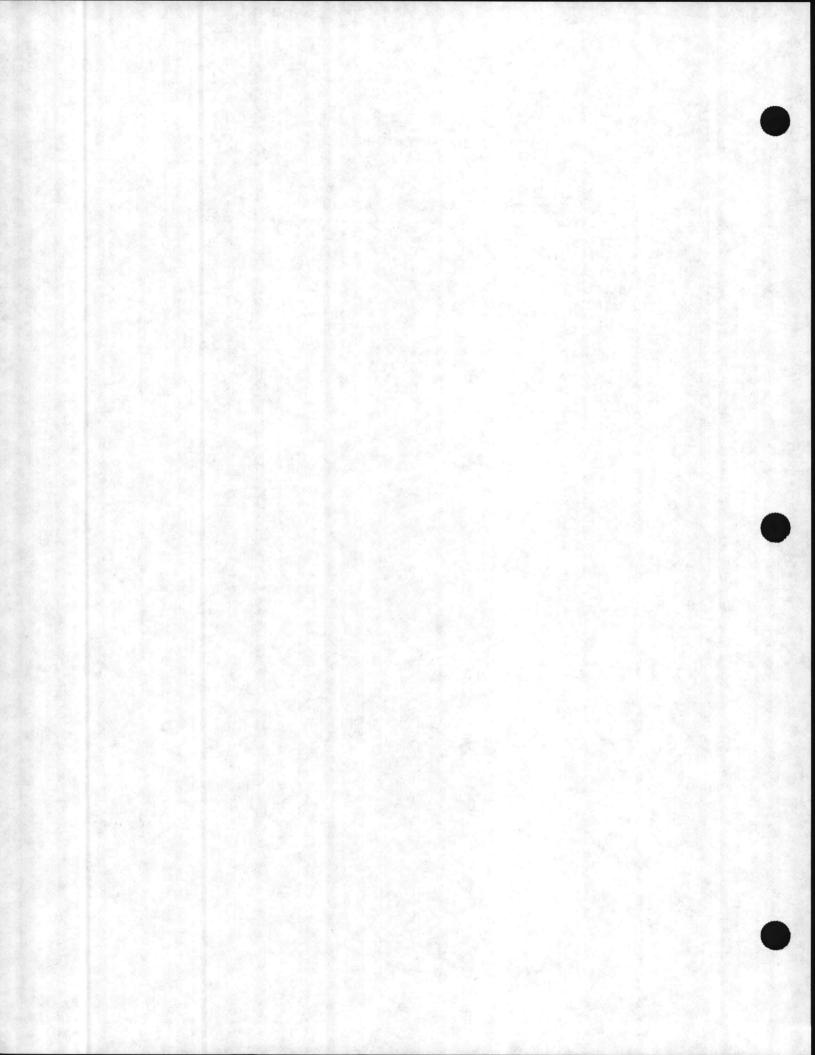


TABLE 5.1-3 ECO RANKING - HOSPITAL POINT PIPE INSULATION

LDG.	MBTU/YR		CARTER COOM	OTD
	mbio/ik	\$/YR	CAPITAL COST	SIR
H14	202.441	451	658	9.22
H15A	44,538.773	99321	160548	8.32
H16	288.530	643	1181	7.32
H18	367.577	819	1592	6.92
H24	135.844	302	593	6.86
H19	405.750	904	1917	6.34
H23	191.244	426	959	5.97
Н39	75.700	168	383	5.92
H21	11.752	26	64	5.49
Н36	74.573	166	421	5.30
H17N	800.186	1784	5055	4.74
H17	274.331	611	2662	3.09
TOTAL	47366.701	105628	176033	8.07
	H14 H15A H16 H18 H24 H19 H23 H39 H21 H36 H17N H17 TOTAL	H15A44,538.773H16288.530H18367.577H24135.844H19405.750H23191.244H3975.700H2111.752H3674.573H17N800.186H17274.331	H15A 44,538.773 99321 H16 288.530 643 H18 367.577 819 H24 135.844 302 H19 405.750 904 H23 191.244 426 H39 75.700 168 H21 11.752 26 H36 74.573 166 H17 800.186 1784	H15A 44,538.773 99321 160548 H16 288.530 643 1181 H18 367.577 819 1592 H24 135.844 302 593 H19 405.750 904 1917 H23 191.244 426 959 H39 75.700 168 383 H21 11.752 26 64 H36 74.573 166 421 H17N 800.186 1784 5055 H17 274.331 611 2662



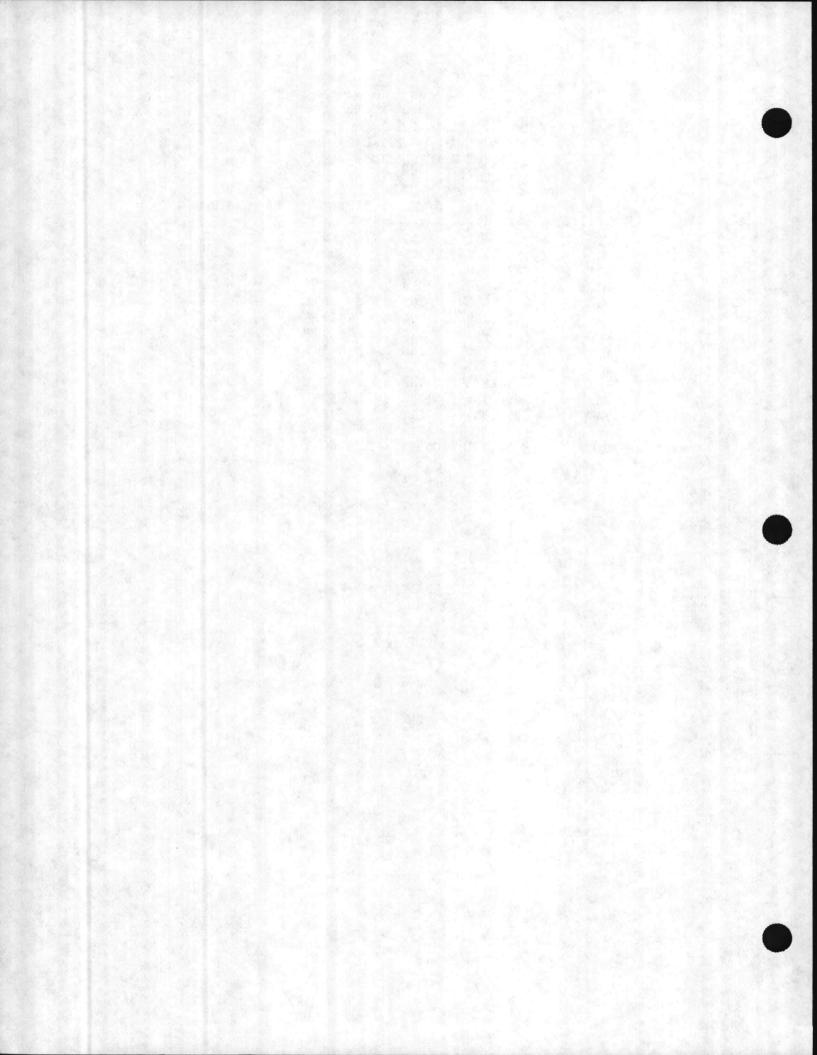


TABLE 5.1-4 ECO RANKING - COURTHOUSE BAY PIPE INSULATION

	ENERGY SAVING	S			
BLDG.	MBTU/YR	\$/YR	CAPITAL COS	ST SIR	_
BB50	371.310	1080	961	18.84	
BB250	61.921	180	235	12.80	
BB255	61.921	180	235	12.80	
BB15	159.479	464	711	10.94	
BB10	854.182	2485	3834	10.87	
BB52	465.528	1354	2108	10.77	
BB2	13.835	40	63	10.66	
BB51	465.804	1355	2155	10.54	
BB269	3.866	11	17	10.50	
BB28	430.901	1253	2040	10.30	
BB265	25.003	72	119	10.18	
BB8	120.162	349	580	10.10	
BB5	704.642	2050	3432	10.01	
BB54	269.918	785	1331	9.89	
BB16	192.531	560	1078	8.71	
BB12	712.779	2074	4018	8.65	
BB13	685.497	1994	3938	8.49	
BB11	584.917	1702	3784	7.54	
BB260	59.038	171	399	7.21	
BB270	59.038	171	399	7.21	
BB14	531.509	1546	3939	6.58	
BB7	741.473	2157	5807	6.23	
BB45	13.263	38	183	3.52	
BB72	10.813	31	372	1.41	
BB27	218.571	636	1032	10.33	
TOTAL	7817.901	22750	42770	7.15	



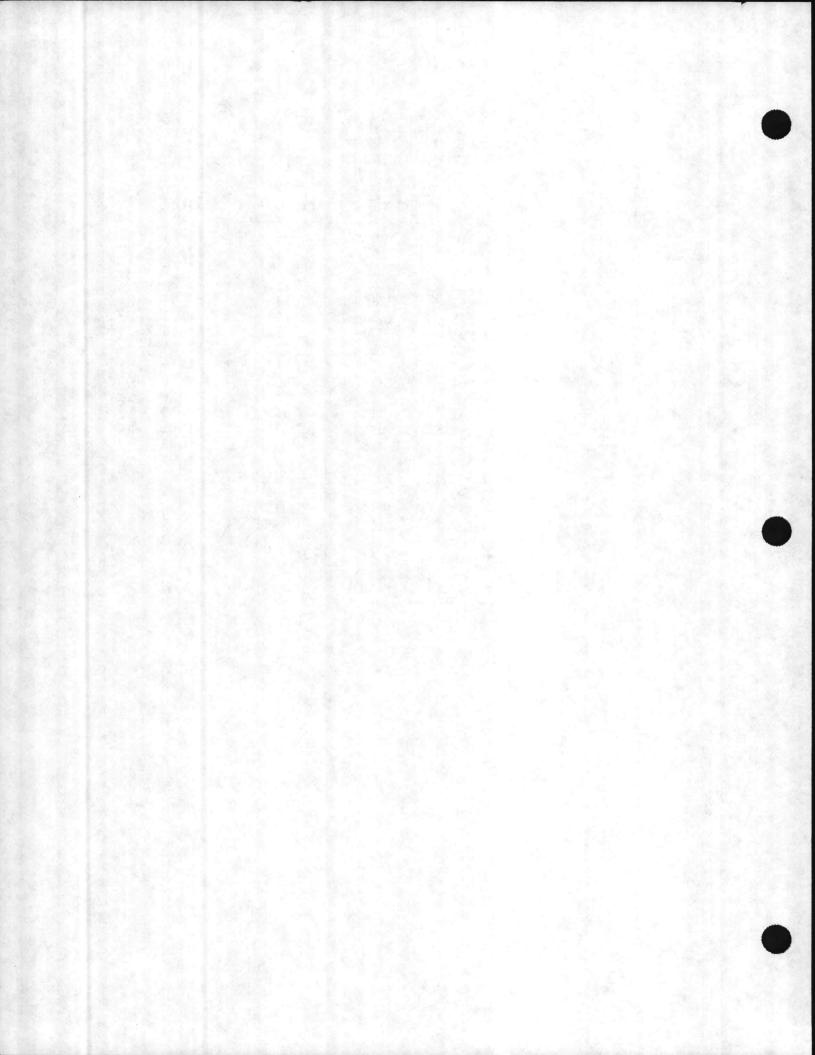


TABLE 5.1-5 ECO RANKING - CAMP GEIGER PIPE INSULATION

	ENERGY SAVIN	GS		
BLDG.	MBTU/YR	\$/YR	CAPITAL COST	SIR
TC740	135.827	395	343	19.28
TC1066	311.659	906	799	19.03
TC845	40.066	116	103	18.93
TC814	30.561	88	79	18.72
TC815	34.479	100	90	18.64
TC1140	43.083	125	113	18.55
TC844	29.316	85	77	18.52
TC841	47.465	138	125	18.39
TC810	37.194	108	101	17.92
TC744	63.126	183	189	16.28
TC1040	35.414	103	108	15.90
TC840	31.853	92	108	14.31
TC715	25.874	75	89	14.08
TC714	25.874	75	89	14.08
TC710	25.874	75	89	14.08
TC711	23.655	68	84	13.67
TC1141	29.487	85	105	13.66
TC1042	29.700	86	109	13.25
TC851	25.066	72	95	12.87
TC1013	23.665	68	90	12.79
TC1050	18.546	53	71	12.71
TC850	22.314	64	87	12.51
TC1063	153.115	445	614	12.17
TC743	24.021	69	96	12.14
TC741	20.509	59	82	12.12
TC834	403.548	1174	1654	11.90
TC842	32.929	95	135	11.87
TC1010	32.166	93	133	11.79
TC1041	25.361	73	105	11.75
TC832	534.713	1556	2266	11.51
TC1054	38.331	111	165	11.33
TC1053	29.628	86	130	11.11
TC735	260.266	757	1155	10.99
TC1059	110.045	320	488	10.98
TC855	488.000	1420	2197	10.83
TC1065	225.467	656	1018	10.80
TC1067	215.449	626	975	10.78
TC745	89.018	259	404	10.73
TC1143	207.268	603	960	10.53
TC1051	24.312	70	113	10.50
TC1068	209.233	608	972	10.49
TC1162	199.182	579	927	10.47
TC950	17.051	49	79	10.44
TC1016	24.398	71	114	10.38
TC1015	24.398	71	114	10.38
TC1012	24.398	71	114	10.38



5-6 (R-1)

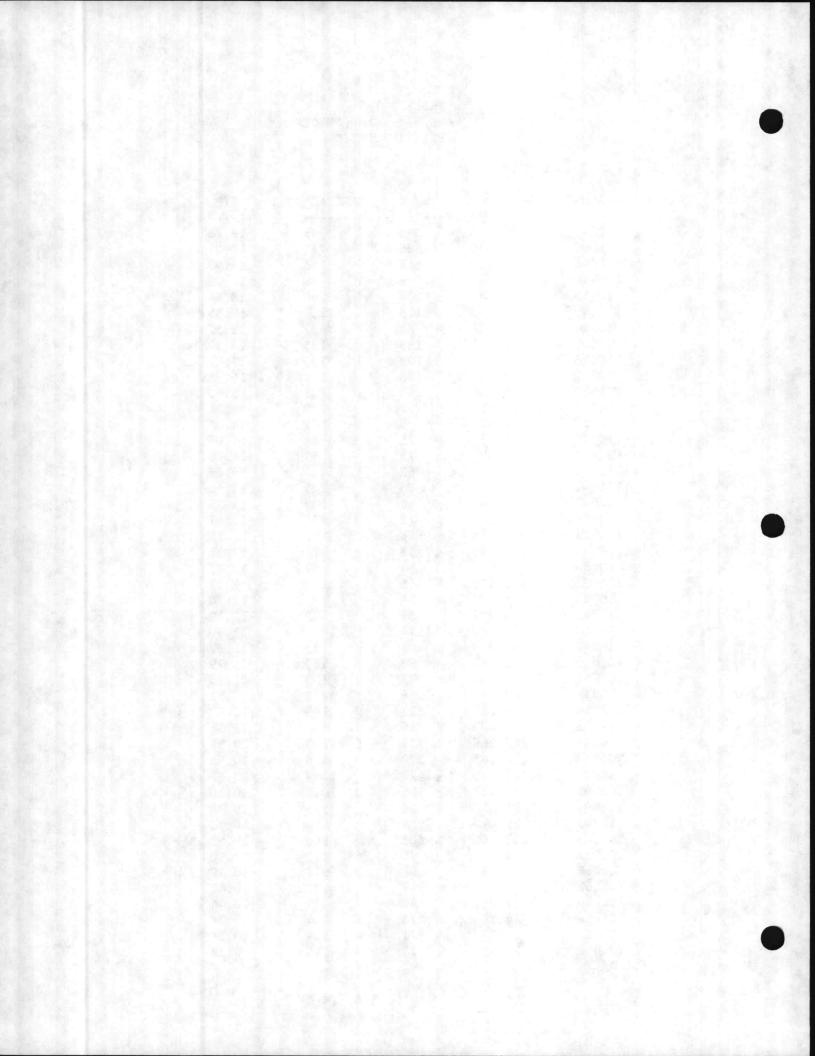


TABLE 5.1-5 ECO RANKING - CAMP GEIGER PIPE INSULATION

ENERGY SAVINGS

BLDG.	MBTU/YR	\$/YR	CAPITAL COST	SIR
TC1004	465.490	1354	2203	10.31
TC854	474.757	1381	2283	10.14
TC716	42.092	122	202	10.13
TC829	24.403	71	117	10.11
TC828	115.398	335	560	10.04
TC1038	112.242	326	545	10.04
TC727	18.171	52	88	10.04
TC726	18.171	52	88	
TC846	424.930	1236	2071	10.04
TC1039	99.315	289	484	10.01
TC1029	138.909	404	680	9.99
TC1131	130.706	380		9.96
TC1060	144.658	420	640	9.95
TC808	313.538	912	710	9.93
TC809	192.828	561	1548	9.87
TC1132	133.807	389	954	9.86
TC1028	133.464		661	9.86
TC1119	133.464	388	660	9.86
TC1047		388	660	9.86
TC1047	144.801	421	717	9.85
	139.921	407	693	9.84
TC1017	141.709	412	702	9.83
TC1018	140.957	410	699	9.83
TC709	189.912	552	942	9.82
TC704	189.912	552	942	9.82
TC754	189.912	552	942	9.82
TC705	189.912	552	942	9.82
TC706	189.912	552	942	9.82
TC707	408.195	1187	2040	9.76
TC708	401.710	1168	2012	9.74
TC749	360.350	1048	1804	9.74
TC729	132.334	385	664	9.72
TC1061	429.489	1249	2171	9.65
TC1062	142.446	414	721	9.63
TC1044	30.980	90	158	9.55
TC728	2.545	7	13	9.54
TC1160	189.494	551	974	9.49
TC816	20.566	59	105	9.49
TC736	275.769	802	1426	9.43
TC1007	382.568	1113	1986	9.40
TC718	321.062	934	1667	9.39
TC719	319.507	929	1660	9.39
TC826	317.434	923	1649	9.39
TC817	317.434	923	1649	9.39
TC819	317.434	923	1649	9.39
TC818	317.434	923	1649	9.39
TC1049	155.699	453	808	9.39

5-7 (R-1)

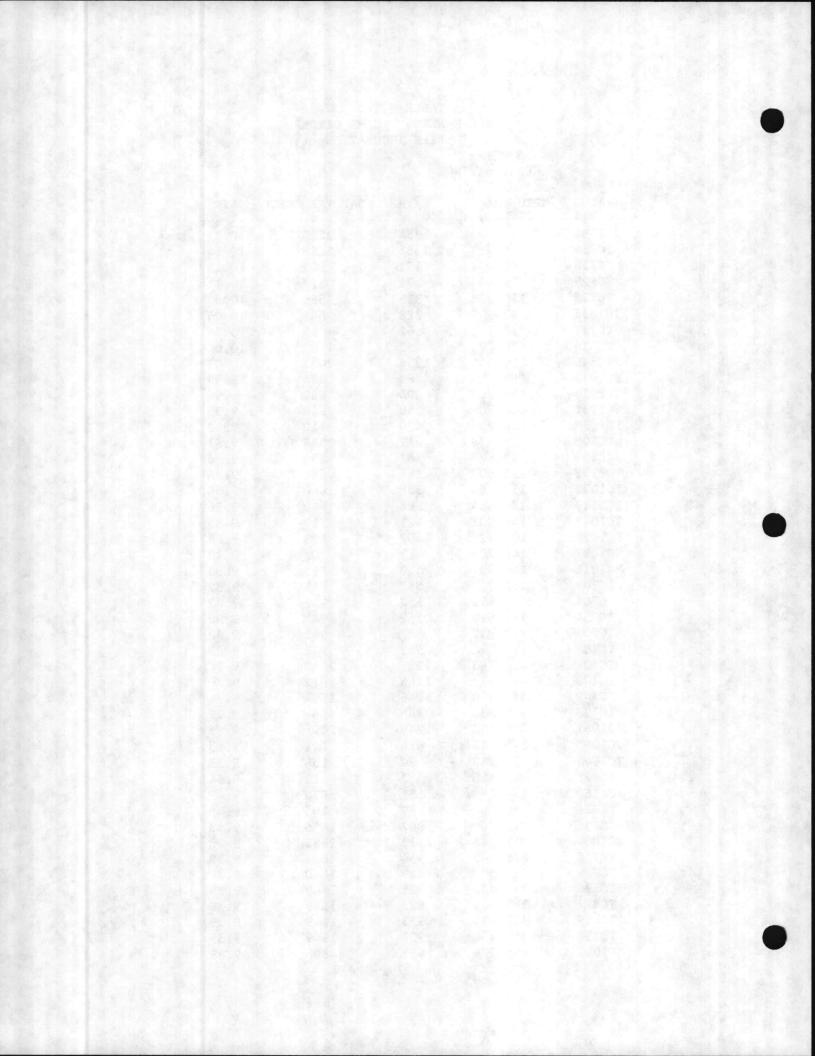


TABLE 5.1-5 ECO RANKING - CAMP GEIGER PIPE INSULATION

ENERGY SAVINGS

BLDG.	MBTU/YR	\$/YR	CAPITAL COST	SIR
TC827	322.656	938	1677	9.38
TC1046	404.605	1177	2105	9.37
TC1005	381.286	1109	1984	9.37
TC839	377.324	1098	1963	9.37
TC836	324.699	944	1690	9.37
TC838	324.181	943	1688	9.37
TC1026	333.447	970	1738	9.36
TC837	321.847	936	1677	9.36
TC1006	400.535	1165	2092	9.34
TC738	328.188	955	1714	9.34
TC739	13.979	40	73	9.33
TC848	412.191	1199	2157	9.32
TC853	412.191	1199	2157	9.32
TC1036	172.456	501	904	9.30
TC1037	171.938	500	902	9.30
TC1058	462.200	1345	2429	9.28
TC1057	462.200	1345	2429	9.28
TC1048	456.518	1328	2399	9.28
TC1027	452.478	1316	2386	9.25
TC1003	432.045	1257	2286	9.22
TC1055	140.106	407	741	9.22
TC807	298.512	868	1581	9.21
TC804	298.512	868	1581	9.21
TC805	308.548	897	1638	9.19
TC1009	403.467	1174	2143	9.18
TC1069	175.973	512	938	9.14
TC806	276.242	803	1475	9.13
TC951	132.131	384	710	9.07
G530	69.473	202	374	9.04
TC712	15.975	46	87	8.91
TC737	72.682	211	398	8.90
TC910	2,015.422	5864	11269	8.72
TC900	238.960	695	1353	8.61
TC1052	22.361	65	127	8.58
TC1056	144.019	419	836	8.40
G550	51.176	148	300	8.30
TC701	63.572	184	381	8.12
TC742	14.381	41	88	7.91
G520	45.672	132	310	7.17
G770	173.891	506	1197	7.08
TC1110	130.012	378	1043	6.07
TC812	32.849	95	272	5.89
TC1008	165.646	482	1714	4.71
TC717	154.644	450	1636	4.61
TC1142	169.125	492	1826	4.52
G640	886.614	2580	9703	4.45

5-8 (R-1)

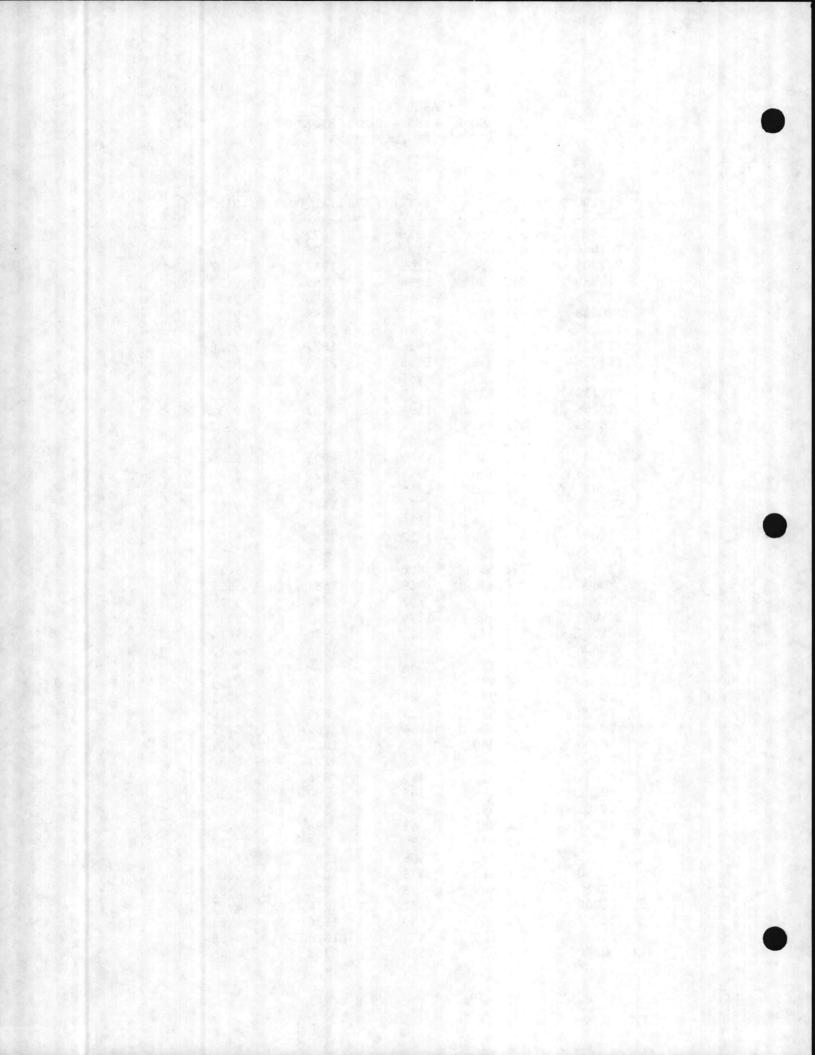


TABLE 5.1-5 ECO RANKING - CAMP GEIGER PIPE INSULATION

ENERGY SAVINGS

BLDG.	MBTU/YR	\$/YR	CAPITAL COST	SIR	
G540	19.419	56	244	3.87	
TC1064	43.726	127	633	3.36	
TC748	69.968	203	1253	2.72	
TC1161	34.761	101	647	2.62	
TC753	27.476	79	573	2.33	
TC750	58.569	170	1241	2.30	
TC751	83.721	243	1798	2.27	
TC752	43.114	125	924	2.27	
TC1045	29.652	86	137	10.51	
TOTAL	27,855.980	81061	153254	7.11	





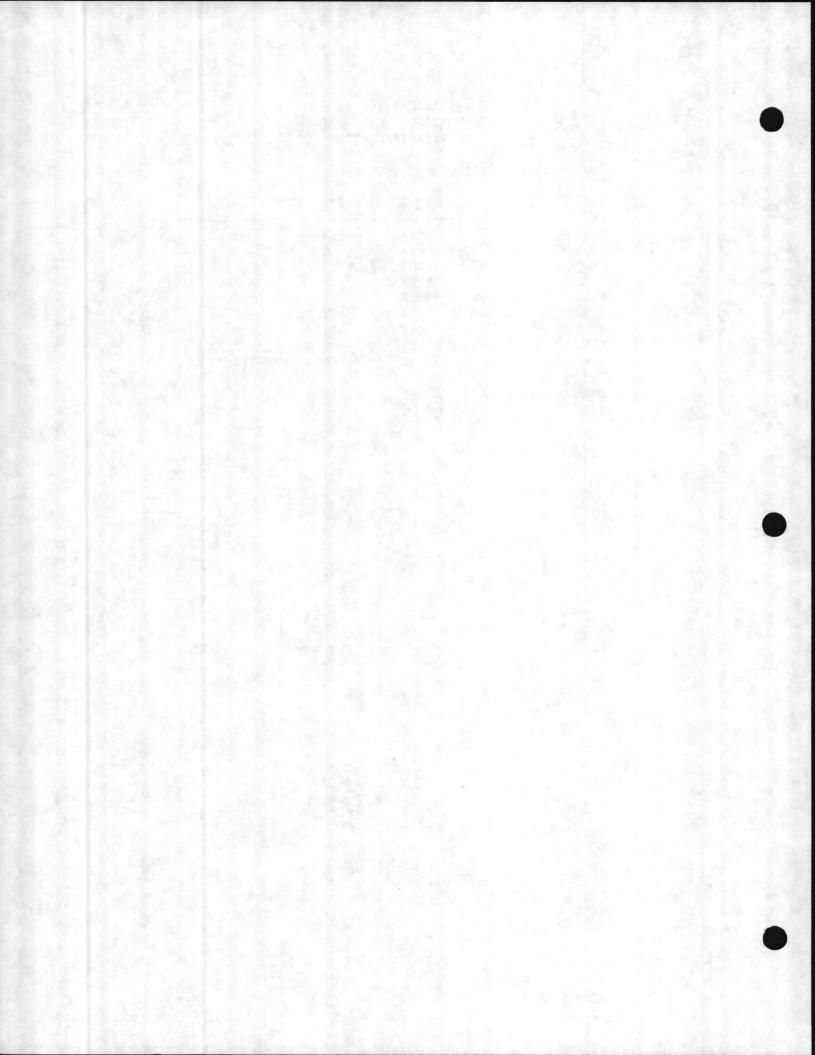
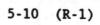


TABLE 5.1-6 ECO RANKING - RIFLE RANGE PIPE INSULATION

	ENERGY SAVI	NGS			
BLDG.	MBTU/YR	\$/YR	CAPITAL COST	SIR	
RR11	1,512.647	4401	7520	9.81	
RR12	428.893	1248	2141	9.77	
RR1	2,251.451	6551	11780	9.32	
RR5	2,202.735	6409	11713	9.17	
RR4	1,870.883	5444	10000	9.13	
RR2	2,097.979	6105	11307	9.05	
RR9	592.621	1724	3222	8.97	
RR8	752.859	2190	5123	7.17	
RR10	242.295	705	2670	4.42	
RR3	152.552	443	1748	4.25	
TOTAL	12104.915	35225	67224	7.05	



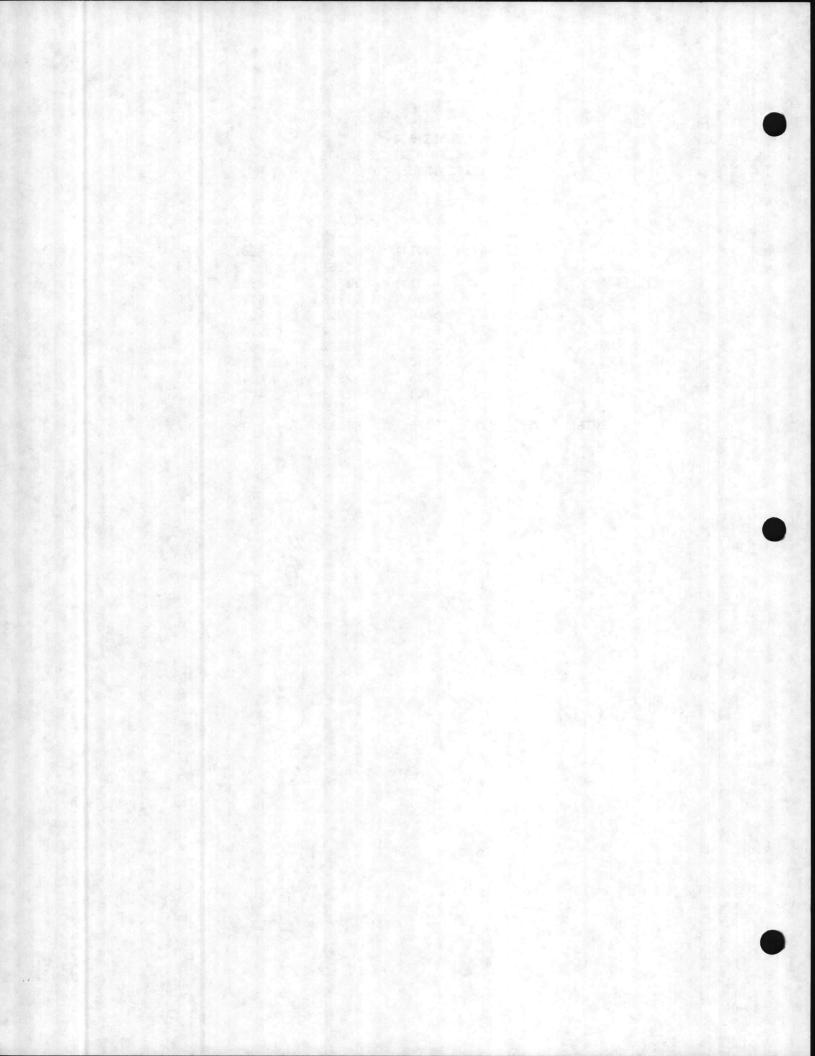


TABLE 5.1-7 ECO RANKING - CAMP JOHNSON PIPE INSULATION

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BLDG.	ENERGY SAVING MBTU/YR	S \$/YR	CAPITAL COST	SIR	
M130	633.202	1842	1533	20.15	1
M611	193.568	563	540	17.48	
M131	65.149	189	183	17.33	•
M316	51.104	148	152	16.32	
M621	74.612	217	233	15.58	
M403	37.435	108	129	14.11	
M504	105.444	306	373	13.97	
M507	89.221	259	311	13.96	
M305	97.226	282	342	13.84	
M514	56.599	164	204	13.51	
M327	26.888	78	101	12.91	
M614	164.819	479	650	12.35	
M303	486.310	1415	2023	11.72	
M311	385.439	1121	1609	11.68	
M420	63.849	185	266	11.67	
M309	383.481	1115	1610	11.62	
M139	880.246	2561	3734	11.50	
M409	52.358	152	224	11.40	
M321	79.832	232	342	11.37	-
M609	97.855	284	420	11.36	
M128	300.803	875	1305	11.24	
M604	72.578	211	315	11.21	
M516	130.952	381	571	11.18	
M307	46.227	134	213	10.56	
M513	13.975	40	65	10.41	
M616	73.710	214	346	10.38	
M422	48.908	142	236	10.10	. '
M602	165.899	482	811	9.97	
M215	775.760	2257	3806	9.94	
M522	96.818	281	476	9.91	
M416	53.061	154	261	9.88	
M509	90.235	262	446	9.86	
M622	148.726	432	739	9.81	
M129	697.968	2031	3469	9.81	
M178	39.616	115	197	9.76	
M103	3.841	11	19	9.76	
M123	340.603	991	1710	9.71	
M237	29.813	86	149	9.70	
M603	143.842	418	727	9.65	1
M124	391.670	1139	1981	9.64	
M105	319.314	929	1615	9.64	
M90	19.204	55	97	9.63	
M216	382.547	1113	1940	9.62	
M323	6.219	18	31	9.58	
M127	343.272	998	1747	9.58	
M502	5.183	15	26	9.58	
M319	4.146	12	21	9.58	1



5-11 (R-1)

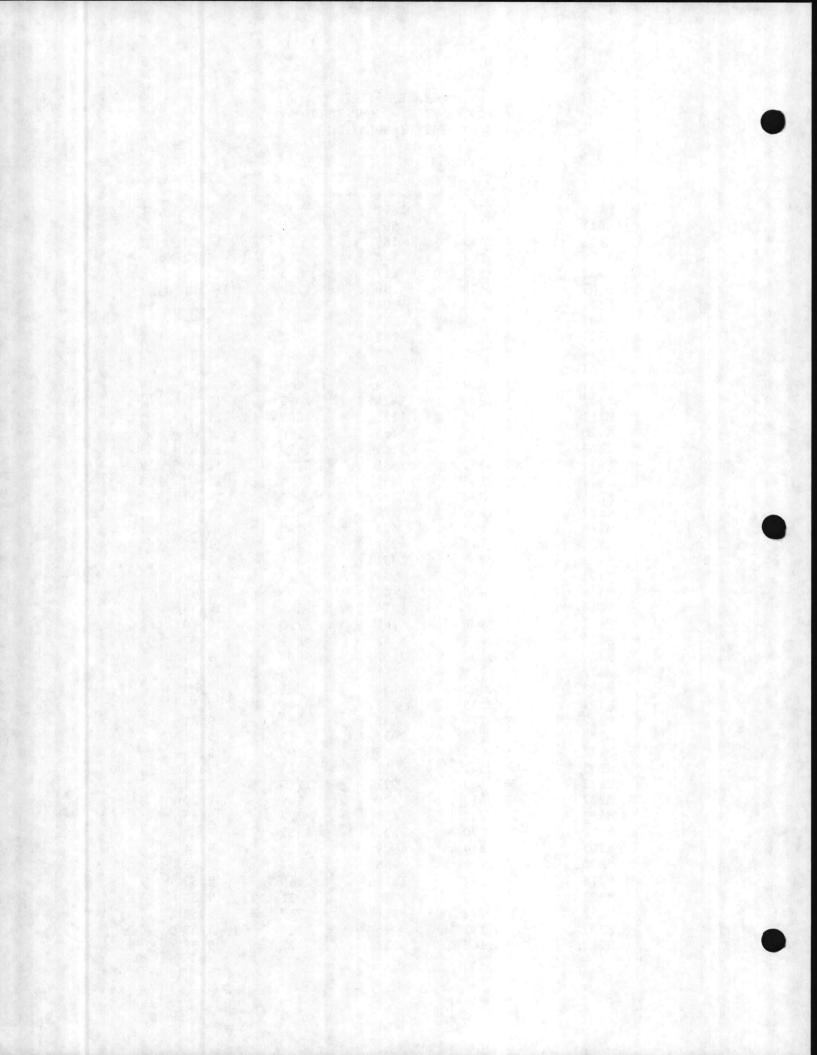


TABLE 5.1-7 ECO RANKING - CAMP JOHNSON PIPE INSULATION

BLDG.	ENERGY SAVING MBTU/YR	s \$/yr	CAPITAL COST	SIR
M126	306.027	890	1574	9.48
M201	12.473	36	64	9.48
M413	22.710	66	117	9.41
M101	1114.034	3241	5778	9.40
M301	92.804	270	485	9.33
M501	212.028	617	1108	9.33
M125	282.550	822	1478	9.32
M512	269.530	784	1413	9.30
M606	6.010	17	31	9.25
M620	12.660	36	66	9.23
M612	28.462	82	150	9.22
M240	105.567	307	560	9.18
M506	20.296	59	107	9.18
M520	7.759	22	41	9.14
M302	30.123	87	161	9.11
M613	13.909	40	74	9.08
M601	6.838	19	37	9.01
M518	69.303	201	378	8.93
M412	1.476	4	8	8.91
M315	73.022	212	402	8.85
M104	1621.867	4719	9100	8.69
M401	29.904	87	170	8.57
M414	12.321	35	71	8.41
M402	20.898	60	123	8.25
M313	19.533	56	116	8.21
M112	34.290	99	205	8,15
M308	7.037	20	42	8.10
M406	7.835	22	47	8.08
M411	2.688	7	16	8.07
M441	53.727	156	· 330	7.93
M619	15.312	44	95	7.83
M408	15.621	45	98	7.77
M419	8.792	25	55	7.71
M318	28.108	81	179	7.63
M314	9.101	26	58	7.61
M102	700.944	2039	4659	7.34
M415	90.540	263	611	7.22
M511	30.174	87	222	6.61
M134	180.220	524	1331	6.60
M207	45.743	133	367	6.07
M206	82.677	240	708	5.69
M231	31.138	90	286	5.29
M607	63.621	185	591	5.24
M100	303.369	882	2856	5.18
M132	515.267	1499	4902	5.12
M503	16.578	48	162	4.97
M407	69.540	202	734	4.62

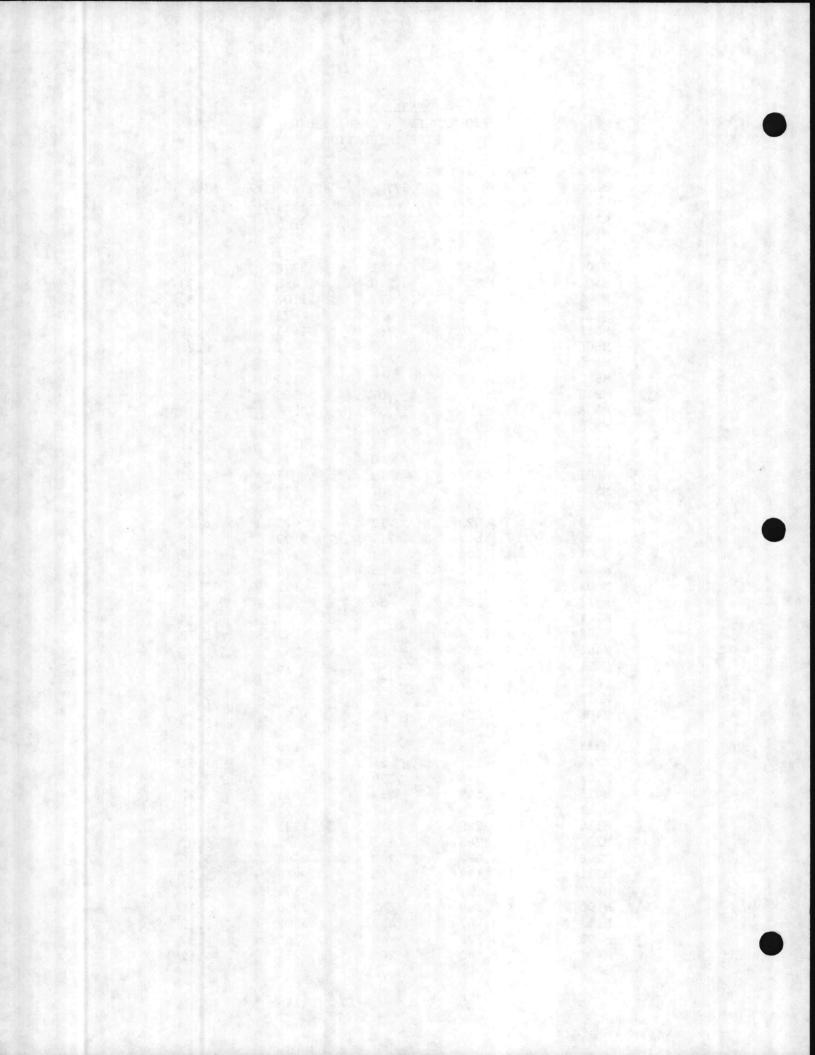


TABLE 5.1-7 ECO RANKING - CAMP JOHNSON PIPE INSULATION

BLDG.	ENERGY SAVINGS	A 000			
	MBTU/YR	\$/YR	CAPITAL COST	SIR	
M209	65.497	190	710	4.50	
M405	5.961	17	70	4.11	
M202	266.017	774	3437	3.77	•
M418	47.201	137	658	3.49	
M424	269.877	785	3795	3.47	
M205	8.665	25	148	2.85	
M521	20.922	60	379	2.68	
M324	641.844	1867	12625	2.48	
M208	22.600	65	479	2.29	
M116	3.042	8	106	1.39	
M210	14.288	41	514	1.35	
M326	0.000	0	0	0.00	
TOTAL	16839.867	49004	103385	6.37	



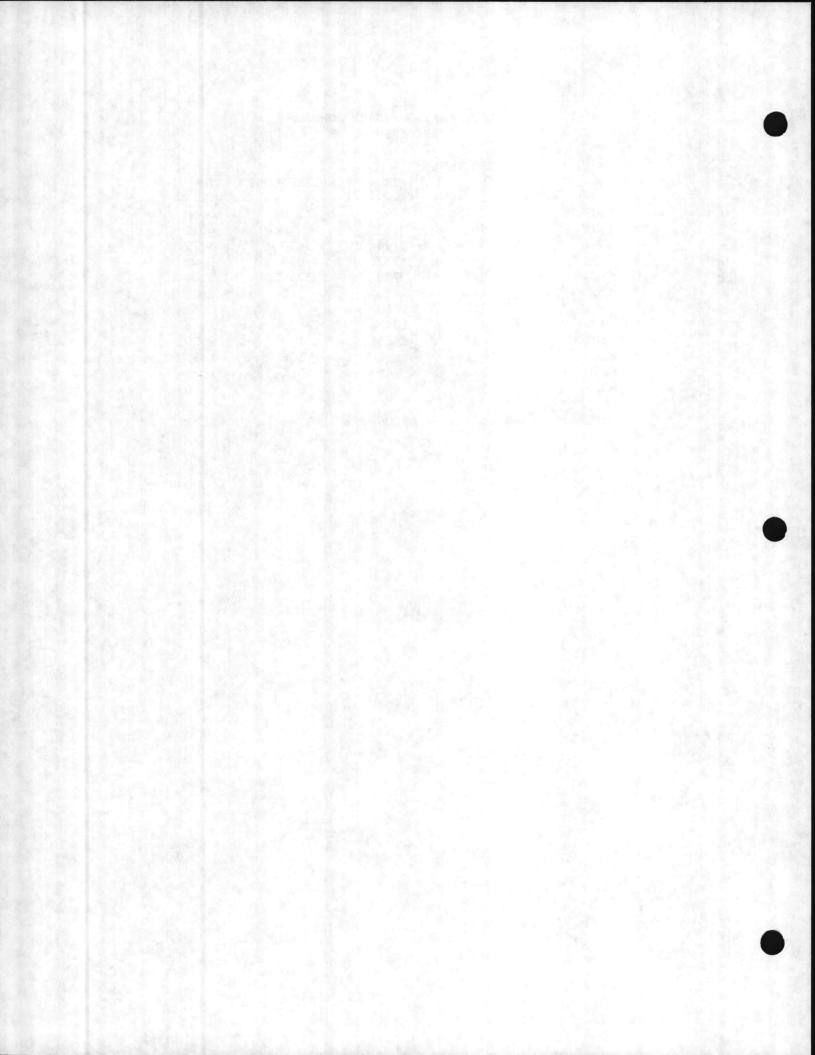


TABLE 5.1-8 ECO RANKING - NEW RIVER AIR STATION PIPE INSULATION

		ENERGY SAVI	NGS		
	BLDG.	MBTU/YR	\$/YR	CAPITAL COST	SIR
	AS4146	148.171	431	431	16.77
	AS211	218.794	636	663	16.08
	AS312	98.782	287	381	12.62
	AS240	127.891	372	524	11.89
	AS4025	287.025	835	1228	11.40
	AS4020	287.025	835	1228	11.40
	AS222	98.793	287	427	11.27
	AS118	285.900	831	1244	11.21
	AS205	112.456	327	508	10.79
	AS232	53.356	155	245	10.61
	AS4110	104.339	303	503	10.11
	AS320	11.752	34	56	10.11
	AS4122	197.199	573	960	10.01
	AS114	19.542	56	96	9.92
	AS217	2,068.351	6018	10207	9.88
	AS216	2001.706	5824	9956	9.81
	AS414	44.363	129	223	9.68
	AS215	1,969.767	5732	9964	9.64
	AS130	469.157	1365	2398	9.54
	AS4120	94.063	273	492	9.32
	AS225	74.511	216	390	9.30
	AS4100	317.044	922	1681	9.20
	AS4015	90.576	263	488	9.04
	AS502	443.815	1291	2530	8.55
	AS302	486.780	1416	2972	7.99
	AS236	345.818	1006	2205	7.65
	AS4012	300.530	874	1938	7.56
	AS425	13.895	40	96	7.03
	AS226	930.963	2709	6463	7.02
	AS214	129.755	377	943	6.71
	AS122	227.705	662	1656	6.70
	AS504	1,419.548	4130	10561	6.55
	AS212	115.731	336	890	6.34
	AS4035	47.231	137	393	5.85
	AS208	32.125	93	291	
	AS213	72.493			5.37
	AS202	212.540	210	715	4.94
	AS515		618	2657	3.90
	AS424	112.466	327	1432	3.83
		332.941	968	4264	3.81
	AS4030	44.144	128	740	2.90
	AS4010 AS4106	76.047	221	1288	2.88
		141.613	412	2404	2.87
	AS4158	94.642	275	1636	2.82
	AS518	92.658	269	2237	2.02
	AS124	91.915	267	2603	1.72

5-14 (R-1)

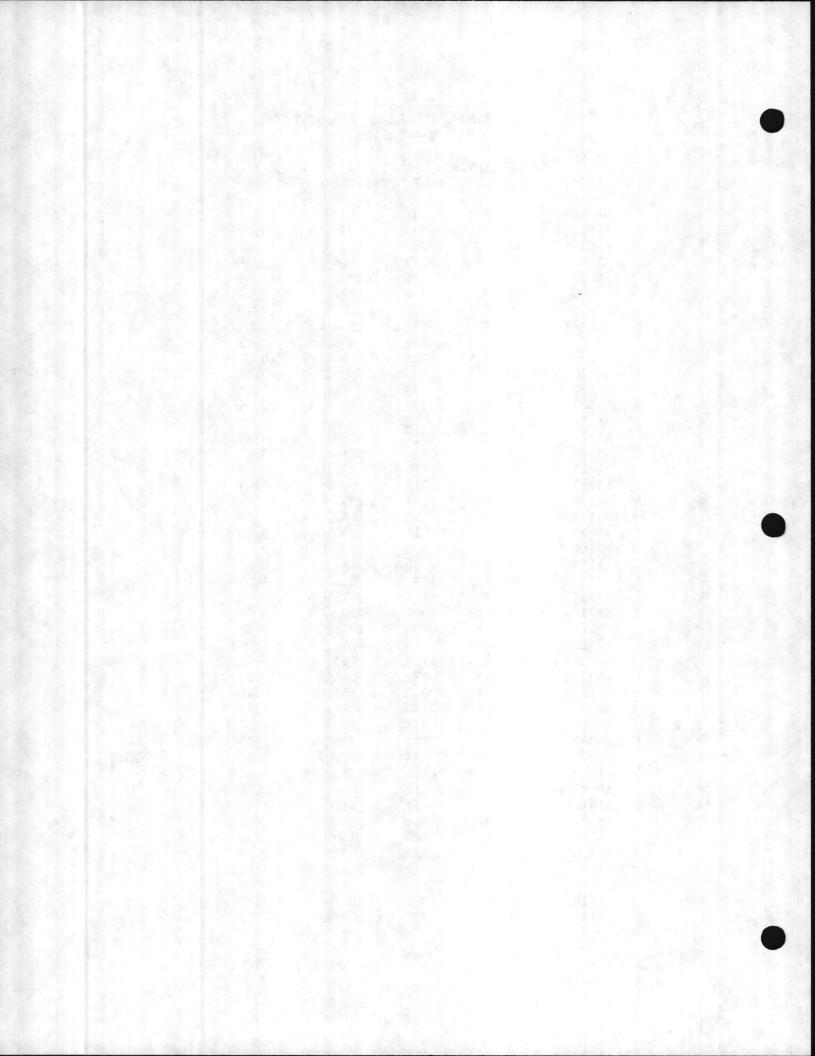
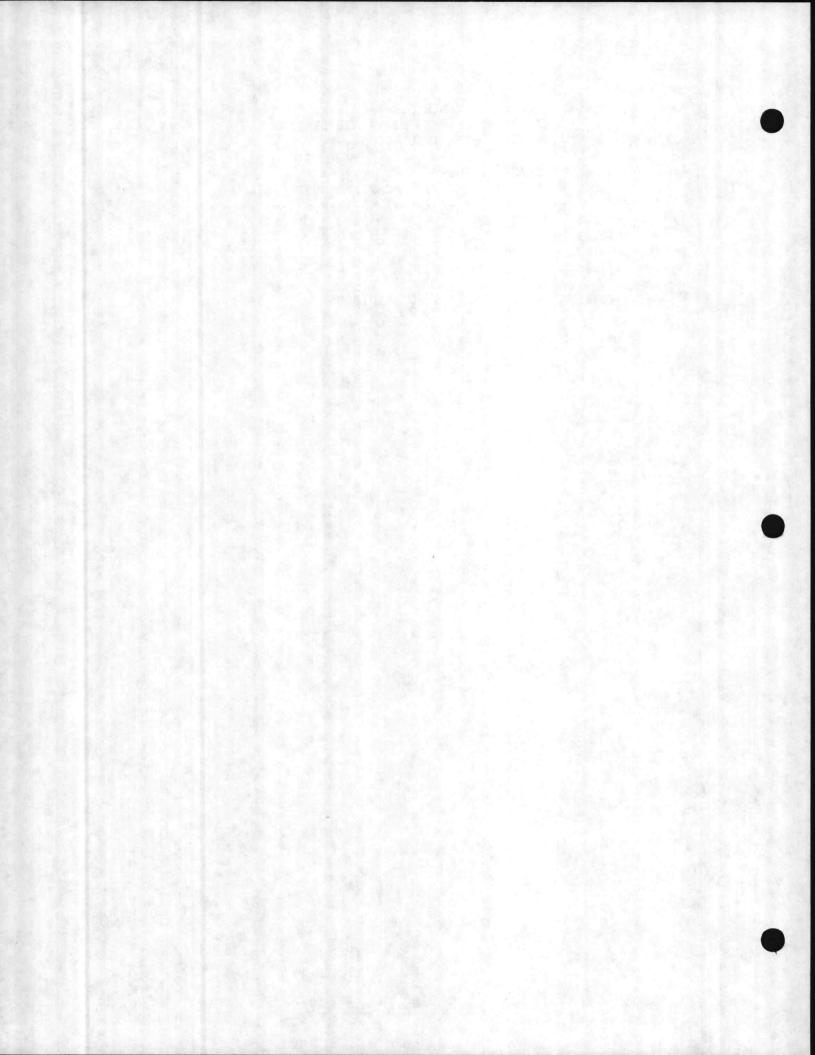


TABLE 5.1-8 ECO RANKING - NEW RIVER AIR STATION PIPE INSULATION

	ENERGY SAVI	NGS			
BLDG.	MBTU/YR	\$/YR .	CAPITAL COST	SIR	
AS4108	232.924	677	6673	1.70	
AS4141	0.000	0	0	0.00	
AS4157	0.000	0	0	0.00	
AS4145	0.000	0	0	0.00	
TOTAL	15178.842	44170	101880	5.83	

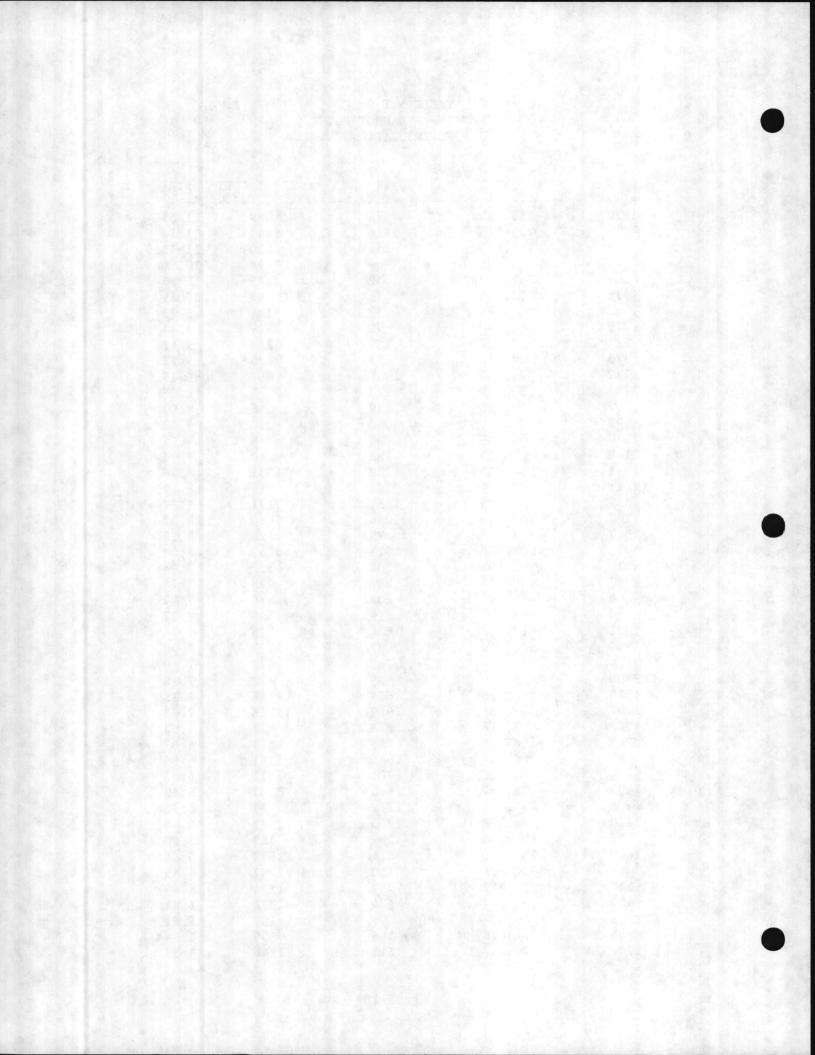
5-15 (R-1)



ENERGY SA		GS		
BLDG.	MBTU/YR	\$/YR	CAPITAL COST	SIR
1220	258.425	576	669	11.57
211	724.469	1615	1943	11.18
3	160.070	356	430	11.15
9	434.899	969	1196	10.90
307	247.899	552	685	10.85
916	33.684	75	99	10.19
1042	113.418	252	349	9.73
1012	40.840	91	129	9.44
221	89.587	199	285	9.42
325	660.865	1473	2135	9.28
322	878.228	1958	2867	9.18
1101	3,687.815	8223	12179	9.08
907	103.048	229	340	9.07
25	2,490.396	5553	8272	9.03
1116	43.002	95	143	9.01
1140	83.779	186	280	8.95
521	564.315	1258	1931	8.76
1011	87.464	195	311	8.41
411	605.925	1351	2171	8.37
122	469.333	1046	1680	8.37
1317	35.663	79	129	8.28
10	902.147	2011	3367	8.03
1015	93.695	208	353	7.95
67	129.023	287	498	7.76
4	92.787	206	376	7.39
50	53.436	119	220	7.27
12	817.991	1824	3375	7.26
304	509.959	1137	2123	7.20
524	342.574	763	1427	7.19
HP405	17.369	38	72	7.19
914	290.826	648	1216	
1201	3,579.066	7981	15268	7.16
908	97.818	218		7.03
HP51	118.979	265	417 511	7.02
236	738.537	1646		6.97
1006	350.520	781	3181	6.96 6.93
1103	825.247	1840	1515 3593	
8	795.051	1772		6.88
1310	796.106	1775	3477	6.85
117	126.795	282	3487	6.84
1400	185.750		559	6.80
6	730.948	414	833	6.68
317	339.857	1630	3297	6.65
400	392.047	757	1534	6.64
HP215		874	1778	6.61
S86	43.504	97	197	6.61
1707	74.620	166	339	6.59
1/0/	274.117	611	1246	6.59

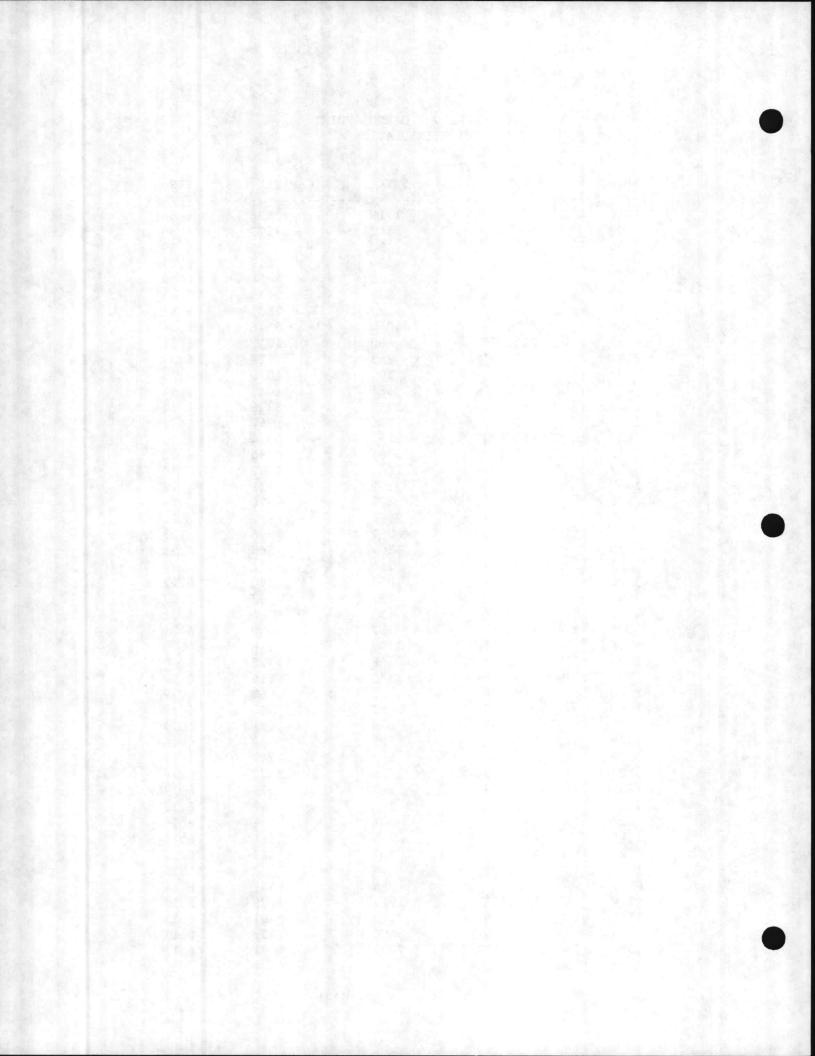
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BLDG.	ENERGY SAVINGS MBTU/YR	\$/YR	CAPITAL COST	SIR	
540	771.102	1719	3525	6.56	-
909	3,830.819	8542	17677	6.50	
1450	17.371	38	80	6.49	
314	176.782	394	819	6.47	
HP165	11.756	26	54	6.44	
219	396.986	885	1849	6.43	
13	600.717	1339	2801	6.43	
420	1,822.846	4064	8546	6.39	
915	215.279	480	1012	6.38	
HP127	23.892	53	112	6.37	
203	226.590	505	1070	6.35	
419	305.667	681	1445	6.34	
123	1,766.732	3939	8375	6.32	
1209	263.060	586	1247	6.32	
205	965.480	2153	4594	6.30	
65	1,383.130	3084	6580	6.30	
17	960.999	2143	4569	6.30	
1407	1,413.693	3152	6731	6.29	
106	144.923	323	690	6.29	
902	1,241.396	2768	5922	6.28	
41	103.865	231	498	6.25	
226	138.939	309	665	6.25	
508	109.741	244	527	6.24	
1106	472.972	1054	2280	6.22	
S96	13.983	31	67	6.22	
1212	60.944	135	294	6.21	
206	151.262	337	730	6.21	
1118	896.795	1999	4336	6.20	
1409	295.512	658	1428	6.20	
900	168.220	375	814	6.19	
HP185	12.498	27	60	6.19	
HP195	12.498	27	60	6.19	
107	142.758	318	691	6.19	
509	144.163	321	699	6.18	
526	359.784	802	1747	6.17	
520	734.968	1638	3572	6.17	
1750	118.128	263	573	6.17	
1111	91.104	203	442	6.17	
408	135.018	301	656	6.16	
1120	320.867	715	1564	6.15	
125	135.608	302	661	6.14	
1770	6.400	14	31	6.14	
HP57	100.523	224	491	6.14	
214	548.184	1222	2678	6.13	
1115	82.219	183	401	6.13	
315	291.705	650	1431	6.11	
326	910.911	2031	4471	6.11	

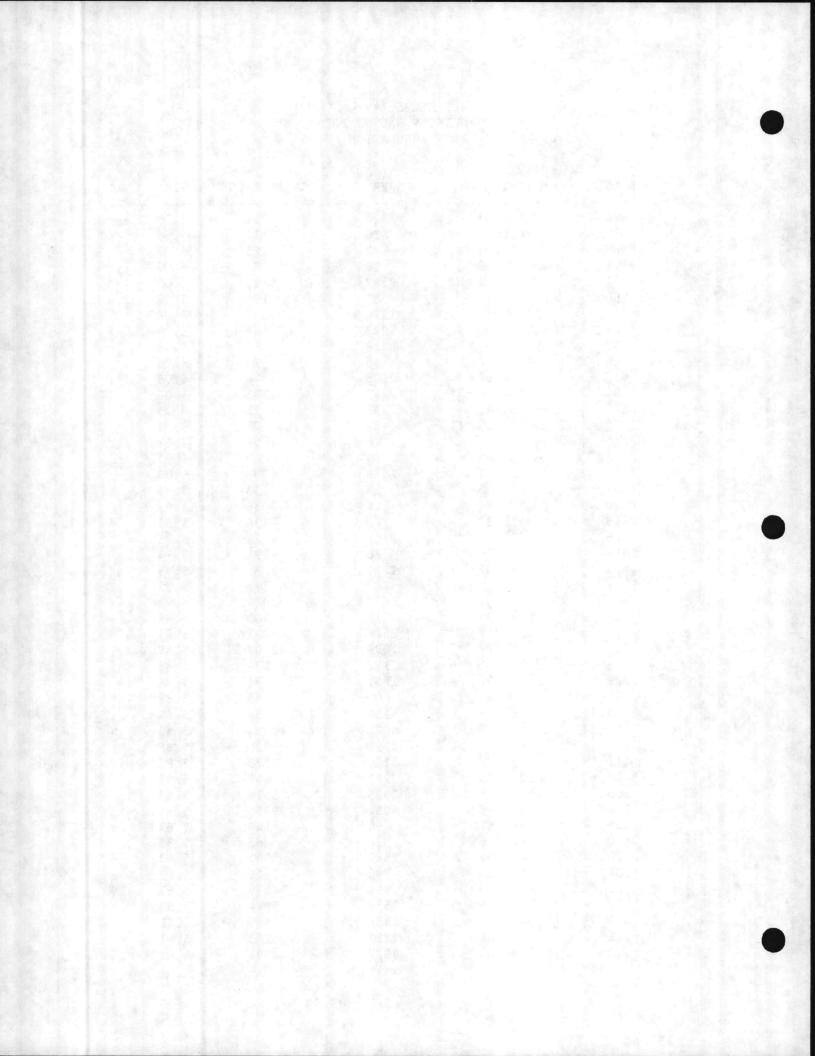
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BLDG.	ENERGY SAVINGS MBTU/YR	.\$/YR	CAPITAL COST	SIR
424	144.903	323	711	6.10
19	307.671	686	1514	6.09
HP560	45.800	102	225	6.09
HP175	12.869	28	63	6.09
422	1,142.192	2547	5620	6.09
60	24.077	53	118	6.08
910	616.356	1374	3037	6.08
1207	131.626	293	649	6.08
1100	97.794	218	483	6.06
14	15.718	35	77	6.06
417	1,080.268	2408	5346	6.06
1404	350.820	782	1735	6.06
HP145	15.147	33	75	6.05
1005	14.719	32	73	6.03
HP135	11.931	26	59	6.02
63	15.875	35	79	6.01
111	1,183.302	2638	5908	6.00
HP550	26.646	59	133	5.98
HP170	7.279	16	36	5.97
119	345.320	770	1736	5.96
316	1,057.470	2358	5323	5.95
1611	38.330	85	193	5.94
1403	538.982	1201	2725	5.93
1107	351.082	782	1777	5.92
416	400.662	893	2029	5.92
323	994.609	2217	5060	5.89
217	1123.919	2506	5721	5.89
320	493.112	1099	2507	5.89
898	54.737	122	279	5.88
1309	830.106	1851	4234	5.88
11	271.904	606	1385	5.88
1105	516.948	1152	2637	5.88
751	1,803.976	4022	10854	5.88
102	1,163.974	2595	5930	5.88
412	1,403.592	3130	7173	5.87
1208	127.226	283	649	5.87
308	1038.435	2315	5316	5.85
1606	1,919.967	4281	9850	5.84
HP155	29.052	64	149	5.83
1610	12.726	28	65	5.83
20	1,160.204	2587	5961	5.83
501	314.263	700	1616	5.83
2	880.779	1964	4539	5.82
309	1147.564	2559	5914	5.82
407	1,045.620	2331	5383	5.82
118	999.027	2227	5153	5.81
313	1,335.360	2977	6891	5.81
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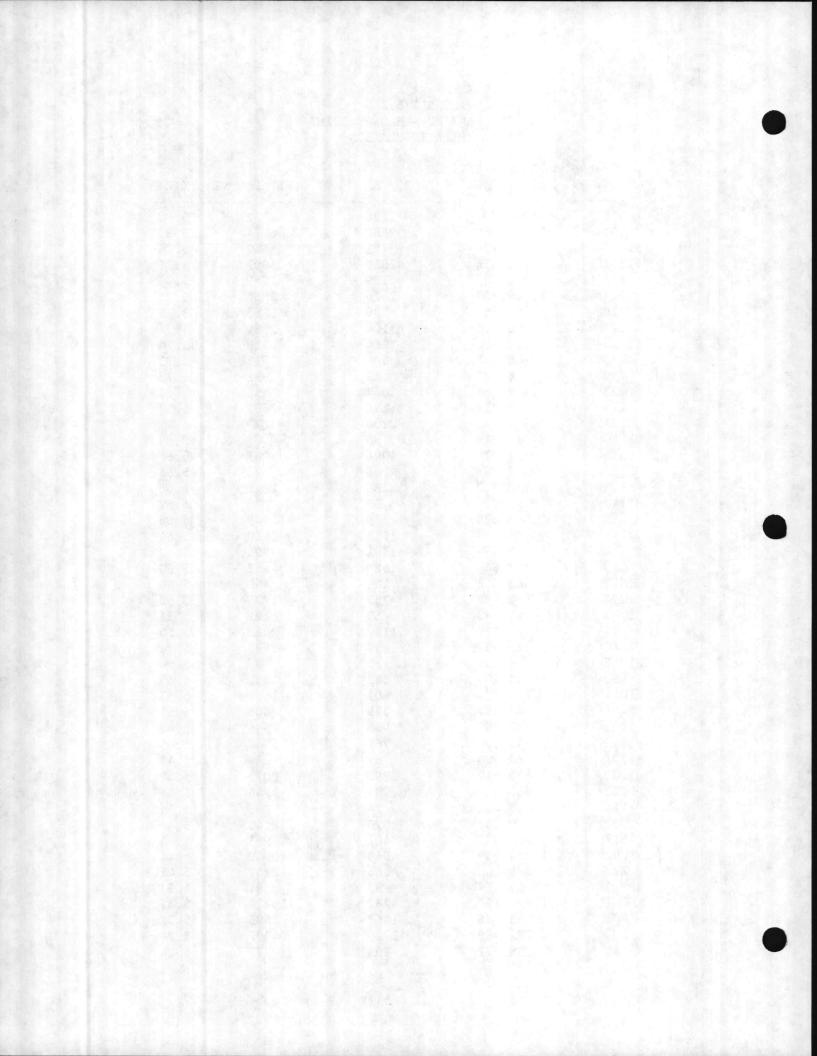
5-18 (R-1)



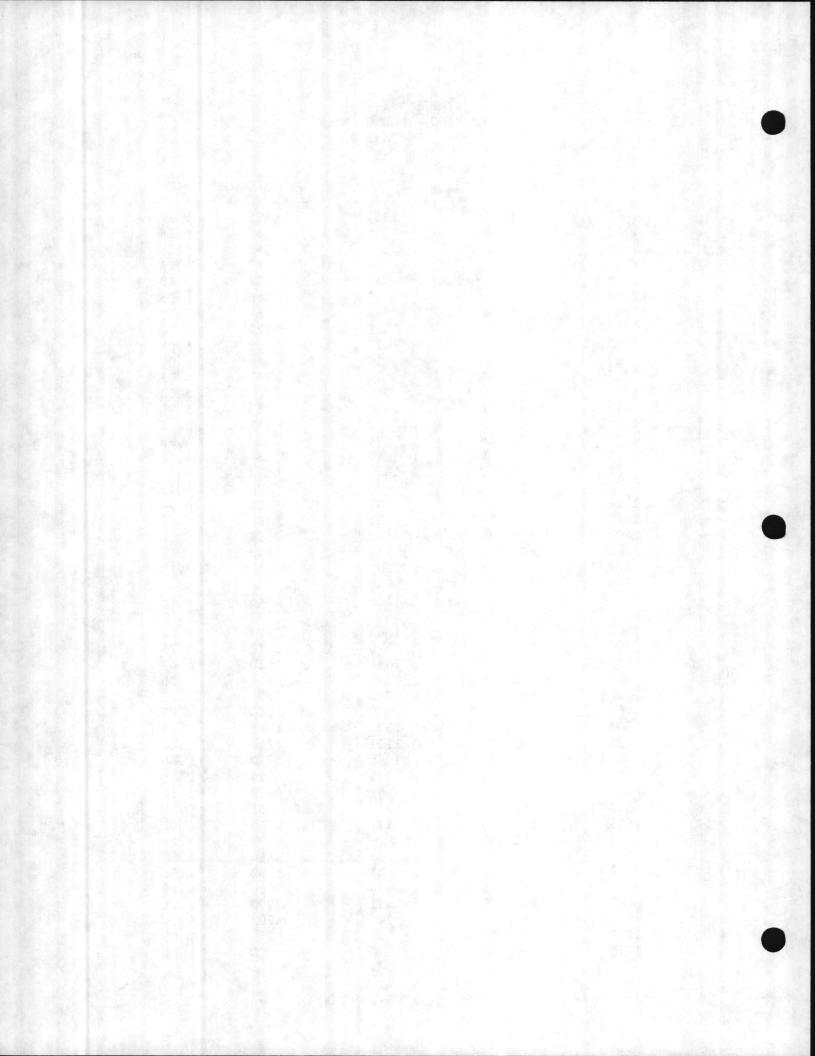
BLDG.	ENERGY SAVINGS MBTU/YR	.\$/YR	CAPITAL COST	SIR
312	954.404	2128	4932	5.80
101	1,202.364	2681	6214	5.80
S1210	67.724	151	352	5.76
1301	1,134.810	2530	5907	5.76
233	511.127	1139	2659	5.76
327	1,084.457	2418	5655	5.75
18	242.150	539	1263	5.75
127	495.125	1104	2587	5.74
1755	118,460	264	618	5.74
403	136.393	304	713	5.73
59	6.025	13	31	5.73
423	469.586	1047	2455	5.73
114	500.711	1116	2681	5.72
321	988.352	2204	5179	5.72
1340	15.916	35	83	5.69
516	581.220	1296	3067	5.68
1780	3.998	8	21	5.68
1104	532.802	1188	2811	5.68
HP140	13.770	30	72	5.67
318	1,047.826	2336	5549	5.66
216	453.568	1011	2410	5.64
54	1,117.488	2491	5955	5.62
213	757.646	1689	4053	5.60
1612	63.558	141	340	5.60
1211	330.629	737	1775	5.58
1004	24.089	53	129	5.58
15	521.172	1162	2815	5.55
1410	669.289	1492	3623	5.54
HP1016	6.904	15	37	5.54
80	155.109	345	840	5.53
1041	269.772	601	1466	5.52
1401	147.797	329	803	5.51
1304	430.093	959	2348	5.49
302	341.879	762	1867	5.49
HP301	30.994	69	169	5.48
1200	1,475.512	3290	8073	5.48
225	867.513	1934	4746	5.48
1114	33.411	74	183	5.46
1607	390.553	870	2145	5.46
518	180.094	401	991	5.44
1202	1,824.319	4068	10042	5.44
223	388.645	866	2152	5.41
HP275	14.677	32	81	5.37
1	1,920.164	4281	10722	5.37
905	655.676	1462	3696	5.32
500	771.469	1720	4392	5.26
43	136.072	303	777	5.24



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	ENERGY SAVINGS				
BLDG.	MBTU/YR	\$/YR	CAPITAL COST	SIR	
401	813.543	1814	4695	5.19	-
1500	114.629	255	663	5.18	
16	68.324	152	395	5.18	
HP285	15.058	33	87	5.18	
HP255	15.897	35	92	5.15	
HP295	15.397	34	89	5.13	
HP265	15.397	34	89	5.13	
300	727.147	1621	4271	5.10	
HP105	9.982	22	58	5.08	
39	4.893	10	29	5.04	
HP267	16.956	37	101	5.03	
1300	343.926	766	2054	5.02	
115	650.476	1450	3887	5.01	
1302	41.635	92	251	4.96	
425	402.789	898	2450	4.93	
HP115	27.049	60	164	4.92	
201	645.777	1440	4029	4.80	
1002	11.194	24	70	4.75	
1316	47.197	105	305	4.64	
HP125	10.575	23	68	4.60	
1601	1,163.733	2595	7908	4.41	
66	62.045	138	445	4.18	
527	355.291	792	2553	4.17	
1706	21.767	48	156	4.17	
901	506.663	1129	3646	4.16	
1108	1,528.399	3408	11112	4.12	
904	172.102	383	1278	4.03	
506	265.015	590	2118	3.75	
519	664.537	1481	5810	3.43	
1502	1,243.791	2773	11074	3.36	
517	401.730	895	3859	3.12	
58	27.119	60	264	3.07	
502	618.316	1378	6398	2.89	
523	502.959	1121	5240	2.87	
507	475.724	1060	5020	2.84	
511	419.296	935	4724	2.66	
89	287.573	641	3429	2.51	
510	396.988	885	4751	2.50	
515	391.964	874	4845	2.42	
84	371.348	828	4877	2.28	
503	345.734	770	4614	2.24	
1117	14.960	33	200	2.23	
62	299.738	668	4090	2.19	
460	239.179	533	3290	2.18	
514	335.610	748	4702	2.14	
1771	17.897	39	261	2.05	
1775	0.000	0	0	0	



	ENERGY SAVIN	IGS			
BLDG.	MBTU/YR	.\$/YR	CAPITAL COST	SIR	
1613	0.000	0	0	0	
27	0.000	0	0	. 0	
TOTAL	113,487.252	253077	598027	5.69	



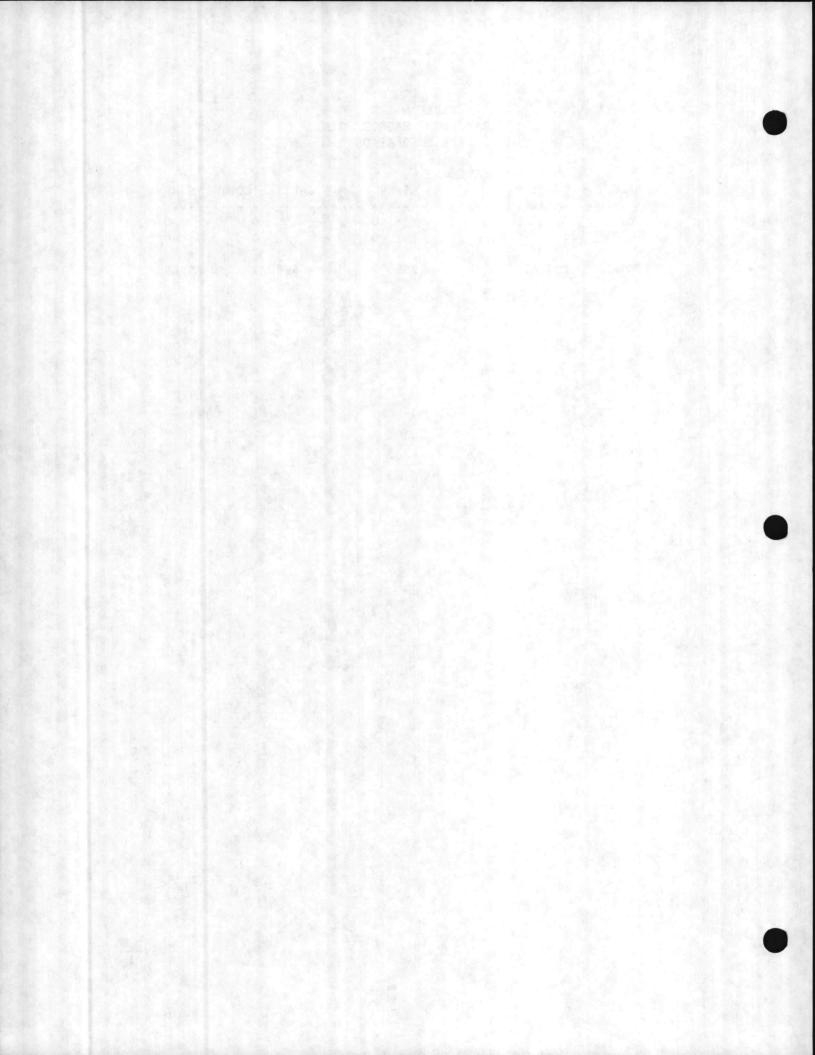


TABLE 5.1-10 ECO RANKING - PARADISE POINT PIPE INSULATION

BLDG.	ENERGY SAVING MBTU/YR	s \$/yr	CAPITAL COST	SIR
2617	75.599	219	223	16.53
2628	63.248	184	192	16.03
2626	287.365	836	1448	9.68
2609	26.028	75	134	9.45
2615	1107.467	3222	6051	8.93
2627	436.846	1271	2577	8.27
2629	31.766	92	192	8.03
2611	36.358	105	222	7.96
2600	42.630	124	289	7.17
2604	26.916	78	215	6.10
2624	615.037	1789	4949	6.06
	22.211	64	187	5.79
2605	892.082	2595	7644	5.69
2602	214.818	625	2236	4.68
2625	22.599	65	255	4.32
2603	5.866	17	149	1.91
2613		11	137	1.34
2607	3.780	11	157	2101
TOTAL	3910.616	11380	27100	5.65



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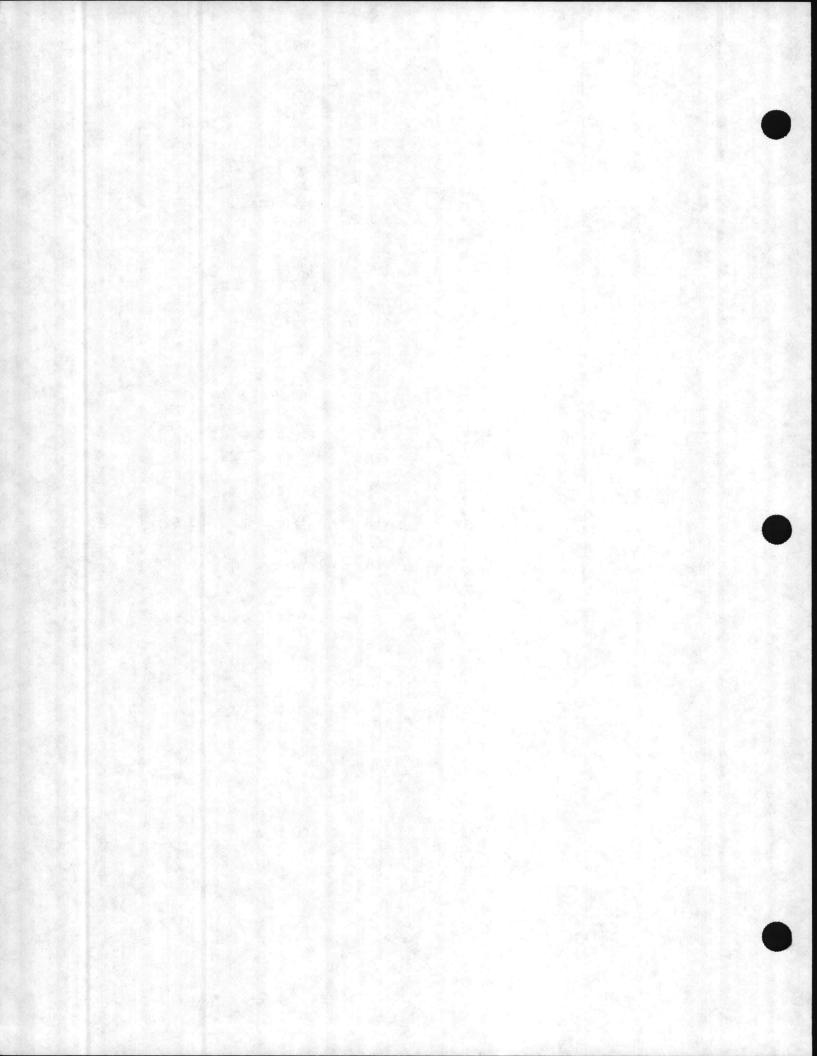


TABLE 5.1-11 ECO RANKING - FRENCH CREEK PIPE INSULATION

	ENERGY SAVINGS			
BLDG.	MBTU/YR	\$/YR	CAPITAL COST	SIR
FC560	133.715	298	400	10.00
FC530	107.421	239	357	9.01
FC555	107.421	239	357	9.01
FC515	94.066	209	350	8.04
FC540	177.863	396	704	7.57
FC525	85.289	190	350	7.29
FC550	85.289	190	350	7.29
FC573	27.685	61	116	7.15
FC565	83.424	186	350	7.13
FC360	54.276	121	261	6.23
FC306	29.060	64	147	5.92
FC520	95.408	212	417	6.85
FC200	52.523	117	273	5.76
FC313	35.721	79	187	5.70
FC301	27.618	61	146	5.66
FC416	50.234	112	270	5.58
FC100	26.382	58	142	5.54
FC400	29.172	65	161	5.41
FC311	21.979	49	128	5.11
FC310	21.979	49	128	5.11
FC309	22.576	50	134	5.04
FC412	45.989	102	287	4.79
FC190	4.200	9	26	4.75
FC303	576.493	1285	3808	4.54
FC304	16.123	35	115	4.17
FC302	169.093	377	1347	3.76
FC415	27.163	60	221	3.67
FC420	293.528	654	2590	3.39
FC411	22.164	49	208	3.19
FC414	22.164	49	208	3.19
FC305	48.020	107	472	3.04
FC251	7.317	16	79	2.77
FC300	125.709	280	1649	2.28
FC312	82.236	183	1733	1.42
FC364	3.478	7	99	1.05
FC413	5.797	12	165	1.05
FC241	0.000	0	0	0.00
TOTAL	2818.575	6285	18735	4.50





