



**CITY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS
HYPERION TREATMENT PLANT
5-MILE OUTFALL INSPECTION and DIVERSION TO THE 1-MILE OUTFALL
FACT SHEET
November, 2006**

**5-MILE
OUTFALL
INSPECTION
DATE**

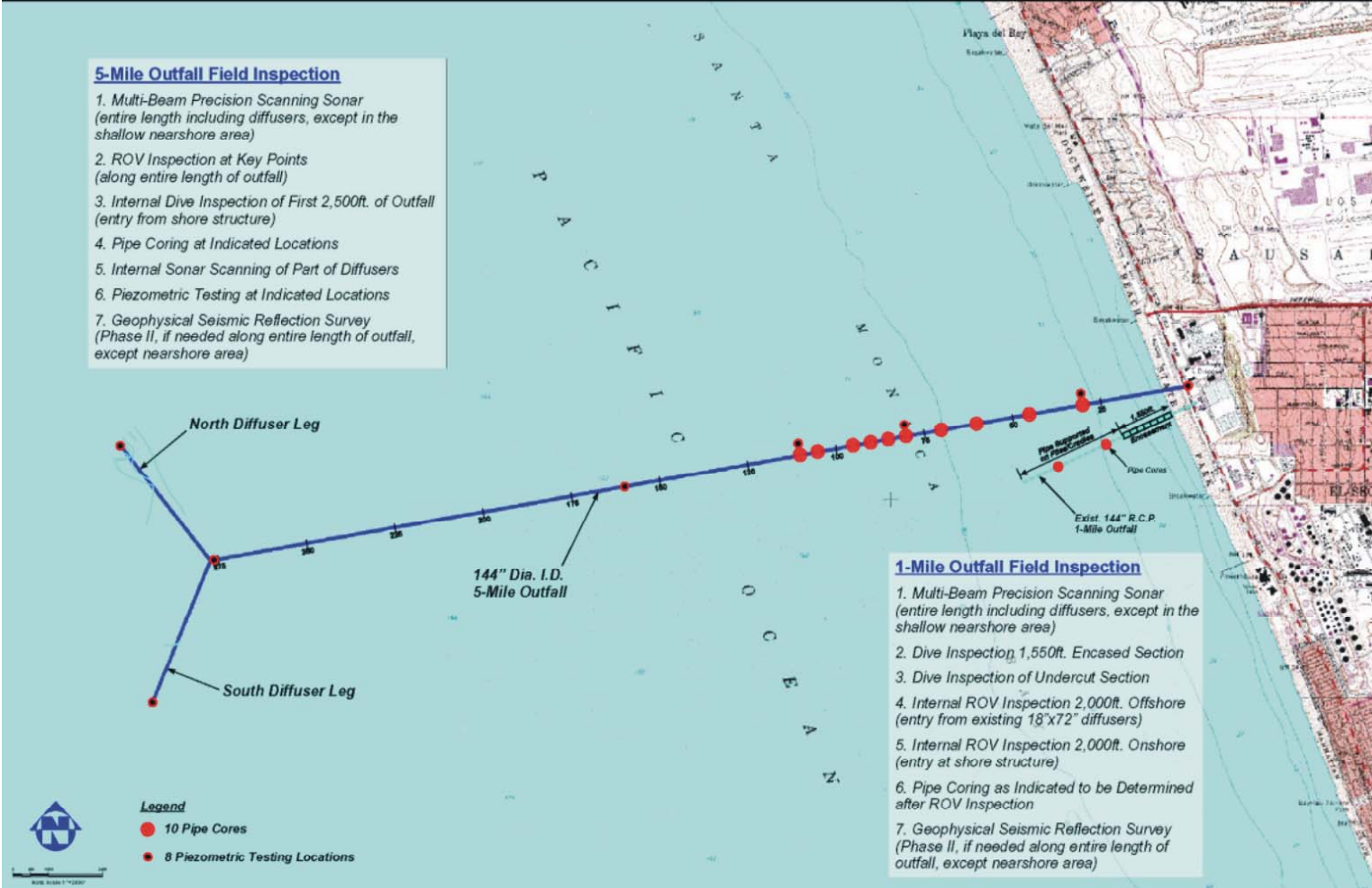
The City of Los Angeles will conduct an inspection of the interior of Hyperion Treatment Plant's 5-mile outfall. The inspection will:

- take place **Tuesday, November 28 through Thursday, November 30, 2006**
- divert Hyperion's effluent from the 5-mile outfall to the rarely-used 1-mile outfall
- send divers into the outfall to assess the structural condition of the 5-mile pipe

