

November 13, 2018
Project No. 1802-2271

California Resources Petroleum Corporation
2575 Vista del Mar Drive, Suite 101
Ventura, California 93001

Attention: Mr. Bruce Carter

Subject: Pre-Construction Marine Biological Dive Survey Letter-Report

Dear Mr. Carter:

This marine biological dive survey report (Report) summarizes the results of pre-construction surveys conducted for California Resources Petroleum Corporation (CRC) at the Grubb Lease Intake/Outfall Structure located on California State Lands Commission (CSLC) Lease PRC 3913.1, offshore of Ventura, California (Project site). The Report describes the survey methods completed by Padre Associates, Inc. (Padre) and associated observations completed during the survey. The purpose of the marine biological survey was to document the type and location of marine plants, macro-epifauna, and fish associated with the habitats within the project areas. The resulting data will be used in the final Project planning effort, and as a baseline for comparison with post-Project marine biological conditions.

The survey consisted of a team of diver-biologists who recorded the physical condition of the offshore pipelines and completed an assessment of biological habitat types and epibiota along the existing intake and wastewater outfall pipelines. The marine portion of the intake and outfall facilities consists of two 12-inch diameter steel intake pipelines measuring a total of approximately 680 feet and 630 feet in length and an outfall pipeline measuring approximately 500 feet in overall length. All lengths are measured from the seaward side of the onshore concrete vault to the offshore terminations of each pipeline. On October 30, 2018 the intake and outfall pipelines were not visible exiting the concrete vault and were not exposed along the beach. It is estimated that the intake and outfall pipelines become exposed somewhere in the surf zone and as observed during the survey, remain exposed for their remaining length offshore.

Initially, a shore dive was attempted on October 30, 2018; however, due to unanticipated high surf it was determined by Padre that such conduction made it unsafe to conduct survey operations from the shore. CRC and Padre determined that vessel-based survey operations would be safer and more efficient in assessing the marine biological resources. The Project team returned on November 1, 2018 to conduct the dive survey from the survey vessel (S/V) *JAB*. This Report describes the equipment and methods that were used during the vessel-based dive survey operations and data recovery.

PERSONNEL AND EQUIPMENT

The Project dive team included divers Ms. Michaela Hoffman and Ms. Haleigh Damron (Padre Marine Biologists). Mr. Jeff Zane was the Padre Health and Safety Officer (HSO) and onboard licensed Emergency Medical Technician (EMT), and Padre Project Manager, Simon

Poulter, provided shore-side support of dive operations. Mr. Zachary Dransoff, CRC Environmental Project Manager observed all survey operations. All divers are certified through the Professional Association of Dive Instructors (PADI) and National Association of Underwater Instructors (NAUI), and Ms. Hoffman is an American Academy of Underwater Sciences (AAUS) certified diver.

The dive survey was conducted from S/V *JAB*, a 43-foot jet powered catamaran, owned and operated by Theory Marine Services, LLC. The vessel was mobilized in Ventura Harbor and transited to the dive site the morning of the survey.

Divers were equipped with open circuit scuba using steel 85 cubic-foot cylinders pressurized to approximately 3,000 pounds per square inch (psi) and equipped with a separate first and second stage regulators. Divers used transect tapes to verify survey distances and a Go Pro® camera and Olympus® Tough point-and-shoot camera to record underwater video and photographs. Divers were equipped with underwater lights and slates for data collection. A “diver down” flag was deployed from the mast of the survey vessel at the dive site.

METHODOLOGY

Prior to the dive, the survey vessel located the end of pipe using the onboard navigation system and deployed a surface buoy at the start of each transect. The divers entered the water from the survey vessel and descended the surface buoy line. Once on the bottom, the visibility was measured to determine the size of the survey corridor. The diver biologists swam three transects along the existing pipeline corridors observing and recording biological resources starting with the waste water outfall pipeline, followed by the southern and northern intake pipelines, respectively.

Transects were swam from the offshore end of each pipe and encroached as far into the surf zone as safely possible (Attachment 1 – Marine Biological Survey Area). Due to low visibility, and to reduce the chance of unsuccessful navigation underwater, each dive consisted of only one pipeline transect; all three pipelines were surveyed in a total of three dives. All observation data was recorded on pre-printed data sheets, in addition to GoPro® video cameras and still photographs on a waterproof Olympus® Tough camera (Attachment 2 – Survey Photographs). In addition, the length of the exposed pipeline and the general condition of any exposed pipeline or accessory features were noted to support future removal planning. All three pipelines were surveyed in three separate dives totaling in 124 minutes of bottom time.