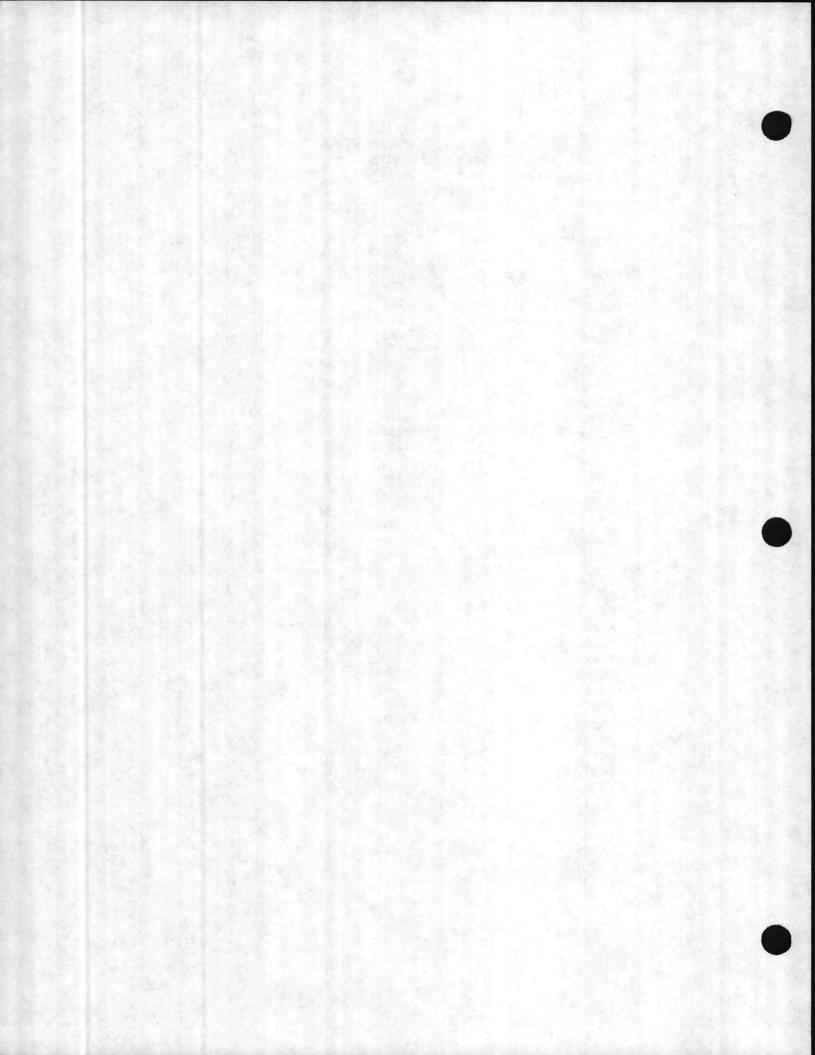


TABLE 5.1-12 COMBINED CONTROLS

BLDG. ENERGY SAVINGS		NGS	S CAPITOL		
INSTALLATION	NO.	MBTU/YR.	\$/YR	COST \$	SIR
HOSPITAL POINT	H15A	2,265.999	5,053	5,441	9.42
HOSPITAL FOINT	H17A	195.841	437	1,814	2.44
	H17	180.823	403	1,814	2.26
	H21	107.355	239	1,814	1.34
	H19	95.151	212	1,814	1.19
	H18	93.027	207	1,814	1.16
TOTAL		2,938.196	6,552	14,511	4.58
WINNER DOTIN	1502	760.708	1,696	1,814	9.49
HADNOT POINT	915	665.554	1,484	1,814	8.30
	1201	643.165	1,434	1,814	8.02
	1118	619.965	1,383	1,814	7.73
	907	605.357	1,350	1,814	7.55
		575.558	1,283	1,814	7.18
	904	571.822	1,275	1,814	7.13
	1012 1212	655.303	1,461	2,107	7.04
	1212	655.018	1,461	2,107	7.03
	1317	624.984	1,394	2,107	6.71
	902	653.975	1,458	2,217	6.67
		531.828	1,186	1,814	6.63
	909	648.688	1,447	2,217	6.62
	1301	640.499	1,428	2,217	6.54
	1011	595.973	1,329	2,107	6.40
	1316	595.509	1,328	2,107	6.39
	1117	573.683	1,279	2,107	6.16
	1775	554.902	1,237	2,107	5.96
	916		892	1,814	4.99
	1601	and the second	869	1,814	4.86
	1108		1,490	3,426	4.41
	901	THE DEPARTMENT OF THE PARTY OF	723	1,814	4.04
	905		688	1,814	3.85
	914		615	1,814	3.44
	1211		539	1,814	3.01
	1114		621	2,217	2.84
	84		479	1,814	2.68
	1		560	2,217	2.56
	509		556	2,217	2.54
	206		555	2,217	2.54
	424			2,217	2.53
	107		554	2,217	2.53
	22		553	2,217	2.52
	30		551		2.47
	150		441	1,814	2.32
	120		969	4,232	2.32
	145		482	2,107	2.32
	178				2.05
	112	0 164.435	367	1,814	2.05

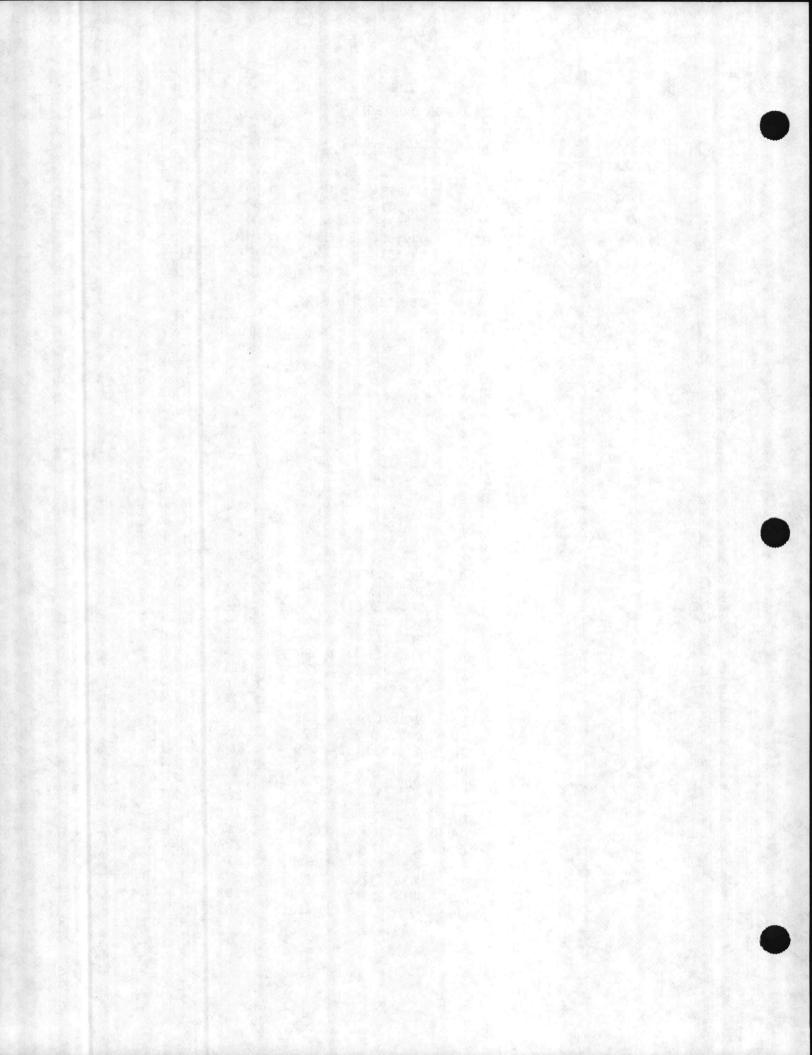


TABLE 5.1-12 COMBINED CONTROLS

	BLDG.	ENERGY SAVI		CAPITOL	SIR
INSTALLATION	NO.	MBTU/YR.	\$/YR	COST \$	
	1771	185.157	413	2,107	1.99
	15	169.797	379	2,107	1.82
	900	141.318	315	1,814	1.76
	1200	202.112	451	2,620	1.75
	500	166.935	372	2,217	1.70
	54	178.185	397	2,620	1.54
	1401	147.583	329	2,217	1.51
	908	196.698	439	3,023	1.47
	1403	111.584	249	1,814	1.39
	751	205.972	459	3,426	1.36
	1707	108.171	241	1,814	1.35
	1005	123.417	275	2,107	1.33
	420	105.048	234	1,814	1.31
	59	147.704	329	2,620	1.28
	2	102.095	228	1,814	1.27
	1101	367.750	820	6,650	1.25
	1041	277.040	618	5,038	1.24
	314	118.374	264	2,217	1.21
	106	116.397	260	2,217	1.19
	508	110.515	246	2,107	1.19
	1015	108.393	242	2,107	1.16
	1209	107.956	241	2,107	1.16
	1220	93.226	208	1,814	1.16
	1750	112.514	251	2,217	1.15
	1612	89.535	200	1,814	1.12
	1404	87.124	194	1,814	1.09
	25	86.989	194	1,814	1.08
	1309	86.024	192	1,814	1.07
	1302	84.373	188	1,814	1.05
	1310	84.563	189	1,814	1.05
	1409	83.899	187	1,814	1.05
	66	95.835	214	2,107	1.03
	412	81.958	183	1,814	1.02
	1410	82.009	183	1,814	1.02
	1606	245.785	548	5,441	1.02
	1607	80.797	180	1,814	1.01
TOTAL		21,887.406	48,810	165,925	2.98
AIR STATION	AS424	403.190	1,173	2,217	5.37
	AS215	279.746	814	1,814	4.56
	AS216		807	1,814	4.51
	AS4110	251.844	733	1,814	4.10
	AS4158		702	2,107	3.38
	AS217		809	2,620	3.13
	AS130	115.831	337	1,814	1.89
	AS202		394	2,217	1.80



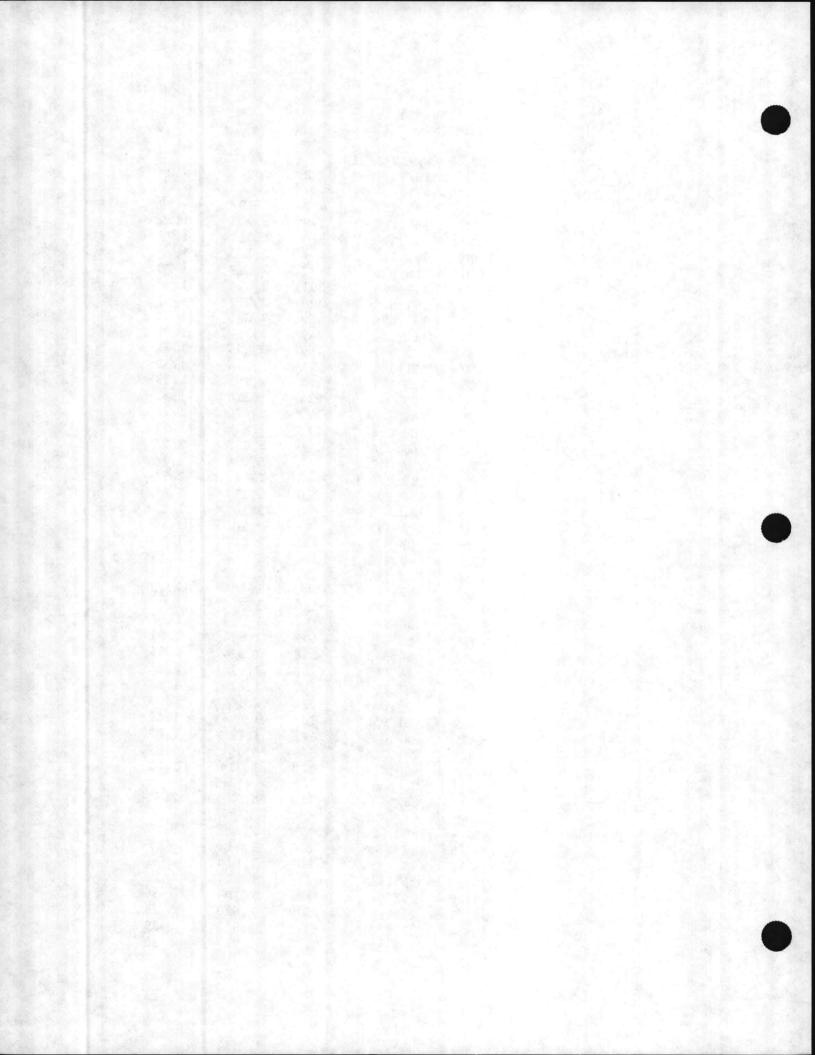


TABLE 5.1-12 COMBINED CONTROLS

INSTALLATION	BLDG. NO.	ENERGY SAV MBTU/YR.	INGS \$/YR	CAPITOL COST \$	SIR
	AS118	118.306	344	2,217	1.57
	AS124	103.130	300	2,217	1.37
	AS4146	88.657	258	2,107	1.24
	AS122	91.845	267	2,217	1.22
	AS236	62.866	183	1,814	1.02
TOTAL		2,447.377	7,122	26,989	2.68
BEACH AREA	BA102	197.062	573	1,814	3.21
	BA104	249.557	726	3,591	2.05
	BA105	180.868	526	3,426	1.56
TOTAL		627.487	1,826	8,831	2.10
RIFLE RANGE	RR11	234.271	682	1,814	3.81
KITED MENOD	RR1	105.654	307	1,173	3.01
	RR5	105.878	308	1,173	3.01
	RR2	103.797	302	1,173	2.95
	RR4	97.647	284	1,173	2.78
	RR9	49.622	144	1,173	1.41
	RR8	76.185	222	1,814	1.24
	RR3	108.925	317	2,620	1.23
TOTAL		881.979	2567	12,113	2.15
FRENCH CREEK	FC100	751.471	1,676	4,635	3.67
	FC303	156.861	350	2,107	1.68
	FC200	207.801	463	3,023	1.56
	FC241	109.732	245	2,107	1.18
	FC251	160.532	358	3,426	1.06
	FC302	80.660	180	1,814	1.01
TOTAL		1,467.057	3,272	17,405	1.91
CAMP JOHNSON	M424	160.131	466	2,106	2.24
	M324	and the second	612	3,023	2.05
	M202		325	1,814	1.82
	M129	The second se	385	2,217	1.76
	M132	and the second	275	1,814	1.54
	M128		309	2,107	1.49
	M134		304	2,217	1.39
	M101		352	2,620	1.36
	M326		215	1,814	1.20
	M303	and the second sec	225	2,217	1.03
TOTAL		1,191.241	3,467	21,949	1.60

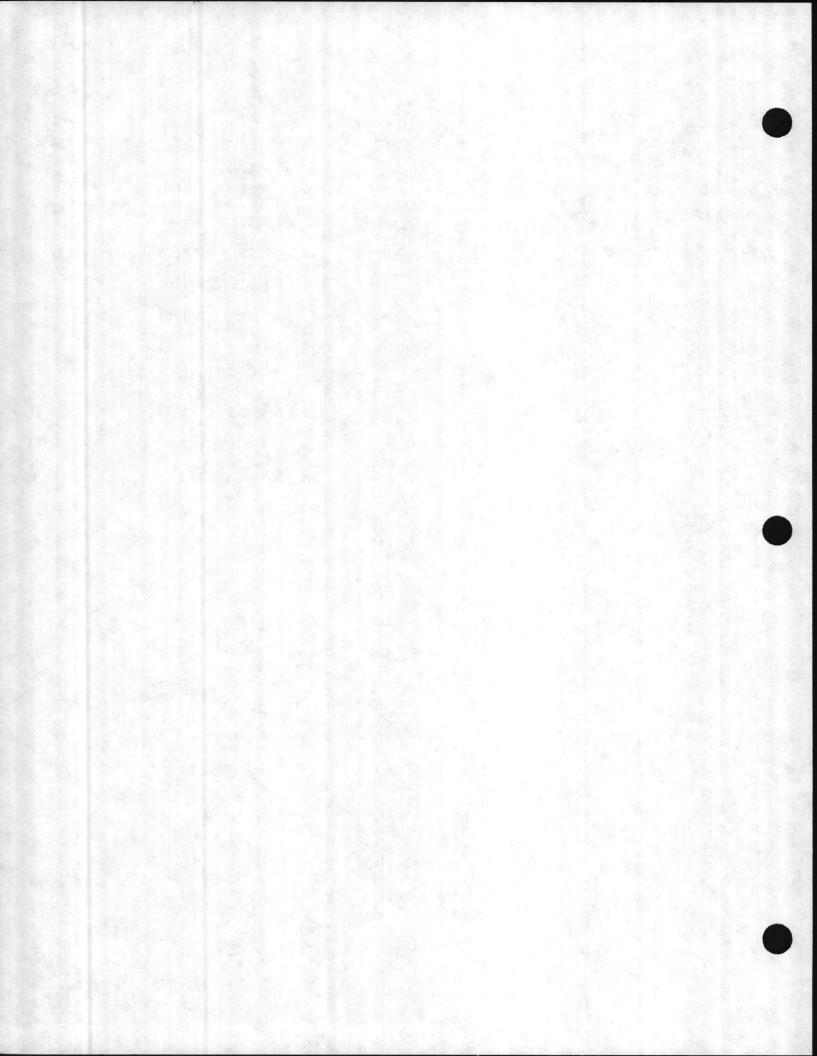
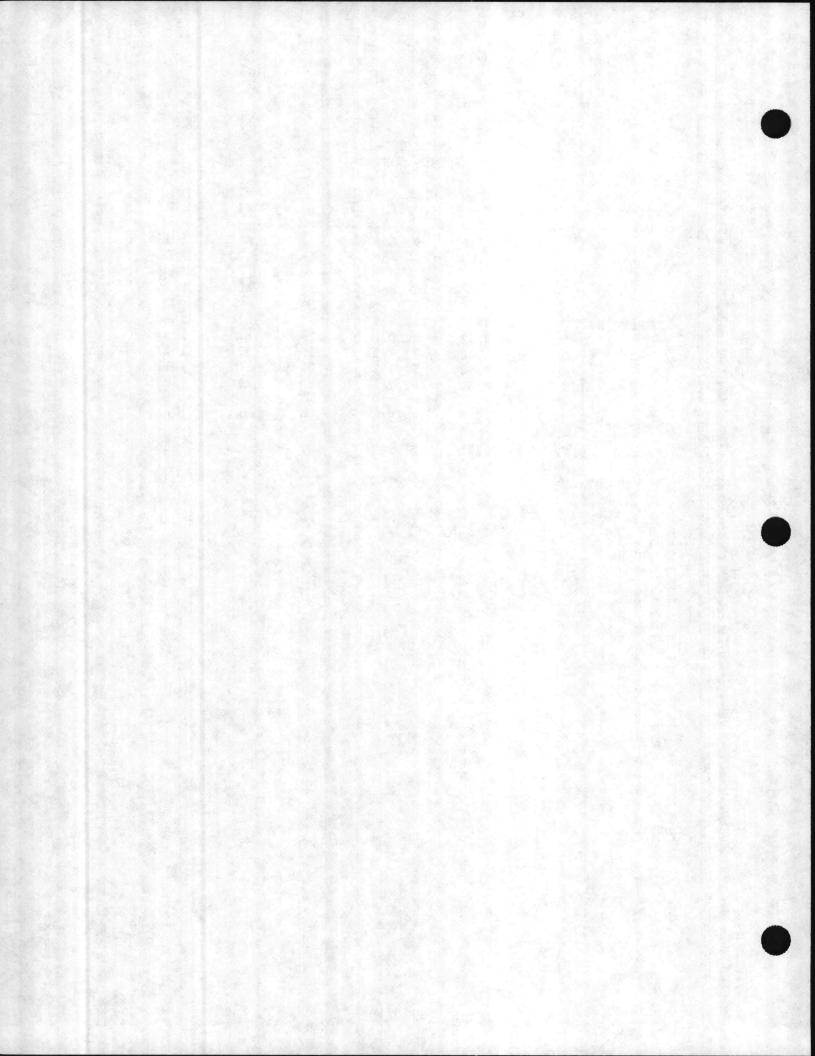


TABLE 5.1-12 COMBINED CONTROLS

	BLDG.	ENERGY SAV	INGS	CAPITOL	
INSTALLATION	NO.	MBTU/YR.	\$/YR	COST \$	SIR
CAMP GEIGER	TC846 TC910	95.408 94.456	278 275	1,814 2,620	1.56 1.06
TOTAL		189.864	553	4,434	1.26
COURTHOUSE BAY	BB51 BB52 BB28 BB50 BB54	171.739 82.070 72.165 79.448 65.144	500 239 210 231 190	1,814 1,814 1,814 2,107 1,814	2.80 1.34 1.17 1.11 1.06
TOTAL		470.566	1,369	9,363	1.48
PARADISE POINT	2624	71.189	207	1,814	1.16
TOTAL		71.189	207	1,814	1.16





5.2 ECO PACKAGES

<u>Introduction</u> - The purpose of this section is to present the improvement projects that will reduce energy consumption and costs at this installation.

<u>Improvement Projects</u> - The ECOs have been grouped into projects based upon similarity of improvement. The preliminary project grouping at this installation is shown on Table 5.2-1, ECO Packages. The ECIP forms for these projects are also included.

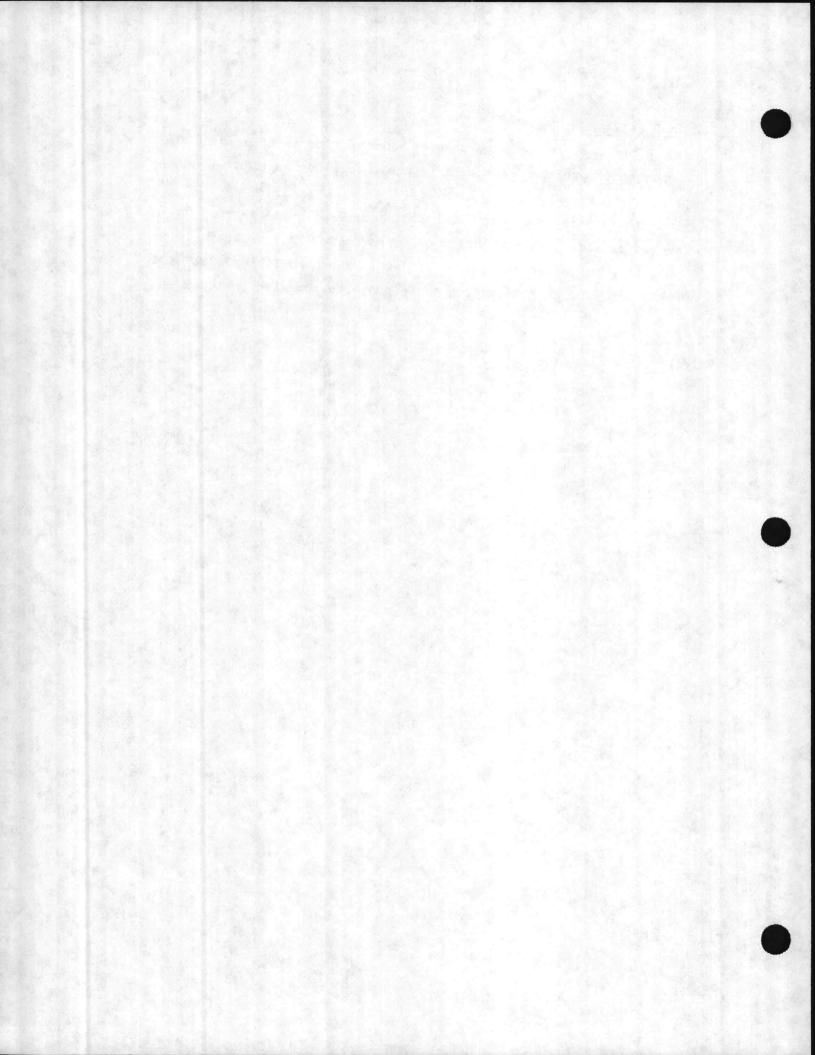
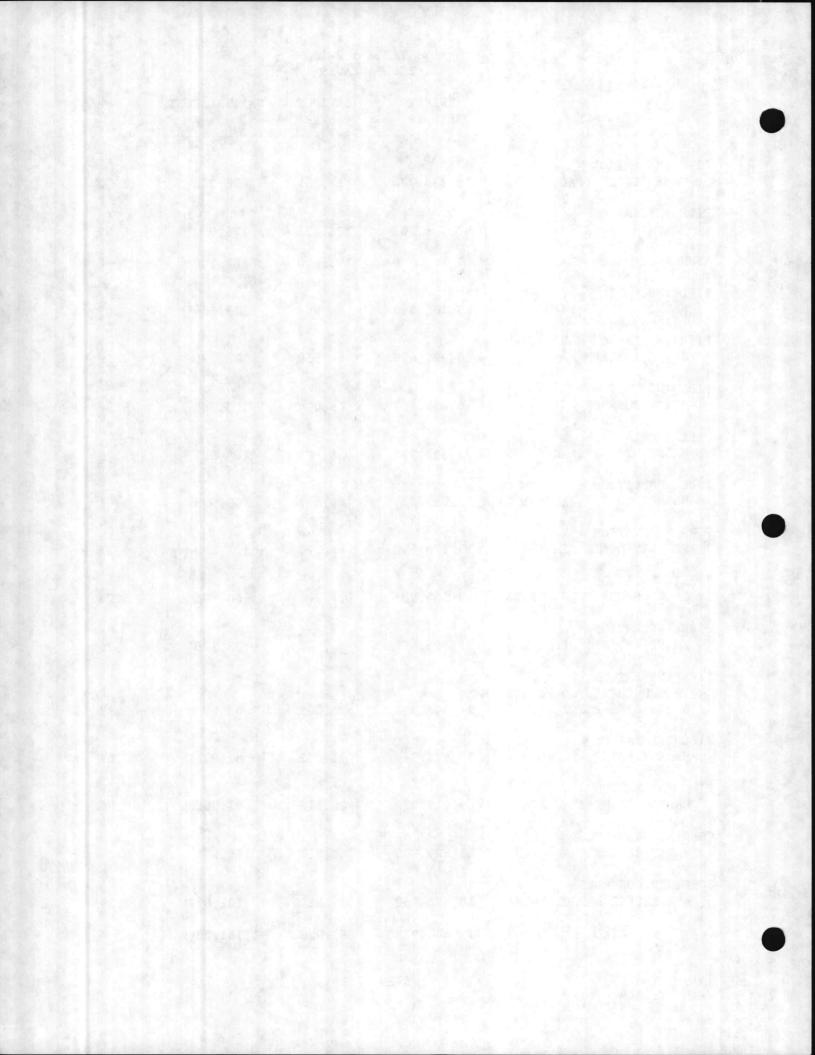


TABLE 5.2-1 ECO PACKAGES

PACKAGE	ENERGY MBTU/YR	SAVINGS \$/YR	CAPITAL COST \$	SIR
	••••••			
PIPE INSULATION -				
CAMP GEIGER (PACKAGE 1)	18,335.774	53,357	88,348	8.12
PIPE INSULATION -				
HOSPITAL POINT	47,366.701	105,621	176,033	8.07
SYPHON JET SUMP PUMPS	0	193,600	187,200	7.80
PIPE INSULATION -				
HADNOT POINT (PACKAGE 1)	29,133.814	64,968	113,684	7.69
PIPE INSULATION - RIFLE				
RANGE & BEACH AREA	15,996.439	46,550	85,890	7.29
PIPE INSULATION -				
CAMP JOHNSON	16,839.867	49,004	103,385	6.37
PIPE INSULATION -				
HADNOT POINT (PACKAGE 2)	21,655.238	48,291	104,321	6.26
PIPE INSULATION -				
HADNOT POINT (PACKAGE 3)	19,953.834	44,497	102,959	5.81
PIPE INSULATION -				
NEW RIVER AIR STATION	15,178.842	44,170	101,880	5.83
PIPE INSULATION -				
CAMP GEIGER (PACKAGE 2)	9,520.206	27,704	64,906	5.74
PIPE INSULATION -				
HADNOT POINT (PACKAGE 4)	19,795.461	44,144	103,129	5.76
PIPE INSULATION -				
FRENCH CREEK, COURTHOUSE				
& PARADISE POINT	14,547.092	35,099	88,605	5.32
PIPE INSULATION -				
HADNOT POINT (PACKAGE 5)	13,928.926	31,062	81,978	5.09
PIPE INSULATION -				
HADNOT POINT (PACKAGE 6)	9,019.979	20,115	91,956	2.94
COMBINED CONTROLS				
HADNOT POINT	21,887.809	48,810	165,925	3.0
COMBINED CONTROLS				
ALL EXCEPT HADNOT POINT	10,284.950	26,934	121,037	2.26
TOTAL	283,444.932	883,926	1,781,236	
	With the second second second	· · · ·		

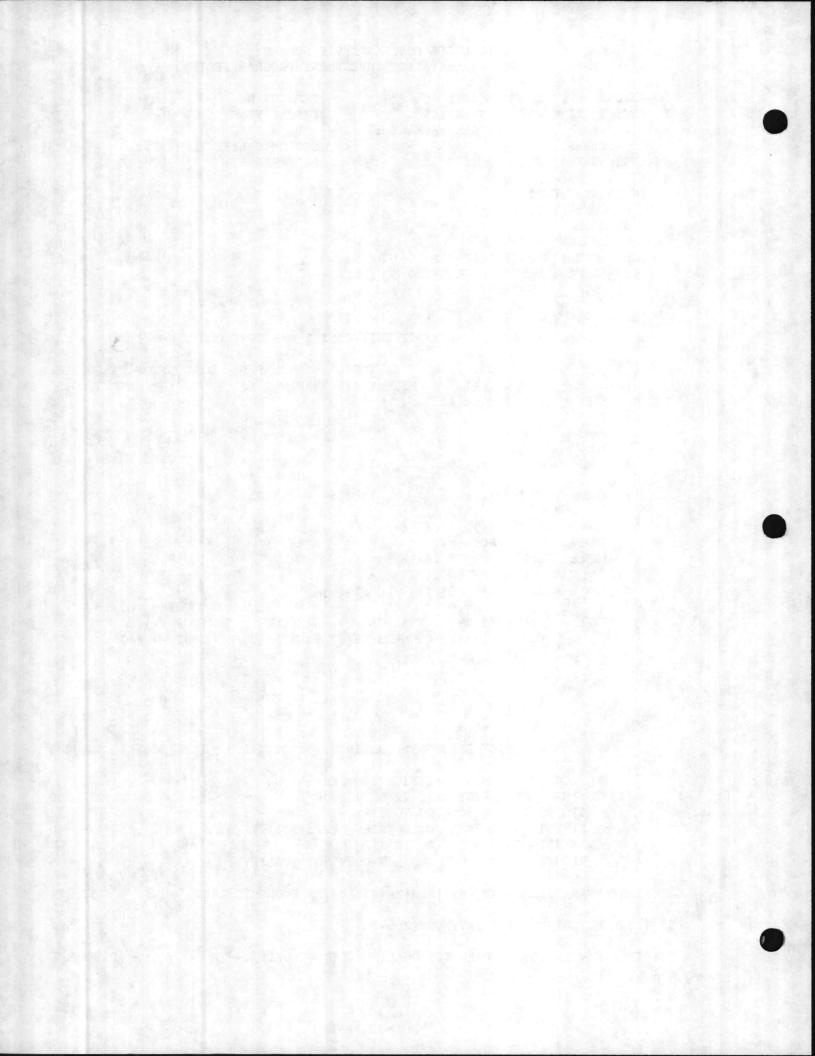
5-29 (R-1)



LOCATION:	CAMP LEJEUNE	PROJECT NO.	
PROJECT TITLE:	PIPE INSULATION	FISCAL YEAR:	1988
PORTION NAME:	CAMP GEIGER PACKAGE 1		
REGION NUMBER:	4	ECONOMIC LIFE IN YEAR	S: 25
ANALYSIS DATE:	JUNE 23 1987	PREPARED BY:	LO SUNDE
1. INVESTMENT C	COST		
A. CONSTRU	CTION COST		\$ 88,348
B. SIOH			4,859
C. DESIGN	COST		5,301
D. ENERGY	CREDIT CALC (1A+1B+1C)X	.9	88,657
E. SALVAGE	VALUE OF EXISTING EQUID	PMENT	0
F. TOTAL I	NVESTMENT (1D-1E)		\$ 88,657

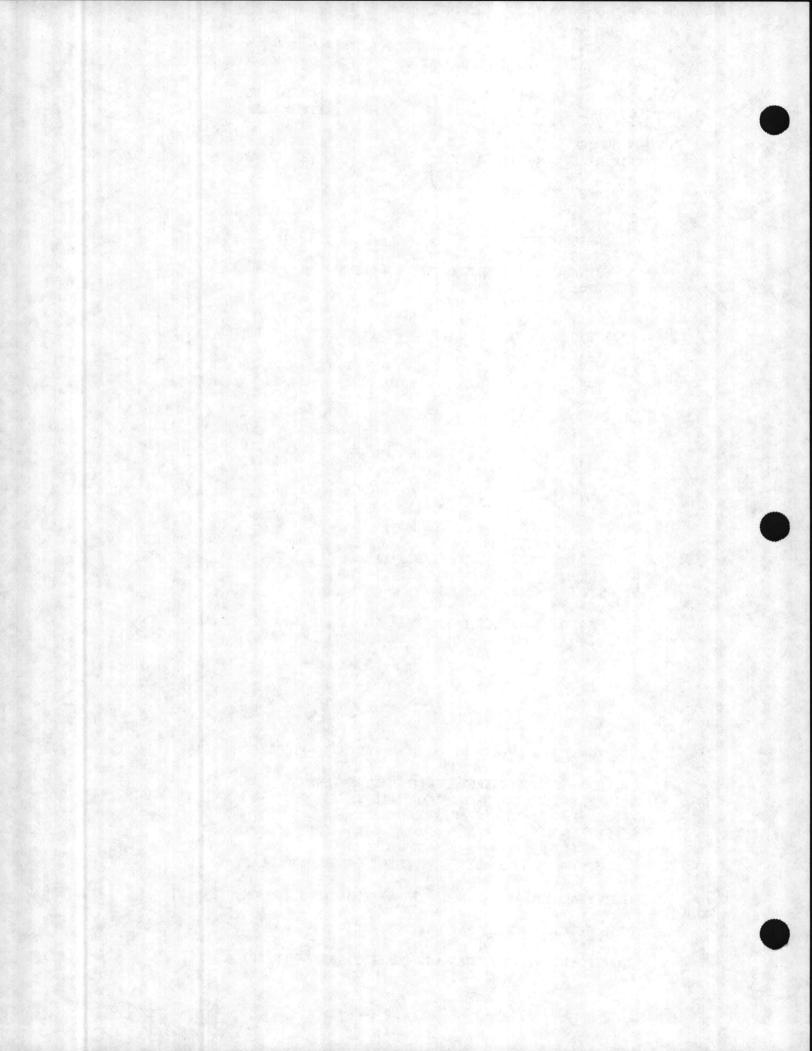
2. ENERGY SAVINGS (+) / (-) ANALYSIS DATE ANNUAL SAVINGS, UNIT COST \$ DISCOUNTED SAVINGS

	in in 1		COST		ANNUAL \$		
		EL		MBTU/YR(2)	SAVINGS (3)	FACTOR(4)	SAVINGS(5)
		ELEC			0	0	0
		DIST	0	0	0	0	0
		RESID	0	0		0	0
		NG	0	0	0	0	0
	Ε.	COAL	2.91	18,336	53,357	13.5	720,321
	F.	TOTAL	\$	18,336	53,357		720,321
3.	NON	ENERGY	SAVINGS (+) / COS	ST (-)			
	Α.	ANNUAL	RECURRING (+/-)		\$	22	
		(1) DI	SCOUNT FACTOR (TA	ABLE 1)		9.08	
	R	(2) DI	SCOUNTED SAVING/C	COST (3AX3A1)	\$		
	ь.	NON RE	CORKING SAVINGS	(+) / COSI (-)		TOCOUNTED	
		TTEM	CAUTING & (.)	WEAR OF		DISCOUNTED	
		LIEM	SAVING \$ (+)			SAVINGS (+)	the second second
			COST \$ (-)(1) (DCCURRENCE(2)	FACTOR (3)	COST(-) (4)
	a.	a start and a start a	0	0	1	0	
	b.		0	0	1	0	
	с.		0	0	1	0	
	d.	TOTAL	0			0	
	c.	TOTAL	NON ENERGY DISCOU	INTED SAVINGS	(+),COST(-)	(3A2+3Bd4)	203
	D.	PROJEC	T NON ENERGY QUAL	TELCATION TES	ст		
			AX NON ENERGY CAL			\$	237,706
	•		3D1 IS = > 3C G			Ŷ	237,700
			3D1 IS < 3C C		F5+3D1)/1F		0
		C IF	3D1b IS = > 1 G	O TO TTEM A			U
			3D1b IS < 1 P		OT QUALTEY		
					or quintin		
4.	FIRS	T YEAR	DOLLAR SAVINGS [2	F3+3A+(3B1d/Y	TRS ECONOMIC	LIFE)] \$	53,379
5.	TOTAL	L NET D	ISCOUNTED SAVINGS	(2F5+3C)		\$	720,524
6.	SIR	(IF < 1	PROJECT DOES NOT	QUALIFY) SIR	= (5/1F) =		8.1

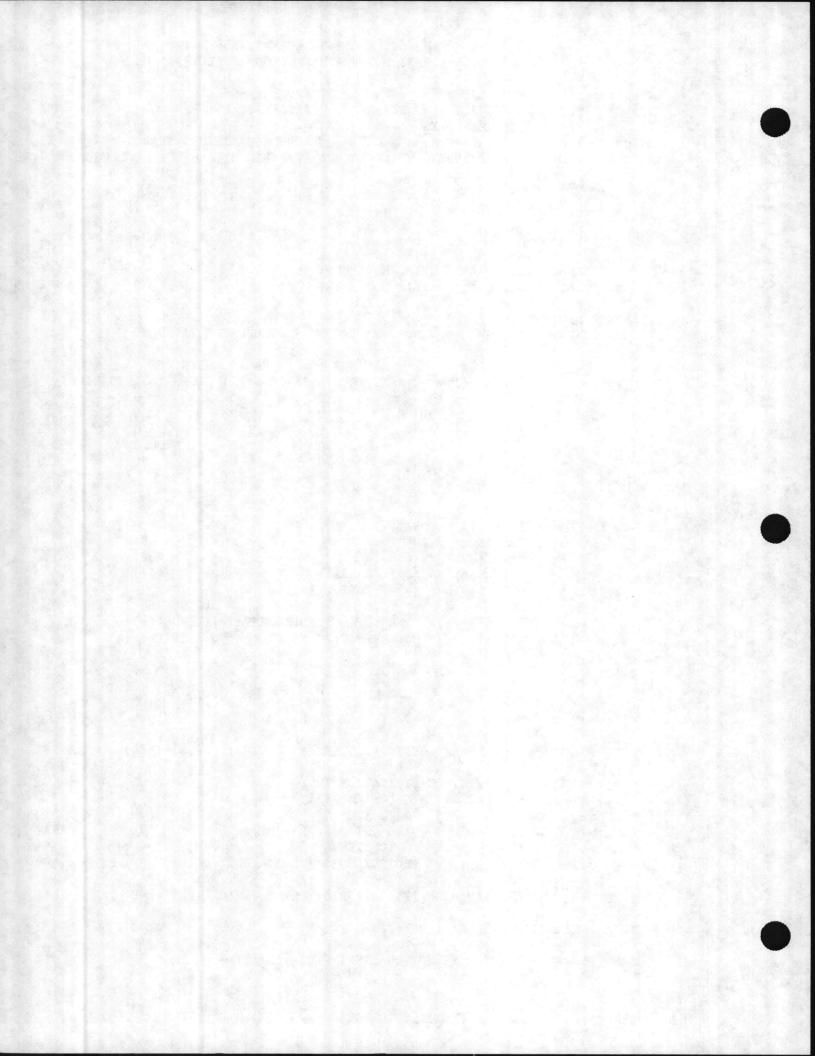


LOCATION:	CAMP LEJEUNE		PROJECT NO.		
	PIPE INSULATION	I	FISCAL YEAR:	[[] 김 영양 (1977)	1988
	HOSPITAL POINT				
EGION NUMBER:			ECONOMIC LI	FE IN YEARS:	25
	JUNE 23 1987			5-0 S. ().	
NALISIS DAIE:	JUNE 23 1987		TRUTINDD DI		
. INVESTMENT C				¢	176,033
	JCTION COST			\$	9,682
B. SIOH					
C. DESIGN					10,562
D. ENERGY	CREDIT CALC (1A-	+1B+1C)X.9			176,649
E. SALVAGE	E VALUE OF EXIST	ING EQUIPMENT			0
F. TOTAL	INVESTMENT (1D-1)	E)		\$	176,649
2. ENERGY SAVIN	NGS (+) / (-)				
ANALYSIS I	DATE ANNUAL SAVI	NGS, UNIT COS	r \$ DISCOUNT	ED SAVINGS	
	COST	SAVINGS	ANNUAL \$	DISCOUNT	DISCOUNTED
FUEL		MBTU/YR(2)	SAVINGS (3)	FACTOR(4)	SAVINGS(5)
A. ELEC	8.15	0	0	0	0
B. DIST	0	0	0	0	0
C. RESID		0	0	0	0
D. NG	Ő	0		0	0
E. COAL	2.23	47,367	105,628	13.5	1,425,975
F. TOTAL	\$	47.367	105,628		1,425,975
2 NON ENERCY	CANTINCS (+) / CO	ST (-)			
	SAVINGS (+) / CO		\$	22	
A. ANNUAL	RECURRING (+/-)	ADTE 1)	Ŷ	9.08	
(1) D1	SCOUNT FACTOR (T	ADLE I)	Ş		
(2) DI P NON PE	SCOUNTED SAVING/ CURRING SAVINGS	(+) / COST (-		205	
D. NON KE	CORKING DAVINGD	(1) / 0001 (·	DISCOUNTED	
TTEM	SAVING \$ (+)	VEAD OF		SAVINGS (+)	
ITEM	COST \$ (-)(1)	OCCURRENCE(2)	FACTOR (3)		(4)
	0	C	1	0	
a. b	Ő	C		. 0	
b.	Ő	C		0	
c. d. TOTAL	0			0	
	NON ENERGY DISCO	UNTED SAVINGS	(+),COST(-)	(3A2+3Bd4)) 203
D. PROJEC	T NON ENERGY QUA	LIFICATION II	221	\$	470,572
(1) 25% M	IAX NON ENERGY CA	ALC (ZFJ A .J.)	Y	
a. IF	3D1 IS = > 3C	GO TO ITEM 4	ADE . 201 \/1E		0
b. IF	3D1 IS < 3C 3D1b IS = > 1	CALC SIR = $($	(2F5+3D1)/1F		· · · · · · · · · · · · · · · · · · ·
c. IF	3D1b IS = > 1	GO TO ITEM 4			
d. IF	3D1b IS < 1	PROJECT DOES	NOT QUALIFY		
4. FIRST YEAR	DOLLAR SAVINGS	[2F3+3A+(3B1d)	YRS ECONOMI	C LIFE)] \$	105,650
	DISCOUNTED SAVIN			\$	1,426,177
					8.1
6. SIR (IF < 1	L PROJECT DOES NO	OT QUALIFY) S	IK = (5/1F)	-	0.1

5-31

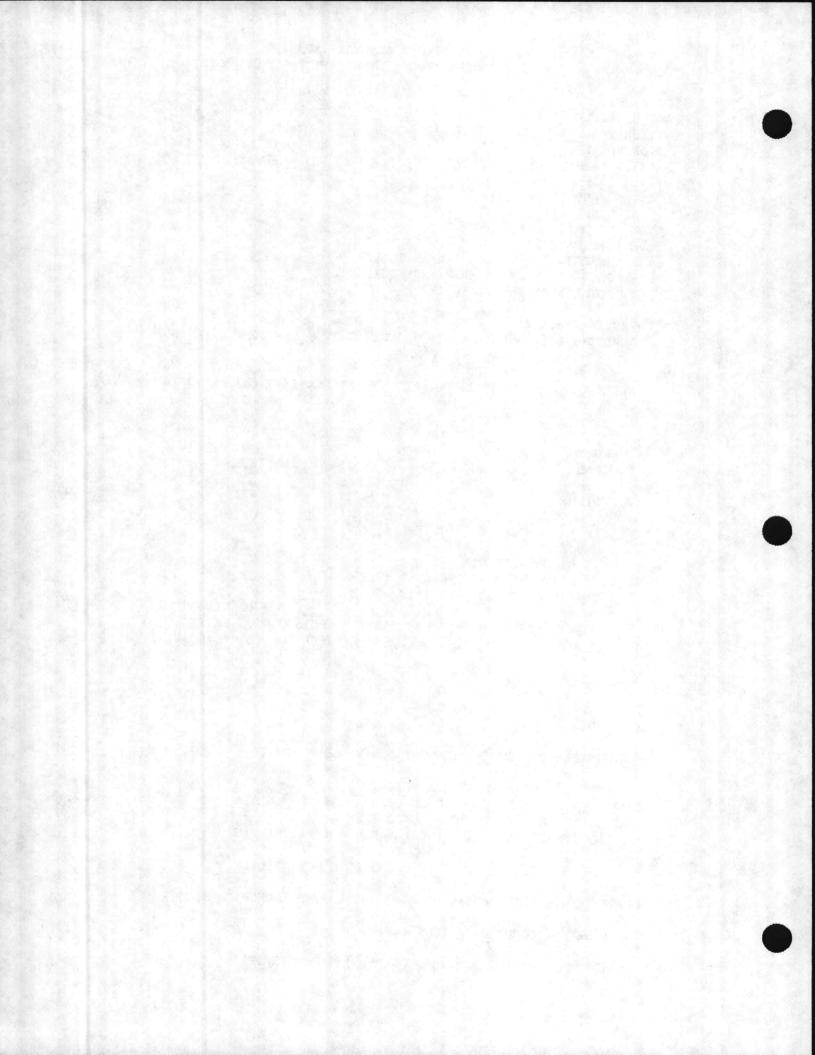


DOTEOR	N:	CAMP LEJEUNE		PROJECT I			
		SYPHON JET SUM STEAM MANHOLES		FISCAL Y	EAR:		1988
EGION	NUMBER :	4				E IN YEARS:	
NALYSI	S DATE:	JUNE 23 1987		PREPARED	BY:		LO SUNDE
	STMENT (f. States	
		JCTION COST		Marka A. S. S.		• \$	46
	SIOH						2
	DESIGN						2
		CREDIT CALC (1A					47
		E VALUE OF EXIST INVESTMENT (1D-1	A DESCRIPTION OF THE REAL PROPERTY OF THE REAL			\$	47
2. ENER	GY SAVI	NGS (+) / (-)	NOS INIT COS		DITE	D CAUINCE	
AN	ALISIS I	DATE ANNUAL SAVI					
ITT	JEL	COST \$/MBTU(1)	SAVINGS MBTU/YR(2)	ANNUAL	\$ (3)	DISCOUNT FACTOR(4)	DISCOUNTE SAVINGS(5
A	ELEC	8.15	0		0	0	
	DIST	0	0		0	0	
	RESID		0		0	0	
D.	NG	0	0		0	0	
Ε.	COAL	2.91	0		0	0	
F.	TOTAL	\$	0		0		
NON	DUPDOV						
		SAVINGS (+) / CO					
					c	1.8/	
Α.		RECURRING (+/-)			\$	484	
	(1) DI	SCOUNT FACTOR (I	ABLE 1)			7.61	
	(1) DI (2) DI	SCOUNT FACTOR (T SCOUNTED SAVING/	COST (3AX3A1)				
	(1) DI (2) DI	SCOUNT FACTOR (I	COST (3AX3A1)		\$	7.61 3,681	
	(1) DI (2) DI NON RE	SCOUNT FACTOR (T SCOUNTED SAVING/ CURRING SAVINGS	CABLE 1) (COST (3AX3A1) (+) / COST (-)	\$ I	7.61 3,681 DISCOUNTED	
	(1) DI (2) DI	SCOUNT FACTOR (I SCOUNTED SAVING/ CURRING SAVINGS	CABLE 1) (COST (3AX3A1) (+) / COST (- YEAR OF) DISCOUNT	\$ I S	7.61 3,681 DISCOUNTED SAVINGS (+)	(4)
B.	(1) DI (2) DI NON RE	SCOUNT FACTOR (T SCOUNTED SAVING/ CURRING SAVINGS SAVING \$ (+) COST \$ (-)(1)	CABLE 1) (COST (3AX3A1) (+) / COST (- YEAR OF OCCURRENCE(2)) DISCOUNT FACTOR (\$ 1 3)	7.61 3,681 DISCOUNTED SAVINGS (+) COST(-) ((4)
В.	(1) DI (2) DI NON RE	SCOUNT FACTOR (T SCOUNTED SAVING/ CURRING SAVINGS SAVING \$ (+)	CABLE 1) (COST (3AX3A1) (+) / COST (- YEAR OF OCCURRENCE(2)) DISCOUNT FACTOR (\$ I S	7.61 3,681 DISCOUNTED SAVINGS (+) COST(-) ((4)
B. a. b.	(1) DI (2) DI NON RE	SCOUNT FACTOR (T SCOUNTED SAVING/ CURRING SAVINGS SAVING \$ (+) COST \$ (-)(1) 0	CABLE 1) COST (3AX3A1) (+) / COST (- YEAR OF OCCURRENCE(2) 0) DISCOUNT FACTOR (\$ 1 3)	7.61 3,681 DISCOUNTED SAVINGS (+) COST(-) ((4)
В.	(1) DI (2) DI NON RE	SCOUNT FACTOR (T SCOUNTED SAVING/ CURRING SAVINGS SAVING \$ (+) COST \$ (-)(1) 0 0	CABLE 1) COST (3AX3A1) (+) / COST (- YEAR OF OCCURRENCE(2) 0 0) DISCOUNT FACTOR (\$ 3) 1 1	7.61 3,681 DISCOUNTED SAVINGS (+) COST(-) (0 0	(4)
B. a. b. c. d.	(1) DI: (2) DI: NON REG ITEM	SCOUNT FACTOR (T SCOUNTED SAVING/ CURRING SAVINGS SAVING \$ (+) COST \$ (-)(1) 0 0 0	CABLE 1) (COST (3AX3A1) (+) / COST (- YEAR OF OCCURRENCE(2) 0 0 0 0) DISCOUNT FACTOR (\$ 3) 1 1 1	7.61 3,681 DISCOUNTED SAVINGS (+) COST(-) (0 0 0 0	
B. a. b. c. d. C.	(1) DI: (2) DI: NON REG ITEM TOTAL	SCOUNT FACTOR (T SCOUNTED SAVING/ CURRING SAVINGS SAVING \$ (+) COST \$ (-)(1) 0 0 0 0	ABLE 1) (COST (3AX3A1) (+) / COST (- YEAR OF OCCURRENCE(2) 0 0 0 0 0 0 0 0 0 0 0 0 0) DISCOUNT FACTOR ((+),COST(\$ 3) 1 1 1	7.61 3,681 DISCOUNTED SAVINGS (+) COST(-) (0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
B. a. b. c. d. C. D.	(1) DI: (2) DI: (2) DI: ITEM ITEM TOTAL TOTAL PROJEC () 25% M	SCOUNT FACTOR (T SCOUNTED SAVING/ CURRING SAVINGS SAVING \$ (+) COST \$ (-)(1) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ABLE 1) (COST (3AX3A1) (+) / COST (- YEAR OF OCCURRENCE(2) 0 0 0 0 0 0 0 0 0 0 0 0 0) DISCOUNT FACTOR ((+),COST(ST	\$ 3) 1 1 1	7.61 3,681 DISCOUNTED SAVINGS (+) COST(-) (0 0 0 0	9 3,68
B. a. b. c. d. C. D.	(1) DI: (2) DI: (2) DI: NON RE ITEM TOTAL TOTAL TOTAL PROJEC (1) 25% M a. IF b. IF	SCOUNT FACTOR (T SCOUNTED SAVING/ CURRING SAVINGS SAVING \$ (+) COST \$ (-)(1) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	CABLE 1) COST (3AX3A1) (+) / COST (- YEAR OF OCCURRENCE(2) 0 0 0 0 0 0 0 0 0 0 0 0 0) DISCOUNT FACTOR ((+),COST(ST)	\$ 3) 1 1 -)	7.61 3,681 DISCOUNTED SAVINGS (+) COST(-) (0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	9 3,68
B. a. b. c. d. C. D.	(1) DI: (2) DI: (2) DI: ITEM ITEM TOTAL TOTAL TOTAL PROJEC D) 25% M a. IF b. IF c. IF	SCOUNT FACTOR (T SCOUNTED SAVING/ CURRING SAVINGS SAVING \$ (+) COST \$ (-)(1) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	CABLE 1) COST (3AX3A1) (+) / COST (- YEAR OF OCCURRENCE(2) 0 0 0 0 0 0 0 0 0 0 0 0 0) DISCOUNT FACTOR ((+),COST(ST) 2F5+3D1)/	\$ 3) 1 1 -) 1F	7.61 3,681 DISCOUNTED SAVINGS (+) COST(-) (0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	9 3,68
B. a. b. c. d. C. D. (1	 (1) DI: (2) DI: NON REGISTRY ITEM TOTAL TOTAL TOTAL PROJEC 25% M a. IF b. IF c. IF d. IF 	SCOUNT FACTOR (T SCOUNTED SAVING/ CURRING SAVINGS SAVING \$ (+) COST \$ (-)(1) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ABLE 1) COST (3AX3A1) (+) / COST (- YEAR OF OCCURRENCE(2) 0 0 0 0 0 0 0 0 0 0 0 0 0) DISCOUNT FACTOR ((+),COST(ST) 2F5+3D1)/ NOT QUALI	\$ 3) 1 1 -) 1F FY	7.61 3,681 DISCOUNTED SAVINGS (+) COST(-) (0 0 0 0 (3A2+3Bd4) \$	
B. b. c. d. C. D. (1 4. FIRS	 (1) DI: (2) DI: (3) DI: (4) DI: <	SCOUNT FACTOR (T SCOUNTED SAVING/ CURRING SAVINGS SAVING \$ (+) COST \$ (-)(1) 0 0 0 0 NON ENERGY DISCO T NON ENERGY DISCO T NON ENERGY QUA AX NON ENERGY QUA AX NON ENERGY CA 3D1 IS - > 3C 3D1 IS - > 1 3D1b IS - > 1 3D1b IS < 1	ABLE 1) (COST (3AX3A1) (+) / COST (- YEAR OF OCCURRENCE(2) 0 0 0 0 0 0 0 0 0 0 0 0 0) DISCOUNT FACTOR ((+),COST(ST) 2F5+3D1)/ NOT QUALI	\$ 3) 1 1 -) 1F FY	7.61 3,681 DISCOUNTED SAVINGS (+) COST(-) (0 0 0 0 (3A2+3Bd4) \$	9 3,68 ERR



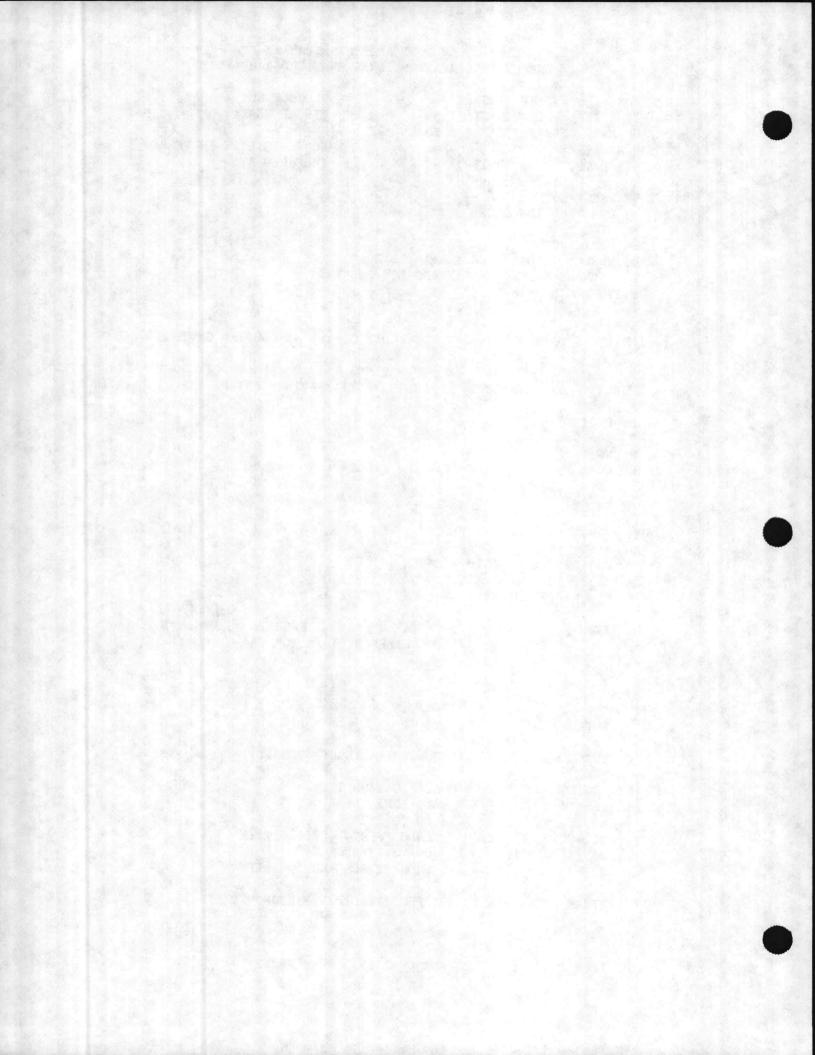
ECT NO. AL YEAR:	1988
DMIC LIFE IN YEARS: ARED BY: LO	25 SUNDE
Ş	113,684 6,253 6,821
\$	114,082 0 114,082
-	L YEAR: MIC LIFE IN YEARS: ARED BY: LO \$

	COST	SAVINGS	ANNUAL \$	DISCOUNT	DISCOUNTED
FUEL	\$/MBTU(1)	MBTU/YR(2)	SAVINGS (3)	FACTOR(4)	SAVINGS(5)
A. ELEC	8.15	0	0	0	U
B. DIST	0	0	0	0	0
C. RESID	0	0	0	0	0
D. NG	0	0		0	0
E. COAL	2.23	29,134	64,968	13.5	877,073
F. TOTAL	\$	29,134	64,968		877,073
3. NON ENERGY S	AVINGS (+) / COS	ST (-)			
A. ANNUAL	RECURRING (+/-)		Ş		
(1) DTS	COUNT FACTOR (T	ABLE 1)		9.08	
(2) DIS	SCOUNTED SAVING/	COST (3AX3A1)	Ş	203	
B. NON REC	CURRING SAVINGS	(+) / COST (-)	DIGGOINTED	
				DISCOUNTED	200 월란이지
ITEM	SAVING \$ (+) COST \$ (-)(1)	YEAR OF OCCURRENCE(2)	FACTOR (3)	SAVINGS (+) COST(-) ((4)
	0	C	1	0	
a. b.	0	C) 1	0	
р. с.	0	C) 1	0	
d. TOTAL	0			0	
C. TOTAL	NON ENERGY DISCO	UNTED SAVINGS	S(+),COST(-)	(3A2+3Bd4) 203
	T NON ENERGY QUA				
(1) 25% M	AX NON ENERGY CA	ALC (2F5 X .3.	3)	\$	289,434
a. IF	3D1 IS = > 3C	GO TO ITEM 4	(075 . 201) /18		0
b. IF	3D1 IS < 3C	CALC SIR =	(215+301)/11		
c IF	3D1b IS = > 1	GO TO ITEM 4			
d. IF	3D1b IS < 1	PROJECT DOES	NOT QUALIFY		
4. FIRST YEAR	DOLLAR SAVINGS	[2F3+3A+(3B1d	YRS ECONOMI	C LIFE)] \$	64,991
5. TOTAL NET D	SISCOUNTED SAVIN	GS (2F5+3C)		\$	877,276
6. SIR (IF < 1	PROJECT DOES N	OT QUALIFY) S	IR = (5/1F)	-	7.7



LOCATION: CAMP LEJ PROJECT TITLE: PIPE INS		PROJECT NO. FISCAL YEAR:		1988
PORTION NAME: RIFLE RA REGION NUMBER:	4	ECONOMIC LIFE IN	YEARS:	25
ANALYSIS DATE: JUNE 23		PREPARED BY:		SUNDE
1. INVESTMENT COST				
A. CONSTRUCTION COS	ST		Ş	85,890
 B. SIOH				4,724
C. DESIGN COST				5,153
D. ENERGY CREDIT CA	LC (1A+1B+1C)X.9			86,191
E. SALVAGE VALUE OF	EXISTING EQUIPMENT			0
F. TOTAL INVESTMENT			\$	86,191

			COST	SAVINGS	ANNUAI	\$	DISCOUNT		SCOUNTED
	FU	EL		MBTU/YR(2)	SAVINGS			SAV	/INGS(5)
	Α.	ELEC	8.15	0		0	0		0
	В.	DIST	0	0		0	0		0
	С.	RESID	0	0		0	0		0
	D.	NG	0	0		0	0		0
		COAL	2.91	15,996	46,5	550	13.5		628,419
	F.	TOTAL	\$	15,996	46,5	550			628,419
3.	NON	ENERGY S	AVINGS (+) / CO	ST (-)					
	Α.		RECURRING (+/-)			\$			
		(1) DIS	COUNT FACTOR (T.	ABLE 1)			9.08		
		(2) DIS	COUNTED SAVING/	COST (3AX3A1)		\$	203		
	В.	NON REC	URRING SAVINGS	(+) / COST (-)				
							DISCOUNTED		
		ITEM	SAVING \$ (+)	YEAR OF	DISCOUN		SAVINGS (+)		
			COST \$ (-)(1)	OCCURRENCE(2)	FACTOR	(3)	COST(-)	(4)	
	а.		0	0		1	0		
	Ъ.		0	0		1	0		
	с.		0	0		1	0		
	d.	TOTAL	0				0		
	c.	TOTAL N	NON ENERGY DISCO	UNTED SAVINGS	(+),COST	(-)	(3A2+3Bd4)	203
			I NON ENERGY QUA AX NON ENERGY CA				Ş		207,378
			3D1 IS = > 3C						
			3D1 IS < 3C		2F5+3D1)	/1F			0
			3D1b IS $= > 1$			1.15			
		d. IF	3D1b IS < 1	PROJECT DOES	NOT QUAL	IFY			
4.	FIRS	ST YEAR	DOLLAR SAVINGS [2F3+3A+(3B1d/	YRS ECON	OMIC	C LIFE)] \$		46,572
5.	TOTA	AL NET D	ISCOUNTED SAVING	SS (2F5+3C)			Ş		628,621
6.	SIR	(IF < 1	PROJECT DOES NO	OT QUALIFY) SI	R = (5/1)	.F) -	•		7.3

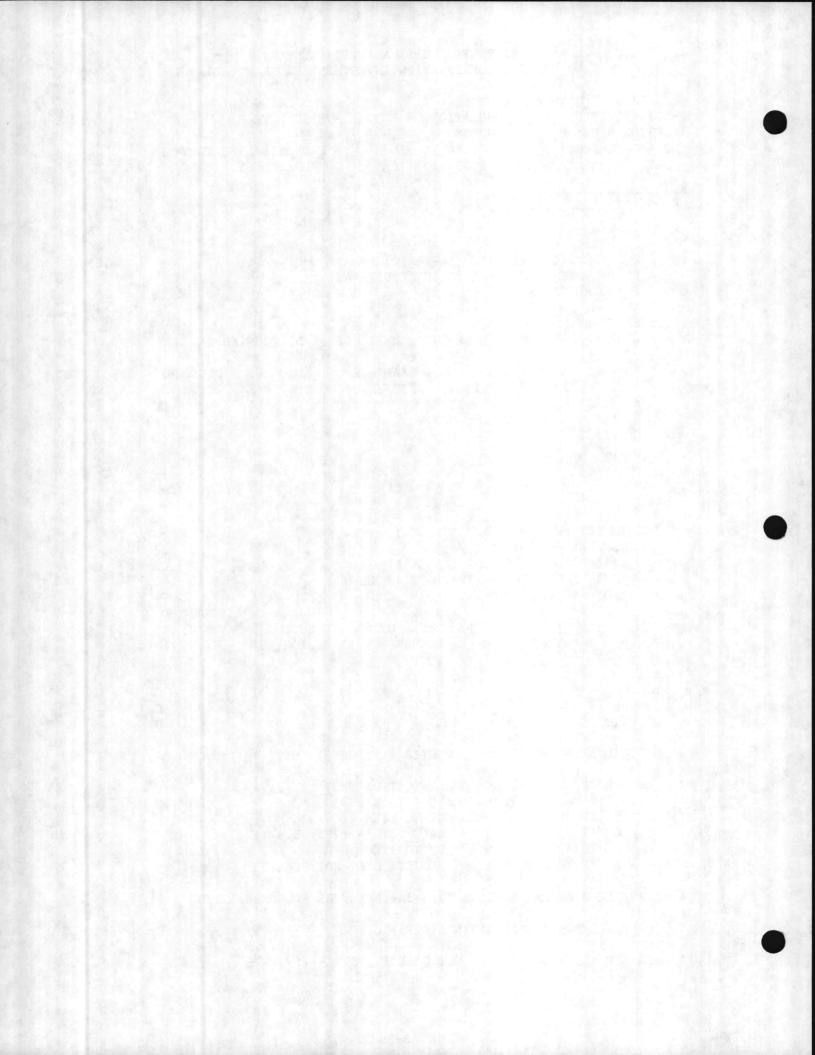


LOCATION:	CAMP LEJEUNE	PROJECT NO.			
PROJECT TITLE: 1	PIPE INSULATION	FISCAL YEAR:		1988	
PORTION NAME:	CAMP JOHNSON			2700	
REGION NUMBER:	4	ECONOMIC LIFE I	N YEARS	25	
ANALYSIS DATE: 3	JUNE 23 1987	PREPARED BY:		SUNDE	
1. INVESTMENT COS	ST .				
A. CONSTRUCT	TION COST		\$	103,385	
B. SIOH			•	5,686	
C. DESIGN CO	DST			6,203	
D. ENERGY CH	REDIT CALC (1A+1B+1C)	X.9		103,747	
E. SALVAGE V	VALUE OF EXISTING EQU	IPMENT		0	
F. TOTAL INV	VESTMENT (1D-1E)		\$	103,747	

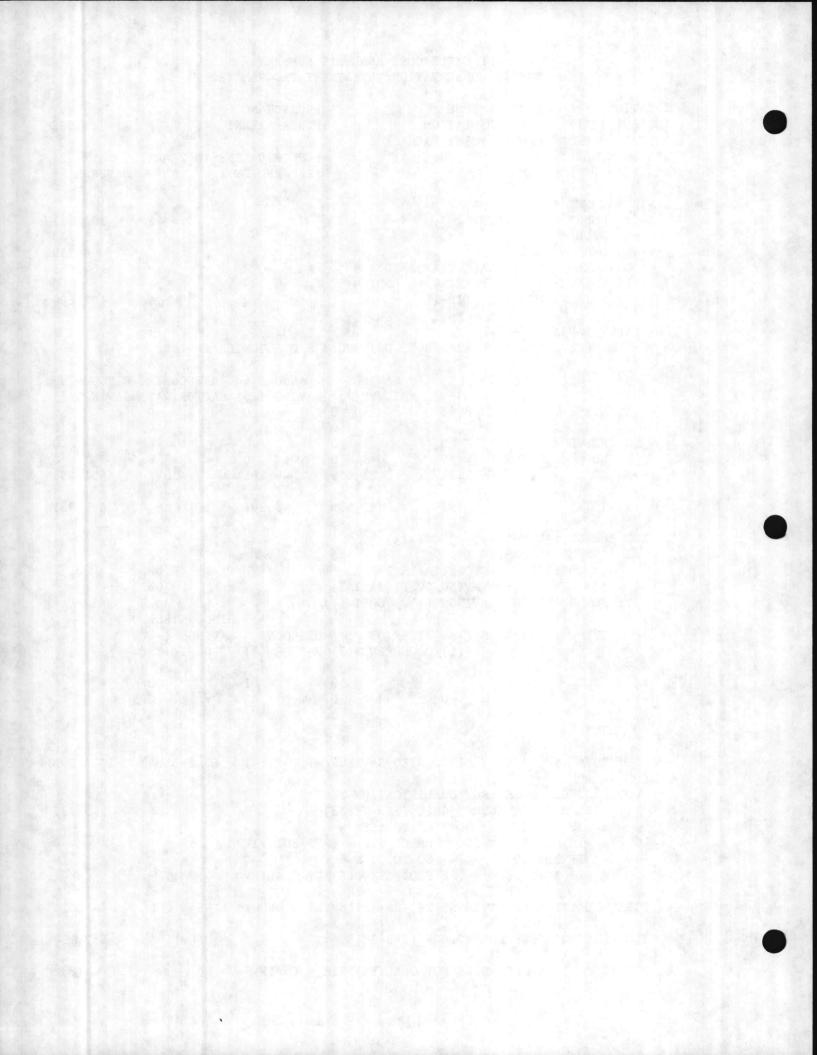
2. ENERGY SAVINGS (+) / (-)
ANALYSIS DATE ANNUAL SAVINGS, UNIT COST \$ DISCOUNTED SAVINGS

			COST	SAVINGS	ANNUAL \$	DISCOUNT	DISCOUNTED
		EL	\$/MBTU(1)	MBTU/YR(2)	SAVINGS (3)	FACTOR(4)	SAVINGS(5)
		ELEC	8.15		0	0	0
		DIST	0	0	0	0	0
		RESID		0		0	0
		NG	0	0	0	0	0
	Е.	COAL	2.91	16,840	49,004	13.5	661,554
	F.	TOTAL	\$	16,840	49,004		661,554
3.	NON	ENERGY	SAVINGS (+) / COS	ST (-)		·	
	Α.	ANNUAL	RECURRING (+/-)		\$	22	
		(1) DI	SCOUNT FACTOR (TA	BLE 1)	- -	9.08	
		(2) DI	SCOUNTED SAVING/C	OST (3AX3A1)	\$	203	
	В.	NON RE	CURRING SAVINGS (+) / COST (-)	ALC: ALC: N	MARY COMMAN	
						ISCOUNTED	
		ITEM	SAVING \$ (+)	YEAR OF	DISCOUNT S	AVINGS (+)	
			COST \$ (-)(1) 0	CCURRENCE(2)	FACTOR (3)	COST(-) (4	4)
	а.		0	0	1	0	
	Ъ.		0	0	1	0	
	с.		0	0	1	0	
	d.	TOTAL	0			0	
	C.	TOTAL 1	NON ENERGY DISCOU	NTED SAVINGS(+),COST(-)	(3A2+3Bd4)	203
	D	PROTECT	NON ENERGY QUAL	TELCATION TEC	π.		
	(1	259 M	AX NON ENERGY CAL	C (2ES V 22)	-	•	
	(-,	a TF	3D1 IS = > 3C G	O TO TTEM (\$	218,313
		b. TF	3D1 IS < 3C C.	AIC STP - (2	F5+3D1 \ /1 F		0
		C IF	BD1b IS $= > 1$ G	O TO TTEM /	r 3+3D1)/1r		0
			BD1b IS < 1 P		OT OUNT TEV		
				ROJECT DOES N	OI QUALIFI		
4.	FIRST	T YEAR I	OLLAR SAVINGS [2	F3+3A+(3B1d/Y	RS ECONOMIC	LIFE)] \$	49,026
5.	TOTAL	L NET DI	SCOUNTED SAVINGS	(2F5+3C)		ş	661,757
6.	SIR ((IF < 1	PROJECT DOES NOT	QUALIFY) SIR	- (5/1F) -		6.4

5-35 (R-1)

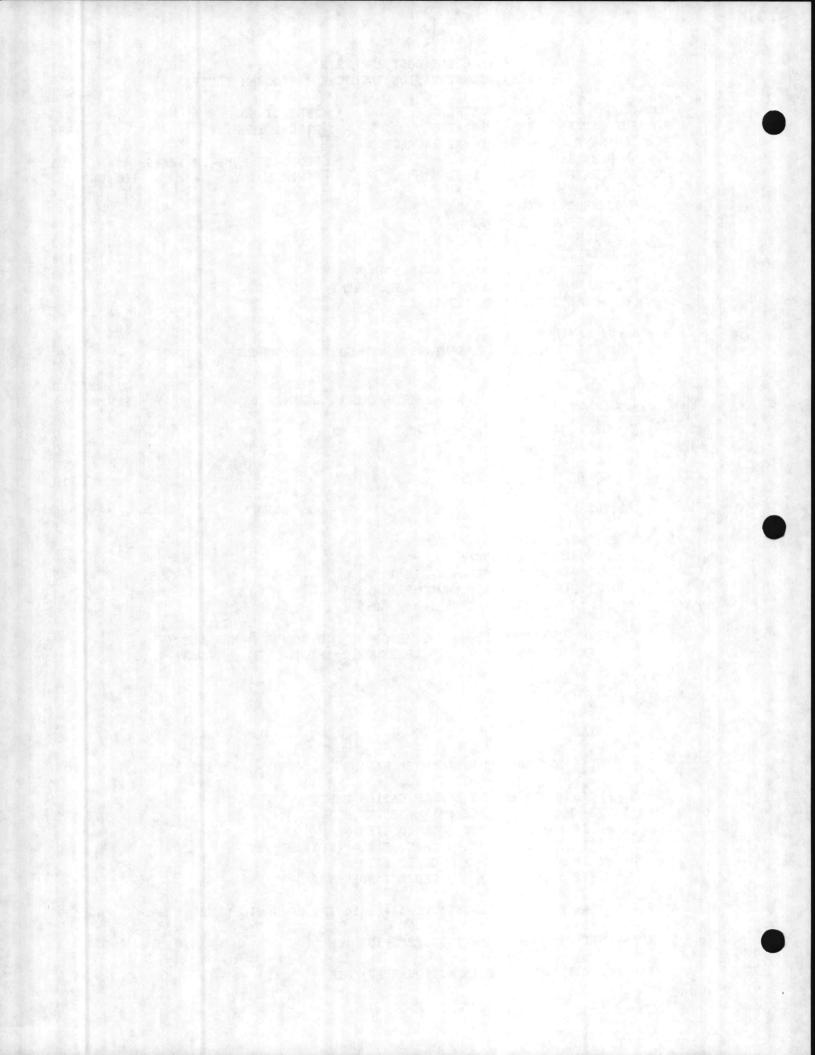


PROJECT TITLE: PORTION NAME:	CAMP LEJEUNE PIPE INSULATIO HADNOT POINT P.	N	PROJECT NO FISCAL YEAR	R:	1988
REGION NUMBER: ANALYSIS DATE:	4 JUNE 23 1987		ECONOMIC LI PREPARED BY	IFE IN YEARS: Y:	25 LO SUNDE
1. INVESTMENT C	10ST				
A. CONSTRU				\$	104,321
B. SIOH				Ŷ	5,738
C. DESIGN	COST				6,25
	CREDIT CALC (1A	+1B+1C)X.9			104,68
	VALUE OF EXIST				
	NVESTMENT (1D-1			\$	104,68
2. ENERGY SAVIN ANALYSIS D	GS (+) / (-) ATE ANNUAL SAVI	NGS, UNIT COS	r \$ Discount	TED SAVINGS	
	COST	SAVINGS	ANNUAL S	DISCOUNT	DISCOUNTE
FUEL	\$/MBTU(1)	MBTU/YR(2)	SAVINGS (3)	FACTOR(4)	SAVINGS (5
A. ELEC	8.15	0	0	0	
B. DIST	0	0	0	0	
C. RESID	0	0	0	0	
D. NG	0	0			
E. COAL	2.23	21,655	48,291	13.5	651,93
F. TOTAL	\$	21,655	48,291		651,93
A. ANNUAL (1) DIS (2) DIS	AVINGS (+) / CO RECURRING (+/-) COUNT FACTOR (T COUNTED SAVING/ URRING SAVINGS SAVING \$ (+)	ABLE 1) COST (3AX3A1) (+) / COST (-)) {	22 9.08 203 DISCOUNTED SAVINGS (+)	
	COST \$ (-)(1)				4)
а.	0	0	1	0	
b.	0	0	1	0	
C.	0	0	1	0	
d. TOTAL	0			. 0	
C. TOTAL N	ON ENERGY DISCO	UNTED SAVINGS	(+),COST(-)	(3A2+3Bd4)	20
D. PROJECT	NON ENERGY QUAL	LIFICATION TES	ST		
	X NON ENERGY CAN D1 IS $- > 3C$)	\$	215,13
b. IF 3	D1 IS < 3C D1b IS = > 1	CALC SIR = (2	2F5+3D1)/1F		
	D1b IS < 1		NOT QUALIFY		
4. FIRST YEAR D	OLLAR SAVINGS [:	2F3+3A+(3B1d/	TRS ECONOMIC	LIFE)] \$	48,31
5. TOTAL NET DI	SCOUNTED SAVING	S (2F5+3C)		\$	652,13
5. SIR (IF < 1	PROJECT DOES NOT	T QUALIFY) SI	R = (5/1F) =		6.3



