

PACIFIC GAS AND ELECTRIC COMPANY
DEPARTMENT OF NUCLEAR POWER GENERATION
DIABLO CANYON POWER PLANT

NUMBER STP H-90
REVISION 3
PAGE 1 OF 18
UNITS

TITLE: SURVEILLANCE TEST PROCEDURE
SURVEILLANCE OF DIABLO CANYON BREAKWATERS

1 AND 2

1.0 SCOPE

1.1 Routine surveillance of the east and west breakwaters provides a means by which their integrity may be monitored. This monitoring process allows the plant staff to determine whether any settling or displacement that occurs in either breakwater has resulted in the elevation of the concrete cap(s) of any section(s) of the breakwater being reduced to less than MLLW. If this occurred to a great enough extent, the flood protection provided to the ASH pumps by the breakwaters may be lost and unavailable for an FSAR design base Tsunami. Routine monthly surveillance during the fall, winter and early spring will allow breakwater degradation to be detected early and remedial action to be taken, if required. Yearly surveys and photographic inspection of the breakwaters will provide trending data for such horizontal/vertical displacement and settling as they may experience from one year to the next.

1.2 This procedure and changes thereto require PSRC review.

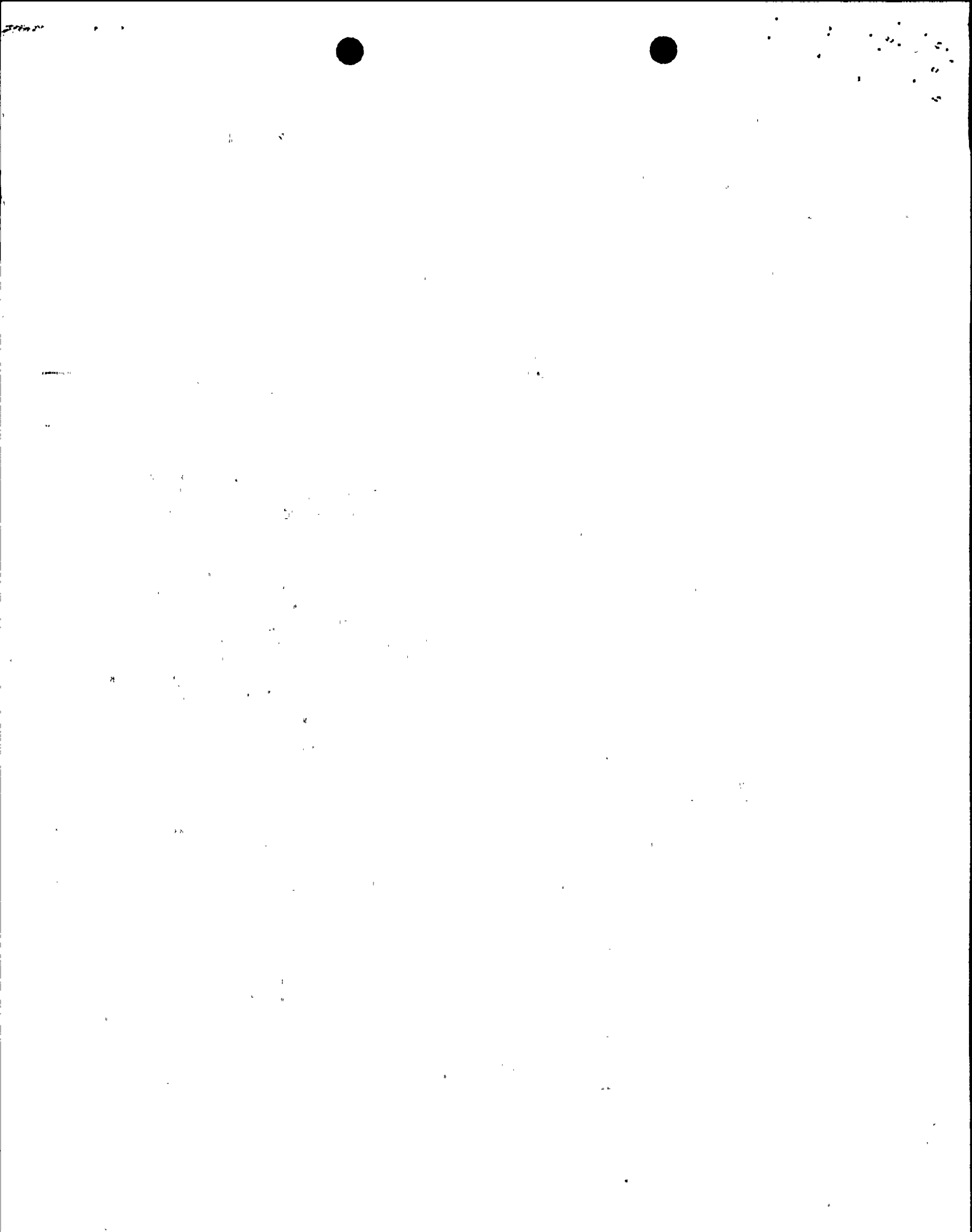
2.0 RESPONSIBILITY

2.1 Power Production Engineer (Test Director), for coordination of test with Department of Engineering Research (DER), General Office Civil Engineering Department and General Office Land Department, data collection, data reduction and reporting of results.

3.0 FREQUENCY

3.1 The breakwaters will be visually inspected once per 31 days during the months of November through April in MODES 1, 2, 3 and 4. The full length of each breakwater shall be verified to be above Mean Lower Low Water Level (MLLW) during each inspection, in accordance with Technical Specification 4.7.13.1.

8906270286 890614
PDR ADDCK 05000275
R PDR



TITLE: SURVEILLANCE OF DIABLO CANYON BREAKWATERS

damage on the attached diagrams (Figures 1 and 2) of the breakwaters. Circle the applicable breakwater areas exhibiting any of the above problems on the diagrams and include explanatory notes in the appropriate "Comments" section of this procedure describing the condition of each circled area. Also, the Test Director should obtain photographs of any damaged/settled/displaced breakwater areas and include them with the completed Test.

- 5.2.7 If the results of any monthly inspection show that damage has occurred to either breakwater, a copy of this Surveillance Test Procedure performed for that month and its associated photograph(s) will be included in the May Monthly Operating Report, in accordance with Technical Specification 6.9.1.7. Plant management should be notified as well. The General Office Civil Engineering Department should also be notified of such findings, to determine if further investigation is required.

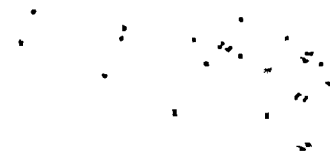
5.3 Annual Inspection And Survey

- 5.3.1 The crest of each breakwater will be visually inspected for settlement and displacement once per 12 months. The inspection will consist of three activities:

- a. Photographs of the entire length of each breakwater will be taken from a sufficient vantage point to show the approximate condition of each.
- b. Surveys of control points on each of the breakwaters will be performed to measure settlement and any horizontal displacement of the breakwater caps.
- c. A visual inspection, including a walkdown of each breakwater, will be performed, per Steps 8.2 and 8.3 of this procedure. If a walkdown is not possible, the instructions of Step 7.3.1 will be followed.

NOTE 1: If the annual inspection and survey occurs during the November through April surveillance period, the routine visual inspection performed for that month will suffice for this part of the annual survey.

NOTE 2: Land Department surveyors will be requested by the General Office Civil Engineering Department to perform the control point surveys cited above.



TITLE: SURVEILLANCE OF DIABLO CANYON BREAKWATERS

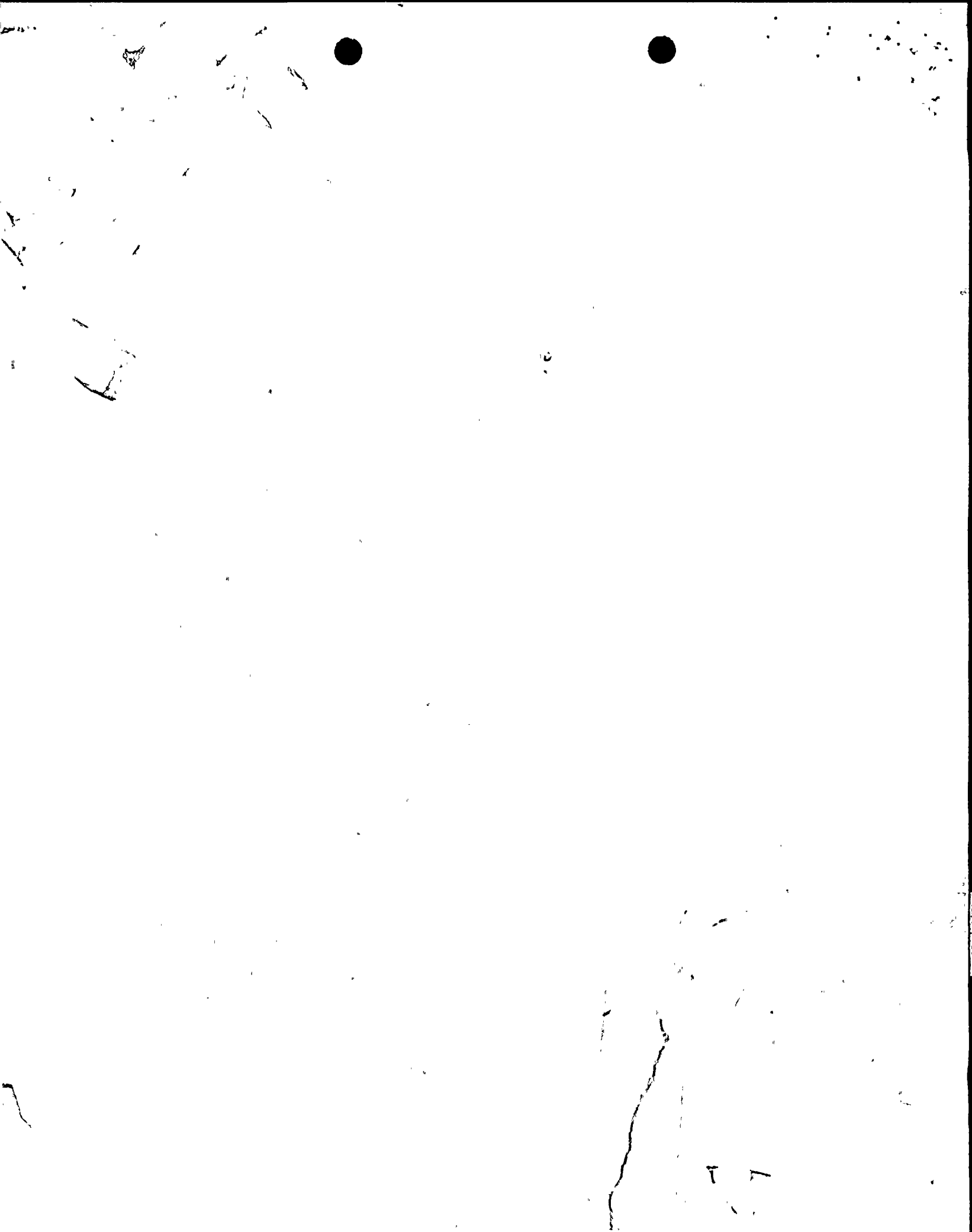
- 3.2 The crests of the breakwaters will be visually inspected and surveyed once per 12 months, to determine if settlement and/or displacement have occurred, in accordance with Technical Specification 4.7.13.2. At this time, photographs will be taken of both breakwaters from a sufficient vantage point to show their approximate condition.

4.0 TECHNICAL SPECIFICATIONS

- 4.1 This test is performed to satisfy Technical Specifications 4.7.13.1 and 4.7.13.2. This test also provides instructions concerning how Technical Specification 4.7.13.3 is to be complied with, if required.

