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**STAFF REPORT:
COASTAL DEVELOPMENT PERMIT APPLICATION
& CONSISTENCY CERTIFICATION**

CDP Application No.: E-01-029

**Consistency
Certification No.:** CC-111-01

Project Applicant: Tyco Networks (US), Inc.

Location: State and federal waters offshore the City of Hermosa Beach (Exhibit 1); 3,100 feet of public rights-of-way within the cities of Hermosa Beach and Redondo Beach along 2nd Street, the Greenbelt, and North Francisca Ave. (Exhibit 2).

Project Description: Bore two conduits from an onshore location on 2nd Street in the City of Hermosa Beach to terminate at seafloor portals 2,640 feet west of mean high tide line; bury two cables, where feasible, in State and federal waters to the 1,200-meter depth; surface-lay the cables from the 1,200-meter depth to the 1,800-meter depth; and lay 3,100 feet of cable along public rights-of-way within cities of Hermosa Beach and Redondo Beach.

Substantive File Documents: Appendix B

SYNOPSIS

Tyco Networks (US), Inc. (hereinafter, "the applicant" or "Tyco") proposes to install and operate two marine fiber optic cables to land at the City of Hermosa Beach in Los Angeles County. Cable Segment 4 will land in Hawaii. Cable Segment 5 will land in Oregon.

Tyco proposes to bury each cable to a target depth of 1.0 meter (unless precluded by seafloor substrates) within State and federal waters to the 1,200-meter water depth out to the edge of the outer continental shelf (approximately 160 miles from the mean high tide line; the seaward extent of the U.S. Army Corps of Engineers ("ACOE") jurisdiction is the 1,000-fathom depth contour (1,800-meter water depth)).

The portion of the project that lies within the Coastal Commission's retained permit jurisdiction, and which is the subject of coastal development permit ("CDP") application E-01-029, is (a) boring two cable conduits under the seafloor from a site on 2nd Street in Hermosa Beach to surface approximately 2,640 seaward of the mean high tide line; (b) burial of both cables to a 1.0-meter water depth to the territorial extent of California State waters; and (c) installation of 3,100 feet of cable under Hermosa Beach and Redondo Beach city streets.

The project also requires a federal permit from the ACOE and therefore requires a consistency certification pursuant to Section 307(c)(3)(A) of the Coastal Zone Management Act. For the portion of the project that lies in State waters, the consistency certification is redundant; the CDP serves as a consistency certification. On December 26, 2001 (amended on June 26, 2002), Tyco submitted a consistency certification to the Coastal Commission certifying that the proposed activities comply with California's Coastal Management Program ("CCMP") and will be conducted in a manner consistent with the CCMP. On June 10, 2002, Tyco submitted a letter extending the period of consistency certification review until July 19, 2002. This staff report is a combined CDP and consistency certification.

Major Coastal Act issues associated with this project include potential impacts to marine resources and commercial fishing. Please see Table 1 for a summary of potential impacts, mitigation measures, and Commission staff recommended conditions of CDP approval.

The Commission staff recommends approval of CDP application E-01-029, as conditioned.

The Commission staff recommends that the Commission concur in CC-111-01.

Table 1. Major Issue Summary: Potential Impacts, Mitigation Measures and Permit Conditions

Significant Issue Area	Proposed Special Conditions and Mitigation Measures
<p>Marine Resources: Marine Mammals</p>	<p>Issue: Whales may become entangled with cables during feeding activities if cables are insufficiently buried or exposed on the seafloor. Marine mammals or sea turtles may collide with vessels and be injured or killed.</p> <p>Mitigation Measures:</p> <p>Special Condition 4 requires the applicant to post a performance bond in the amount of \$1,000,000 (\$500,000 per cable) to ensure condition compliance, particularly cable removal, after the lifetime of the cables.</p> <p>Special Condition 7 requires the cable to be buried to a depth of 1.0 meter except where precluded by seafloor substrates in state waters and in federal waters out to the 1,200-meter water depth. Where a 1.0-meter burial depth cannot be achieved, the applicant shall bury the cable to the maximum depth feasible.</p> <p>Special Condition 9 requires that within 45 days of cable installation, the applicant shall submit to the Executive Director and the signatories of the Fishing Agreement: (a) as-built plans in writing (Route Position List) and on alignment or strip charts depicting bathymetry, seafloor substrates or features, seabed profile, depth of cable burial below the seafloor, and cable tension; (b) electronic as-built plans; and (c) as-built cable plans overlaid on National Oceanic and Atmosphere Administration (“NOAA”) navigation charts. The applicant shall also submit the as-built plans, as described above, for its cable segments located in federal waters out to the 1,800-meter water depth.</p> <p>Special Condition 10 requires that within 60 days of cable installation, the applicant shall submit to the Executive Director: (a) the as-built plan and profile of the cable conduits; (b) a cable installation report containing the elements described below; and (c) an operations report describing any cable post-installation activities, including routine or non-routine post-lay surveys, repair activities, and cable inspection activities. The applicant has agreed to the same requirement for its cable located in federal waters out to the 1,800-meter water depth.</p> <p>Special Condition 13 requires that four trained marine wildlife monitors approved by the Executive Director shall be onboard the cable installation vessel (including repair and maintenance operations), the post-lay inspection vessel, and burial vessels at all times (with two monitors working during each 12-hour shift) to monitor for marine wildlife in the work area. Two trained marine wildlife monitors shall be onboard all vessels used for retrieval of entangled fishing gear, and for the inspection surveys conducted every 18 to 24 months as required by Special Condition 16. The monitors shall have the authority to order cessation of all project operations until the monitors determine there is no longer a threat and/or the animal(s) transits the area. The monitors will also be present during cablelaying in federal waters (out to the 1,800-meter water depth).</p>