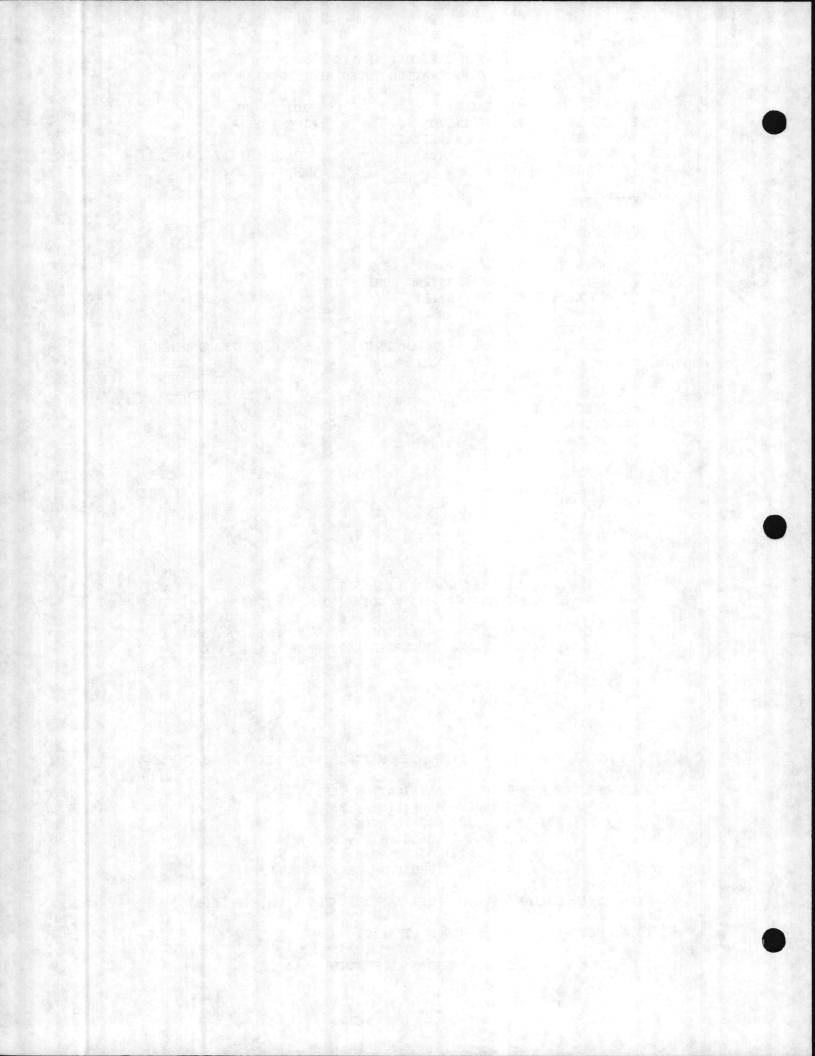
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LOCATION:	CAMP LEJEUNE		PROJECT NO.		
PROJECT TITLE:	PIPE INSULATIO	N	FISCAL YEAR	:	198
PORITON NAME:	HADNOT POINT P				
REGION NUMBER:	4			FE IN YEARS:	
ANALYSIS DATE:	JUNE 23 1987		PREPARED BY	: 6.64	LO SUNDE
1. INVESTMENT	COST				
	UCTION COST			\$	100.05
B. SIOH				ę	
C. DESIGN	COST			1 a.C. 1	5,66
	CREDIT CALC (1A	+18+1C)V 0			6,17
E SALVAG	E VALUE OF EXIST	TNC FOULDMENT			103,31
F. TOTAL	INVESTMENT (1D-1)	E)		\$	103,31
				Ť	105,51
. ENERGY SAVI	NGS (+) / (-)				
ANALYSIS	DATE ANNUAL SAVI	NGS, UNIT COS	r \$ DISCOUNT	ED SAVINGS	
	COST	SAVINGS	ANNUAL S	DISCOUNT	DISCOUNTE
FUEL	\$/MBTU(1)	MBTU/YR(2)	SAVINGS (3)	FACTOR(4)	SAVINGS (5
A. ELEC	8.15	0	0	0	SAVINGS (J
B. DIST	0	0	Ő	0	
C. RESID		Ő		0	
D. NG	0		0	0	
E. COAL	2.23		44,497		600,71
F. TOTAL	ş		44,497	영소 성격하는	
	Ŷ	19,994	44,49/		600,71
. NON ENERGY	SAVINGS (+) / COS	ST (-)		2 <u>1</u>	
A. ANNUAL (1) DIS (2) DIS	RECURRING (+/-) SCOUNT FACTOR (TA SCOUNTED SAVING/(ABLE 1) COST (3AX3A1)	\$	22 9.08 203	
A. ANNUAL (1) DIS (2) DIS	RECURRING (+/-) SCOUNT FACTOR (TA	ABLE 1) COST (3AX3A1)	Ş	9.08 203	
A. ANNUAL (1) DIS (2) DIS	RECURRING (+/-) SCOUNT FACTOR (TA SCOUNTED SAVING/(CURRING SAVINGS (ABLE 1) COST (3AX3A1) (+) / COST (-)	\$	9.08 203 DISCOUNTED	
A. ANNUAL (1) DIS (2) DIS B. NON REG	RECURRING (+/-) SCOUNT FACTOR (TA SCOUNTED SAVING/(ABLE 1) COST (3AX3A1) (+) / COST (-) YEAR OF	\$ DISCOUNT S	9.08 203 DISCOUNTED GAVINGS (+)	4)
A. ANNUAL (1) DIS (2) DIS B. NON REG	RECURRING (+/-) SCOUNT FACTOR (TA SCOUNTED SAVING/C CURRING SAVINGS (SAVING \$ (+) COST \$ (-)(1) C	ABLE 1) COST (3AX3A1) (+) / COST (-) YEAR OF DCCURRENCE(2)	\$ DISCOUNT FACTOR (3)	9.08 203 DISCOUNTED SAVINGS (+) COST(-) (4	4)
A. ANNUAL (1) DIS (2) DIS B. NON REC ITEM	RECURRING (+/-) SCOUNT FACTOR (TA SCOUNTED SAVING/C CURRING SAVINGS (SAVING \$ (+) COST \$ (-)(1) C	ABLE 1) COST (3AX3A1) (+) / COST (-) YEAR OF DCCURRENCE(2) 0	\$ DISCOUNT FACTOR (3) 1	9.08 203 DISCOUNTED SAVINGS (+) COST(-) (4	4)
A. ANNUAL (1) DIS (2) DIS B. NON REG ITEM a. b.	RECURRING (+/-) SCOUNT FACTOR (TA SCOUNTED SAVING/C CURRING SAVINGS (SAVING \$ (+) COST \$ (-)(1) C 0 0	ABLE 1) COST (3AX3A1) (+) / COST (-) YEAR OF DCCURRENCE(2)	\$ DISCOUNT FACTOR (3) 1 1	9.08 203 DISCOUNTED SAVINGS (+) COST(-) (4 0 0	4)
A. ANNUAL (1) DIS (2) DIS B. NON REC ITEM	RECURRING (+/-) SCOUNT FACTOR (TA SCOUNTED SAVING/C CURRING SAVINGS (SAVING \$ (+) COST \$ (-)(1) C	ABLE 1) COST (3AX3A1) (+) / COST (-) YEAR OF DCCURRENCE(2) 0	\$ DISCOUNT FACTOR (3) 1	9.08 203 DISCOUNTED SAVINGS (+) COST(-) (4	4)
A. ANNUAL (1) DIS (2) DIS B. NON REC ITEM a. b. c. d. TOTAL	RECURRING (+/-) SCOUNT FACTOR (TA SCOUNTED SAVING/C CURRING SAVINGS (SAVING \$ (+) COST \$ (-)(1) C 0 0 0 0	ABLE 1) COST (3AX3A1) (+) / COST (-) YEAR OF DCCURRENCE(2) 0 0 0 0	\$ DISCOUNT FACTOR (3) 1 1 1 1	9.08 203 DISCOUNTED SAVINGS (+) COST(-) (4 0 0 0 0 0	
A. ANNUAL (1) DIS (2) DIS B. NON REG ITEM a. b. c. d. TOTAL C. TOTAL N	RECURRING (+/-) SCOUNT FACTOR (TA SCOUNTED SAVING/C CURRING SAVINGS (SAVING \$ (+) COST \$ (-)(1) C 0 0 0 0 0 0 0 0 0 0 0 0 0	ABLE 1) COST (3AX3A1) (+) / COST (-) YEAR OF DCCURRENCE(2) 0 0 0 0 0 0	\$ DISCOUNT FACTOR (3) 1 1 1 +),COST(-)	9.08 203 DISCOUNTED SAVINGS (+) COST(-) (4 0 0 0 0 0	
A. ANNUAL (1) DIS (2) DIS B. NON REG ITEM a. b. c. d. TOTAL C. TOTAL N D. PROJECT	RECURRING (+/-) SCOUNT FACTOR (TA SCOUNTED SAVING/C CURRING SAVINGS (SAVING \$ (+) COST \$ (-)(1) C 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ABLE 1) COST (3AX3A1) (+) / COST (-) YEAR OF DCCURRENCE(2) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$ DISCOUNT FACTOR (3) 1 1 1 1 1 1 T	9.08 203 DISCOUNTED SAVINGS (+) COST(-) (4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	20:
A. ANNUAL (1) DIS (2) DIS B. NON REG ITEM a. b. c. d. TOTAL C. TOTAL D. PROJECT (1) 25% MA	RECURRING (+/-) SCOUNT FACTOR (TA SCOUNTED SAVING/C CURRING SAVINGS (SAVING \$ (+) COST \$ (-)(1) C 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ABLE 1) COST (3AX3A1) (+) / COST (-) YEAR OF DCCURRENCE(2) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$ DISCOUNT FACTOR (3) 1 1 1 1 1 1 T	9.08 203 DISCOUNTED SAVINGS (+) COST(-) (4 0 0 0 0 0	203
A. ANNUAL (1) DIS (2) DIS B. NON REG ITEM a. b. c. d. TOTAL C. TOTAL N D. PROJECT (1) 25% MA a. IF 3	RECURRING (+/-) SCOUNT FACTOR (TA SCOUNTED SAVING/C CURRING SAVINGS (SAVING \$ (+) COST \$ (-)(1) C 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ABLE 1) COST (3AX3A1) (+) / COST (-) YEAR OF DCCURRENCE(2) 0 0 0 0 UNTED SAVINGS(LIFICATION TES C (2F5 X .33) 0 TO ITEM 4	\$ DISCOUNT FACTOR (3) 1 1 1 1 1 1 1 T	9.08 203 DISCOUNTED SAVINGS (+) COST(-) (4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	203 198,234
A. ANNUAL (1) DIS (2) DIS B. NON REG ITEM a. b. c. d. TOTAL C. TOTAL N D. PROJECT (1) 25% MA a. IF 3 b. IF 3	RECURRING $(+/-)$ SCOUNT FACTOR (TA SCOUNTED SAVING/C CURRING SAVINGS (SAVING \$ (+) COST \$ (-)(1) C 0 0 0 0 NON ENERGY DISCOUNT NON ENERGY DISCOUNT NON ENERGY QUAL X NON ENERGY QUAL X NON ENERGY CAL BD1 IS -> 3C G BD1 IS < 3C C	ABLE 1) COST (3AX3A1) (+) / COST (-) YEAR OF DCCURRENCE(2) 0 0 0 0 0 0 0 0 0 0 0 0 0	\$ DISCOUNT FACTOR (3) 1 1 1 1 1 1 1 T	9.08 203 DISCOUNTED SAVINGS (+) COST(-) (4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	203 198,234
A. ANNUAL (1) DIS (2) DIS B. NON REC ITEM a. b. c. d. TOTAL C. TOTAL N D. PROJECT (1) 25% MA a. IF 3 b. IF 3 c. IF 3	RECURRING $(+/-)$ SCOUNT FACTOR (TA SCOUNTED SAVING/C CURRING SAVINGS (SAVING \$ (+) COST \$ (-)(1) C 0 0 0 0 NON ENERGY DISCOUNT NON ENERGY DISCOUNT NON ENERGY QUAL AX NON ENERGY QUAL AX NON ENERGY CAL BD1 IS -> 3C C BD1 IS < 3C C BD1 IS -> 1 C	ABLE 1) COST (3AX3A1) (+) / COST (-) YEAR OF DCCURRENCE(2) 0 0 0 0 0 0 0 0 0 0 0 0 0	\$ DISCOUNT FACTOR (3) 1 1 1 1 1 1 1 5 5 5 5 3 0 1 1 1 1 1 5 5 5 5 5 5 5 5 5 5 5 5 5 5	9.08 203 DISCOUNTED SAVINGS (+) COST(-) (4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	20: 198,234
A. ANNUAL (1) DIS (2) DIS B. NON REG ITEM a. b. c. d. TOTAL C. TOTAL N D. PROJECT (1) 25% MA a. IF 3 b. IF 3 c. IF 3 d. IF 3	RECURRING $(+/-)$ SCOUNT FACTOR (TA SCOUNTED SAVING/C CURRING SAVINGS (SAVING \$ (+) COST \$ (-)(1) C 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ABLE 1) COST (3AX3A1) (+) / COST (-) YEAR OF DCCURRENCE(2) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$ DISCOUNT FACTOR (3) 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	9.08 203 DISCOUNTED SAVINGS (+) COST(-) (4 0 0 0 0 (3A2+3Bd4) \$	203 198,234 (
A. ANNUAL (1) DIS (2) DIS B. NON REC ITEM a. b. c. d. TOTAL C. TOTAL N D. PROJECT (1) 25% MA a. IF 3 b. IF 3 c. IF 3 d. IF 3 c. IF 3 c. IF 3	RECURRING $(+/-)$ SCOUNT FACTOR (TA SCOUNTED SAVING/C CURRING SAVINGS (SAVING \$ (+) COST \$ (-)(1) C 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ABLE 1) COST (3AX3A1) (+) / COST (-) YEAR OF DCCURRENCE(2) 0 0 0 0 0 0 0 0 0 0 0 0 0	\$ DISCOUNT FACTOR (3) 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	9.08 203 DISCOUNTED SAVINGS (+) COST(-) (4 0 0 0 0 (3A2+3Bd4) \$	4) 203 198,234 C 44,519
A. ANNUAL (1) DIS (2) DIS B. NON REC ITEM a. b. c. d. TOTAL C. TOTAL N D. PROJECT (1) 25% MA a. IF 3 b. IF 3 c. IF 3 d. IF 3	RECURRING $(+/-)$ SCOUNT FACTOR (TA SCOUNTED SAVING/C CURRING SAVINGS (SAVING \$ (+) COST \$ (-)(1) C 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ABLE 1) COST (3AX3A1) (+) / COST (-) YEAR OF DCCURRENCE(2) 0 0 0 0 0 0 0 0 0 0 0 0 0	\$ DISCOUNT FACTOR (3) 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	9.08 203 DISCOUNTED SAVINGS (+) COST(-) (4 0 0 0 0 (3A2+3Bd4) \$	203 198,234 C



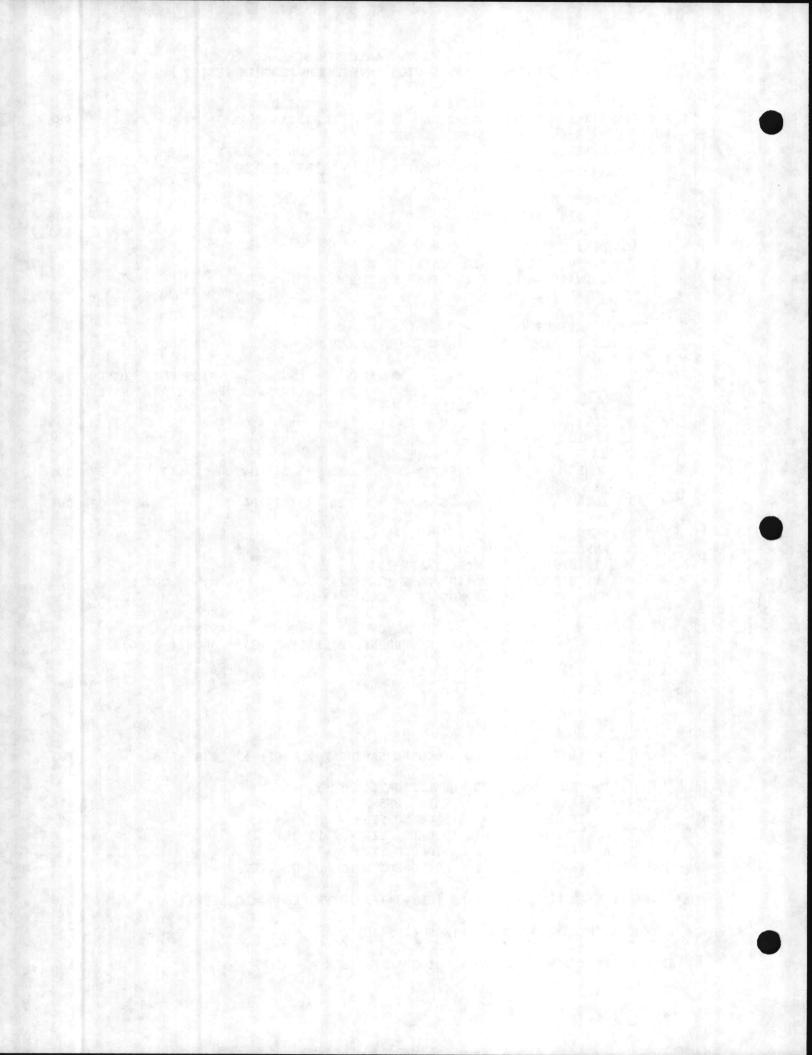
LOCATION	V :	CAMP LEJEUNE		PROJECT NO.		
		PIPE INSULATIO				100
				FISCAL YEAR	•	198
PORITON	NAME :	NEW RIVER AIR	STATION			
	NUMBER :			ECONOMIC LI	FE IN YEARS:	2
ANALYSIS	S DATE:	JUNE 23 1987		PREPARED BY		LO SUNDE
1. INVES	STMENT C	OST	•			
		CTION COST				
		CITON COST			\$	101,88
	SIOH	승규는 것 같은 것 같이 많이			1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	5,60
	DESIGN					6,11
D.	ENERGY	CREDIT CALC (14	+1B+1C)X.9			102,23
Ε.	SALVAGE	VALUE OF EXIST	ING EOUIPMENT			,
		NVESTMENT (1D-1			\$	102,23
		(12 -	,		Ŷ	102,25
2 ENEDC	W CANTN	GS (+) / (-)				
					an kalendar kalendar	
ANA	LISIS DA	ATE ANNUAL SAVI	NGS, UNIT COS	r ș discount	ED SAVINGS	
				1997 - A		
			SAVINGS			
	EL	\$/MBTU(1)	MBTU/YR(2)	SAVINGS (3)	FACTOR(4)	SAVINGS(5)
	ELEC	8.15	0		0	
Β.	DIST	0	0	0		전학과 동물을 했다.
	RESID	0	0	0	Ő	(
	NG	Ő	ő	ő		
	COAL	2.91			0	
ь.	COAL	2.91	15,179	44,170	13.5	596,303
F.	TOTAL	\$	15,179	44,170		596,30
NON	NEDOV CH	WINCE (/	cm ()			
		VINGS (+) / CO		Barris Martin		
		RECURRING (+/-)		\$	22	
	(1) DISC	COUNT FACTOR (T	ABLE 1)		9.08	
	(2) DISC	COUNTED SAVING/	COST (3AX3A1)	\$	203	
В.	NON RECL	JRRING SAVINGS	(+) / COST (-)	,		
					DISCOUNTED	
	ITEM	SAVING \$ (+)	VEAR OF		SAVINGS (+)	
		COST \$ (-)(1)	OCCURPENCE (2)	EACTOR (2)	COCT () (1
		0031 \$ (-)(1)	OCCORRENCE(2)	FACTOR (3)	COST(-) (4)
		•	•			
a.		0	0	1	0	
b.		0	0	1	0	
c.		0	0	1	0	
d.	TOTAL	0			0	
с.	TOTAL NO	N ENERGY DISCO	UNTED SAVINGS	(+) COST $(-)$	(3A2+3Bd4)	203
					(0.12.0204)	203
D.	PROJECT	NON ENERGY QUA	LIFICATION TES	T		
		NON ENERGY CA			\$	196,779
Sec. 14	a. IF 3D	1 IS = > 3C	GO TO ITEM 4			
1	b. IF 3D	1 IS < 3C	CALC SIR = $(2$	(F5+3D1)/1F		C
Section of the	c. IF 3D	1b IS = > 1	GO TO TTEM 4			
and the	d. IF 3D	1b IS < 1	PROJECT DOES N	OT OUALIFY		
. FIRST	YEAR DO	LLAR SAVINGS [:	2F3+3A+(3B1d/Y	RS ECONOMIC	LIFE)] \$	44,193
. TOTAL	NET DIS	COUNTED SAVING	S (2F5+3C)		\$	596,504
STD /	IF < 1 P	POTECT DODO NOT		15 13 51		
. 51K (.	IF C I P	ROJECT DOES NOT	I QUALIFY) SIR	= (5/1F) =		5.8

5-38 (R-1)

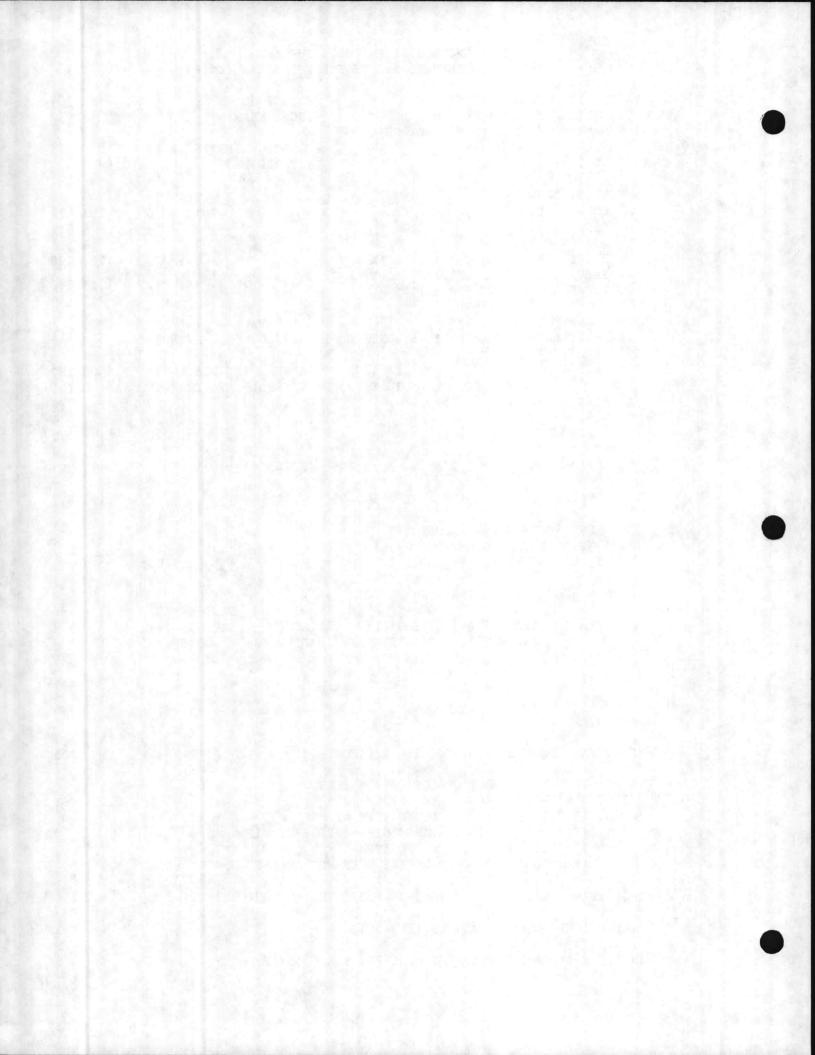


LOCATION: CAMP LEJEUNE PROJECT TITLE: PIPE INSULATION PORTION NAME: CAMP GEIGER PACKAGE 2	PROJECT NO. FISCAL YEAR:	1988
REGION NUMBER: 4 ANALYSIS DATE: JUNE 23 1987	ECONOMIC LIFE IN YEARS: PREPARED BY: LO SUND	25 E
 INVESTMENT COST A. CONSTRUCTION COST B. SIOH C. DESIGN COST D. ENERGY CREDIT CALC (1A+1B+1C)X.9 E. SALVAGE VALUE OF EXISTING EQUIPMENT 	3 3 65	,906 ,570 ,894 ,133 0
F. TOTAL INVESTMENT (1D-1E)	\$ 65	,133

			COST	SAVINGS	ANNUAL \$	DISCOUNT	DISCOUNTED
		EL	\$/MBTU(1)	MBTU/YR(2)	SAVINGS (3)	FACTOR(4)	SAVINGS(5)
		ELEC		0	0	0	0
		DIST	0	0	0	0	0
		RESID	0	0	0	0	0
		NG	0	0		0	0
	Ε.	COAL	2.91	9,520	27,704	13.5	374,001
	F.	TOTAL	\$	9,520	27,704		374,001
3.			SAVINGS (+) / CO				
	Α.		RECURRING (+/-)		\$	22	
			SCOUNT FACTOR (TA			9.08	
	B	(2) DI	SCOUNTED SAVING/	COST (3AX3A1)	\$	203	
	р.	NON KI	CORKING SAVINGS	(+) / COSI (-)		TCCOUNTED	
		ITEM	CANTING & (1)	VEAD OF		DISCOUNTED	
		TIEM		ILAR UF	DISCOUNT S	SAVINGS (+)	
			COST \$ (-)(1)	OCCORRENCE(2)	FACTOR (3)	COST(-) (4)
	a.		0	0	1	0	
	b.		0	0	1	0	
	с.		0	0	1	0	
	d.	TOTAL	0			0	
	c.	TOTAL	NON ENERGY DISCO	UNTED SAVINGS	(+),COST(-)	(3A2+3Bd4)	203
	D.	PROJEC	T NON ENERGY QUAL	LIFICATION TES	T		
			AX NON ENERGY CAL			\$	123,420
	•		3D1 IS = > 3C (Ŷ	123,420
			3D1 IS < 3C		F5+3D1)/1F		0
		C IF	3D1b IS = > 1	$\frac{1}{20} \text{ TO } \text{ TTEM } 4$.13+301)/11		U
			3D1b IS < 1		OT OUNT TEV		
		u. 11		ROJECI DOES N	OI QUALIFI		
4.	FIRST	I YEAR	DOLLAR SAVINGS [2	2F3+3A+(3B1d/Y	RS ECONOMIC	LIFE)] \$	27,726
5.	TOTAL	L NET D	ISCOUNTED SAVINGS	5 (2F5+3C)		\$	374,204
6.	SIR	(IF < 1)	PROJECT DOES NOT	CQUALIFY) SIR	= (5/1F) =		5.7



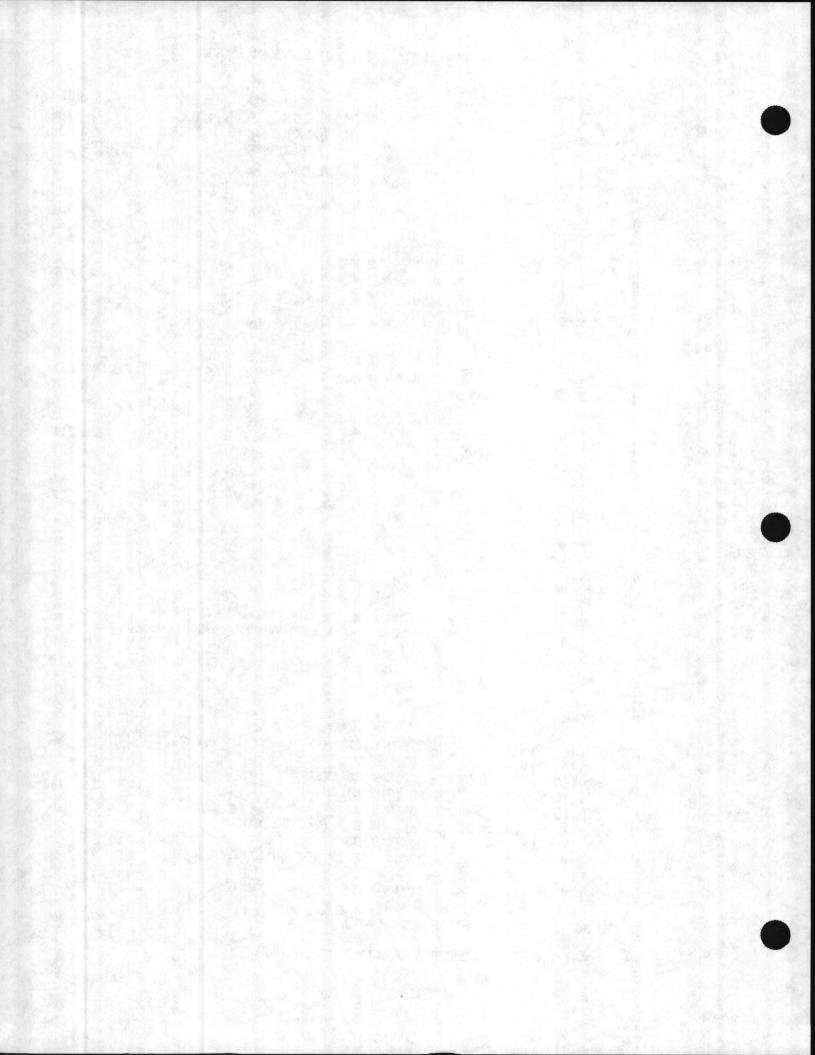
ORTION NAME: HADNOT POINT PACKAGE 4 EGION NUMBER: 4 ENALYSIS DATE: JUNE 23 1987 INVESTMENT COST \$ A. CONSTRUCTION COST \$ A. CONSTRUCTION COST \$ A. CONSTRUCTION COST \$ B. SIGH \$ C. DESIGN COST \$ D. ENERGY CREDIT CALC (1A+1B+1C)X, 9 103,43 E. SLAVACE VALUE OF EXISTING EQUIPMENT \$ F. TOTAL INVESTMENT (1D-1E) \$ COST SAVINGS A. ELEC \$/MBTU(1) MBTU/YR(2) SAVINGS (3) FACTOR(4) SAVINGS \$ B. DIST 0 0 COST \$ 10 COST SAVINCS ANNUAL \$ DIST 0 0 0 D. NG 0 0 0 D. NG 0 0 0 COAL 2.23 19,795 44,144 13.5 595,94 F. TOTAL \$ 19,795 44,144 13.5 595,94 NON ENERGY SAVINGS (+) / COST (-)	LOCATION:		N.	PROJECT NO.		
LECION NUMBER: 4 ECONOMIC LIFE IN YEARS: 10 NALYSIS DATE: JUNE 23 1987 PREPARED BY: LO SUNDE INVESTMENT COST \$ 103,12 A. CONSTRUCTION COST \$ 103,12 S. SIOH \$,60 \$,60 C. DESIGN COST \$ 103,43 E. SALVACE VALUE OF EXISTINC EQUIPMENT \$ 103,44 F. TOTAL INVESTMENT (1D-1E) \$ 103,44 COST SAVINCS ANNUAL \$ DISCOUNT DISCOUNT \$ FUEL \$/MBTU(1) METU/TR(2) \$AVINGS (3) FACTOR(4) FUEL \$/MBTU(1) METU/TR(2) \$AVINGS (3) FACTOR(4) \$ FUEL \$/MBTU(1) METU/TR(2) \$AVINGS (3) FACTOR(4) \$ \$ GO 0 0 0 0 0 0 0 RESID 0 0 0 0 0 0 0 RESID 0	PORTION NAME:	HADNOT POINT P.	N ACKAGE 4	FISCAL YEAR		198
NALYSIS DATE: JUNE 23 1987 PREPARED BY: LO SUNDE INVESTMENT COST A. CONSTRUCTION COST \$ 103,11 B. SIOH 5,6 C. DESIGN COST 6,11 D. ENERGY CREDIT CALC (1A+1B+1C)X,9 103,43 E. SALVACE VALUE OF EXISTING EQUIPMENT \$ 103,43 F. TOTAL INVESTMENT (1D-1E) \$ 103,43 COST SAVINGS ANNUAL \$ DISCOUNT DISCOUNT ANALYSIS DATE ANNUAL SAVINGS, UNIT COST \$ DISCOUNT DISCOUNT DISCOUNT FUEL \$ COST SAVINGS COST SAVINGS ANNUAL \$ DISCOUNT DISCOUNT PIEL \$ ANNUAL SAVINGS (3) FACTOR(4) SAVINGS (5) A. ELEC 8.15 0 0 B. DIST 0 0 0 B. DIST 0 0 0 COAL 2.23 19,795 44,144 13.5 595,94 F. TOTAL \$ 19,795 44,144 13.5 595,94 NON ENERGY SAVINGS (+) / COST (-) \$ 22 10 DISCOUNT FACTOR (TABLE 1) 9,08 203 B. NON RECURRING SAVINGS(COST (3X3A1) \$ 203 DISCOUNTED SAVING/COST (3X3A1) <	REGION NUMBER:	4		ECONOMIC LI	FE IN YEARS:	2
A. CONSTRUCTION COST \$ 103,12 B. SIGH 5,6 C. DESIGN COST 6,11 D. ENERGY CREDIT CALC (1A+1B+1C)X,9 103,43 E. SALVAGE VALUE OF EXISTING EQUIPMENT \$ 103,44 F. TOTAL INVESTMENT (1D-1E) \$ 103,44 COST SAVINGS ANNUAL \$ DISCOUNTED SAVINGS MALYSIS DATE ANNUAL SAVINGS, UNIT COST \$ DISCOUNTED SAVINGS SAVINGS (3) FACTOR(4) FUEL \$/METU(1) METU/YR(2) SAVINGS (3) FACTOR(4) A. ELEC 8.15 0 0 B. DIST 0 0 0 B. DIST 0 0 0 D. NG 0 0 0 D. NG 0 0 0 F. TOTAL \$ 19,795 44,144 13.5 G. DISCOUNTED SAVINGS (+) / COST (-) A. ANNUAL RECURRING (+/-) \$ 22 A. ANNUAL RECURRING (+/-) \$ 203 \$ 203 B. NON RECURRING SAVINGS (+) / COST (-) A. ANNUAL RECURRING (+/-) \$ 203 B. NON RECURRING SAVINGS (+) / COST (-) DISCOUNTED SAVING (+/-) \$ 203 B. NON RECURRING SAVINGS (+) / COST (-) DISCOUNTED \$ 203	ANALYSIS DATE:	JUNE 23 1987		PREPARED BY	:	
B. SIOH5,6,6,1C. DESIGN COST6,11D. ENERGY CREDIT CALC (1A+1B+1C)X,9103,43E. SALVAGE VALUE OF EXISTING EQUIPMENT103,43F. TOTAL INVESTMENT (1D-1E)\$ 103,43COSTSAVINGSANALYSIS DATE ANNUAL SAVINGS, UNIT COST \$ DISCOUNTED SAVINGSCOSTSAVINGSANALYSIS DATE ANNUAL SAVINGS, UNIT COST \$ DISCOUNT DISCOUNTFUEL\$/METU(1)METU/YR(2)SAVINGS (3) FACTOR(4)A. ELEC8.150010\$101010\$10101110121013014101510151016101710181019,79544,14419,79519,79544,1441010101011101110 <tr< td=""><td></td><td></td><td></td><td></td><td></td><td></td></tr<>						
C. DESIGN COST 6,14 D. ENERGY CREDIT CALC (1A+1B+1C)X.9 103,43 E. SALVAGE VALUE OF EXISTING EQUIPMENT F. TOTAL INVESTMENT (1D-1E) $$ 103,43$ COST SAVINGS ANNUAL $$ 0$ ISCOUNT DISCOUNT ANALYSIS DATE ANNUAL SAVINGS, UNIT COST $$ DISCOUNTED SAVINGS$ COST SAVINGS ANNUAL $$ DISCOUNT DISCOUNT FUEL $/METU(1) METU/YR(2) SAVINGS (3) FACTOR(4) SAVINGS (3)A. ELEC 8.15 0 0 0 0B. DIST 0 0 0 0 0C. RESID 0 0 0 0 0E. COAL 2.23 19,795 44,144 13.5 595,94F. TOTAL $ 19,795 44,144 595,94NON ENERGY SAVINGS (+) / COST (-)A. ANNUAL RECURRING (+/-) $ 22(1) DISCOUNT FACTOR (TABLE 1) 9,08(2) DISCOUNT FACTOR (TABLE 1) 9,08(2) DISCOUNT FACTOR (TABLE 1) 9,08(2) DISCOUNTED SAVINGS (5) / COST (-)ITEM SAVING $ (+) YEAR OF DISCOUNT SAVINGS (+)COST $ (-)(1) OCCURRENCE(2) FACTOR (3) COST(-) (4)a. 0 0 1 0C. TOTAL 0 10C. TOTAL 0 20D. PROJECT NON ENERGY QUALIFICATION TEST(1) 25 MAX NON ENERGY CALC (2FS X. 33)a. IF 3DI IS - 3C GO TO ITEM 4b. IF 3DI IS - 3C GO TO ITEM 4d. IF 3DI IS - 1 ROJECT DOES NOT QUALIFYFIRST YEAR DOLLAR SAVINGS (2F5+3C) $ 596,14$		CTION COST			\$	103,12
D. ENERGY CREDIT CALC (14+1B+1C)X.9 E. SALVAGE VALUE OF EXISTING EQUIPMENT F. TOTAL INVESTMENT (1D-1E) S 103,45 ENERGY SAVINGS (+) / (-) ANALYSIS DATE ANNUAL SAVINGS, UNIT COST \$ DISCOUNTED SAVINGS COST SAVINGS ANNUAL \$ DISCOUNT DISCOUNT FUEL \$/METU(1) MBTU/YR(2) SAVINGS (3) FACTOR(4) SAVINGS (3) A. ELEC 8.15 0 0 0 0 B. DIST 0 0 0 0 0 C. RESID 0 0 0 0 0 D. NG 0 0 0 0 C. RESID 0 0 0 0 0 E. COAL 2.23 19,795 44,144 13.5 595,94 F. TOTAL \$ 19,795 44,144 595,94 NON ENERGY SAVINGS (+) / COST (-) A. ANNUAL RECURRING (+/-) \$ 22 (1) DISCOUNT FACTOR (TABLE 1) 9.08 (2) DISCOUNTED SAVING/COST (3AX3A1) \$ 203 B. NON RECURRING SAVINGS (+) / COST (-) ITEM SAVING \$ (+) YEAR OF DISCOUNT SAVINGS (+) COST \$ (-)(1) OCCURRENCE(2) FACTOR (3) COST(-) (4) a. 0 0 1 0 c. 0 0 1 0 C. TOTAL 0 10 C. TOTAL 0 10 C. TOTAL 0 10 C. TOTAL NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2FS X.33) \$ 196,66 a. 1F 3D1 IS - > 3C CALC SIR - (2F5+3D1)/1F c. IF 3D1 IS - > 1 COTO ITEM 4 d. IF 3D1 IS - > 1 COTO ITEM 4 d. IF 3D1 IS - > 1 COTO ITEM 4 d. IF 3D1 IS - > 1 COTO ITEM 4 d. IF 3D1 IS - > 1 COTO ITEM 4 d. IF 3D1 IS - > 1 COTO ITEM 4 d. IF 3D1 IS - > 1 FROJECT DOES NOT QUALIFY FIRST YEAR DOLLAR SAVINGS (2F5+3C) \$ 596,14						5,67
D. ENERGY CREDIT CALC (1A+1B+1C)X.9 E. SALVAGE VALUE OF EXISTING EQUIPMENT F. TOTAL INVESTMENT (1D-1E) COST SAVINGS (1) / (-) ANALYSIS DATE ANNUAL SAVINGS, UNIT COST \$ DISCOUNTED SAVINGS COST SAVINGS ANNUAL \$ DISCOUNT DISCOUNT FUEL \$/METU(1) METU/YR(2) SAVINGS (3) FACTOR(4) A. ELEC 8.15 0 0 0 D. NG 0 0 0 0 C. RESID 0 0 0 0 D. NG 0 0 0 0 E. COAL 2.23 19,795 44,144 13.5 595,94 F. TOTAL \$ 19,795 44,144 595,94 F. TOTAL \$ 19,795 44,144 595,94 NON ENERGY SAVINGS (+) / COST (-) A. ANNUAL RECURRING (+/-) \$ 22 (1) DISCOUNT FACTOR (TABLE 1) 9.08 (2) DISCOUNT FACTOR (TABLE 1) 9.08 (2) DISCOUNTED SAVING/SOST (3AX3A1) \$ 203 B. NON RECURRING SAVINGS (+) / COST (-) ITEM SAVING \$ (+) YEAR OF DISCOUNT SAVINGS (+) COST \$ (-)(1) OCCURRENCE (2) FACTOR (3) COST(-) (4) a. 0 0 1 0 c. 0 0 1 0 C. TOTAL 0 1 0 C. TOTAL 0 1 0 C. TOTAL 0 1 0 C. TOTAL 0 1 0 D. PROJECT NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2FS X. 33) \$ 196,66 a. IF 3D1 IS -> 3C GALC SIR - (2F5+3D1)/1F c. IF 3D1 IS -> 3C CALC SIR - (2F5+3D1)/1F c. IF 3D1 IS -> 1 FROJECT DOES NOT QUALIFY FIRST YEAR DOLLAR SAVINGS (2F5+3C) \$ 596,14	C. DESIGN	COST			- 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1	
E. SALVAGE VALUE OF EXISTING EQUIPMENT \$ 103,49 F. TOTAL INVESTMENT (1D-1E) \$ 103,49 COST SAVINGS ANNUAL \$ DISCOUNTED SAVINGS MALYSIS DATE ANNUAL SAVINGS, UNIT COST \$ DISCOUNTED SAVINGS SAVINGS (3) FACTOR(4) SAVINGS(5) FUEL \$/MBTU(1) MBTU/YR(2) SAVINGS (3) FACTOR(4) SAVINGS(5) A. ELEC 8.15 0 0 0 0 B. DIST 0 0 0 0 0 0 C. RESID 0	D. ENERGY	CREDIT CALC (1A.	+1B+1C)X.9			
F. TOTAL INVESTMENT (1D-1E) \$ 103,44 COST SAVINGS, UNIT COST \$ DISCOUNTED SAVINGS NALYSIS DATE ANNUAL SAVINGS, UNIT COST \$ DISCOUNTED SAVINGS DISCOUNTED SAVINGS (3) FACTOR(4) FUEL \$/MBTU(1) MBTU/YR(2) SAVINGS (3) FACTOR(4) SAVINGS(5) A. ELEC 8.15 0 0 0 0 B. DIST 0 0 0 0 0 0 C. RESID 0 <t< td=""><td></td><td></td><td></td><td></td><td></td><td>the second se</td></t<>						the second se
ANALYSIS DATE ANNUAL SAVINGS, UNIT COST \$ DISCOUNTED SAVINGS COST SAVINGS ANNUAL \$ DISCOUNT DISCOUNT FUEL \$/MBTU(1) MBTU/YR(2) SAVINGS (3) FACTOR(4) SAVINGS (3) A. ELEC 8.15 0 0 0 0 0 0 0 B. DIST 0 0 0 0 0 0 0 0 0 B. DIST 0 0 0 0 0 0 0 0 B. DIST 0 0 0 0 0 0 0 0 D. NG 0 0 0 0 0 0 0 0 E. COAL 2.23 19,795 44,144 13.5 595,94 F. TOTAL \$ 19,795 44,144 595,94 NON ENERGY SAVINGS (+) / COST (-) \$ 22 1 1 9.08 203 3 B. NON RECURRING SAVINGS (+) / COST (-) DISCOUNTED SAVINGS (+) / COST (-) DISCOUNTED SAVINGS (+) / COST (-) 1 ITEM SAVING \$ (+) / YE					\$	103,49
COST SAVINGS ANNUAL \$ DISCOUNT DISCOUNT FUEL \$/MBTU(1) MBTU/YR(2) SAVINGS (3) FACTOR(4) SAVINGS (5) A. ELEC 8.15 0 0 0 0 B. DIST 0 0 0 0 0 C. RESID 0 0 0 0 0 D. NG 0 0 0 0 0 E. COAL 2.23 19,795 44,144 13.5 595,94 F. TOTAL \$ 19,795 44,144 595,94 NON ENERGY SAVINGS (+) / COST (-) A. ANNUAL RECURRING (+/-) \$ 22 (1) DISCOUNT FACTOR (TABLE 1) 9.08 \$ 203 B. NON RECURRING SAVINGS (+) / COST (-) DISCOUNT SAVINGS (+) COST (-) ITEM SAVING \$ (+) YEAR OF DISCOUNT SAVINGS (+) COST (-) ITEM SAVING \$ (+) YEAR OF DISCOUNT SAVINGS (+) COST (-) (4) \$ a. 0 0 1 0 </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>						
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F. TOTAL\$19,79544,144595,94NON ENERGY SAVINGS (+) / COST (-) A. ANNUAL RECURRING (+/-)\$22(1) DISCOUNT FACTOR (TABLE 1)9.08(2) DISCOUNT FACTOR (TABLE 1)9.08(2) DISCOUNTED SAVING/COST (3AX3A1)\$203B. NON RECURRING SAVINGS (+) / COST (-)ITEMSAVING \$ (+)VEAR OFDISCOUNT SAVINGS (+)COST \$ (-)(1) OCCURRENCE(2) FACTOR (3)COST (-) (4)a.00b.0c.000c.000c.000c.000c.000c.000c.00010c.010c.010c.010c.010c.010c.010101010111111111121212121313141415151415 </td <td></td> <td></td> <td>0</td> <td>0</td> <td>0</td> <td></td>			0	0	0	
NON ENERGY SAVINGS (+) / COST (-) A. ANNUAL RECURRING (+/-) (1) DISCOUNT FACTOR (TABLE 1) (2) DISCOUNTED SAVING/COST (3AX3A1) B. NON RECURRING SAVINGS (+) / COST (-) ITEM SAVING \$ (+) YEAR OF DISCOUNT SAVINGS (+) COST \$ (-)(1) OCCURRENCE(2) FACTOR (3) COST(-) (4) a. 0 0 1 0 b. 0 0 1 0 c. 0 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0	E. COAL	2.23	19,795	44,144	13.5	595,94
 A. ANNUAL RECURRING (+/-) \$ 22 (1) DISCOUNT FACTOR (TABLE 1) 9.08 (2) DISCOUNTED SAVING/COST (3AX3A1) \$ 203 B. NON RECURRING SAVINGS (+) / COST (-) DISCOUNT ED ITEM SAVING \$ (+) YEAR OF DISCOUNT SAVINGS (+) COST \$ (-)(1) OCCURRENCE(2) FACTOR (3) COST(-) (4) a. 0 0 1 0 b. 0 0 1 0 c. 0 0 1 0 d. TOTAL 0 0 1 0 C. TOTAL NON ENERGY DISCOUNTED SAVINGS (+), COST(-) (3A2+3Bd4) 20 D. PROJECT NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X .33) \$ 196,66 a. IF 3D1 IS -> 3C GO TO ITEM 4 b. IF 3D1 IS -> 3C GO TO ITEM 4 d. IF 3D1 IS -> 1 GO TO ITEM 4 d. IF 3D1 IS -> 1 GO TO ITEM 4 FIRST YEAR DOLLAR SAVINGS (2F3+3A+(3B1d/YRS ECONOMIC LIFE)] \$ 44,16 TOTAL NET DISCOUNTED SAVINGS (2F5+3C) \$ 596,14 	F. TOTAL	\$	19,795	44,144		595,94
 A. ANNUAL RECURRING (+/-) \$ 22 (1) DISCOUNT FACTOR (TABLE 1) 9.08 (2) DISCOUNTED SAVING/COST (3AX3A1) \$ 203 B. NON RECURRING SAVINGS (+) / COST (-) DISCOUNTED ITEM SAVING \$ (+) YEAR OF DISCOUNT SAVINGS (+) COST \$ (-)(1) OCCURRENCE(2) FACTOR (3) COST(-) (4) a. 0 0 1 0 b. 0 0 1 0 c. 0 0 1 0 d. TOTAL 0 0 1 0 C. TOTAL NON ENERGY DISCOUNTED SAVINGS (+), COST(-) (3A2+3Bd4) 20 D. PROJECT NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X .33) \$ 196,66 a. IF 3D1 IS -> 3C GO TO ITEM 4 b. IF 3D1 IS -> 3C GO TO ITEM 4 d. IF 3D1 IS -> 1 GO TO ITEM 4 d. IF 3D1 IS < 1 PROJECT DOES NOT QUALIFY FIRST YEAR DOLLAR SAVINGS (2F3+3A+(3B1d/YRS ECONOMIC LIFE)] \$ 44,16 TOTAL NET DISCOUNTED SAVINGS (2F5+3C) \$ 596,14 	NON ENERCY C					
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ITEMSAVING \$ (+)YEAR OFDISCOUNTSAVINGS (+) COST \$ (-)(1)a.0010b.0010c.0010d.TOTAL001D.PROJECT NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY QALC (2F5 X .33)\$196,66a.IF 3D1 IS = > 3CGO TO ITEM 4\$196,66b.IF 3D1 IS < 3C				I	DISCOUNTED	
COST \$ (-)(1) OCCURRENCE(2) FACTOR (3) $COST(-)$ (4) a. 0 0 1 0 b. 0 0 1 0 c. 0 0 1 0 c. 0 0 1 0 c. 0 0 1 0 d. TOTAL 0 0 1 D. PROJECT NON ENERGY DISCOUNTED SAVINGS(+),COST(-) (3A2+3Bd4) 20 D. PROJECT NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X .33) \$ 196,66 a. IF 3D1 IS -> 3C GO TO ITEM 4 5 196,66 b. IF 3D1 IS < 3C	ITEM	SAVING \$ (+)	YEAR OF			
b. 0 0 1 0 c. 0 0 1 0 d. TOTAL 0 0 1 0 c. TOTAL NON ENERGY DISCOUNTED SAVINGS(+), COST(-) (3A2+3Bd4) 20 D. PROJECT NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X .33) \$ 196,66 a. IF 3D1 IS -> 3C GO TO ITEM 4 \$ 196,66 b. IF 3D1 IS < 3C					COST(-) (4)
b. 0 0 1 0 c. 0 0 1 0 d. TOTAL 0 0 1 0 c. TOTAL 0 0 1 0 c. TOTAL 0 0 0 1 0 c. TOTAL 0 0 0 0 0 0 c. TOTAL NON ENERGY DISCOUNTED SAVINGS(+), COST(-) (3A2+3Bd4) 20 D. PROJECT NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X .33) \$ 196,66 a. IF 3D1 IS = > 3C GO TO ITEM 4 1 1 196,66 b. IF 3D1 IS < 3C	a.	0	0	1	0	
 c. 0 0 1 0 d. TOTAL 0 O. TOTAL NON ENERGY DISCOUNTED SAVINGS(+), COST(-) (3A2+3Bd4) 20 D. PROJECT NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X .33) \$ 196,66 a. IF 3D1 IS -> 3C GO TO ITEM 4 b. IF 3D1 IS < 3C CALC SIR - (2F5+3D1)/1F c. IF 3D1b IS -> 1 GO TO ITEM 4 d. IF 3D1b IS < 1 PROJECT DOES NOT QUALIFY FIRST YEAR DOLLAR SAVINGS [2F3+3A+(3B1d/YRS ECONOMIC LIFE)] \$ 44,16 TOTAL NET DISCOUNTED SAVINGS (2F5+3C) \$ 596,14	b.	0				
 d. TOTAL 0 0 0 C. TOTAL NON ENERGY DISCOUNTED SAVINGS(+),COST(-) (3A2+3Bd4) 20 D. PROJECT NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X .33) a. IF 3D1 IS = > 3C GO TO ITEM 4 b. IF 3D1 IS < 3C CALC SIR = (2F5+3D1)/1F c. IF 3D1b IS < 1 GO TO ITEM 4 d. IF 3D1b IS < 1 PROJECT DOES NOT QUALIFY FIRST YEAR DOLLAR SAVINGS [2F3+3A+(3B1d/YRS ECONOMIC LIFE)] \$ 44,16 TOTAL NET DISCOUNTED SAVINGS (2F5+3C) \$ 596,14 	с.					
 D. PROJECT NON ENERGY QUALIFICATION TEST (1) 25% MAX NON ENERGY CALC (2F5 X .33) a. IF 3D1 IS = > 3C GO TO ITEM 4 b. IF 3D1 IS < 3C CALC SIR = (2F5+3D1)/1F c. IF 3D1b IS = > 1 GO TO ITEM 4 d. IF 3D1b IS < 1 PROJECT DOES NOT QUALIFY FIRST YEAR DOLLAR SAVINGS [2F3+3A+(3B1d/YRS ECONOMIC LIFE)] \$ 44,16 TOTAL NET DISCOUNTED SAVINGS (2F5+3C) \$ 596,14						
<pre>(1) 25% MAX NON ENERGY CALC (2F5 X .33) a. IF 3D1 IS = > 3C GO TO ITEM 4 b. IF 3D1 IS < 3C CALC SIR = (2F5+3D1)/1F c. IF 3D1b IS = > 1 GO TO ITEM 4 d. IF 3D1b IS < 1 PROJECT DOES NOT QUALIFY . FIRST YEAR DOLLAR SAVINGS [2F3+3A+(3B1d/YRS ECONOMIC LIFE)] \$ 44,16 . TOTAL NET DISCOUNTED SAVINGS (2F5+3C) \$ 596,14</pre>	C. TOTAL NO	ON ENERGY DISCOU	NTED SAVINGS (+),COST(-)	(3A2+3Bd4)	20
<pre>(1) 25% MAX NON ENERGY CALC (2F5 X .33) a. IF 3D1 IS = > 3C GO TO ITEM 4 b. IF 3D1 IS < 3C CALC SIR = (2F5+3D1)/1F c. IF 3D1b IS = > 1 GO TO ITEM 4 d. IF 3D1b IS < 1 PROJECT DOES NOT QUALIFY . FIRST YEAR DOLLAR SAVINGS [2F3+3A+(3B1d/YRS ECONOMIC LIFE)] \$ 44,16 . TOTAL NET DISCOUNTED SAVINGS (2F5+3C) \$ 596,14</pre>	D. PROJECT	NON ENERGY OUAL	IFICATION TES	т		
 b. IF 3D1 IS < 3C CALC SIR = (2F5+3D1)/1F c. IF 3D1b IS = > 1 GO TO ITEM 4 d. IF 3D1b IS < 1 PROJECT DOES NOT QUALIFY FIRST YEAR DOLLAR SAVINGS [2F3+3A+(3B1d/YRS ECONOMIC LIFE)] \$ 44,16 TOTAL NET DISCOUNTED SAVINGS (2F5+3C) \$ 596,14 	(1) 25% MAX	NON ENERGY CAL	C (2F5 X .33)		\$	196,66
 d. IF 3D1b IS < 1 PROJECT DOES NOT QUALIFY FIRST YEAR DOLLAR SAVINGS [2F3+3A+(3B1d/YRS ECONOMIC LIFE)] \$ 44,16 TOTAL NET DISCOUNTED SAVINGS (2F5+3C) \$ 596,14 	b. IF 31	01 IS < 3C C	CALC SIR = $(2$	F5+3D1)/1F		
. FIRST YEAR DOLLAR SAVINGS [2F3+3A+(3Bld/YRS ECONOMIC LIFE)] \$ 44,16 . TOTAL NET DISCOUNTED SAVINGS (2F5+3C) \$ 596,14	d. IF 31 d. IF 31	$\begin{array}{ccc} \text{olb } 1\text{S} = > 1 & \text{G} \\ \text{olb } 1\text{S} < 1 & \text{P} \\ \end{array}$	ROJECT DOES N	OT QUALIFY		
. TOTAL NET DISCOUNTED SAVINGS (2F5+3C) \$ 596,14					LIFE)] \$	44,16
					a start and the	
					Ŷ	



LOCATION:	CAMP LEJEUNE	PROJECT NO.	1988
PROJECT TITLE:	PIPE INSULATION	FISCAL YEAR:	
PORTION NAME: REGION NUMBER: ANALYSIS DATE:	FR. CK., CTHSE. BAY & PAR. 4	PT. ECONOMIC LIFE IN PREPARED BY:	YEARS: 25 LO SUNDE
1. INVESTMENT C	COST		\$ 88,605
A. CONSTRU	JCTION COST		4 873

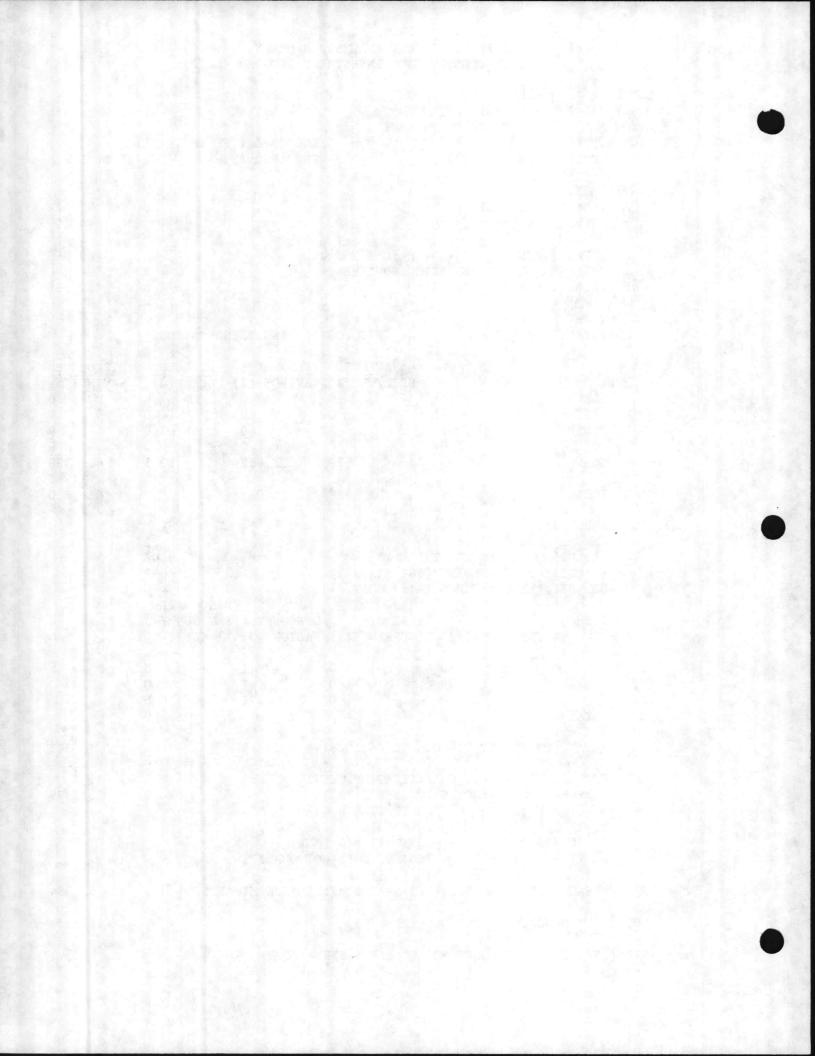
n: oonsine		4,0/5
B. SIOH		5,316
C. DESIGN COST		88,915
D. ENERGY CREDIT CALC (1A+1B+1C)X.9		0
E. SALVAGE VALUE OF EXISTING EQUIPMENT	Ś	88,915
F. TOTAL INVESTMENT (1D-1E)	상황은 전체 공간	

1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	COST	SAVINGS	ANNUAL \$	DISCOUNT	DISCOUNTED
1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	COST \$/MBTU(1)	METTI/VR(2)	SAVINGS (3) FACTOR(4)	SAVINGS(5)
FUEL	\$/MBIU(1) 8.15	0	0	0	
A. ELEC			the second s	0	0
B. DIST	0	0	0	0	0
C. RESID	0	10 636	23,719 11,380	13.5	320,211
D. COAL	2.23	10,030	11 380	13.5	
E. COAL	2.91	3,911	11,500		
F. TOTAL	\$	14,547	35,099		473,840
3 NON ENERGY S	AVINGS (+) / CO	ST (-)			
A ANNUAL	RECURRING (+/-)			\$ 22	
(1) DIS	COUNT FACTOR (T	ABLE 1)		9.08	
(1) DID	COUNTED SAVING/	COST (3AX3A1)		\$ 203	
(Z) DIS	URRING SAVINGS	(+) / COST (-)		
B. NON REC				DISCOUNTED	
TOTAL	SAVING \$ (+)	YEAR OF	DISCOUNT	SAVINGS (+)	
ITEM	COST \$ (-)(1)	OCCURRENCE (2)	FACTOR (3)) COST(-)	(4)
	0	()	1 0	
a.	Ő			1 0	Repairing a start
b.	0			1 0	
С.	0			C)
d. TOTAL					203
C. TOTAL	NON ENERGY DISCO	DUNTED SAVING	S(+),COST(-) (3A2+3Bd4	() 203
(1) 25% M	T NON ENERGY QUA AX NON ENERGY CA	ALC (2F5 X .)	3)		\$ 156,367
	20 × 27	CO TO LIEM 4	15. · · · · · · · · · · · · · · · · · · ·	F	0
c. IF d. IF	3D1 IS = > 3C 3D1 IS < 3C 3D1b IS = > 1 3D1b IS < 1	GO TO ITEM 4 PROJECT DOES	NOT QUALIE	Y	
	DOLLAR SAVINGS				\$ 35,122
	SAVIN				\$ 474,043
6. SIR (IF < 1	PROJECT DOES N	OT QUALIFY)	SIR = (5/1F)) -	5.3



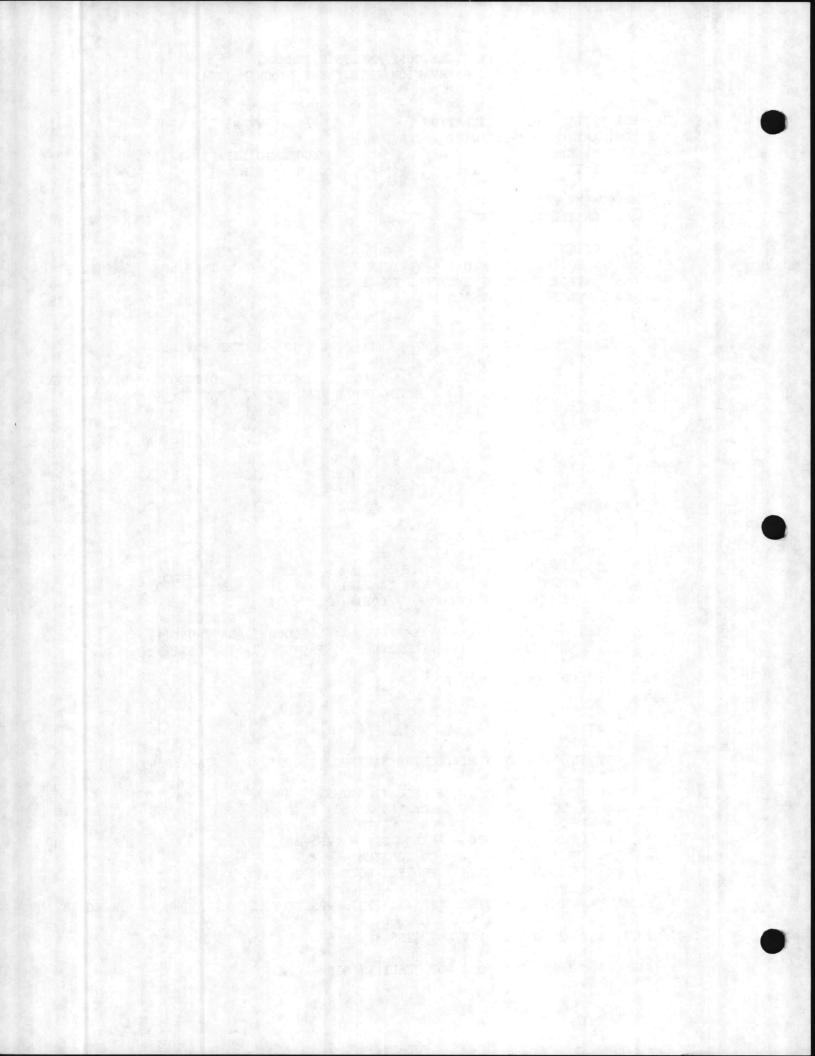
PORTION NAME:	CAMP LEJEUNE PIPE INSULATIO HADNOT POINT P	N	PROJECT NO FISCAL YEA		198
REGION NUMBER:			ECONOMIC L	IFE IN YEARS	: 2
ANALYSIS DATE:				Y:	
1. INVESTMENT C	OST				
A. CONSTRU	CTION COST			\$	81,97
B. SIOH				1996 B. (1996 B.	4,50
C. DESIGN	COST				4,91
D. ENERGY	CREDIT CALC (1A	+1B+1C)X.9			82,26
	VALUE OF EXIST				
	NVESTMENT (1D-1			\$	
2. ENERGY SAVING ANALYSIS DA	GS (+) / (-) ATE ANNUAL SAVI	NGS. UNIT COS'	T Ŝ DISCOUN	TED SAVINGS	
FUEL	\$ /METTI(1)	SAVINGS MBTU/YR(2)	ANNUAL S	DISCOUNT	DISCOUNTE
A. ELEC	8.15	MB10/1R(2)	SAVINGS (3		SAVINGS(5
B. DIST	0.15	0	0		
C. RESID	0	0	0	the state of the second of the second	
D. NG	0			and the second	
E. COAL	2.23		31,062		419,33
F. TOTAL	\$	13,929	31,062		419,33
NON ENERGY S	AVINGS (+) / CO	ST (-)			
A ANNUAL	RECURRING (+/-)	51 (-)		\$ 22	
	COUNT FACTOR (T.			9.08	
(2) DISC	COUNTED SAVING/ URRING SAVINGS	COST (3AX3A1)		\$ 203	
D. NON RECO	DRAING SAVINGS	(+) / COSI (-)	All a regard	DISCOUNTED	
TTEM	SAVING \$ (+)	VEAD OF	DISCOUNT	DISCOUNTED	
	SAVING φ (+)	OCCURRENCE(2)	DISCOUNT	COST(-) ((1.)
TIEM	0051 \$ (-)(1)	000011111101(2)	FACTOR (3)	/ /	(4)
а.	0	0		0	(4)
	State State State			0	(4)
a. b. c.	0	0	1	0 0	(4)
a. b.	0	0 0	1	0 0	(4)
a. b. c. d. TOTAL	0 0 0	0 0 0	1 1 1	0 0 0 0	
a. b. c. d. TOTAL C. TOTAL NO	0 0 0 0	0 0 0 UNTED SAVINGS (1 1 1 (+),COST(-)	0 0 0 0	
a. b. c. d. TOTAL C. TOTAL NO D. PROJECT (1) 25% MAX	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 UNTED SAVINGS(LIFICATION TES LC (2F5 X .33)	1 1 1 (+),COST(-) ST	0 0 0 0	9 20
a. b. c. d. TOTAL C. TOTAL NO D. PROJECT (1) 25% MAJ a. IF 31	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 UNTED SAVINGS LIFICATION TES LC (2F5 X .33) GO TO ITEM 4	1 1 1 (+),COST(-) ST)	0 0 0 (3A2+3Bd4) \$) 20 138,37
a. b. c. d. TOTAL C. TOTAL NO D. PROJECT (1) 25% MAX a. IF 31 b. IF 31	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 UNTED SAVINGS(LIFICATION TES LC (2F5 X .33) GO TO ITEM 4 CALC SIR - (2	1 1 1 (+),COST(-) ST)	0 0 0 (3A2+3Bd4) \$) 20 138,37
a. b. c. d. TOTAL C. TOTAL NO D. PROJECT (1) 25% MAX a. IF 31 b. IF 31 c. IF 31	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 UNTED SAVINGS(LIFICATION TES LC (2F5 X .33) GO TO ITEM 4 CALC SIR - (2 GO TO ITEM 4	1 1 1 (+),COST(-) ST) 2F5+3D1)/1F	0 0 0 (3A2+3Bd4) \$	
a. b. c. d. TOTAL C. TOTAL NO D. PROJECT (1) 25% MAX a. IF 31 b. IF 31 c. IF 31 d. IF 31	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 UNTED SAVINGS(LIFICATION TES LC (2F5 X .33) GO TO ITEM 4 CALC SIR = (2 GO TO ITEM 4 PROJECT DOES N	1 1 1 (+),COST(-) ST) 2F5+3D1)/1F NOT QUALIFY	0 0 0 (3A2+3Bd4) \$) 20 138,37
a. b. c. d. TOTAL C. TOTAL NO D. PROJECT (1) 25% MAX a. IF 31 b. IF 31 c. IF 31 d. IF 31 d. IF 31	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 UNTED SAVINGS(LIFICATION TES LC (2F5 X .33) GO TO ITEM 4 CALC SIR - (2 GO TO ITEM 4 PROJECT DOES N 2F3+3A+(3B1d/Y	1 1 1 (+),COST(-) ST) 2F5+3D1)/1F NOT QUALIFY	0 0 0 (3A2+3Bd4) \$ C LIFE)] \$) 20 138,37

5-42 (R-1)



LIFE CYCLE COST ANALYSIS SUMMARY ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

PROJECT TITLE:	CAMP LEJEUNE PIPE INSULATIO	N	PROJECT NO. FISCAL YEAR		1988
REGION NUMBER:	HADNOT POINT P	ACKAGE 6			
ANALYSIS DATE:			ECONOMIC LI PREPARED BY	FE IN YEARS:	25 LO SUNDE
1. INVESTMENT C		•			
A. CONSTRU	JCTION COST			\$	91,956
B. SIOH					5,058
C. DESIGN					5,517
D. ENERGY	CREDIT CALC (1A	+1B+1C)X.9			92,278
E. SALVAGE	E VALUE OF EXIST	ING EQUIPMENT			0
F. TOTAL I	INVESTMENT (1D-1	E)		\$	92,278
2. ENERGY SAVIN ANALYSIS D	NGS (+) / (-) DATE ANNUAL SAVI	NGS, UNIT COS'	T \$ DISCOUNT	ED SAVINGS	
					DI GOODINED
FUEL		MBTU/YR(2)	ANNUAL \$	FACTOR	DISCOUNTED SAVINGS(5)
A. ELEC	8.15	0	SAVINGS (3)	PACIOR(4)	SAVINGS(5)
B. DIST	0	0	ő	Contraction of the second s	0
C. RESID	0	0	Ő	Ő	0
D. NG	0				0
E. COAL	2.23	9,020	20,115		AT THE R. L. LEWIS CO. LANSING MICH.
F. TOTAL	\$	9,020	20,115		271,546
2 NON ENERGY					
J. NUN ENERGI S	AVINGS (+) / COS	ST (-)			
	RECURRING (+/-) COUNT FACTOR (TA		\$		
				9.08	
B. NON REC	COUNTED SAVING/O URRING SAVINGS	(+) / COST (-)	, Ş	203	
김 사람은 관람이 없다.				DISCOUNTED	
ITEM	SAVING \$ (+)	YEAR OF	DISCOUNT	SAVINGS (+)	
	COST \$ (-)(1) (DCCURRENCE(2)	FACTOR (3)	COST(-) (4	4)
а.	0	0	1	0	
b.	0	0	1	0	
с.	0	0	1	0	
d. TOTAL	0			0	
C. TOTAL N	ON ENERGY DISCOU	JNTED SAVINGS (+),COST(-)	(3A2+3Bd4)	203
D. PROJECT	NON ENERGY QUAL	IFICATION TES	T		
(1) 25% MA	X NON ENERGY CAL	C (2F5 X .33)		\$	89,610
a. 1F 3	$\begin{array}{ccc} D1 & IS = > 3C & G\\ D1 & IS & < 3C & G \end{array}$	SO TO TTEM 4 SALC STR $= (2)$	E5 (2D1) /1E		
c. IF 31	D1b IS $= > 1$ G	$\frac{1}{20} \text{ TO } \text{ ITFM } 4$	FJ+JD1)/1F		0
d. IF 31	D1b IS < 1 F	ROJECT DOES N	OT QUALIFY		
4. FIRST YEAR DO	OLLAR SAVINGS [2	F3+3A+(3B1d/Y	RS ECONOMIC	LIFE)] \$	20,137
5. TOTAL NET DIS				ŝ	
				?	271,749
6. SIR (IF < 1)	PROJECT DOES NOT	QUALIFY) SIR	= (5/1F) =		2.9



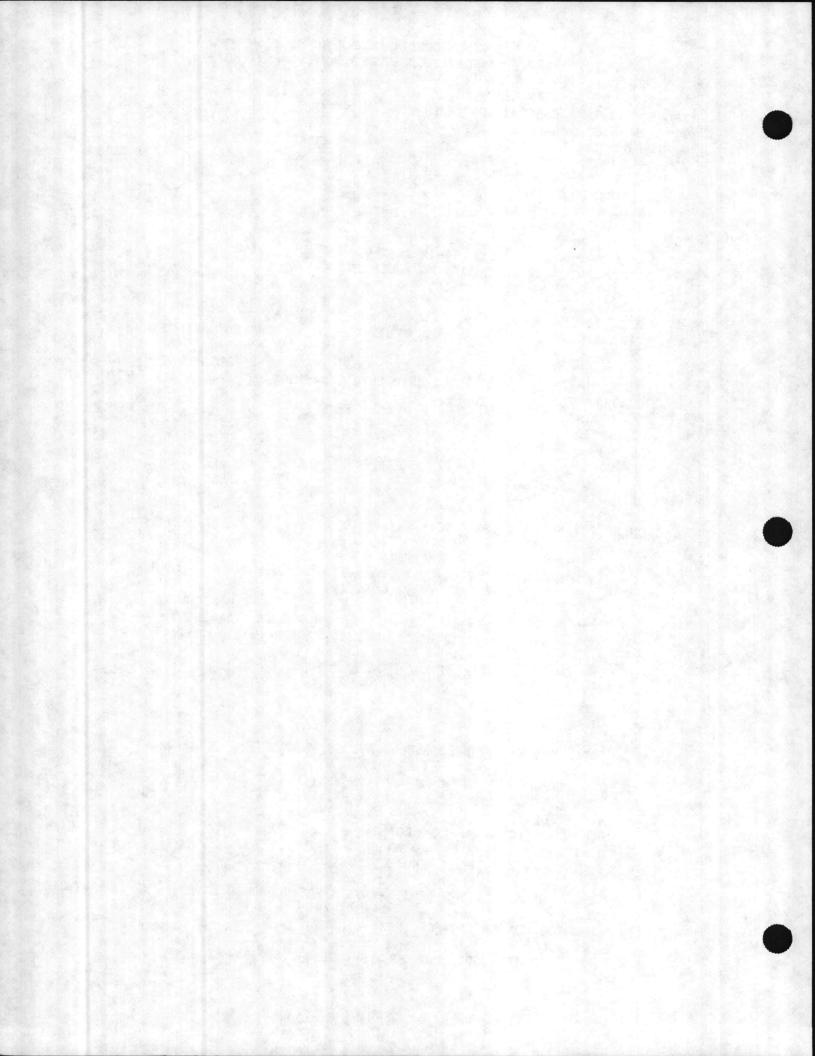
LIFE CYCLE COST ANALYSIS SUMMARY ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

LOCATION: PROJECT TITLE:	CAMP LEJEUNE COMBINED CONTROLS	PROJECT NO. FISCAL YEAR:		1988
PORTION NAME: REGION NUMBER: ANALYSIS DATE:	HADNOT POINT 4 JUNE 23 1987	ECONOMIC LIFE IN PREPARED BY:	YEARS: LO	15 SUNDE
1. INVESTMENT (A. CONSTRU B. SIOH	COST JCTION COST		\$	165,925 9,126
C. DESIGN	COST CREDIT CALC (1A+1B+1C)X. E VALUE OF EXISTING EQUIP	9 MENT		9,956 166,506 0
E. SALVAG	INVESTMENT (1D-1E)		\$	166,506

2. ENERGY SAVINGS (+) / (-)
ANALYSIS DATE ANNUAL SAVINGS, UNIT COST \$ DISCOUNTED SAVINGS

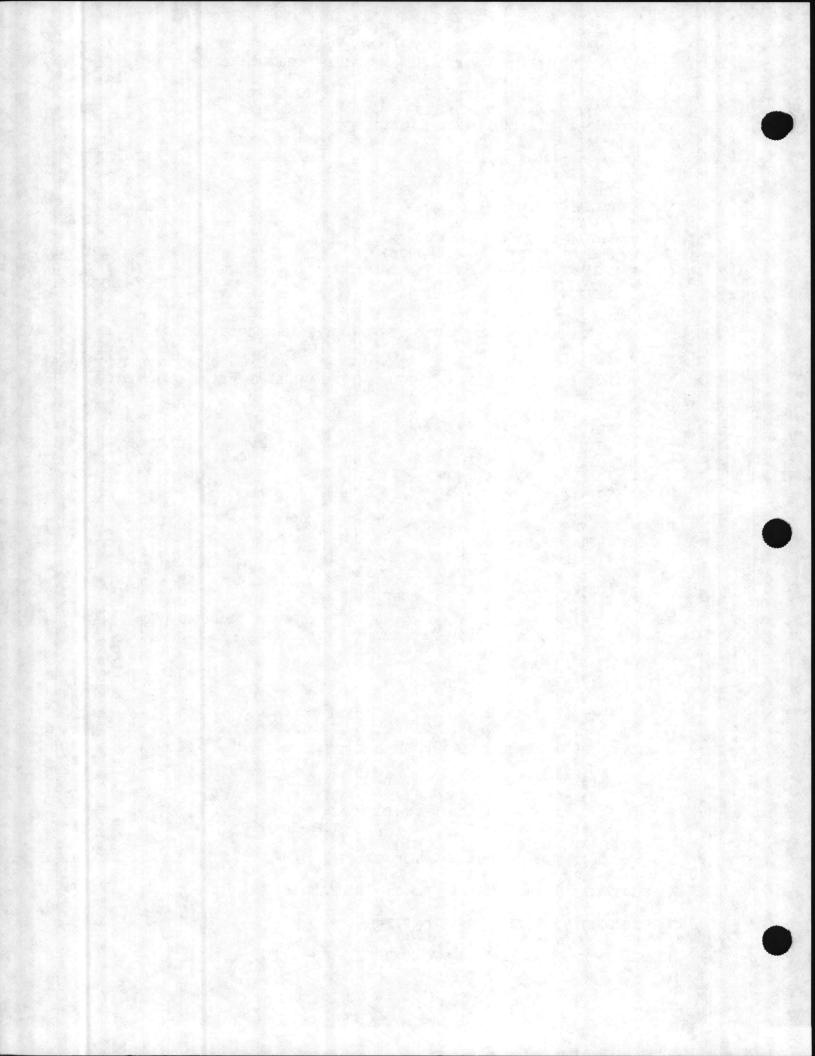
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	COST	SAVINGS		DISCOUNT	DISCOUNTED SAVINGS(5)
FUEL	\$/MBTU(1)	MBTU/YR(2)		FACTOR(4)	•
A. ELEC	8.15	U	•	0	0 0
B. DIST	0	0	0	0	0
C. RESID	0	0	0	0	0
D. NG	0	0		0	
E. COAL	2.23	21,888	48,810	10.18	496,884
F. TOTAL	\$	21,888	48,810		496,884
. NON ENERGY SA	VINGS (+) / CO	ST (-)		. 0	
A ANNUAL H	RECURRING $(+/-)$		\$	7.61	
(1) DIS(COUNT FACTOR (T	ABLE 1)		Constant of the Constant of th	
(2) DIS	COUNTED SAVING/ URRING SAVINGS	COST (JAXJAI)		; 0	
B. NON RECO	URKING SAVINGS	(+) / 0001 (DISCOUNTED	
	SAVING \$ (+)	VEAD OF	DISCOUNT	SAVINGS (+)	
ITEM	COST \$ (-)(1)	OCCURRENCE(2)	FACTOR (3)	COST(-)	(4)
	0	C) 1	0	
a.	0	() 1	0	
b.	0	() 1	0	
c. d. TOTAL	0			0	
A STATE OF A	ION ENERGY DISC	OUNTED SAVING	S(+),COST(-)	(3A2+3Bd4) 0
D. PROJECT	NON ENERGY QU X NON ENERGY C	ALLE (2F5 X .3	3)	\$	163,972
- TE 3	$rac{1}{1}$ TS = > 3C	GO TO ITEM 4			
a. IF	3D1 IS < 3C	CALC SIR -	(2F5+3D1)/1H	7	0
- TE S	2D1b TS = > 1	GO TO TIEM 4			
d. IF 3	SD1b IS < 1	PROJECT DOES	NOT QUALIFY	ľ	
4. FIRST YEAR					\$ 48,810
			The second second		\$ 496,884
	ISCOUNTED SAVIN				3.0
6. SIR (IF < 1	PROJECT DOES N	NOT QUALIFY) S	SIR = (5/1F)		5.0



LIFE CYCLE COST ANALYSIS SUMMARY ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

LOCATION.	CAMP LEJEUNE		PROJECT NO.		
	COMBINED CONTRO		FISCAL YEAR:		1988
	ALL CAMPS EXCEN		FIDORE ILAK		1,00
REGION NUMBER:		LI IMDIOI II.	ECONOMIC LI	FE IN YEARS:	15
	JUNE 23 1987		PREPARED BY		
MALIDIO DAIL.	00ME 25 1707			·	
1. INVESTMENT (COST				
	JCTION COST			\$	121,037
B. SIOH				-	6,657
C. DESIGN	COST				7,262
D. ENERGY	CREDIT CALC (1A-	+1B+1C)X.9			121,461
	E VALUE OF EXIST				0
F. TOTAL	INVESTMENT (1D-1)	E)		\$	121,461
2. ENERGY SAVIN	NGS (+) / (-)				
ANALYSIS 1	DATE ANNUAL SAVI	NGS, UNIT COST	r ș discount.	ED SAVINGS	
	COST	SAVINGS	ANNULAT C	DISCOUNT	DISCOUNTED
THIFT	\$/MBTU(1)				
	\$/MBIU(1) 8.15			0	
A. ELEC	0.13	0		0	Ő
B. DIST	the second states and the second states of the	0	0	0	
C. RESID	2.23	4 405	9,824	10 18	
D. COAL	2.23	4,405	17,110	10.18	174,179
E. COAL	2.91	5,880	17,110	10.10	1/4,1/5
F. TOTAL	\$	10,285	26,934		274,184
	SAVINGS (+) / CO				
	RECURRING (+/-)		\$		
	SCOUNT FACTOR (T			7.61	
	SCOUNTED SAVING/			170	
B. NON RE	CURRING SAVINGS	(+) / COSI (-		DISCOUNTED	
TTEM	SAVING \$ (+)	VEAD OF			
IIEM	COST \$ (-)(1)				4)
	0031 \$ (-)(1)	OCCORRENCE(2)	FROIDE (J)	0051(-) (+)
а.	0	0	1	0	
b.	0	0	1	0	
с.	0	0	1	0	
d. TOTAL	0			0	
C. TOTAL	NON ENERGY DISCO	UNTED SAVINGS	(+),COST(-)	(3A2+3Bd4)	170
				·	
	T NON ENERGY QUA			s	90,481
	AX NON ENERGY CA		,	Ŷ	90,401
	3D1 IS = > 3C		25-1011/15		0
D. IF	3D1 IS < 3C 3D1b IS = > 1	CALC SIR = (213+301)/11		U
	3D1b IS = > 1 3D1b IS < 1		NOT OUALIFY		
u. 11	5010 10 11		den den en e		
4. FIRST YEAR	DOLLAR SAVINGS [2F3+3A+(3B1d/	YRS ECONOMIC	LIFE)] \$	26,956
5 TOTAL NET D	ISCOUNTED SAVING	(2F5+3C)		\$	274,354
6. SIR (IF < 1	PROJECT DOES NO	T QUALIFY) SI	R = (5/1F) =		2.3



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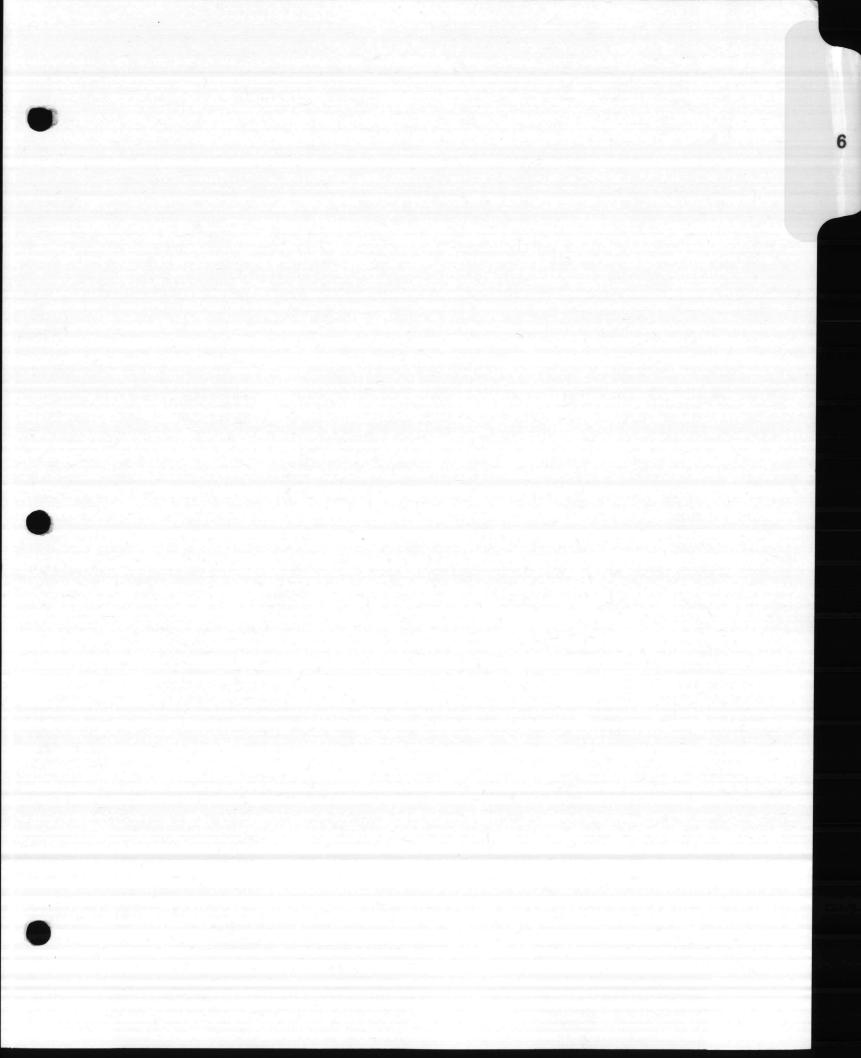
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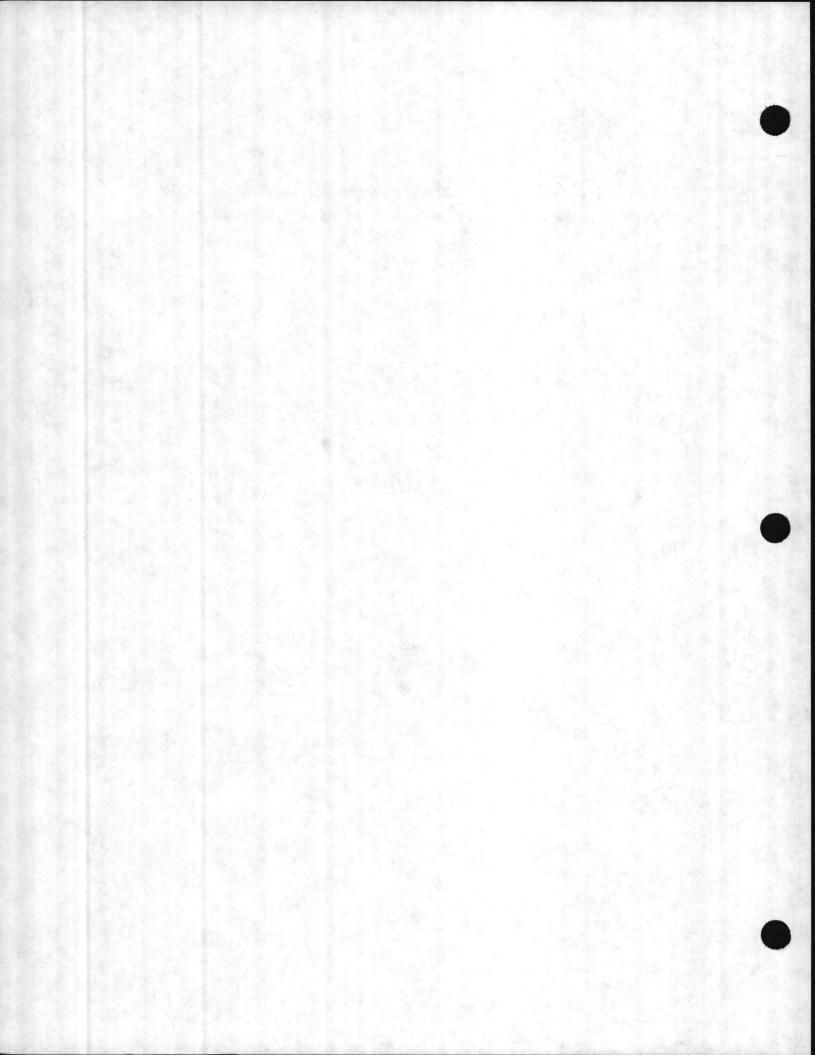




6.0 PRELIMINARY DD 1391 FOR RECOMMENDED PROJECT

6.1 INTRODUCTION

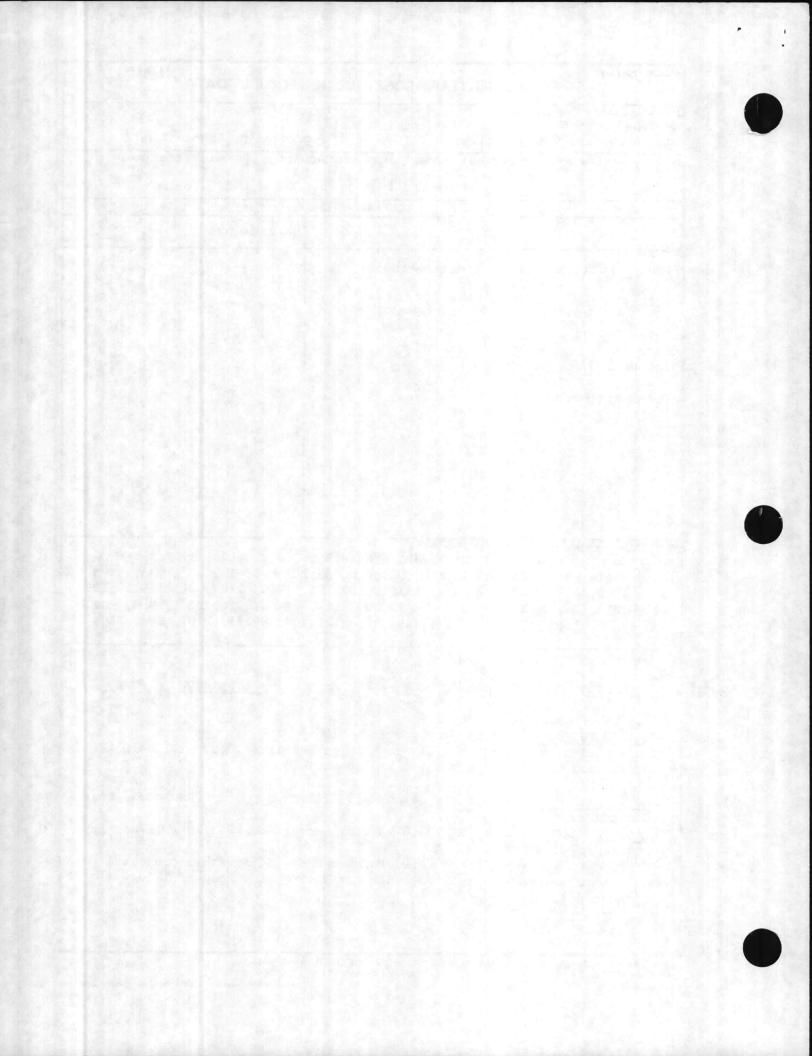
The first page of the DD1391's for the packages described in Section 5.2, "ECO packages" are presented in this Section.