RESULTS

The following section details the results of a dive survey conducted on November 1, 2018 within the Project site. Diver biologists identified habitat types and locations of marine plants, macro-epifauna, and fish associated with the wastewater outfall pipeline and the southern and northern intake pipelines, respectively.

Ocean conditions during the surveys consisted of clear skies, with calm winds in the morning (one to two miles per hour [mph]) increasing to 8 mph in the afternoon, and swell height of one to two feet. Tide was falling during the first dive from 4.3 feet at 06:10 to 2.7 feet at 11:32 and rising during the second and third dive to a 4.7-foot tide at 17:01. Underwater visibility was

3.5 feet during the first dive decreasing to 2.5 feet over the course of the survey day. Due to reduced visibility, the survey corridor was limited to approximately six feet (three feet on either side of each pipeline).

In general, substrate types were similar along all three pipelines and consisted of medium-sized cobble (four to eight-inch diameter) and small boulders (ten to 15-inch diameter), as well as low-relief sandstone bedrock and short expanses of sand in between bedrock. Sand waves of less than one inch were observed within sandy-bottom areas. A bed of giant kelp (*Macrocystis pyrifera*) was observed offshore of the Project site but appeared to end west of pipelines' termini and was not established within the survey corridors.

WASTEWATER OUTFALL PIPELINE

Approximately 237 feet of the wastewater outfall pipeline was surveyed from its offshore terminus in 15 feet of water, northeast toward shore to a depth of the nine feet where visibility and surge precluded survey operations. The pipeline was exposed and visible along its entire length. The pipeline appeared intact with no holes or visible corrosion. No diffuser was observed at the offshore terminus of the pipe; the pipeline was open to the sea water.

The habitat on the wastewater outfall pipeline consisted of low red and brown turf alga, encrusting and articulated coralline algae (*Corallina* sp., *Calliarthron* sp. and *Lithothamnium* sp.), branching red algae (*Mastocarpus [Gigartina] papillate*, *Cryptosiphonia woodii* and *Mazzaella [Rhodoglossum] affinis*) covered with epibiotic bryozoans (*Bugula neritina*).

A patch of surf grass (*Phyllospadix* sp.) was observed growing on the top of the pipeline at a water depth of 12 feet. The surfgrass patch covered a total area of approximately five square feet. Neither surfgrass or eelgrass (*Zostera marina*) were observed anywhere else within the survey corridor. No invasive species were identified (i.e., *Culerpa taxifolia* or *Sargassum horneri*). Giant kelp was observed in one location off the pipeline approximately seven feet south of the pipeline in 13 feet of water. The kelp was sparse and only two individual thalli were observed.

Epibiotia and macrofauna consisted of dense growth of bryozoans (*Hippodiplosia insculpta* and *Membranipora* sp.), stalked tunicates (*Styela montereyensis*), and Spanish shawl nudibranchs (*Flabellinopsis iodinea*). An occasional solitary anemone (*Anthopleura* sp.) was observed underneath and between the pipeline and bedrock. In addition, California spiny lobster (*Panulirus interruptus*) were observed within gaps underneath the pipeline and inside of the end of the pipeline where it is open to the seawater. Evidence of gaper clams (*Tresus* sp.) was observed within the sand and cobble substrate. No fish or abalone species were observed inside the survey corridor along the wastewater outfall pipeline.

SOUTHERN INTAKE PIPELINE

Approximately 464 feet of the southern intake pipeline was surveyed from its offshore intake structure (possible remnant filter) in 16 feet of water, northeast toward shore to a depth of ten feet where visibility and surge precluded survey operations. The southern intake pipeline was exposed and visible along its entire length. The pipeline and the offshore intake structure appeared intact with no holes or visible corrosion. Accessory pipe structures, approximately three to four inches in diameter, were identified running underneath and diagonal to the pipeline route. These accessory structures had no visible corrosion and appeared to run underneath the sand.

The general habitat and algal communities were similar to the wastewater outfall pipeline; however, no surfgrass or giant kelp were observed. Feather boa, a kelp-like brown algae (*Egregia menziesii*) was observed within the survey corridor along the southern intake pipeline. Epibiota and macrofauna were similar to the previous outfall pipeline. Fish activity inside the survey corridor was minimal, with none being identified to species due to low visibility. No abalone species were observed within the survey corridor along the southern intake pipeline.