5.0 ACCEPTANCE CRITERIA

- 5.1 The full lengths of both breakwaters (east and west) are verified to be above Mean Lower Low Water (MLLW) Level, as determined by the monthly and yearly inspections called out by this procedure.
- 5.2 Criteria for Monthly Inspection/Walkdown -- specifically, look for the following:
- 5.2.1 Cracking of the cap sections on their tops, top and bottom edges and sides.
 - 5.2.2 Loss of material from cap sections due to wave action.
 - 5.2.3 Wave damage to cap sections or tri-bars in direct contact with cap sections (i.e., loss of cap section or tri-bar material due to wave action).
 - 5.2.4 Cracking of the tri-bars which are in direct contact with any side of any cap section.
 - 5.2.5 Settling or horizontal displacement of the cap sections. These problems would be detected by indications such as misalignment of adjacent caps in the vertical and/or horizontal directions on one or both sides of the caps, and cracking of the cap's concrete at their interface --- especially at keyways interlocking one cap with the next cap.
 - 5.2.6 Make note of any sections of the breakwaters which are below MLLW. Also, make note of 1) cap sections showing signs of settling, horizontal displacement, cracking and/or wave damage and 2) tri-bars in direct contact with any cap section which are cracking or have suffered wave



TITLE: SURVEILLANCE OF DIABLO CANYON BREAKWATERS

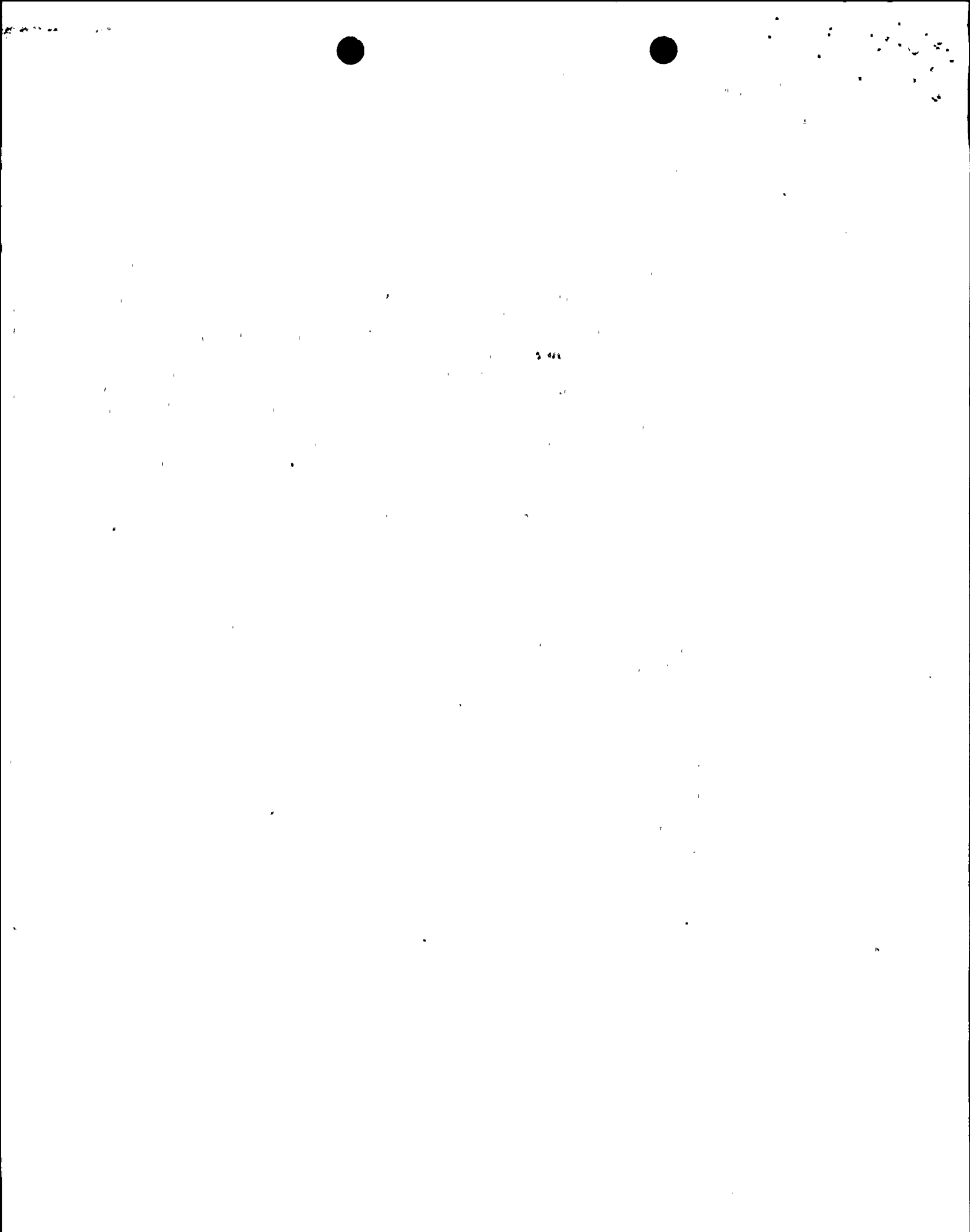
5.3.4 Photographs of each breakwater, obtained from DER or taken by plant personnel, and a copy of the results of the annual Land Department survey will be attached to the copy of this procedure performed for the month in which the survey is done. The breakwater surveillance test performed during the month of the survey will be completed using the results of the visual breakwater inspection called out by the STP, and any significant findings of the annual survey will be documented in the remarks section at the end of this test. Attaching photographic and survey data to the surveillance test completed for the survey month will provide documentation for that surveillance test's results. This documentation will quantify the amount of breakwater settlement and horizontal displacement occurring from year to year.

10.0 REFERENCES

- 10.1 Technical Specification 3/4.7.13.
- 10.2 Letter of January 5, 1984 from G. H. Moore to P. K. Willerup, Attn. D. J. Foley re: Diablo Canyon Breakwater Surveillance Surveys (Chron. No. 040695).
- 10.3 FSAR Volume VI, Section 3.4 - "Water Level (Flood) Design Criteria."

11.0 ATTACHMENTS

- 11.1 Figure 1, 7/85
- 11.2 Figure 2, 7/85



DIABLO CANYON POWER PLANT

u-ll

NUMBER	STP H-90
REVISION	3
PAGE	5 OF 18
UNITS	1 AND 2

TITLE: SURVEILLANCE OF DIABLO CANYON BREAKWATERS

START DATA SECTION

PLANT OPERATING MODE <u>1</u>	UNIT NO. <u>182</u>	<u>YES</u>	<u>NO</u>
-------------------------------	---------------------	------------	-----------

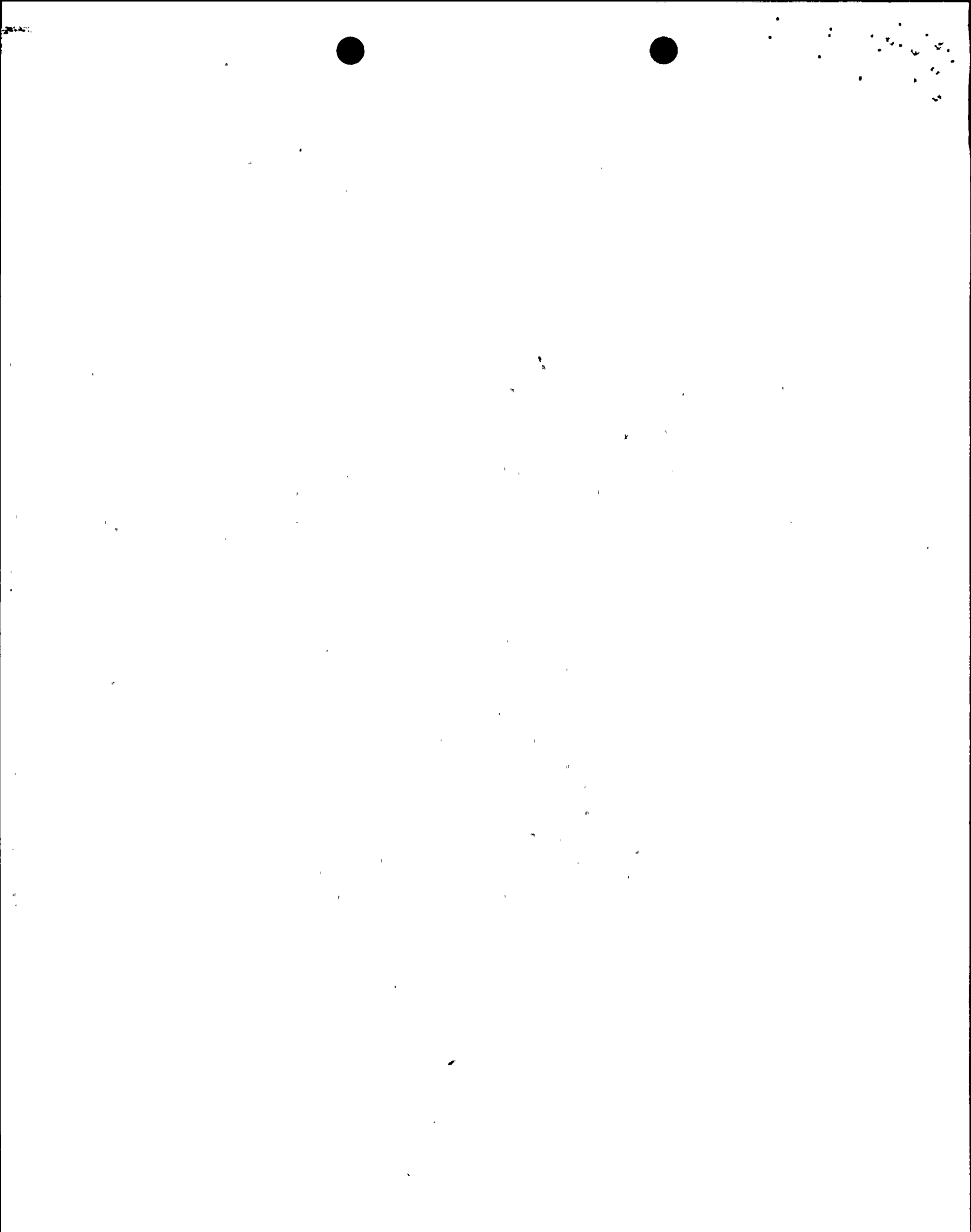
6.0 PRECAUTIONS AND LIMITATIONS

- 6.1 Person making breakwater inspection must wear a lifejacket at all times when walking down the breakwater.
- 6.2 Another person will accompany the person walking down the breakwaters to act as a safety observer.
- 6.3 All Precautions and Limitations have been read and understood. []

7.0 PREREQUISITES

- 7.1. A set of up-to-date National Oceanic and Atmospheric Administration (NOAA) tide tables for the California coastal region must be available for test use. These tables will be kept in the DCPD Engineering Department Performance Engineering Group files.
- 7.2 For a given month (November through April) in which a visual inspection is being made, use the NOAA tide tables to determine:
 - 7.2.1 Any high tide for the month which is greater than the Mean Lower Low Water Level (MLLW) and occurs during daylight hours. MLLW is (-)2.6 feet MSL, or 2.6 feet below mean sea level for the plant site.
 - 7.2.2 The day of the month on which it occurs.
 - 7.2.3 The time of day at which the selected high tide occurs.

04084 2262'



YES NO

7.2.4 Wave forecasts will be obtained from DER personnel at the intake cove's Oceanographic Laboratory. This data can be used to determine whether the breakwaters may be walked down safely.