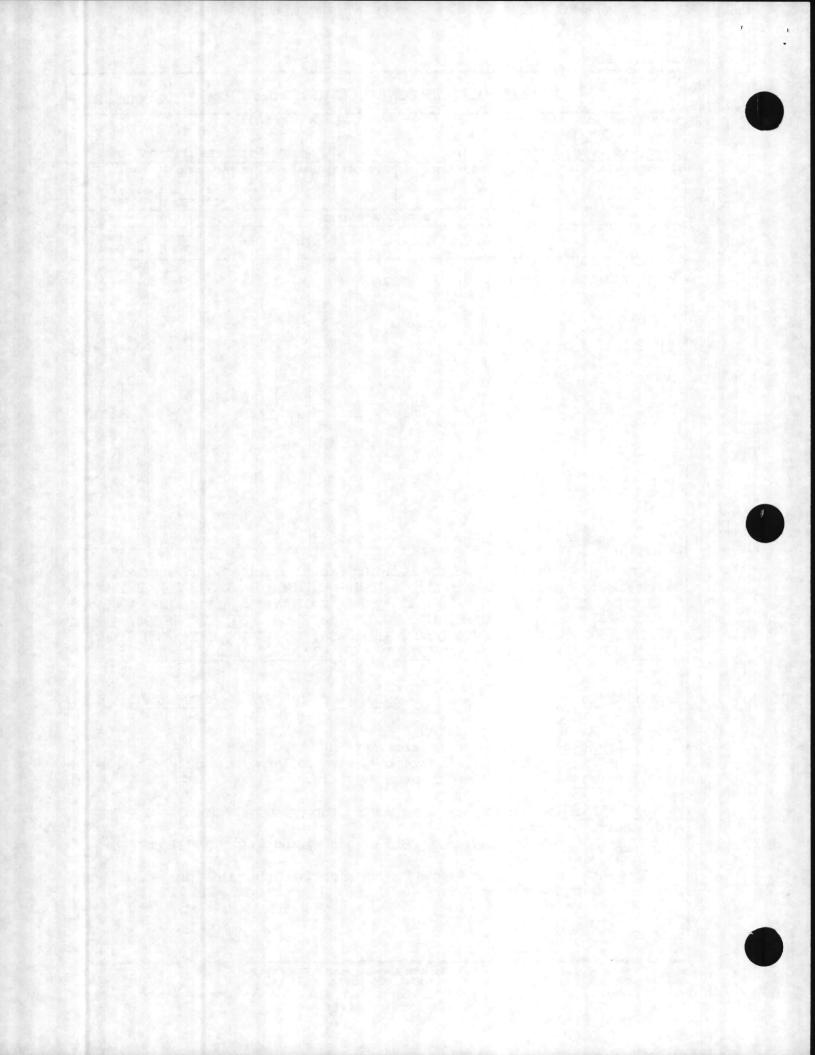
INSTALLATION AND L	OCATION		ROJECT	TITLE	12:	3 June 87
Marine Corps Bas						
Camp Lejeune, No	orth Carolina	Up	grade	Pipe Ins	difference and the second	
PROGRAM ELEMENT	6. CATEGORY CODE	7. PROJECT NU	MBER	8. PROJE	CT COST	(\$000)
	12 M			126.	76	
	9. COS	TESTIMATES		100		
-102	ITEM		U/M	QUANTITY	UNIT COST	COST (\$000)
Pipe Insulation	(Hadnot Point Packa	ge1)	L.S		-	113.684
SIOH (5.5%)						6.25
Total Funded Cos	st		·		2	119.93
Unfunded Cost (1	Design 6%)		1033	1. jt 4. j		6.82
Total Project Co	ost (FY87)					126.75
					377	
					1	1111
					10.0	
Upgrade pipe in Condensate Retu	OPOSED CONSTRUCTION sulation on the Buil rn System in the fol	lowing bui	ilding	s: 1220,	, 211,	3, 9, 30
Upgrade pipe in Condensate Retu 916, 1042, 1012 411. 1317. 10.	sulation on the Buil	lowing bui 01, 907, 25 304, 524,	ilding 5, 111 , HP40	s: 1220, 6, 1140, 5, 914, 1	, 211, 521, 1 1201, 9	3, 9, 30 011, 122 08, HP51
Upgrade pipe in Condensate Retu 916, 1042, 1012 411, 1317, 10, 236, 1006, 1103 and 909	sulation on the Buil rn System in the fol , 221, 325, 322, 110 1015, 67, 4, 50, 12, , 8, 1310, 117, 1400	lowing bui 01, 907, 25 304, 524, 0, 6, 317,	ilding 5, 111 , HP40 400,	s: 1220, 6, 1140, 5, 914, 1	, 211, 521, 1 1201, 9 707, 58	3, 9, 30 011, 122 08, HP51
Upgrade pipe in Condensate Retu 916, 1042, 1012 411, 1317, 10, 236, 1006, 1103 and 909 11. <u>REQUIREMENT</u> <u>PROJECT: Upgra</u> <u>SPECIFIC PURPOS</u> REQUIREMENT: T	sulation on the Buil rn System in the fol , 221, 325, 322, 110 1015, 67, 4, 50, 12, , 8, 1310, 117, 1400	lowing but 01, 907, 25 304, 524, 0, 6, 317, N/A onsumption t only save	ilding 5, 111 , HP40 400,	s: 1220, 6, 1140, 5, 914, 1 HP215, 17 SUBSTANDA	, 211, 521, 1 1201, 9 707, S8	3, 9, 30 011, 122 08, HP51 6, 540, N/A
Upgrade pipe in Condensate Retu 916, 1042, 1012 411, 1317, 10, 236, 1006, 1103 and 909 11. <u>REQUIREMENT</u> <u>PROJECT: Upgra SPECIFIC PURPOS</u> <u>REQUIREMENT: T</u> installation ob <u>CURRENT SITUATI</u> and condensate <u>IMPACT IF NOT F</u>	Sulation on the Builrn System in the fol, 221, 325, 322, 1101015, 67, 4, 50, 12,, 8, 1310, 117, 1400N/AADEQUATEide pipe insulationE:Reduce energy coThis project will nototain its scheduled eION:Energy is beinglines.PROVIDED:29,133.8 M	lowing but ol, 907, 25 304, 524, o, 6, 317, N/A onsumption t only save energy goal g wasted th	e doll hrough	s: 1220, 6, 1140, 5, 914, J HP215, 17 SUBSTANDA Cars, but	, 211, 521, 1 1201, 9 707, S8 ARD will h	3, 9, 30 011, 122 08, HP51 6, 540, N/A melp this
Upgrade pipe in Condensate Retu 916, 1042, 1012 411, 1317, 10, 236, 1006, 1103 and 909 11. <u>REQUIREMENT</u> <u>PROJECT</u> : Upgra <u>SPECIFIC PURPOS</u> <u>REQUIREMENT</u> : T installation ob <u>CURRENT SITUATI</u> and condensate <u>IMPACT IF NOT F</u> to be wasted ea ADDITIONAL: AT	Sulation on the Builrn System in the fol, 221, 325, 322, 1101015, 67, 4, 50, 12,, 8, 1310, 117, 1400N/AADEQUATEide pipe insulationE:Reduce energy coThis project will nototain its scheduled eION:Energy is beinglines.PROVIDED:29,133.8 M	lowing bui lowing bui 304, 524, b, 6, 317, N/A N/A onsumption t only save energy goal g wasted the MBtu of energy has been pro-	e doll hrough ergy a	s: 1220, 6, 1140, 5, 914, J HP215, 17 SUBSTANDA ars, but poorly : and \$64,90 ed for th:	, 211, 521, 1 1201, 9 707, S8 ARD will h insulat 58 will is proj	3, 9, 30 011, 122 08, HP51 6, 540, N/A help this hed steam continu

D1 DEC 76 1391 S/N 0102-LF 401-3010

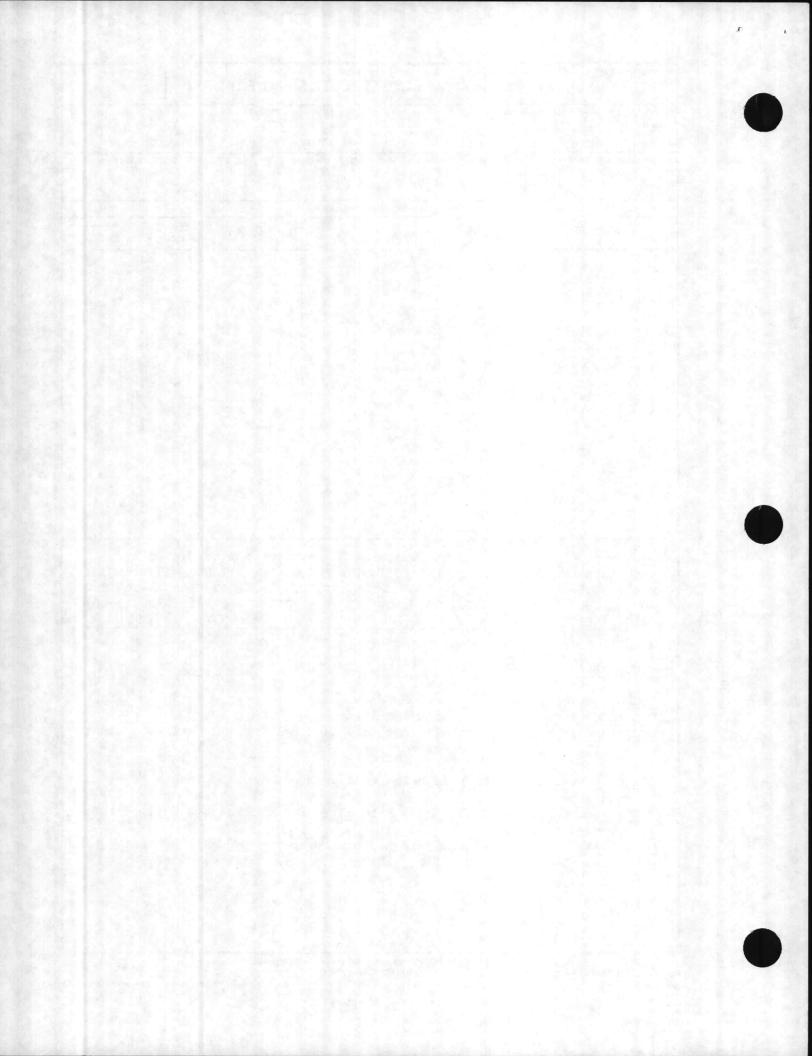
No OTH 87



3. INSTALLATION AND L			4. PROJE	CT TI	TLE		June 87
Marine Corps Ba							
Camp Lejeune, No. PROGRAM ELEMENT	e. CATEGORY CODE				Pipe Ins		
PROGRAM ELEMENT	6. CATEGORY CODE	7. PROJEC	TNUMBE	R	B. PROJE	CT COST	(\$000)
					1 11	6.32	
	9. C	OST ESTIMA	TES				
	ITEM		U/I	4 0	UANTITY	UNIT	COST (\$000)
Pipe Insulation	(Hadnot Point Pack	age 2)	L.S	•	1	-	104.321
SIOH (5.5%)							5.738
Total Funded Cos					Plan.		110.059
Unfunded Cost (D							6.259
Total Project Co	st (FY87)						116.318
			Section of	100			P. Bala West
Upgrade pipe in	nsulation on the B	uilding S	Steam D	ist	ribution	n Syste	m and
Upgrade pipe in Condensate Retu 219, 13, 420, 9 902, 226, 41, 5	nsulation on the B urn System in the 915, 203, HP127, 1 508, 419, S96, 1212	following 14, 1106, , 206, 11	g build, 205, 118, 14	ing: 17, 09.	s: 1450 65, 140 900, 10), 314,)7, 127)7, HP1	HP165, , 106, 95.
Upgrade pipe in Condensate Retu 219, 13, 420, 9 902, 226, 41, 9 HP185, 509, 112	nsulation on the B urn System in the 915, 203, HP127, 1	following 14, 1106 , 206, 11 , 1111, 4	g build , 205, 118, 14 408, 12	ing: 17, 09, 3, 1	s: 1450 65, 140 900, 10 1770, HI), 314,)7, 127)7, HP1)57, 12	HP165, , 106, 95.
Upgrade pipe in Condensate Retu 219, 13, 420, 9 902, 226, 41, 9 HP185, 509, 112 214, 326, 315, 1.	nsulation on the B urn System in the 915, 203, HP127, 1 508, 419, S96, 1212 20, 526, 1750, 520 424, HP560, HP175	following 14, 1106 , 206, 11 , 1111, 4 , 19, 60,	g build , 205, 118, 14 408, 12 , 422,	ing: 17, 09, 3, 1 1207	s: 1450 65, 140 900, 10 1770, HI 7, and 9), 314,)7, 127)7, HP1)7, 12)57, 12	HP165, , 106, 95, 5, 1115,
Condensate Retu 219, 13, 420, 9 902, 226, 41, 9 HP185, 509, 112 214, 326, 315, 1. REQUIREMENT	nsulation on the B urn System in the 915, 203, HP127, 1 508, 419, S96, 1212 20, 526, 1750, 520 424, HP560, HP175 N/A	following 14, 1106 , 206, 11 , 1111, 4	g build , 205, 118, 14 408, 12 , 422,	ing: 17, 09, 3, 1 1207	s: 1450 65, 140 900, 10 1770, HI 7, and 9), 314,)7, 127)7, HP1)57, 12	HP165, , 106, 95, 5, 1115,
Upgrade pipe in Condensate Retu 219, 13, 420, 9 902, 226, 41, 8 HP185, 509, 112 214, 326, 315, 1. <u>REQUIREMENT</u> PROJECT: Upgrade	nsulation on the B urn System in the 915, 203, HP127, 1 508, 419, S96, 1212 20, 526, 1750, 520 424, HP560, HP175 N/A e pipe insulation	following 14, 1106 , 206, 11 , 1111, 4 , 19, 60,	g build , 205, 118, 14 408, 12 , 422,	ing: 17, 09, 3, 1 1207	s: 1450 65, 140 900, 10 1770, HI 7, and 9), 314,)7, 127)7, HP1)7, 12)57, 12	HP165, , 106, 95, 5, 1115,
Upgrade pipe in Condensate Retu 219, 13, 420, 9 902, 226, 41, 9 HP185, 509, 112 214, 326, 315, 1. REQUIREMENT PROJECT: Upgrade SPECIFIC PURPOSE	nsulation on the B urn System in the 915, 203, HP127, 1 508, 419, S96, 1212 20, 526, 1750, 520 424, HP560, HP175 N/A e pipe insulation : Reduce energy c	following 14, 1106 , 206, 11 , 1111, 4 , 19, 60 ADEQUATH	g build , 205, 118, 14 408, 12 , 422, 5 5	ing: 17, 09, 3, 1207	s: 1450 65, 140 900, 10 1770, HI 7, and 9 /A <u>St</u>), 314,)7, 127)7, HP1 >57, 12 910	HP165, , 106, 95, 5, 1115, ARD N/A
Upgrade pipe in Condensate Retu 219, 13, 420, 9 902, 226, 41, 9 HP185, 509, 112 214, 326, 315, 1. REQUIREMENT PROJECT: Upgrade SPECIFIC PURPOSE REQUIREMENT: The	nsulation on the B urn System in the 915, 203, HP127, 1 508, 419, S96, 1212 20, 526, 1750, 520 424, HP560, HP175 N/A e pipe insulation : Reduce energy c is project will no	following 14, 1106, 11 , 206, 11 , 1111, 4 , 19, 60, ADEQUATH onsumption t only sa	g build , 205, 118, 14 408, 12 , 422, E	ing: 17, 09, 3, 1207	s: 1450 65, 140 900, 10 1770, HI 7, and 9 /A <u>St</u>), 314,)7, 127)7, HP1 >57, 12 910	HP165, , 106, 95, 5, 1115, ARD N/A
Upgrade pipe in Condensate Retu 219, 13, 420, 9 902, 226, 41, 9 10, 12 214, 326, 315, 1. REQUIREMENT PROJECT: Upgrade SPECIFIC PURPOSE REQUIREMENT: The installation obta	nsulation on the B urn System in the 915, 203, HP127, 1 508, 419, S96, 1212 20, 526, 1750, 520 424, HP560, HP175 N/A e pipe insulation : Reduce energy c is project will no ain its scheduled of	following 14, 1106 , 206, 11 , 1111, 4 , 19, 60, ADEQUATE onsumption t only same energy go	g build , 205, 118, 14 408, 12 , 422, 5 5 5 5 6 7 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8	ing: 17, 09, 3, 1207 N.	s: 1450 65, 140 900, 10 1770, HH 7, and 9 /A <u>St</u> s, but v), 314,)7, 127)7, HP1 >57, 12)10 JBSTAND	HP165, , 106, 95, 5, 1115, ARD N/A
Upgrade pipe in Condensate Retu 219, 13, 420, 9 902, 226, 41, 9 10, 12 214, 326, 315, 1. REQUIREMENT PROJECT: Upgrade SPECIFIC PURPOSE: REQUIREMENT: The installation obta	nsulation on the B urn System in the 915, 203, HP127, 1 508, 419, S96, 1212 20, 526, 1750, 520 424, HP560, HP175 N/A e pipe insulation : Reduce energy c is project will no ain its scheduled on N: Energy is being	following 14, 1106 , 206, 11 , 1111, 4 , 19, 60, ADEQUATE onsumption t only same energy go	g build , 205, 118, 14 408, 12 , 422, 5 5 5 5 6 7 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8	ing: 17, 09, 3, 1207 N.	s: 1450 65, 140 900, 10 1770, HH 7, and 9 /A <u>St</u> s, but v), 314,)7, 127)7, HP1 >57, 12)10 JBSTAND	HP165, , 106, 95, 5, 1115, ARD N/A
Upgrade pipe in Condensate Retu 219, 13, 420, 9 902, 226, 41, 9 10, 12 214, 326, 315, 1. REQUIREMENT PROJECT: Upgrade SPECIFIC PURPOSE REQUIREMENT: The installation obta	nsulation on the B urn System in the 915, 203, HP127, 1 508, 419, S96, 1212 20, 526, 1750, 520 424, HP560, HP175 N/A e pipe insulation : Reduce energy c is project will no ain its scheduled N: Energy is being ines.	following 14, 1106, 206, 11, 1111, 4, 19, 60, ADEQUATH ONSUMPTION t only sa energy go g wasted	g build , 205, 118, 14 408, 12 , 422, 5 5 5 5 6 7 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8	ings 17, 09, 3, 1207 N/ N/	s: 1450 65, 140 900, 10 1770, HI 7, and 9 /A <u>St</u> s, but w), 314,)7, 127)7, HP1 >57, 12 010 /////////////////////////////////	HP165, , 106, 95, 5, 1115, ARD N/A lp this d steam
Upgrade pipe in Condensate Retu 219, 13, 420, 9 902, 226, 41, 3 HP185, 509, 112 214, 326, 315, 1. <u>REQUIREMENT</u> PROJECT: Upgrade SPECIFIC PURPOSE REQUIREMENT: The installation obta CURRENT SITUATION and condensate 12 IMPACT IF NOT PRO	N/A Pipe insulation on the B N/A N/A N/A E pipe insulation Reduce energy c ain its scheduled N: Energy is being ines. NIDED: 21,655.2	following 14, 1106, 206, 11, 1111, 4, 19, 60, ADEQUATH ONSUMPTION t only sa energy go g wasted	g build , 205, 118, 14 408, 12 , 422, 5 5 5 5 6 7 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8	ings 17, 09, 3, 1207 N/ N/	s: 1450 65, 140 900, 10 1770, HI 7, and 9 /A <u>St</u> s, but w), 314,)7, 127)7, HP1 >57, 12 010 /////////////////////////////////	HP165, , 106, 95, 5, 1115, ARD N/A lp this d steam
Upgrade pipe in Condensate Retu 219, 13, 420, 9 902, 226, 41, 9 HP185, 509, 112 214, 326, 315, 1. REQUIREMENT PROJECT: Upgrade SPECIFIC PURPOSE: REQUIREMENT: The installation obta CURRENT SITUATION and condensate in IMPACT IF NOT PRO to be wasted each ADDITIONAL: An each	N/A N/A Pipe insulation N/A N/A N/A N/A N/A N/A N/A N/A	following 14, 1106 , 206, 11 , 1111, 4 , 19, 60, <u>ADEQUATE</u> onsumption t only sate energy goog wasted Btu of er has been	g build , 205, 118, 14 408, 12 , 422, E on ave dol bals. through hergy an prepare	ings 17, 09, 3, 120 N N lars h pc ad 1	s: 1450 65, 140 900, 10 1770, HH 7, and 9 /A <u>SU</u> s, but w porly in 48,291 for this), 314,)7, 127)7, HP1)57, 12)10 ///////////////////////////////////	HP165, , 106, 95, 5, 1115, ARD N/A lp this d steam ontinue ct.
Upgrade pipe in Condensate Retu 219, 13, 420, 9 902, 226, 41, 9 HP185, 509, 112 214, 326, 315, 1. REQUIREMENT PROJECT: Upgrade SPECIFIC PURPOSE: REQUIREMENT: The installation obta CURRENT SITUATION and condensate in IMPACT IF NOT PRO to be wasted each ADDITIONAL: An each	N/A Pipe insulation N/A N/A N/A N/A N/A N/A N/A N/A	following 14, 1106 , 206, 11 , 1111, 4 , 19, 60, <u>ADEQUATE</u> onsumption t only sate energy goog wasted Btu of er has been	g build , 205, 118, 14 408, 12 , 422, E on ave dol bals. through hergy an prepare	ings 17, 09, 3, 120 N N lars h pc ad 1	s: 1450 65, 140 900, 10 1770, HH 7, and 9 /A <u>SU</u> s, but w porly in 48,291 for this), 314,)7, 127)7, HP1)57, 12)10 ///////////////////////////////////	HP165, , 106, 95, 5, 1115, ARD N/A lp this d steam ontinue ct.

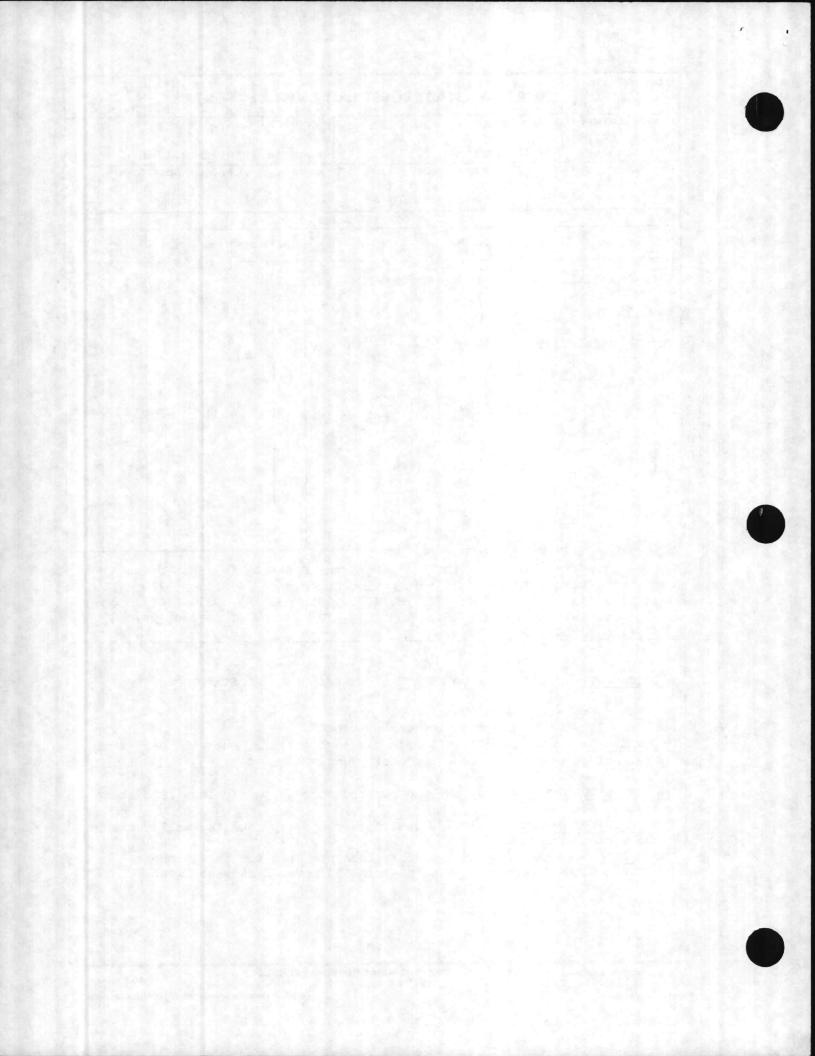


. INSTALLATION A		ATION		4. PROJECT	TITLE		
Marine Corps			Sec. Sec.	S. Course			
Camp Lejeune	, Nort	th Carolina		Upgrade	e Pipe Ins	ulation	נ
. PROGRAM ELEME	ENT	6. CATEGORY CODE	7. PROJEC	TNUMBER	8. PROJE	CT COST	(\$000)
			94				
					11	4.80	dined in
		9. 0	OST ESTIMAT	TES			1.0.0
the first of		ITEM		U/M	QUANTITY	COST	COST (\$000)
Pipe Insulat	ion (H	Hadnot Point Pac	kage 3)	L.S			102.95
SIOH (5.5%)							5.66
Total Funded	Cost			•		1.4	108.62
Unfunded Cos	t (Des	sign 6%)					6.17
Total Projec	t Cost	t (FY87)				14	114.80
				•			
							1.1
Upgrade pipe Condensate R	insu. eturn	SED CONSTRUCTION lation on the Bu System in the f	ollowing	building	gs: 1404	417,	1100, 1
Upgrade pipe Condensate R HP145, 1005, 1403, 1208, 20,501, HP15 11. <u>REQUIREMENT</u> <u>PROJECT</u> : Up <u>SPECIFIC PUR</u> <u>REQUIREMENT</u> : installation <u>CURRENT SITU</u> and condensa	eturn HP13 320, 5, 16 0 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	lation on the Bu System in the f 5, 63, 111, 119, 323, 217, 898, 1 10, and 2. N/A AD pipe insulation Reduce energy s project will n in its scheduled : Energy is bei	ollowing HP550, H 309, 102, EQUATE consumpti ot only s energy g ng wasted	building HP170, 31 H1, 110 N/A N/A ton save dol: goals.	gs: 1404 16, 1611, 05, 751, 4 <u>SUBST7</u> lars, but	4, 417, 1209, 4 112, 300 ANDARD will ha	1100, 14 416, 110 8, 1606, N/A elp this ed steam



3. INSTALLATION AND LO Marine Corps Base		UNSTRUCTIO	ON PR	OJECT DA	TA	DATE 3 June 87
Marine Corps Base		4.1	ROJECT	TITLE	12	5 June 87
이 이 이 이 이 것 같은 것 같은 것 같은 것 같은 것 같은 것 						
Camp Lejeune, Nor		U	pgrad	e Pipe In	sulation	on
. PROGRAM ELEMENT	6. CATEGORY CODE	7. PROJECT N	UMBER	8. PROJ	ECT COST	(\$000)
	•					
	-	DET ESTIMATES	1.11	1 11	4.99	Section Section
		USI COTMATES	1		1	T
	ITEM		U/M	QUANTITY	COST	COST (\$000)
Pipe Insulation (Hadnot Point Packa	age 4)	L.S	1	-	103.129
SIOH (5.5%)					1.1	5.672
Total Funded Cost					1	108.801
Unfunded Cost (De	sign 6%)				14	6.188
Total Project Cos	+ (5207)		100			
iotal Project tos	(FY87)		•			114.989
101, 312, 233, 13 1780, 516, HP140,	System in the fol 01, S1210, 327, 18 318, 216, 54, 213	3, 423, 175	5, 403	, 59, 32	1, 1104	1, 1340.
	302, and 225.					
1.						
1. REQUIREMENT	N/A ADEQUATE	<u> </u>		SUBSTAN	DARD	N/A
l. REQUIREMENT PROJECT: Upgrade	pipe insulation			SUBSTAN	DARD	N/A
l. REQUIREMENT PROJECT: Upgrade SPECIFIC PURPOSE:	pipe insulation Reduce energy co	onsumption			j.	
1. REQUIREMENT PROJECT: Upgrade SPECIFIC PURPOSE: REQUIREMENT: This	pipe insulation	onsumption only save	dolla		j.	
1. REQUIREMENT PROJECT: Upgrade SPECIFIC PURPOSE: REQUIREMENT: This installation obta: CURRENT SITUATION	pipe insulation Reduce energy co s project will not in its scheduled e : Energy is being	onsumption only save energy goals	dolla s.	urs, but u	will he	elp this
1. REQUIREMENT PROJECT: Upgrade SPECIFIC PURPOSE: REQUIREMENT: This installation obta:	pipe insulation Reduce energy co s project will not in its scheduled e : Energy is being nes. VIDED: 19,795.5 M	onsumption only save energy goals	dolla s. rough	poorly in	will he	elp this ed steam
1. <u>REQUIREMENT</u> <u>PROJECT</u> : Upgrade <u>SPECIFIC PURPOSE</u> : <u>REQUIREMENT</u> : This installation obta: <u>CURRENT SITUATION</u> and condensate lin <u>IMPACT IF NOT PROV</u> to be wasted each <u>ADDITIONAL</u> : An eco	pipe insulation Reduce energy co s project will not in its scheduled e : Energy is being nes. VIDED: 19,795.5 M	onsumption only save energy goals wasted the Btu of energy as been press	dolla s. rough rgy an	poorly in d \$44,144	will he nsulate 4 will 5 proje	elp this ed steam continue ect.
1. <u>REQUIREMENT</u> <u>PROJECT</u> : Upgrade <u>SPECIFIC PURPOSE</u> : <u>REQUIREMENT</u> : This installation obta: <u>CURRENT SITUATION</u> and condensate lin <u>IMPACT IF NOT PROV</u> to be wasted each <u>ADDITIONAL</u> : An eco	pipe insulation Reduce energy co s project will not in its scheduled e : Energy is being nes. <u>VIDED</u> : 19,795.5 M year. conomic analysis h	onsumption only save energy goals wasted the Btu of energy as been press	dolla s. rough rgy an	poorly in d \$44,144	will he nsulate 4 will 5 proje	elp this ed steam continue ect.
1. <u>REQUIREMENT</u> <u>PROJECT</u> : Upgrade <u>SPECIFIC PURPOSE</u> : <u>REQUIREMENT</u> : This installation obta: <u>CURRENT SITUATION</u> and condensate lin <u>IMPACT IF NOT PROV</u> to be wasted each <u>ADDITIONAL</u> : An eco	pipe insulation Reduce energy co s project will not in its scheduled e : Energy is being nes. <u>VIDED</u> : 19,795.5 M year. conomic analysis h	onsumption only save energy goals wasted the Btu of energy as been press	dolla s. rough rgy an	poorly in d \$44,144	will he nsulate 4 will 5 proje	elp this ed steam continue ect.

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INSTALLATION AND L	OCATION	14	PROJEC	T. T. T. I		12	23 June 8
Marine Corps Ba		1.	ROJEC				
Camp Lejeune, N		Ur	grade	Pipe	Insi	latior	3
PROGRAM ELEMENT	6. CATEGORY CODE	7. PROJECT N	-	-		CT COST	
				<			
		a start and			91.4	11	
Contraction of the	9. C	OST ESTIMATES					
1989 <u>-</u>	ITEM		U/M	QUAP	TITY	UNIT	COST (\$000)
Pipe Insulation	(Hadnot Point Pac	kage 5)	L.	s	ne anije Vroje	-	81.978
SIOH (5.5%)							4.50
Total Funded Co	st.'				汉市		86.48
Unfunded Cost (4.91
Total Project Co	ost (FY87)						91.40
		and an and a state.	1	1.1		1.00	198. 1. 1
							1 (A)
						K	
							- 433
Upgrade pipe in:	POSED CONSTRUCTION sulation on the Bu						
Upgrade pipe in: Condensate Retu: 1607, 518, 1202 HP265, HP295, 30	sulation on the Bu: rn System in the fo , 223, HP275, 1, 90 00, HP105, 39, HP20	ollowing bu 05, 500, 43 67, 115, 13	ildin , 401	gs: , HP2	1200, 85, 1	. HP301 16, 150	l, 1114, 00, HP255
Upgrade pipe in: Condensate Retu: 1607, 518, 1202 HP265, HP295, 30 1316, HP125, 160	sulation on the Bu rn System in the fo , 223, HP275, 1, 90	ollowing bu 05, 500, 43 67, 115, 13	ildin , 401	gs: , HP2	1200, 85, 1	. HP301 16, 150	l, 1114, 00, HP255
Upgrade pipe in: Condensate Retu: 1607, 518, 1202 HP265, HP295, 30 1316, HP125, 160	sulation on the Bu rn System in the fo , 223, HP275, 1, 90 00, HP105, 39, HP20 01, 66, 1706, 527,	bllowing bu 05, 500, 43 67, 115, 13 and 901.,	ildin , 401 00, 1	gs: , HP2 302,	1200, 85, 1 425,	. HP301 16, 150 HP115,	l, 1114, 00, HP255 201, 100
Upgrade pipe in: Condensate Retu: 1607, 518, 1202 HP265, HP295, 30 1316, HP125, 160	sulation on the Bu: rn System in the fo , 223, HP275, 1, 90 00, HP105, 39, HP20	ollowing bu 05, 500, 43 67, 115, 13 and 901.,	ildin , 401 00, 1	gs: , HP2 302,	1200, 85, 1	. HP301 16, 150 HP115,	l, 1114, 00, HP255
Upgrade pipe in: Condensate Retu: 1607, 518, 1202 HP265, HP295, 30 1316, HP125, 160	sulation on the Built rn System in the for , 223, HP275, 1, 90 00, HP105, 39, HP20 01, 66, 1706, 527, N/A ADEQUATE	bllowing bu 05, 500, 43 67, 115, 13 and 901 E N/	ildin , 401 00, 1	gs: , HP2 302,	1200, 85, 1 425,	. HP301 16, 150 HP115,	l, 1114, 00, HP255 201, 1003
Upgrade pipe in: Condensate Retu: 1607, 518, 1202 HP265, HP295, 30 1316, HP125, 160 L1. <u>REQUIREMENT</u> <u>PROJECT</u> : Upgrad	Sulation on the Builtrn System in the for, 223, HP275, 1, 9000, HP105, 39, HP2001, 66, 1706, 527,N/AADEQUATEde pipe insulation	bllowing bu 05, 500, 43 67, 115, 13 and 901 E N/	ildin , 401 00, 1	gs: , HP2 302,	1200, 85, 1 425,	. HP301 16, 150 HP115,	l, 1114, 00, HP255 201, 100
Upgrade pipe in: Condensate Retu: 1607, 518, 1202 HP265, HP295, 34 1316, HP125, 164 L1. <u>REQUIREMENT</u> <u>PROJECT</u> : Upgrad SPECIFIC PURPOSI	sulation on the Bui rn System in the fo , 223, HP275, 1, 90 00, HP105, 39, HP20 01, 66, 1706, 527, N/A <u>ADEQUATH</u> de pipe insulation E: Reduce energy of	bllowing bu 05, 500, 43 67, 115, 13 and 901 E N/ consumption	ildin , 401 00, 1	gs: , HP2 302, <u>SUB</u>	1200, 85, 1 425, STANE	, HP301 16, 150 HP115, DARD	N/A
Upgrade pipe in: Condensate Retu: 1607, 518, 1202 HP265, HP295, 30 1316, HP125, 160 L1. REQUIREMENT PROJECT: Upgrad SPECIFIC PURPOSE REQUIREMENT: T	Sulation on the Builtrn System in the for, 223, HP275, 1, 9000, HP105, 39, HP2001, 66, 1706, 527,N/AADEQUATEde pipe insulation	consumption blowing bu 5, 500, 43 57, 115, 13 and 901., N/	ildin , 401 00, 1 A	gs: , HP2 302, <u>SUB</u>	1200, 85, 1 425, STANE	, HP301 16, 150 HP115, DARD	N/A
Upgrade pipe in: Condensate Retu: 1607, 518, 1202 HP265, HP295, 30 1316, HP125, 160 L1. <u>REQUIREMENT</u> <u>PROJECT: Upgrad SPECIFIC PURPOSI REQUIREMENT: THE installation obt</u>	Sulation on the Builtrn System in the for, 223, HP275, 1, 9000, HP105, 39, HP2001, 66, 1706, 527,N/AADEQUATIONde pipe insulationE: Reduce energy ofhis project will nottain its scheduled	billowing bu 05, 500, 43 67, 115, 13 and 901 E N/ consumption of only sav energy goa	ildin , 401 00, 1 A A e dol. ls.	gs: , HP2 302, <u>SUB</u> lars,	1200, 85, 1 425, STANE	, HP301 16, 150 HP115, DARD will h	N/A N/A
Upgrade pipe in: Condensate Retu: 1607, 518, 1202 HP265, HP295, 30 1316, HP125, 160 L1. <u>REQUIREMENT</u> <u>PROJECT</u> : Upgrad <u>SPECIFIC PURPOS</u> <u>REQUIREMENT</u> : TH installation ob <u>CURRENT SITUATIO</u>	Sulation on the Builtrn System in the for, 223, HP275, 1, 9000, HP105, 39, HP2001, 66, 1706, 527,N/AADEQUATEde pipe insulationE: Reduce energy ofhis project will notain its scheduledON: Energy is bein	billowing bu 05, 500, 43 67, 115, 13 and 901 E N/ consumption of only sav energy goa	ildin , 401 00, 1 A A e dol. ls.	gs: , HP2 302, <u>SUB</u> lars,	1200, 85, 1 425, STANE	, HP301 16, 150 HP115, DARD will h	N/A N/A
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Upgrade pipe in: Condensate Retu: 1607, 518, 1202 HP265, HP295, 30 1316, HP125, 160 L1. <u>REQUIREMENT</u> <u>PROJECT</u> : Upgrad <u>SPECIFIC PURPOSE</u> <u>REQUIREMENT</u> : The installation ob <u>CURRENT SITUATION</u> and condensate in <u>IMPACT IF NOT PE</u> to be wasted each <u>ADDITIONAL</u> : An	Sulation on the Builtrn System in the for, 223, HP275, 1, 9000, HP105, 39, HP2001, 66, 1706, 527,N/AADEQUATIONde pipe insulationE: Reduce energy ofhis project will nottain its scheduledON: Energy is beinlines.ROVIDED: 13,928.9ch year.economic analysis	bilowing bu 05, 500, 43 67, 115, 13 and 901 E N/ Consumption of only sav energy goa ng wasted t MBtu of en has been p	ildin , 401 00, 1 A A e dol ls. hrougi ergy a repar	gs: , HP2 302, <u>SUB</u> lars, h poo and \$ ed fo	1200, 85, 1 425, STANE but rly i 31,06 or thi	will h	N/A N/A N/A N/A nelp this ced steam continue
Upgrade pipe in: Condensate Retu: 1607, 518, 1202 HP265, HP295, 30 1316, HP125, 160 L1. <u>REQUIREMENT</u> <u>PROJECT</u> : Upgrad <u>SPECIFIC PURPOSE</u> <u>REQUIREMENT</u> : The installation ob <u>CURRENT SITUATION</u> and condensate in <u>IMPACT IF NOT PE</u> to be wasted each <u>ADDITIONAL</u> : An	Sulation on the Builtrn System in the for, 223, HP275, 1, 9000, HP105, 39, HP2001, 66, 1706, 527,N/AADEQUATIONde pipe insulationE: Reduce energy ofhis project will nottain its scheduledON: Energy is beinlines.ROVIDED: 13,928.9ch year.economic analysis	bilowing bu 05, 500, 43 67, 115, 13 and 901 E N/ Consumption of only sav energy goa ng wasted t MBtu of en has been p	ildin , 401 00, 1 A A e dol ls. hrougi ergy a repar	gs: , HP2 302, <u>SUB</u> lars, h poo and \$ ed fo	1200, 85, 1 425, STANE but rly i 31,06 or thi	will h	N/A N/A continue ject.

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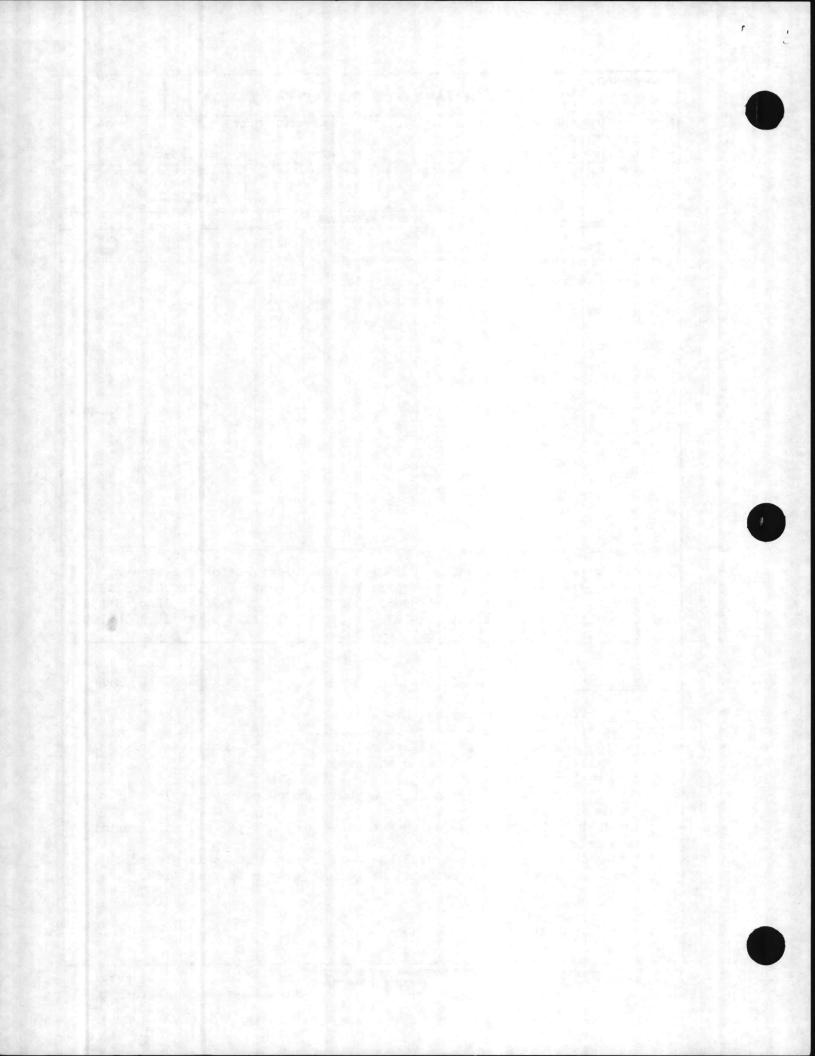
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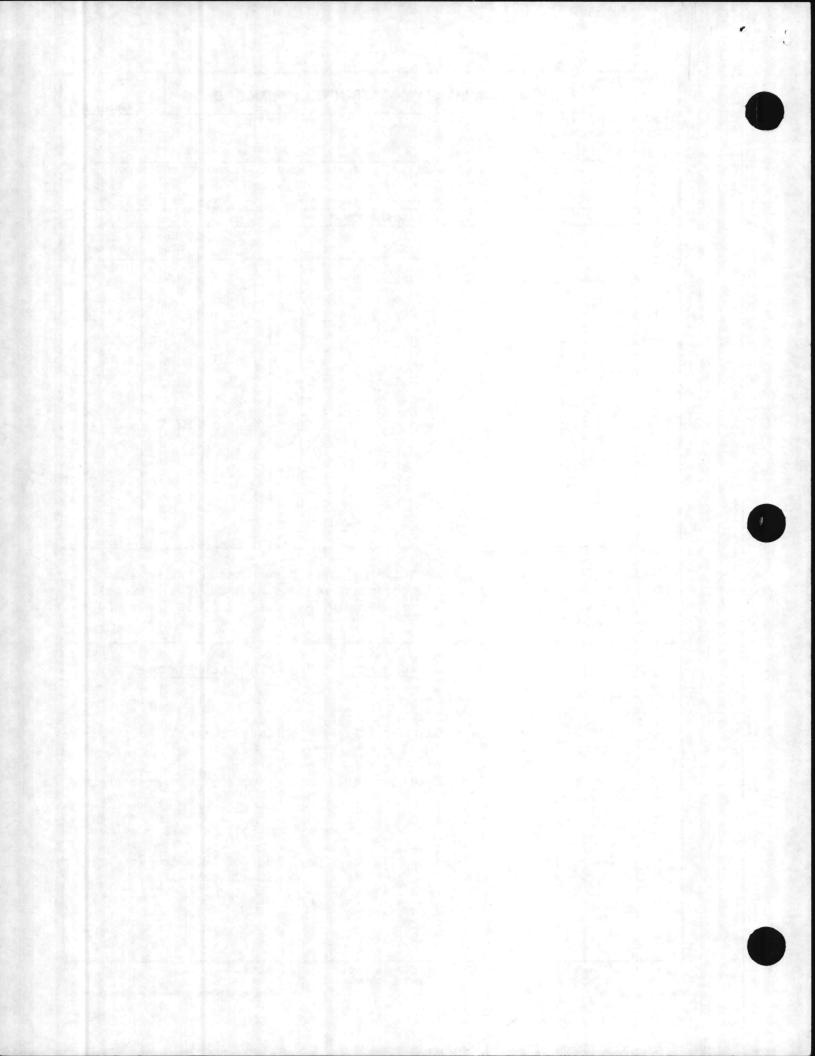
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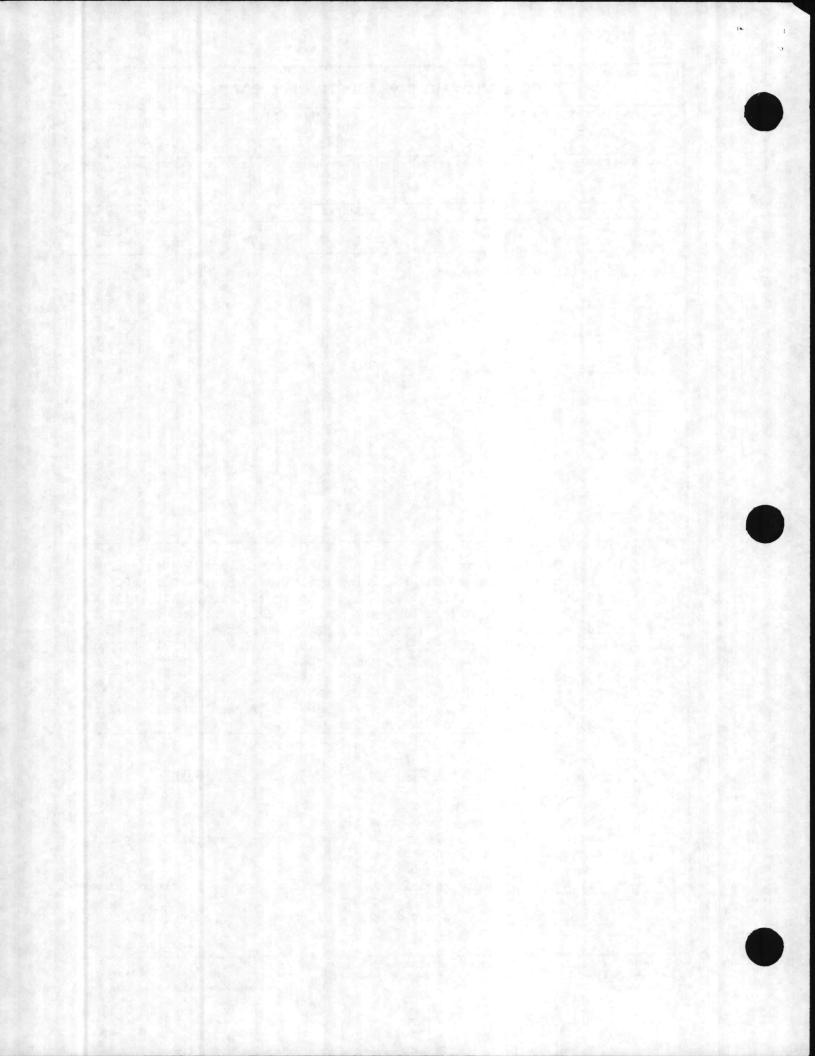


Marine Corps Bas Camp Lejeune, No			4. PROJEC Upgrad	TTITLE le Pipe In:		<u>3 June 87</u> n
. PROGRAM ELEMENT	6. CATEGORY CODE	7. PROJEC	TNUMBER		2.53	(\$000)
	9. C	OST ESTIMAT	ES	1 104		
	ITEM		U/M	QUANTITY	UNIT	COST (\$000)
Pipe Insulation	(Hadnot Point Pac	kage 6)	L.S	-		91.95
SIOH (5.5%)						5.05
Total Funded Cos	t		1	AN TANK	50 A H	97.01
Unfunded Cost (D	esign 6%)			1.2	34	5.51
Total Project Co	st (FY87)					102.53
Upgrade pipe ins	ulation on the Bu	ilding St	eam Dis	tribution	System	and
Upgrade pipe ins Condensate Retur 1502, 517, 58, 5 514, and 1771.		ollowing	buildin	gs: 1108,	904, 5	06, 519,
Upgrade pipe ins Condensate Retur 1502, 517, 58, 5 514, and 1771. 11. <u>REQUIREMENT</u> <u>PROJECT</u> : Upgrad <u>SPECIFIC PURPOSE</u> <u>REQUIREMENT</u> : Th	ulation on the Bu n System in the fo 02, 523, 507, 511	ollowing , 89, 510 <u>EQUATE</u> consumpti ot only s	on ave dol	gs: 1108, 84, 1117, N/A <u>SU</u>	904, 5 503, 6	06, 519, 2, 460, <u>RD</u> N/2
Upgrade pipe ins Condensate Retur 1502, 517, 58, 5 514, and 1771. 11. <u>REQUIREMENT</u> <u>PROJECT: Upgrad SPECIFIC PURPOSE</u> <u>REQUIREMENT: Th</u> installation obt	N/A AD N/A AD Reduce energy of s project will no ain its scheduled N: Energy is being	consumpti consumpti energy g	on oave dol oals.	gs: 1108, 84, 1117, N/A <u>SU</u> lars, but	904, 50 503, 6 BSTANDA	06, 519, 2, 460, <u>RD</u> N/2 elp this
Condensate Retur 1502, 517, 58, 5 514, and 1771. 11. <u>REQUIREMENT</u> <u>PROJECT: Upgrad</u> <u>SPECIFIC PURPOSE</u> <u>REQUIREMENT: Th</u> installation obt <u>CURRENT SITUATIO</u> and condensate 1 <u>IMPACT IF NOT PR</u> to be wasted eac <u>ADDITIONAL: An</u>	N/A AD N/A AD e pipe insulation : Reduce energy (is project will no ain its scheduled N: Energy is bein ines. OVIDED: 9020.0 M	ollowing , 89, 510 EQUATE consumpti ot only s energy g ng wasted Btu of en has been	on ave dol oals. throug ergy an	gs: 1108, 84, 1117, N/A <u>SUN</u> lars, but h poorly : d \$20,115 ed for th:	904, 5 503, 6 BSTANDA will he insulate will co	06, 519, 2, 460, <u>RD</u> N/2 elp this ed steam ontinue ect.



IMSTALLATION AND LOCATION 4. PROJECT TITLE Marine Corps Base Upgrade Pipe Insulation CAMD Leigune, North Carolina Upgrade Pipe Insulation PROGRAM ELEMENT 6. CATEGORY CODE 7. PROJECT NUMBER 8. PROJECT COST (5000) III5.27 9. COST ESTIMATES 115.27 ITEM U/M QUANTITY UNIT COST Pipe Insulation (Camp Johnson) L.S - 103.38 SIOH (5.5%) 5.68 109.07 Total Funded Cost 109.07 115.27 Unfunded Cost (Design 6%) 6.20 Total Project Cost (FY87) 115.27 Upgrade pipe insulation on the Building Steam Distribution System and Condensate Return System in the following buildings: M90, M100, M101, M102, M132, M134, M139, M174, M124, M125, M126, M127, M126, M127, M128, M130, M311, M32, M134, M139, M178, M201, M202, M205, M206, M207, M206, M301, M313, M314, M315, M314,					HOJE	CT DA	23	3 June 8
Camp Letjeune, North Carolina Upgrade Pipe Insulation PROGRAM ELEMENT 6.CATEGORY CODE 7.PROJECT NUMBER 8.PROJECT COST (\$000) 115.27 1.5.27 0.0007 ESTIMATES 115.27 Pipe Insulation (Camp Johnson) L.S - 103.38 SIOH (5.5%) 5.68 109.07 6.200 Total Funded Cost 109.07 115.27 Unfunded Cost (Design 6%) 6.200 6.200 Total Project Cost (FY87) 115.27 115.27 Description of PROFOGED CONSTRUCTION 000, MIO, MIO, MIO, MIO, MIO, MIO, MIO, MIO				4. PROJ	ECT TIT	LE		
PROGRAM ELEMENT 6. CATEGORY CODE 2. PROJECT NUMBER 5. PROJECT COST (5000) ITEM UM CUANTITY UNIT COST ITEM UM CUANTITY UNIT COST Pipe Insulation (Camp Johnson) L.S - 103.38 SIGH (5.5%) 5.68 Total Funded Cost 109.07 Unfunded Cost (Design 6%) 6.20 Total Project Cost (FY87) 115.27 Upgrade pipe insulation on the Building Steam Distribution System and Condensate Return System in the following buildings: M90, M100, M101, M122, M132, M134, M139, M178, M201, M202, M205, M206, M207, M208, M209, M210, M215, M214, M137, M244, M25, M126, M307, M306, M305, M305, M306, M406, M407, M406, M407, M408, M409, M411, M412, M413, M414, M415, M418, M419, M420, M422, M422, M424, M418, M314, M415, M416, M409, M411, M412, M413, M414, M415, M416, M418, M419, M420, M422, M424, M424, M414, M501, M502, M502, M504, M504, M604, M606, M607, M609, M611, M612, M520, M521, M522, M601, M602, M603, M604, M606, M607, M609, M611, M612, M632, M621, and M622. III. REQUIREMENT N/A SUBSTANDARD N/A SUBSTANDARD N/A SUBSTANDARD				1.1				
Item UM Guantity UNIT <						-		
ITEM UM QUANTITY UUT COST (6800) Pipe Insulation (Camp Johnson) L.S - 103.38 SIOH (5.5%) L.S - 103.78 Total Funded Cost 109.07 6.20 Unfunded Cost (Design 6%) 6.20 Total Project Cost (FY87) 115.27 Upgrade pipe insulation on the Building Steam Distribution System and Condensate Return System in the following buildings: M90, M100, M101, M102, M103, M104, M105, M12, M116, M123, M124, M125, M126, M127, M128, M129, M130, M131, M132, M134, M139, M178, M201, M202, M205, M206, M207, M307, M308, M309, M311, M314, M139, M178, M201, M202, M205, M206, M207, M307, M308, M309, M311, M314, M139, M178, M201, M202, M302, M303, M305, M307, M308, M309, M311, M314, M139, M178, M201, M202, M203, M302, M303, M305, M307, M308, M309, M311, M314, M139, M178, M201, M202, M203, M302, M303, M305, M307, M308, M309, M311, M314, M139, M178, M201, M202, M203, M302, M303, M305, M307, M308, M309, M311, M314, M139, M178, M201, M202, M203, M321, M321, M324, M326, M327, M401, M402, M403, M405, M406, M407, M408, M409, M411, M412, M414, M415, M416, M418, M41	PROGRAM ELEMENT	6. CATEGORY CODE	7. PROJEC	TNUMBE	R	8. PROJE	CT COST	(\$000)
ITEM UM QUANTITY UUT Cost COST (68000) Pipe Insulation (Camp Johnson) L.S - 103.38 SIOH (5.5%) L.S - 103.78 Total Funded Cost 109.07 109.07 Unfunded Cost (Design 6%) 6.20 Total Project Cost (FY87) 115.27 Unfunded Cost (Design 6%) 6.20 Total Project Cost (FY87) 115.27 Upgrade pipe insulation on the Building Steam Distribution System and Condensate Return System in the following buildings: M90, M100, M101, M102, M103, M104, M105, M12, M116, M123, M124, M125, M126, M127, M128, M129, M130, M131, M132, M134, M139, M178, M201, M202, M205, M206, M207, M208, M209, M210, M215, M216, M231, M237, M240, M301, M302, M303, M305, M307, M308, M309, M311, M313, M314, M319, M314, M319, M314, M319, M318, M319, M321, M321, M324, M326, M327, M401, M402, M403, M405, M406, M407, M408, M409, M411, M412, M413, M414, M415, M416, M418, M418, M416, M318, M319, M312, M324, M324, M414, M511, M502, M503, M504, M506, M507, M509, M511, M512, M513, M514, M516, M518, M503, M514, M516, M507, M509, M511, M512, M513, M514, M516, M518, M503, M514, M516, M507, M509, M511, M512, M513, M514, M516, M518, M503, M514, M616, M619, M620, M621, and M622. M11. REQUIREMENT N/A ADEQUATE N/A SUBSTANDARD N/A REQUIREMENT N/A ADEQUATE N/A SUBSTANDAR								
ITEMU/MQUANTITYU/UTCOSTPipe Insulation (Camp Johnson)L.S103.38SIOH (5.5%)109.07Total Funded Cost109.07Unfunded Cost (Design 6%)6.20Total Project Cost (FY87)115.27Upgrade pipe insulation on the Building Steam Distribution System and Condensate Return System in the following buildings: M90, M100, M101, M102, M103, M134, M132, M144, M139, M178, M201, M202, M205, M206, M207, M208, M209, M210, W215, M216, M217, M218, M314, M315, M314, M315, M314, M315, M314, M319, M327, M401, M402, M403, M406, M407, M408, M409, M411, M412, M413, M414, M415, M416, M418, M419, M407, M408, M409, M411, M520, M521, M522, M601, M602, M603, M604, M606, M607, M609, M611, M612, M613, M614, M616, M619, M620, M601, M602, M603, M614, M616, M619, M620, M621, M324, M344, M414, M501, M520, M521, M522, M601, M602, M603, M604, M606, M607, M609, M611, M612, M613, M614, M616, M619, M620, M601, M602, M603, M604, M606, M607, M609, M611, M612, M613, M614, M616, M619, M620, M621, and M622.11.REQUIREMENTN/AADEQUATEN/ASUBSTANDARDN/APROJECT:Upgrade pipe insulation SPECIFIC PURPOSE: Reduce energy consumption REQUIREMENT: This project will not only save dollars, but will help thi installation obtain its scheduled energy goals.N/ACURRENT SITUATION: Energy is being wasted through poorly insulated stear and condensate lines.MEtu of energy and \$49,004 will continue to be wasted each year.(Coptinued)			NET ESTIMAN	TEC	·	115.	27	
Dim Dim <thdim< th=""> <thdim< th=""> <thdim< th=""></thdim<></thdim<></thdim<>		. u	JOI COI MA	120				1
SIOH (5.5%) 5.668 Total Funded Cost 109.07 Unfunded Cost (Design 6%) 6.20 Total Project Cost (FY87) 115.27 Upgrade pipe insulation on the Building Steam Distribution System and Condensate Return System in the following buildings: M90, M100, M101, M102, M103, M104, M105, M12, M16, M123, M124, M125, M126, M207, M206, M207, M206, M207, M208, M209, M210, M215, M216, M231, M237, M240, M301, M302, M303, M305, M374, M326, M327, M401, M402, M403, M405, M406, M407, M408, M409, M411, M412, M413, M414, M415, M416, M418, M419, M420, M422, M424, M441, M501, M520, M521, M522, M503, M504, M506, M507, M509, M511, M512, M513, M514, M516, M518, M514, M516, M512, M513, M514, M516, M512, M613, M614, M616, M619, M620, M621, and M622. I1. REQUIREMENT N/A ADEQUATE N/A SUBSTANDARD N/A PROJECT: Upgrade pipe insulation SPECIFIC PURPOSE: Reduce energy consumption SPECIFIC PURPOSE: Reduce energy consumption SUESTANDARD N/A PROJECT: Upgrade pipe insulation SPECIFIC PURPOSE: Reduce energy consumption SUESTANDARD N/A SPECIFIC SITUATION: Energy is being wasted through poorly insulated steam and condensate lines. IMPACT IF NOT PROVIDED: 16,839,9 MEtu of energy and \$49,004 will continue to be wasted each year. (Coptinued)	1.1.1. (A. 19)	ITEM		U/	M QU.	ANTITY		
Total Funded Cost 109.07 Unfunded Cost (Design 6%) 6.20 Total Project Cost (FY87) 115.27 Upgrade pipe insulation on the Building Steam Distribution System and Condensate Return System in the following buildings: M90, M100, M101, M102, M103, M104, M105, M112, M116, M123, M124, M125, M126, M217, M128, M129, M130, M131, M132, M134, M139, M178, M201, M202, M205, M206, M207, M208, M209, M210, M215, M216, M231, M237, M204, M301, M302, M303, M305, M307, M306, M309, M311, M313, M314, M315, M316, M318, M319, M321, M323, M324, M326, M327, M401, M402, M403, M405, M406, M407, M402, M403, M405, M502, M503, M504, M506, M507, M509, M511, M512, M513, M514, M516, M518, M501, M502, M503, M504, M506, M507, M509, M511, M512, M513, M514, M516, M418, M419, M420, M422, M424, M411, M511, M502, M503, M504, M506, M607, M609, M611, M612, M613, M614, M616, M619, M620, M621, and M622. 11. REQUIREMENT N/A SUBSTANDARD N/A PROJECT: Upgrade pipe insulation SPECIFIC PURPOSE: Reduce energy consumption REQUIREMENT: This project will not only save dollars, but will help this installation obtain its scheduled energy goals. N/A CURRENT SITUATION: Energy is being wasted through poorly insulated steam and condensate lines. IMPACT IF NOT PROVIDED: 16,839,9 MEtu of energy and \$49,004 will continue to be wasted each year. (Coptinued)	Pipe Insulation	(Camp Johnson)		L	.s.	-)	-	103.38
Unfunded Cost (Design 6%) Total Project Cost (FY87) Description of Proceed Construction Upgrade pipe insulation on the Building Steam Distribution System and Condensate Return System in the following buildings: M90, M100, M101, M102, M103, M104, M105, M112, M116, M123, M124, M125, M126, M127, M128, M129, M130, M131, M132, M134, M139, M178, M201, M202, M205, M206, M207, M208, M209, M210, M215, M216, M231, M237, M240, M301, M302, M303, M305, M307, M308, M309, M311, M313, M314, M315, M316, M318, M319, M321, M323, M324, M326, M327, M401, M402, M403, M405, M406, M407, M408, M409, M411, M412, M413, M414, M415, M416, M418, M419, M420, M422, M424, M441, M501, M502, M503, M504, M506, M507, M509, M511, M512, M513, M514, M516, M518, M502, M503, M504, M506, M507, M509, M511, M512, M513, M514, M516, M518, M502, M501, M522, M601, M602, M603, M604, M606, M607, M609, M611, M612, M613, M614, M616, M619, M620, M621, and M622. 11. <u>REQUIREMENT</u> N/A <u>ADEQUATE</u> N/A <u>SUBSTANDARD</u> N/2 <u>PROJECT:</u> Upgrade pipe insulation <u>SPECIFIC Upgrade</u> pipe insulation <u>SPECIFIC TURPOSE</u> : Reduce energy consumption <u>REQUIREMENT</u> N/A <u>ADEQUATE</u> N/A <u>SUBSTANDARD</u> N/2 <u>(Coptinued)</u>	SIOH (5.5%)							5.68
Unfunded Cost (Design 6%) Total Project Cost (FY87) Description of Proceed Construction Upgrade pipe insulation on the Building Steam Distribution System and Condensate Return System in the following buildings: M90, M100, M101, M102, M103, M104, M105, M124, M126, M125, M126, M127, M128, M129, M130, M131, M132, M134, M139, M178, M201, M202, M205, M206, M207, M208, M209, M210, M215, M216, M231, M237, M240, M301, M302, M306, M307, M308, M309, M311, M313, M314, M315, M316, M318, M319, M321, M323, M324, M326, M327, M401, M402, M403, M405, M406, M407, M408, M409, M411, M502, M503, M504, M506, M507, M509, M511, M512, M513, M514, M516, M518, M520, M521, M522, M601, M602, M603, M604, M606, M607, M609, M611, M612, M613, M614, M616, M619, M620, M621, and M622. 11. <u>REQUIREMENT</u> N/A <u>ADEQUATE</u> N/A <u>SUBSTANDARD</u> N/A <u>PROJECT:</u> Upgrade pipe insulation <u>SPECIFIC PURPOSE</u> : Reduce energy consumption <u>REQUIREMENT</u> N/A <u>ADEQUATE</u> N/A <u>SUBSTANDARD</u> N/A <u>Installation obtain its scheduled energy goals.</u> <u>CURRENT SITUATION</u> : Energy is being wasted through poorly insulated steam and condensate lines. <u>IMPACT IF NOT PROVIDED</u> : 16,839.9 MBtu of energy and \$49,004 will continue to be wasted each year. (Coptinued)	Total Funded Co	st						109 07
Total Project Cost (FY87) 115.27 PESCRIPTION OF PROPOSED CONSTRUCTION 115.27 Upgrade pipe insulation on the Building Steam Distribution System and Condensate Return System in the following buildings: M90, M100, M101, M102, M103, M104, M105, M112, M146, M123, M124, M125, M126, M127, M128, M120, M130, M131, M132, M134, M139, M178, M201, M202, M205, M206, M207, M208, M209, M210, M215, M216, M231, M237, M201, M302, M303, M305, M307, M308, M309, M311, M313, M314, M315, M316, M318, M319, M321, M323, M304, M302, M305, M306, M309, M311, M313, M314, M315, M316, M318, M319, M321, M323, M324, M326, M327, M401, M402, M402, M402, M406, M407, M408, M409, M411, M412, M413, M414, M415, M416, M418, M419, M420, M422, M424, M441, M501, M520, M503, M504, M506, M507, M509, M511, M512, M513, M514, M516, M518, M520, M521, M522, M501, M602, M602, M603, M606, M607, M609, M611, M612, M613, M614, M616, M619, M620, M621, and M622. 11. REQUIREMENT N/A ADEQUATE N/A SUBSTANDARD N/A PROJECT: Upgrade pipe insulation SPECIFIC PURPOSE: Reduce energy consumption REQUIREMENT: N/A ADEQUATE N/A SUBSTANDARD N/A PROJECT: Upgrade pipe insulation SPECIFIC PURPOSE: Reduce energy consumption REQUIREMENT: This project will not only save dollars, but will help this installation obtain its scheduled energy goals. CURRENT SITUATION: Energy is being wasted through poorly insulated steam and condensate lines. IMPACT IF NOT PROVIDED: 16,839.9 MEtu of energy and \$49,00	Unfunded Cost (Design 68)			NE 90.35	Geografi	nda sa kara	i de la companya de l Esta de la companya d
DESCRIPTION OF PROPOSED CONSTRUCTION Upgrade pipe insulation on the Building Steam Distribution System and Condensate Return System in the following buildings: M90, M100, M101, M102, M103, M104, M105, M112, M116, M123, M124, M125, M126, M127, M128, M129, M130, M131, M132, M134, M139, M178, M201, M202, M205, M206, M207, M208, M209, M210, M215, M216, M231, M237, M240, M301, M302, M303, M305, M307, M308, M309, M311, M313, M314, M315, M316, M318, M319, M321, M323, M324, M326, M327, M401, M402, M403, M405, M406, M407, M408, M409, M411, M412, M413, M414, M415, M416, M418, M449, M420, M422, M424, M441, M501, M502, M503, M504, M506, M507, M509, M511, M512, M513, M514, M516, M518, M520, M521, M522, M601, M602, M603, M604, M606, M607, M609, M611, M612, M613, M614, M616, M619, M620, M621, and M622. 11. REQUIREMENT N/A ADEQUATE N/A SUBSTANDARD N/A PROJECT: Upgrade pipe insulation SPECIFIC PURPOSE: Reduce energy consumption REQUIREMENT: This project will not only save dollars, but will help this installation obtain its scheduled energy goals. CURRENT SITUATION: Energy is being wasted through poorly insulated steam and condensate lines. IMPACT IF NOT PROVIDED: 16,839.9 MBtu of energy and \$49,004 will continue to be wasted each year. (Coptinued)						Sara a		
Description of Proposed Construction Upgrade pipe insulation on the Building Steam Distribution System and Condensate Return System in the following buildings: M90, M100, M101, M102, M103, M104, M105, M112, M116, M123, M124, M125, M126, M127, M128, M129, M130, M131, M132, M134, M139, M178, M201, M202, M205, M206, M207, M208, M209, M210, M215, M216, M231, M237, M240, M301, M302, M303, M305, M307, M308, M309, M311, M313, M314, M315, M316, M318, M319, M321, M323, M324, M326, M327, M401, M402, M403, M405, M406, M407, M408, M409, M411, M412, M413, M414, M415, M416, M418, M419, M420, M422, M424, M441, M501, M502, M503, M504, M506, M507, M509, M511, M512, M513, M514, M516, M518, M520, M521, M522, M601, M602, M603, M604, M606, M607, M609, M611, M612, M613, M614, M616, M619, M620, M621, and M622. 11. REQUIREMENT N/A ADEQUATE N/A SUBSTANDARD N/A PROJECT: Upgrade pipe insulation SPECIFIC PURPOSE: Reduce energy consumption REQUIREMENT: This project will not only save dollars, but will help this installation obtain its scheduled energy goals. CURRENT SITUATION: Energy is being wasted through poorly insulated stead and condensate lines. IMPACT IF NOT PROVIDED: 16,839.9 MEtu of energy and \$49,004 will continue to be wasted each year.	Total Project C	ost (FY87)				a start h		115.27
Upgrade pipe insulation on the Building Steam Distribution System and Condensate Return System in the following buildings: M90, M100, M101, M102, M103, M104, M105, M112, M116, M123, M124, M125, M126, M127, M128, M129, M130, M131, M132, M134, M139, M178, M201, M202, M205, M206, M207, M208, M209, M210, M215, M216, M231, M237, M240, M301, M302, M303, M305, M307, M308, M309, M311, M313, M314, M315, M316, M318, M319, M321, M323, M324, M326, M327, M401, M402, M403, M405, M406, M407, M408, M409, M411, M412, M413, M414, M415, M416, M418, M419, M420, M422, M424, M441, M501, M502, M503, M504, M506, M507, M509, M511, M512, M513, M514, M516, M518, M520, M521, M522, M601, M602, M603, M604, M606, M607, M609, M611, M612, M613, M614, M616, M619, M620, M621, and M622. 11. REQUIREMENT N/A ADEQUATE N/A SUBSTANDARD N/A PROJECT: Upgrade pipe insulation SPECIFIC PURPOSE: Reduce energy consumption REQUIREMENT: This project will not only save dollars, but will help this installation obtain its scheduled energy goals. CURRENT SITUATION: Energy is being wasted through poorly insulated steam and condensate lines. IMPACT IF NOT PROVIDED: 16,839.9 MBtu of energy and \$49,004 will continue to be wasted each year. (Coptinued)				4	1.			
Upgrade pipe insulation on the Building Steam Distribution System and Condensate Return System in the following buildings: M90, M100, M101, M102, M103, M104, M105, M112, M116, M123, M124, M125, M126, M127, M128, M129, M130, M131, M132, M134, M139, M178, M201, M202, M205, M206, M207, M208, M209, M210, M215, M216, M231, M237, M240, M301, M302, M303, M305, M307, M308, M309, M311, M313, M314, M315, M316, M318, M319, M321, M323, M324, M326, M327, M401, M402, M403, M405, M406, M407, M408, M409, M411, M412, M413, M414, M415, M416, M418, M419, M420, M422, M424, M441, M501, M502, M503, M504, M506, M507, M509, M511, M512, M513, M514, M516, M518, M520, M521, M522, M601, M602, M603, M604, M606, M607, M609, M611, M612, M613, M614, M616, M619, M620, M621, and M622. 11. REQUIREMENT N/A ADEQUATE N/A SUBSTANDARD N/A PROJECT: Upgrade pipe insulation SPECIFIC PURPOSE: Reduce energy consumption REQUIREMENT: This project will not only save dollars, but will help thi installation obtain its scheduled energy goals. CURRENT SITUATION: Energy is being wasted through poorly insulated stead and condensate lines. IMPACT IF NOT PROVIDED: 16,839.9 MBtu of energy and \$49,004 will continue to be wasted each year. (Coptinued)				State 1	1.0	3		
II. REQUIREMENT N/A ADEQUATE N/A SUBSTANDARD N/A PROJECT: Upgrade pipe insulation SPECIFIC PURPOSE: Reduce energy consumption REQUIREMENT: This project will not only save dollars, but will help this installation obtain its scheduled energy goals. CURRENT SITUATION: Energy is being wasted through poorly insulated steam and condensate lines. IMPACT IF NOT PROVIDED: 16,839.9 MBtu of energy and \$49,004 will continue to be wasted each year.	Upgrade pipe in	sulation on the Bu	ilding S ollowing	team D	istri	bution M90.	System M100.	n and M101.
REQUIREMENT N/A ADEQUATE N/A SUBSTANDARD N/A PROJECT: Upgrade pipe insulation SPECIFIC PURPOSE: Reduce energy consumption REQUIREMENT: This project will not only save dollars, but will help this installation obtain its scheduled energy goals. Mathematical Structure CURRENT SITUATION: Energy is being wasted through poorly insulated stead and condensate lines. IMPACT IF NOT PROVIDED: 16,839.9 MBtu of energy and \$49,004 will continue to be wasted each year. Impact in the stead of the	Upgrade pipe in Condensate Retu Ml02, Ml03, Ml0 Ml29, Ml30, Ml3 M208, M209, M21 M307, M308, M30 M324, M326, M32 M412, M413, M41 M502, M503, M50	sulation on the Bu rn System in the f 4, M105, M112, M11 1, M132, M134, M13 0, M215, M216, M23 9, M311, M313, M31 7, M401, M402, M40 4, M415, M416, M41 4, M506, M507, M50	ollowing 6, Ml23, 9, Ml78, 1, M237, 4, M315, 3, M405, 8, M419, 9, M511,	build M124, M201, M240, M316, M406, M420, M512,	ings: M125 M202 M301 M318 M407 M422 M513	M90, M126 M205 M302 M319 M408 M424 M514	M100, , M127, , M206, , M303, , M321, , M409, , M441, , M516,	M101, M128, M207, M305, M323, M411, M501, M518,
REQUIREMENT N/A ADEQUATE N/A SUBSTANDARD N/A PROJECT: Upgrade pipe insulation SPECIFIC PURPOSE: Reduce energy consumption REQUIREMENT: This project will not only save dollars, but will help this installation obtain its scheduled energy goals. Image: CURRENT SITUATION: Energy is being wasted through poorly insulated stead and condensate lines. IMPACT IF NOT PROVIDED: 16,839.9 MBtu of energy and \$49,004 will continue to be wasted each year.	Upgrade pipe in Condensate Retu M102, M103, M10 M129, M130, M13 M208, M209, M21 M307, M308, M30 M324, M326, M32 M412, M413, M41 M502, M503, M50 M520, M521, M52	sulation on the Bu rn System in the f 4, M105, M112, M11 1, M132, M134, M13 0, M215, M216, M23 9, M311, M313, M31 7, M401, M402, M40 4, M415, M416, M41 4, M506, M507, M50 2, M601, M602, M60	ollowing 6, Ml23, 9, Ml78, 1, M237, 4, M315, 3, M405, 8, M419, 9, M511, 3, M604,	build M124, M201, M240, M316, M406, M406, M512, M606,	ings: M125 M202 M301 M318 M407 M422 M513	M90, M126 M205 M302 M319 M408 M424 M514	M100, , M127, , M206, , M303, , M321, , M409, , M441, , M516,	M101, M128, M207, M305, M323, M411, M501, M518,
SPECIFIC PURPOSE: Reduce energy consumption REQUIREMENT: This project will not only save dollars, but will help this installation obtain its scheduled energy goals. CURRENT SITUATION: Energy is being wasted through poorly insulated stead and condensate lines. IMPACT IF NOT PROVIDED: 16,839.9 MBtu of energy and \$49,004 will continue to be wasted each year.	Upgrade pipe in Condensate Retu M102, M103, M10 M129, M130, M13 M208, M209, M21 M307, M308, M30 M324, M326, M32 M412, M413, M41 M502, M503, M50 M520, M521, M52 M613, M614, M610	sulation on the Bu rn System in the f 4, M105, M112, M11 1, M132, M134, M13 0, M215, M216, M23 9, M311, M313, M31 7, M401, M402, M40 4, M415, M416, M41 4, M506, M507, M50 2, M601, M602, M60	ollowing 6, Ml23, 9, Ml78, 1, M237, 4, M315, 3, M405, 8, M419, 9, M511, 3, M604,	build M124, M201, M240, M316, M406, M406, M512, M606,	ings: M125 M202 M301 M318 M407 M422 M513	M90, M126 M205 M302 M319 M408 M424 M514	M100, , M127, , M206, , M303, , M321, , M409, , M441, , M516,	M101, M128, M207, M305, M323, M411, M501, M518,
SPECIFIC PURPOSE: Reduce energy consumption REQUIREMENT: This project will not only save dollars, but will help thi installation obtain its scheduled energy goals. CURRENT SITUATION: Energy is being wasted through poorly insulated stear and condensate lines. IMPACT IF NOT PROVIDED: 16,839.9 MBtu of energy and \$49,004 will continue to be wasted each year. (Continued)	Upgrade pipe in Condensate Retu M102, M103, M10 M129, M130, M13 M208, M209, M21 M307, M308, M30 M324, M326, M32 M412, M413, M41 M502, M503, M50 M520, M521, M52 M613, M614, M61	sulation on the Bu rn System in the f 4, M105, M112, M11 1, M132, M134, M13 0, M215, M216, M23 9, M311, M313, M31 7, M401, M402, M40 4, M415, M416, M41 4, M506, M507, M50 2, M601, M602, M60 6, M619, M620, M62	ollowing 6, Ml23, 9, Ml78, 1, M237, 4, M315, 3, M405, 8, M419, 9, M511, 3, M604, 1, and M	build Ml24, M201, M240, M316, M406, M420, M512, M606, M622.	ings: M125 M202 M301 M318 M407 M422 M513	M90, M126 M205 M302 M319 M408 M424 M514 M609	M100, , M127, , M206, , M303, , M321, , M409, , M441, , M516, , M611,	M101, M128, M207, M305, M323, M411, M501, M518, M612,
REQUIREMENT: This project will not only save dollars, but will help this installation obtain its scheduled energy goals. CURRENT SITUATION: Energy is being wasted through poorly insulated steam and condensate lines. IMPACT IF NOT PROVIDED: 16,839.9 MBtu of energy and \$49,004 will continue to be wasted each year. (Continued)	Upgrade pipe in Condensate Retu M102, M103, M10 M129, M130, M13 M208, M209, M21 M307, M308, M30 M324, M326, M32 M412, M413, M41 M502, M503, M50 M520, M521, M52 M613, M614, M61	sulation on the Bu rn System in the f 4, M105, M112, M11 1, M132, M134, M13 0, M215, M216, M23 9, M311, M313, M31 7, M401, M402, M40 4, M415, M416, M41 4, M506, M507, M50 2, M601, M602, M60 6, M619, M620, M62	ollowing 6, Ml23, 9, Ml78, 1, M237, 4, M315, 3, M405, 8, M419, 9, M511, 3, M604, 1, and M	build Ml24, M201, M240, M316, M406, M420, M512, M606, M622.	ings: M125 M202 M301 M318 M407 M422 M513	M90, M126 M205 M302 M319 M408 M424 M514 M609	M100, , M127, , M206, , M303, , M321, , M409, , M441, , M516, , M611,	M101, M128, M207, M305, M323, M411, M501, M518, M612,
installation obtain its scheduled energy goals. <u>CURRENT SITUATION</u> : Energy is being wasted through poorly insulated stear and condensate lines. <u>IMPACT IF NOT PROVIDED</u> : 16,839.9 MBtu of energy and \$49,004 will continue to be wasted each year. (Continued)	Upgrade pipe in Condensate Retu M102, M103, M10 M129, M130, M13 M208, M209, M21 M307, M308, M30 M324, M326, M32 M412, M413, M41 M502, M503, M50 M520, M521, M52 M613, M614, M610 H1. <u>REQUIREMENT</u> <u>PROJECT:</u> Upgrad	sulation on the Bu rn System in the f 4, M105, M112, M11 1, M132, M134, M13 0, M215, M216, M23 9, M311, M313, M31 7, M401, M402, M40 4, M415, M416, M41 4, M506, M507, M50 2, M601, M602, M60 6, M619, M620, M62 N/A <u>ADEQU</u> de pipe insulation	ollowing 6, Ml23, 9, Ml78, 1, M237, 4, M315, 3, M405, 8, M419, 9, M511, 3, M604, 1, and M	build M124, M201, M240, M316, M406, M420, M512, M606, M512.	ings: M125 M202 M301 M318 M407 M422 M513	M90, M126 M205 M302 M319 M408 M424 M514 M609	M100, , M127, , M206, , M303, , M321, , M409, , M441, , M516, , M611,	M101, M128, M207, M305, M323, M411, M501, M518, M612,
CURRENT SITUATION: Energy is being wasted through poorly insulated stead and condensate lines. IMPACT IF NOT PROVIDED: 16,839.9 MBtu of energy and \$49,004 will continue to be wasted each year.	Upgrade pipe in Condensate Retu M102, M103, M10 M129, M130, M13 M208, M209, M21 M307, M308, M30 M324, M326, M32 M412, M413, M41 M502, M503, M50 M520, M521, M52 M613, M614, M610 M11. <u>REQUIREMENT</u> <u>PROJECT:</u> Upgrad SPECIFIC PURPOS	sulation on the Bu rn System in the f 4, M105, M112, M11 1, M132, M134, M13 0, M215, M216, M23 9, M311, M313, M31 7, M401, M402, M40 4, M415, M416, M41 4, M506, M507, M50 2, M601, M602, M60 6, M619, M620, M62 N/A <u>ADEQU</u> de pipe insulation <u>E</u> : Reduce energy	ollowing 6, M123, 9, M178, 1, M237, 4, M315, 3, M405, 8, M419, 9, M511, 3, M604, 1, and M ATE	build M124, M201, M240, M316, M406, M420, M512, M606, M512, M606, M512.	ings: M125 M202 M301 M318 M407 M422 M513 M607	M90, M126 M205 M302 M319 M408 M424 M514 M609	M100, , M127, , M206, , M303, , M321, , M409, , M441, , M516, , M611,	M101, M128, M207, M305, M323, M411, M501, M518, M612,
and condensate lines. <u>IMPACT IF NOT PROVIDED</u> : 16,839.9 MBtu of energy and \$49,004 will continue to be wasted each year. (Continued)	Upgrade pipe in Condensate Retu M102, M103, M10 M129, M130, M13 M208, M209, M21 M307, M308, M30 M324, M326, M32 M412, M413, M41 M502, M503, M50 M520, M521, M52 M613, M614, M610 H1. <u>REQUIREMENT</u> <u>PROJECT: Upgrad</u> <u>SPECIFIC PURPOS</u> <u>REQUIREMENT: T</u>	sulation on the Bu rn System in the f 4, M105, M112, M11 1, M132, M134, M13 0, M215, M216, M23 9, M311, M313, M31 7, M401, M402, M40 4, M415, M416, M41 4, M506, M507, M50 2, M601, M602, M60 6, M619, M620, M62 N/A <u>ADEQU</u> de pipe insulation <u>E</u> : Reduce energy his project will n	ollowing 6, Ml23, 9, Ml78, 1, M237, 4, M315, 3, M405, 8, M419, 9, M511, 3, M604, 1, and M ATE consumpt ot only	build M124, M201, M240, M316, M406, M420, M512, M606, M512. N/A	ings: M125 M202 M301 M318 M407 M422 M513 M607	M90, M126 M205 M302 M319 M408 M424 M514 M609	M100, , M127, , M206, , M303, , M321, , M409, , M441, , M516, , M611,	M101, M128, M207, M305, M323, M411, M501, M518, M612,
IMPACT IF NOT PROVIDED: 16,839.9 MBtu of energy and \$49,004 will continue to be wasted each year. (Continued)	Upgrade pipe in Condensate Retu M102, M103, M10 M129, M130, M13 M208, M209, M21 M307, M308, M30 M324, M326, M32 M412, M413, M41 M502, M503, M50 M520, M521, M52 M613, M614, M610 M613, M614, M610 M610, M610 M610, M610M610 M610, M610 M610, M610M610 M610, M6	sulation on the Burn System in the f 4, M105, M112, M11 1, M132, M134, M13 0, M215, M216, M23 9, M311, M313, M31 7, M401, M402, M40 4, M506, M507, M50 2, M601, M602, M60 6, M619, M620, M62 N/A ADEQU de pipe insulation E: Reduce energy his project will n tain its scheduled	ollowing 6, Ml23, 9, Ml78, 1, M237, 4, M315, 3, M405, 8, M419, 9, M511, 3, M604, 1, and M ATE consumpt ot only energy	build M124, M201, M240, M316, M406, M420, M512, M606, M512, M606, M512. N/A	ings: M125 M202 M301 M318 M407 M422 M513 M607	M90, M126 M205 M302 M319 M408 M424 M514 M609 <u>SUBST</u> s, but	M100, , M127, , M206, , M303, , M321, , M409, , M441, , M516, , M611, ANDARD will h	M101, M128, M207, M305, M323, M411, M501, M518, M612, N/A
continue to be wasted each year. (Continued)	Upgrade pipe in Condensate Retu M102, M103, M10 M129, M130, M13 M208, M209, M21 M307, M308, M30 M324, M326, M32 M412, M413, M41 M502, M503, M50 M520, M521, M52 M613, M614, M610 M613, M614, M610 M610, M610M610 M610, M610 M610, M610 M610, M610M610 M610, M610M610 M610, M610M610 M610, M610M610 M61000000000000000000000	sulation on the Bu rn System in the f 4, M105, M112, M11 1, M132, M134, M13 0, M215, M216, M23 9, M311, M313, M31 7, M401, M402, M40 4, M415, M416, M41 4, M506, M507, M50 2, M601, M602, M60 6, M619, M620, M62 N/A <u>ADEQU</u> de pipe insulation <u>E</u> : Reduce energy his project will n tain its scheduled <u>ON</u> : Energy is bei	ollowing 6, Ml23, 9, Ml78, 1, M237, 4, M315, 3, M405, 8, M419, 9, M511, 3, M604, 1, and M ATE consumpt ot only energy	build M124, M201, M240, M316, M406, M420, M512, M606, M512, M606, M512. N/A	ings: M125 M202 M301 M318 M407 M422 M513 M607	M90, M126 M205 M302 M319 M408 M424 M514 M609 <u>SUBST</u> s, but	M100, , M127, , M206, , M303, , M321, , M409, , M441, , M516, , M611, ANDARD will h	M101, M128, M207, M305, M323, M411, M501, M518, M612, N/2
	Upgrade pipe in Condensate Retu M102, M103, M10 M129, M130, M13 M208, M209, M21 M307, M308, M30 M324, M326, M32 M412, M413, M41 M502, M503, M50 M520, M521, M52 M613, M614, M610 M613, M614, M610 M614, M610 M610 M614, M610 M614, M610 M614, M610 M614, M610 M614, M610 M614, M610 M614, M610 M614, M610 M614, M610 M610, M610 M610, M610 M610, M610 M610, M610 M610, M610M610, M610 M610, M610M610, M610 M610, M6100M610 M610, M6100 M610, M610M610	sulation on the Bu rn System in the f 4, M105, M112, M11 1, M132, M134, M13 0, M215, M216, M23 9, M311, M313, M31 7, M401, M402, M40 4, M415, M416, M41 4, M506, M507, M50 2, M601, M602, M60 6, M619, M620, M62 N/A <u>ADEQU</u> de pipe insulation <u>E: Reduce energy</u> his project will n tain its scheduled <u>ON: Energy is bei</u> lines.	ollowing 6, M123, 9, M178, 1, M237, 4, M315, 3, M405, 8, M419, 9, M511, 3, M604, 1, and M ATE consumpt ot only energy ng waste	build M124, M201, M240, M316, M406, M420, M512, M606, M512, M606, M512. N/A Sion save d goals. d thro	ings: M125 M202 M301 M318 M407 M422 M513 M607	M90, M126 M205 M302 M319 M408 M424 M514 M609 <u>SUBST</u> s, but	M100, , M127, , M206, , M303, , M321, , M409, , M441, , M516, , M611, ANDARD will h insulat	M101, M128, M207, M305, M323, M411, M501, M518, M612, N/2 nelp this
	Upgrade pipe in Condensate Retu M102, M103, M10 M129, M130, M13 M208, M209, M21 M307, M308, M30 M324, M326, M32 M412, M413, M41 M502, M503, M50 M520, M521, M52 M613, M614, M610 M613, M614, M610 M610, M610 M610, M610 M610, M610, M610, M610 M610, M610, M610, M610, M610 M610, M610, M6	sulation on the Burn System in the f 4, M105, M112, M11 1, M132, M134, M13 0, M215, M216, M23 9, M311, M313, M31 7, M401, M402, M40 4, M415, M416, M41 4, M506, M507, M50 2, M601, M602, M60 6, M619, M620, M62 N/A ADEQU de pipe insulation E: Reduce energy his project will n tain its scheduled ON: Energy is bei lines. ROVIDED: 16,839.	ollowing 6, M123, 9, M178, 1, M237, 4, M315, 3, M405, 8, M419, 9, M511, 3, M604, 1, and M ATE consumpt ot only energy ng waste	build M124, M201, M240, M316, M406, M420, M512, M606, M512, M606, M512. N/A Sion save d goals. d thro	ings: M125 M202 M301 M318 M407 M422 M513 M607	M90, M126 M205 M302 M319 M408 M424 M514 M609 <u>SUBST</u> s, but	M100, M127, M206, M303, M321, M409, M41, M516, M611, M	M101, M128, M207, M305, M323, M411, M501, M518, M612, N/2 nelp this ced steam

.