NORTHERN INTAKE PIPELINE

Approximately 518 feet of the northern take pipeline was surveyed from the offshore intake structure in 15 feet of water, northeast toward shore to a depth of ten feet where visibility and surge precluded survey operations. The northern intake pipeline was exposed and visible along its entire length. An accessory pipeline structure, three to four inches in diameter, ran parallel approximately the entire length of the northern intake pipeline. Both the intake pipeline and accessory structures appeared to be intact with no visible corrosion. The accessory structure ran underneath and on top of the intake pipeline and was intermittently buried in the sand.

Dense beds of red alga, *Cryptosiphonia woodii* and *Mazzaella affinis*, and articulated coralline algae grew along the top of the northern intake pipeline. No kelp, surfgrass, or eelgrass species were observed within the survey corridor. Several California spiny lobster were observed underneath the pipeline and inside the offshore intake structure, as well as other invertebrate species including angular unicorn snails (*Acanthinucella spirata*), Spanish shawl nudibranch and solitary anemones. Portions of the northern intake pipeline also supported tunicates and orange and yellow sponges (*Halichondria* sp.). One sculpin (Cottidae) was identified sitting on the northern intake pipeline, but the survey corridor was generally devoid of fish activity. No abalone species were observed within the survey corridor along the northern intake pipeline.

SUMMARY AND RECOMMENDATIONS

A team of diver biologists completed a marine biological survey to identify the habitat types, macrofauna and fish present within the survey corridor along three pipelines at the Project site. Substrate consisted of mixed cobble, sandstone bedrock and sandy areas. Algal species and macrofauna observed were typical of southern California marine waters within similar depth ranges and with similar substrate types; however, the survey corridor was generally devoid of typical invertebrate and fish species associated with hard bottom habitats.

No invasive algae were observed along the pipeline corridors. No abalone, or other sensitive species were observed. Two individual kelp thalli were observed within the survey corridor; however, established kelp beds were not observed within the Project site. Dense epibiotic bryozoans and sponges were observed; however, macrofauna and fish were infrequent.

The wastewater outfall pipeline and southern and northern intake pipelines were intact with no holes or corrosion. Accessory pipeline structures were observed adjacent to the southern and northern intake pipelines, as well as the intake filter structure which appeared intact at the pipelines' termini.

Should you have any questions regarding this Report, please contact Michaela Hoffman at (805) 786-2650 ext. 47 or mhoffman@padreinc.com or Simon Poulter at (805) 683-1233 ext. 4 or spoulter@padreinc.com.

Sincerely,

Padre Associates, Inc.



Michaela Hoffman
Project Biologist

Attachments: Attachment 1 – Marine Biological Survey Area Figure
Attachment 2 – Dive Survey Photographs
Attachment 3 – Dive Survey Data Sheets

cc: Zachary Dransoff, CRC Environmental Project Manager

ATTACHMENT 1

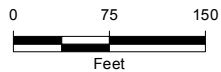
MARINE BIOLOGICAL SURVEY AREA FIGURE



LEGEND:

- Approximate Location of Giant Kelp (*Macrocystis pyrifera*)
- Approximate Pipeline Location (to be fully removed)
- Mean High Water Mark (MHW)
- 6-ft Survey Corridor
- 20ft x 40ft Concrete Vault
- Staging Area

Source: Esri Online Imagery Basemap, NOAA
 Coordinate System: NAD 1983 State Plane California V FIPS 0405 Feet
 Notes: For the purposes of this map, the NOAA defined shoreline is assumed to be consistent with the MHW line. No field studies were done to establish the MHW line.
 ft = Feet; in = Inch
 This map was created for informational and display purposes only.



padre
 associates, inc.
 ENGINEERS, GEOLOGISTS &
 ENVIRONMENTAL SCIENTISTS

PROJECT NAME: CRC - DECOMMISSIONING OF GRUBB LEASE INTAKE/OUTFALL STRUCTURE VENTURA COUNTY, CA	
PROJECT NUMBER: 1802-2271	DATE: November 2018

MARINE BIOLOGICAL SURVEY AREA

FIGURE
1

ATTACHMENT 2

DIVE SURVEY PHOTOGRAPHS



Photo 1. Surfgrass (*Phyllospadix* sp.) and articulated coralline algae (*Corrallina* sp., *Calliarthron* sp.) growing on wastewater outfall pipeline; Date: 11/1/2018.