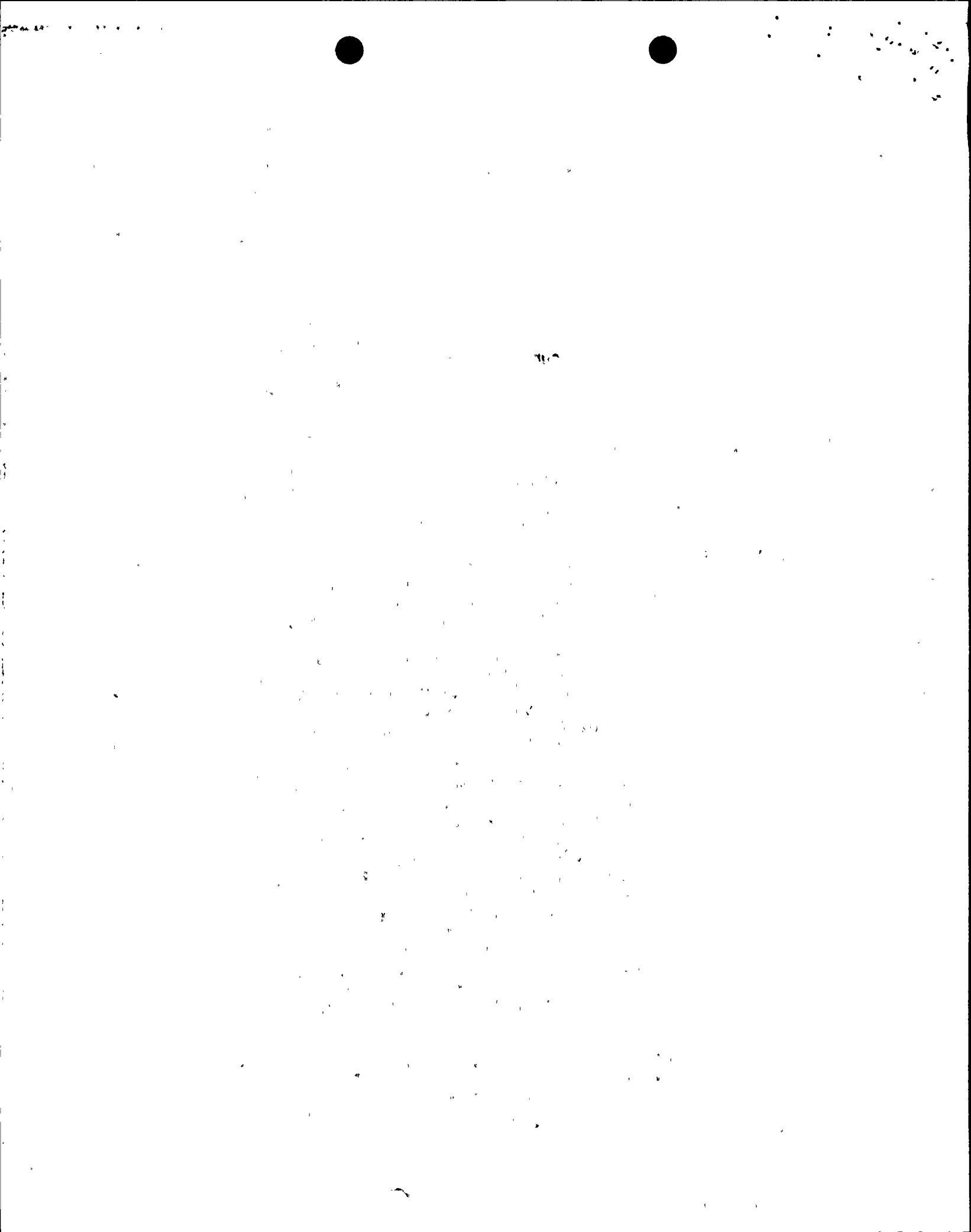
CAUTION: Do not schedule a visual inspection of the breakwaters if DER wave forecasts predict high waves, or if a storm is in progress. Obtain DER input on advisability of a breakwater inspection, based on their wave predictions.

7.3 If it is determined that the sea is too rough to allow a walkdown of the breakwaters on the day originally selected, select an alternate day meeting the specifications in Step 7.2 above.

7.3.1 As wave conditions permit on the day chosen in either Step 7.2 or Step 7.3, the Test Director will proceed to perform the breakwater visual inspection. However, if walkdown of the breakwaters proves to be impossible for a given month, steps will be taken to visually inspect them from a sufficient vantage point to check their condition by other means than a walkdown. Specifically, if a walkdown cannot be performed, then from the vantage point cited above, the breakwaters will both be verified to be above MLLW. Also, any degradation signs, as delineated in Steps 5.2.1 through 5.2.5 of this procedure, that are observed will be noted on the surveillance test procedure per the instructions of Step 5.2.6 and photographed. Any photographs taken will be included with the completed test for that month.

7.4 Photographic data may be obtained from the Environmental Engineering Unit of the DER Ecological Services Group which shows the condition of each breakwater for the annual breakwater inspection and survey.

04004 2263



DIABLO CANYON POWER PLANT

NUMBER STP M-90
REVISION 3
PAGE 7 OF 18
UNITS 1 AND 2

TITLE: SURVEILLANCE OF DIABLO CANYON BREAKWATERS

YES NO N/A

- 7.5 Survey results must be obtained from the General Office Land Department after the annual breakwater inspection and survey are complete.
- 7.6 Any additional photographs required as a result of monthly inspections will be obtained from the DER Ecological Services Group or by the plant staff.
- 7.7 Security will be notified that a walkdown of the breakwaters is planned. Notification will be made by the Test Director prior to the walkdown.
- 7.8 The keys to the locks on the gates barring access to the breakwaters will be secured prior to the walkdown. The gate padlocks require a No. 2 key.

8.0 PROCEDURE

8.1 Monthly Surveillance

8.1.1 Verification of Breakwater Heights

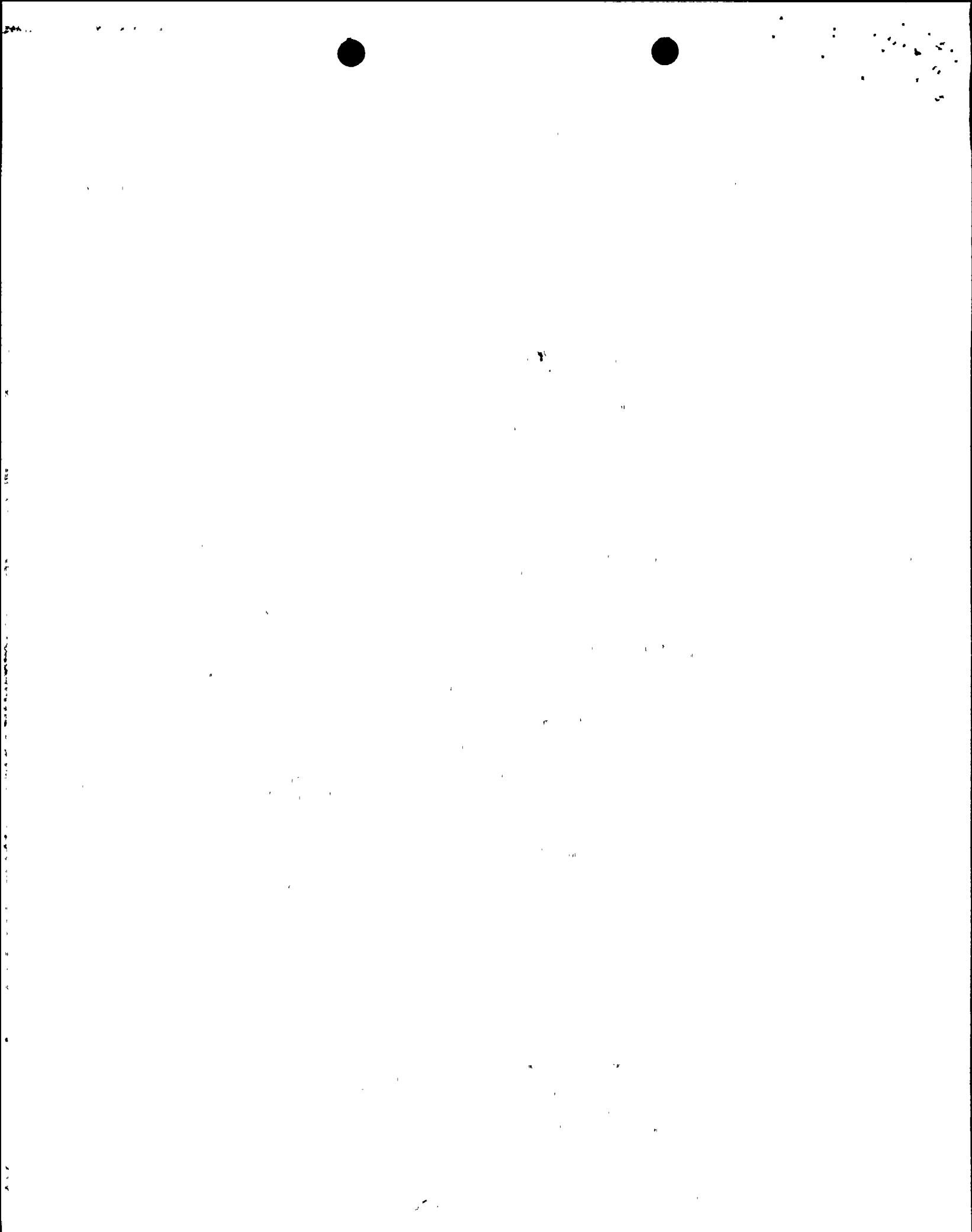
- a. From a suitable vantage point, visually verify that the full lengths of both east and west breakwaters are above MLLW. Basically, this consists of determining that the tide level at the time of inspection is greater than MLLW and that the full length of each breakwater is above this level.

Is the full length of each breakwater above mean lower low water level (MLLW)?*

[]

*If not, identify which concrete cap section(s) on the affected breakwater(s) do not meet the Acceptance Criteria by circling it/them on Figure 1 and/or Figure 2 of this test procedure. Make reference to the section or sections of concern in the "Remarks" section of this test procedure.

04004 226A



DIABLO CANYON POWER PLANT

NUMBER
REVISION
PAGE

STP M-90
3
8 OF 18

TITLE: SURVEILLANCE OF DIABLO CANYON BREAKWATERS

UNITS

1 AND 2

YES NO N/A

- b. If the answer to Step 8.1.1.a. above is "no", have 500 feet or more of either breakwater been reduced to less than MLLW?

[] [] [✓]

If this question is answered "yes", immediately notify the Shift Foreman, comply with the ACTION statement of Tech. Spec. 3.7.13, and submit an Action Request.

- c. If the answer to Step 8.1.1.b. above is "NO", approximately what length (in feet) of the affected breakwater(s) has been reduced to less than MLLW? (Assistance in determining this information may be obtained from the GC Civil Engineering Department.)

East Breakwater: _____ Ft.

West Breakwater: _____ Ft.

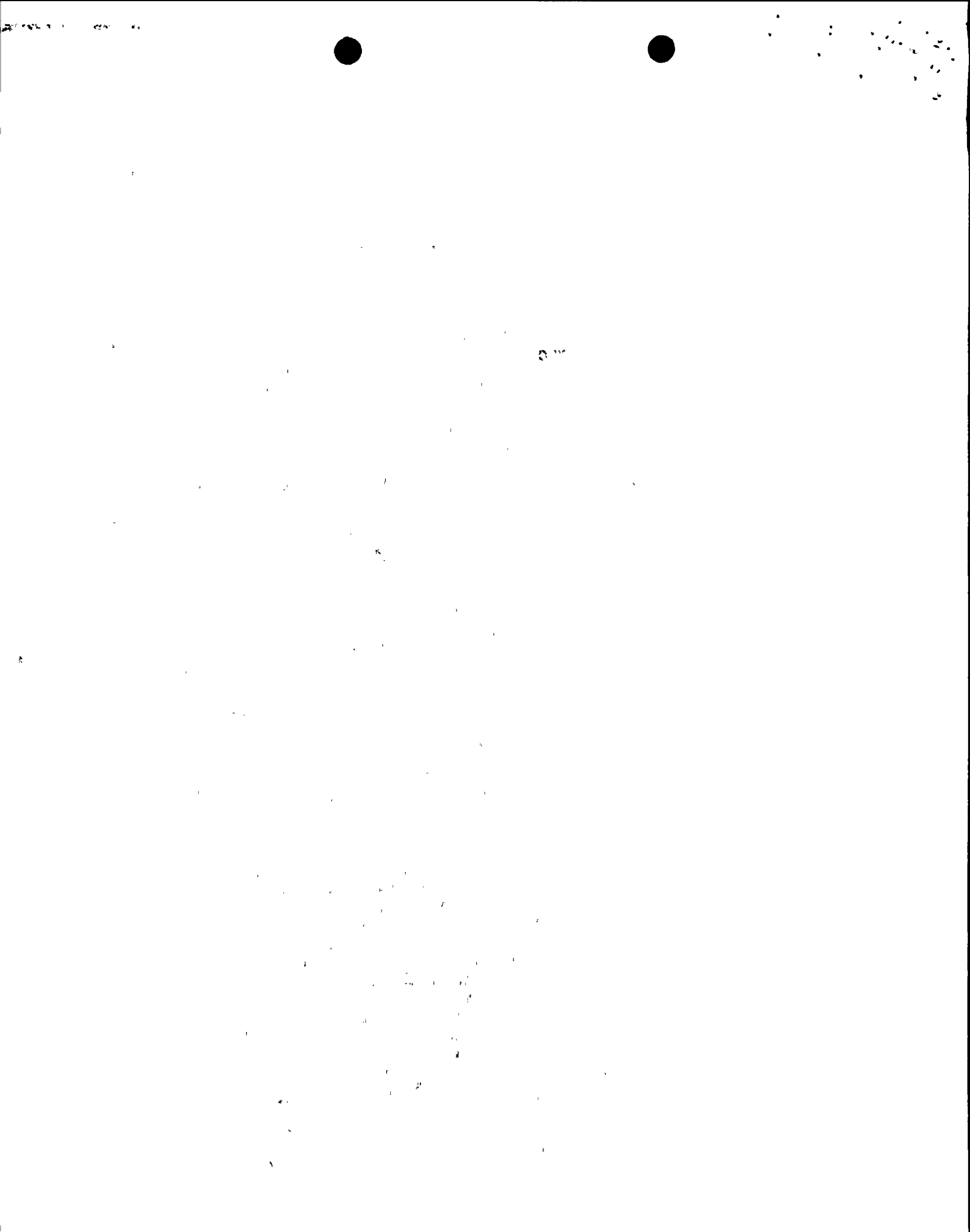
- d. Is the ACTION statement of Tech. Spec. 3.7.13 being complied with?