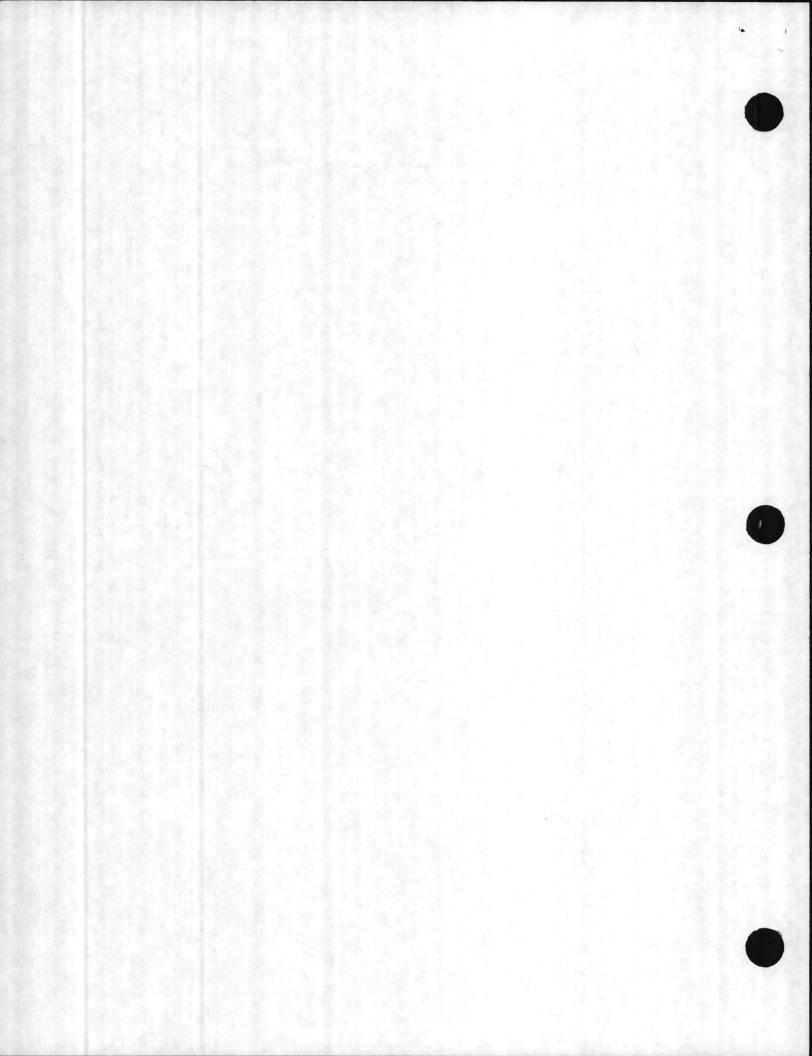




11. Continued

ADDITIONAL: An economic analysis has been prepared for this project. The Savings-to-Investment Ratio (SIR) is 6.4 over a 25 year life.

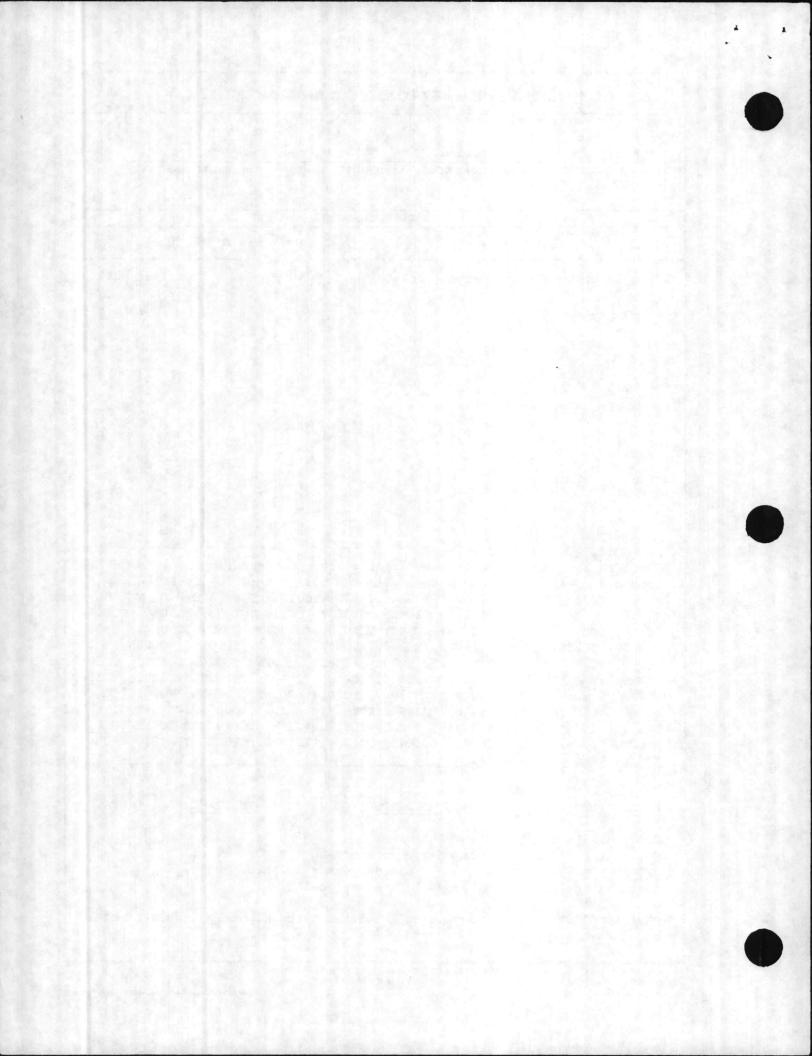




Marine Corps Ba		and the second	4. PROJECT	TITLE		June 87
Camp Lejeune, N			Upgrade	Pipe Ins	ulation	
PROGRAM ELEMENT		7. PROJEC	TNUMBER		ECT COST (
					98.51	
	ITEM	OGT ESTIMAT	U/M	QUANTITY	UNIT	COST (\$000)
Pipe Insulation	(Camp Geiger Pac)	kage 1)	L.9	• -	1.20	88.348
SIOH (5.5%)		行動的心				4.859
Total Funded Co	st					93.207
Unfunded Cost (Design 6%)			transferrance in		5.301
Total Project C	Cost (FY87)			(internet)		98.508
				10月1日		27 S S
Condensate Retu TC845, TC814, T TC715, TC714, T TC1063, TC743, TC1059, TC735, TC950, TC1016, TC726, TC828, T TC808, TC1028, TC706, TC704, T TC1160, TC736,	sulation on the B ern System in the C815, TC1140, TC8 C710, TC711, TC11 TC741, TC834, TC8 TC855, TC1065, TC TC1012, TC1015, T TC727, TC1038, TC1 TC1132, TC809, TC TC707, TC708, TC74 TC1007, TC719, TC TC836, TC838, TC10 and TC848.	following 44, TC841 41, TC104 42, TC101 1067, TC7 C1004, TC 119, TC84 1047, TC1 9, TC729, 817, TC81	buildin , TC810 2, TC85 0, TC10 45, TC10 854, TC 6, TC10 018, TC TC1061 8, TC71	ngs: TC74 , TC744, 1 1, TC1013 41, TC832 143, TC10 716, TC82 39, TC102 1017, TC7 , TC1044, 8, TC819,	40, TC10 TC1040, , TC1050 , TC1054 51, TC106 9, TC106 9, TC106 9, TC113 09, TC728, TC728, TC826,	066, TC840,), TC850, 1, TC1053 068, TC11 52, TC101 31, TC106 05, TC754 TC816, TC1046,
SPECIFIC PURPOS REQUIREMENT: The installation of	ade pipe insulatio <u>SE</u> : Reduce energy his project will n btain its schedule <u>ION</u> : Energy is be	on consumpt ot only s d energy	ave dol goals.		will he	

Enel()

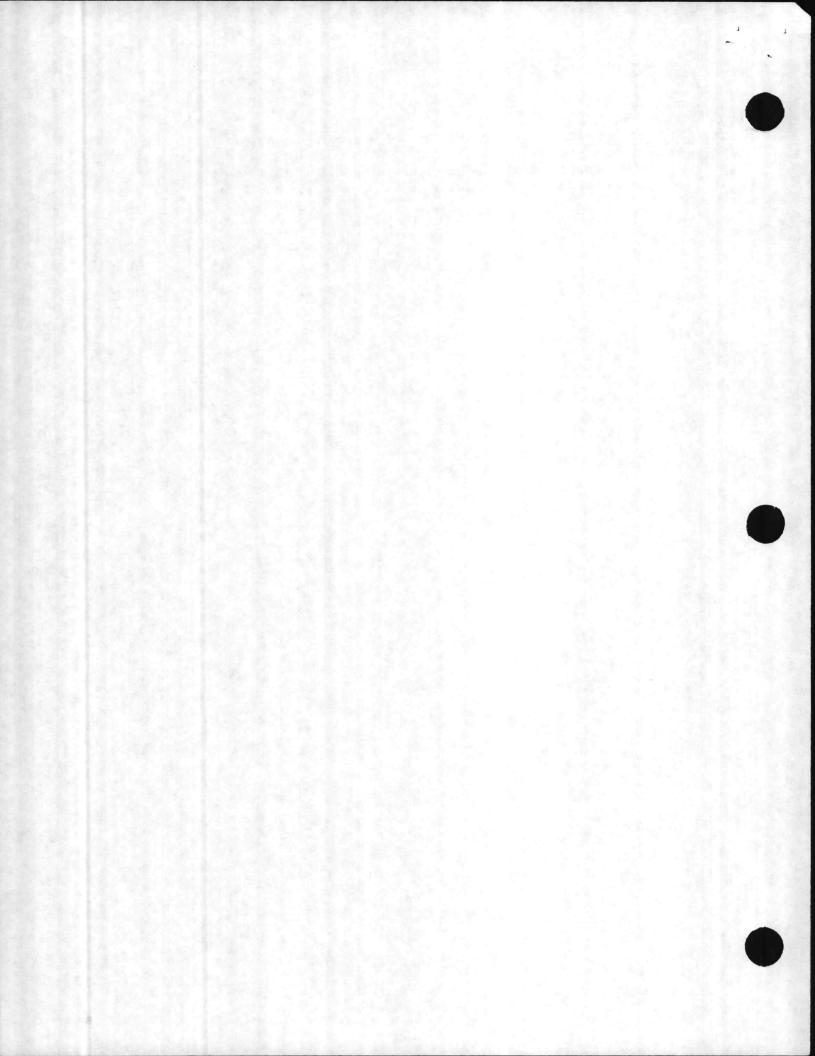
11



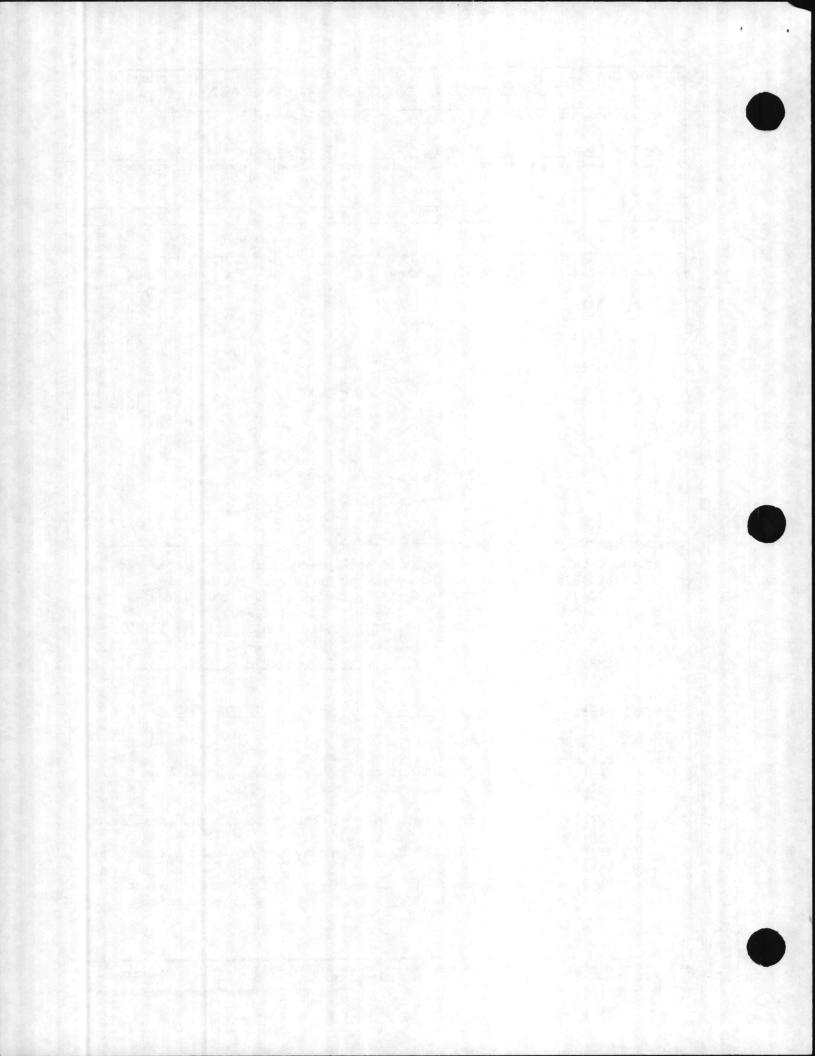


11. Continued

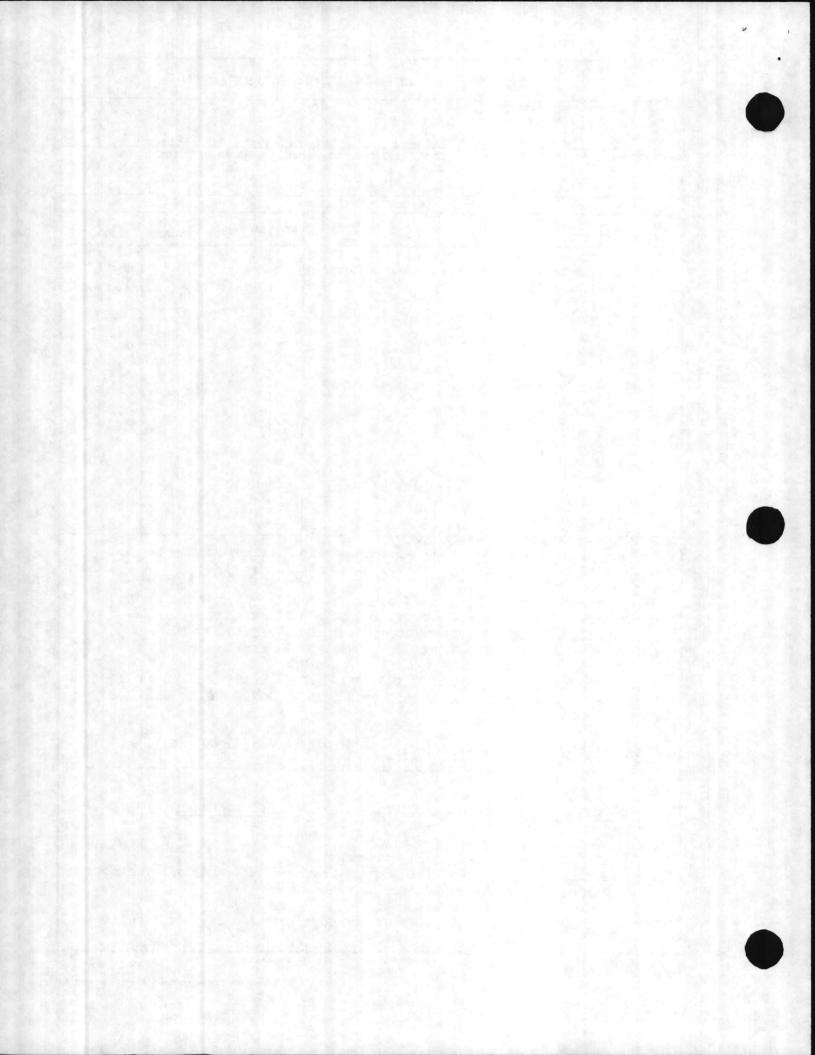
<u>IMPACT IF NOT PROVIDED</u>: 18,335.774 MBtu of energy and \$53,357 will continue to be wasted each year. <u>ADDITIONAL</u>: An economic analysis has been prepared for this project. The Savings-to-Investment Ratio (SIR) is 8.1 over a 25 year life.



Marine Corp			4. PROJE	T TIT	LE		3 June 8	
	e, North Carolina		Upgrad	e Pi	pe Ins	ulation	n	
PROGRAM ELEMI	ENT 6. CATEGORY CODE	7. PROJE	CT NUMBER	1.2	S. PROJ	ECT COST	(\$000)	
				Sec. 1				
		9. COST ESTIMATE			72.	72.370		
		CUST EST MA	TES	1			T	
	ITEM	的资料	UN	00/	NTITY	COST	COST (\$000)	
Pipe Insula	tion (Camp Geiger Pac	kage 2)	L.	s.	-	-	64.906	
SIOH (5.5%)							3.570	
Total Funde	d Cost		-				68.476	
Unfunded Co:	st (Design 6%)		-322	die:	de la constante		3.894	
	ct Cost (FY87)		-	1.44			72.370	
					24	na th	12.370	
				La la			1.2.2.2.1	
				1.80				
DESCRIPTION OF	PROPOSED CONSTRUCTION							
Upgrade pipe Condensate 1 TC1058, TC10 TC1009, TC10 TC1056, G550 TC1142, G640	PROPOSED CONSTRUCTION e insulation on the B Return System in the D57, TC1048, TC1055, D69, TC806, TC951, G5 D, TC701, TC742, G520 D, G540, TC1064, TC74	following TC1027, T 30, TC712 , G770, T	buildi: C805, T , TC737 Cll10,	ngs: C1003 , TC9 FC813	TC10 3, TC8 910, T 2, TC1	36, TCI 07, TCE C900, T 008, TC	1037, 304, rc1052, c717,	
Upgrade pipe Condensate 1 TC1058, TC10 TC1009, TC10 TC1056, G550	e insulation on the B Return System in the 057, TC1048, TC1055, 069, TC806, TC951, G5 0, TC701, TC742, G520	following TC1027, T 30, TC712 , G770, T	buildi: C805, T , TC737 Cll10,	ngs: C1003 , TC9 FC813	TC10 3, TC8 910, T 2, TC1	36, TCI 07, TCE C900, T 008, TC	1037, 304, rc1052, c717,	
Upgrade pipe Condensate I TC1058, TC10 TC1009, TC10 TC1056, G550 TC1142, G640 and TC1045.	e insulation on the B Return System in the 057, TC1048, TC1055, 069, TC806, TC951, G5 0, TC701, TC742, G520 0, G540, TC1064, TC74	following TCl027, T 30, TC712 , G770, T 8, TCl161	buildi: C805, T , TC737 Cll10, , TC753	ngs: C1003 , TC9 TC812 , TC3	TC10 3, TC8 910, T 2, TC1 750, T	36, TC 07, TC C900, T 008, TC C751, T	1037, 304, rc1052, c717, rc752,	
Upgrade pipe Condensate I TC1058, TC10 TC1009, TC10 TC1056, G550 TC1142, G640 and TC1045.	e insulation on the B Return System in the 057, TC1048, TC1055, 069, TC806, TC951, G5 0, TC701, TC742, G520 0, G540, TC1064, TC74	following TCl027, T 30, TC712 , G770, T 8, TCl161 UATE n consumpt not only	N/A N/A	ngs: C1003 , TC9 TC812 , TC3 <u>SU</u>	TC10 3, TC8 910, T 2, TC10 750, T JBSTAN	36, TC 07, TC C900, T 008, TC C751, T	N/A	
Upgrade pipe Condensate i TC1058, TC10 TC1009, TC10 TC1056, G550 TC1142, G640 and TC1045.	N/A ADEQ N/A ADEQ Server System in the N/A ADEQ Server State	following TCl027, T 30, TC712 , G770, T 8, TCl161 UATE n consumpt not only d energy ing waste	N/A N/A d throug	ngs: ClOO: , TCS TC812 , TC <u>SU</u>	TC10 3, TC8 910, TC 2, TC10 750, TC JBSTANN 5, but	36, TCJ 07, TC8 C900, TC 008, TC C751, T DARD will P insulat	1037, 304, rc1052, c717, rc752, N/A nelp this	
Upgrade pipe Condensate I TC1058, TC10 TC1009, TC10 TC1056, G550 TC1142, G640 and TC1045.	N/A ADEQ N/A ADEQ Server System in the N/A ADEQ Server State	following TCl027, T 30, TC712 , G770, T 8, TCl161 UATE n consumpt not only d energy ing waste MBtu of	N/A N/A ion goals. d throug	ngs: Cloo: , TCS TCS12 , TCS SU	TC10 3, TC8 910, TC 2, TC10 750, TC UBSTANN 5, but 5, but 527,704	36, TCJ 07, TC8 C900, T 008, TC C751, T DARD will P insulat a will	N/A N/A N/A Continue	
Upgrade pipe Condensate I TC1058, TC10 TC1009, TC10 TC1056, G550 TC1142, G640 and TC1045. II. REQUIREMENT PROJECT: Up SPECIFIC PUB REQUIREMENT installation CURRENT SITU and condensa IMPACT IF NO to be wasted ADDITIONAL:	N/A ADEQ N/A ADEQ Server System in the N/A ADEQ Server State	following TCl027, T 30, TC712 , G770, T 8, TCl161 UATE n consumpt not only d energy ing waste MBtu of s has bee	N/A N/A ion save do goals. d throug energy a n prepar	ngs: Cloo: , TCS TCS12 , TCS SU SU llars gh pc and s ced f	TC10 3, TC8 910, TC 2, TC10 750, TC JBSTANN 5, but porly : 27,704 For th:	36, TCJ 07, TC8 C900, T 008, TC C751, T DARD will h insulat will h is proj	N/A N/A N/A continue	



	FY 1	988_ MIL	ITARY C	UNSIN	UCTION	PRO	JE	T DAI	A	23	June 87
Marine Corr Camp Lejeur	os Base		ina			OJECT					
PROGRAM ELEM		6. CATEGO	and the second se	7. PRO	JECT NUN			e Insi B. PROJE			
									_		
			9. C	OST ESTI	MATES			98.7	9		
nan baa f		ITEM				U/M	QUA	NTITY	UN		COST (\$000)
Pipe Insula and Paradia			Creek, Co	ourthou	ıse Bay	L.S	0/4	-	-		88.605
SIOH (5.5%)										4.873
Total Fund	ed Cost						•				93.478
Unfunded C	ost (De	esign 6%))							á s	5.316
Total Proj	ect Cos	st (FY87))		ta makin	Self-ri	1962	a lain			98.794
Upgrade pi	pe inst	lation of	on the B	uildin follow	g Steam ing bui	n Dis	stri	bution	n Sys	stem	n and
0. DESCRIPTION of Upgrade pi Condensate French Cre FC303, FC3 FC364, FC4 FC520, FC5	ek: FC	n System Cl00, FC 305, FC3 411, FC4	on the B in the 190, FC2 06, FC30 12, FC41	follow 00, FC 9, FC3 3, FC4	ing bui 241, FC 10, FC3 14, FC4	11dir 2251, 311, 415,	FC3 FC4	300, F 12,FC3 16, FC	7C303 313,	l, F FC3	C302, 360,
Upgrade pi Condensate French Cre FC303, FC3 FC364, FC4	pe insu Return eek: FC 004, FC 000, FC 025, FC e Bay: 7, BB28	ulation of n System Cl00, FC 305, FC3 411, FC4 530, FC5 BB2, BB , BB45,	on the B in the 190, FC2 06, FC30 12, FC41 40, FC55 5, BB7,	follow 00, FC 9, FC3 3, FC4 0, FC5 BB8, B	ing bui 241, FC 10, FC3 14, FC4 55, FC3 B10, BH	11dir 2251, 311, 415, 365, 311,	FC FC3 FC4 FC5 BB1	300, F 12,FC3 16, FC 73 2, BB1	C303 313, C420	l, F FC3 , FC BB14	C302, 360, 2515,
Upgrade pi Condensate French Cre FC303, FC3 FC364, FC4 FC520, FC5 Courthouse BB16, BB27	pe inst Return eek: F(004, FC 000, FC	alation of System Cl00, FC 305, FC3 411, FC4 530, FC5 BB2, BB , BB45, 270 2600, 2	on the B in the 190, FC2 06, FC30 12, FC41 40, FC55 5, BB7, BB50, BB 602, 260	follow 00, FC 9, FC3 3, FC4 0, FC5 BB8, B 51, BB	ing bui 241, FC 10, FC3 14, FC4 55, FC3 B10, BE 52, BB5 94, 2605	11dir 2251, 311, 415, 365, 311, 54, E	FC3 FC3 FC4 FC5 BB1 3B72	300, F 12,FC3 16, FC 73 2, BB1 , BB25	C303 313, C420 L3, 1 50, 1	l, F FC3 , FC BB14 BB25	C302, 860, 2515, 4, BB15, 55, BB260
Upgrade pi Condensate French Cre FC303, FC3 FC364, FC4 FC520, FC5 Courthouse BB16, BB27 BB265, BB2 Paradise F	pe insu Return eek: FC 004, FC 200, FC 25, FC 25, FC 269, BB 269, BB 269, BB	alation of System Cl00, FC 305, FC3 411, FC4 530, FC5 BB2, BB , BB45, 270 2600, 2	on the B in the 190, FC2 06, FC30 12, FC41 40, FC55 5, BB7, BB50, BB 602, 260	follow 00, FC 9, FC3 3, FC4 0, FC5 BB8, B 51, BB 03, 260 27, 26	ing bui 241, FC 10, FC3 14, FC4 55, FC3 B10, BE 52, BB5 94, 2605	11dir 2251, 311, 415, 365, 311, 54, E	Pigs: FC3 FC4 FC5 BB1 3B72	300, F 12,FC3 16, FC 73 2, BB1 , BB25	2420 13, 1 50, 1 , 26	l, F FC3 , FC BB14 BB25	C302, 860, 2515, 4, BB15, 55, BB260
Upgrade pi Condensate French Cre FC303, FC3 FC364, FC4 FC520, FC5 Courthouse BB16, BB27 BB265, BB2 Paradise F 2615, 2617	Pe insu Return ek: F(004, FC 000, FC 025, FC 25, FC 269, BB 269, BB 269, BB 201nt: 7, 2624 <u>VT</u> Upgrad PURPOSE VT: Th	Alation of System Cl00, FC 305, FC3 411, FC4 530, FC5 BB2, BB , BB45, 270 2600, 2 , 2625, N/A e pipe i : Reduction of the second	on the B in the 190, FC2 06, FC30 12, FC41 40, FC55 5, BB7, BB50, BB 602, 260 2626, 26 <u>ADEQU</u> nsulatic re energy ect will	follow 00, FC 9, FC3 3, FC4 0, FC5 BB8, B 51, BB 03, 260 27, 26 UATE on 7 consu not on	ing bui 241, FC 10, FC3 14, FC4 55, FC3 BE10, BE 52, BES 04, 2609 228, 263 N/A mption	e do:	ngs: FC3 FC3 FC4 FC5 BB1 BB72 507, SUB	300, F 12,FC3 16, FC 73 2, BB1 , BB25 2609, <u>STAND</u>	22303 313, 2420 13, 1 50, 1 50, 1 , 26	l, F FC3 , FC BB14 BB25	2613, N/A
Condensate French Cre FC303, FC3 FC364, FC4 FC520, FC5 Courthouse BB16, BB27 BB265, BB2 Paradise F 2615, 2617 11. REQUIREMEN PROJECT: SPECIFIC F REQUIREMEN	Pe insu Return eek: FC 004, FC 000, FC 025, FC 25, FC 269, BB 269, BB 269, BB 269, BB 269, BB 200int: 7, 2624 Upgrad PURPOSE NT: Th ion obt ITUATIO	hlation of System Cl00, FC 305, FC3 411, FC4 530, FC5 BB2, BB , BB45, 270 2600, 2 , 2625, N/A e pipe i : Reduct is projet ain its N: Enertical Enertical System N: Enertical System	on the B in the 190, FC2 06, FC30 12, FC41 40, FC55 5, BB7, BB50, BB 602, 260 2626, 260 <u>ADEQU</u> nsulatic e energy sct will schedule	follow 00, FC 9, FC3 3, FC4 0, FC5 BB8, B 51, BB 03, 260 027, 26 UATE on v consu not on ed ener	ing bui 241, FC 10, FC3 14, FC4 55, FC3 B10, BF 52, BB5 04, 2605 28, 262 N/A mption hly save	e do:	ngs: FC3 FC4 FC5 BB1 BB72 507, SUB	300, F 12,FC3 16, FC 73 2, BB1 , BB25 2609, STANDA	2C303 313, 2420 13, 1 50, 1 50, 1 , 26 <u>ARD</u>	1, F FC3 , FC BB14 BB25 11,	N/A N/A N/A



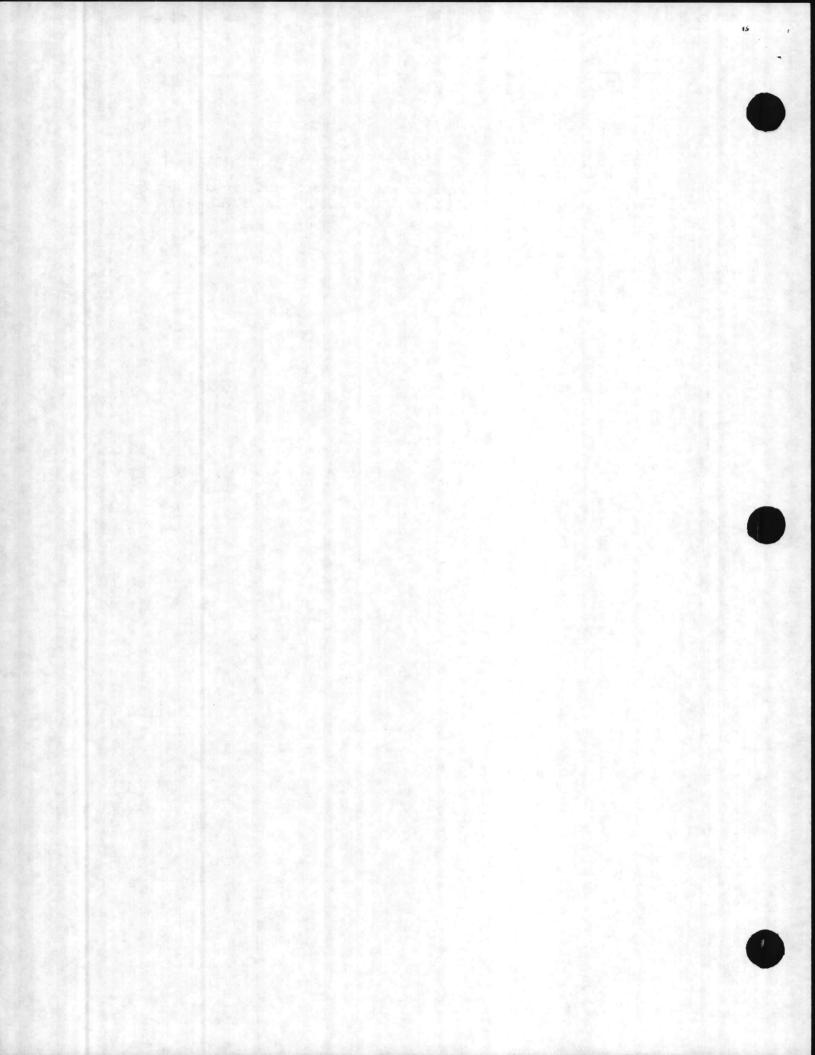


11. Continued

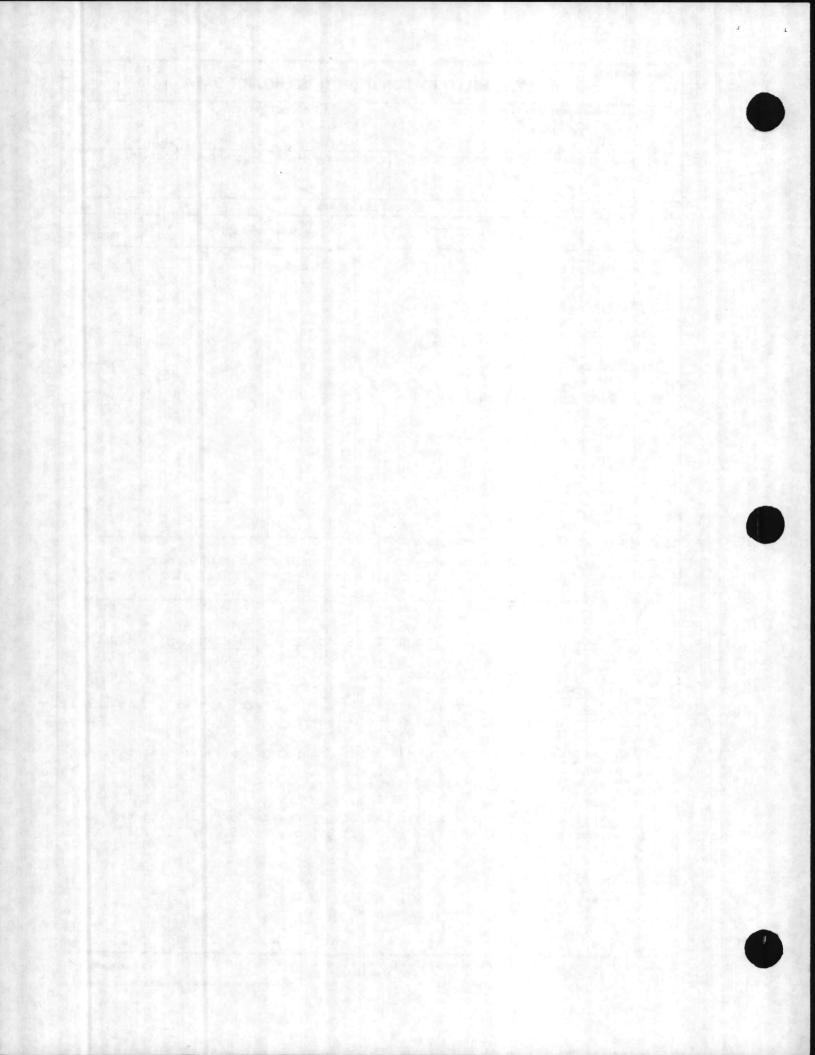
IMPACT IF NOT PROVIDED: 14,547.1 MBtu of energy and \$35,099 will continue to be wasted each year. ADDITIONAL: An economic analysis has been prepared for this project. The Savings-to-Investment Ratio (SIR) is 5.3 over a 25 year life.





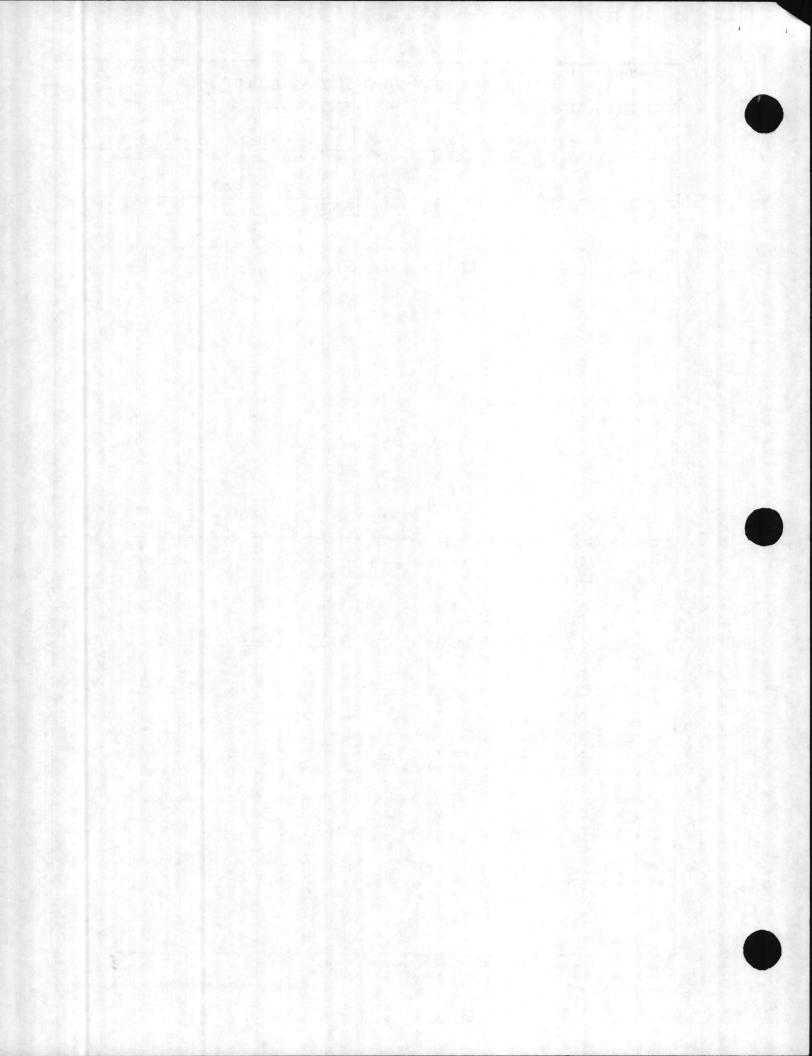


Marine Corp	AND LOCATION		4. PR	OJECT	TITLE			
Camp Lejeur	ne, North Carolina						ulatio	on T (\$000)
PROGRAM ELEMENT 6. CATEGORY CODE 7. PR		7. PROJE	CT NUN	ABER	8.			1 (\$000)
						196.	28	
	and the second	COST ESTIMA	TES				UNIT	соят
	ITEM			U/M	QUAN	TITY	COST	(\$000)
Pipe Insula	ation (Hospital Point)			L.S		-	- ;	176.033
SIOH (5.5%))							9.682
Total Funde	ed Cost		•	diana.	a she	10.40		185.715
Unfunded Co	ost (Design 6%)			1.19				10.562
Total Proje	ect Cost (FY87)							196.277
5				ŀ				
Upgrade pi	OF PROPOSED CONSTRUCTION pe insulation on the B	-						
Upgrade pij Condensate		following	, bui	ldin				
Upgrade pij Condensate	pe insulation on the B Return System in the	following	, bui	ldin				
Upgrade pij Condensate H17, H17N,	pe insulation on the B Return System in the H18, H19, H21, H23, H	following	, bui	1din 39.	gs:	н14,		
Upgrade pij Condensate H17, H17N, Il. REQUIREMEN PROJECT:	pe insulation on the B Return System in the H18, H19, H21, H23, H T N/A <u>ADEQ</u> Upgrade pipe insulatio	following 24, H36 a UATE n	y bui and H	1din 39.	gs:	н14,	H15A	, H16,
Upgrade pij Condensate H17, H17N, 11. <u>REQUIREMEN'</u> <u>PROJECT:</u> SPECIFIC P	pe insulation on the B Return System in the H18, H19, H21, H23, H T N/A ADEQ Upgrade pipe insulatio URPOSE: Reduce energy	following 24, H36 a UATE n consumpt	y bui ind H 'N/A	ldin 39.	gs: <u>SUE</u>	H14,	H15A	, H16, N/A
Upgrade pij Condensate H17, H17N, 11. REQUIREMEN PROJECT: SPECIFIC P REQUIREMEN	pe insulation on the B Return System in the H18, H19, H21, H23, H T N/A <u>ADEQ</u> Upgrade pipe insulatio	following 24, H36 a UATE n consumpt not only	y bui and H 'N/A cion save	ldin 39. dol	gs: <u>SUE</u>	H14,	H15A	, H16, N/A
Upgrade pij Condensate H17, H17N, Il. REQUIREMEN PROJECT: SPECIFIC P REQUIREMEN installati	pe insulation on the B Return System in the H18, H19, H21, H23, H T N/A ADEQ Upgrade pipe insulatio URPOSE: Reduce energy T: This project will on obtain its schedule TUATION: Energy is be	following 24, H36 a UATE n consumpt not only d energy	y bui and H 'N/A cion save goal	ldin 39. dol s.	gs: <u>SUE</u> lars,	H14, SSTAN	H15A DARD will	, H16, N/A help this
Upgrade pij Condensate H17, H17N, Il. REQUIREMEN' PROJECT: SPECIFIC P REQUIREMEN' installati CURRENT SI and conden	pe insulation on the B Return System in the H18, H19, H21, H23, H T N/A ADEQ Upgrade pipe insulatio URPOSE: Reduce energy T: This project will on obtain its schedule TUATION: Energy is be sate lines.	following 24, H36 a UATE n consumpt not only d energy ing waste	y bui and H 'N/A cion save goal goal	dol s.	gs: <u>SUE</u> lars, h poo	H14, SSTAN but	H15A DARD will insul	, H16, N/A help this ated steam
Upgrade pij Condensate H17, H17N, Il. REQUIREMEN PROJECT: SPECIFIC P REQUIREMEN installati CURRENT SI and conden IMPACT IF to be wast	pe insulation on the B Return System in the H18, H19, H21, H23, H T N/A ADEQ Upgrade pipe insulatio URPOSE: Reduce energy T: This project will on obtain its schedule TUATION: Energy is be sate lines. NOT PROVIDED: 47,366. ed each year.	following 24, H36 a UATE n consumpt not only d energy ing waste 7 MBtu of	N/A N/A save goal ed th	dol s. roug	gs: <u>SUE</u> lars, h poc and {	but but but	H15A DARD will insul 621 w	, H16, N/A help this ated steam ill contir
Upgrade pij Condensate H17, H17N, 11. <u>REQUIREMEN</u> <u>PROJECT:</u> <u>SPECIFIC P</u> <u>REQUIREMEN</u> installation <u>CURRENT SI</u> and conden <u>IMPACT IF</u> to be wast ADDITIONAL	pe insulation on the B Return System in the H18, H19, H21, H23, H T N/A ADEQ Upgrade pipe insulatio URPOSE: Reduce energy T: This project will on obtain its schedule TUATION: Energy is be sate lines. NOT PROVIDED: 47,366.	following 24, H36 a UATE n consumpt not only d energy ing waste 7 MBtu of s has bee	y bui and H 'N/A cion save goal ed th f ene en pr	dol s. roug rgy epar	gs: <u>SUE</u> lars, h poo and s red fo	but but but but	H15A DARD will insul 621 w is pr	, H16, N/A help this ated steam ill contir oject.
Upgrade pij Condensate H17, H17N, 11. <u>REQUIREMEN</u> <u>PROJECT:</u> <u>SPECIFIC P</u> <u>REQUIREMEN</u> installation <u>CURRENT SI</u> and conden <u>IMPACT IF</u> to be wast ADDITIONAL	pe insulation on the B Return System in the H18, H19, H21, H23, H T N/A ADEQ Upgrade pipe insulatio URPOSE: Reduce energy T: This project will on obtain its schedule TUATION: Energy is be sate lines. NOT PROVIDED: 47,366. ed each year. : An economic analysi	following 24, H36 a UATE n consumpt not only d energy ing waste 7 MBtu of s has bee	y bui and H 'N/A cion save goal ed th f ene en pr	dol s. roug rgy epar	gs: <u>SUE</u> lars, h poo and s red fo	but but but but	H15A DARD will insul 621 w is pr	, H16, N/A help this ated steam ill contir oject.
Upgrade pij Condensate H17, H17N, 11. <u>REQUIREMEN</u> <u>PROJECT:</u> <u>SPECIFIC P</u> <u>REQUIREMEN</u> installation <u>CURRENT SI</u> and conden <u>IMPACT IF</u> to be wast ADDITIONAL	pe insulation on the B Return System in the H18, H19, H21, H23, H T N/A ADEQ Upgrade pipe insulatio URPOSE: Reduce energy T: This project will on obtain its schedule TUATION: Energy is be sate lines. NOT PROVIDED: 47,366. ed each year. : An economic analysi	following 24, H36 a UATE n consumpt not only d energy ing waste 7 MBtu of s has bee	y bui and H 'N/A cion save goal ed th f ene en pr	dol s. roug rgy epar	gs: <u>SUE</u> lars, h poo and s red fo	but but but but	H15A DARD will insul 621 w is pr	, H16, N/A help this ated steam ill contir oject.
Upgrade pij Condensate H17, H17N, 11. <u>REQUIREMEN</u> <u>PROJECT:</u> <u>SPECIFIC P</u> <u>REQUIREMEN</u> installation <u>CURRENT SI</u> and conden <u>IMPACT IF</u> to be wast ADDITIONAL	pe insulation on the B Return System in the H18, H19, H21, H23, H T N/A ADEQ Upgrade pipe insulatio URPOSE: Reduce energy T: This project will on obtain its schedule TUATION: Energy is be sate lines. NOT PROVIDED: 47,366. ed each year. : An economic analysi	following 24, H36 a UATE n consumpt not only d energy ing waste 7 MBtu of s has bee	y bui and H 'N/A cion save goal ed th f ene en pr	dol s. roug rgy epar	gs: <u>SUE</u> lars, h poo and s red fo	but but but but	H15A DARD will insul 621 w is pr	, H16, N/A help this ated steam ill contir oject.

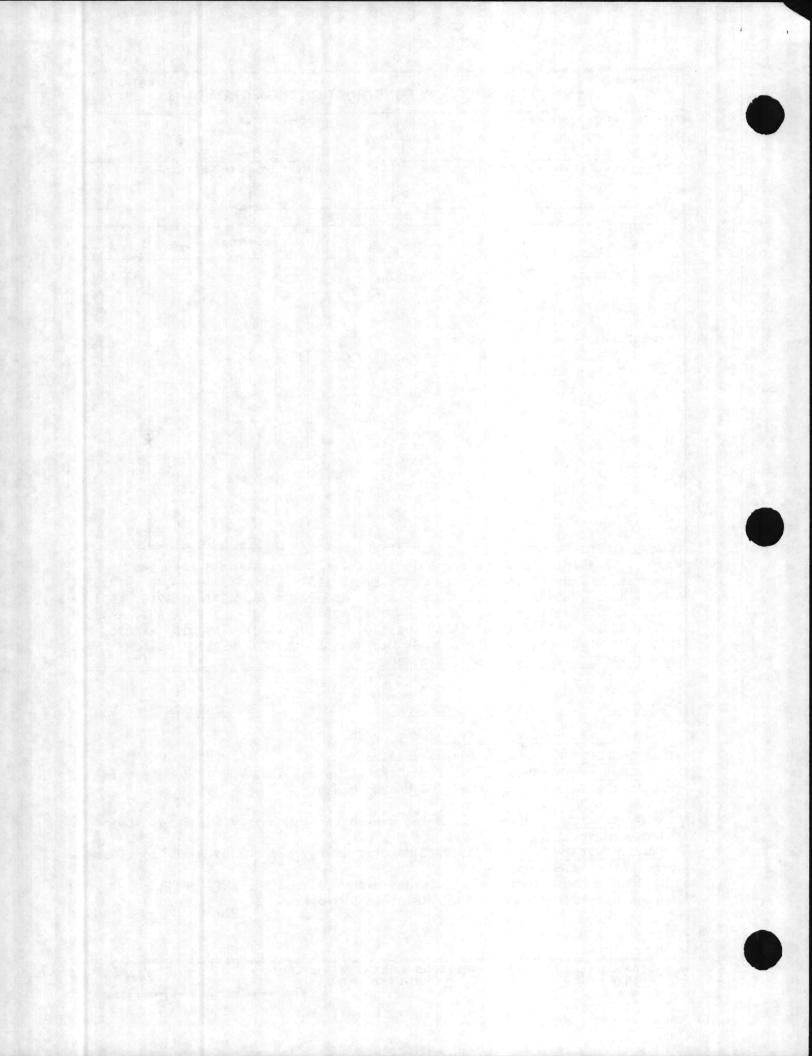


Manina Com	AND LOCATION		4. PR	OJECT	TITLE	1.19	
	s Base						
Camp Lejeun	ne, North Carolina	Sull'A.	Upg	rade	Pipe Inst	the second s	And in case of the local data was a second data was a second data was a second data was a second data was a se
PROGRAM ELEM	ENT 6. CATEGORY CODE	7. PROJ	ECT NUN	ABER	8. PROJE	CT COST	(\$000)
		10 - C - C - C - C - C - C - C - C - C -			95.7	7	
		. COST ESTIM	ATES		1		
						UNIT	COST
	ITEM			U/M	QUANTITY	COST	(\$000)
Pipe Insula	tion (Rifle Range an	nd Beach A	rea)	L.S	- "		85.890
SIOH (5.5%)						~ ~	4.724
Total Funde	d Cost		•.				90.614
Unfunded Co	ost (Design 6%)						5.153
Total Proje	ect Cost (FY87)			ं			95.767
			۰.				
							11.1.2
					1.1	10.0	
							2 .
							, 1.
						2	
of Jacano Lat	pe insulation on the Return System in the	e followin	na bui	ldin	gs:		
Rife Range:		R4, RR5, 1	RR8, R	æ9,		1, RR1:	2
Rife Range: Beach Area	: RR1, RR2, RR3, R	R4, RR5, 1	RR8, R	æ9,		1, RR1:	2
Rife Range:	: RR1, RR2, RR3, R : BA101, BA102, BA10	R4, RR5, 1	RR8, R	ж9, 05, в	A128	1, RR1: STANDA	
Rife Range: Beach Area 11. REQUIREMENT PROJECT: SPECIFIC PU REQUIREMENT	: RR1, RR2, RR3, R : BA101, BA102, BA10	R4, RR5, 1 03, BA104 EQUATE ion gy consump 1 not only	RR8, R , BA10 ption y save	2R9, 05, B N/	Al28 A <u>SUB</u>	STANDA	<u>rd</u> n/A
Rife Range: <u>Beach Area</u> 11. <u>REQUIREMEN'</u> <u>PROJECT:</u> <u>SPECIFIC PI</u> <u>REQUIREMEN'</u> installation <u>CURRENT SI'</u> and conden <u>IMPACT IF</u>	RR1, RR2, RR3, R BA101, BA102, BA10 T N/A AD Upgrade pipe insulat URPOSE: Reduce enery T: This project wil on obtain its schedu TUATION: Energy is S sate lines. NOT PROVIDED: 15,99	R4, RR5, 1 03, BA104 EQUATE ion gy consump 1 not only led energy	RR8, R , BA10 otion y save y goal ted th	N/ s. hroug	Al28 A <u>SUB</u> lars, but h poorly	STANDA	RD N/F
Rife Range: <u>Beach Area</u> 11. <u>REQUIREMEN'</u> <u>PROJECT:</u> <u>SPECIFIC PI</u> <u>REQUIREMEN'</u> installation <u>CURRENT SI'</u> and conden <u>IMPACT IF</u> to be wast ADDITIONAL	RR1, RR2, RR3, R BA101, BA102, BA10 T N/A AD Upgrade pipe insulat URPOSE: Reduce energy T: This project will on obtain its schedu TUATION: Energy is T sate lines.	R4, RR5, 1 03, BA104 EQUATE ion gy consumy 1 not only led energy being was 6.4 MBtu sis has b	PR8, R , BA10 ption y save y goal ted th of ene	R9, <u>5, B</u> N/ dol s. nroug ergy cepar	Al28 A <u>SUB</u> lars, but h poorly and \$46,5 ed for th	STANDA will i insula 40 wil nis pro	RD N/F help this ted steam 1 continu ject.

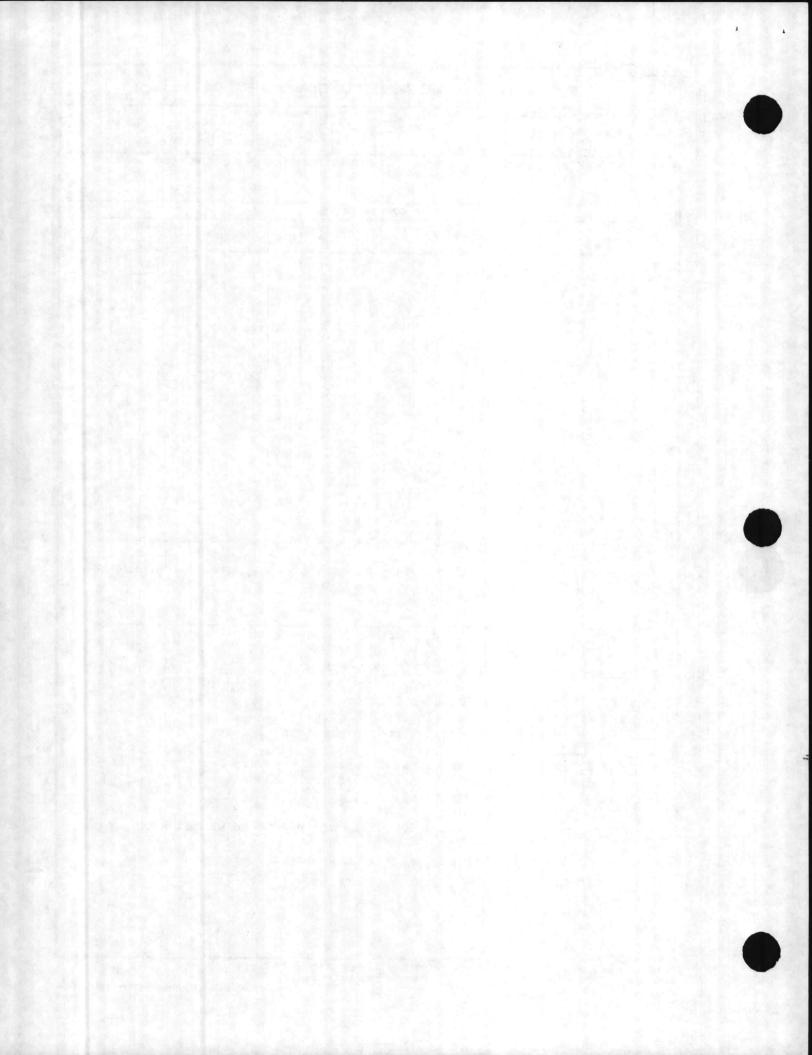
7-001-3010



	FY 1988 MI	LITARY CONST	RUCTIO	N PR	OJECT DA	TA	June 8
3. INSTALLATION A Marine Corps					TITLE		
S. PROGRAM ELEM			OJECT NU		Pipe Ins	CT COST	
		9. COST EST	MATES	-		1.1	
	ITEM			U/M	QUANTITY	COST	COST (\$000)
Pipe Insulati	on (New River	Air Station)		L.S		-	101.880
SIOH (5.5%)						i.	5.60
Total Funded	Cost						107.48
Unfunded Cost	(Design 6%)				•		6.11
Total Project	Cost (FY87)	90 1					113.596
			κ.	•	1. Sugar		113.596
							e stander Geografie
					·····		
AS124, AS130,	AS202, AS205 AS225, AS226	n the followin , AS208, AS211 , AS232, AS236 , AS515, AS518	, AS212	, AS , AS 0, A	213, AS21 302, AS31 S4012, AS	4, AS21 2, AS32 4015, A	5, AS216
AS424, AS425, AS4025, AS403	0, AS4035, AS	4100, AS4106,	AS4108,	AS4	110, AS41	20, AS4	S4C2O, 122,
AS424, AS425, AS4025, AS403 AS4141, AS414	ASJ02, ASJ04 0, AS4035, AS 5, AS4146, AS	4100, AS4106,	, AS401 AS4108,	AS4	110, AS41	20, AS4	S4C20, 122,
AS424, AS425, AS4025, AS403	0, AS4035, AS	4100, AS4106,	, AS401 AS4108,	AS4	110, AS41 <u>SUBSTA</u>	20, AS4	S4C20, 122, N/A
AS424, AS425, AS4025, AS403 AS4141, AS414 11. REQUIREMENT PROJECT: Upg: SPECIFIC PURP REQUIREMENT:	0, AS4035, AS 5, AS4146, AS N/A rade pipe inst OSE: Reduce of This project	4100, AS4106, 4157, AS4158 ADEQUATE	N/A N/A tion save d	AS4	SUBSTA	20, AS4	122, N/A
AS424, AS425, AS4025, AS403 AS4141, AS414 11. REQUIREMENT PROJECT: Upg: SPECIFIC PURPO REQUIREMENT: Installation of CURRENT SITUA and condensate IMPACT IF NOT	0, AS4035, AS 5, AS4146, AS N/A rade pipe inst OSE: Reduce of This project obtain its sch TION: Energy e lines. PROVIDED: 1	4100, AS4106, 4157, AS4158 ADEQUATE alation energy consump will not only meduled energy is being waste	N/A N/A tion save d goals. ed thro	AS4	<u>SUBSTA</u> rs, but w poorly in	20, AS4	122, N/A p this steam
AS424, AS425, AS4025, AS403 AS4141, AS414 11. REQUIREMENT PROJECT: Upg: SPECIFIC PURP REQUIREMENT: installation of CURRENT SITUA and condensate MPACT IF NOT to be wasted of ADDITIONAL:	0, AS4035, AS 5, AS4146, AS N/A rade pipe inst OSE: Reduce of This project obtain its scl TION: Energy e lines. PROVIDED: 1 each year. An economic an	Alequate ADEQUATE ADEQUATE alation energy consump will not only neduled energy	N/A N/A tion save d goals. ed thro f energ en prep	AS4 olla: ugh j y and ared	SUBSTA rs, but w poorly in d \$44,170 for this	20, AS4 NDARD ill hel sulated will c projec	122, N/A p this steam ontinue



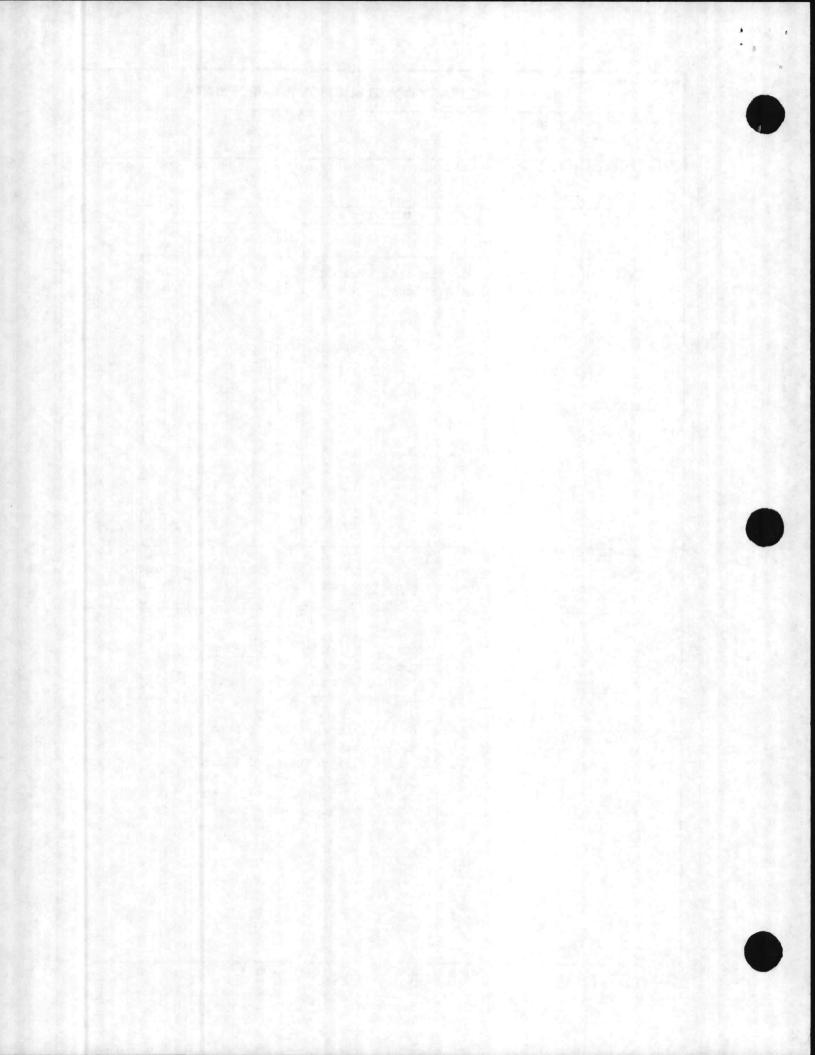
Marine Corp	AND LOC	ATION	4.1	ROJECT	TITLE		3 June 87
			Re	nlace	Steam Ma	nhole 1	Eiectors
Camp Lejeur		th Carolina	7. PROJECT N	-		CT COST	
PHOSPAM ELEN		C. CATEGORT CODE					100
S. T. Sales	1				208	.73	
		9. C	OST ESTIMATES	-		1	1
		ITEM		U/M	QUANTITY	COST	COST (\$000)
Syphon Je	t Sump	Pumps		Ea.	400	468	187.200
SIOH (5.5%)	1						10.296
Total Fund	ed Cost	:		·			197.496
Unfunded Co	ost (De	esign 6%)		1.0			11.232
Total Proj	ect Cos	st (FY87)					208.728
			٠.	1			1. 64
				1			
						1 × 1	1.1
D. DESCRIPTION	OF PROPO	SED CONSTRUCTION		-	1	1	-
Replace Ex	isting	steam pit and ma	anhole eject	tor su	mp pumps	which	have been
discontinu	ed with	h syphon jet sump	p pumps.				
BUT S WAS		CALLER A. D.S.		(Vernet 1947			
11.					CUDOWAN		N/A
REQUIREMEN	T	N/A ADEQU	JATE N/	A	SUBSTAN	DARD	N/A
	Replace	e Steam Manhole I					
PRO.TECT.			Ejectors.				
PROJECT: SPECIFIC P	URPOSE	: Reduce mainter	Ejectors. nance costs				
SPECIFIC P REQUIREMEN	T: Th	is project will :	nance costs reduce main	tenand			
SPECIFIC F REQUIREMEN CURRENT SI	TUATIO	is project will : N: Excessive ma	nance costs reduce main intenance d	tenano ollar:	s are bei	ng sper	nt on
SPECIFIC F REQUIREMEN CURRENT SI maintainir	TUATIO	is project will :	nance costs reduce main intenance d are unrelia	tenano ollar:	s are bei	ng sper have be	nt on een
SPECIFIC F REQUIREMEN CURRENT SI maintainir	T: Th TUATIO g ejec ned by	is project will : <u>N:</u> Excessive manufacturer	nance costs reduce main intenance d are unrelia	tenano ollar: ble a:	s are bein nd which l	have be	een
SPECIFIC F REQUIREMEN CURRENT SI maintainin discontinu IMPACT IF ADDITIONAI	T: Th TUATIO ng ejec ned by NOT PR	is project will : <u>N</u> : Excessive manufacture manufacturer <u>OVIDED</u> : \$193,60 economic analysi	nance costs reduce main intenance d are unrelia 0 will cont s has been	tenano ollar: ble a: inue prepa:	s are bein nd which l to be was red for th	have be ted eac his pro	een ch year. oject.
SPECIFIC F REQUIREMEN CURRENT SI maintainin discontinu IMPACT IF ADDITIONAI	T: Th TUATIO ng ejec ned by NOT PR	is project will : <u>N</u> : Excessive manufacture the manufacturer <u>OVIDED</u> : \$193,60	nance costs reduce main intenance d are unrelia 0 will cont s has been	tenano ollar: ble a: inue prepa:	s are bein nd which l to be was red for th	have be ted eac his pro	een ch year. oject.



	ND LOCATION				I More Ef		3 June 87
Marine Corps					ontrols	ricien	L
Camp Lejeune	ENT 6. CATEGORY CODE	7. PROJEC				CT COST	(\$000)
			- Alia	0.00	18	6.0	
	9.	COST ESTIMA	TES				1
	ITEM			U/M	QUANTITY	COST	COST (\$000)
Controls (N:	ight Setback, Outside	Air Shuto	off,				
	t Water Outside Air H					1.11.2	
(Ha	adnot Point)			L.S		-	165.925
SIOH (5.5%)			1				9.126
	1.0				1		175.05
Total Funde	a Cost						1 1
Unfunded Co	st (Design 6%)					1	9.95
Unitunded CO.	00 (D0D1911 00)		. 1	•			
Total Proje	ct Cost (FY87)		·				186.00
						100	10.00
							1.0
						× .	
					1		
Install nig	F PROPOSED CONSTRUCTION ht setback, outside a	air steam :	shutc	off a	and hot wa	ater ou	tside ai:
Install nig reset contr 11. REQUIREMENT PROJECT: I SPECIFIC PU this instal CURRENT SIT the HVAC sy IMPACT IF N to be waste ADDITIONAL:	ht setback, outside a ols in buildings: (QUATE t HVAC con will not heduled en eing waste ient contr .8 MBtu of is has bee	N/A trols only ergy d by ols. ener	s. save goal ine: rgy a	SUBSTAND e dollars ls. fficient and \$48,8 ed for th	ARD , but w operati 10 will is proj	N/A will help ion of continue

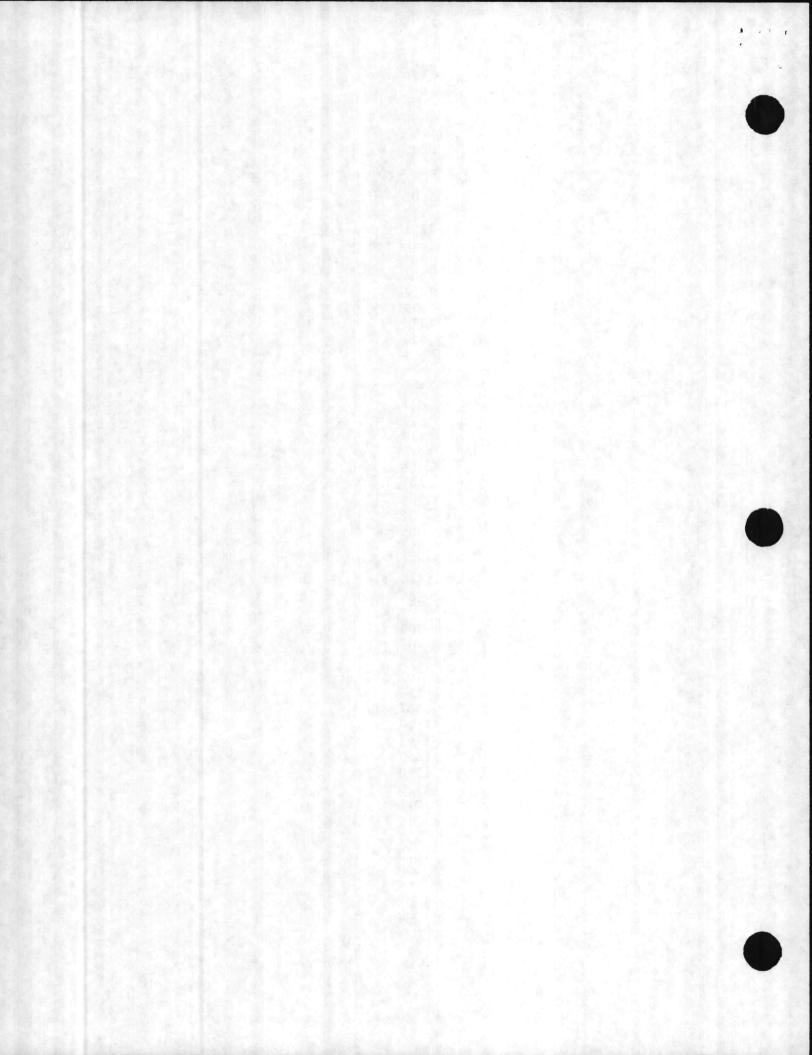
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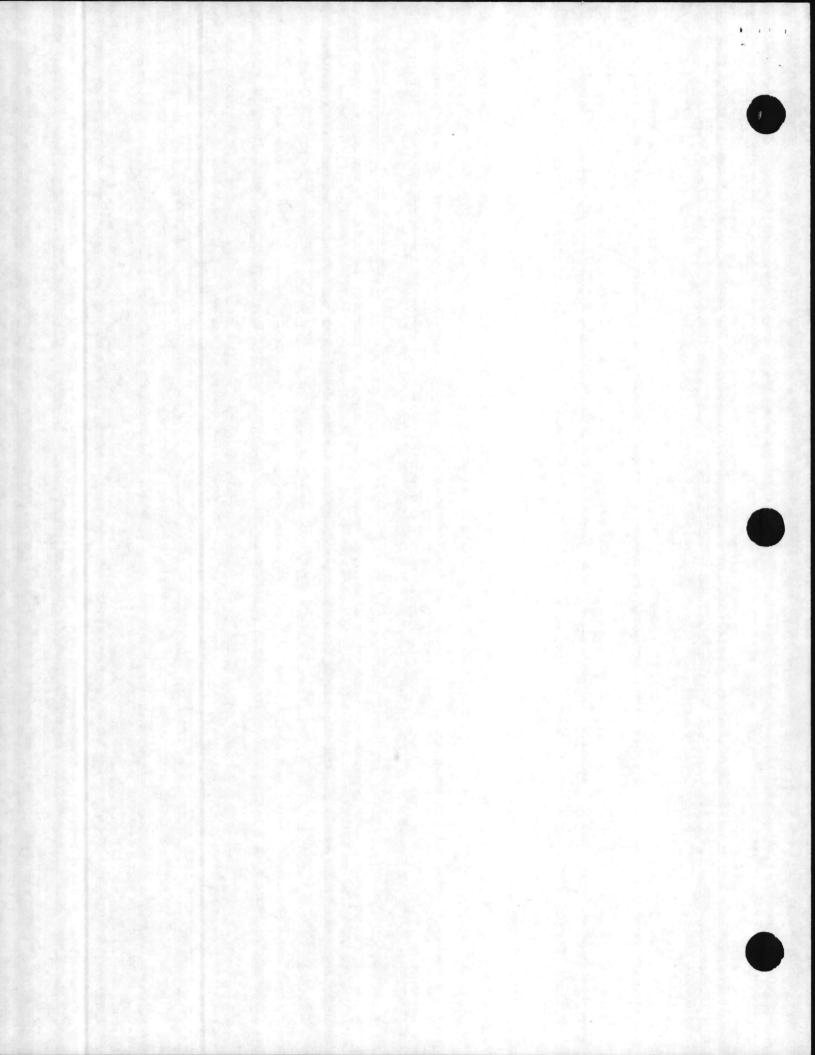
INSTALLATION	BLDG. NO.
HADNOT POINT	1502 915 1201 1118 907 904
	1012 1212 1116 1317 902
	909 1301 1011 1316 1117 1775
	916 1601 1108 901 905
	914 1211 1114 84 1
	509 206 424 107
	226 307 1500 1202 1450
	1780 1120 1771 15 900
	1200 500 54 1401 908



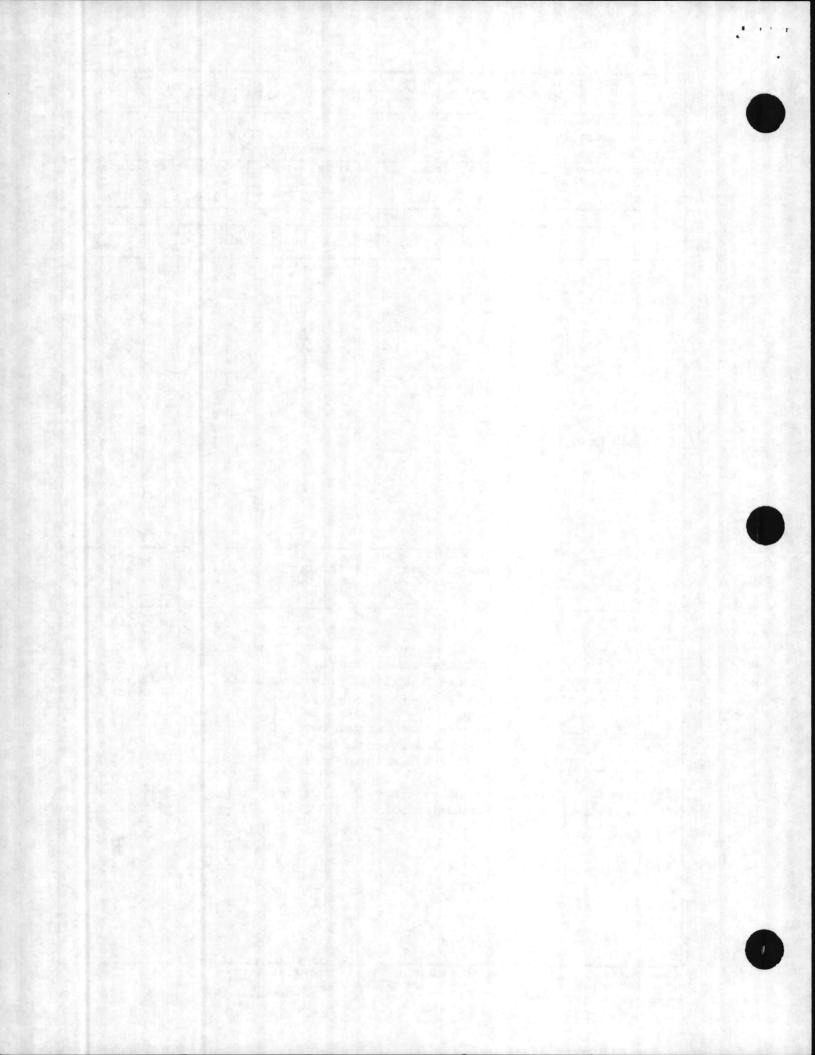




INSTALLATION	BLDG. NO.
	1403
	751
	1707
	1005
	420
	59
	2
	1101
	1041
	314
	106
	508
	1015
	1209
	1220
	1750
	1612
	1404
	25
	1309
	1302
	1310
	1409
	66
	412
	1410
	1606
	1607

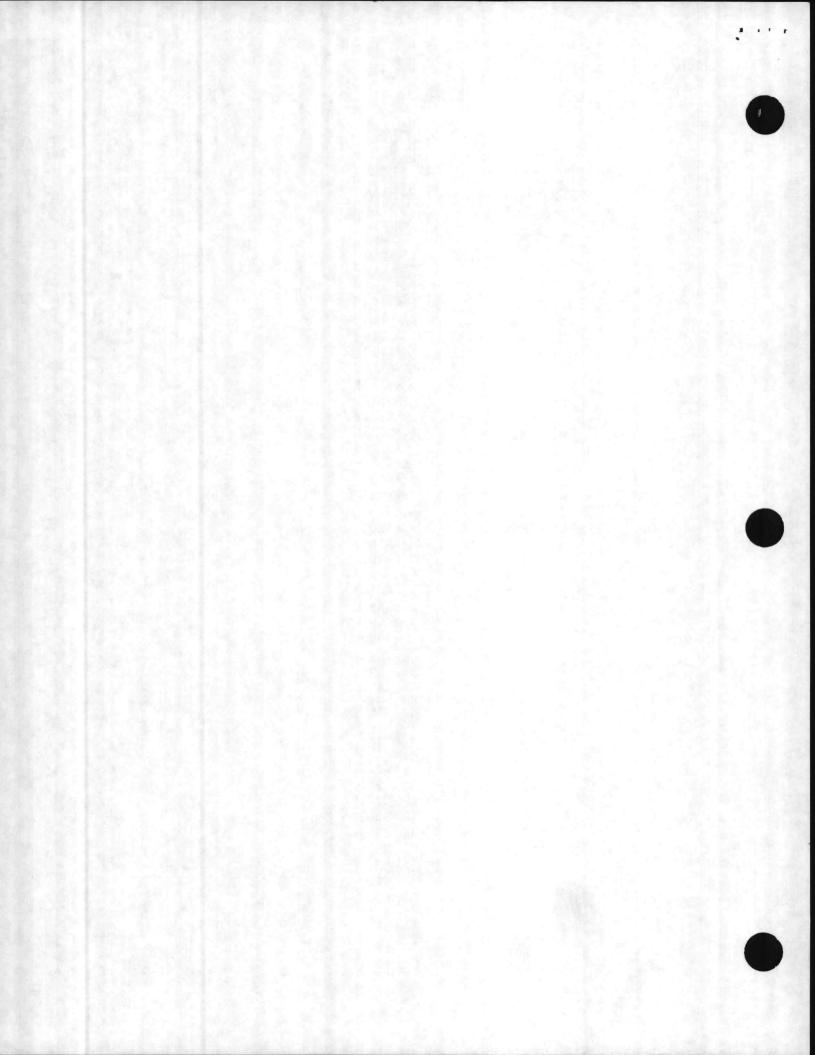


		19 88 MILITARY C	ONSTRUC		DJECT	1111		A	23	June 87
Marine Corps Camp Lejeune	Base			In		L Mo	re Ef:	fici	ent	
PROGRAM ELEM		6. CATEGORY CODE	7. PROJEC	TNU	JMBER 8. PR		B. PROJE	PROJECT COST (\$000)		
	14.60		OST ESTIMA	TES			134	4.96		la ligada de
		ITEM			U/M	QUA	NTITY	UN CO		COST (\$000)
Hot	t Water	etback, Outside A Coutside Air Res os Except Hadnot	set)	ff,	L.S			-		121.037
SIOH (5.5%)					Gelse	Min St				6.657
Total Funded	d Cost						lanin (127.694
Unfunded Co:	st (Des	sign 6%)								7.262
Total Proje	ct Cost	t (FY87)		۰.						134.956
						5		- 34		
										1 - N
Install night	ht set	DEC CONSTRUCTION Dack, outside air buildings: (see	r steam s attached	shuto l lis	ff an t)	nd i	hot wa	ter	out	side air
Install night reset contro	ht sethols in nstall RPOSE:	N/A <u>ADEQ</u> More efficient N This project w	Attached UATE HVAC cont ill not o	N/A N/A nly	t) save	<u>SU</u> do	BSTAND	ARD		N/A
Install night reset contro- net contro- ne	nstall RPOSE: lation UATION stems OT PRO d each An e	N/A <u>ADEQU</u> more efficient I This project wi obtain its sched : Energy is bein due to inefficien VIDED: 10,285.0	UATE HVAC cont ill not o duled ene ng wasted nt contro MBtu of has been	N/A rols only ergy d by ols. ener	t) save goal inef cgy a	SU do s. fic nd d f	BSTAND llars, ient o \$26,93 or thi	but pera	t wi atic ill roje	N/A Ill help on of continue
Install night reset contro- need contro- need contro- need contro- need contro- need control need control nee	nstall RPOSE: lation UATION stems OT PRO d each An e	N/A <u>ADEQU</u> more efficient I This project with obtain its scheet : Energy is bein due to inefficient VIDED: 10,285.0 year. conomic analysis	UATE HVAC cont ill not o duled ene ng wasted nt contro MBtu of has been	N/A rols only ergy d by ols. ener	t) save goal inef cgy a	SU do s. fic nd d f	BSTAND llars, ient o \$26,93 or thi	but pera	t wi atic ill roje	N/A Ill help on of continue