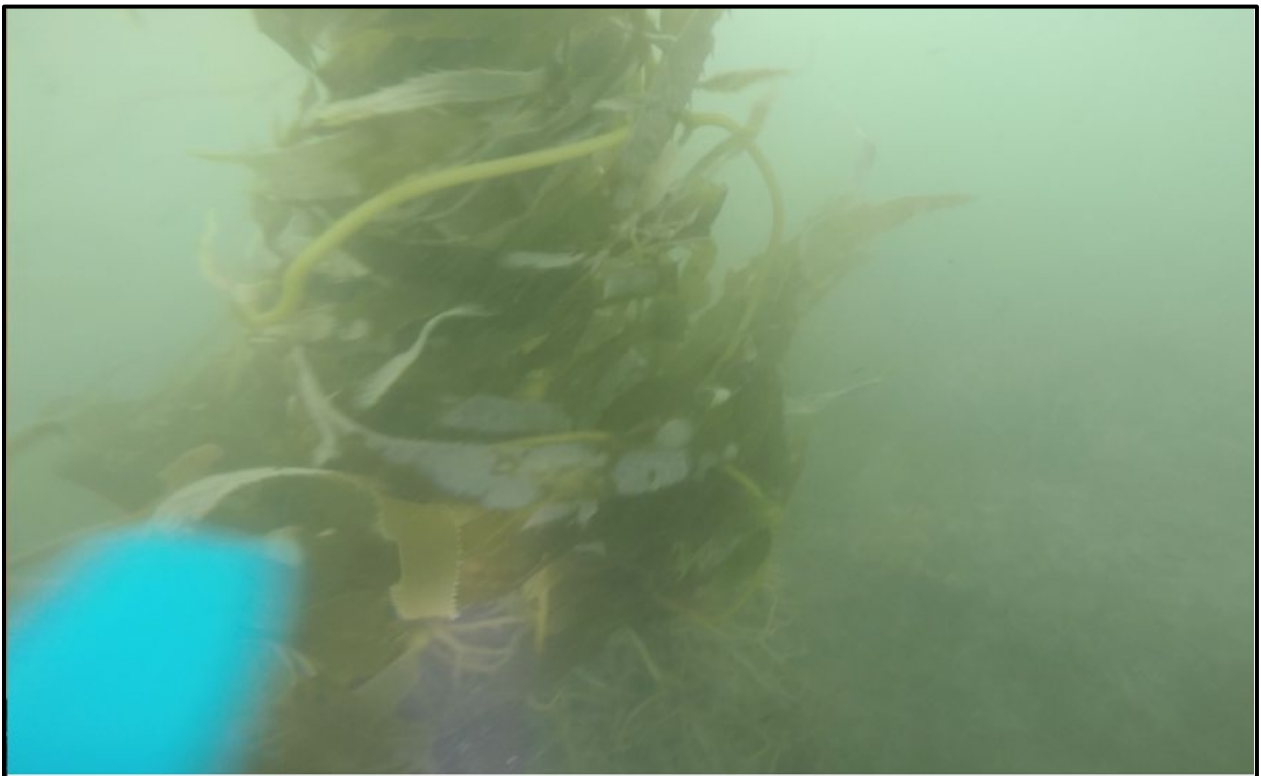


Photo 2. Giant kelp (*Macrocystis pyrifera*) adjacent to wastewater outfall pipeline; Date: 11/1/2018



Photo 3. California spiny lobster (*Panulirus interruptus*) underneath southern intake pipeline; Date: 11/1/2018



Photo 4. Accessory structure running underneath/diagonal to southern intake pipeline route; Date: 11/1/2018



Photo 5. Dense algal growth on southern intake pipeline; Date: 11/1/2018



Photo 6. Overview of habitat on northern intake pipeline; Date: 11/1/2018



Photo 7. California spiny lobster adjacent to northern intake pipeline; Date: 11/1/2018



Photo 8. Angular unicorn snail (*Acanthinucella spirata*) from northern intake pipeline; Date: 11/1/2018



**Photo 9. Spanish shawl nudibranch (*Flabellinopsis iodinea*) on northern intake pipeline;
Date: 11/1/2018**



**Photo 10. Solitary anemone (*Anthopleura* sp.) and Spanish shawl nudibranch on
northern intake pipeline; Date: 11/1/2018**