[] [] [✓]

8.2 Walkdown of East Breakwater

- 8.2.1 Walk down the 17 concrete cap sections of the east breakwater and determine if:
 - 1) any vertical or horizontal displacement of any cap section has occurred with respect to the other cap sections;
 - 2) any cap section has cracked or lost material due to wave action and
 - 3) any of the tri-bars which are in direct contact with any side of any cap section has cracked or lost material due to wave action.
 If any such conditions are observed, circle the affected cap section or sections or the approximate location(s) of the cracked/wave damaged tri-bar(s) on Figure 1 of this test procedure. If no displacement/damage is observed for a given cap section, simply mark N/A in the "Comments" space

04084 2265



DIABLO CANYON POWER PLANT

NUMBER STP M-90
REVISION 3
PAGE 9 OF 18
UNITS 1 AND 2

TITLE: SURVEILLANCE OF DIABLO CANYON BREAKWATERS

for that section. This instruction also applies for inspected tri-bars and the sea wall. Also, determine if the sea wall beyond the base of the breakwater (see Figure 1) has 1) cracked, 2) settled or 3) lost material due to wave action. If a walkdown cannot be performed for a given month, follow the pertinent instructions of Step 7.3.1 regarding breakwater visual inspection alternatives.

NOTE: Breakwater concrete cap sections are approximately 30 feet in length. If the lines of demarcation between the cap sections are not clearly visible, simply determine the condition of the cap in 30 foot lengths from its tip to its base.

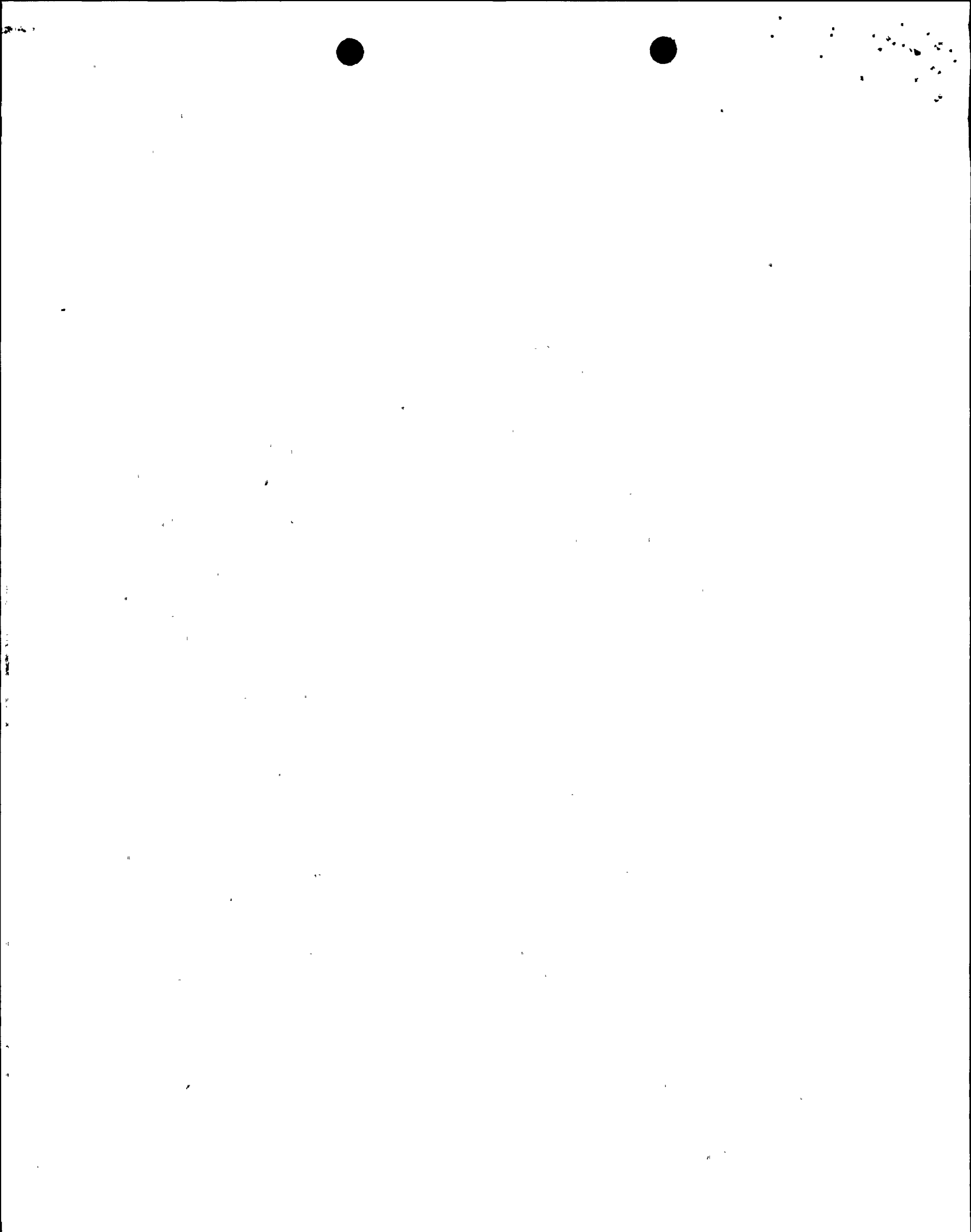
04084 2266

CAP SECTION NO.**

COMMENTS

<u>CAP SECTION NO.**</u>	<u>COMMENTS</u>	<u>N/A</u>
1	<i>no visible signs of deterioration</i>	[]
2		[]
3		[]
4		[]

**Refer to Figure 1 of this procedure for cap section numbering scheme.



DIABLO CANYON POWER PLANT

NUMBER STP M-90
REVISION 3
PAGE 10 OF 18
UNITS 1 AND 2

TITLE: SURVEILLANCE OF DIABLO CANYON BREAKWATERS

CAP SECTION NO.**

COMMENTS

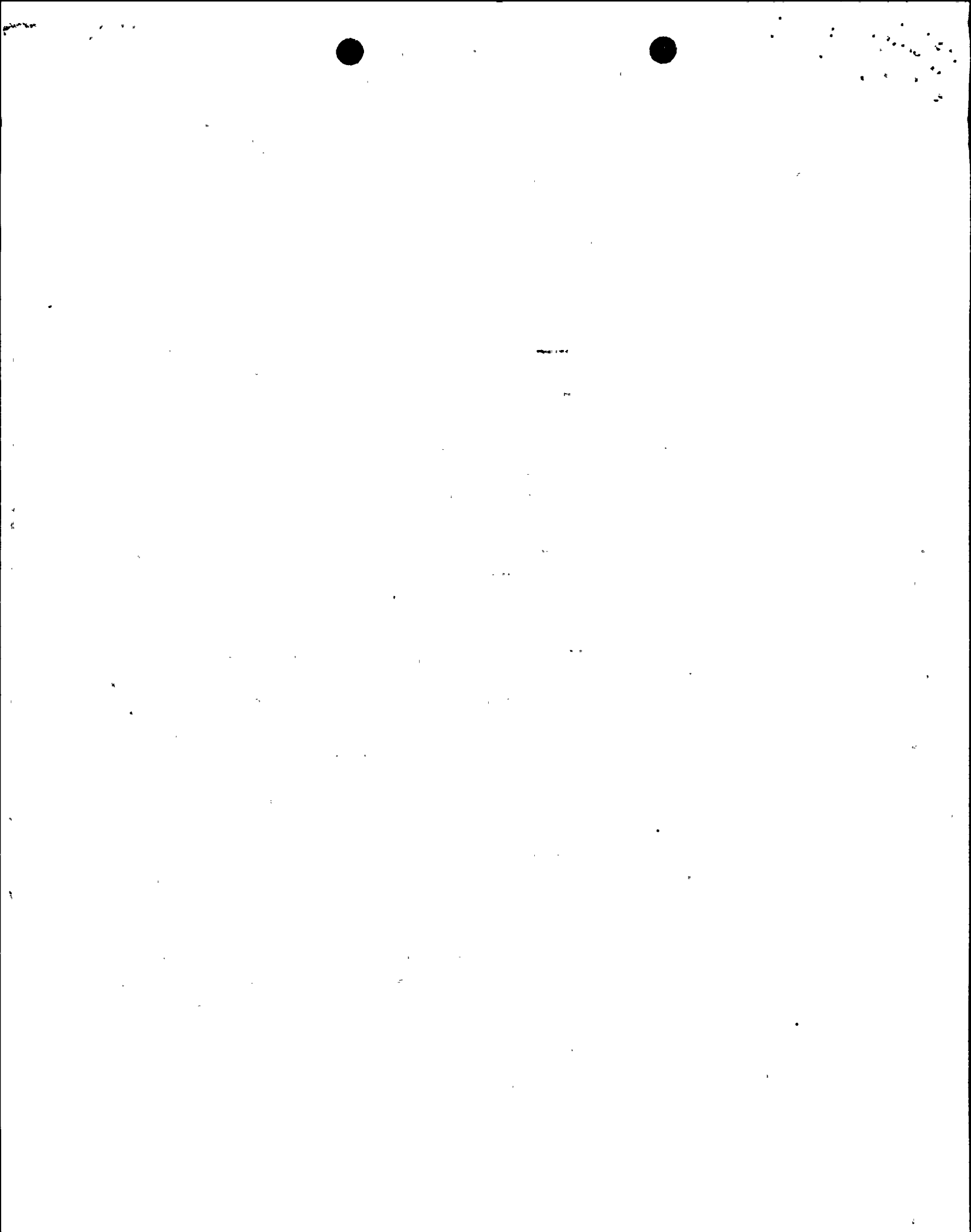
N/A

5	<i>no visible signs of deterioration</i>	[]
6		[]
7		[]
8		[]
9		[]
10		[]
11		[]

**Refer to Figure 1 of this procedure for cap section numbering scheme.

X000596a.06 10III

04004 2267



TITLE: SURVEILLANCE OF DIABLO CANYON BREAKWATERS

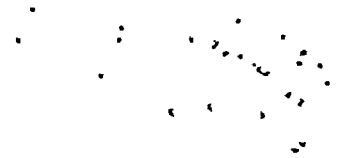
CAP SECTION NO.**

COMMENTS

<u>CAP SECTION NO.**</u>	<u>COMMENTS</u>	<u>N/A</u>
12	<i>no visible signs of deterioration</i>	[]
13		[]
14		[]
15		[]
16		[]
17		[]
SEA WALL		[]

**Refer to Figure 1 of this procedure for cap section numbering scheme.

04084 2268



TITLE: SURVEILLANCE OF DIABLO CANYON BREAKWATERS

8.3 Walkdown of West Breakwater

8.3.1 Walk down the 29 concrete cap sections of the west breakwater. Follow the guidelines of the instructions of Step 8.2.1 of this procedure concerning making notations on Step 8.3.1 "Comments" spaces and Figure 2 to document any observed cap section displacement/cracking/wave damage or tri-bar cracking/wave damage. If a walkdown cannot be performed for a given month, follow the pertinent instructions of Step 7.3.1 regarding breakwater visual inspection alternatives. Circle any affected cap section/sections or cracked/wave damaged tri-bar approximate locations on Figure 2 of this procedure.