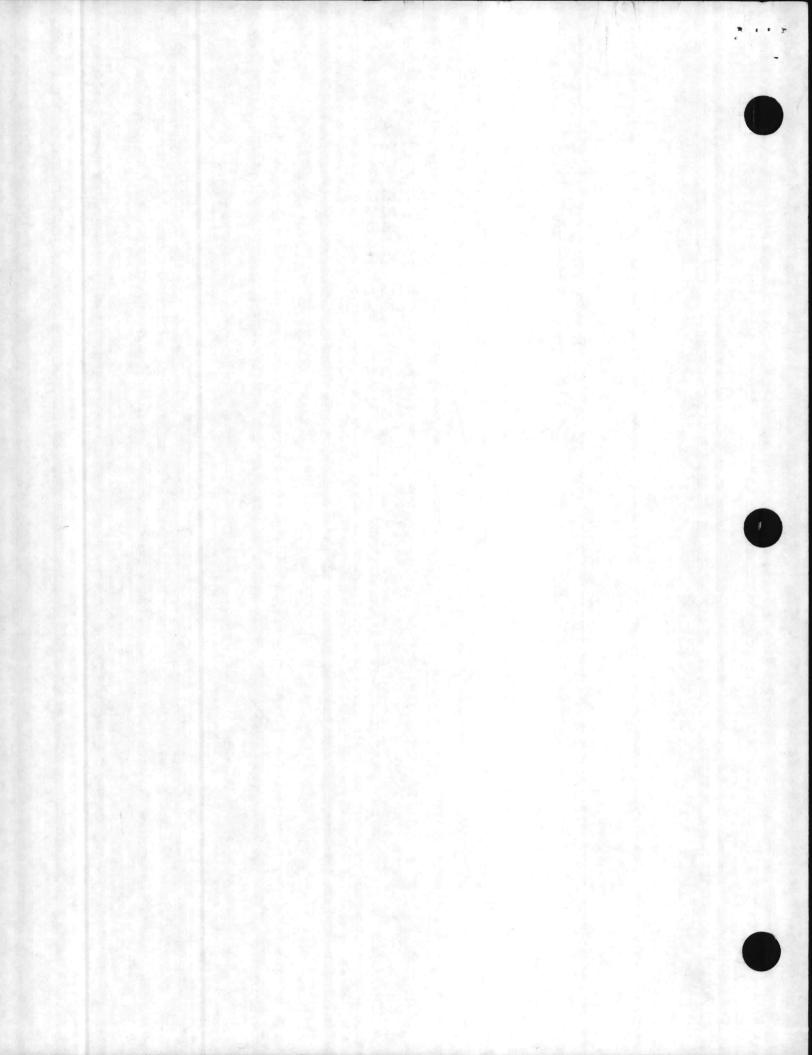
INSTALLATION	BLDG. NO.
HOSPITAL POINT	H15A
	H17A
	H17
	H21
	H19 H18
	hio
AIR STATION	AS424
	AS215
	AS216
	AS4110
	AS4158
	AS217
	AS130
	AS202
	AS118
	AS124
	AS4146
	AS122
	AS236
BEACH AREA	BA102
	BA104
	BA105
RIFLE RANGE	RR11
	RR1
	RR5
	RR2
	RR4
	RR9
	RR8
	RR3
FRENCH CREEK	FC100
I REITON ORBER	FC303
	FC200
	FC241
	FC251
	FC302
CAMP JOHNSON	M424
onan oonnoon	M324
	M202
	M129





	BLDG.
INSTALLATION	NO.
	M128
	M134
	M101
	M326
	M303
CAMP GEIGER	TC846
	TC910
COURTHOUSE BAY	BB51
	BB52
	BB28
	BB50
	BB54
PARADISE POINT	2624





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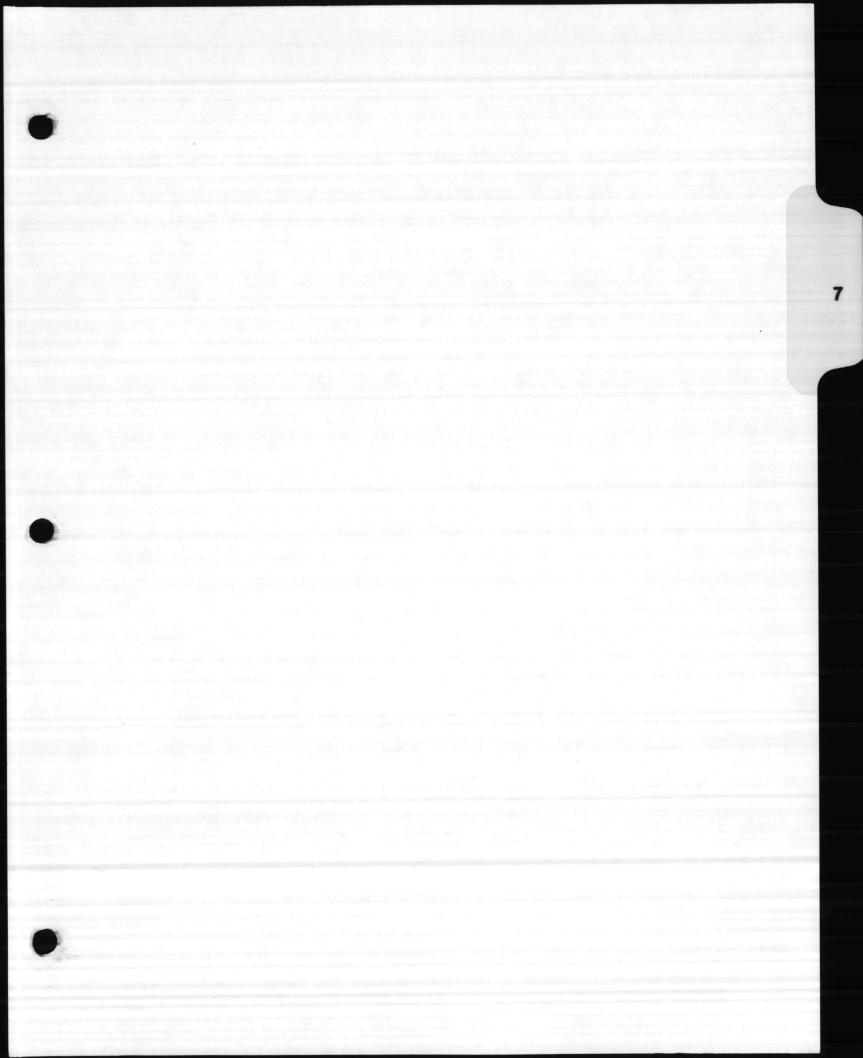
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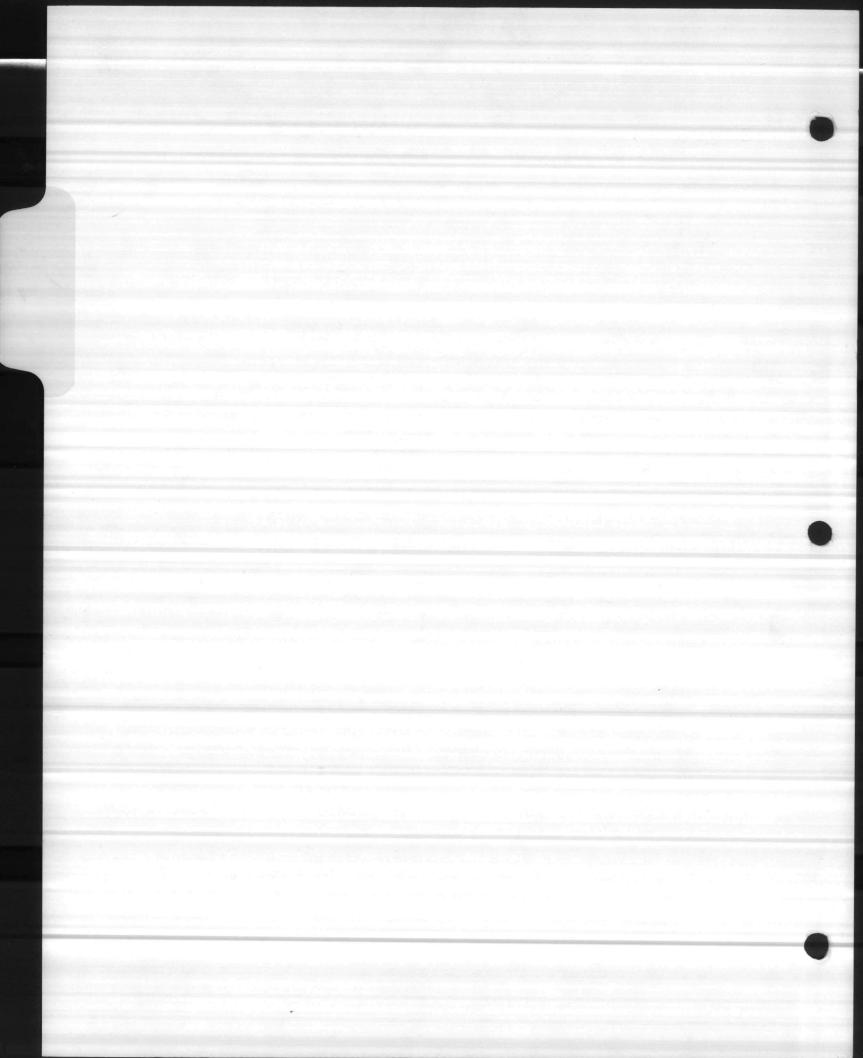
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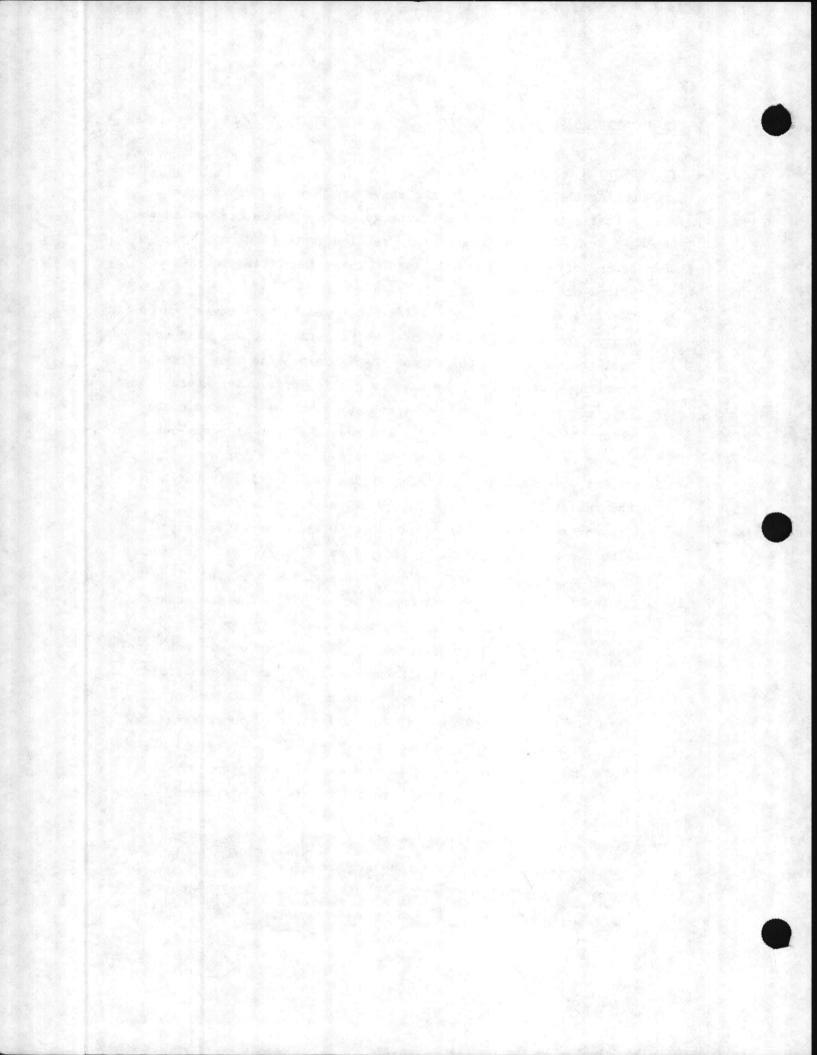


7.0 IDENTIFIED SOURCES OF ENERGY LOSS NOT IN SCOPE OF WORK

7.1 INTRODUCTION

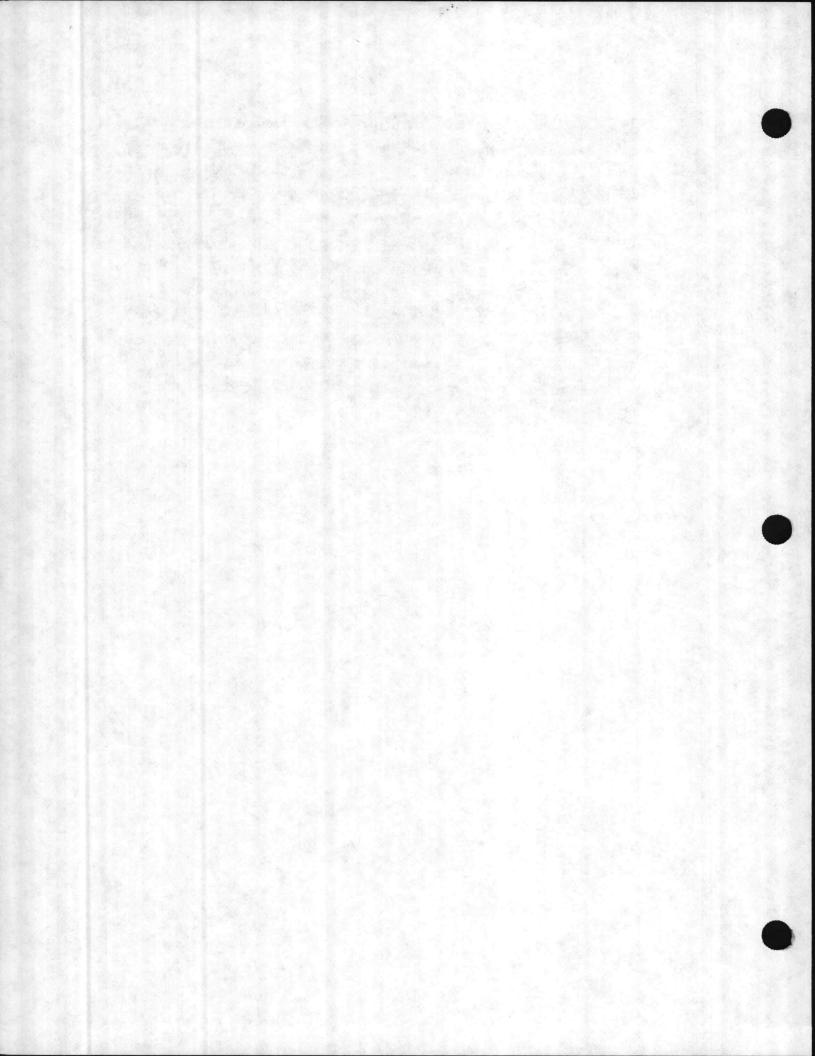
During the field survey, the surveyors detected or were told about other potential sources of energy savings which are not in the Scope of Work. The purpose of this section is to point out these sources and offer possible solutions. These identified sources of energy loss are as follows:

- 1. Cherry Point Public Works maintenance people have commented on energy losses from fintube heat exchangers which are used to cool the condensate to protect the FRP pipe line from steam in the trap discharge. Camp Lejeune Public Works maintenance people have stated there are problems with the FRP condensate return pipe lines which have resulted in a loss of water and energy from leaks. In systems designed by MAIN for our clients, we have used a piping system called "Ricwil" which has the FRP pipeline inside a rugged PVC pipe. A length (approximately 10 feet) of schedule 40 stainless steel pipe with a sparge tube on the inside, is used to connect the steam trap discharge to the FRP condensate return line. This length of pipe allows the trap condensate to mix with the condensate and cool to the allowable operating temperature for FRP pipe.
- 2. The architectural features of the buildings may or may not have been surveyed in the past with energy losses being quantified. During the survey, we observed buildings with insufficient insulation, single pan glass, air infiltration, doors standing open in hangers and industrial buildings, 100% make-up air for industrial buildings, etc. These observed conditions may be a source of sufficient energy loss to justify correction or further analysis.
- 3. Camp Geiger buildings TC1064 through TC1069 have condensate receivers which pump the condensate into the return piping system. This return piping system has about one mile of pipe between the buildings and the condensate return tank at the



boiler house G650. Those buildings which do not have pumped condensate return systems are connected to this same return line. In these buildings with the gravity return system, it is necessary to raise inlet steam pressure to the heat exchangers so that the condensate pressure is high enough to overcome the pressure in the return line. The increased inlet steam pressure is too great for the heat exchanger to operate properly. Therefore, to get proper operation of the heat AND STEAM TRAPS exchanger, the inlet steam pressure must be lowered and the condensate be discharged to the storm drain system. This results in several hundred Btus being lost for every pound of condensate dumped and requires additional treated water for boiler feedwater makeup.

IN DOING SO, THE RAISED INLET STEAM PRESSURE EXCEEDS THE PRESSURE SETTINGS ON THE STEAM TRAPS, CAUSING Them to malfuction and blow steam straight Thru.



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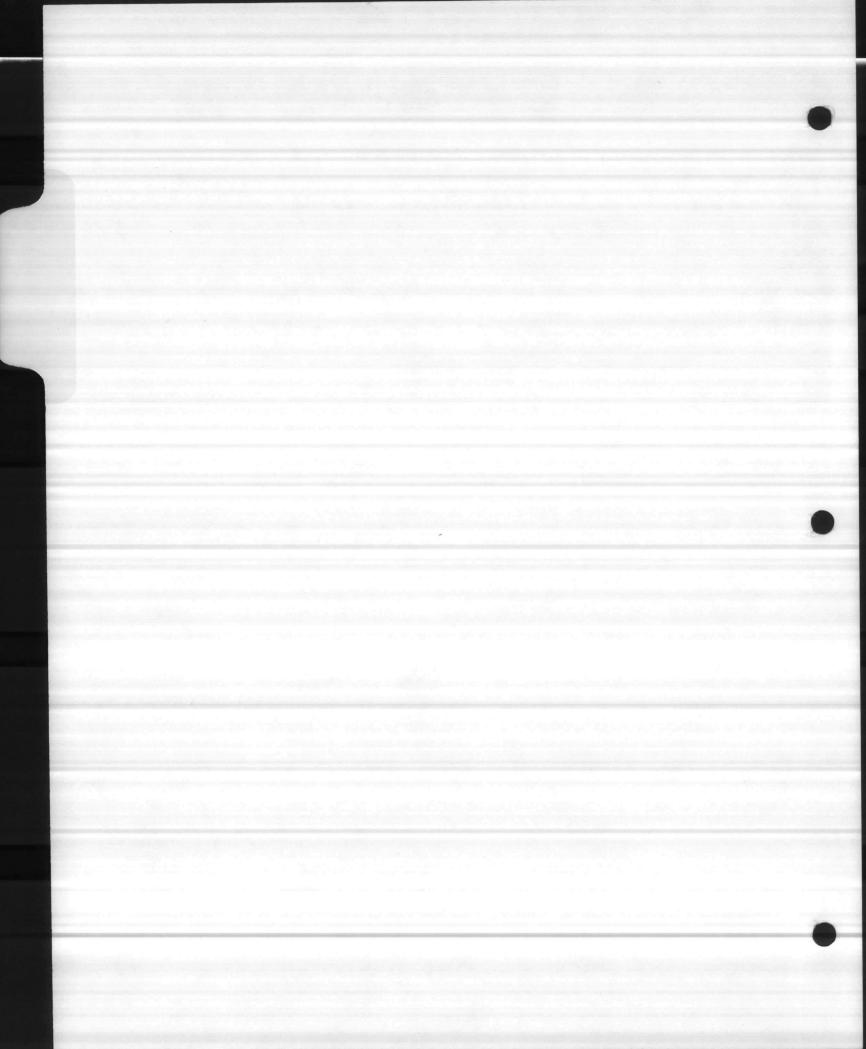
Appendix

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APPEZDIX



APPENDICES

PAGE

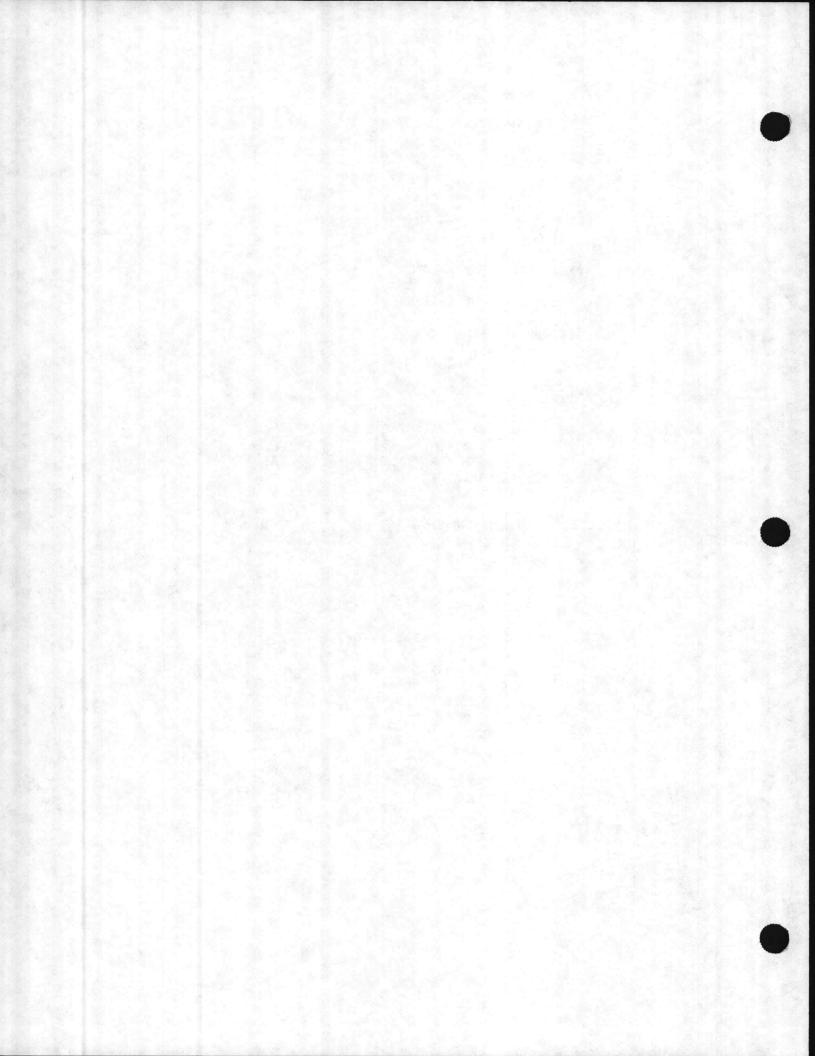
A	BUILDING LIST	A-1
В	EXISTING STEAM EJECTOR	B-1
с	AUTOMATIC SUMP DRAINER	C-1
D	SYPHON JET SUMP PUMP	D-1
E	ASHRAE 90A - 1980	E-1
F	PIPE INSULATION COSTS	F-1

G PIPE INSULATION MATERIAL TAKEOFF

NEW RIVER AIR STATION	G-AS-1
BEACH AREA	G-BA-1
CAMP GEIGER	G-CG-1
CAMP JOHNSON	G-CJ-1
COURTHOUSE BAY	G-CB-1
FRENCH CREEK	G-FC-1
HADNOT POINT	G-HP-1
HOSPITAL POINT	G-H-1
PARADISE POINT	G-PP-1
RIFLE RANGE	G-RR-1

H PIPE INSULATION ENERGY SAVINGS

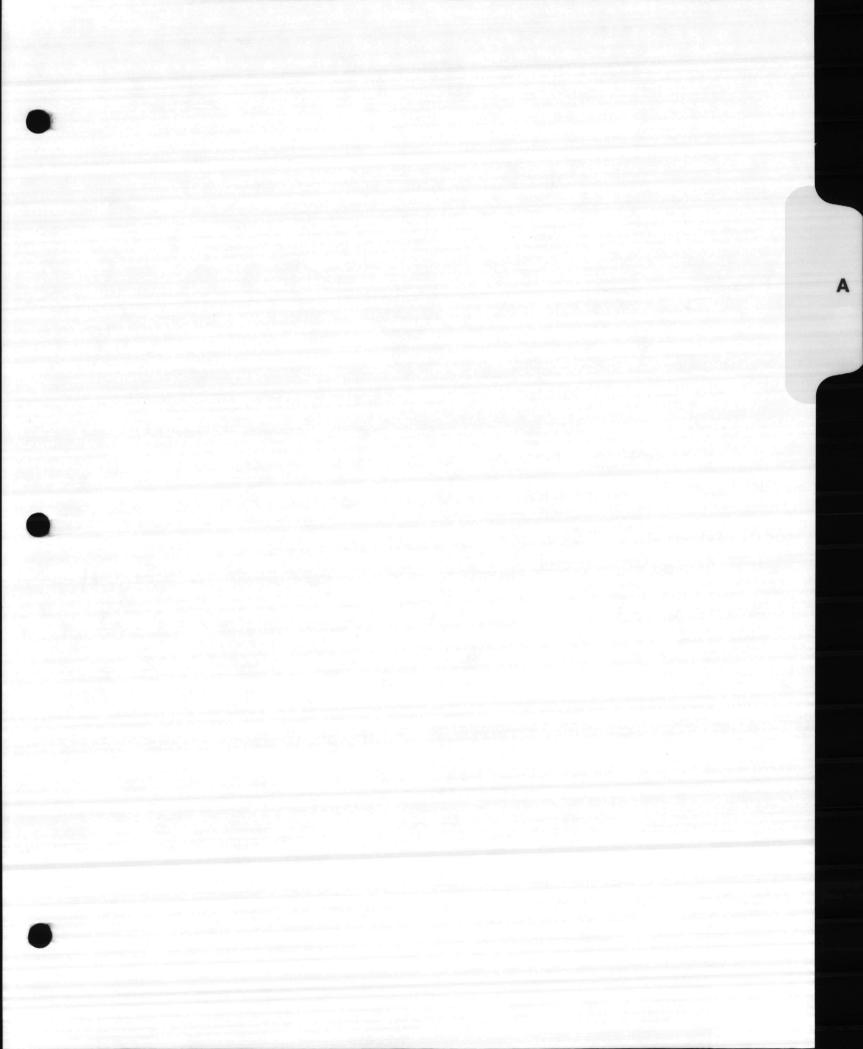
NEW RIVER AIR STATION	H-AS-1
BEACH AREA	H-BA-1
CAMP GEIGER	H-CG-1
CAMP JOHNSON	H-CJ-1
COURHOUSE BAY	H-CB-1
FRENCH CREEK	H-FC-1
HADNOT POINT	H-HP-1
HOSPITAL POINT	H-H-1
PARADISE POINT	H-PP-1
RIFLE RANGE	H-RR-1

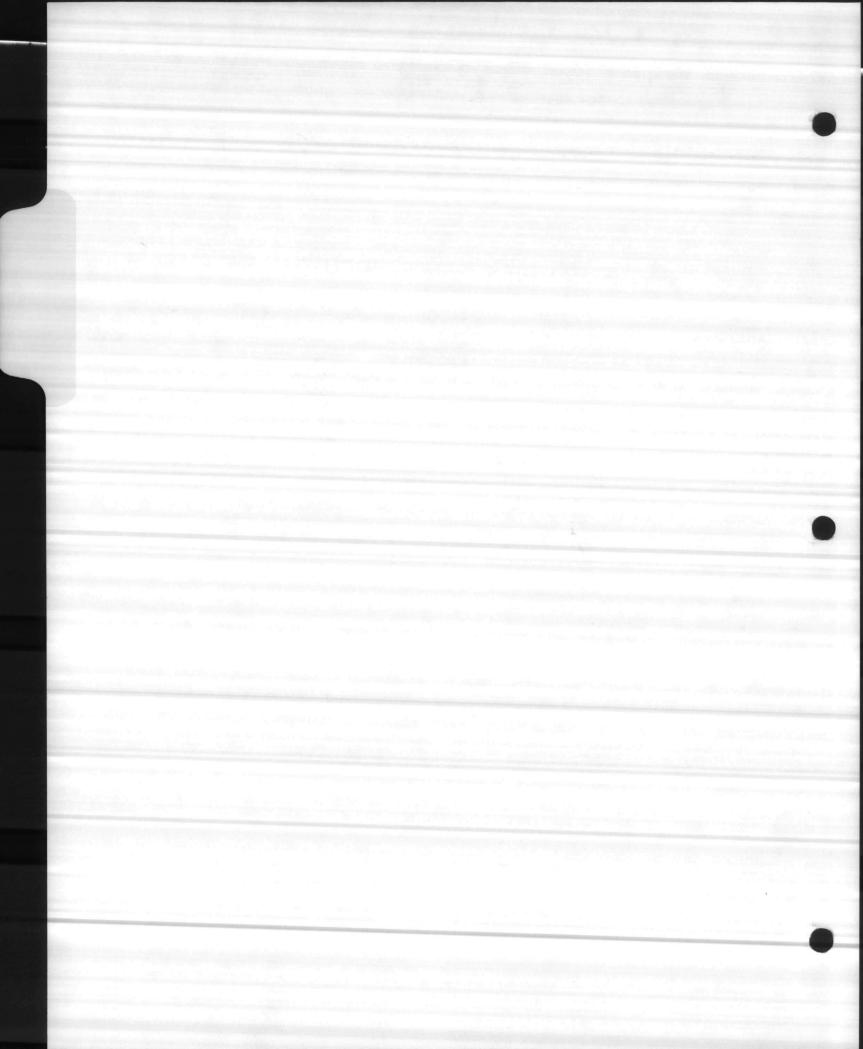


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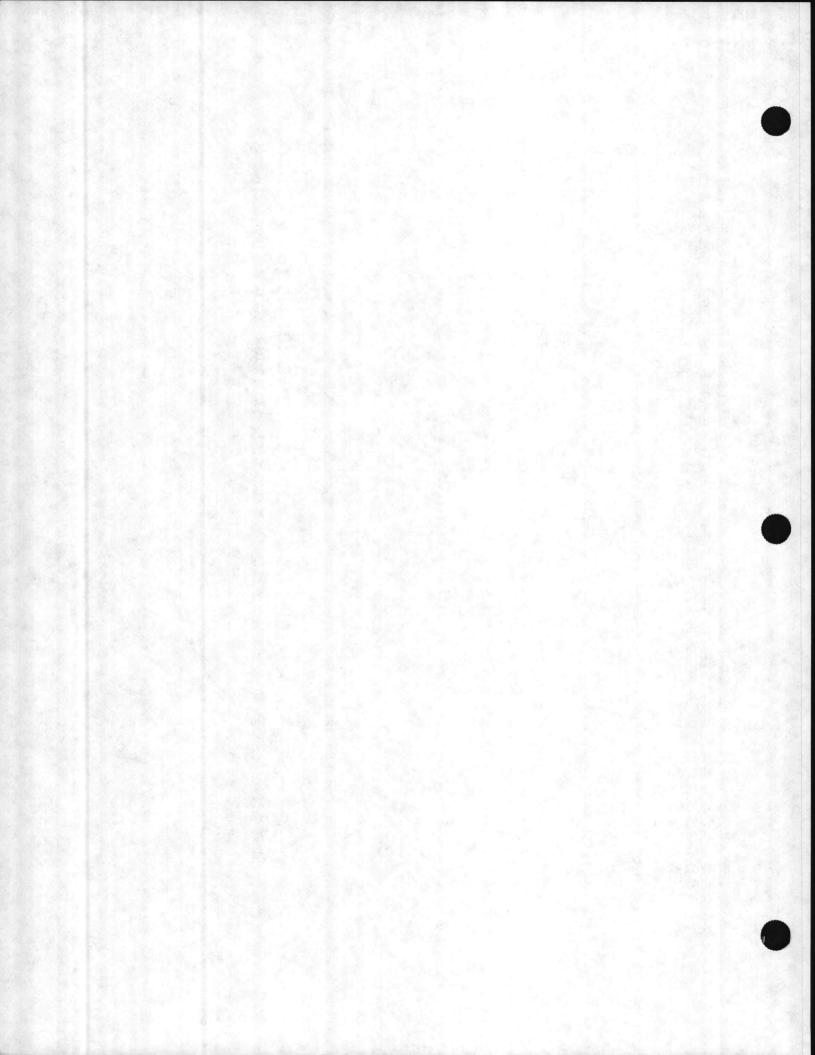


AIR STATION BUILDING LIST

BUILDING NO.	BUILDING USE	MAP LOC
AS114	новву ѕнор	B5/25
AS118	AUTO MAINT SHOP	B5/25
AS122	PW SHOPS	B5/26
AS124	PW SHOPS	B5/25
AS130	GEN WHSE	C1/26
AS202	GYMNASIUM	B5/26
AS205	EX SNACK STD	B5/26
AS208	EM CLUB E1-E5	B5/26
AS211	ADMIN	B5/26
AS212	BEQ E1-E4	C1/26
AS213	BEQ E1-E4	C1/26
AS214	BEQ E1-E4	C1/26
AS215	BEQ E1-E4	C1/26
AS215 AS216	ADMIN	C1/26
AS210 AS217	ADMIN	C1/26
AS222	APPL INSTR BLDG	C1/31
AS225	MECH ROOM	C1/26
AS225 AS226	EM DINING FAC	C1/31
AS220 AS232	RETAIL STR EX	B5/31
AS232 AS236	CHAPEL	B5/31
	THEATRE	B5/31
AS240	DENTAL CLINIC	B5/31
AS302		C1/32
AS312	APPL INSTR BLDG	
AS320	OPERATIONAL TR	C1/32
AS414	COMMISSARY	C1/26
AS424	GEN STORAGE	C1/31
AS425	DATA PRO CENTER	C1/32
AS502	FIRE/RESCUE ST	C2/32
AS504	HANGER	C2/31
AS515	HANGER	C2/26
AS518	HANGER	C2/25
AS4010	BEQ E1-E4	C3/23
AS4012	EM DINING FAC	C3/23
AS4015	BEQ E1-E4	C3/23
AS4020	BEQ E1-E4	C2/24
AS4025	BEQ E1-E4	C2/23
AS4030	BEQ E1-E4	C2/23
AS4035	BEQ E1-E4	C3/23
AS4100	HANGER	C3/25
AS4106	HANGER	C4/25
AS4108	HANGER	C4/24
AS4110	GENL STG	C3/25
AS4120	ARMORY	C4/24
AS4122	REG/GROUP HDQ	C4/24
AS4141	AVIONICS	C2/25
AS4145	ARMORY	C2/25
AS4146	GSE SHOP	C2/25
AS4157	ADMIN	C4/23

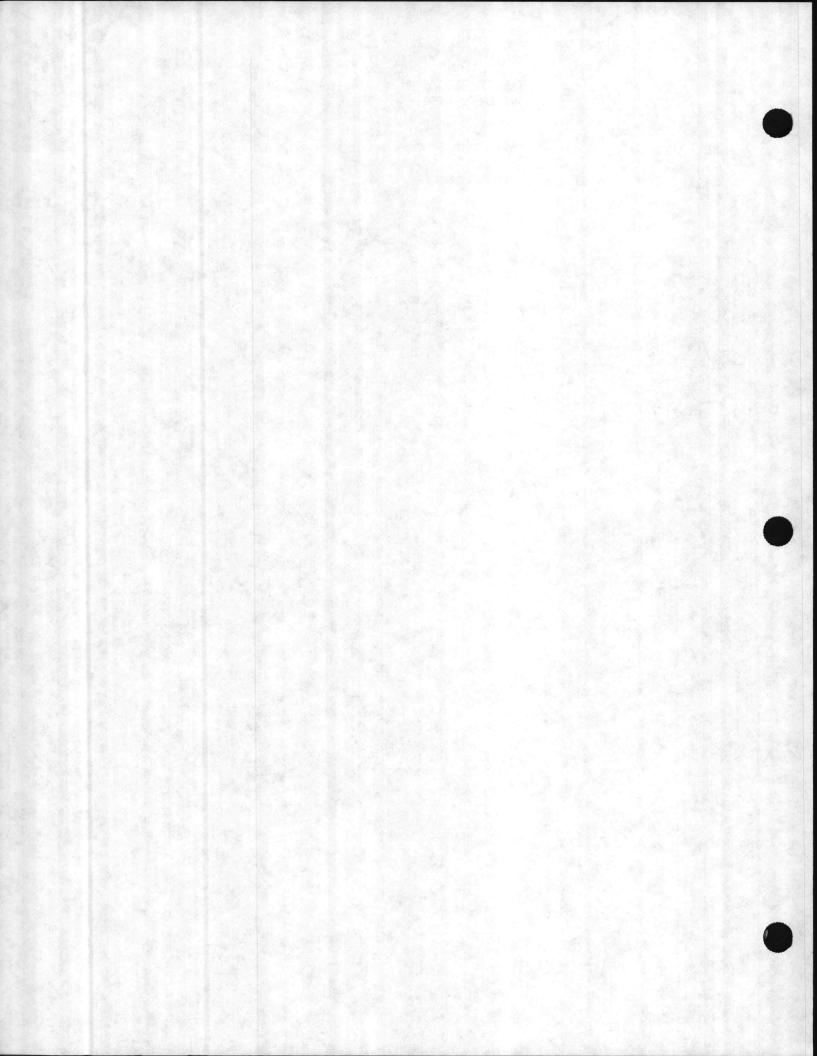


A-l



AIR STATION BUILDING LIST

		MAP
BUILDING NO.	BUILDING USE	LOC
AS4158	MAINT BUILDING	C4/23

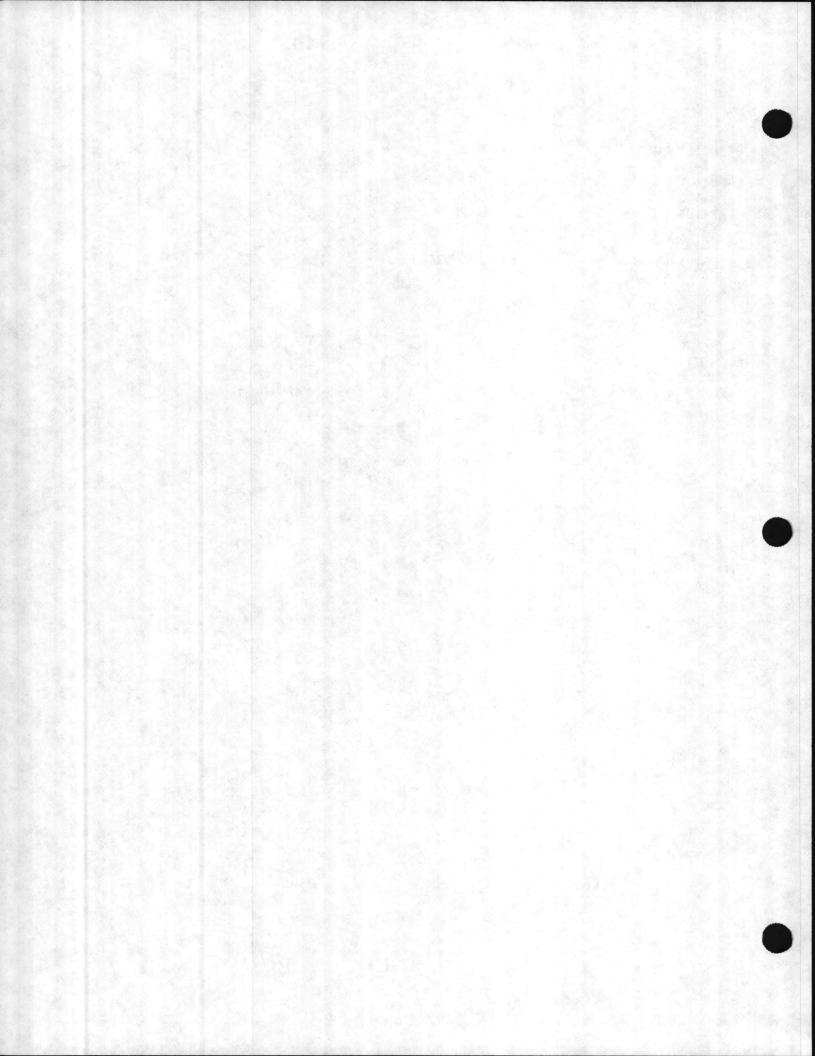


BEACH AREA BUILDING LIST

		MAP
BUILDING NO.	BUILDING USE	LOC
BA101	LOCATION EXCHANGE	N5/115
BA102	BN SQDRN HDQTRS	N5/115
BA103	EM DINING FAC	P1/114
BA 104	BEQ E1-E4	P1/114
BA105	DISPENSARY	P1/114
BA128	GEN STG A/G/ORG	P1/114

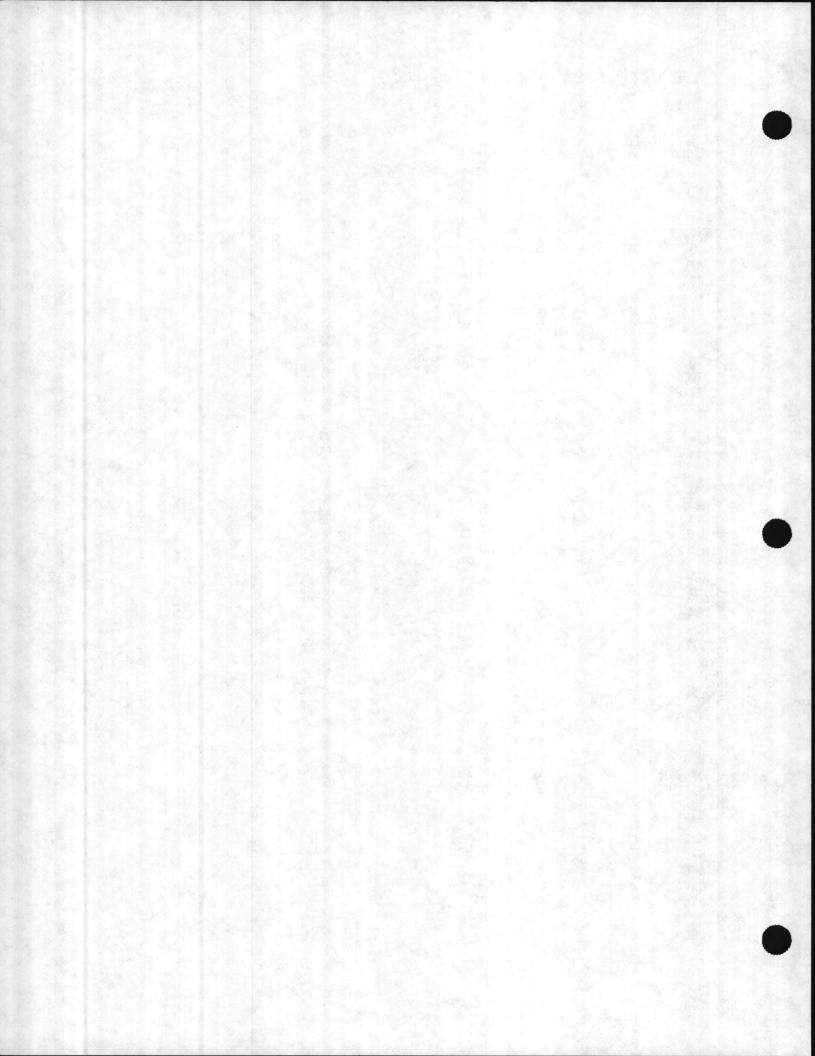








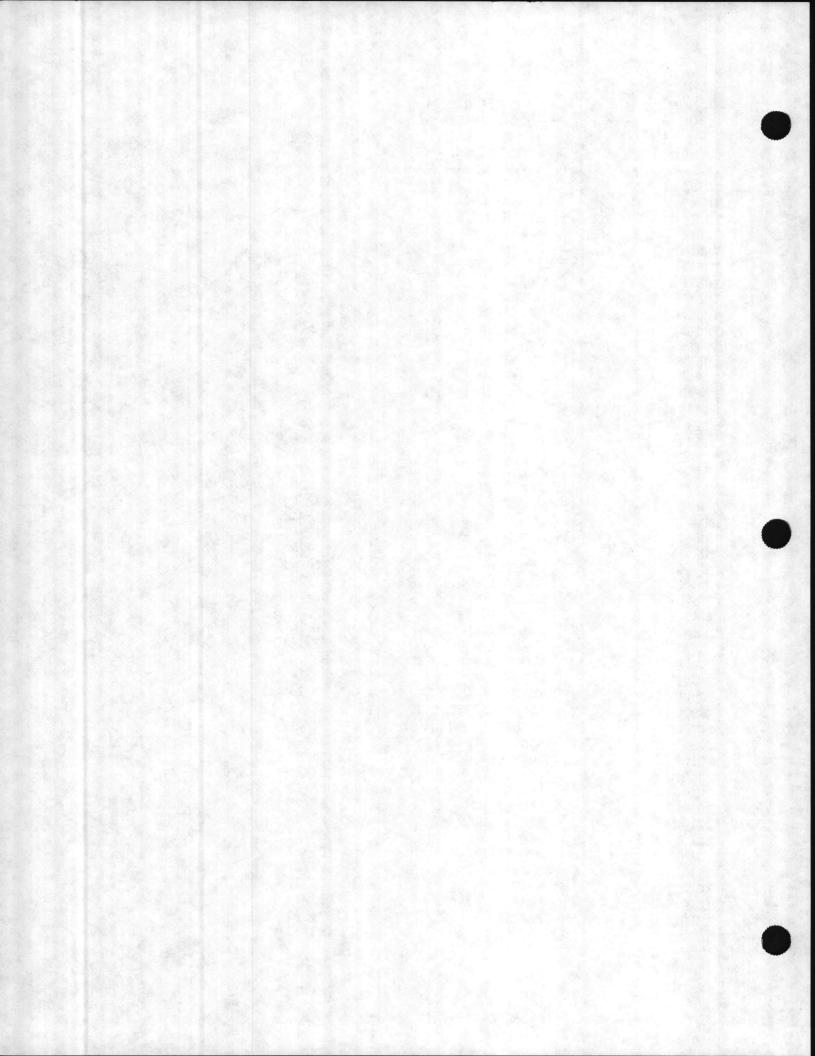
		MAP
BUILDING NO.	BUILDING USE	LOC
G520	REG/GROUP HDQ	A2/23
G530	REG/GROUP HDQ	A5/24
G540	DISPENSARY	A5/24
G550	DISPENSARY	A5/24
G640	EM DINING FAC	A5/24
GG770	DISPENSARY	B1/24
TC701	FIRE STATION	B1/23
TC704	REG/GROUP HDQ	B1/23
TC705	REG/GROUP HDQ	B1/23
TC706	REG/GROUP HDQ	B1/23
TC707	BEQ E1-E4	B1/23
TC708	BEQ E1-E4	B1/23
TC709	BEQ E1-E4	B1/23
TC710	LATRINE	B1/23
TC711	LATRINE	B1/23
TC712	LATRINE	B1/23
TC714	LATRINE	B1/23
TC715	PW SHOPS	B1/23
TC716	APPL INSTR BUILDING	B1/23
TC717	BEQ E1-E4	B1/23
TC718	BEQ E1-E4	B1/23
TC719	BEQ E1-E4	B1/23
TC726	CO/BTRY HDQ	B1/23
TC727	BN SQDRN HDQ	B1/23
TC728	ACAD INSTR BUILDING	B1/24
TC729	BEQ E1-E4	B1/24
TC735	COMM CENTER	B1/24
TC736	BEQ E1-E4	B1/24
TC737	BN SQDRN HDQ	B1/24
TC738	BN SQDRN HDQ	B1/24
TC739	BOQ W1-02	B1/24
TC740	LATRINE	B1/24
TC741	LATRINE	B1/24
TC742	LATRINE	B1/24
TC743	LATRINE	B1/24
TC744	LATRINE	B1/24
TC745	BN SQDRN HDQ	B1/24
TC748	SPEC SER ISSUE OFFIC	B1/24
TC749	SPEC ISSUE OFFICE	B1/24
TC750	LIBRARY	B1/24
TC751	COMM CENTER	B1/24
TC752	BOQ W1-02	B1/24
TC753	BN SQDRN HDQ	B1/24
TC754	ADMIN	B1/24
TC804	BEQ E1-E4	B2/23
TC805	BEQ E1-E4	B2/23
	BEQ E1-E4	B2/23
TC806		B2/23





	CAMP GEIGER	MAP
BUILDING NO.	BUILDING USE	LOC
TC808	BEQ E1-E4	B2/23
TC809	CO/BTRY HDQ	B2/23
TC810	LATRINE	B2/23
TC812	LATRINE	B2/23
TC814	LATRINE	B2/23
TC815	LATRINE	B2/23
TC816	ARMORY	B2/23
TC817	GEN STORAGE A/G/ORG	B2/23
TC818	BEQ E1-E4	B2/23
TC819	BEQ E1-E4	B2/23
TC826	BEQ E1-E4	B2/23
TC827	BEQ E1-E4	B2/23
TC828	BEQ E1-E4	B1/24
TC829	BEQ E1-E4	B2/24
TC832	PW SHOPS	B2/24
TC834	LAUNDRY	B2/24
TC836	BEQ E1-E4	B2/24
TC837	BEQ E1-E4	B2/24
TC838	BEQ E1-E4	B2/24
TC839	BEQ E1-E4	B2/24
TC840	ADMIN	B2/24
TC841	LATRINE	B2/24
TC842	LATRINE	B2/24
TC844	LATRINE	B2/24
TC845	LATRINE	B2/24
TC846	CO/BTRY HDQ	B1/24
TC848	BEQ E1-E4	B2/24
TC850	LATRINE	B2/24
TC851	LATRINE	B2/24
TC853	CO/BTRY HDQ	B2/24
TC854	REG/GROUP HDQ	B2/24
TC855	ACAD INSTR	B2/24
TC900	THEATRE	B3/23
TC910	LOCATION EXCHANGE	B2/23
TC950	LATRINE	B2/24
TC951	ACAD INSTR BUILDING	B2/24
TC1003	POST OFFICE	B3/23
TC1004	BEQ E1-E4	B3/23
TC1005	BEQ E1-E4	B3/23
TC1006	BEQ E1-E4	B3/23
TC1007	BEQ E1-E4	B3/23
TC1008	BEQ E1-E4	B3/23
TC1009	BEQ E1-E4	B3/23
TC1010	LATRINE	B3/23
TC1012	LATRINE	B3/23
TC1013	LATRINE	B3/23
TC1015	LATRINE	B3/23
TC1016	LATRINE	B3/23

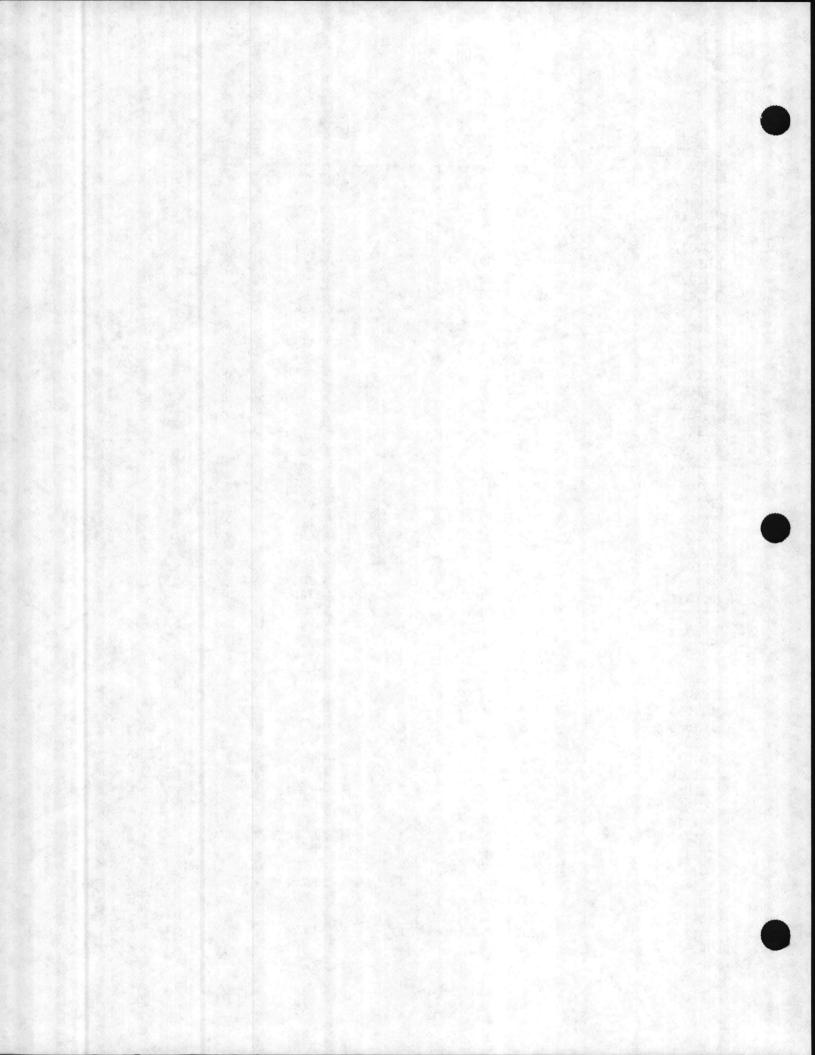




		MAP
BUILDING NO.	BUILDING USE	LOC
	GEN STORAGE	B3/23
TC1017 TC1018	BEQ E1-E4	B3/23
TC1019	BEQ E1-E4	B3/23
TC1026	BEQ E1-E4	B3/24
TC1027	BEQ E1-E4	B3/24
TC1028	BOQ W1-02	B3/23
TC1029	BN SQDN HDQ	B3/24
TC1036	ACAD INSTR BUILDING	B3/24
TC1037	ACAD INSTR BUILDING	B3/24
TC1038	ACAD INSTR BUILDING	B3/24
TC1039	BEQ E1-E4	B3/24
TC1040	LATRINE	B3/24
TC1041	LATRINE	B3/24
TC1042	LATRINE	B3/24
TC1044	LATRINE	B3/24
TC1045	LATRINE	B3/24
TC1046	ACAD INSTR BUILDING	B3/24
TC1047	BEQ E1-E4	B3/24
TC1048	GEN STORE	B3/24
TC1049	LATRINE	B3/24
TC1050	LATRINE	B3/24
TC1051	GEN STORAGE A/G/ORG	B3/24
TC1052	LATRINE	B3/24
TC1053	GEN STORAGE	B3/24
TC1054	LATRINE	B3/24
TC1055	BEQ	B3/24
TC1056	CO/BTRY HDQ	B3/24
TC1057	GEN STORAGE	B3/24
TC1058	GEN STORAGE	B3/24
TC1059	COMM CENTER	B3/24
TC1060	APPL INSTR BUILDING	B3/25
TC1061	CO/BTRY HDQ	B3/23
TC1062	GEN STORAGE	B3/25
TC1063	BN SQDRN HDQ	B3/25
TC1064	BEQ E6-E9	B3/23
TC1065	BEQ E6-E9	B3/23
TC1066	BEQ E6-E9	B3/23
TC1067	BOQ W1-02	B3/23
TC1068	BOQ W1-02	B3/23
TC1069	BPQ W1-02	B3/23
TC1110	BN SQDRN HDQ	B3/23
TC1119	COMM CENTER	B3/24
TC1131	BEQ E1-E4	B3/24
TC1132	BEQ E1-E4	B3/24
TC1140	LATRINE	B3/24
TC1141	LATRINE	B3/24 B3/24
TC1142	BEQ E1-E4	B3/24 B3/24
TC1143	ACAD INSTR BUILDING	DJ/24



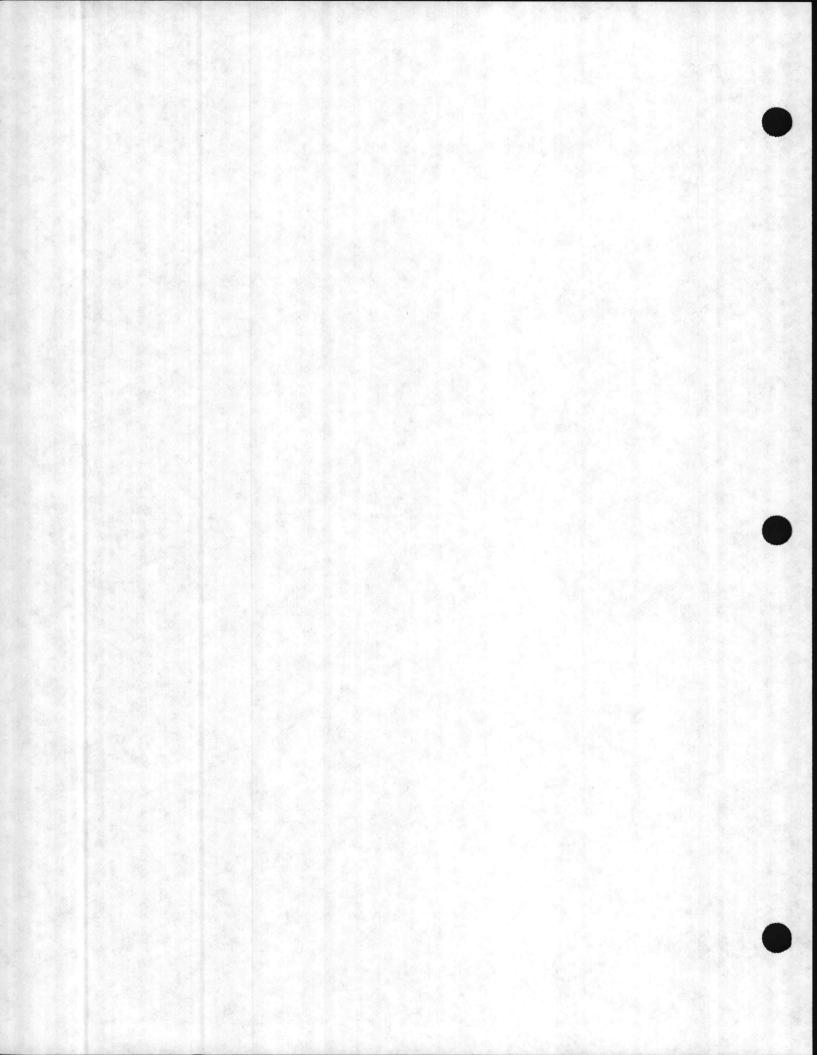




BUILDING NO.	BUILDING USE	LOC
TC1160	BOQ W1-02	B3/23
TC1161	BOQ W1-02	B3/23
TC1162	BOQ W1-02	B3/23



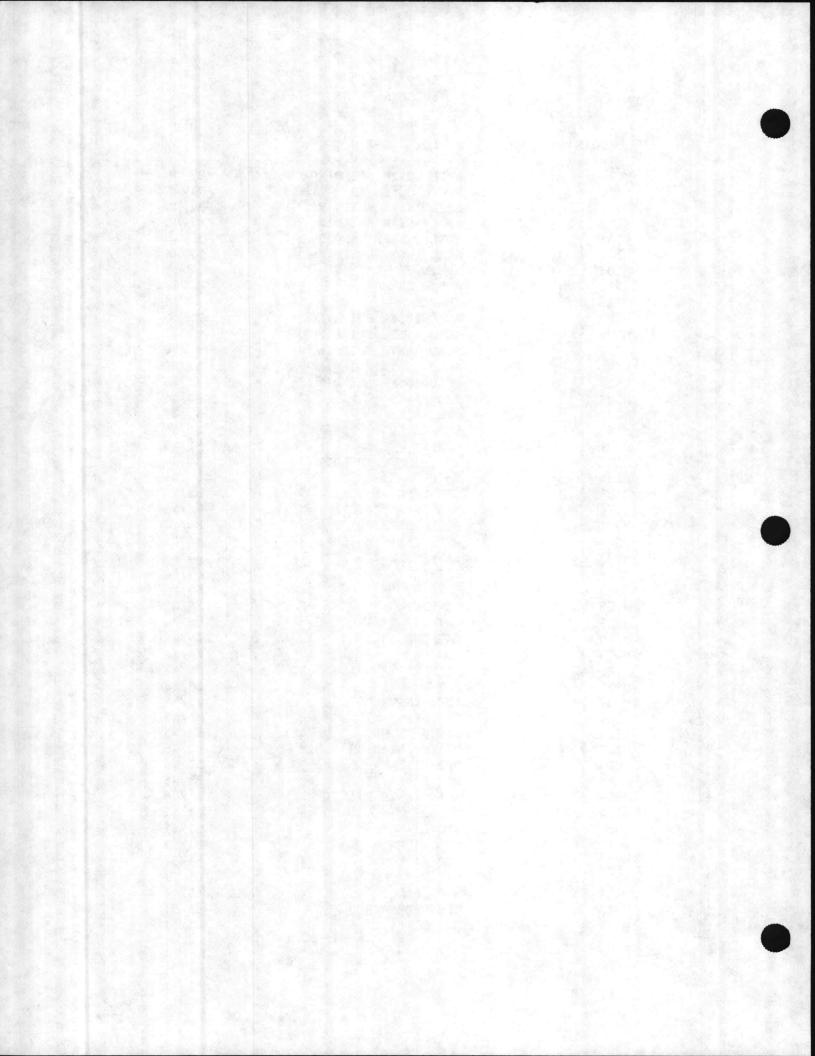




CAMP JOHNSON BUILDING LIST

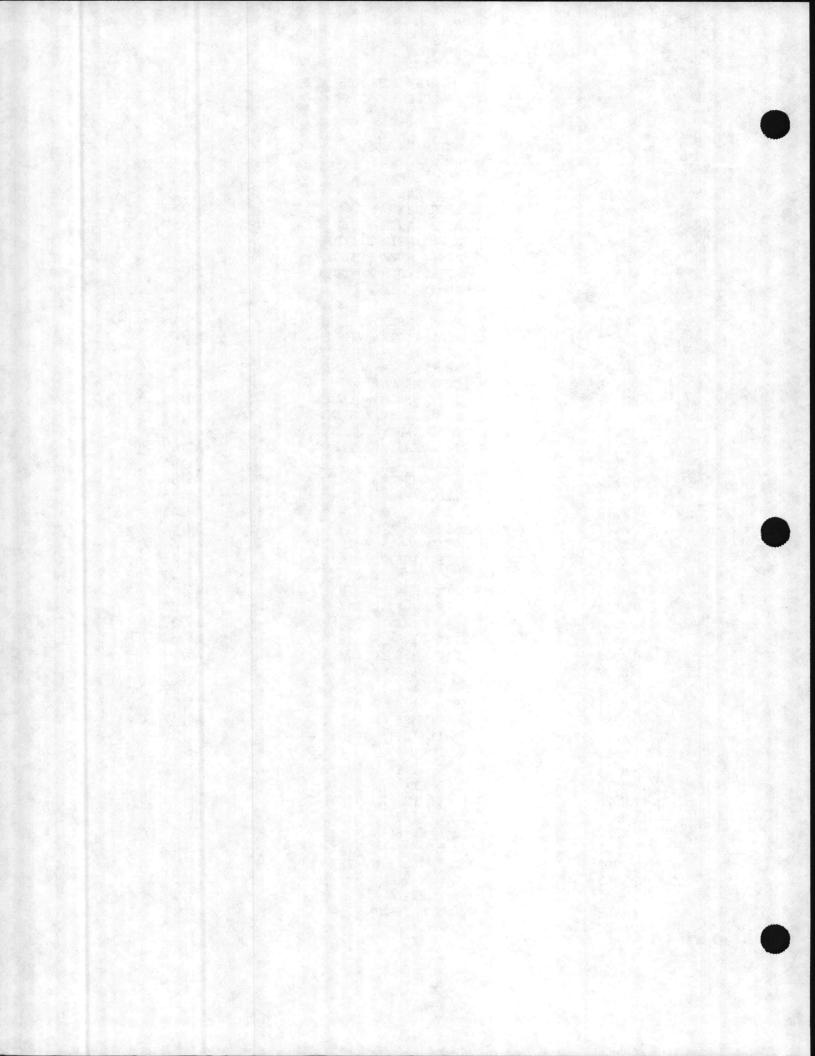
BUILDING NO.	BUILDING USE	MAP LOC
м90	APPL INSTR BUILDING	B3/46
M100	NCO CLUB E4-E5	B1/46
M101	APPL INSTR BUILDING	B2/46
M102	APPL INSTR BUILDING	B2/46
M103	PUBLIC WORKS SHOPS	B2/46
M104	ACAD INSTR BUILDING	B2/46
M105	ADMIN	B2/51
M112	GEN WHSE MC	B1/46
M116	CHAPEL	B1/46
M123	ACAD INSTR BUILDING	B2/46
M124	ACAD INSTR BUILDING	B2/46
M125	ACAD INSTR BUILDING	B2/46
M126	ACAD INSTR BUILDING	B2/46
M127	ACAD INSTR BUILDING	B2/46
M128	BEQ E6-E9	B2/46
M129	GYMNASIUM	B1/45
M130	BEQ E6-E9	B1/45
M131	ADMIN	B1/45
M132	APPL INSTR BUILDING	B1/46
M134	EM CLUB E1-E3	B1/46
M139	CBT TRNG PL/TK	B2/51
M178	WTR TREATMENT FAC	B2/45
M201	APPL INSTR BUILD	B4/44
M202	APPL INSTR BUILD	B4/44
M205	LATRINE	B4/44
M206	LATRINE	B4/44
M207	LATRINE	B4/44
M208	LATRINE	B4/44
M209	LATRINE	B4/44
M210	LATRINE	B4/44
M215	ADMIN	B4/44
M216	ACAD INSTR BUILD	B4/44
M231	BOQ W1-02	B5/43
M237	APPL INSTR BUILD	B5/44
M240	CPO MESS	B5/44
M301	GEN WHSE MC	B1/46
M302	POLICE STATION	B1/46
M303	BEQ E1-E4	B1/46
M305	BEQ E1-E4	B1/46
M307	ACAD INSTR BUILDING	B1/46
M308	ARMORY	B1/51
M309	BEQ E1-E4	B1/51
M311	BEQ E1-E4	B1/51
M313	BEQ E1-E4	B1/51
M314	GEN WHSE MC	B1/51
M441	MECH BLDG.	A5/46
M315	TRHSG/DETACHED	B1/51
M316	BEQ E1-E4	B1/51





CAMP JOHNSON BUILDING LIST

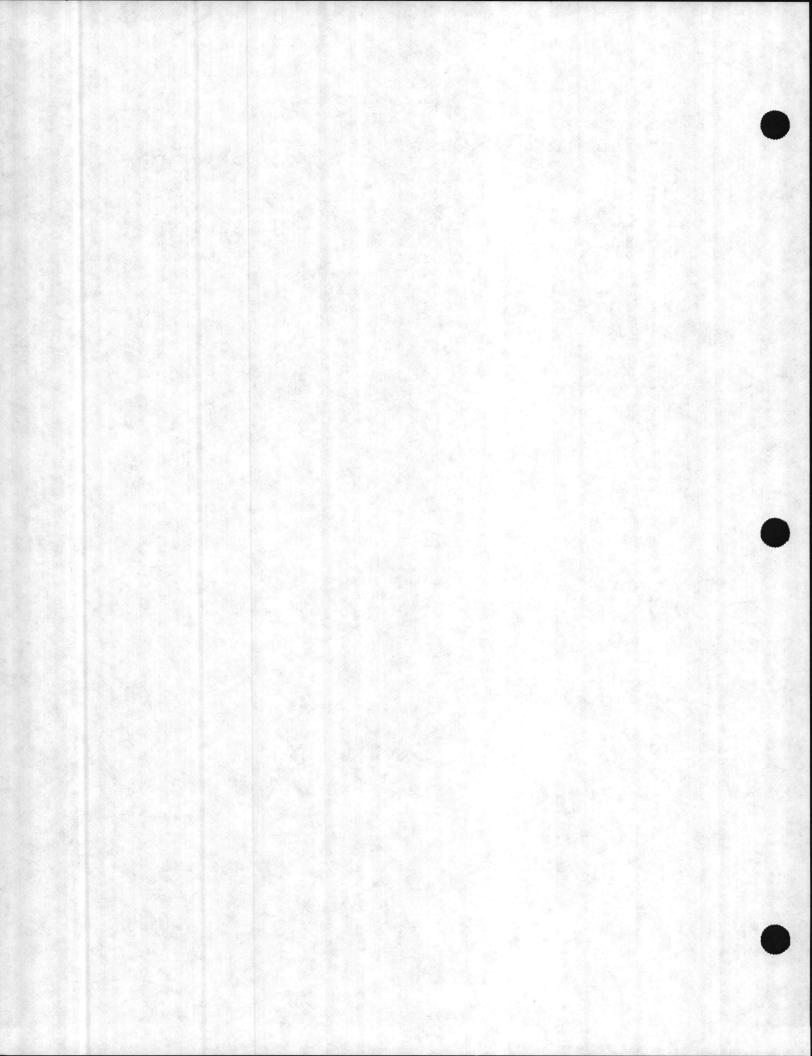
BUILDING NO.	BUILDING USE	MAP LOC
M318	BEQ E1-E4	B1/51
M319	GEN WHSE MC	B1/51
M321	LIBRARY	B1/51
M323	ACAD INSTR BUILDING	B1/51
M324	APPL INSTR BUILDING	B1/51
M326	APPL INSTR BUILDING	B1/51
M327	APPL INSTR BUILDING	B1/51
M401	ADMIN	B1/46
M402	ADMIN	B1/46
M403	ACAD INSTR BUILDING	B1/46
M405	ACAD INSTR BUILDING	B5/46
M406	ACAD INSTR BUILDING	B5/46
M407	APPL INSTR BUILDING	B5/46
M408	GEN WHSE MC	B1/46
M408	APPL INSTR BUILDING	A5/46
	APPL INSTR BUILDING	A5/46
M411	ACAD INSTR BUILDING	A5/46
M412		
M413	ACAD INSTR BUILDING	A5/46
M414	ADMIN	B1/46
M415	GEN WHSE MC	B1/46
M416	BEQ E1-E4	A5/46
M418	ADMIN	A5/46
M419	ADMIN	A5/46
M420	ACAD INSTR BUILDING	A5/46
M422	APPL INSTR BUILDING	A5/46
M424	EM DINING FAC	A5/51
M501	GEN WHSE MC	A5/52
M502	TRHSG/DETACHED	A5/52
M503	BEQ E1-E4	A5/52
M504	BEQ E1-E4	A5/52
M506	GEN WHSE MC	A5/52
M507	BEQ E1-E4	A5/52
M509	BEQ E1-E4	A5/52
M511	BEQ E1-E4	A5/52
M512	GEN WHSE MC	A5/52
M513	APPL INSTR BUILDING	B1/52
M514	BEQ E1-E4	A5/52
M516	BEQ E1-E4	A5/52
M518	BEQ E1-E4	A5/52
M520	APPL INSTR BUILDING	B1/52
M521	BEQ E1-E4	B1/52
M522	BEQ E1-E4	B1/52
M601	ADMIN	A5/51
M602	DRY CLEANING PL	A5/51
M603	ADMIN	A5/51
M604	BEQ E1-E4	A5/51
M606	GEN WHSE MC	A5/51
M607	BEQ E1-E4	A5/51



CAMP JOHNSON BUILDING LIST

		MAP
BUILDING NO.	BUILDING USE	LOC
M609	BEQ E1-E4	A5/51
M611	ADMIN	A5/51
M612	ADMIN	A5/51
M613	ADMIN	A5/51
M614	BEQ E1-E4	A5/51
M616	BEQ E1-E4	A5/51
M619	TRKSG/DETACHED	A5/51
M620	ACAD INSTR BUILDING	A5/51
M621	BEQ E1-E4	A5/51
M622	BEQ E1-E4	A5/51





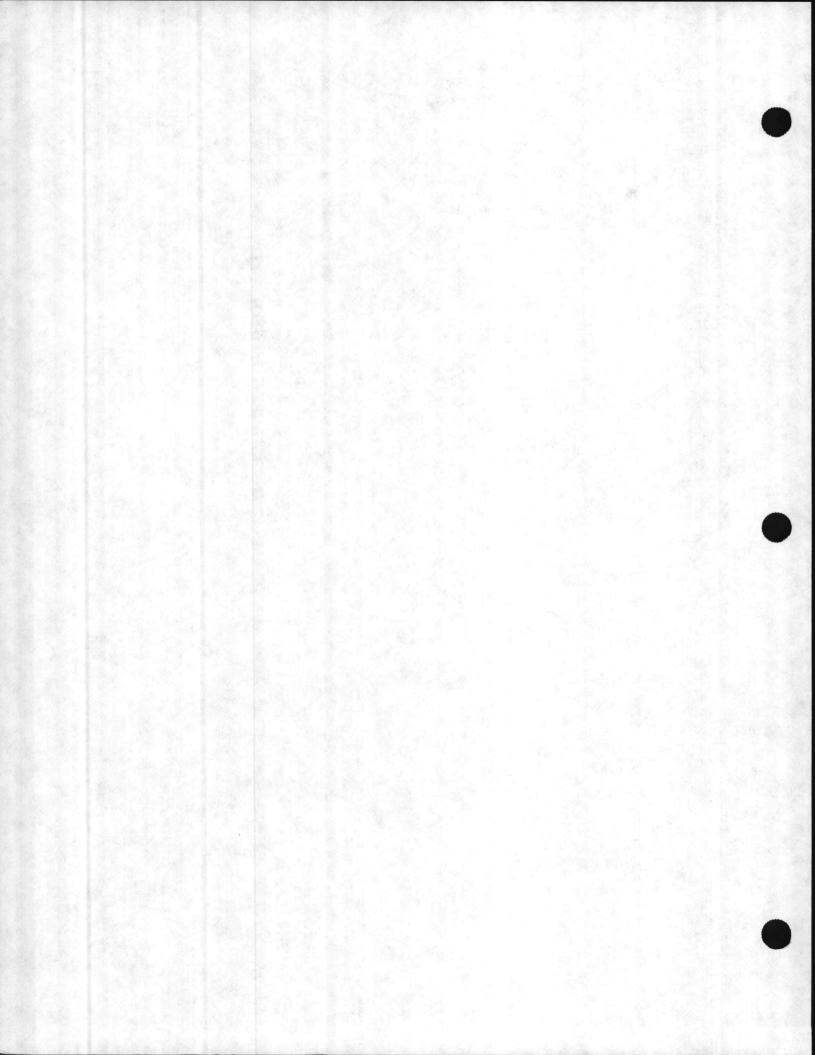
COURTHOUSE BAY BUILDING LIST

MAD

		MAP
BUILDING NO.	BUILDING USE	LOC
BB2	THEATRE/GYM	N2/72
BB5	BN SQDRN HDQTRS	N2/71
BB7	EM DINING FAC	N2/72
BB8	ADMIN	N2/72
BB10	DISPENSARY	N2/71
BB11	BEQ E1-E4	N2/71
BB12	BEQ E1-E4	N2/71
BB13	BEQ E1-E4	N2/72
BB14	BEQ E1-E4	N2/72
BB15	ADMIN	N2/72
BB16	GENL STORAGE	N2/72
BB27	PO MESS	M5/72
BB28	ADMIN	M5/73
BB45	COM OFF MESS	N2/71
BB50	APPL INSTR BLDG	N1/73
BB51	CONST EQ MAINT SHOP	M5/73
BB52	APPL INSTR BLDG	N1/73
BB54	EM CLUM E1-E3	M5/72
BB72	LATRINE	M5/73
BB250	BEQ	M5/72
BB255	BEQ E1-E4	M5/72
BB260	BEQ E1-E16	M5/71
BB265	BEQ E1-E6	M5/71
BB269	MECH ROOM	M4/71
BB270	BEQ E1-E6	M5/71

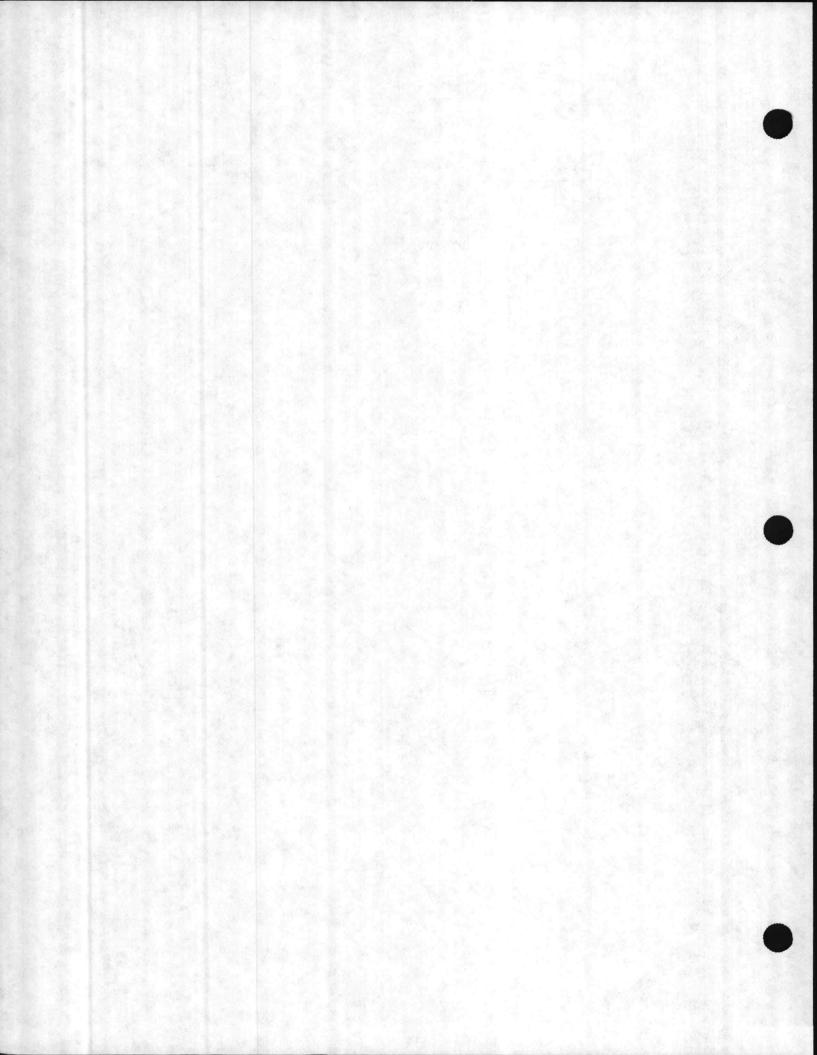






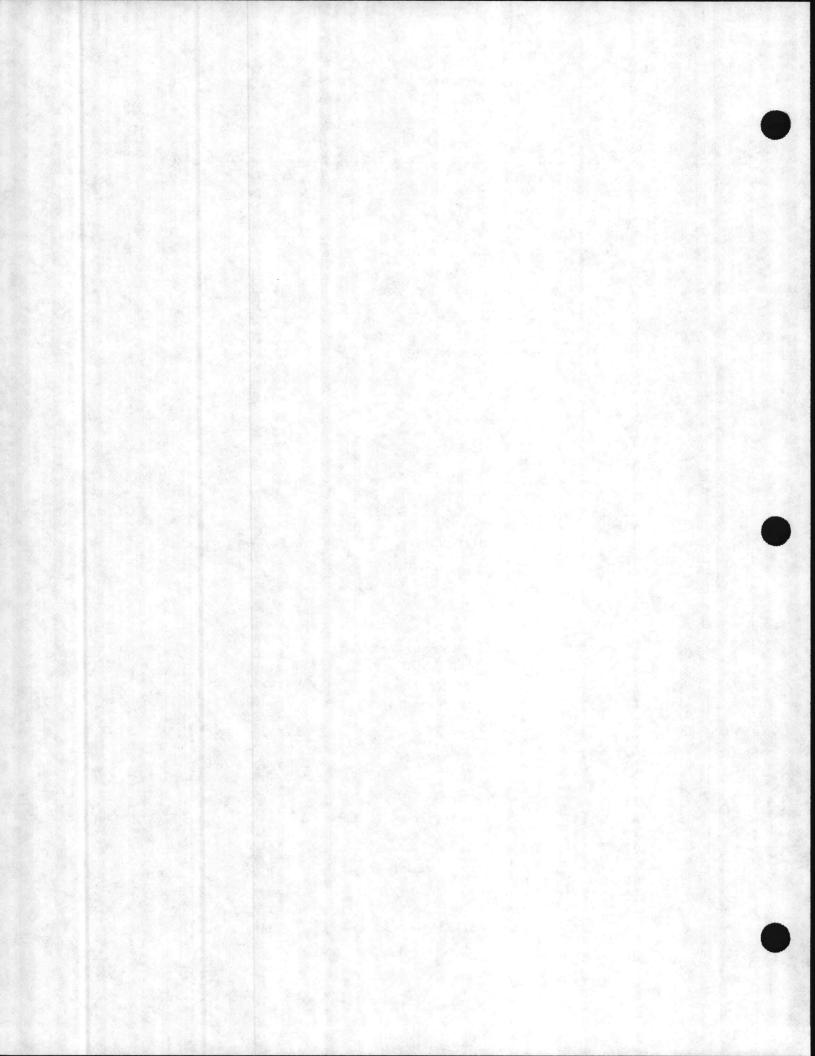
FRENCH CREEK BUILDING LIST

BUILDING NO.	BUILDING USE	MAP LOC
FC100	AUTO SHOP	G4/91
FC190	FLD MAINT SHOP	G4/91
FC200	CONST EQ M/SHOP	G4/92
FC241	AUTO SHOP	G5/93
FC251	ELEC/COMM MNT SHOP	G5/93
FC300	BN SQDRN HDQ	G5/91
FC301	ARMORY	H1/91
FC302	ARMORY	H1/91
FC303	EM DINING FAC	H1/86
FC304	BEQ E1-E4	H1/91
FC305	BEQ E1-E4	H1/91
FC306	BEQ E1-E4	H1/91
FC309	BEQ E1-E4	H1/86
FC310	BEQ E1-E4	H1/86
FC311	BEQ E-5	H1/86
FC312	ACAD INSTR BUILDING	H1/85
FC313	DISPENSARY	H1/85
FC360	BEQ E1-E4	H1/91
FC364	BN OPR CENTER	H2/86
FC400	CO/BTRY HDQ	H2/85
FC411	BEQ E5	H2/85
FC412	BEQ E	H3/85
FC413	BEQ E1-E4	H2/85
FC414	BEQ E1-E4	H3/85
FC415	BEQ E1-E4	H2/86
FC416	BEQ E5	H3/85
FC420	EM DINING FAC	H3/86
FC515	BEQ E1-E4	H3/84
FC520	BEQ E1-E4	H1/85
FC525	BEQ E1-E4	H3/84
FC530	BEQ E1-E4	H1/85
FC540	EM DINING FAC	H3/84
FC550	BEQ E1-E4	H3/83
FC555	BEQ E1-E4	H3/83
FC560	BEQ E1-E4	H3/83
FC565	BEQ E1-E4	H3/83
FC573	BEQ E1-E4	H3/84

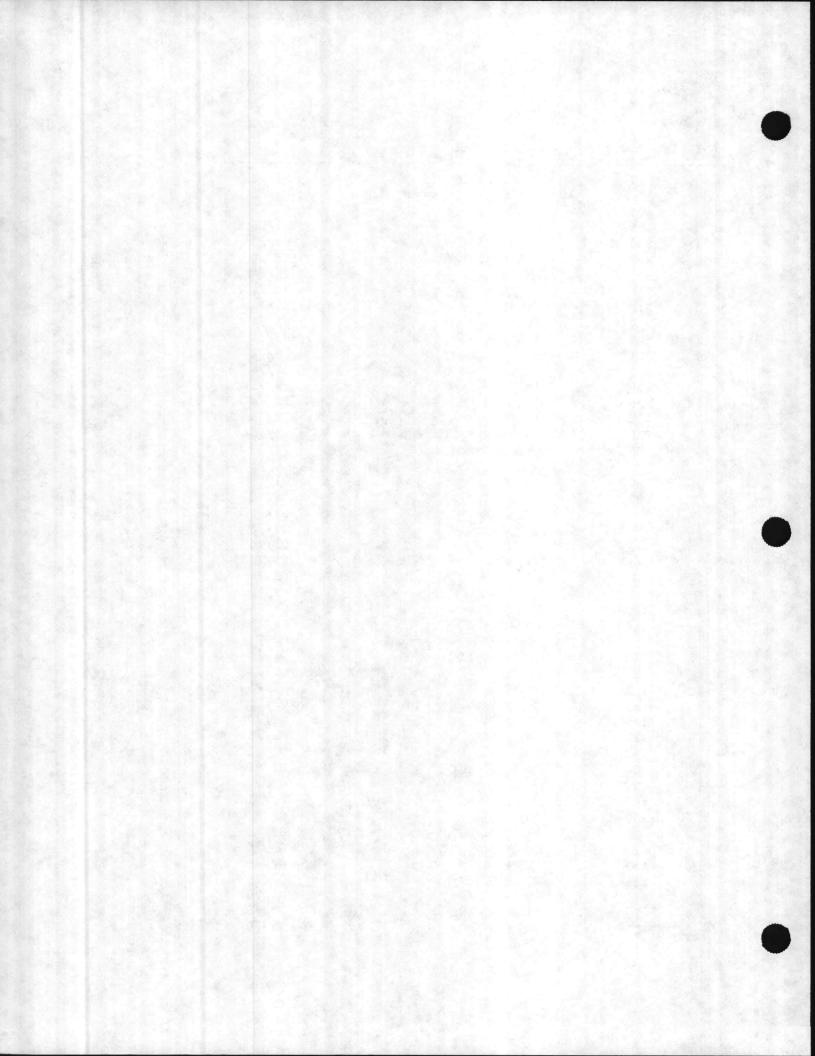


BUILDING NO.	BUILDING USE	MAP LOC
		F5 /76
1	ADMIN	F5/76 G2/74
2 3	DIV/WING HDQ	
4	POLICE STATION	F3/76
	LOCATION EX	F3/76
6	BEQ E1-E4	F4/76
8	CO/BTRY HDQ	F4/76
9	EM DINING FAC	F4/76
10	DIV/WING HDQ	F4/76
11	GEN WHSE	F4/76
12	BEQ E1-E4	F5/76
13	ADMIN	F5/76
14	RED CROSS/NAVY RLF	G1/81
15	DISPENSARY	F5/81
16	CHAPEL	G1/81
17	CHAPEL	F2/75
18	FIRE STATION	F2/74
19	THEATER	F3/75
20	WTR TRMNT FAC	F5/76
27	ADMIN	F5/76
39	SQUASH COURT	G2/81
41	RED CROSS NAVY RLF	F2/75
43	COBBLER SHOP & M.P.STA	F3/76
50	ADMIN	F4/81
54	PHOTO BUILDING	F4/76
58	BEQ E6-E9	F3/76
59 60	DIV/WING HDQ	F3/81
62	BEQ E1-E4 EM CLUB E1-E4	F3/81 F4/81
63	LIBRARY	F4/81
65	HOSPITAL	F4/81
66	ADMIN	F4/81
67	BEQ E6-E9	F3/76
80	PRINTING PLANT	F3/76
84	MBX	F4/82
89	BOWLING ALLEY	F3/81
101	CO/BTRY HDQ	F3/75
101	DIV/WING HDQ	F2/75
102	GEN STORAGE	F2/74
100	GEN STORAGE	F3/75
107	CO/BTRY HDQ	F3/74
111	BN SQDRM HDQ	F3/74
114	GYMNASIUM	F3/74
117	ELEC/COM MANT SHOP	F3/74
117	ACAD INSTR BUILDING	F3/73
118	CO/BTRY HDQ	F3/73
122	EM DINING	F3/73
122	REG/GROUP HDQ	F3/72
125	EM CLUB E1-E3	F3/72
125		20/12