Photo 11. Sculpin (*Cottidae*); Date: 11/1/2018

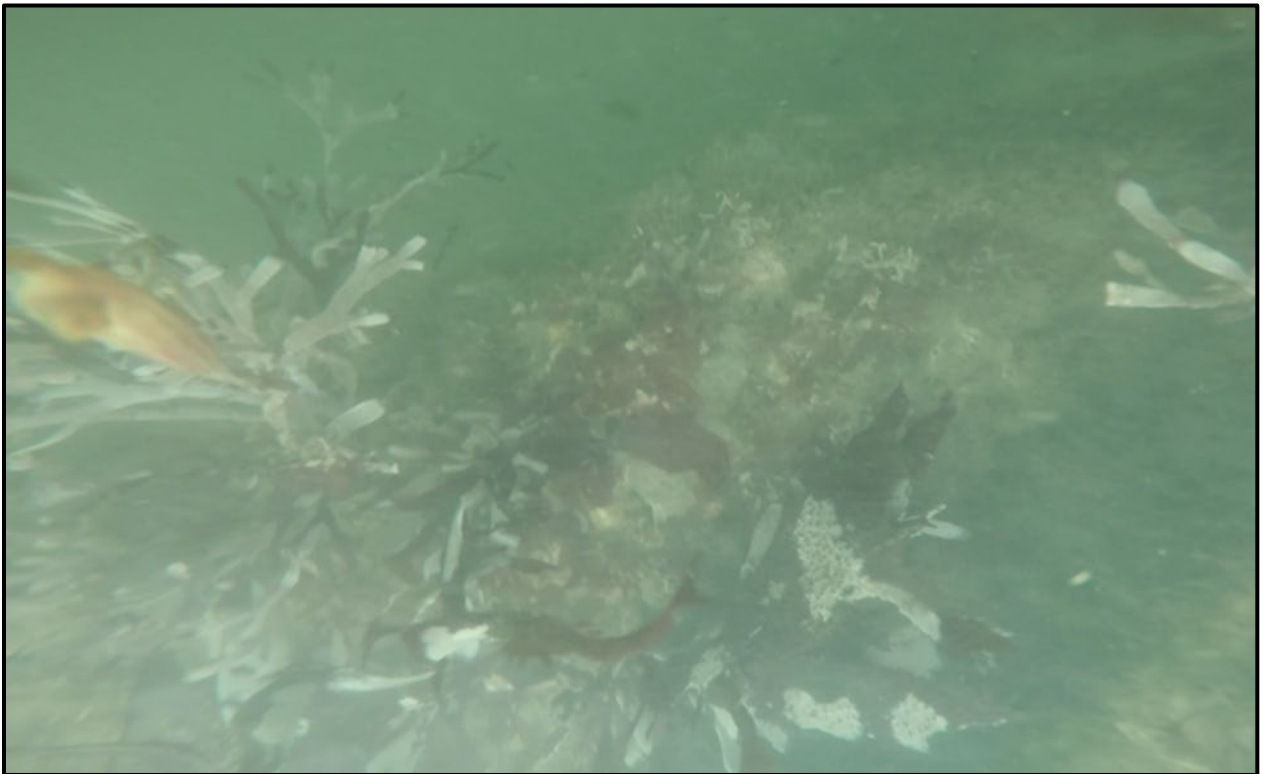


Photo 12. Low-relief hardbottom habitat adjacent to northern intake pipeline; Date: 11/1/2018



**Photo 13. Cobble substrate located under and adjacent to northern intake pipeline;
Date:11/01/18**

ATTACHMENT 3

DIVE SURVEY DATA SHEETS

270-300° shore: parallel

Pre-Construction Marine Biological Data Sheet

Date: 11/1/2018	Divers: M. Hoffman H. Damron	Weather: sun, clear swell: 1-2 ft wind: 0-2 mph
Dive Location: CRC Grubb Lease Pipes		
Transect No. Dive 1		Visibility (ft): 3.5 ft
Start: 0916/1018	Depth: 16	Pipe Surveyed: Waste Water Intake, (202°, 220°) 12-in. outfall (North or South) (circle one) (213°, 233°) (192°, 120°)
Stop: 1006/1024	Depth: 15/11	Estimated length of pipe exposed: 100%
General pipe conditions: Intact, 50% max coverage w/ loose sand		
Substrate: sand Low relief sand stone (6-2 ft)		Kelp: <input checked="" type="radio"/> Yes No (circle one) Macr. Algae
		Surfgrass: <input checked="" type="radio"/> Yes No Eelgrass: <input checked="" type="radio"/> Yes No
Invasives: <i>Undaria</i> Yes <input checked="" type="radio"/> No	<i>Sargassum muticum</i> Yes <input checked="" type="radio"/> No	
<i>Caulerpa</i> Yes <input checked="" type="radio"/> No	<i>Sargassum horneri</i> Yes <input checked="" type="radio"/> No	
General flora community: Low red turf, algae, Corallina, sparse kelp, <i>Anneliopsis</i> <i>Mastocarpus</i>		
General fauna community: <i>Anthopleura</i> , <i>Spina</i> , <i>Idotea</i> , Ling Cod (5 ft) <i>Acanthinucella spirata</i> (Angular unicorn snail), Bivalves		
Black abalone (<i>Haliotis cracherodii</i>): Yes <input checked="" type="radio"/> No		
White abalone (<i>Haliotis sorenseni</i>): Yes <input checked="" type="radio"/> No		