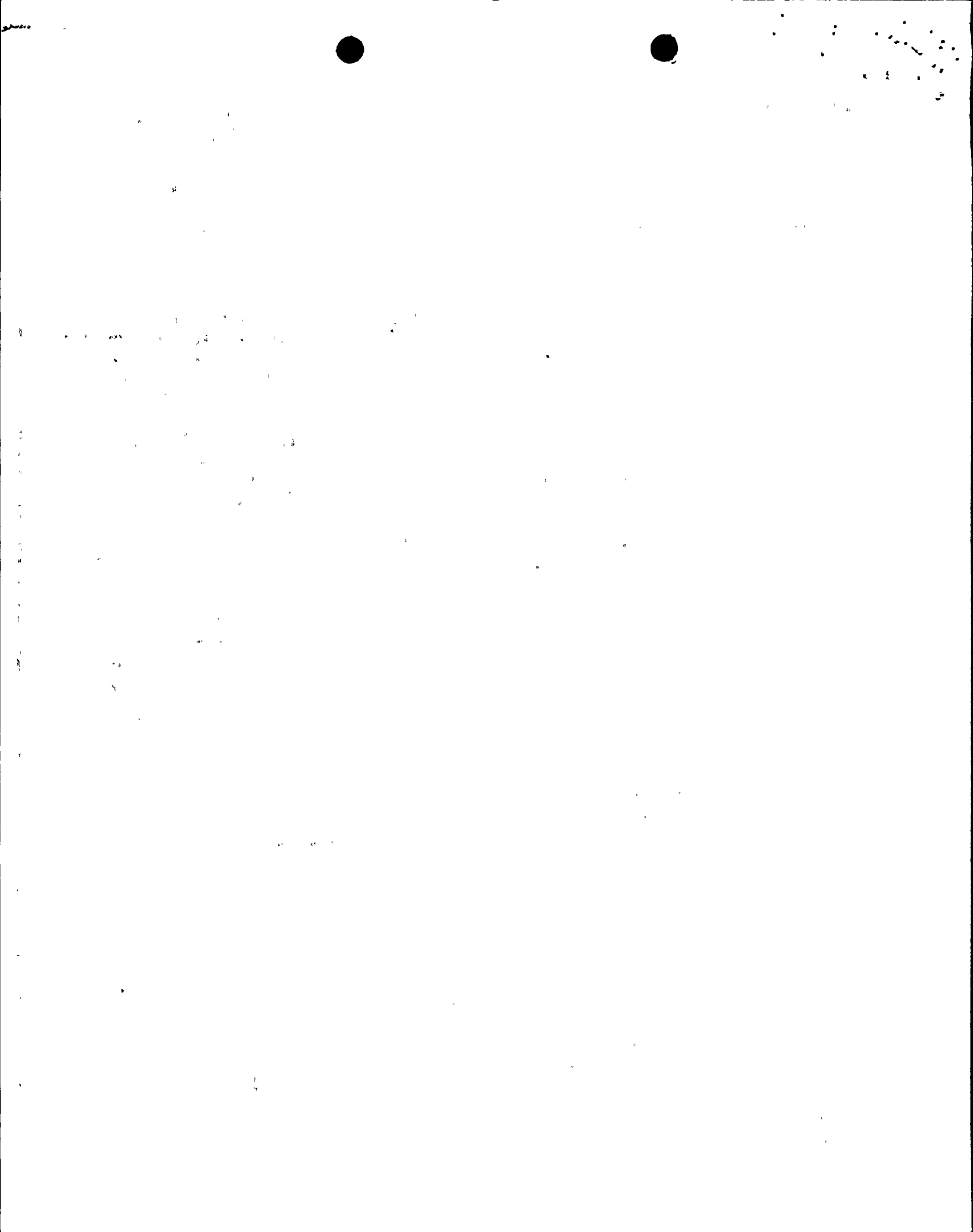
040842269

CAP SECTION NO.***

COMMENTS

<u>CAP SECTION NO.***</u>	<u>COMMENTS</u>	<u>N/A</u>
1	<i>no visible signs of deterioration</i>	[]
2		[]
3		[]
4		[]
5		[]

***Refer to Figure 2 of this procedure for cap section numbering scheme.



TITLE: SURVEILLANCE OF DIABLO CANYON BREAKWATERS

CAP SECTION NO.***

COMMENTS

N/A
[]

6 *no visible signs of deterioration*

7 []

8 []

9 []

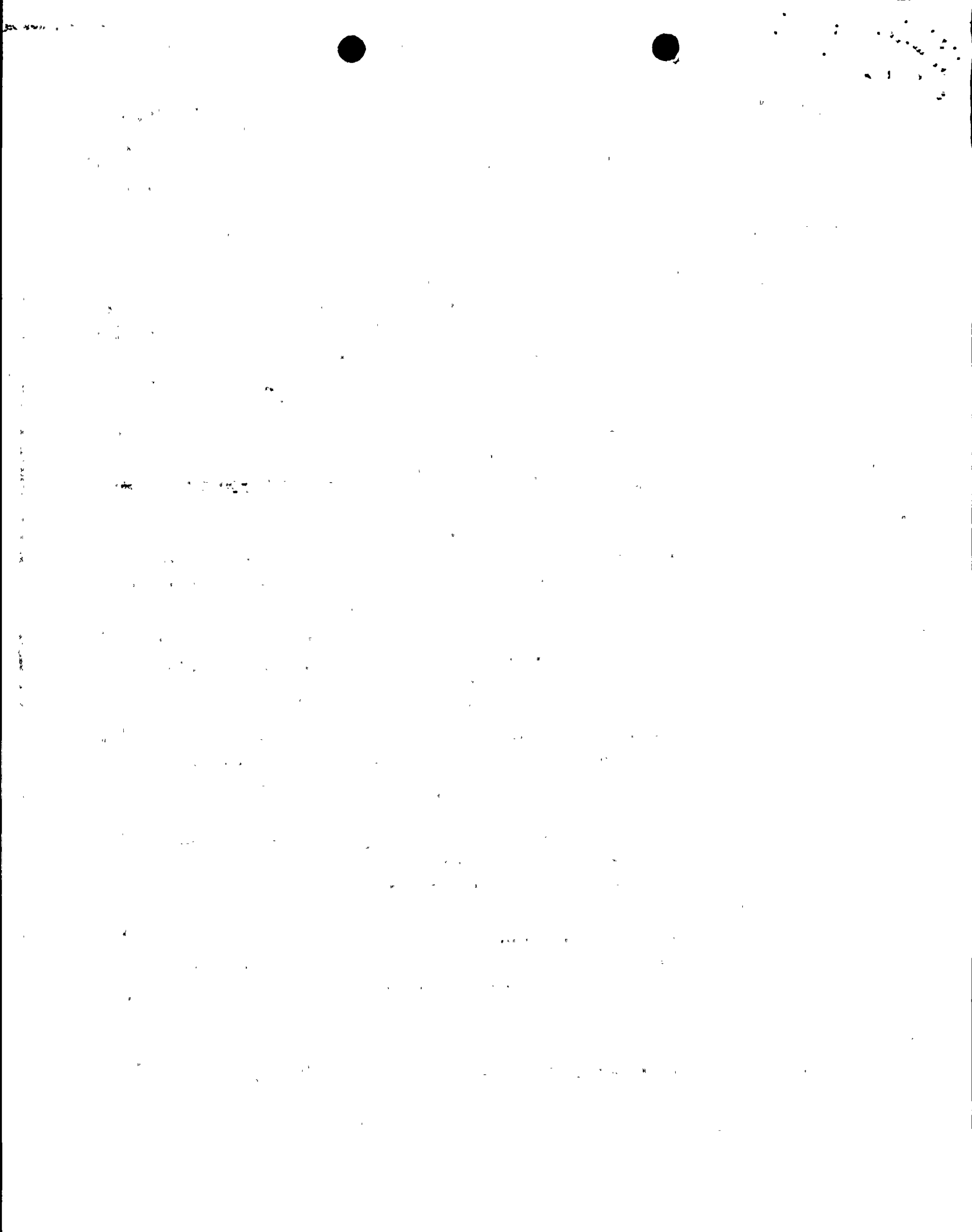
10 []

11 []

12 []

0:4084 2270'

***Refer to Figure 2 of this procedure for cap section numbering scheme.



DIABLO CANYON POWER PLANT

NUMBER STP M-90
REVISION 3
PAGE 14 OF 18
UNITS 1 AND 2

TITLE: SURVEILLANCE OF DIABLO CANYON BREAKWATERS

CAP SECTION NO.***

COMMENTS

<u>CAP SECTION NO.***</u>	<u>COMMENTS</u>	<u>N/A</u>
13	<i>no visible signs of deterioration</i>	[]
14		[]
15		[]
16		[]
17		[]
18		[]
19		[]

***Refer to Figure 2 of this procedure for cap section numbering scheme.

04084 2271



Handwritten notes and markings in the top right corner, including a list of numbers and symbols.