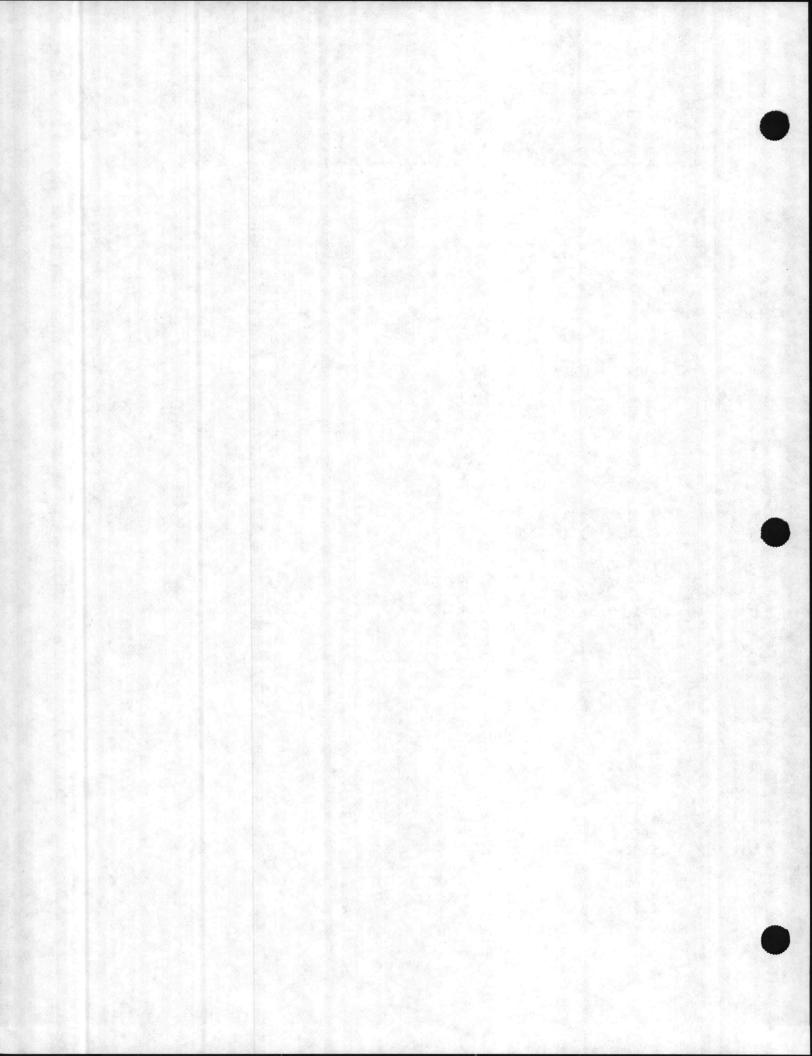




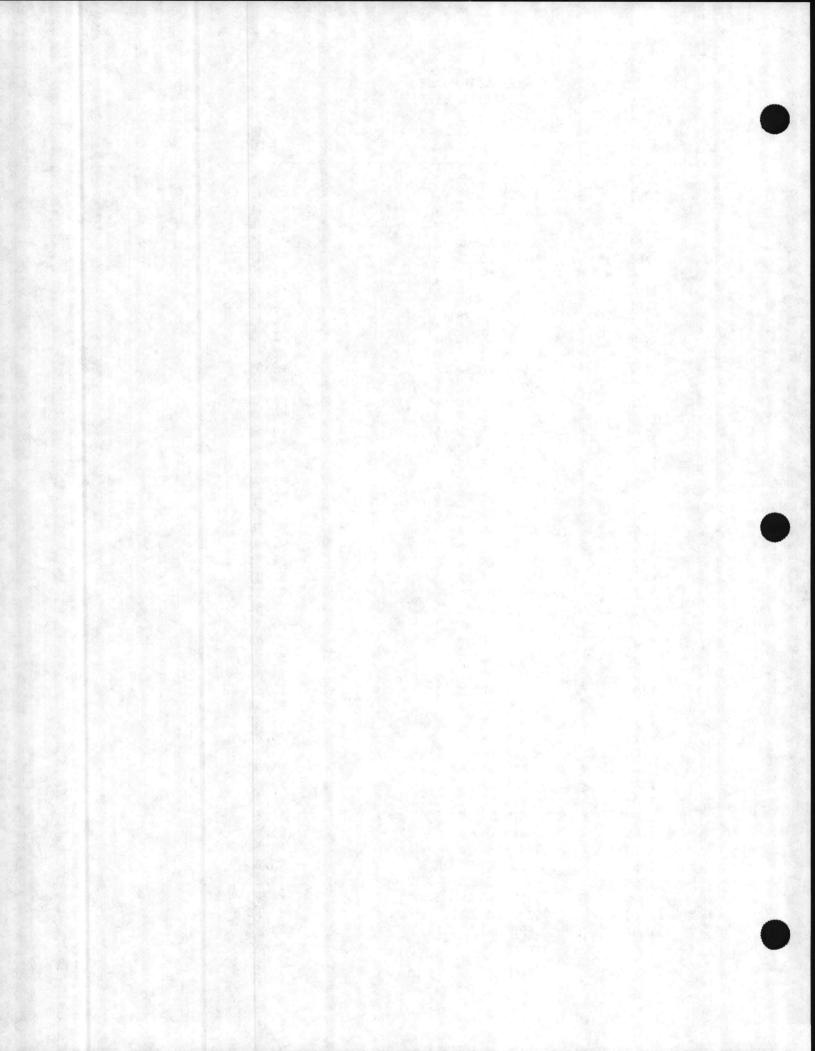
BUILDING NO.	BUILDING USE	MAP LOC
127	BN SQDRN HDQ	F3/72
201	GYMNASIUM	F5/75
203	BN SQDRN HDQ	F5/75
205	BEQ E1-E4	F5/75
206	GEN STORAGE	F4/75
211	EM DINING FAC	F5/75
213	BEQ E1-E4	F5/74
214	BN SQDRN HDQ	F4/74
216	REG HDQ	F4/74
217	BEQ E1-E4	F5/74
219	BN SQDRN HDQ	F5/74
221	BN SQDRN HDQ	F5/74
223	REG/GROUP HDQ	G1/74
225	ADMIN	F4/75
226	GEN STORAGE	F5/74
233	ADMIN	F5/75
236	CBT TRNG PL/TK	F3/75
300	GYMNASIUM	F5/76
302	ADMIN	G1/76
304	CO/BTRY HDQ	G1/75
307	ELEC MAINT SHOP	G1/76
308	BEQ E1-E4	G1/75
309	BEQ E1-E4	G1/76
312	BEQ E1-E4	G1/75
313	BEQ E1-E4	G1/76
314	BN SQDRN HDQ	G1/74
315	BN SQDRN HDQ	G1/76
316	BEQ E1-E4	G1/74
317	BM SQDRN HDQ	G2/75
318	BEQ E1-E4	G2/74
320	DIV/WING HDQ	G2/74
321	BEQ E1-E4	G2/75
322	PO MESS SNCO	G1/75
323	BEQ E1-E4	G2/75
325	EM DINING FAC	G2/75
326	BEQ E1-E4	G2/75
327	BEQ E1-E4	G2/75
400	BN SQDRN HDQ	G1/81
400	GYMNASIUM	G2/81
401	LOCATION EX	G2/81
405	BEQ E1-E4	G2/81
407	EM DINING FAC	G2/76
400	EM DINING FAC	G3/76
411 412	BEQ E1-E4	G2/76
412 416	BM SQDRN HDQ	G2/76
410	BEQ E1-E4	G3/76
417	BN SQDRN HDQ	G3/76
419	BEQ E1-E4	G2/76
420	DEA DT P4	,



BUILDING NO.	BUILDING USE	MAP LOC
422	BEQ E1-E4	G3/76
423	REG/GROUP HDQ	G3/76
424	GEN STORAGE	G3/76
425	PO MESS NCO	G1/81
460	DENTAL CLINIC	G3/75
500	GYMNASIUM	G2/82
501	BN SQDRM HDQ	G3/82
502	BEQ E1-E4	G3/82
503	BEQ E1-E4	G3/82
506	BEQ E1-E4	G3/82
507	BEQ E1-E4	G3/82
508	EM DINING FAC	G3/81
509	GEN STORAGE	G3/82
510	BEQ E1-E4	G3/81
511	BEQ E1-E4	G3/82
514	BEQ E1-E4	G3/81
515	BEQ E1-E4	G4/82
516	BN SQDRN HDQ	G3/81
517	BEQ E1-E4	G4/81
518	DIV/WING HDQ	G3/81
519	BEQ E1-E4	G4/81
520	BN SQDRN HDQ	G4/81
521	EM DINING FAC	G4/81
523	BEQ E1-E4	G5/81
524	EM CLUB E1-E3	G3/83
526	BN SQDRN HDQ	G5/81
527	BEQ E1-E4	G5/81
540	CBT TRNG PL/TK	G4/76
751	FIELD HOUSE	G1/82
898	GUEST HOUSE	F3/82
900	FIRST AID & SICK CALL	F2/86
901	FIELD MAINT SHOP	F2/86
902	AUTO MAINT SHOP	F1/86
904	GEN STORAGE	F2/91
905	BN SQDRN HDQ	F3/91
907	GEN STORAGE	F4/86
908	AUTO VEH MAINT SHOP	F3/91
909	GEN STORAGE	F3/86
910	WELDING SHOP	F1/86
914	REG GROUP HDQ	F3/91
915	GEN STORAGE	F4/91
916	GEN STORAGE	F4/91
1002	FILLING STATION	F3/85
1004	FUEL PUMP HSE	F3/85
1005	ADMIN	F3/85
1006	EM CLUB E1-E3	F3/86
1011	GEN WHSE	F4/86
1012	GEN WHSE	F4/86



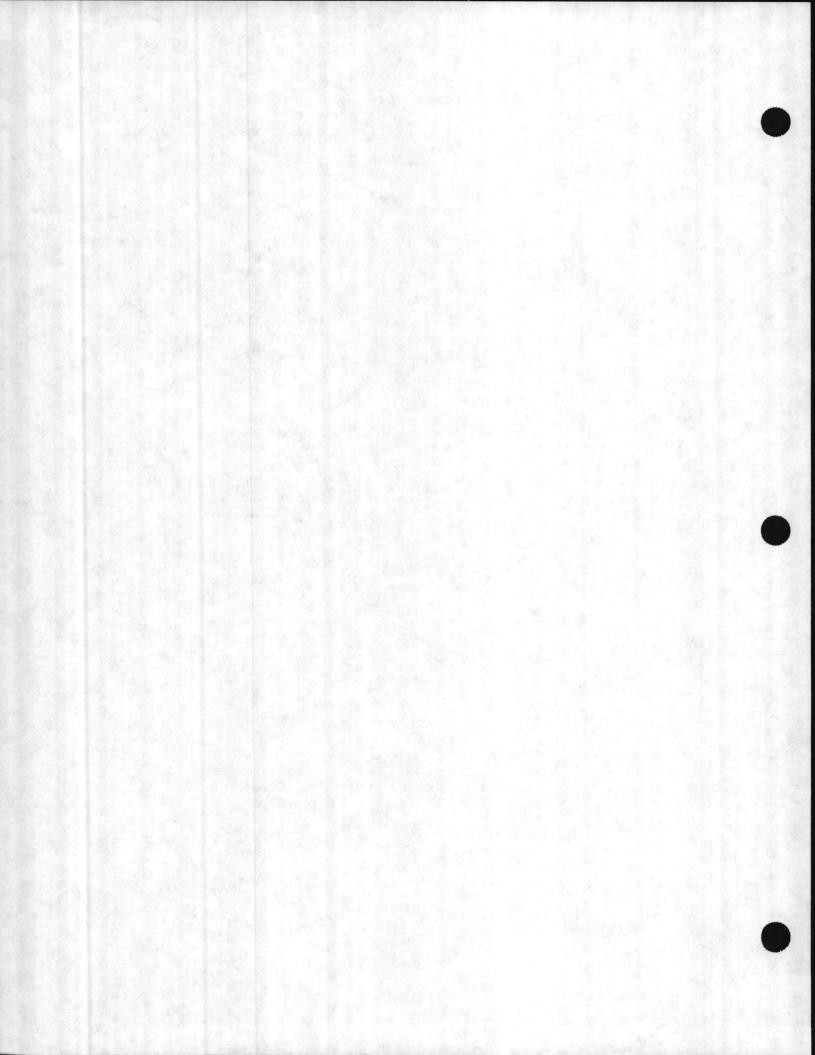
		MAP
BUILDING NO.	BUILDING USE	LOC
1015	FOOD LOCKERS	F4/86
1015	DISPENSARY	F4/91
1041	BEQ ES	F4/91
1100	PRINTING PLANT	F2/84
1100	GEN WHSE MC	F3/84
1101	HOBBY SHOP	F3/85
1103	PW SHOPS	F3/85
1104	ADMIN	F3/85
1105	HOBBY SHOP	F4/85
1100	HOBBY SHOP	F4/85
1107	BN SQDRN HDQ	F3/84
1100	MC GUARD	F2/84
1111	MOVER STORAGE	F4/85
1114	PHOTO LAB	F2/84
1115	GEN WHSE MC	F4/86
1110	GEN WHSE HO	F4/86
1117	GEN STG	F5/86
1120	HOBBY SHOP-AUTO	F3/85
1120	BEQ E1-E4	F4/85
1200	COMMISSARY	F3/84
1200	GEN WHSE MC	F3/84
1201	PW SHOPS	F3/84
1202	LOCATION EX	F4/85
1207	ADMIN	F4/85
1208	EM DINING FAC	F4/85
1205	GEN STORAGE	F5/85
1212	GEN STORAGE	F5/86
1220	RESTAURANT	F3/84
1300	COLD STORAGE	F3/84
1301	GEN WHSE MC	F3/84
1302	GEN WHISE HO GEN STORAGE	F4/84
1302	GEN STORAGE	F4/84
1304	GEN WHSE MC	F4/84
1309	AUTO ORG SHOP	F4/84
1316	GEN WHSE MC	F5/85
1318	GEN WHSE HC	F5/85
1340	BEQ E1-E4	F4/85
1400	FIRE STATION	F3/83
1400	GEN STORAGE	F3/83
1401	ADMIN	F4/84
1405	ADMIN	F4/84
1409	BOAT SHOP	F4/84
1409	GEN WHSE MC	F4/84
1410	AUTO ORTGL SHOP	F5/85
1500	LAUNDRY/DRY CLEANING	F4/83
1502	AUTO VEH MNT SHOP	F4/83
1601	CO/BTRY HDQ	F5/83
	SERVOMART	F4/83
1606	DERVOIMI	14/05



MAP

		MAP
BUILDING NO.	BUILDING USE	LOC
1607	AUTO SHOP	F5/83
1610	EX SERVICE STATION	F4/83
1611	EX SERVICE STATION	F4/82
1612	EX SERVICE STATION	F4/82
1613	FILLING STATION	F4/82
1706	SHLTR MISC PIPE	F5/85
1707	COMM MAINT SHOP	F5/83
1750	AUTO SHOP	G1/83
1755	AUTO SHOP	G1/84
1770	POST OFFICE	G2/82
1771	COMM MAINT SHOP	G1/84
1775	MOTOR TRANSPORT	G2/84
1780	AUTO SHOP	G2/84
25	DRY CLEANING PL	F3/76
1404	RANGE OPERATION CTR	F4/84
HP51	BEQ E1-E4	F4/81
HP57	BEQ E1-E4	F3/76
HP105	BEQ	F3/75
HP115	BEQ E1-E6	F3/74
HP125	BEQ E1-E6	F3/74
HP127	REG HDQ	F3/72
HP135	No. 1	F3/74
HP140	BEQ MECH ROOM	
HP140 HP145		F2/74
	BEQ	F3/74
HP155	BEQ	F3/74
HP165	BEQ	F3/73
HP170	MECH ROOM	F3/73
HP175	BEQ	F3/74
HP185	BEQ	F3/73
HP195	BEQ	F3/73
HP215	BEQ	F4/75
HP255	BEQ	F5/74
HP265	BEQ	F5/74
HP267	MECH ROOM	F5/74
HP275	BEQ	F5/74
HP285	BEQ	F5/74
HP295	BEQ	F5/74
HP301	BEQ E1-E4	G1/76
HP405	BEQ E1-E4	G2/81
HP550	BEQ	G4/81
HP560	BEQ	G4/81
HP1016	EX MAINT SHOP	F4/86
S86	MECH ROOM	F4/81
S 96	MECH ROOM	F3/81
S1210	MECH ROOM	F4/85





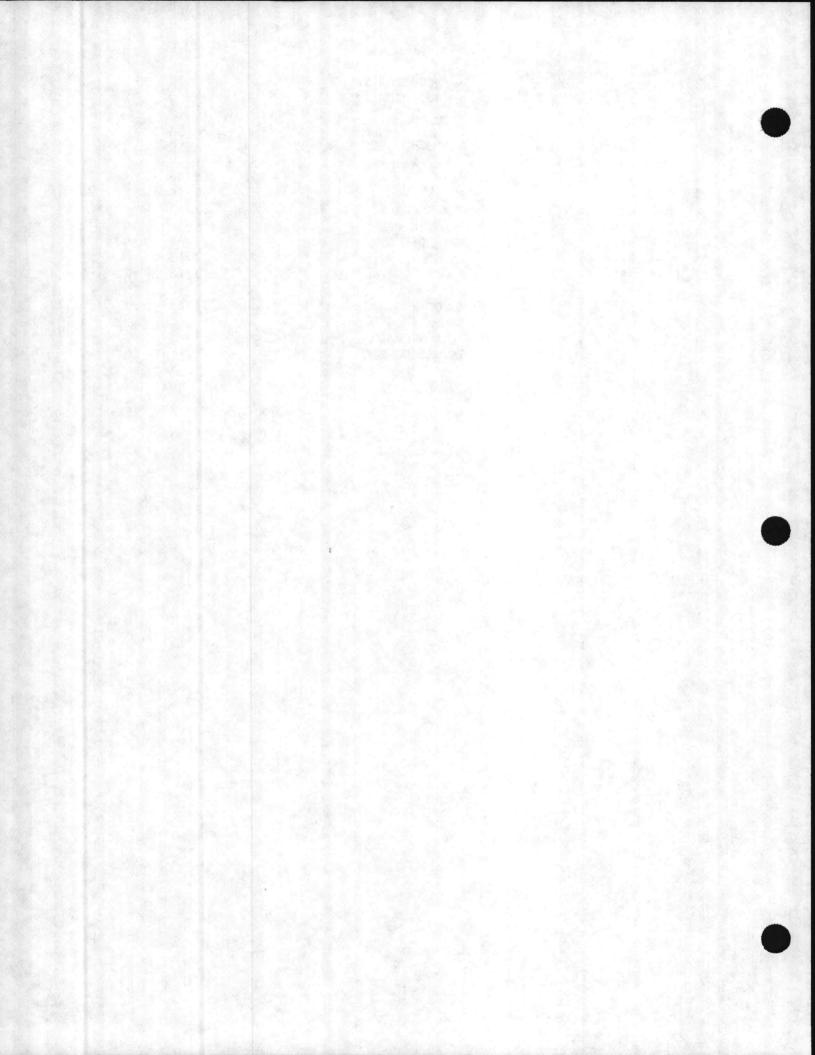
HOSPITAL POINT BUILDING LIST

A TA

BUILDING NO.	BUILDING USE	LOC
H14	BEQ	F2/66
H16	BEQ	F2/66
H17	GEN STORAGE	F1/65
H18	OPR VEH GAR	F165
H19	PW SHOPS	F1/65
H21	LAUNDRY	F1/66
H23	BEQ	F1/65
H24	BEQ	F1/65
Н36	MOTOR POOL	F1/65
Н39	EX SNACK STD	F1/65
H17N	GENL STORAGE	F1/65
H15A	BATTALION HDQ	F2/65





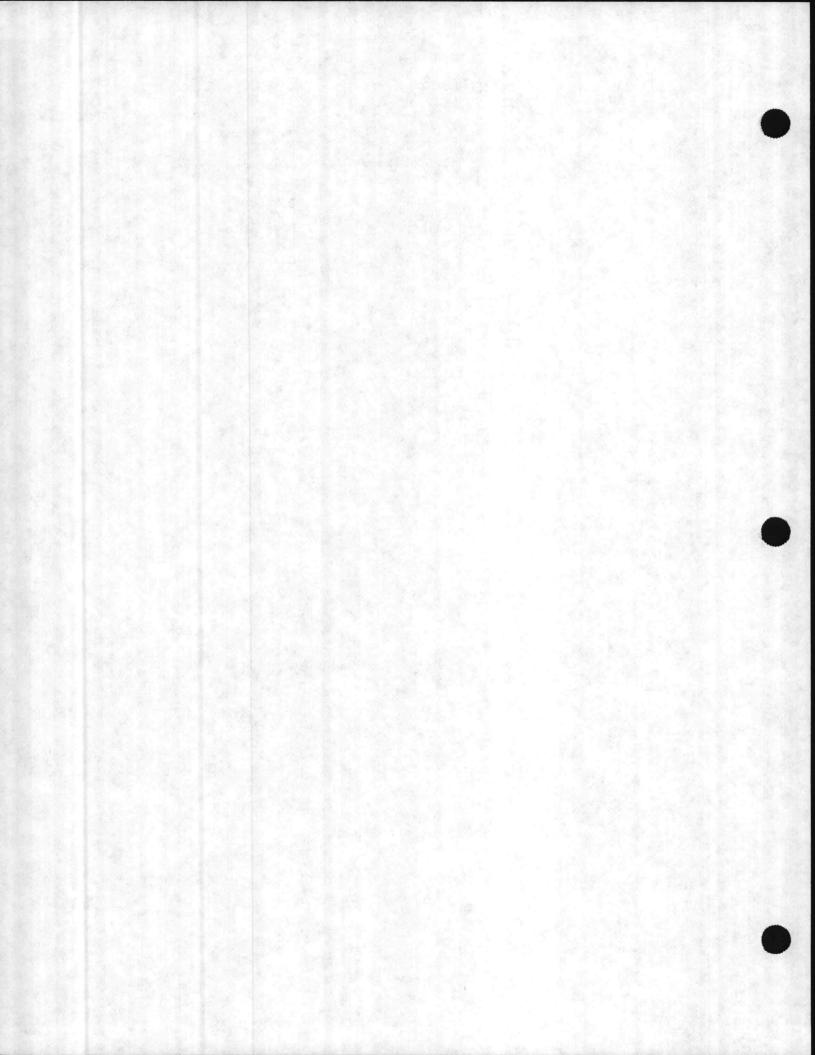


PARADISE POINT BUILDING LIST

		MAP
BUILDING NO.	BUILDING USE	LOC
2600	FIRE STATION	C5/63
2602	BOQ W1-02	C5/63
2603	BOQ W1-02	C5/63
2604	BOQ W1-02	C5/63
2605	BOQ W1-02	C5/62
2607	BOQ W1-02	D1/62
2609	BOQ W1-02	D1/63
2611	BOQ W1-02	D1/63
2613	BOQ W1-02	D1/63
2615	COM OFF MESS	C5/63
2617	BOQ W1-02	C5/63
2624	CHILD CARE CENTER	C4/63
2625	CHILD CARE CENTER	C5/63
2626	REC PAVILION	C5/63
2627	SCOUT PAVILION	C5/63
2628	COM OFF MESS	C5/64
2629	GEN WHSE MKC	C5/63







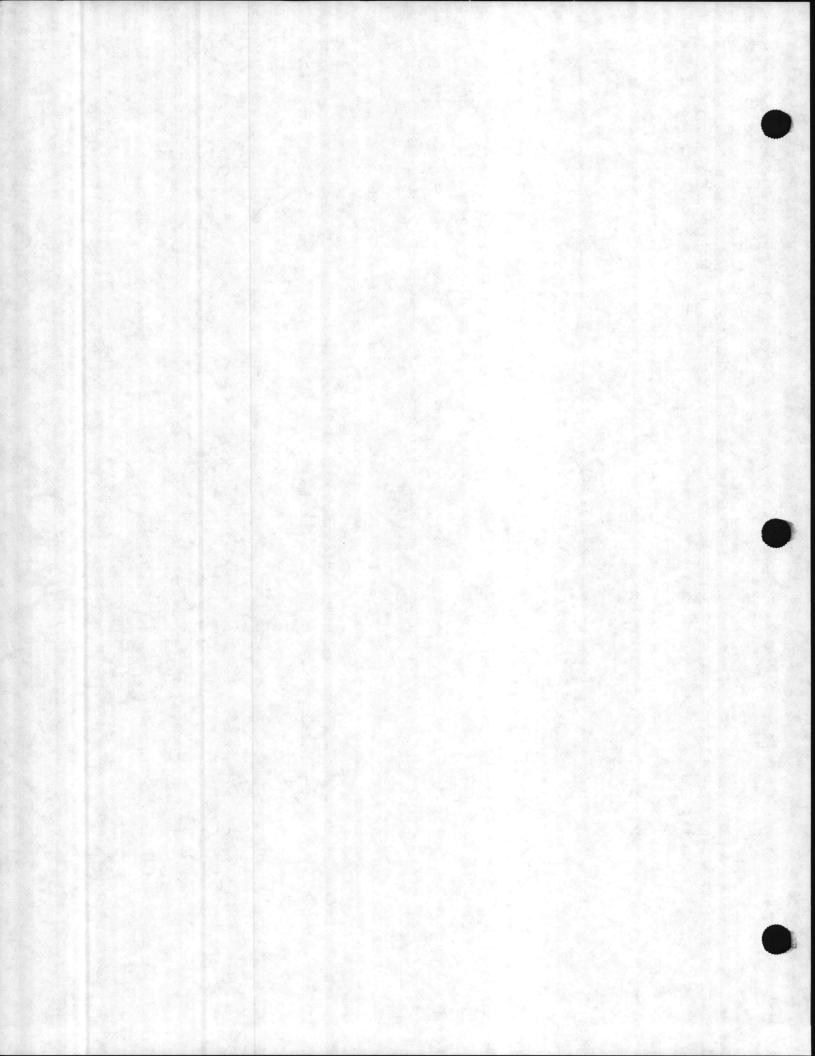
RIFLE RANGE BUILDING LIST

MAD

		MAP
BUILDING NO.	BUILDING USE	LOC
RR1	BEQ E1-E4	M2/26
RR2	BEQ E1-E4	M2/26
RR3	EM DINING FAC	M2/26
RR4	BEQ E1-E4	M3/26
RR5	BEQ E1-E4	M3/26
RR8	GYMNASIUM	M3/26
RR9	BOQ W1-02	M2/26
RR10	LOCATION EXCHANGE	M2/26
RR11	ADMIN	M2/26
RR12	ADMIN	M3/26







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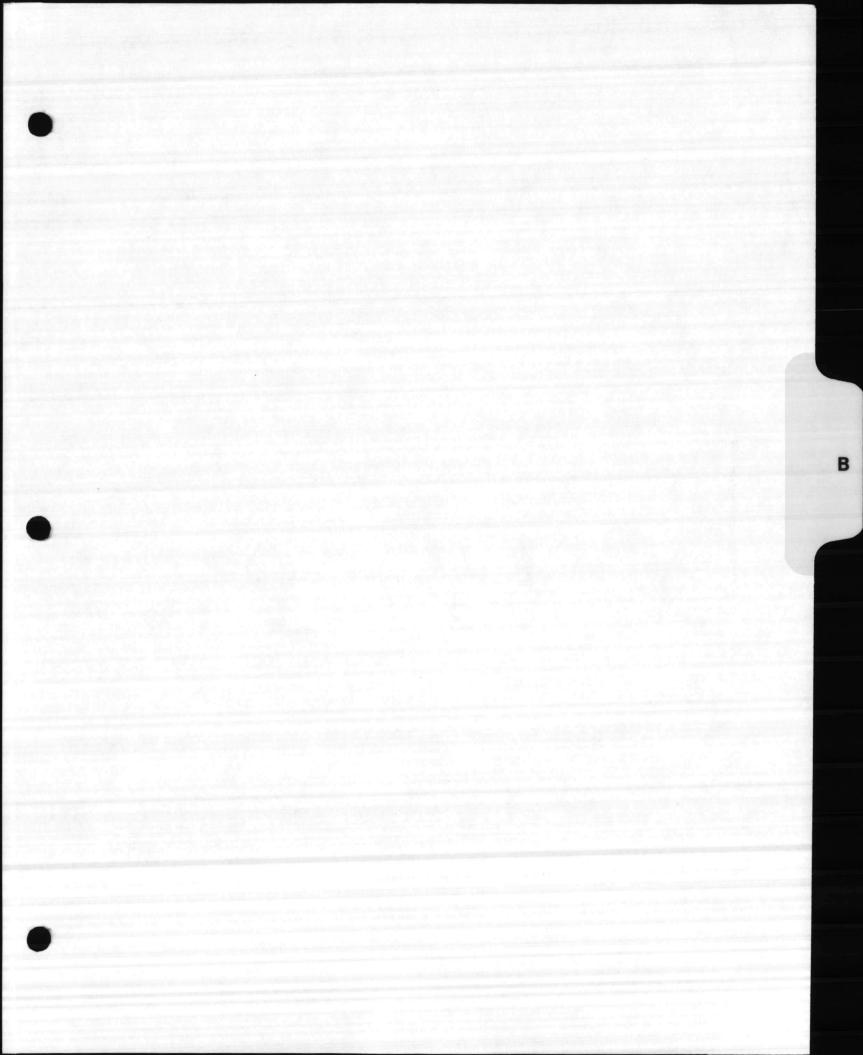
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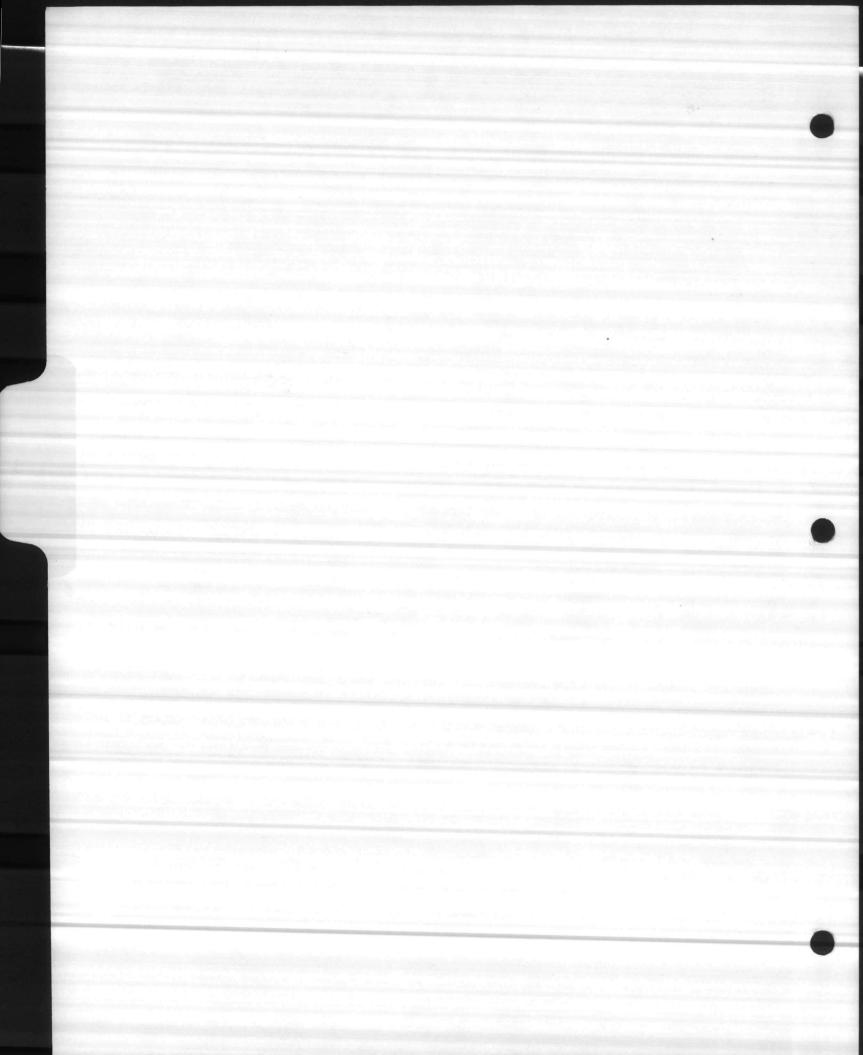
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Model 1R, 2R and 2R-SL specifications

POWER

Models 1R and 2R are designed for water operation. Model 2R-SL is steam operated. Pumps work efficiently with water or steam pressures ranging from 10 to 150 psi.

FLOAT ASSEMBLY

Made entirely of copper, the float slides on the center tube to automatically actuate a low-friction, leakless valve. The link action of the float arm = effects positive instantaneous control of the water or steam pressure.

STRAINER

A large brass strainer provides a substantial base with four legs to hold the pump above accumulation of dirt in the sump.

PUMP

The pump is a bronze ejector type and has no moving parts. This provides exceptionally long life expectancy.

TUBE:

The tube is brass construction and provides a guide , for the float.

CONSTRUCTION

With the exception of the float, which is copper, all parts are made of bronze or brass to eliminate Just and corrosion problems.

Shipping weights

Model 1R: 13 lbs. Model 2R: 14 Ibs. Model 2R-SL: 15 lbs.

For more information, see your Penberthy distributor:

PENBERTHY HOUDAILLE

Penberthy Division, Houdalite Indust 112, Prophetstown, Illinole 81277 -



2784 ALL STREET FOR 1 400 10 1-45 0 27 11010 STEAM BONBLIN TION LE'S

284 4.82 1.00 1.48 1.47 1.80 4.8

DIMENSIONS

20'

Drainer

Diam.

1044 "

12% ".

1424

e pal alives

0.1

100

External steam

loop or Model 2R-SL only.

High

Water

13%

13%

15%

Pipe

(Iniet)

14

**

**

CAPACITIE

COOM

Pipe

(Outlet)

"A"

1.

1%"

1%*

18

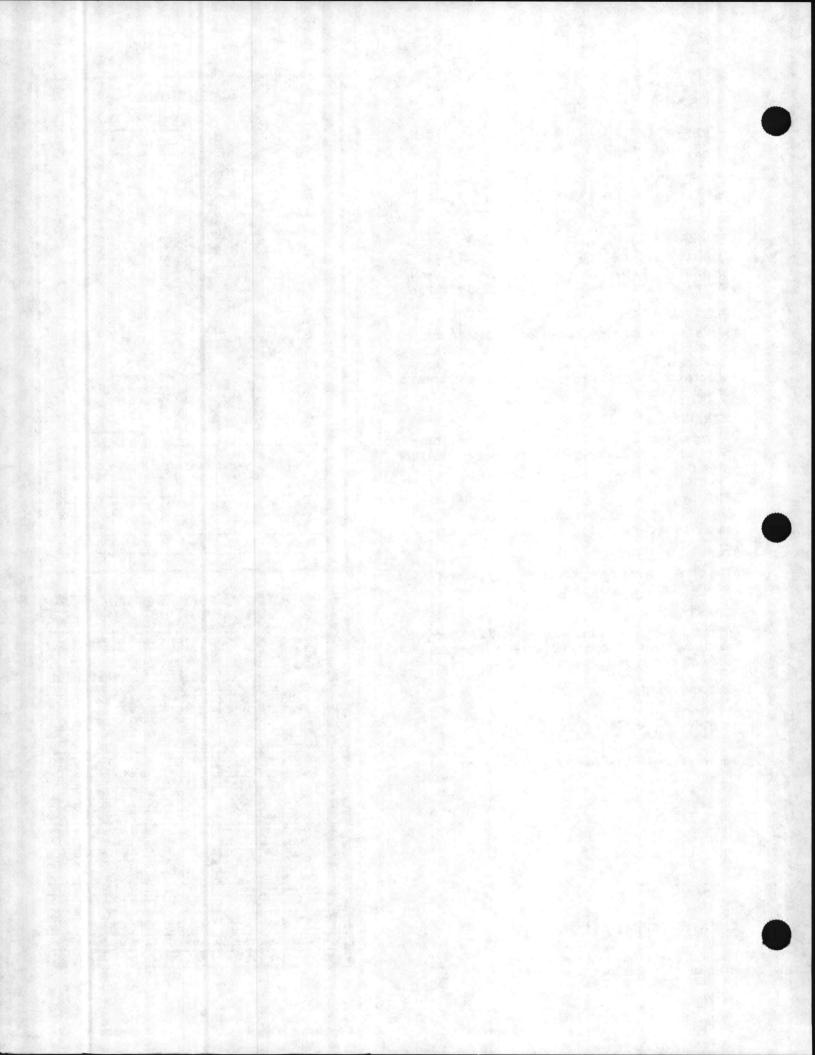
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28-SI

B-1 @1974 Peoperty Neutel



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Mouel R Water Operated Cellar Drainer

and

Model 2R-SL Steam Operated Sump Pump

INSTALLATION INSTRUCTIONS

- (1) Sump should be at least 16" diameter.
- (2) Pump must be placed on hard level surface. Use bricks or other suitable support in bottom of open tile sumps, never place drainer directly on clay or earth surface.
- (3) Choose a location which will allow discharge piping to be routed with the least elevation, the least number of turns, and the least total length of pipe.
- (4) Do not use pipe size smaller than the pump connections.
- (5) Inlet piping should be equipped with the special strainer union supplied with your pump. This strainer will protect the valve and nozzle from pipe scale and dirt.
- (6) Install a swing type check valve in discharge line to prevent backflow when pump stops. (1" size for Model 1R, 1¼" size for Models 2R and 2R-SL).

- Flush out inlet line before making final connections to pump.
- (8) These pumps are factory set to operate at 10 to 60 PSI motive pressure (water for Models 1R & 2R, steam for Model 2R-SI) for higher pressures — up to 150 PSI, hanger should be set at corresponding number on valve lever arm.
- (9) Open inlet supply valve and leave it open.

(4) Clean inlet union strainer periodically.

gravel or mud.

(10) To check installation, gradually fill sump with water. Pump valve will open when water level reaches about ¼" below float rim. Drainer will pump water until level drops sufficiently for float to pull valve shut.

OPERATING INSTRUCTIONS

(5)

- Check operation of pump a few times each year by adding water to sump, especially before normal heavy operating period.
- (2) Remove debris from sump periodically.
- (3) Clean suction screen if it appears to be covered with lint or other material.

SERVICE INSTRUCTIONS

IF PUMP FAILS TO OPERATE:

- (1) Check to be sure float is free to move up and down.
- (2) Check for leaky or damaged float.
- (3) Check for clogged inlet line or jets.

IF PUMP FAILS TO EMPTY SUMP:

- Check for sticking check valve or restriction in outlet flow.
- (2) Check for excessive inflow into sump.

(3) Check to be sure you have sufficient water or steam pressure available. (IMPORTANT: Total elevation from bottom of sump to top of discharge line not to exceed 1 foot for each 4 PSI of motive pressure.)

Do not allow pump to handle cement, mortar, plaster,

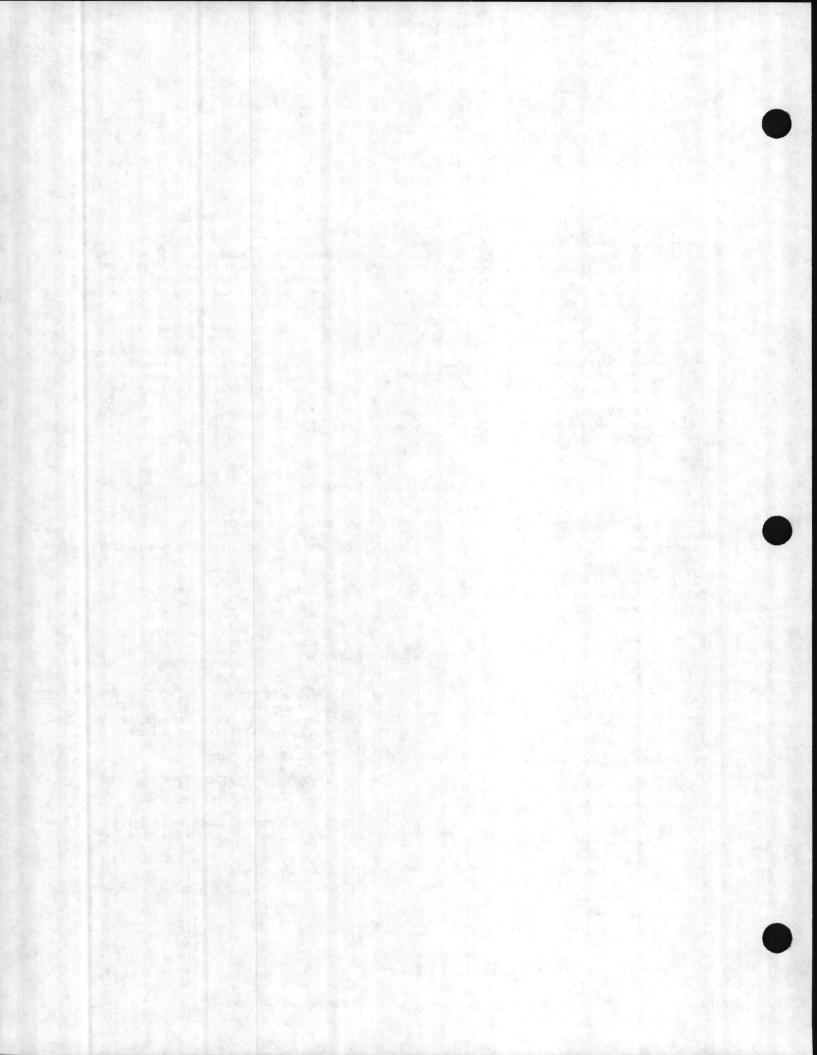
- (4) Check for clogged strainer.
- IF VALVE WILL NOT SHUT OFF:
- (1) Check to be sure float is free to move.
- (2) If valve is sticking, disassemble and clean out, or loosen packing gland until valve works freely.

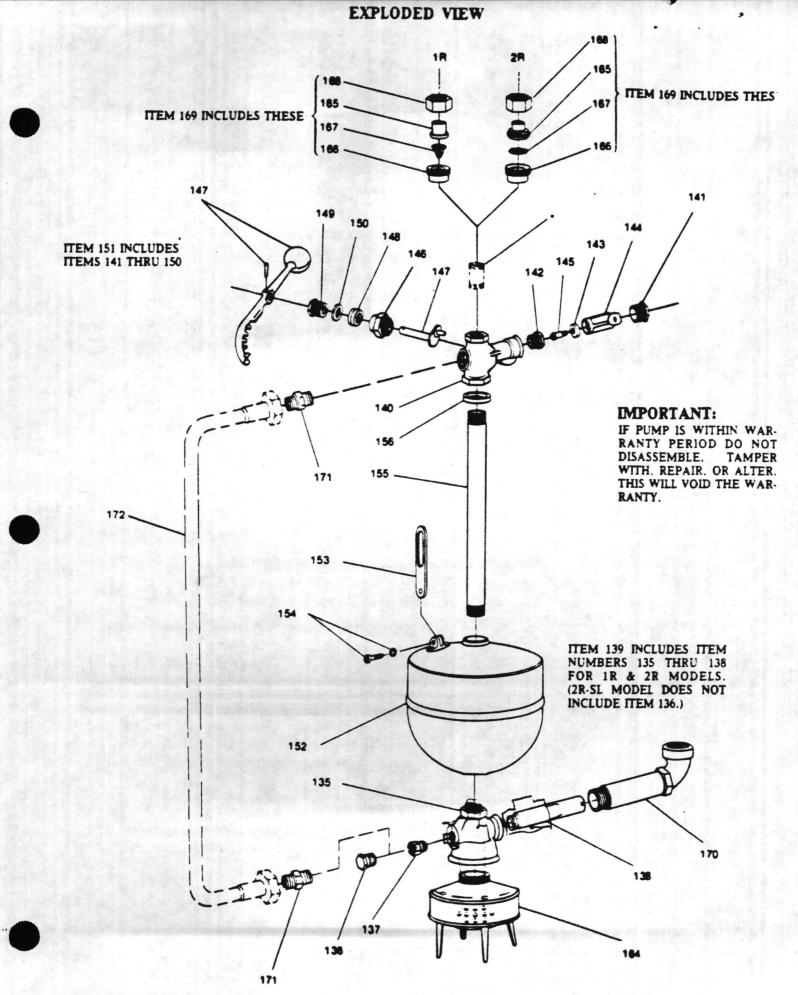
PENBERTHY

P.O. Box 112

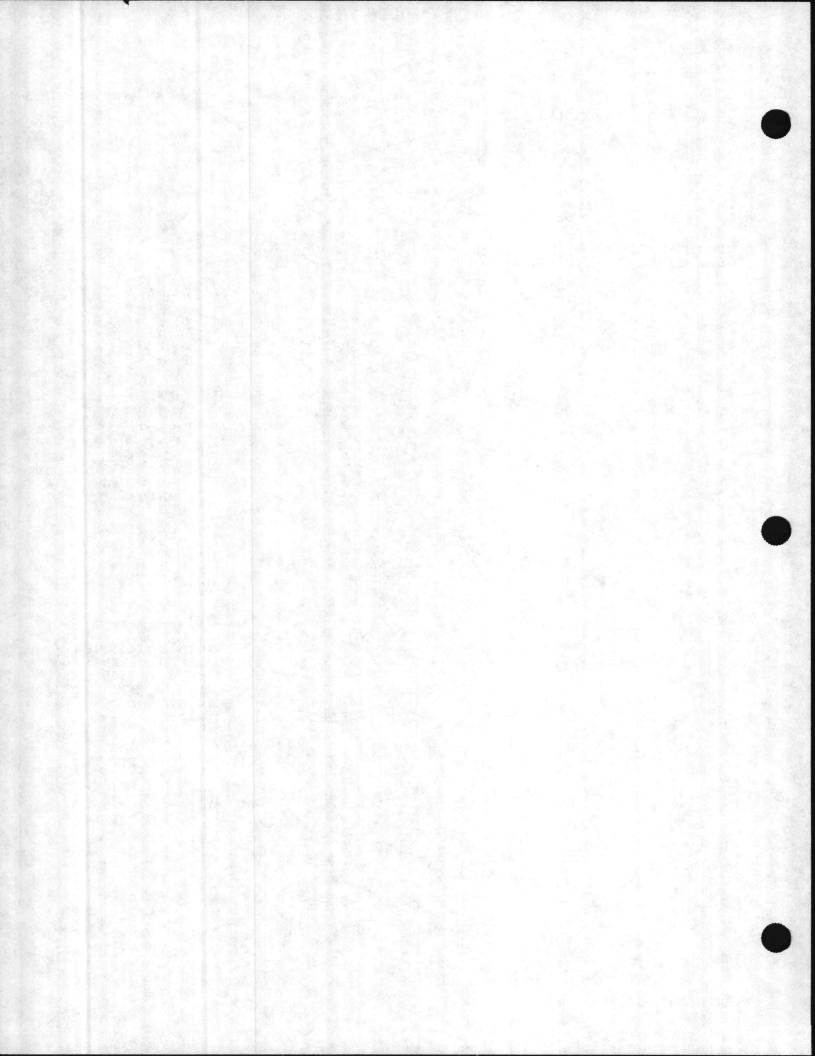
Prophetstown. Illinois 61277







***SUPPLIED BY CUSTOMER**



DISASSEMBLY - REASSEMBLY INSTRUCTIONS

DISASSEMBLY STRAINER UNION ASSEMBLY

- (1) Disconnect cellar drainer at inlet and outlet unions.
- (2) Remove cellar drainer from sump.
- (3) Remove inlet strainer union assembly (item 169) which includes coupling nut (item 168), union male seat (item 165), union strainer screen (item 167), and union female seat (item 166).
- (4) Remove any inlet and outlet pipes.

STEAM LOOP

- On 2R-SL Model. loosen coupling nuts of tube assembly (item 172) and remove tube assembly.
- (2) Remove both adaptors (item 171).

WATER AND DELIVERY JETS

- (1) On 1R and 2R Models remove plug (item 136) and water jet (item 137) from ejector body (item 135).
- (2) On 2R-SL Models remove steam jet (item 137) from ejector body (item 135).
- (3) Remove discharge elbow (item 170) and delivery jet (item 138) from ejector body.

STRAINER

- (1) Remove strainer assembly (item 164) from ejector body.
- (2) Strainer parts are riveted together; if disassembly is required, drill out rivets and use brass screws to reassemble.

FLOAT

- Hanger (item 153) may be removed from float (item 152) by unfastening hanger screw and lock washer (item 154).
- (2) Loosen float guide tube (item 155) from valve body (item 140) and remove the tube washer (item 156).
- (3) Slide float (item 152) off of tube (item 155).
- (4) Loosen tube from ejector body (item 135).
- (5) Remove hanger (item 153) from valve lever (item 147).

VALVE

- Remove valve body plug (item 141) for 1R and 2R Models and adapter (item 171) for 2R-SL Model from valve body.
- (2) Loosen and remove valve bonnet (item 146).
- (3) Valve disc holder (item 144) may be removed at this time. Valve disc (item 143) and screw (item 145) may be taken off at this time.
- (4) To disassemble valve packing remove pin (item 147) from lever (item 147) and slide lever off stem. Loosen valve packing gland (item 149) from valve bonnet. and remove. Valve packing (item 148) and gland washer (item 150) may be pulled out from valve bonnet.
- (5) Valve seat (item 142) may now be unscrewed from valve body.

REASSEMBLY WATER AND DELIVERY JETS

- (1) Fasten ejector body to strainer assembly.
- (2) Replace delivery jet and discharge elbow onto ejector body.
- (3) Water jet and plug may be replaced on 1R and 2R Models to the ejector body.
- (4) Fasten steam jet onto ejector body on 2R-SI Model.
- (5) Replace the adaptor onto ejector body.

FLOAT

- (1) Tighten tube to ejector body, and slide float onto tube.
- (2) Connect hanger to float by tightening hanger screw and lock washer.

VALVE

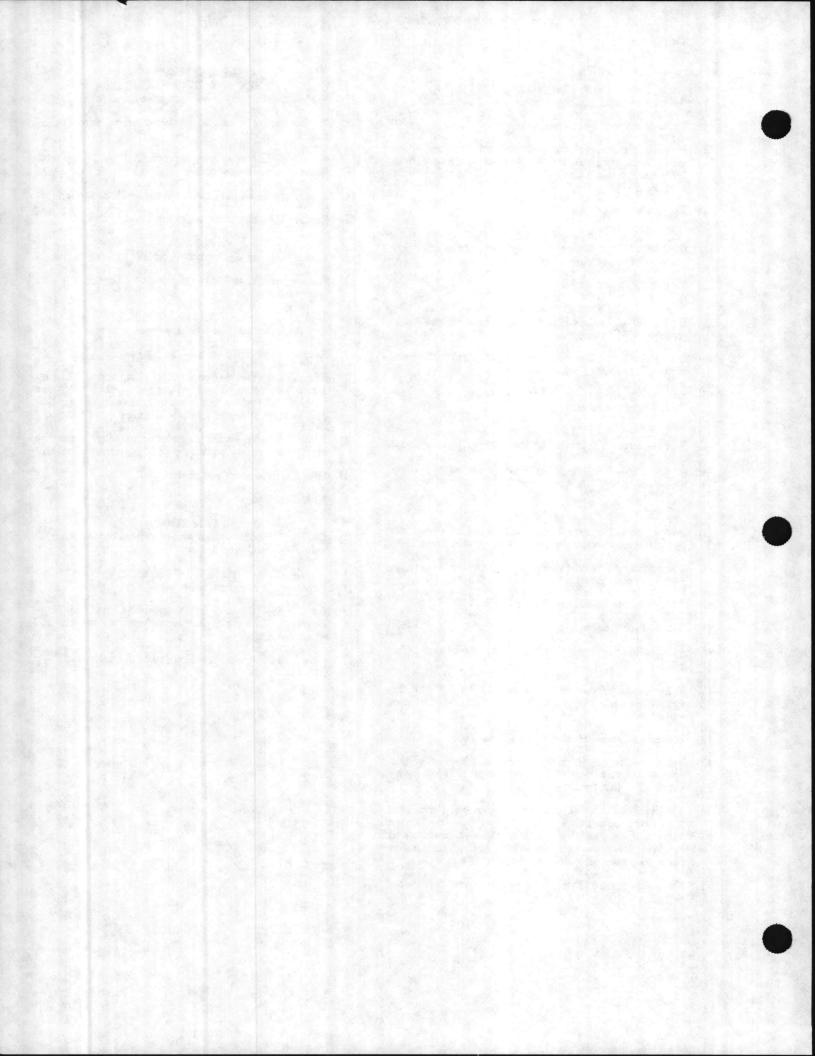
- (1) Replace valve body and tube washer to tube.
- (2) Replace valve body seat.
- (3) Reassemble valve disc onto holder using screw. Then insert holder in valve body. Take valve stem and valve bonnet, and replace into valve body making certain that peg on stem slides into holder. Tighten valve bonnet.
- (4) Slide two valve packings, and one packing washer on stem; then replace packing gland. Tighten moderately.
- (5) Slide lever on stem and replace pin.
- (6) Slide float hanger on lever.

STEAM LOOP

 On 2R-SI Models attach steam loop tube assembly to valve body and ejector body.

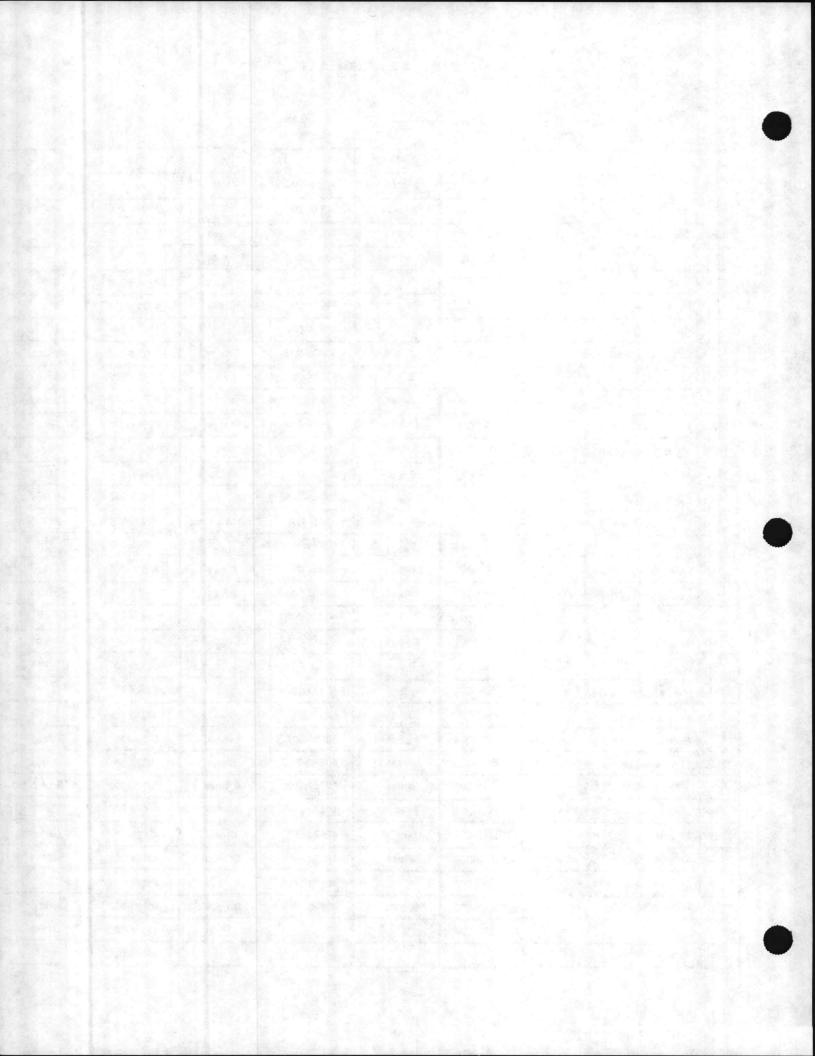
STRAINER UNION ASSEMBLY

- (1) Replace any inlet and outlet pipes.
- (2) Replace inlet strainer union assembly, including coupling nut, union male seat, union strainer screen, and union female seat.
- (3) Attach cellar drainer to inlet and outlet unions.

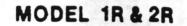


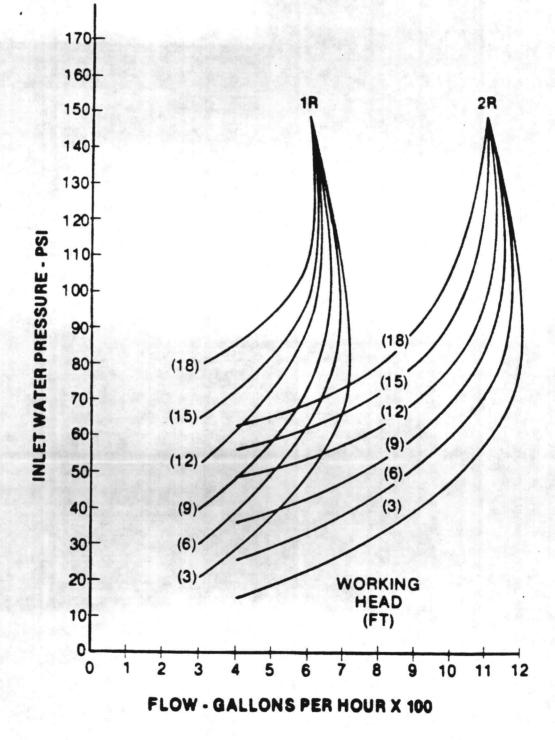
PARTS & MATERIALS LIST

Key		18		2R		2R	-SL
NO.	Part Description	Part No.	Material	Part No.	Material	Part No.	Materia
135	Ejector Body	40928-002	Bronze	40928-002	Bronze	40928-002	Bronze
136	Ejector Body Plug	40614-002	Brass	40614-002	Braas		1
137	Water Jet	40927-002	Brass	40616-002	Brass		
137	Steam Jet		1. 1. 1. 1.			4231 2-002	S.S.
138	Delivery Jet	40617-002	Brass	40618-002	Brass	42313-002	\$.S
139	Ejector Assembly	40615-001		40616-001		42310-001	
140	Valve Body (Includes Seat)	40633-002	Bonze	40636-002	Bronze	4231 4-002	Bronze
141	Valve Body Plug	40€1 4-002	Brass	40614-002	Brass	4061 4-002	Brass
142	Valve Body Seat	40640-002	Brass	40640-002	Brass	40640-002	Brass
143	Valve Disc	12691-010	Rubber	12691-010	Rubber	12691-020	Teflon
144	Valve Disc Holder	40639-002	Bronze	40639-002	Bronze	40639-002	Bronze
145	Valve Disc Screw	40538-002	Brass	40638-002	Brass	40638-002	Brass
146	Valve Bonnet	40603-002	Brass	40603-002	Brass	40603-002	Brass
147	Valve Stem, Lever & Pin	40607-001	Bronze & Brass	40607-001	Bronze & Brass	42335-001	Bronze & B
148	Valve Packing (2 Required)	40606-002	Graphite Asbestos	40606-002	Graphite Asbestos	40606-002	Graphite
149	Valve Packing Gland	40604-002	Brass	40604-002	Brass	40604-002	Brass
150	Valve Packing Gland Washer	40605-002	Brass	40605-002	Brass	40605-002	Brass
151	Valve Assembly	40921-001		40922-001	and the second second	4231 4-001	
152	Float	40611-001	Copper	40611-001	Copper	40611-001	Copper
153	Hanger	40608-002	Brass	40608-002	Brass	42336-002	Brass
154	Hanger Screw & Lock Washer	40609-001		40609-001		40609-001	100 200
155	Float Guide Tube	40613-002	Brass	4061 3-002	Brass	42310-002	Brass
156	Guide Tube Washer	40601-002	Rubber	40601-002	Rubber	40601-002	Rubber
164	Strainer Assembly	40598-001	Brass	40598-001	Brass	40598-001	Brass
165	Strainer Union - Male Seat	40642-002	Brass	40622-002	Bronze	40622-002	Bronze
166	Strainer Union- Female Seat	42337-002	Bronze	40623-002	Bronze	40623-002	Bronze
167	Strainer Union Screen	40643-002	Monel	40625-002	Brass	40625-002	Brass
168	Strainer Union- Coupling Nut	51180-002	Brass	40624-002	Bronze	40624-002	Bronze
169	Strainer Union Assembly	40642-001		40622-001	10000	40622-001	1.0000
170	Discharge Elbow	40619-002	Bronze	40820-002	Bronze	40820-002	Bronze
171	Adaptor	an an and			Line Press	42311-002	Brass
172	Tube Assembly					42315-001	Brass



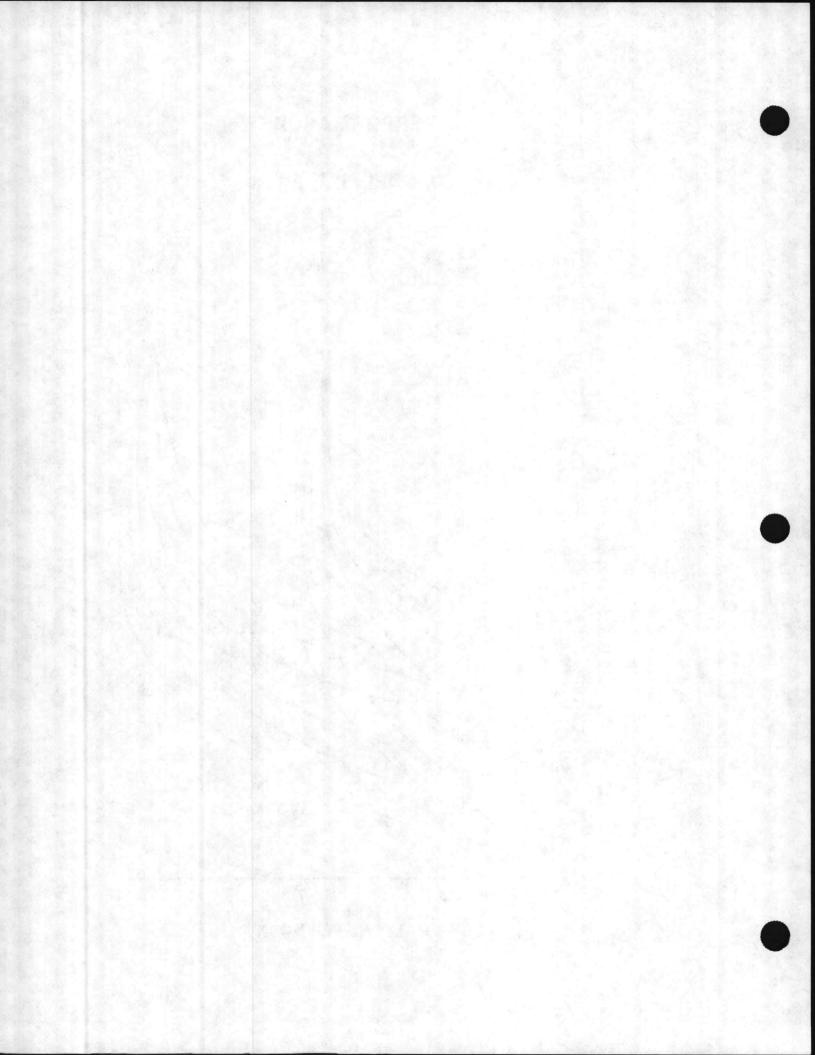
PERFORMANCE



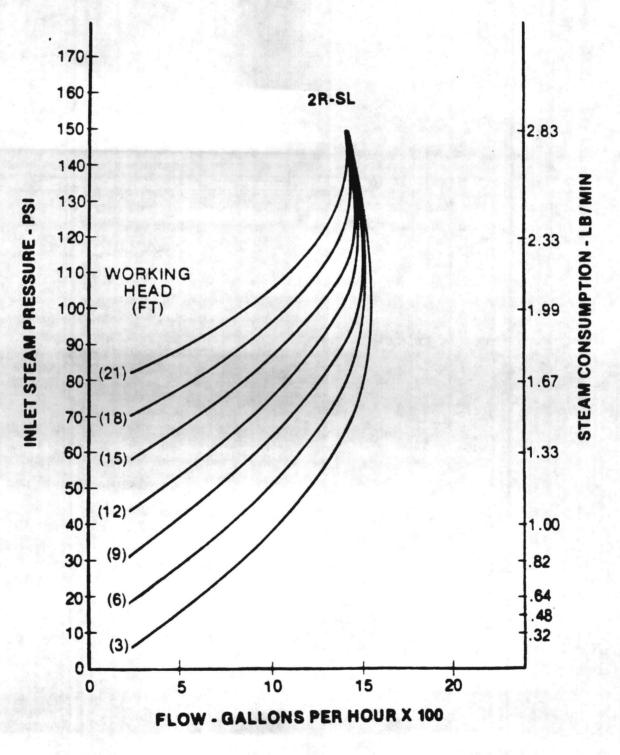


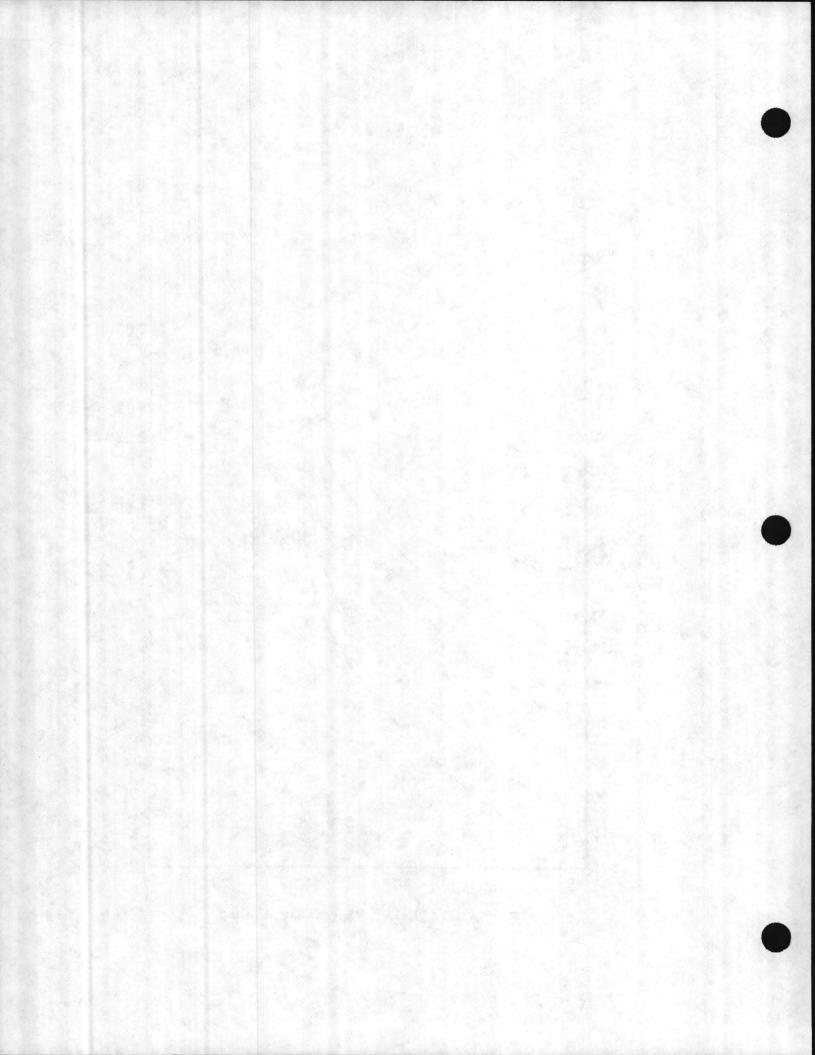


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MODEL 2R-SL

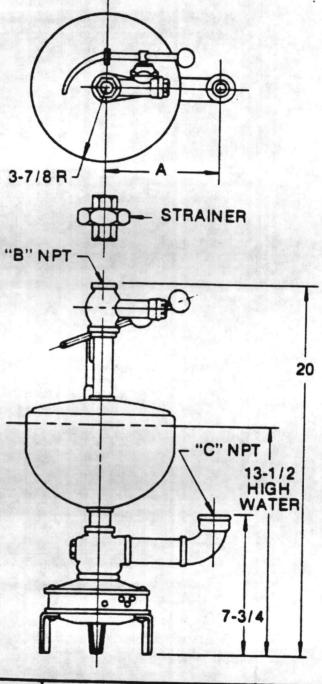






DIMENSIONS

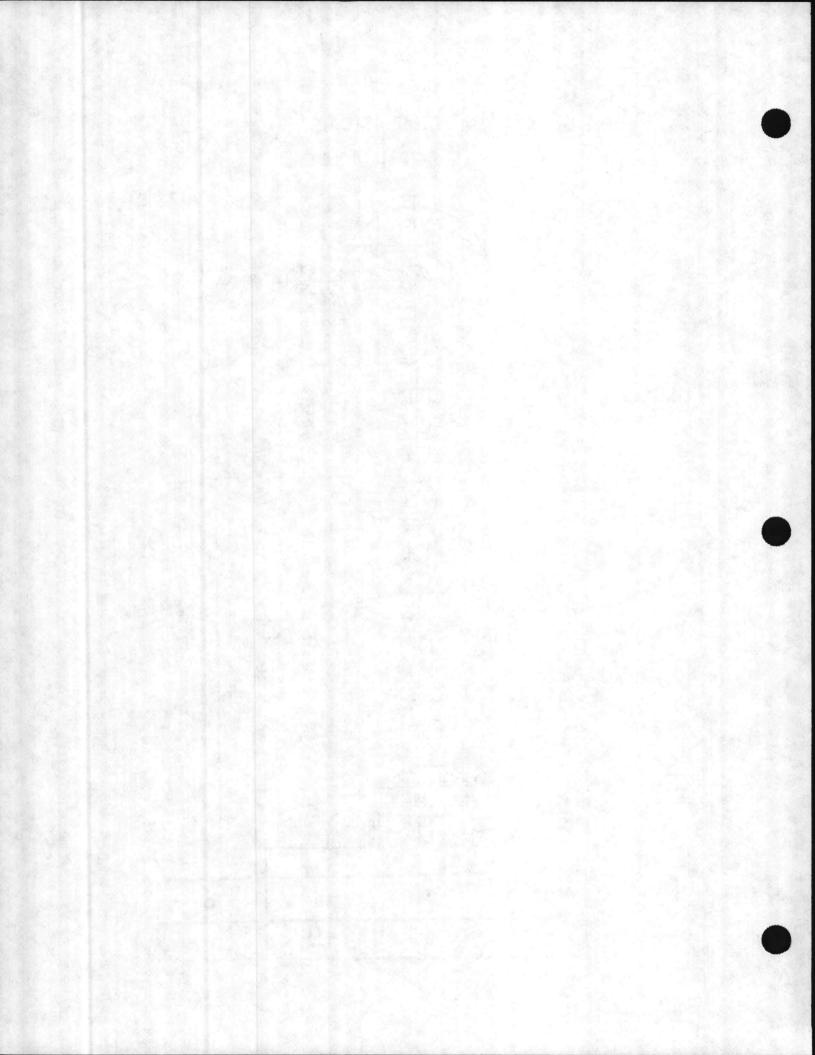
MODEL 1R & 2R



MODEL	A	B	С
1R	6	1/2	1

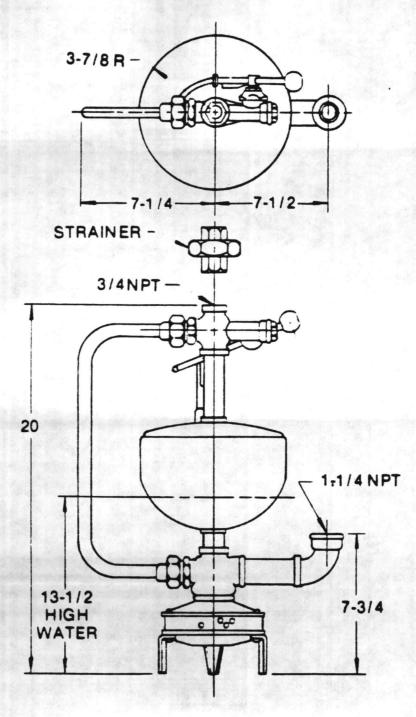
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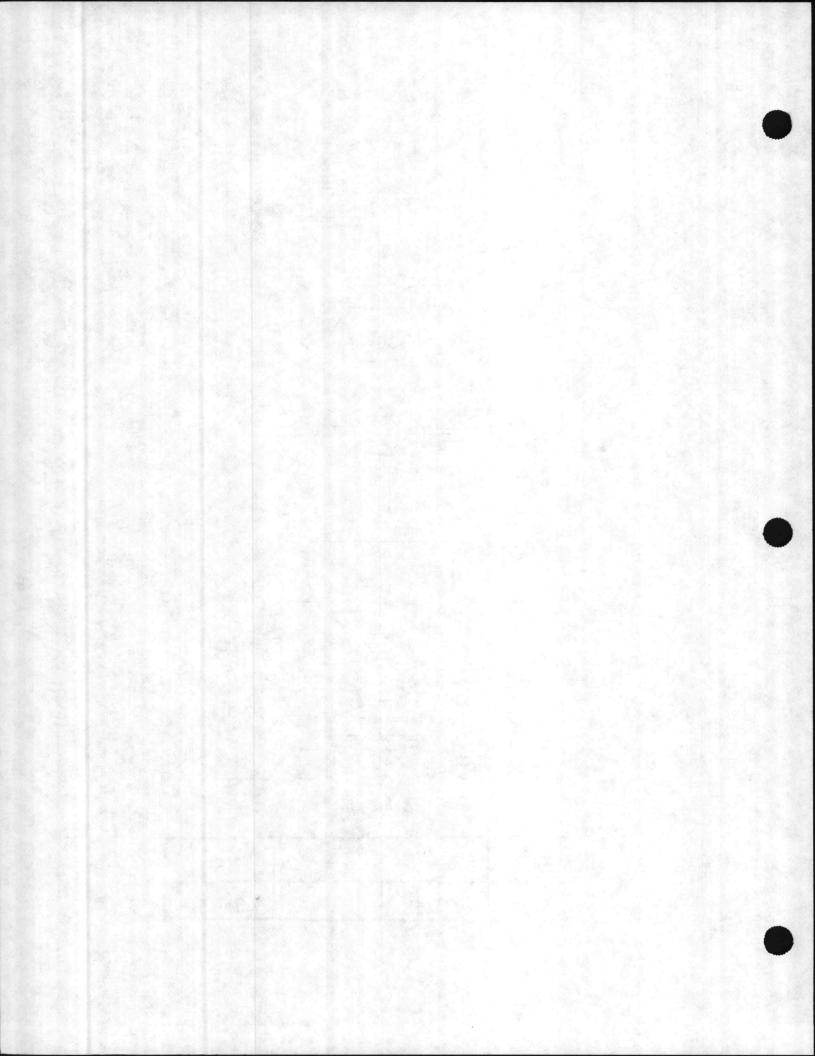
MODEL 2R-SL

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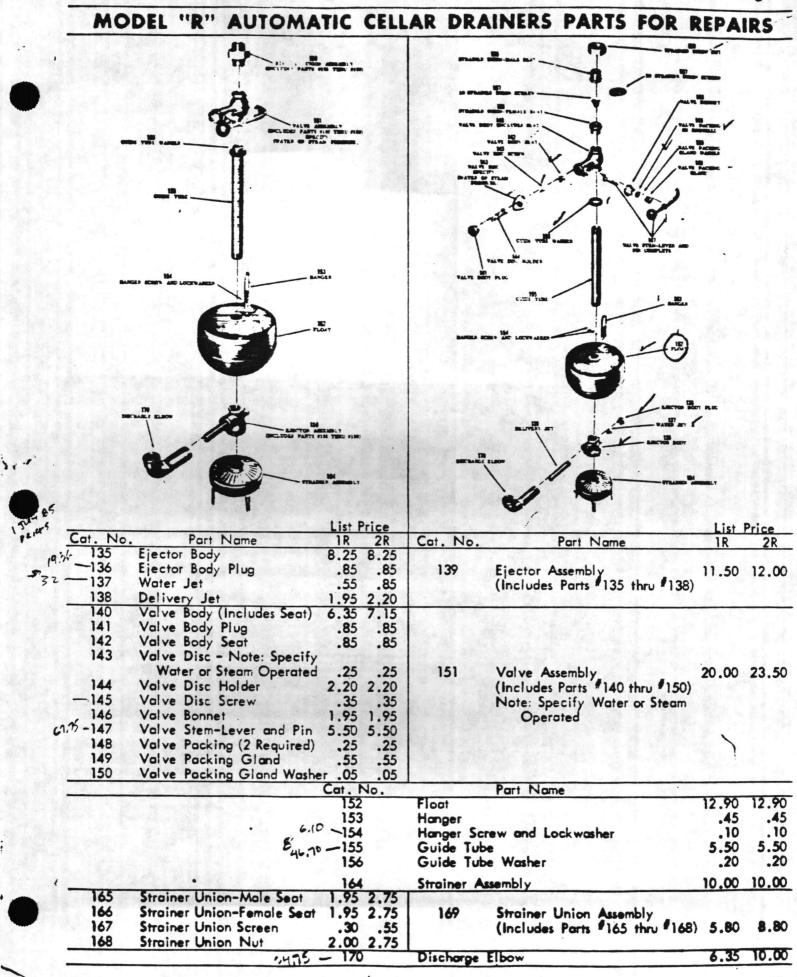
MODEL	A	B	С
2R	7-1/2	3/4	1-1/4





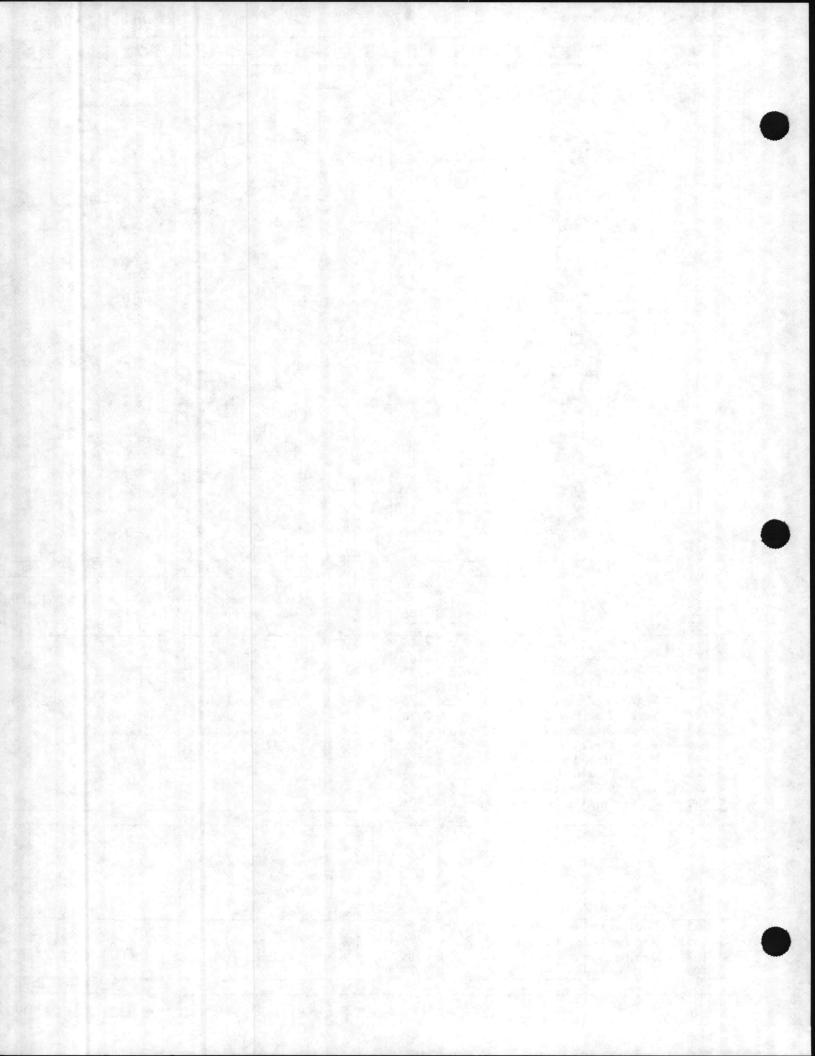
Prophetstown, Illinois

Detroit 11, Michigan



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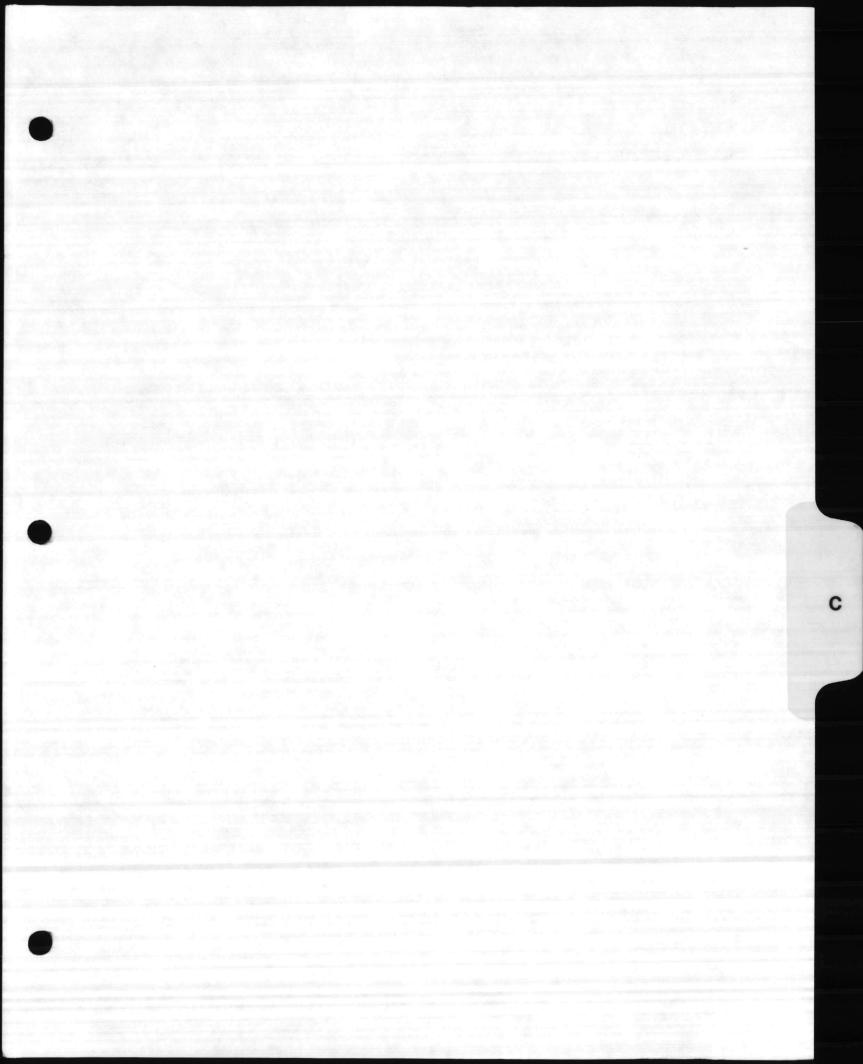
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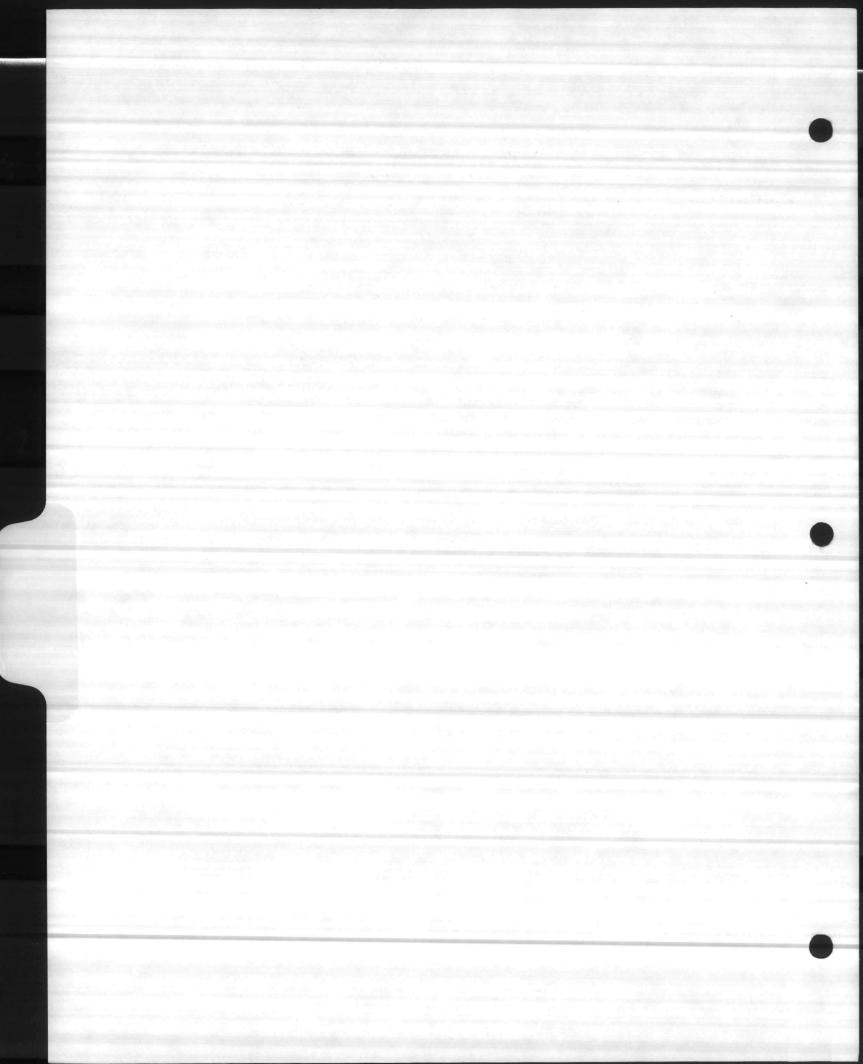
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application report

PENBERTHY HOUDAILLE

06/208/08.