Field Investigations Will Provide the Data to Evaluate Remaining Outfall Life

5-Mile Outfall Field Inspection

1. Multi-Beam Precision Scanning Sonar (entire length including diffusers, except in the shallow nearshore area)
2. ROV Inspection at Key Points (along entire length of outfall)
3. Internal Dive Inspection of First 2,500ft. of Outfall (entry from shore structure)
4. Pipe Coring at Indicated Locations
5. Internal Sonar Scanning of Part of Diffusers
6. Piezometric Testing at Indicated Locations
7. Geophysical Seismic Reflection Survey (Phase II, if needed along entire length of outfall, except nearshore area)



1-Mile Outfall Field Inspection

1. Multi-Beam Precision Scanning Sonar (entire length including diffusers, except in the shallow nearshore area)
2. Dive Inspection 1,550ft. Encased Section
3. Dive Inspection of Undercut Section
4. Internal ROV Inspection 2,000ft. Offshore (entry from existing 18"x72" diffusers)
5. Internal ROV Inspection 2,000ft. Onshore (entry at shore structure)
6. Pipe Coring as Indicated to be Determined after ROV Inspection
7. Geophysical Seismic Reflection Survey (Phase II, if needed along entire length of outfall, except nearshore area)

1-MILE AND 5-MILE OUTFALL SNAPSHOT

The 1-mile outfall:

- was placed into service in 1951
- is no longer used for regular effluent discharges, but only for emergencies
- is visually inspected annually (exterior only)

The 5-mile outfall:

- was placed into service in approximately 1960
- is used to discharge secondary treated effluent on a daily basis
- is visually inspected annually (exterior only)
- has never been inspected internally in its fifty year existence

5-MILE OUTFALL INSPECTION DETAILS

The 5-mile outfall inspection includes several scientific and engineering examinations for what assures us that, after more than 50 years of use, the ocean pipeline is structurally sound, safe and reliable. The inspection will include:

- internal dive inspection, external ROV (remote operated vehicle) inspection
- field studies including pipe coring from the inside and piezometric testing
- hydraulic analysis – overall status of pipe interior, friction factor in pipe reaches, localized problems, pressure-flow relationship, structural limitations
- structural evaluation – hydraulic (internal) pressure and pressure transients, wave load (wave regime, rock armor, physical wave tank modeling, and recommended improvements)
- seafloor mapping to determine how the outfall has been affected by the seafloor and subsurface conditions
- a subsequent six-month study by the City's engineering consultants, with recommendations to follow. Please note that the study may recommend repairs or other work to the ocean pipeline to meet the highest of safety standards.

5-MILE OUTFALL DAY-BY-DAY SCHEDULE

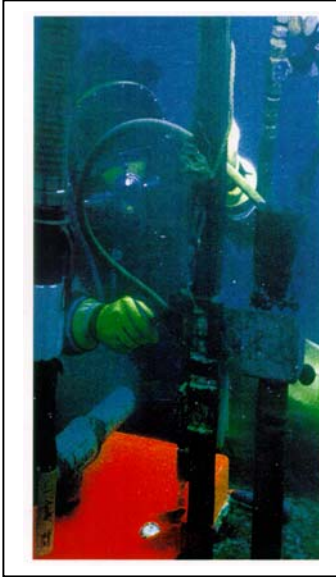
Day-by-day inspection activities, November 28-30, 2006:

- Tuesday, November 28th – effluent will be switched from the 5-mile to the 1-mile outfall at about 3:00 a.m. using large bulkheads (big heavy gates) to stop flows to the 5-mile outfall. Engineers will monitor water levels and ensure that all measures are in place.
- Wednesday, November 29th – up to three divers will enter the 5-mile outfall from the Hyperion access shaft in the morning and inspect the interior of the outfall pipe during two 12-hour shifts – one 12-hour shift on Wednesday, November 29th and one 12-hour shift on Thursday, November 30th.
- Thursday, November 30th – effluent will be returned to the 5-mile outfall at about 7:00 p.m.

5-MILE OUTFALL SAFETY

Safety measures include:

- backup breathing systems for divers
- diver tracking
- continuous hard-wire voice communications between divers and support crews
- extensive additional safety protocols



Core drilling example.



Divers will access the 5-mile outfall from this shaft located inside Hyperion.