DIABLO CANYON POWER PLANT

NUMBER STP M-90
REVISION 3
PAGE 15 OF 18
UNITS 1 AND 2

TITLE: SURVEILLANCE OF DIABLO CANYON BREAKWATERS

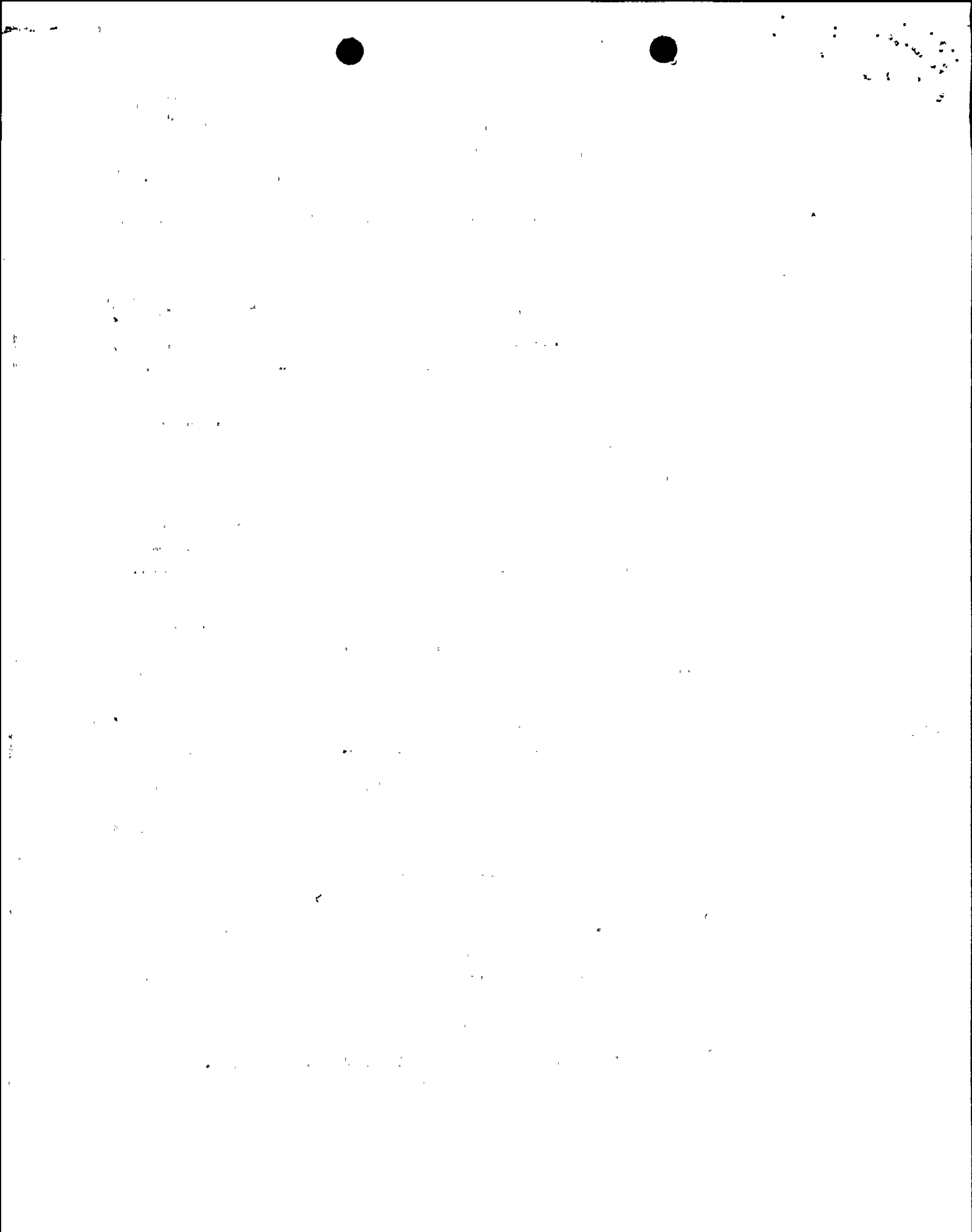
CAP SECTION NO.***

COMMENTS

<u>CAP SECTION NO.***</u>	<u>COMMENTS</u>	<u>N/A</u>
20	<i>no visible signs of deterioration</i>	[]
21		[]
22		[]
23		[]
24		[]
25		[]
26		[]

04084 2272

***Refer to Figure 2 of this procedure for cap section numbering scheme.



TITLE: SURVEILLANCE OF DIABLO CANYON BREAKWATERS

CAP SECTION NO.***

COMMENTS

<u>CAP SECTION NO.***</u>	<u>COMMENTS</u>	<u>N/A</u>
27	<i>no visible signs of deterioration</i>	[]
28		[]
29		[]

Inspection/Walkdown performed by: *J Whitehead / J D Riddell*
Date 4/6/89 Time 0900

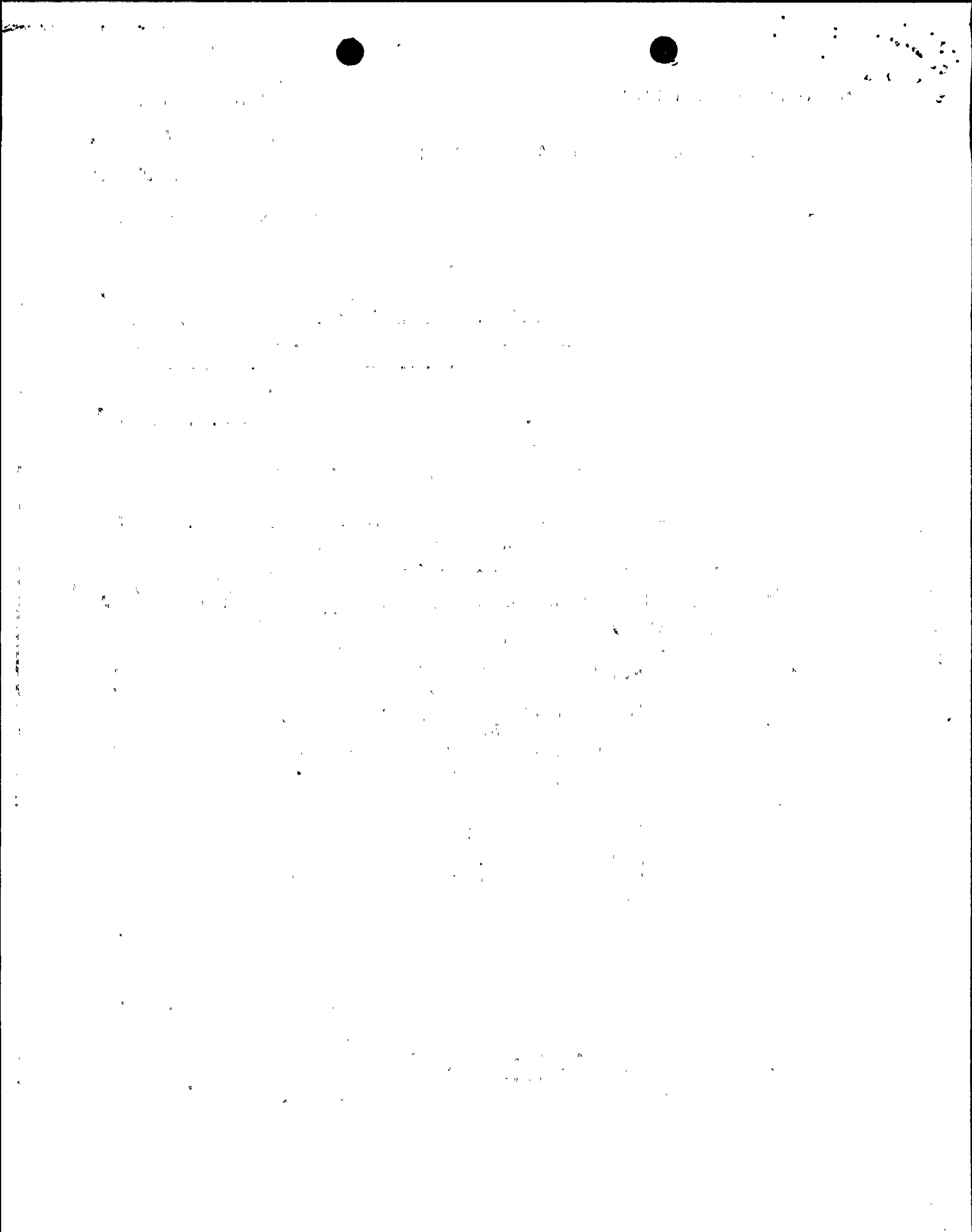
8.4 Photographic Data

8.4.1 Attach to this completed test photographs of any cap section(s) found to be displaced/cracked/wave damaged and/or tri-bar(s) found to be cracked/wave damaged during the breakwater walkdowns.

NOTE: This data may be secured with the help of DER on-site personnel, who operate photographic equipment daily on the plant site. Also, plant personnel may obtain such data by taking required photographs themselves.

***Refer to Figure 2 of this procedure for cap section numbering scheme.

04084 2273



TITLE: SURVEILLANCE OF DIABLO CANYON BREAKWATERS

YES NO

8.5 Annual Survey Data

8.5.1 During the month in which the annual survey of the breakwaters is performed, walk down and visually inspect the breakwaters per the instructions of Sections 8.1 through 8.4 above. If a walkdown of the breakwaters is impossible, follow the instructions of Step 7.3.1. above. Secure copies of the results of the breakwater surveys from the General Office Civil Engineering Department and reproductions of photos taken of the breakwaters during the surveys. Attach this data to the completed procedure.

9.0 DATA REDUCTION AND REPORTING OF RESULTS

9.1 Verify Acceptance Criteria have been satisfied:

9.1.1 Does each Breakwater meet the Acceptance Criteria of this procedure?

[]¹

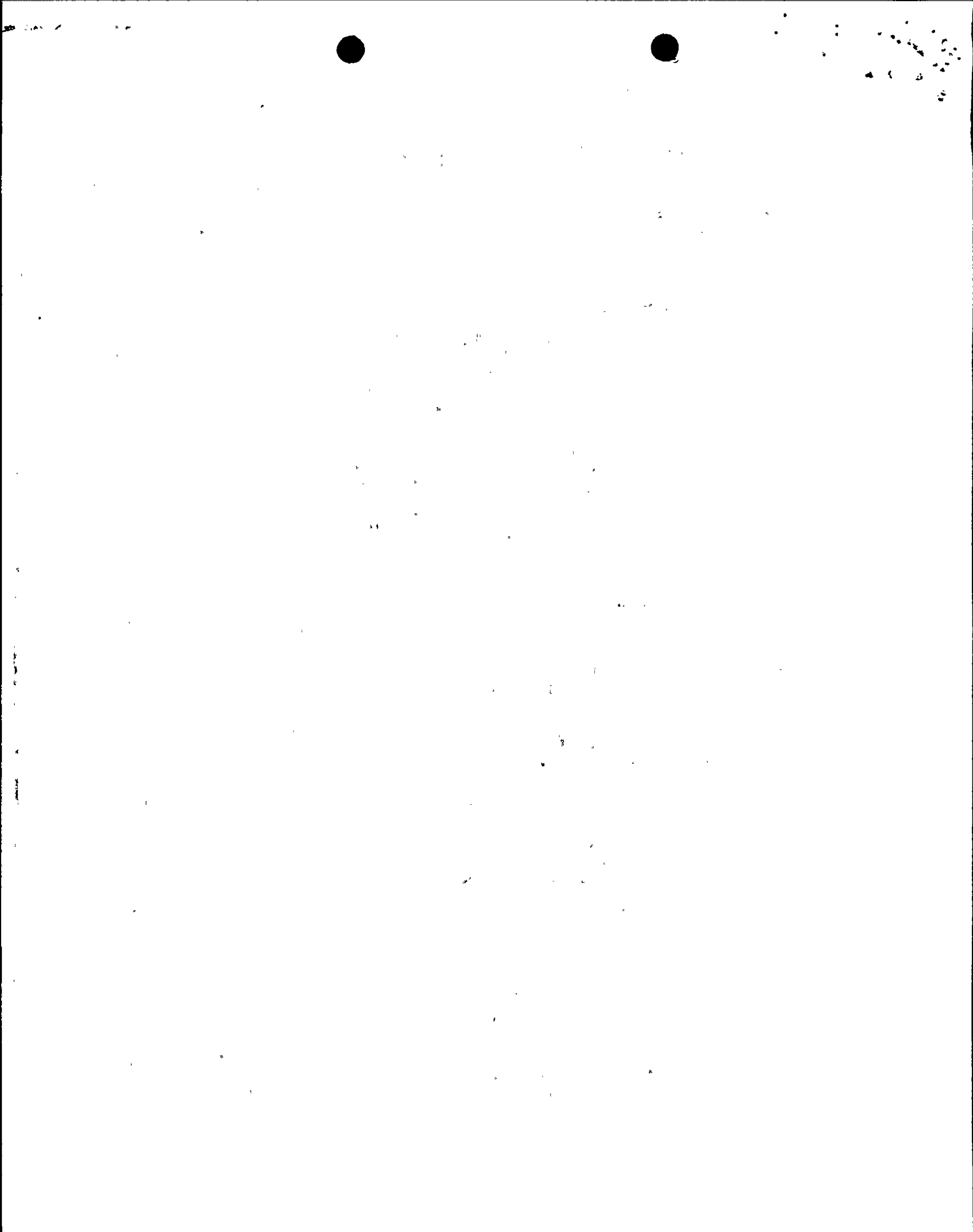
9.2 If the Acceptance Criteria are not met, initiate an ACTION REQUEST and immediately notify the Shift Foreman. AR# N/A

9.3 REMARKS: Explain any NO or N/A entries in any of the data and list any discrepancies found:

OK
4/15/89 ~~AR#~~ No significant change since the last inspection

¹If either or both breakwaters do not meet the test Acceptance Criteria, submit an Action Request and comply with the ACTION statement of Tech. Spec. 3.7.13. If 500 feet or more of either or both of the breakwaters do not meet the Acceptance Criteria, immediately notify the Shift Foreman, comply with ACTION statement b. of Tech. Spec. 3.7.13 immediately, and then submit an Action Request and comply with ACTION statement a. of Tech. Spec. 3.7.13.