100 Section Application Report 177 Issued 11/NEL

FOR: AUTOMATIC SUMP DRAINER - GOVERNMENT UNIT

> The U.S. Government has been purchasing the 2R Cellar Drainers which 5/01.56 are listed as:

National Stock Number: 4320-00-510-8037 Description: Sump, pump

The new Penberthy Houdaille Automatic Sump Drainer has been approved as the replacement for the 2R units and listed under the same National Stock Number.

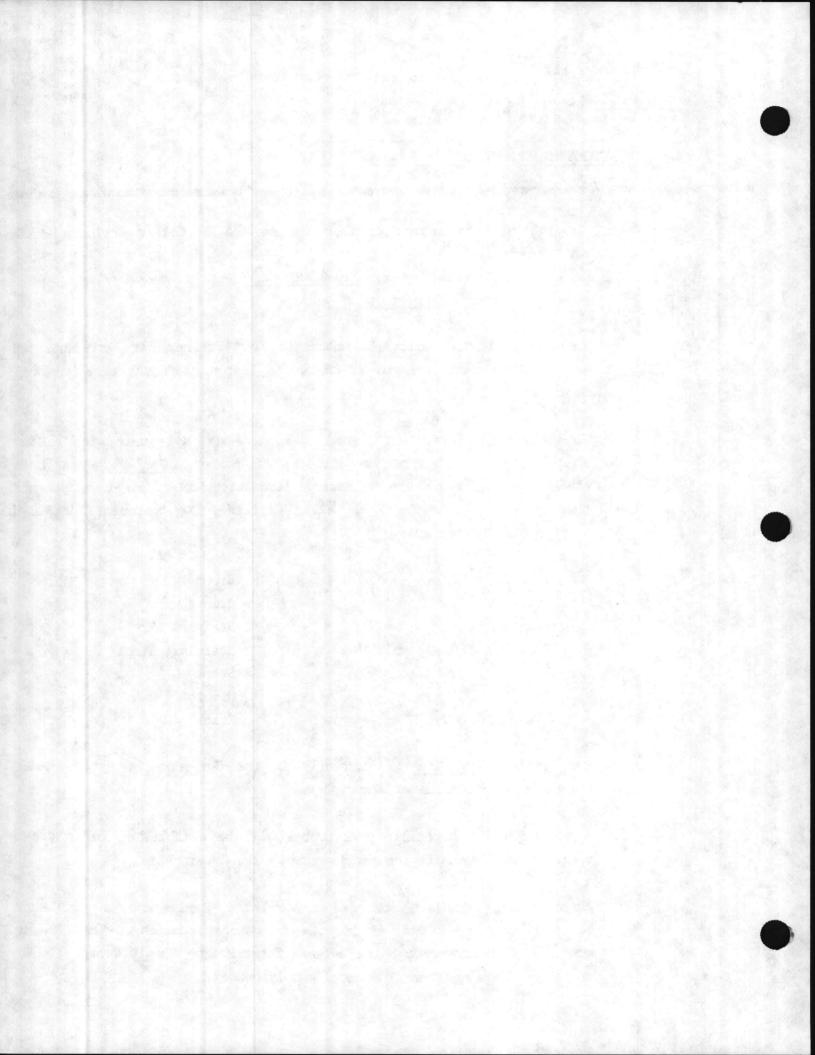
To satisfy the Government's need to replace a single unit with a like single unit, Penberthy Houdaille part number 59637-000 has been assigned to combine the necessary Automatic Sump Drainer components that equates to the Model 2R Cellar Drainer. The components included in this part number are:

LL 1 Jet	Bronze
Pilot Valve 1"	Bronze
Float Rod	Stainless Steel
Float Rod Sub-assembly 1"	Stainless Steel
Stand Pipe Sub-assembly 1"	Steel
Foot Valve 1"	Bronze
Bushing 1" x 1/2" Hex	Steel

Part number 59637-000 is currently in the Government's system under the National Stock Number shown above.

A new Perberthy Houdaille part number will be established for a steam operated unit when the request is made by the Government.

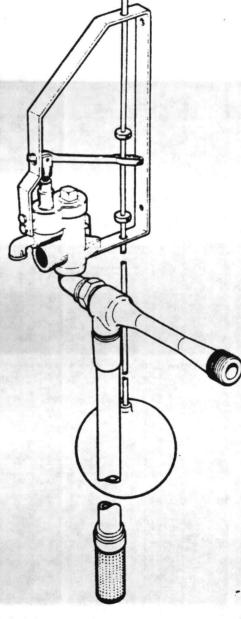
Automatic Sump Drainers are used on Air Force, Marine and Navy military bases as back up purps, or for use in remote locations. These bases order these units through the Defense Construction Supply Center (DCSC) and also often buy then from local supply houses.



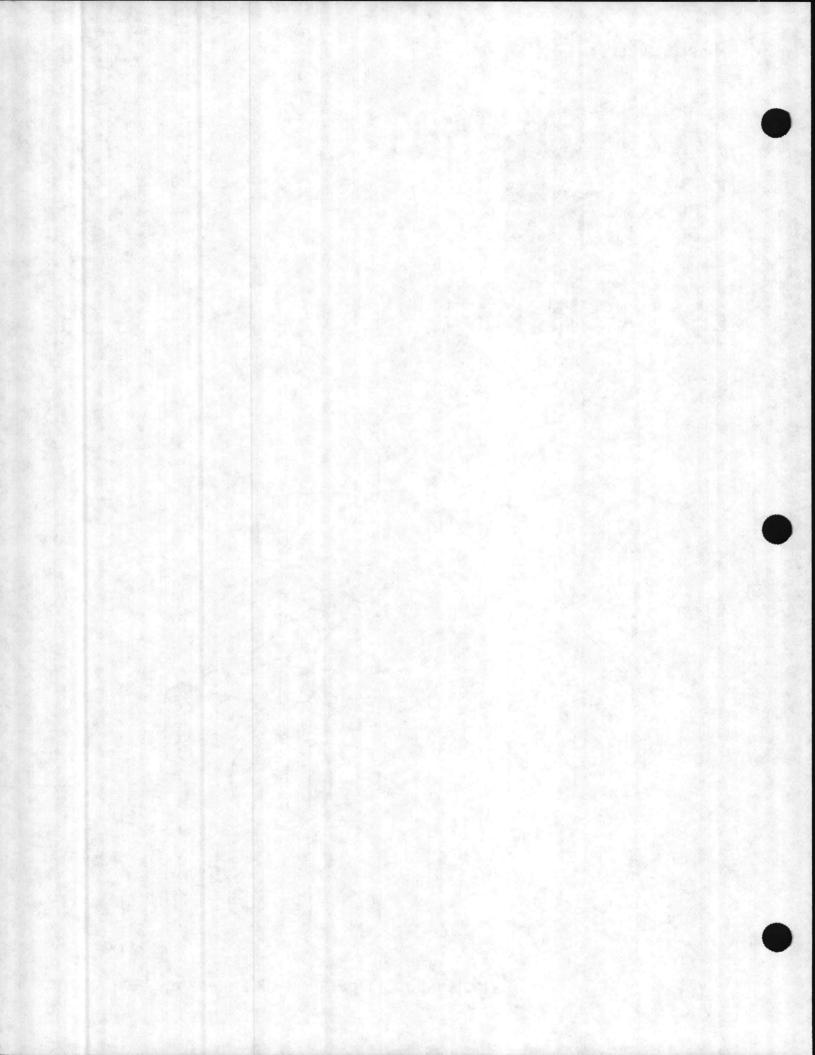
PENBERTHY HOUDAILLE®

Section 1000 Instal Instr 1958 Issued 6/82 Replaces NEW

Automatic Sump Drainer



Installation / Operation / Maintenance Instructions



PENBERTHY HOUDAILLE

INSTALLATION / OPERATION / MAINTENANCE FOR AUTOMATIC SUMP DRAINER

This manual has been prepared as an aid and guide for personnel involved in installation or maintenance. All instructions must be read and understood thoroughly before attempting any installation, operation, or maintenance. Failure to follow *any* instruction could possibly result in a malfunction of the automatic sump drainer resulting in leakage of the contained fluid, property damage, or physical injury to personnel.

Caution: Penberthy Houdaille does not have any control over the manner in which its automatic sump drainer is handled, installed, or used, and Penberthy Houdaille cannot and does not warrant or guarantee that an automatic sump drainer is suitable or compatible with the user's specific application.

WARNING: Safety glasses should be worn when installing or operating an automatic sump drainer.

I. INTRODUCTION:

A. Features and Specifications

Penberthy Houdaille automatic sump drainers consist of a pilot operated valve, jet pump, stand pipe, foot valve, float rod and float. They are designed to remove liquids from sumps when the liquid reaches a predetermined level. They will then pump the liquid against a maximum discharge pressure until the sump liquid level lowers to a predetermined level.

B. Design Ratings PSIG at Maximum and Minimum Operating Temperatures

The pilot operated valve maximum allowable operating pressure is 200 PSIG at -20°F to +400°F.

The jet pump maximum allowable operating pressures are listed below:

MATERIAL	BODIES	NOZZLES
Bronze	200 PSIG at -20°F to +150°F 125 PSIG at +400°F	200 PSIG at -20°F to +400°F
316 STS	200 PSIG at -150°F to +150°F 125 PSIG at +400°F	200 PSIG at -150°F to +400°F

To determine the maximum allowable working pressure at a specific temperature for the specific jet pump, the user should refer to Penberthy Houdaille dimension sheets, or when provided, the specifically stated design limits on a Penberthy Houdaille product proposal.

The foot valve maximum allowable working pressure is 150 PSIG at -20°F to +180°F.

Caution: On installations requiring operating presures above 150 PSIG, a pressure relief valve must be installed in the jet pump discharge line to keep from over-pressuring the foot valve and the jet pump in the event of discharge line plugging or blockage.

C. Application Data

Maximum sump liquid temperature is +180°F when operating with liquid and +150°F when operating with steam, at a 5 ft. suction lift. Minimum operating pressure is 40 PSIG.

Jet pump application range; size 1" valve will handle models LL, LM, GL, and GH in sizes 3/4", 1", 1-1/4", and 1-1/2". Size 2" valve will handle models LL, LM, GL, and GH in sizes 2" and 2-1/2".

Note: For specific application data within the above ranges, the user should consult the Penberthy Houdaille product proposal for the specific model and size of automatic sump drainer, or should request Penberthy Houdaille to supply the applicable technical data bulletin.

WARNING: Under no circumstances should these design ratings or application data be exceeded. Exceeding design ratings or application data may cause property damage or physical injury to personnel.

II. INSPECTION AND PERFORMANCE CONFIRMATION:

A. Receiving Inspection

Upon receipt of automatic sump drainer, check all components carefully for damage incurred in shipping. If damage is evident or suspected, do not attempt installation. Notify carrier immediately and request damage inspection.

B. User's Rating Inspection

The user should confirm:

1. That the pilot operated valve size and pressure/temperature rating, stamped on nameplate (163) conforms to the description on the user's purchase order.

2. That the jet pump size, cast on side of body, model designation, stamped on nozzle hex flats, and pressure/temperature rating, printed within jet pump installation instructions, conforms to the description on the user's purchase order.

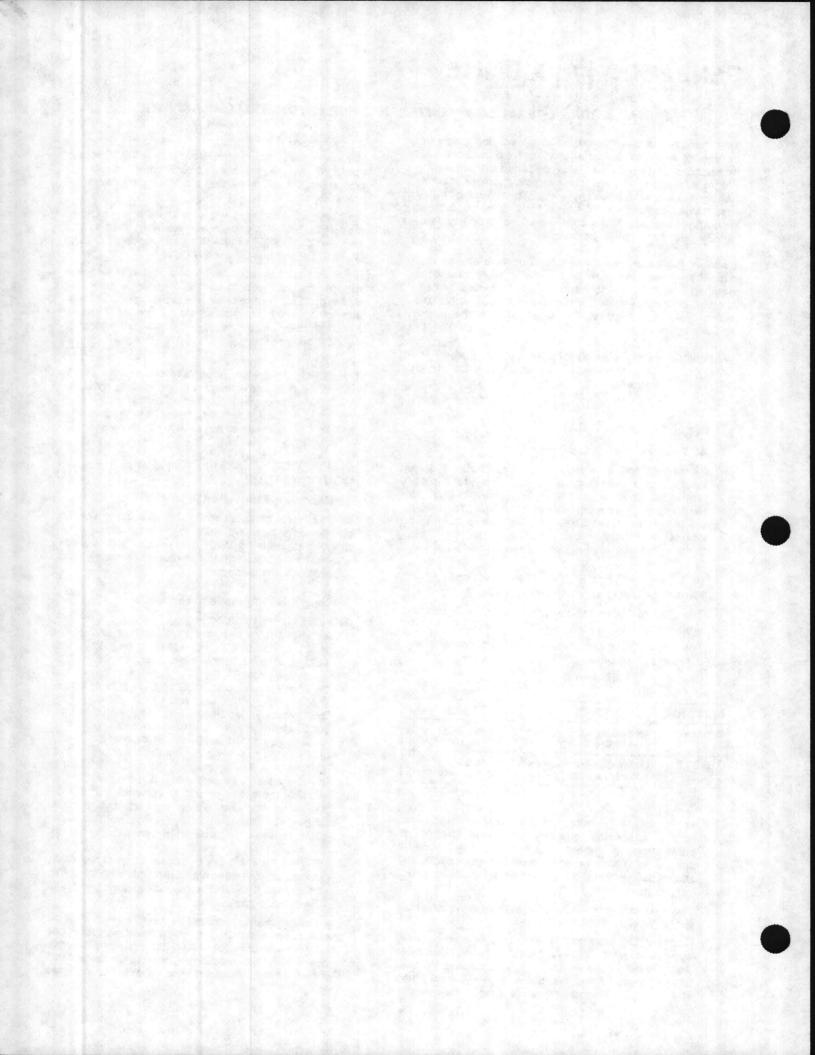
3. That the operating conditions described in the purchase order agree with the actual operating conditions at the installation site.

4. That the actual operating conditions at the installation site are within the application data shown on the Penberthy Houdaille Technical Data Bulletin or product proposal referred to above.

5. That the materials of construction of the automatic sump drainer are compatible with both the contained fluid and surrounding atmosphere in the specific application.

Caution: If the size, model or performance data of the automatic sump drainer as received does not conform with any of the criteria above, do not proceed with installation. Contact an authorized Penberthy Houdaille distributor for direction on what to do.





III. INSTALLATION:

Installation should only be undertaken by qualified experienced personnel who are familiar with this equipment and have read and understood all the instructions in this manual.

The user should refer to Penberthy Houdaille dimension sheets or Penberthy Houdaille product proposal to obtain dimensional information for the specific size and model automatic sump drainer.

A. Planning Considerations

1. Become thoroughly familiar with the installation instruction manual furnished with the jet DUMD.

2. Penberthy Houdaille automatic sump drainers must be installed in a vertical position with the pilot lever at the top.

3 The sump drainer assembly must be supported by the inlet and discharge piping, or by the float road bracket. There are two 5/16" dia. holes spaced 12-1/2" apart on the vertical leg of the bracket provided for this purpose. If the user elects to support the assembly by the bracket, then the inlet and discharge piping must be separately supported as the bracket is not designed to carry piping loads.

4. Locate the assembly so the foot valve does not rest on the bottom of the sump, and the float does not touch the sump walls.

5. Locate pilot operated valve so it is accessible for servicing, and float actuation adjustments.

6. The motive fluid line should be equipped by the user with a strainer and a shut-off valve to keep debris from entering the valve and jet pump and to permit servicing.

7. Use Tetion[‡] tape, or equivalent, on all male tapered pipe thread connections.

8. Make provision for safe disposal of 3/8" side connection pilot bleed flow. A small amount of motive fluid will be discharged by the pilot operated valve shortly before and while the valve is open. When operating with a liquid, this flow may be directed to the sump. When operating with steam, it is advisable to vent this flow to atmosphere. In either case, a 1/4 inch pipe or 1/4" I.D. copper line is recommended. See Mounting, Section III, paragraph B.

B. Mounting

1. Install and pipe to pilot operated valve according to the method chosen in Section III, paragraph A3 above.

2. Install the jet pump to the pilot operated valve using reducing bushing when required, which is included within the foot valve carton.

3. Install and support the jet pump discharge line as needed, making sure that the intallation instructions furnished with the jet pump are followed.

4. Thread the foot valve to the stand pipe, and the stand pipe to the jet pump suction and tighten.

5. Install the bleed line according to the method chosen in Section III, paragraph A8 above. When discharging the bleed liquid into the sump, the bleed line can be attached to the stand pipe with hose clamps.

WARNING: Bleed steem must be vented to stmosphere in a safe place.

> Do not bleed motive steem to sump liguld because bloed steem may cause splashing of sump liquid, vibration, and may also heat the liquid to a point where the jet pump will cavitate and stop pumping.

> Do not turn on motive fluid pressure to pilot operated valve until pilot bleed piping has been completed. Failure to provide piping for pilot bleed will cause motive fluid to discharge from bleed elbow at motive pressure possibly resutting in property damage or injury to personnel.

6. Slip the float rod threaded end first, thru the top bracket hole. Install one collar above and below the lever as the float rod passes thru the lever hole. Push float rod thru the bottom bracket hole; and attach float ball to the threaded end. Tighten top collar in place temporarily so float rods holds the lever down.

IV. OPERATION:

A. Pre-Optional Check

1. Assure that all installation procedures have been completed.

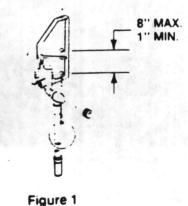
2. Check to determine that all connections are pressure tight.

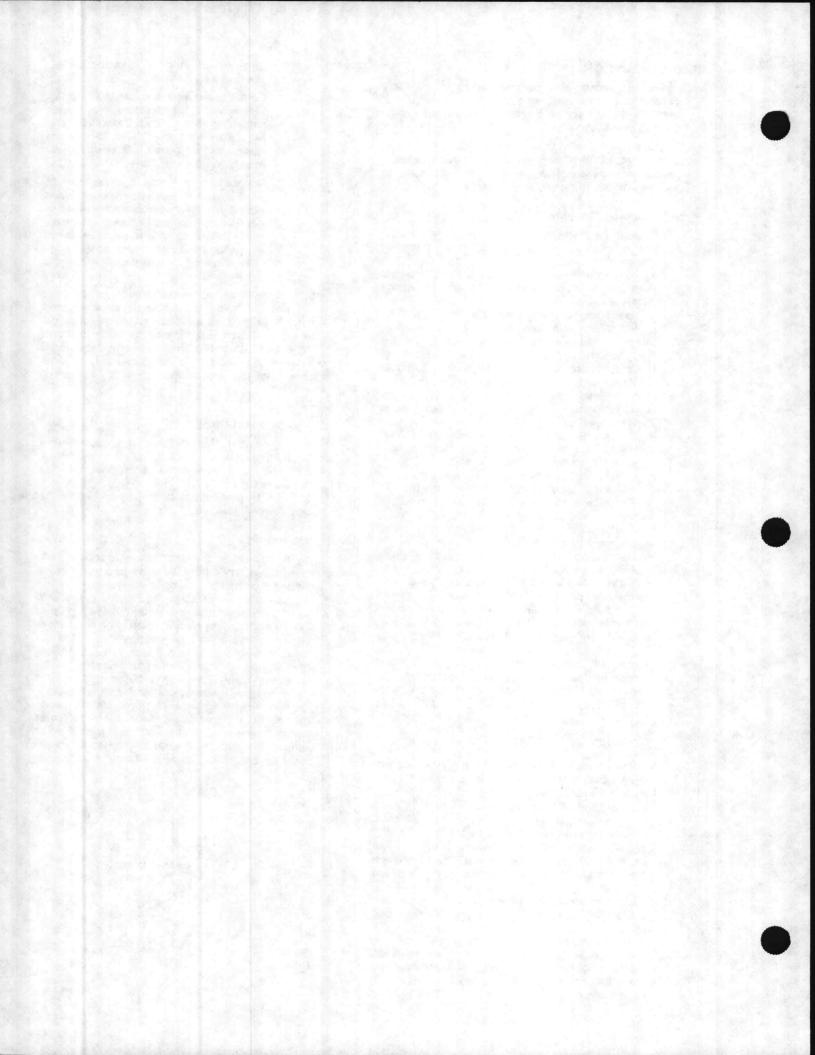
3. Take all precautions necessary to handle the possibility of leakage.

B. Operating

1. While holding the lever in the up (open) position, slowly open the fluid valve to allow the unit to begin pumping, then open valve fully.

2. Move the lever down and hold in place to cause the valve to close. Note: It may take up to 30 seconds for the closing cycle to be completed. 3. Adjust the collars on the float rod at the desired turn-on and turn-off points. See Fig. 1. Note that a) maximum rod travel is 8 inches; b) for minimum travel, collars must be no closer than 1 inch apart or the lever will bind; c) it takes up to 30 seconds for the valve closing cycle to be completed, during which time the jet pump continues to empty the sump; d) turn-off liquid level must be above the suction strainer or the jet will break suction before the cycle is complete and never turn off.





V. MAINTENANCE

Maintenance should only be undertaken by qualified experienced personnel who are familiar with this equipment and have read and understood all the instructions in this manual.

Caution: Do not proceed with any maintenance unless the automatic sump drainer has been relieved of all pressure or vacuum, has been allowed to reach ambient temperature, and has been drained or purged of all fluids.

A. Preventative Maintenance

The user must create maintenance schedules, safety manuals and inspection details for each specific installation of an automatic sump drainer.

On all installations the following items should be regularly evaluated by the user for purposes of maintenance.

1. Motive fluid line strainer for corrosion and debris build-up.

2. All connections for tightness.

3. External moving parts for clearance wear and lubrication.

4. Turn-on and turn-off levels for correct setting.

The user must determine upon evaluation of his or her own operating experience an appropriate maintenance schedule necessary for his or her specific application. Realistic maintenance schedules can only be determined with full knowledge of the services and application situation involved.

B. Maintenance Procedures

1. Leakage around the pilot stem is an indication of an inadequate seal. Obtain a replacement seal and proceed to replace it as described within the disassembly-reassembly procedures. Section V, paragraph D.

2. Leakage around the pilot seat is an indication of a worn out seat. Obtain a replacement seat and proceed to replace it as described within the disassembly-reassembly procedures. Section V, paragraph D.

3. Should leakage occur through the valve piston seat, disassemble according to instruction in Section V, paragraph D. Lap piston seat into body seat using valve lapping compound. Clean out thoroughly before reassembling.

4. Should the piston stick open, or closed, it is likely that debris is jamming within the tight clearances around the piston. Disassemble, clean, and reassemble according to procedures.

5. In case of jet pump problems, follow the instructions within the jet pump installation manual for the specific model jet pump.

Cure

C. Troubleshooting

Problem

Valve will not shut off.

Cause Piston sticks. Lever sticks.

Clean out piston. Lubricate and re move binds. Improper collar setting.

Excessive stem leaks.

Sump fills faster than jet can pump.

Jet stops pumping.

Liquid level lowers to foot valve, breaking suction.

Problem

Valve will not turn on.

Cause	Cure
Piston sticks.	Clean out piston.
Lever sticks.	Lubricate and re- move binds.
Improper collar setting.	Reset according to instructions. Section IV, Paragraph B

Reset according to

instructions. Section

Replace stem seat.

Reduce flow or re-

Remove restrictions

Reset according to

instructions. Section

IV, paragraph B.

in jet discharge line.

IV. paragraph B.

size drainer.

D. Removal - Disassembly - Reassembly

Caution: Do not proceed with the removal of automatic sump drainer from connecting piping unless the automatic sump drainer has been relieved of all pressure or vacuum, has been allowed to reach ambient temperature, and has been drained or purged of all fluids.

WARNING:	When servicing the valve, it is desirable
	to clamp the lower part of the body in a
	vise. Do not clamp above the iniet con-
	nection or permanent damage to the
	piston cylinder may result.

1. To service the pilot stem.

a) Mark locations of collars on float rod, loosen and remove collars and float rod.

b) Remove the two hex head bracket screws near the pilot bleed and pry bracket away from valve just enough to pull lever out of the pivot hole.

c) Loosen and remove gland/pilot stem assembly.

d) Turn stem counterclockwise to unscrew from fork. Set spring and washer aside with fork/lever assembly.

e) Pull stem out of gland exposing the seal inside gland.

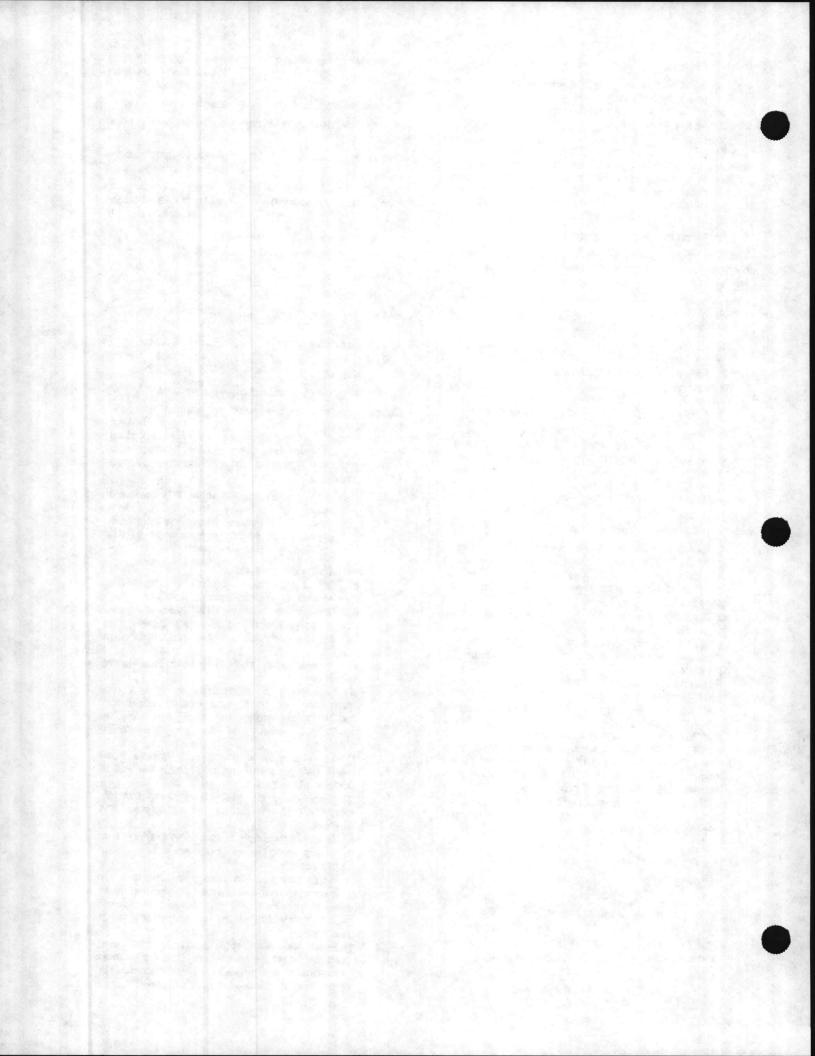
 Pull seal out of gland with needle nose pliers being careful not to scratch the inside surface of the gland.

g) Remove Terlion seat by catching the I.D. with the first few threads of a 3/8 bolt, and pull out.

h) Begin reassembly by pressing the new seat in place using a spherical nose tool about 11/16 dia.

I) Install new seal on stem open and first. Do not scrape inside diameter of seal on stem threads or permanent damage to the seal will result. (Preferably avoid any contact of threads and seal.)

j) Press the stem/seal assembly into gland until the seal bottoms out. Once the three components are in place, do not disassemble, or permanent damage to seal will result.



k) Replace washer and spring on threaded end of stem and thread into fork until it bottoms out hand tight.

I) Using Tetion® tape on gland threads, replace gland in pilot operated valve body and wrench tighten.

m) Relocate lever in bracket hole and reattach bracket to pilot operated valve body with hex head screws.

26)

n) Replace collars and lever on float rod.

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p) Check operation through several cycle: and adjust settings if necessary.

2. To service the piston.

a) Unscrew plug on top of pilot operated valve and remove.

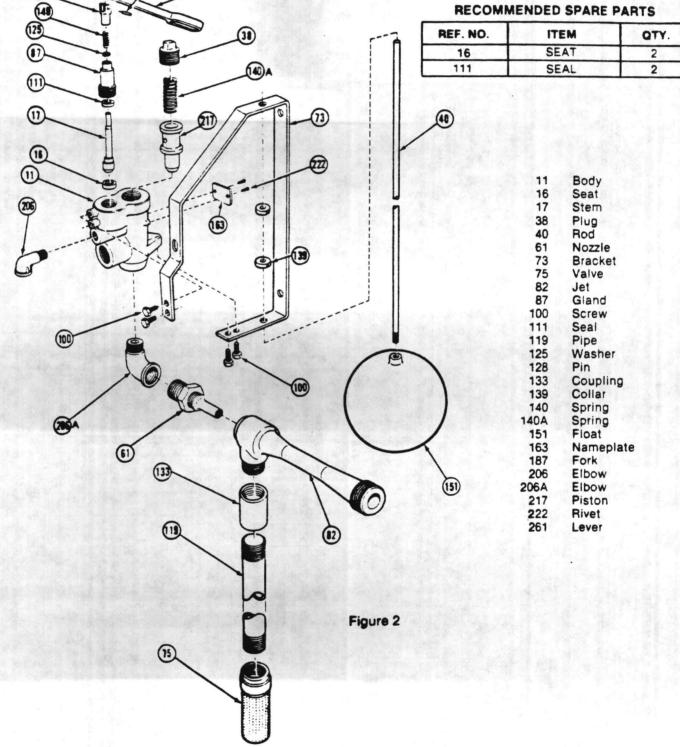
b) Remove spring and piston.

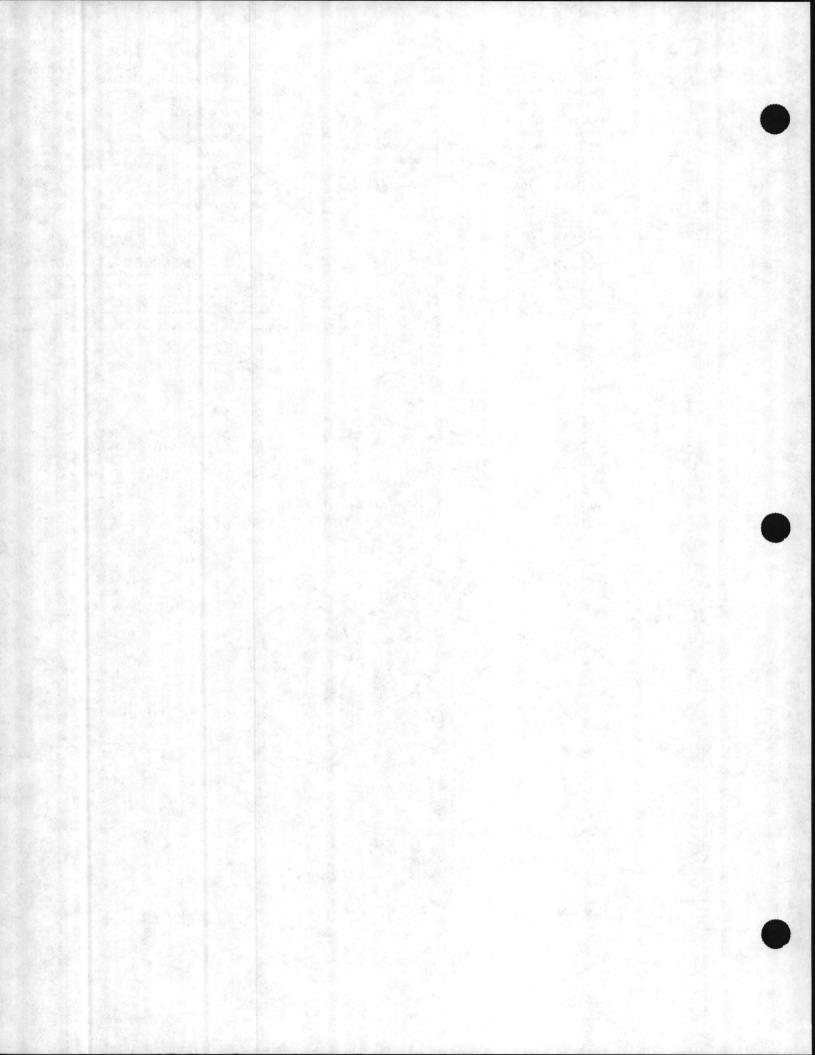
c) After lapping and clean out have been completed, replace items in reverse order.

d) Use Tefion® tape on plug threads and wrench tighten.

e) Check operation thru several cycles and adjust settings if necessary.

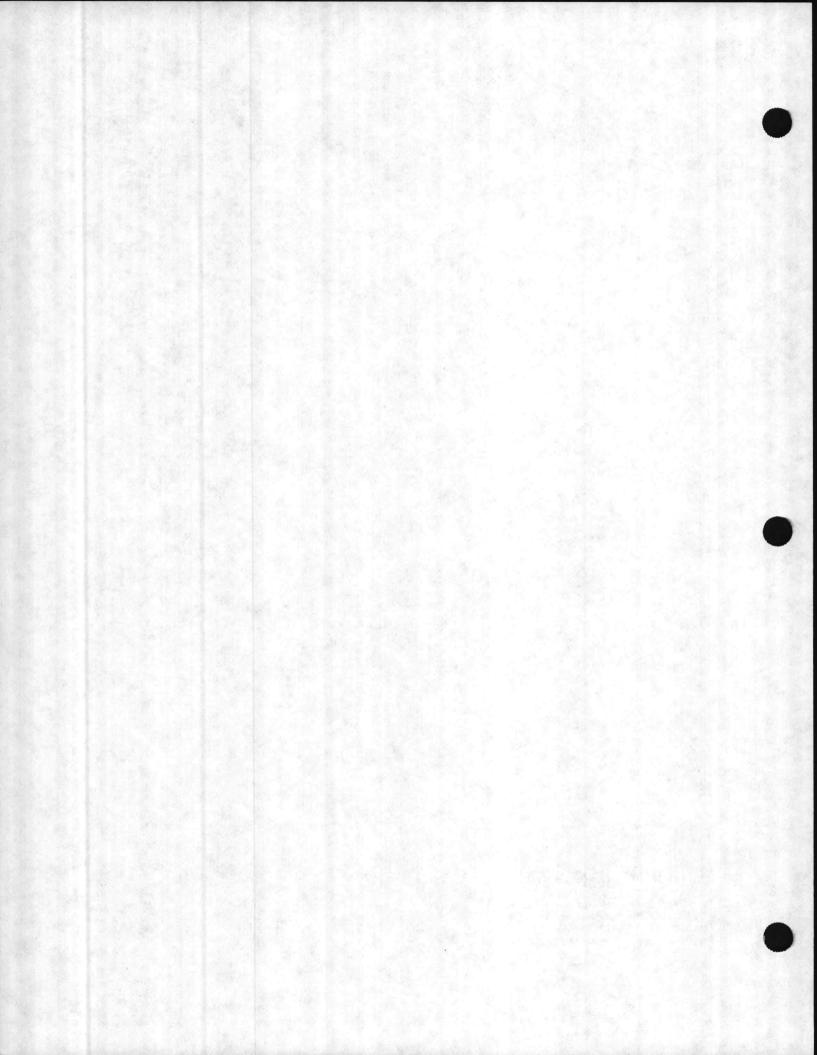
RECOMMENDED SPARE PARTS





PENBERTHY HOUDAILLE

Penberthy Division/Houdaille Industries P.O. Box 112, Prophetstown, Illinois 61277 Telephone. 815/537-2311 Telex 25 7339 Printed in U.S.A. Form No. 18204-009



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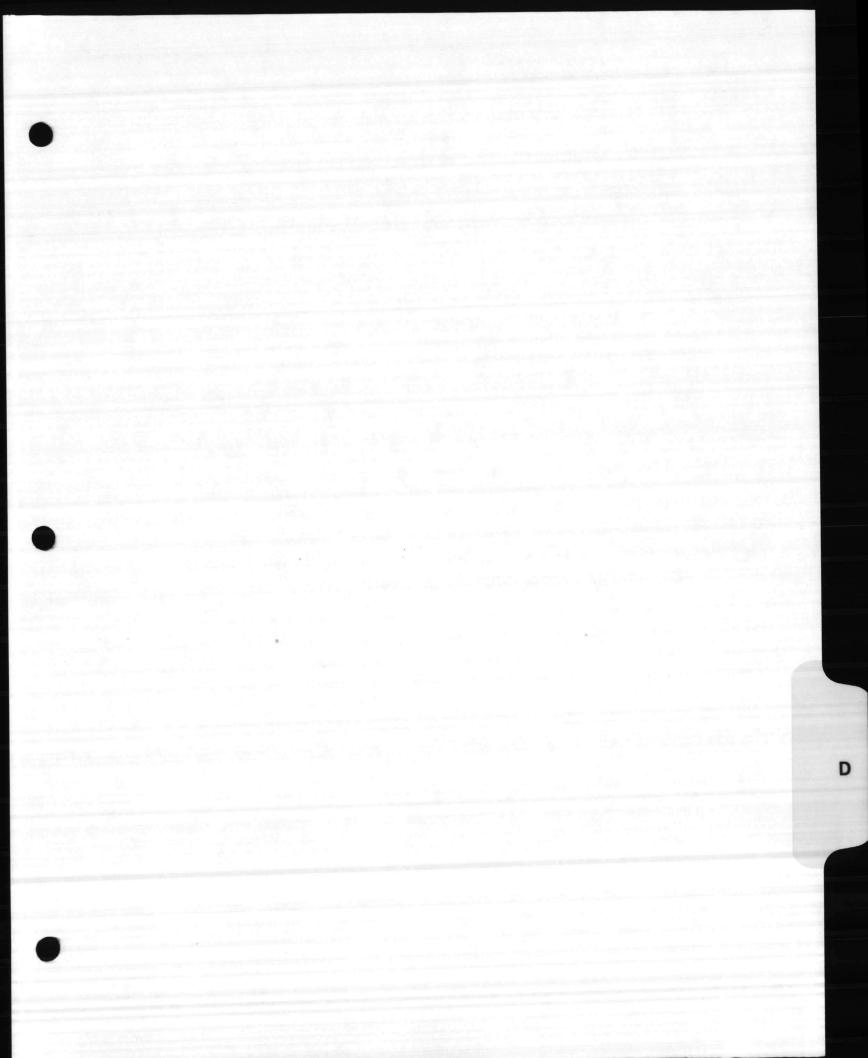
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The R.F. James Company . Manufacturers Representatives

*····· ··· · · · · ·

Atando Center 717-N Atando Avenue Charlotte, N.C. 28206 (704) 334-3120

December 16, 1986



Mr. Lindell Sunde C. T. Main Inc. Engineers Two Fairview Plaza Charlotte, N. C. 28224

REF: SUMP PUMP TRAP ASSEMBLY, CHERRY POINT, N. C.

Dear Lindell:

Enjoyed talking with you this past week about the pumps for Cherry Point. Attached, please find the data sheets on these units. There are several advantages to using this unit in lieu of the Penberthy:

- 1) The cost of the initial unit is half that of Penberthy or others.
- 2) Direct replacement without piping changes.
- 3) Only one moving part (disc in steam trap).
- The unit operates as a main drip as not to backup condensate in main header when not in use draining ground water from sump.

Please contact us if you have any questions.

Sincerely, Bob Januar

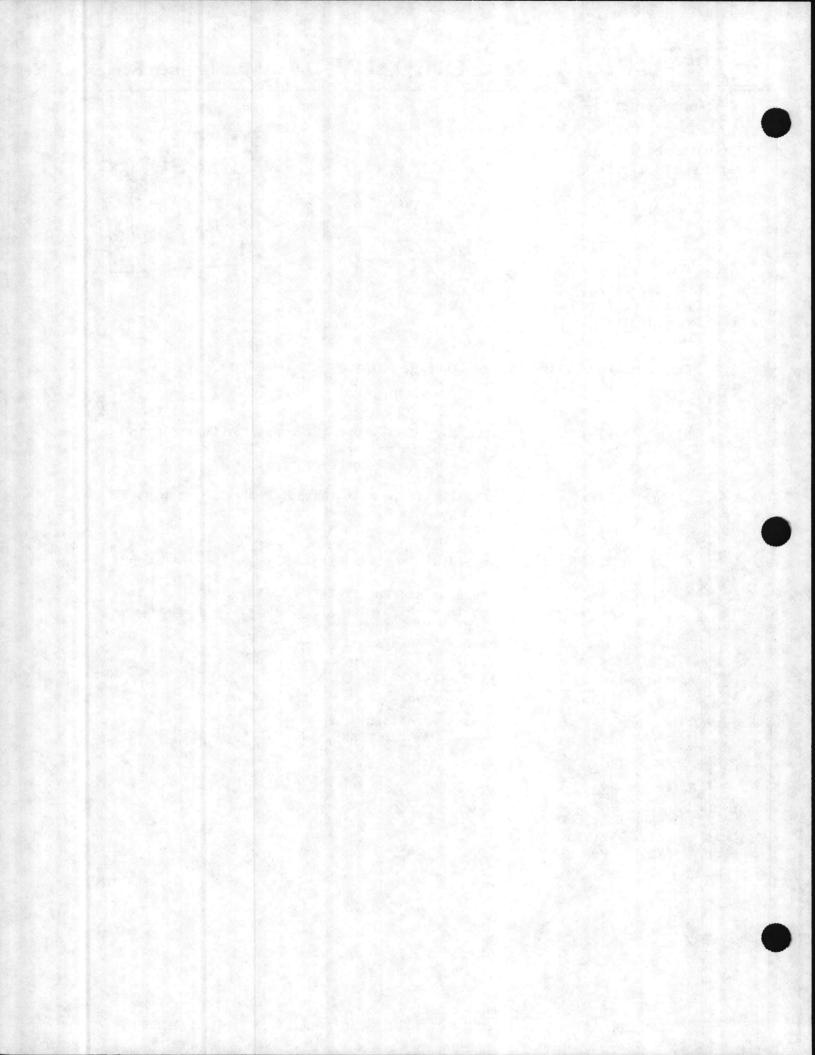
Bob James, President THE R. F. JAMES COMPANY, INC.

BJ/ev

cc: Bud Whitlock Fred Watkins Ellis Monroe

D-1

Steam Traps • Temperature and Pressure Controls • Instrumentation



The R.F. James Company . Manufacturers Representatives

RECEIVED CHAS. T. MAIN. INC. DEC 1 7 1985 CHARLOTTE, N. C.

Atando Center 717-N Atando Avenue Charlotte, N.C. 28206 (704) 334-3120

spirax sarco

December 16. 1986

Mr. Lindell Sunde C. T. Main Inc. Engineers Two Fairview Plaza Charlotte, N. C. 28224

SUMP PUMP TRAP ASSEMBLY, CHERRY POINT, N. C. REF:

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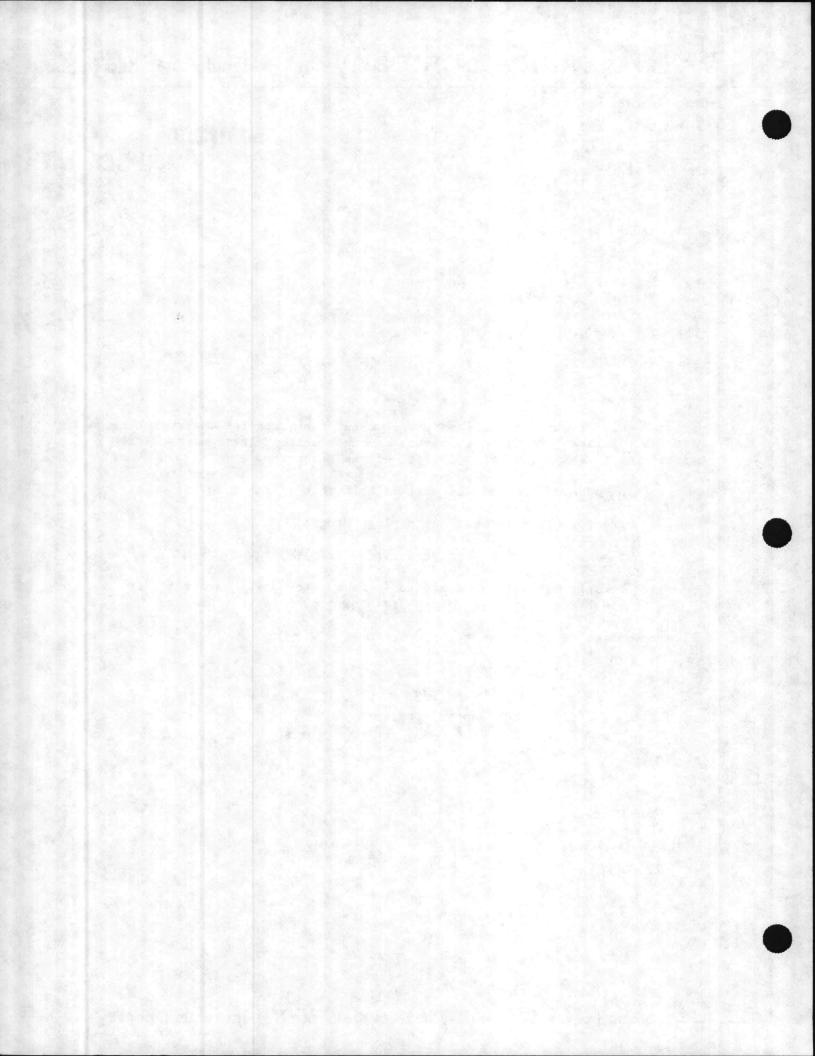
Please contact us if you have any questions.

Sincerely, Bob Jamesir

Bob James, President THE R. F. JAMES COMPANY, INC.

BJ/ev

cc: Bud Whitlock Fred Watkins Ellis Monroe



STEAM OPERATED SUMP PUMPS:

Spirax Sarco Model TD42GL, 304 stainless steel trap operator body, cap, disc, and strainer with GL series bronze steam syphon, rated at 150 psi steam inlet pressure.

OPERATION AND MOUNTING:

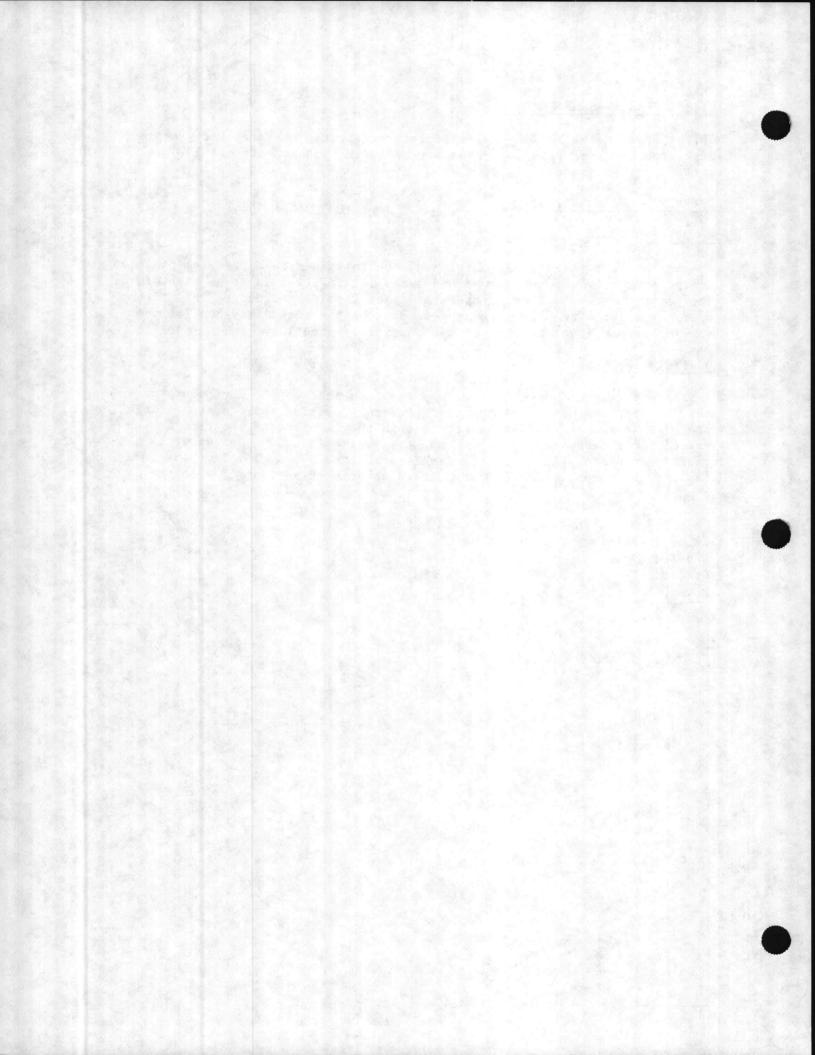
Mounting:

The Spirax Sarco liquid jet pump should be installed in a parallel position in the sump at the point at which desired liquid level is to be maintained. The piping to the TD42 steam operator inlet should be equal to that of the operator inlet size. The discharge piping of the type GL syphon jet pump should also be equal to that of syphon discharge outlet.

Operation:

As the water level rises in the sump equal to that of the TD42 operator cap, the flash steam above the disc condenses opening the operator. Inlet pressure steam then is discharged through the GL operator creating a high velocity syphon suction on the sump water. The incoming sump water is discharged to drain. As the water level recedes below the level of the TD42 cap the thermodynamic disc snaps closed shutting off steam flow to the GL syphon.

Capacity: 3/4" Spirax Sarco TD42GL 1" Inlet Steam Pressure: 100 psig Suction Lift: 2' Maximum Discharge Hd From Pit Bottom: 10' Maximum Pump GPM Capacity: 51 Gallons



spirax /sarco

LIQUID JET PUMPS

Available type

TD 42 with strainer screen and can TD 42 with strainer screen and blowdown valve

Limiting conditions Maximum operating conditions PMO - Max operating pressure 600 psi 42 bar TMO Max operating temperature 752°F 400°C Minimum pressure for satisfactory operation 3.5 psi 0.25 bar Maximum back pressure should not exceed 80% of the inlet pressure under any conditions of operation otherwise the trap may Maximum body design conditions PN 63 Phila - Max allowable pressure 930 psi 62 bar TMA Max allowable temperature 752°F 400°C Cold hydraulic test 899 psi 62 bar PhiA .

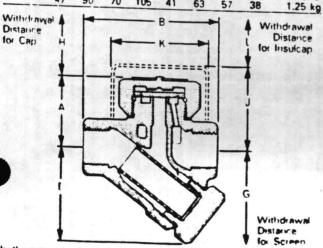
Sizes and pipe connections V2 L. V2 H and V4 H Sciewed NPT, API or BSP.

Materials

No	Part	Material					-
1	Body	Stainless	Steel	-	1.2.		117
		ordiness	ASTM	A7.	43 G	~	
23	Сар	Stainless	Steel		10 01	AISI	
3	Disc	Stainless		DC	1449		
5	Strainer Screen	Stainless					
6		Stainless		BS	1449		
	Insulcap loptional extral	Alumiour	Steel	-	-	AISI	416
0	Dia di C					-	12
9	DI	Stainless			TM A		
10	D1	Stainless		AS	TMA	276	431
	Blowdown Valve	Stainless	Steel	24	_	SI 4	

Dimensions (approximate) in millimeters & inches TD 42 Size P . -

					-0	н.	J	ĸ	L	Weight
	1/2 L	16	3.1 78	2.2 55	34	16	23	23	1.5	1 65 lb
	1/2 H	16	3.1 78	2.2 55	3.4 85	1.6	2.3	2.3	1.5	0.75 kg 1 75 lb 0.8 kg
7	3/4 H	1.9 47	35 90	2.4	4.0 100	16	25 63	2.3 57	1.5 38	2.2 lb 1 kg
	1/2 L	16	31	28	4.1	16	2.3	2.3	1.5	22 16
	1⁄2 H	16	31	28	103 4 1 103	41	23	2.3	38	1.0 kg 23 lb
	3/4 H	19	35	27	41	1.6	57 25	23	38	2 75 lb

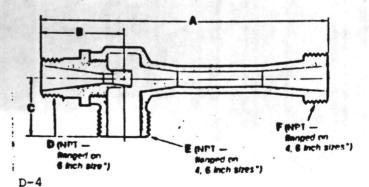


TD 42 with cap 2 1.11 -----

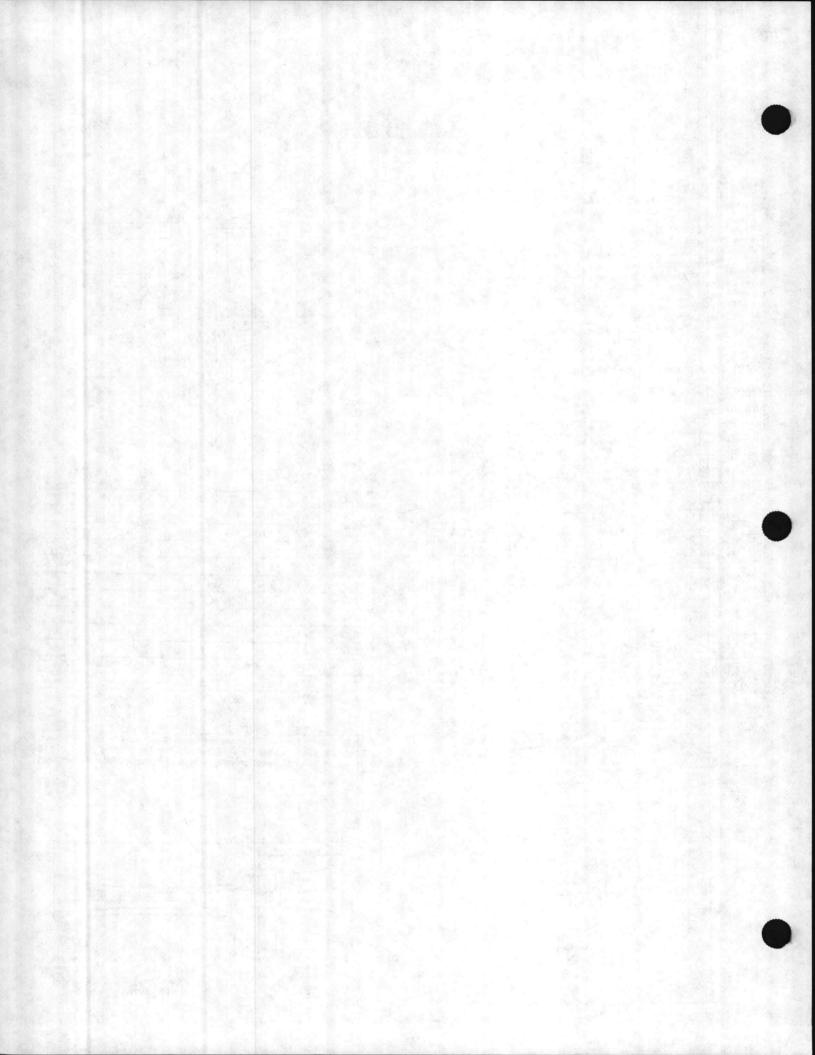
CAST - GL.

	L'EIZE M	A		C	D'	E + 198	F*
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	1 % B	4%	1%	1%	1.	1/2	12
	14	4'/1	1%	1%	1.	1/2	112
	. 1/4	5'/.	2	11/2	11	3/4	3/4
7	11.	7.1.	21.	1%	(1)	1	1
1	1%	9	211	2'1.	(1)	1%	11/4
	11/1	11	2%	21/1	1	1%	11/2
	2	14%	3%	3	1%	2	2
	21,	18%	3%	4%	11/2	2'/2	2'/,
	3	23%	4	5	2	3	3
	4	32'1.	5	6	3	4 tienge	4 tiange
	6	473/4	5%	51/2	4 tiange (blind terred boli holes)	6 tiange (Dlind tapred bolt holes)	6 tienge

"All cast units have NFT connections except. 4 Inch size has NFT inlet, flanged suction and discharpe; 6 inch size has fianged inlet, suction and discharge finist and suction flanges on 6 inch size are blind tapped bolt holes)

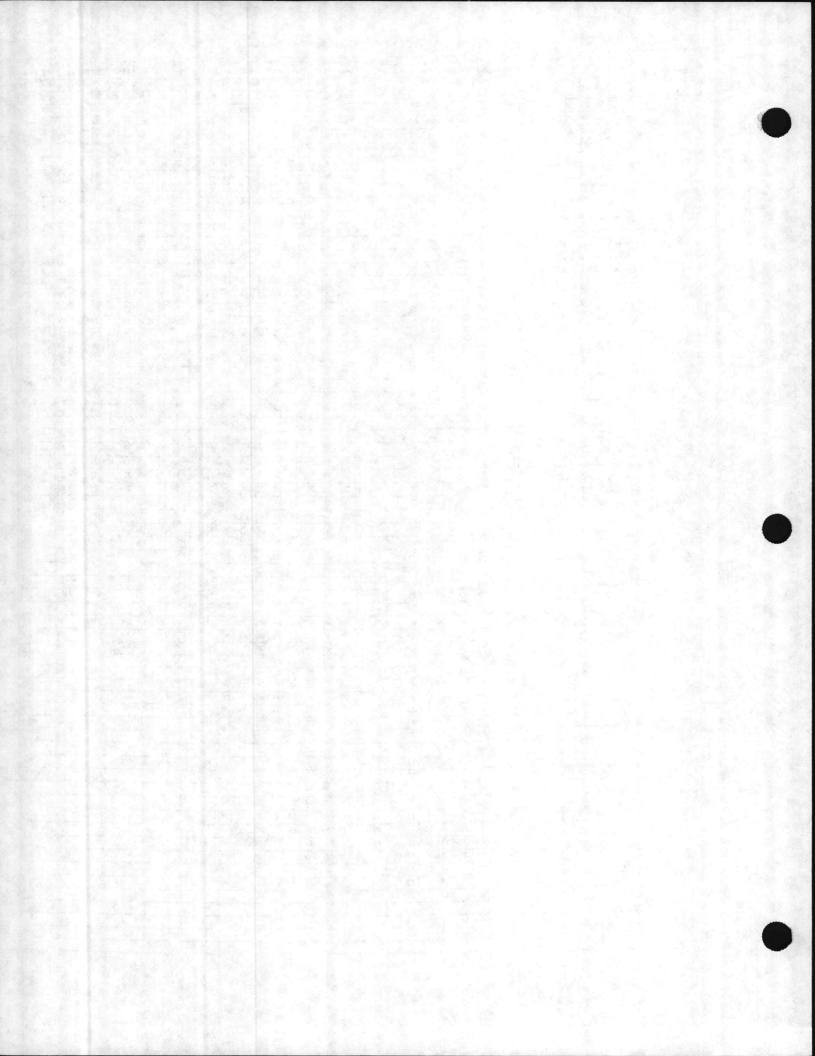


In the interests of development and improvement of the product, we reserve the right to change the specification



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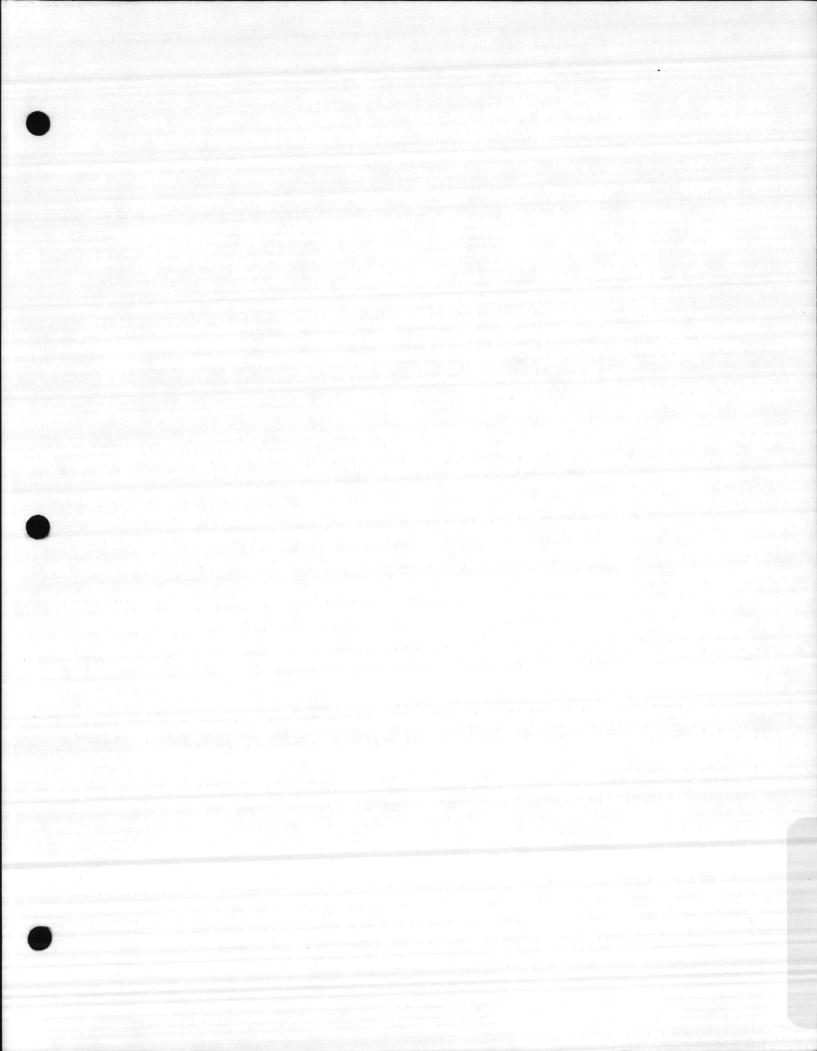
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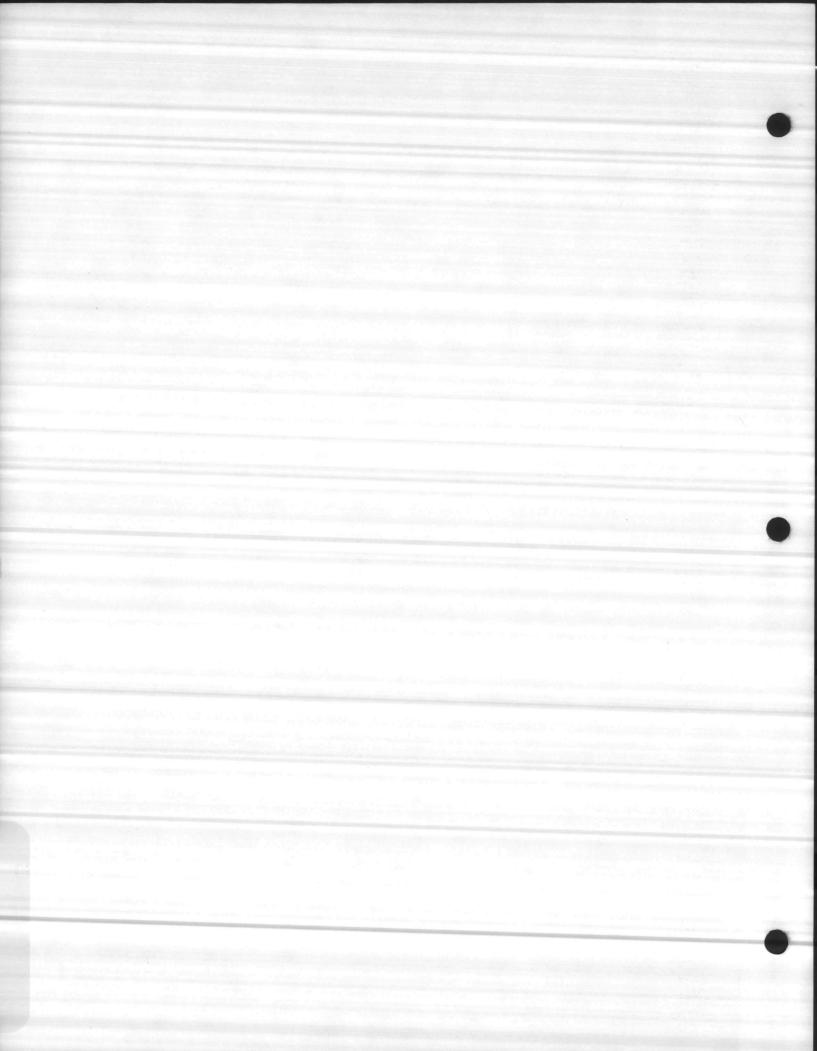
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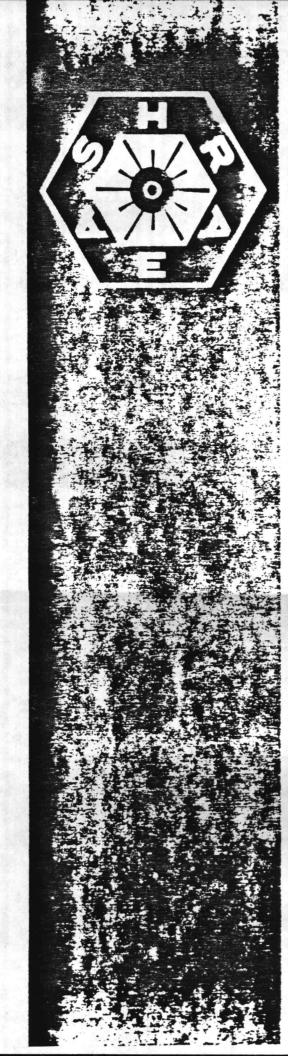
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THIS PUBLICATION INCLUDES THE FOLLOWING SECTIONS:

- (1) ANSI/ASHRAE/IES 90A-1980 (SUPERSEDES SECTIONS 1-9 OF ASHRAE/IES STANDARD 90-75)
- (2) ASHRAE/IES 908-1975 (SECTIONS 10 AND 11 OF ASHRAE/IES STANDARD 90-75)
- (3) ASHRAE 90C-1977 (SECTION 12 AS PUBLISHED FEBRUARY 16, 1977)

CLARIFICATION OF THE STATUS OF EACH SECTION IS INCLUDED IN THE FOREWORD.

ASHRAE STANDARD

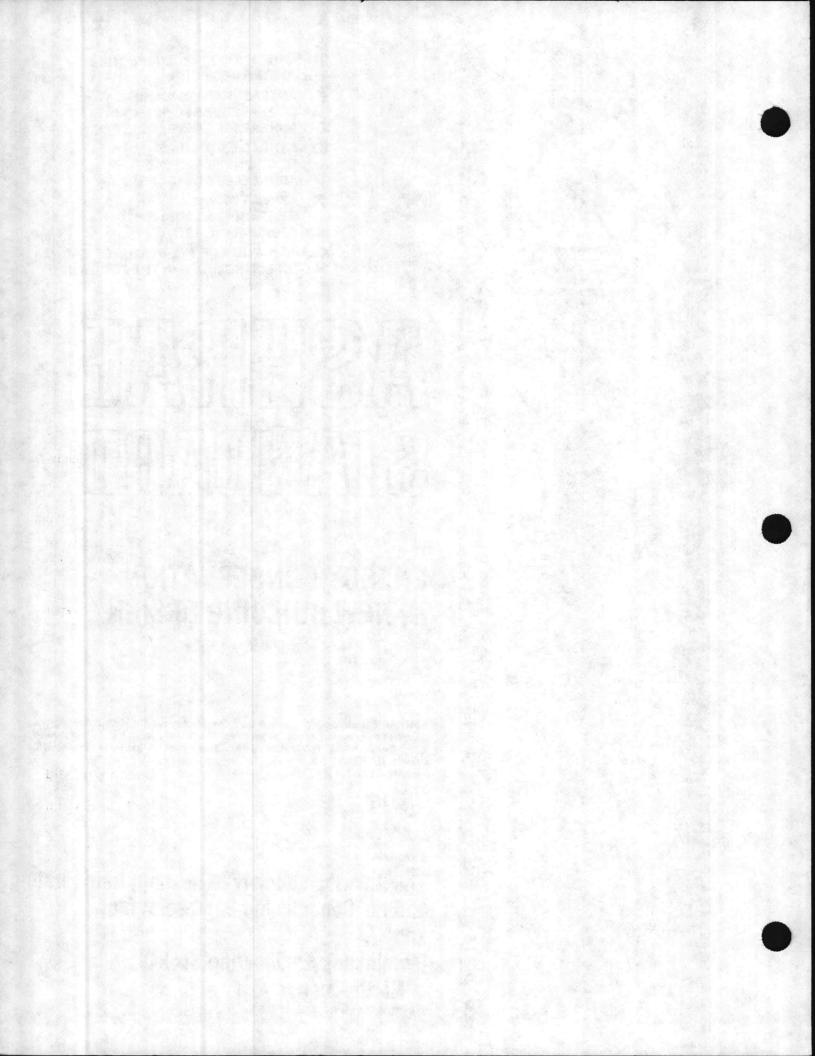
ENERGY CONSERVATION IN NEW BUILDING DESIGN

ASHRAE Standards are updated on a five-year cycle; the date following the Standard number is the year of approval. The latest copies may be purchased from the ASHRAE Publication Sales Department, 1791 Tullie Circle, NE, Atlanta, GA 30329 York, N.Y. 10017.

C 1980

Coopensored by

The American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. and Illuminating Engineering Society of North America



T	abk S	5.1
Minimum	Pipe	Insulation

				Insula	tion Thicks	ess for Pipe	Sizes*	
Piping System Types	Temp	uid erature nge	Runouts 2 in.**	(1 in.) and Less	1 ¼-2 in.	2¥2-4 in.	546in.	(8 in.) and Larger
2 Mar 1 2 M	•℃	F	in.	in.	in.	in.	in.	in.
Heating Systems Steam & Hot Water								
High Pressure/Temp	152-238	306-450	1.5	2.5	2.5	3.0	3.5	3.5
Medium Pressure/Temp	122-151	251-305	1.5	2.0	2.5	2.5	3.0	3.0
Low Pressure/Temp	94-121	201-250	1.0	1.5	1.5	2.0	2.0	2.0
Low Temperature	49-93	120-200	0.5	1.0	1.0	1.5	1.5	1.5
Steam Condensate								
(for Feed Water)	Any	Any	1.0	1.0	1.5	2.0	2.0	2.0
Cooling Systems	14 C 18	1	1					
Chilled Water,	4.5-13	40-55	0.5	0.5	0.75	1.0	1.0	1.0
Refrigerant, or Brine	Below 4.5	Below 40	1.0	1.0	1.5	1.5	1.5	1.5

•See 5 10.1 and 5.10.2 (Pipe sizes are nominal dimensions.) For piping exposed to ambient temperatures, increase thickness by 0.5 in. ••Runouts to Individual Terminal Units (not exceeding 12 ft in length)

5.10.2 The required minimum thicknesses do not consider condensation. Additional insulation with vapor barriers may be required to prevent condensation under some conditions.

5.11 Air Handling Duct System Insulation

All ducts, plenums and enclosures installed in or on buildings shall be thermally insulated as follows:

5.11.1 All duct systems, or portions thereof, shall be insulated to provide a thermal resistance, excluding film resistances, of

$$R = \frac{\Delta t}{47.3} m^2 \cdot {}^{\circ}C/W \quad (R = \frac{\Delta t}{15} ft^2 \cdot h \cdot F/Btu)$$

Where Δt = the design temperature differential between the air in the duct and the duct surface in °C (F).

	Table Required R	and the second se	
At°C	R	AIF	R
15	0.32	27	1.8
30	0.63	54	3.6
45	0.95	81	5.4
60	1.30	108	7.2
75	1.60	136	9.1
90	1.90	162	11.0

For residential buildings with uninsulated roofs over attics containing ducts the air temperatures shown in Table 5.3 shall be used.

Proved the second se	ible 5.3 attic Temperatures	
Summer Conditions Roof Pitch	•C	F
5 in 12 and up	54	130
3 in 12 to 5 in 12	60	140
Less than 3 in 12	66	150
Winter conditions		

All Pitches 5.5°C (10 F) over Outdoor Design

Exceptions. Duct insulation is not required in any of the following cases:

a. Where Δt is 14 °C (25F) or less

b. Where supply or return air ducts are installed in basements, cellars or unventilated crawl spaces having insulated walls in one- and two-family dwellings

c. When the heat gain or loss of the ducts, without insulation, will not increase the energy requirements of the building

d. Within HVAC equipment

e. Exhaust air ducts

5.11.2 Uninsulated ducts in uninsulated sections of exterior walls and in attics above the insulation might not meet the requirements of this Standard.

5.11.3 The required thermal resistances do not consider condensation. Additional insulation with vapor barriers may be required to prevent condensation under some conditions.

5.12 Duct Construction

All ductwork shall be constructed and erected in accordance with the following SMACNA standards:

a. Heating and Air Conditioning Systems Installation Standards, 3rd edition February 1977²¹

b. Low Pressure Duct Construction Standards, 5th edition, 1976²²

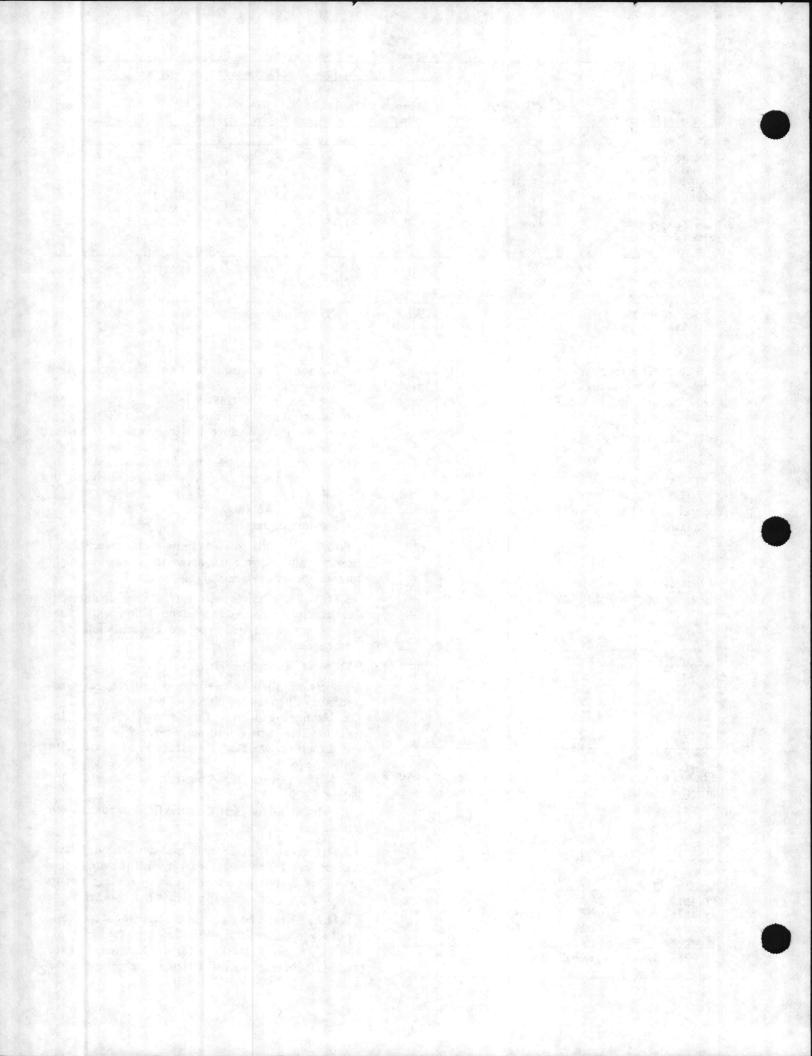
c. High Pressure Duct Construction Standards, 3rd edition, 1975²³

d. Fibrous Glass Duct Construction Standards, 4th edition, 1975²⁴

5.12.1 High-pressure and medium-pressure ducts shall be leak tested in accordance with the applicable SMACNA Standard, with the rate of leakage not to exceed the maximum rate specified in that standard.

5.12.2 There is no standard at this time for leak testing of low pressure ducts. When low pressure supply air ducts are located outside of the conditioned space (except return air plenums), all transverse joints shall be

ANSI/ASHRAE/IES 90A-1980

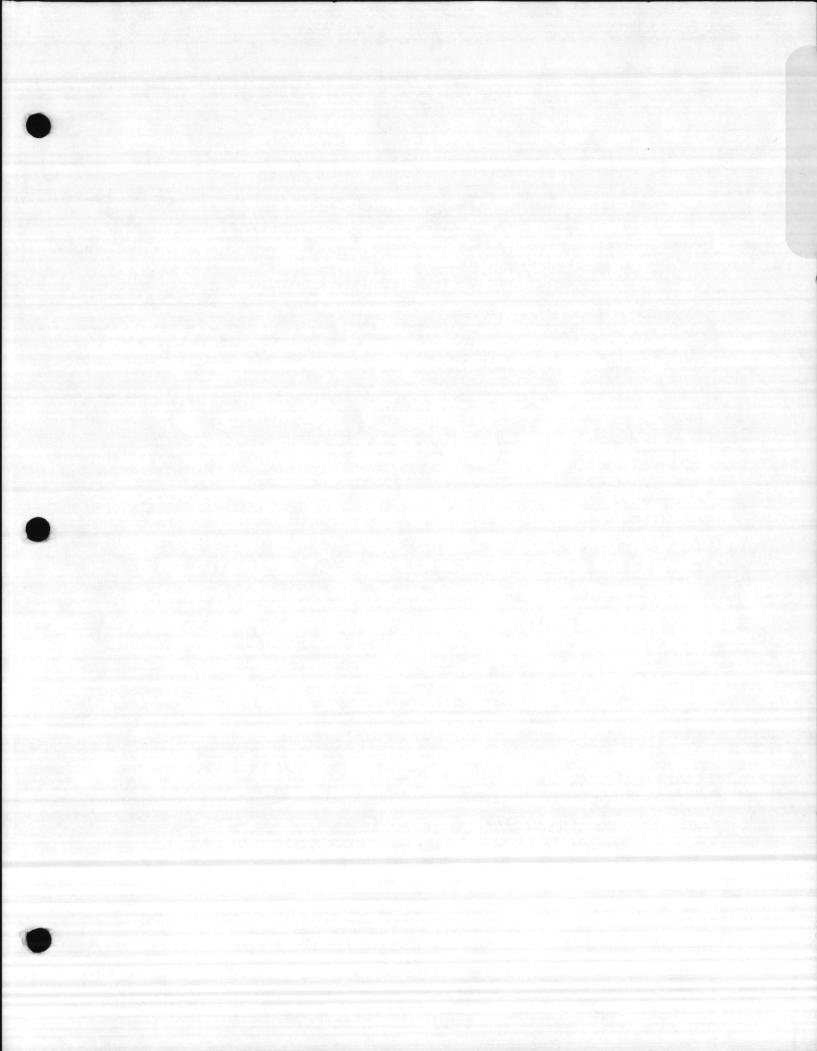


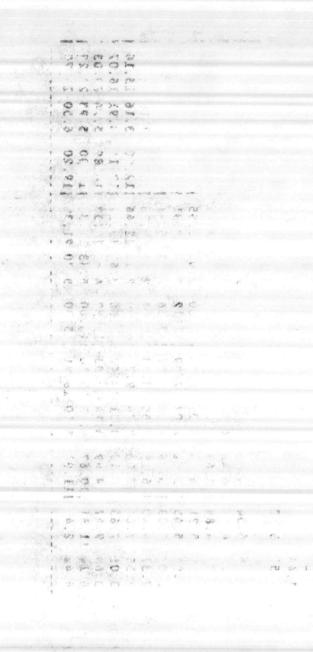
TAB PLACEMENT HERE

DESCRIPTION:

*Scanned as next image

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APPENDIX F INSULATION COSTS \$/LINEAL FT

REFERENCE: 1987 MEANS MECHANCAL COST DATA MATERIAL: Fiberglass with all service jacket

							INSUL	ATION	THICKNE	SS					
PIPE SIZE	1"				1 1/2	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	2"				2 1/2		3"		
(IN.)	MAT'L	LABOR	TOTAL	MAT'L	LABOR	TOTAL	MAT'L	LABOR	TOTAL	MAT'L	LABOR	TOTAL	MAT'L	LABOR	TOTAL
1/2	1.05	1.38	2.43	2.23	1.44	3.67	3.58	1.51	5.09	1					
3/4	1.20	1.44	2.64	1 2.31	1.51	3.82	1 3.72	1.58	5.30	1			1. 1. 11		
1	1.27	1.51	2.78	1 2.46	1.58	4.04	1 3.98	1.66	5.64	i			1		
1 1/4	1.40	1.58	2.98	1 2.68	1.66	4.34	4.23	1.74	5.97	1 5.73	1.82	7.55	1. 253		
1 1/2	1.56	1.58	3.14	2.83	1.66	4.49	4.42	1.14	6.16	5.92	1.82	7.74	1.18.29		
2	1.69	1.66					4.63			6.13	1.94	8.07	1 1 1 1 1 1		
2 1/2	1.89	1.74	3.63	3.37	1.84	5.21	4.99	1.95	6.94	6.60	2.05	8.65	1		
3	2.10	1.84	3.94	3.50	1.95	5.45	1 5.32	2.07	7.39	1 7.12	2.19	9.31	1		
3 1/2	2.31	1.95	4.26	4.01	2.07	6.08	5.76	2.21	7.97	1 7.56	2.35	9.91	1		
4	2.74	2.21	4.95	4.23	2.37	6.60	6.18	2.55	8.73	8.08	2.70	10.78	1 Sugar		
5	3.15	2.37	5.52	4.51	2.55	7.06	7.01	2.76	9.77	9.50	2.96	12.46	112.00	3.16	15.1
6	3.37	2.76	6.13	4.64	3.01	7.65	7.16	3.31	10.47	9.66	3.61	13.27	112.16	3.91	16.0
	4.88	3.31											114.89		20.0
10	5.76						10.67						117.30		23.2
12	6.57	4.14	10.71	8.07	4.42	12.49	111.81	5.10	16.91	115.50	5.80	21.30	119.20	6.50	25.7

F-1