1-MILE OUTFALL MONITORING PLAN

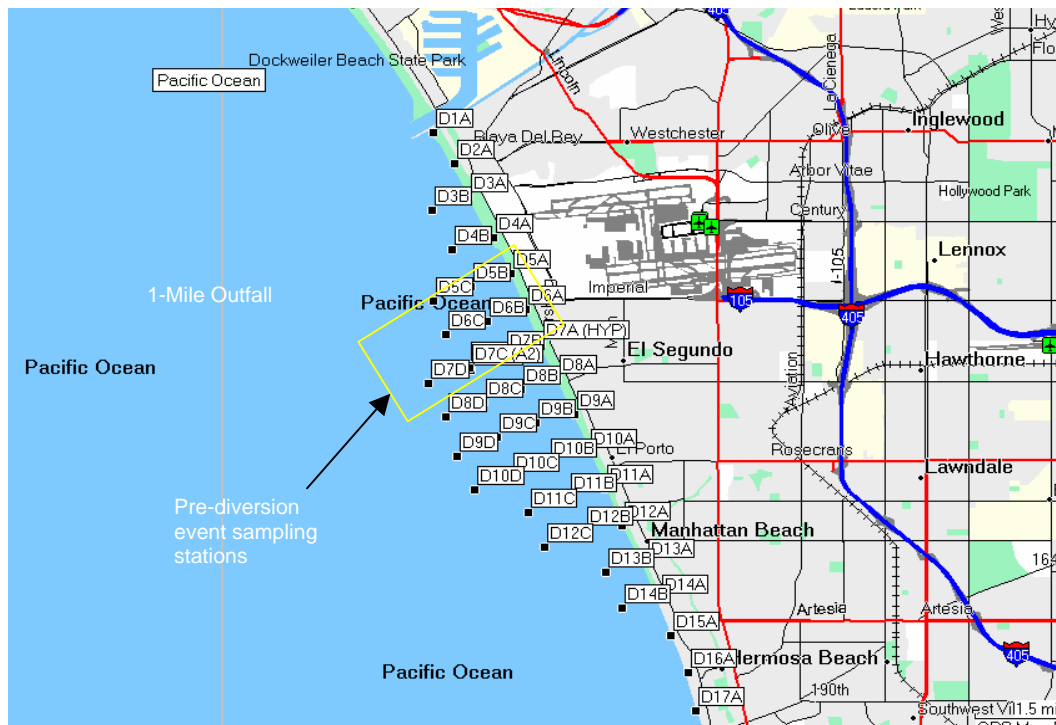
The City's Environmental Monitoring Division (EMD) has developed an extensive receiving water monitoring plan that includes:

- closing the beaches (from Ballona Creek to the Manhattan Beach Pier) in conjunction with the Department of Health Services and Heal the Bay
- compliance with all approved NPDES permit requirements (Regional Water Quality Control Board and Environmental Protection Agency)
- lab tests indicate that levels of all three indicator bacteria will most likely be below state bacterial limits
- tracking the effluent plume (tracking where effluent goes after discharge through the 1-mile outfall)
- assessing the environmental impact (immediate and over time)

More technical details of the monitoring plan include:

- effluent analyses – 1-mile effluent samples will be collected and all NPDES effluent constituents will be tested
- use of high frequency radar system by USC and the Southern California Coastal Ocean Observing System (SCCOOS) headed by the Scripps Institution of Oceanography (UCSD) to determine real-time data of local current velocity vectors
- use of drifters (basketball-sized metal spheres that will determine and provide real-time current direction and speed of both pre-diversion and diversion periods
- use of SAR (Synthetic Aperture Radar) to provide photographs of the 1-mile effluent plume from space
- extensive monitoring of indicator bacteria (shoreline and nearshore), benthic macrofauna (assess affect and recovery of benthic community from affects of discharge), and phytoplankton (bloom, harmful algae, and affect of increased nutrients)
- conductivity-temperature-depth (CTD) studies which include testing for salinity, temperature, pressure (depth), colored dissolved organic matter, chlorophyll a, transmissivity (turbidity/water clarity), pH, and dissolved oxygen in order to track the effluent plume and its movement

Because Hyperion has never inspected the inside of its 5-mile outfall pipe, this project has raised the interest of NASA/JPL who will be providing satellite imagery of the shape and dispersion of the predicted plume migration area, and USC, UCLA, Scripps and SCCWRP will be assisting the City with monitoring the effluent plume: current direction and speed, shape and dispersion of the plume, as well as any possible public health and environmental impacts.



Map of sampling stations – yellow triangle indicates stations that were sampled during the pre-diversion event survey.



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