04084 2274



DIABLO CANYON POWER PLANT

NUMBER STP M-90
REVISION 3
PAGE 18 OF 18
UNITS 1 AND 2

TITLE: SURVEILLANCE OF DIABLO CANYON BREAKWATERS

04084 2275

YES NO

9.4 If this test was a complete test and both Breakwaters met the Acceptance Criteria, then update the Master Surveillance Schedule per AP C-3S1.

9.4.1 Was the Master Schedule updated? []

9.5 Performed by (PPE):

J. Whitehead / J. Donnell Date 4/6/89

9.6 Forward completed procedure to the Test Coordinator (TC). []

9.7 (TC) Distribute procedure to PPE. []

9.8 (PPE) Review procedure for completeness and acceptability. []

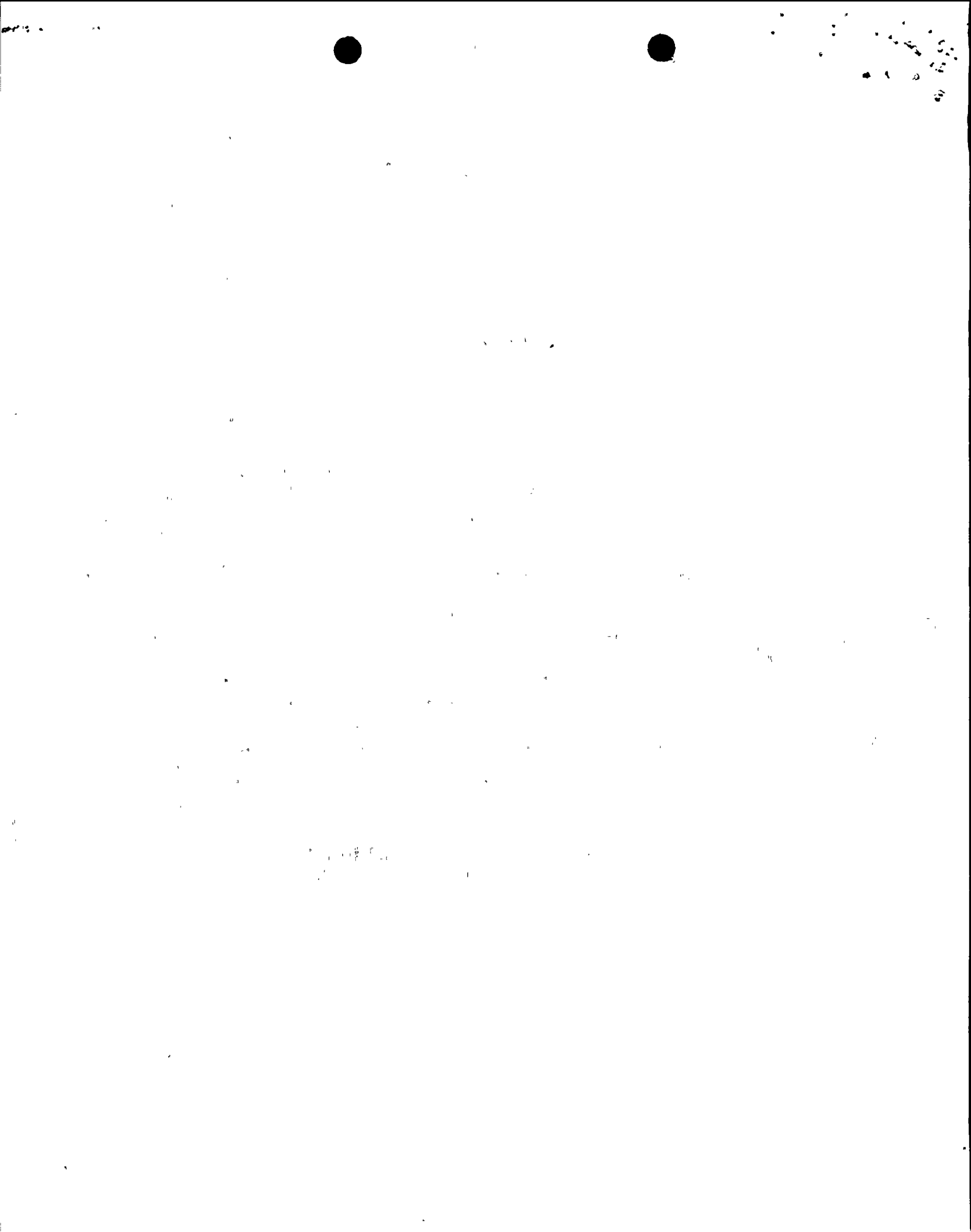
9.9 REMARKS: _____

9.10 Reviewed by (PPE): [Signature] Date 4/6/89

YES NO

9.11 A copy of this completed and reviewed test has been submitted to the Regulatory Compliance Dept. []

9.12 (PPE) Submit completed procedure to the Test Coordinator for filing.



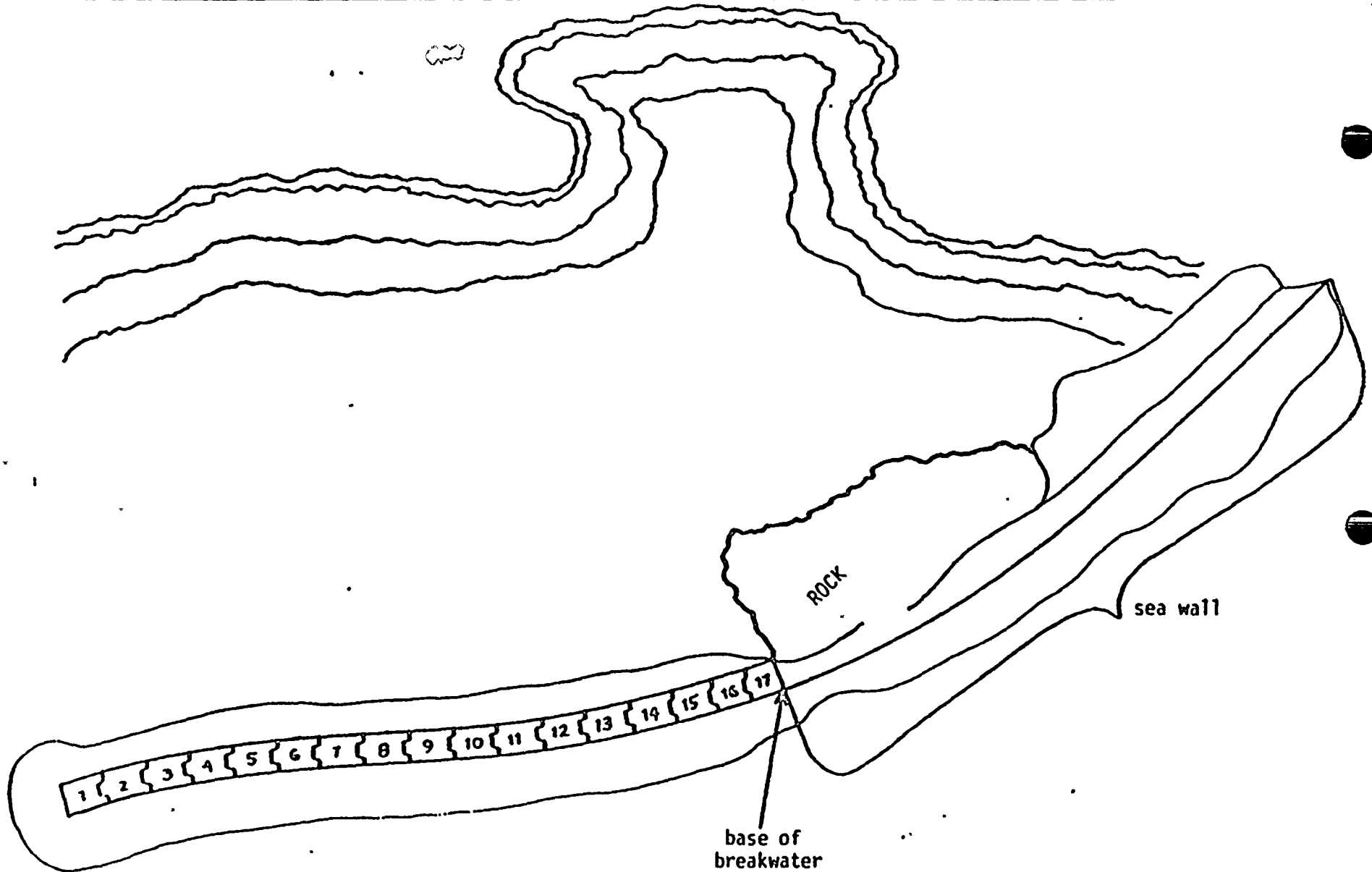
7/85

04084 2276i

Page 1 of -

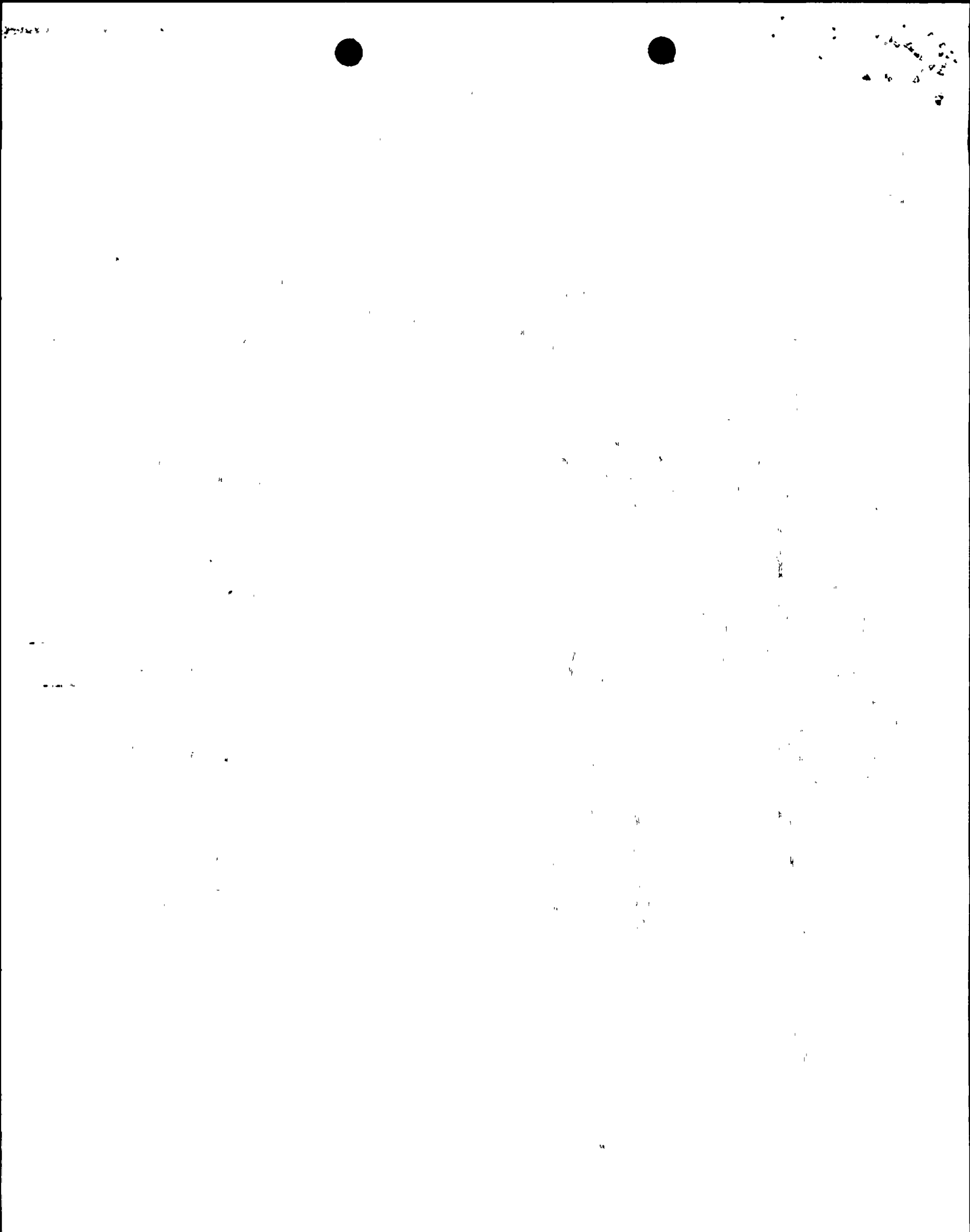
PACIFIC GAS AND ELECTRIC COMPANY
DIABLO CANYON POWER PLANT UNIT NOS. 1 AND 2
ATTACHMENT 11.1