Other Observations:

Offshore / SW end of 12-in wastewater pipe open to
seawater. CA Spiny lobster (*Panulirus interruptus*) inside
pipe.

Pre-Construction Marine Biological Data Sheet

Date: 11/1/2016	Divers: M. Hoffman H. Damron	Weather: syn, clear. temp: 77 swell: 1-2 ft, wind: 0 mph
Dive Location: CRC Grubb lease pipes		
Transect No. DIVE 2-SOUTH		Visibility (ft): 2-3 ft
Start: 1150	Depth: 16 ft	Pipe Surveyed: Waste Water Intake, 12-in outfall (North or <u>South</u>) (circle one)
Stop: 1210	Depth: 14 ft	
General pipe conditions: Intact; 3-4' accessory pipe running under		Estimated length of pipe exposed: 100% pipe hooded exposed by growth
Substrate: Sand, cobble (3,4-8 m) low relief sand stone under- neath pipeline		Kelp: Yes <input type="radio"/> No (circle one)
Invasives: <i>Undaria</i> Yes <input type="radio"/> No <input checked="" type="radio"/>		Surfgrass: Yes <input type="radio"/> No <input checked="" type="radio"/>
Caulerpa Yes <input type="radio"/> No <input checked="" type="radio"/>		Eelgrass: Yes <input type="radio"/> No <input checked="" type="radio"/>
		Sargassum muticum Yes <input type="radio"/> No <input checked="" type="radio"/>
		Sargassum horneri Yes <input type="radio"/> No <input checked="" type="radio"/>
General flora community: low red turf algae, encrusting coralline algae.		
General fauna community: Anthopleura, CA spiny lobster, bryozoans		
Black abalone (<i>Haliotis cracherodii</i>): Yes <input type="radio"/> No <input checked="" type="radio"/>		
White abalone (<i>Haliotis sorenseni</i>): Yes <input type="radio"/> No <input checked="" type="radio"/>		

Other Observations:

Surveyed inshore to 10 ft isobath. Visibility disappeared.
 Very surgy. Discontinue transect.

Pre-Construction Marine Biological Data Sheet

Date: 11/1/18		Divers: M Hoffman H. Damron	Weather: Partly cloudy sun. Swell: 1-2 ft wind: 5-8 mph
Dive Location: CRC Grubb Lease Pipelines			
Transect No. Dive 3 NORTH		Visibility (ft): 2-3 ft	
Start: 130E	Depth: 15	Pipe Surveyed: Waste Water Intake, 12-in outfall (North or South) (circle one)	
Stop: 1330 -23 1341	Depth: 10	Estimated length of pipe exposed: 100%	
General pipe conditions: NO holes appears intact, dense growth cannot view pipe surface due to algal growth			
Substrate: sand stone low relief reef, cobble		Kelp: Yes <input type="radio"/> No (circle one)	
		Surfgrass: Yes <input type="radio"/> No	
		Eelgrass: Yes <input type="radio"/> No	
Invasives: Undaria Yes <input type="radio"/> No		Sargassum muticum Yes <input type="radio"/> No	
Caulerpa Yes <input type="radio"/> No		Sargassum horneri Yes <input type="radio"/> No	
General flora community: low red turfs, articulated & encrusting coralline algae,			
General fauna community: Spanish shawl nudibranch, Anthopleura CA spiny lobster, sculpin			
Black abalone (<i>Haliotis cracherodii</i>): Yes <input type="radio"/> No			
White abalone (<i>Haliotis sorenseni</i>): Yes <input type="radio"/> No			

Other Observations:

End transect @ 10 ft isobath; surge increase
vis decrease