TITLE: EAST BREAKWATER (FIGURE 1) - STP M-90



X000596a.06 1911

10-10-68
10-10-68
10-10-68



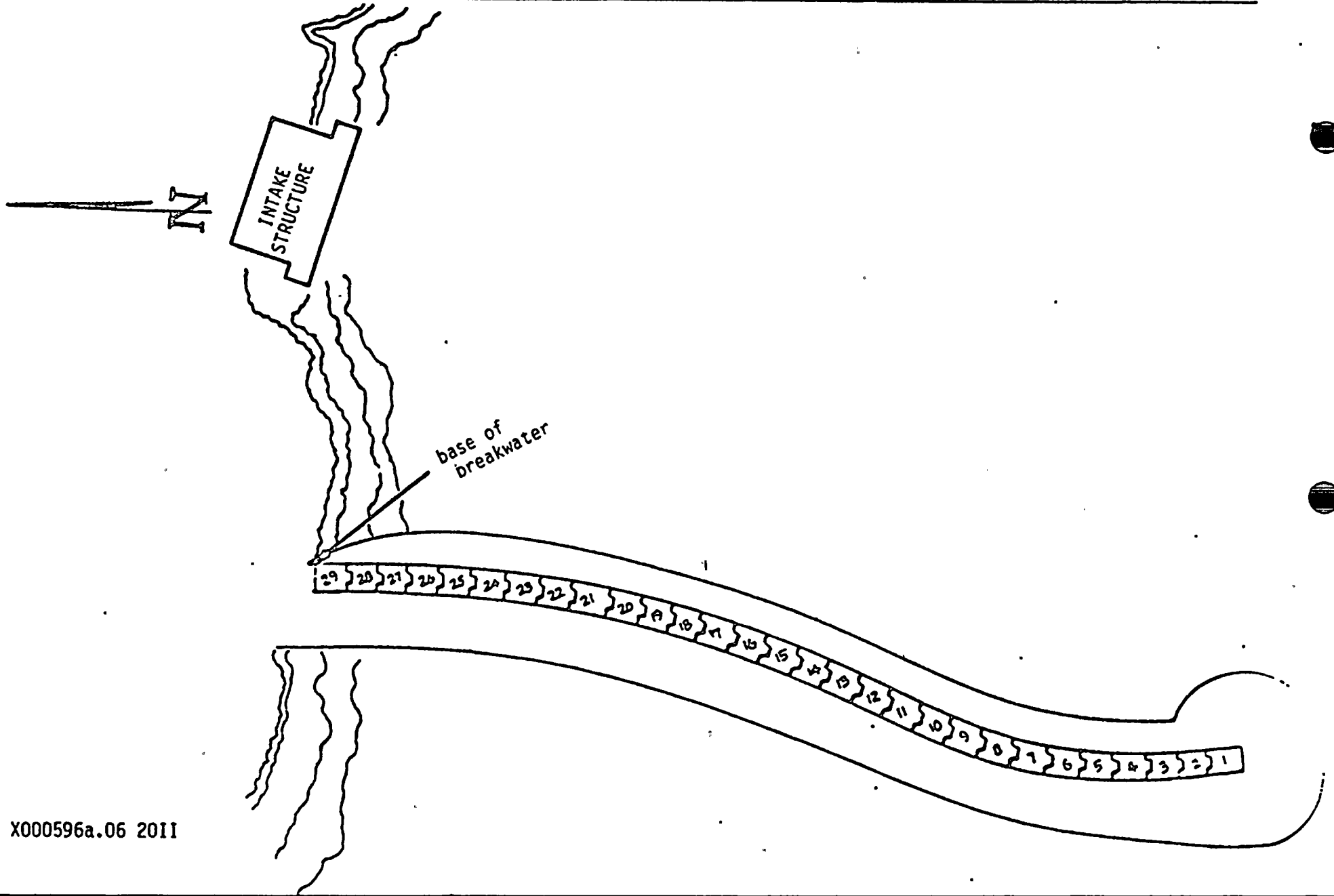
7/85

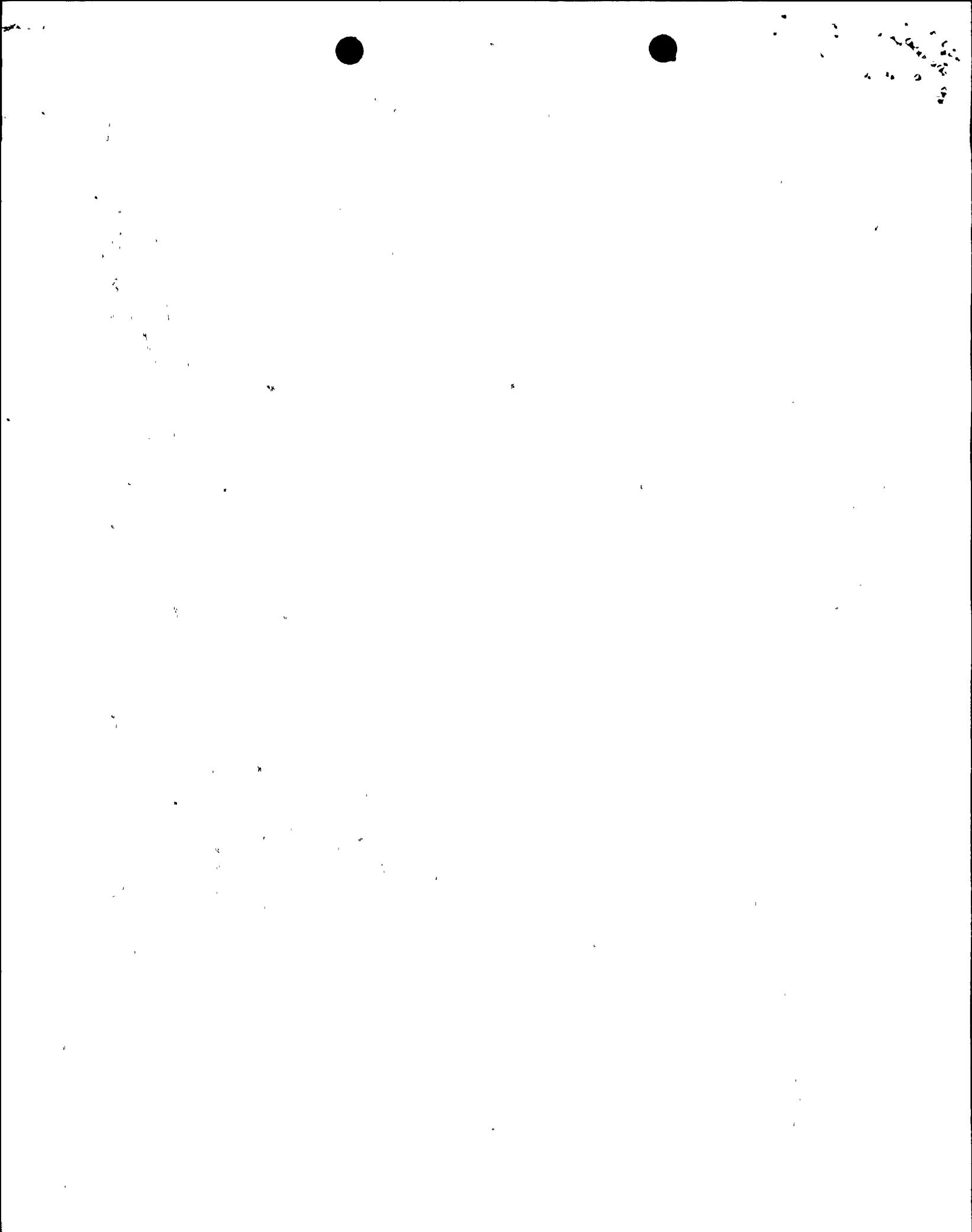
0 4 0 8 4 2 2 7 7

Page 1 of 1

PACIFIC GAS AND ELECTRIC COMPANY
DIABLO CANYON POWER PLANT UNIT NOS. 1 AND 2
ATTACHMENT 11.2

TITLE: WEST BREAKWATER (FIGURE 2) - STP H-90

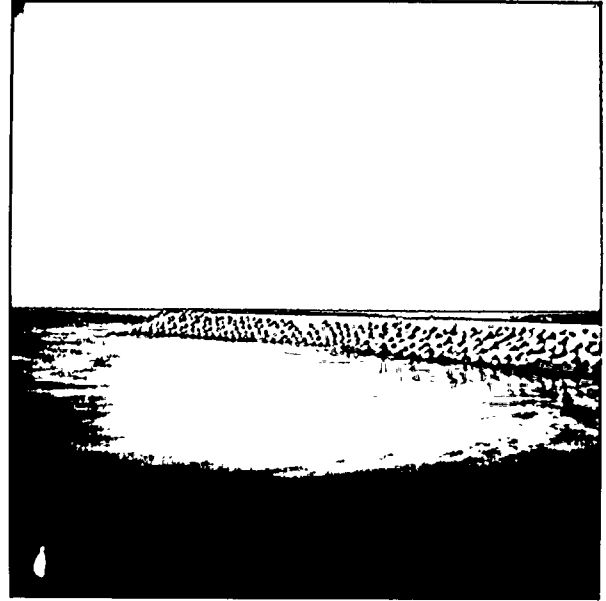




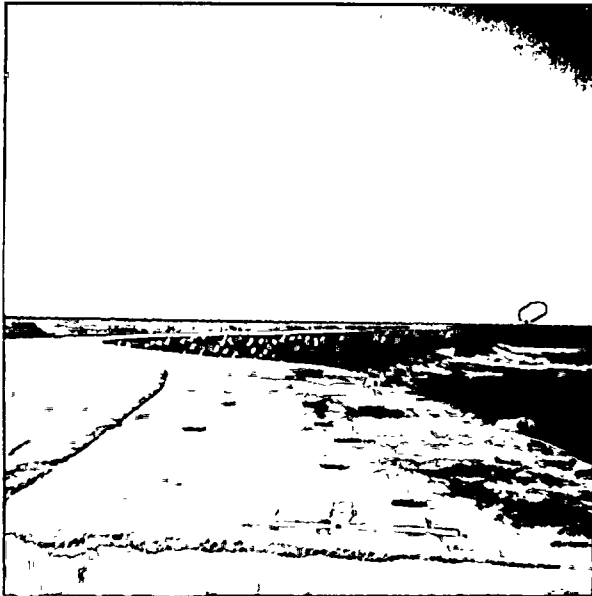
Attachment 2 to the Monthly Operating Report for May 1989



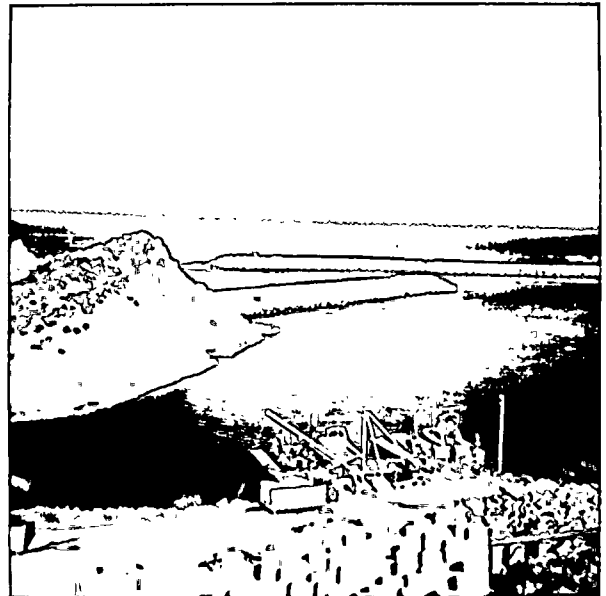
E. Breakwater
1989



W. Breakwater
1989



W. Breakwater
1989



W & E Breakwater
1989