Significant Issue Area	Proposed Special Conditions and Mitigation Measures
<p>Marine Resources: Marine Mammals (continued)</p>	<p>Special Condition 14 requires the applicant within 30 days of the last day of all marine operations that require marine wildlife monitors onboard a vessel(s) to submit to the Executive Director and NMFS a marine wildlife monitoring report prepared by the approved marine wildlife monitors. The report is to include (i) an evaluation of the effectiveness of monitoring protocols and (ii) reporting of marine mammal, sea turtle or other wildlife sightings.</p> <p>Special Condition 15 requires the applicant to address portions of the route where cable burial is infeasible due to seafloor substrates, by developing and implementing a cable slack and suspension minimization plan, incorporating "best available technology," so that the cable will conform as closely as technically possible to the contours of the seafloor. At least 30 days prior to cable installation, the applicant shall submit the cable slack and suspension minimization plan to the Executive Director for review and approval. "Best available technology" shall include but not be limited to the use, where appropriate, of cable slack control and ROV or diver repositioning of the cable to avoid or minimize cable suspensions. During cable surface-lay operations, the applicant shall also employ a ROV-follow vessel with real-time ROV video feed to the cable ship during cable installation to ensure that the slack-control program is effective and to identify areas of cable suspension. If the ROV video feed identifies a suspended segment of cable that can be eliminated or minimized by repositioning or introduction of additional cable slack, the applicant shall recover the cable and reinstall it using the above methods. During post-lay inspection and burial operations, the applicant shall use a ROV to reposition and/or bury to 1.0 meter any suspended or exposed cable segment, unless precluded by seafloor substrates. Tyco has agreed to implement the above measures in federal waters (out to the 1,800-meter water depth).</p> <p>Special Condition 18 requires that every 18 to 24 months for the life of the project, the applicant shall survey the cable route to verify that the cables have remained buried consistent with the as-built cable burial plan required by Special Condition 9. The applicant has agreed to implement these survey requirements in federal waters (out to the 1,800-meter water depth). If the survey shows that a segment(s) of the cable is no longer buried consistent with the as-built cable burial plan required by Special Condition 9, the applicant shall, within 30 days of survey completion, submit to the Executive Director for approval a plan to re-bury those cable segments.</p> <p>Special Condition 21 requires that within 90 days of either taking a cable out of service or after the expiration or sooner termination of the applicant's City of Hermosa Beach lease(s) or permit(s), the applicant shall apply for an amendment to this permit to remove the cable(s) from the territorial waters of the State of California. Upon approval by the Commission of the permit amendment, the applicant shall implement the cable removal project authorized by the amendment in accordance with the time schedule specified. Within the same timeframe, the applicant has agreed to apply to the U.S. Army Corps of Engineers to remove from federal waters (out to the 1,800-meter</p>

Significant Issue Area	Proposed Special Conditions and Mitigation Measures
<p>Marine Resources: Marine Mammals (continued)</p>	<p>water depth): (1) unburied cable segments located in water depths less than 1,000 meters; (2) unburied cable segments located in active fishing areas; and (3) any unburied cable segments that over the life of the cable have become exposed, and were subsequently re-buried, and are located in active fishing areas or water depths less than 1,000 meters.</p> <p>Special Condition 26 requires that in the event that fishermen snag a cable and lose or cut gear, or that any other type of entanglement occurs (<i>e.g.</i>, whale), the applicant shall use all feasible measures to retrieve the fishing gear or object. The applicant shall notify the Executive Director within 48 hours of the applicant's knowledge of gear loss or other cable entanglement. Retrieval shall occur no later than six weeks after discovering or receiving notice of the incident, unless otherwise authorized by the Executive Director. The applicant has agreed to implement these requirements in federal waters (out to the 1,800-meter water depth).</p>
<p>Marine Resources: Hard Bottom</p>	<p>Issue: Because sensitive, rare, and slow-growing epifaunal species reside on rocky substrates in the project area, disturbance to these species from cable laying, installation and repair activities can permanently destroy them. Cable-laying activities may also damage rocky substrate.</p> <p>Mitigation Measures:</p> <p>Special Condition 19 requires that within 90 days of cable installation, a video survey (displaying real-time position and water depth of the ROV) of the segments of the seafloor along the construction corridor which were identified as consisting of rocky substrate prior to or during the installation of the cable shall be completed by a qualified consultant approved by the Executive Director. The survey report shall identify the location and quantify the extent of any disturbance to hard bottom caused by project operations. The applicant has agreed that the survey will also cover federal waters out to the 1,200-meter water depth.</p> <p>Special Condition 20 requires the applicant to compensate for all project-related impacts to hard bottom habitat through payment of a compensatory hard bottom mitigation fee to be used to construct a new artificial reef or augment an existing artificial reef in State waters within the Southern California Bight. The construction of a new artificial reef, or augmentation of an existing reef, shall be carried out pursuant to a Memorandum of Agreement by and between the Coastal Commission, the California Department of Fish and Game and the United Anglers of Southern California (Exhibit 3). The amount of the hard bottom mitigation fee shall be calculated by multiplying the total square footage of impacted hard bottom by a compensation rate of \$27.31 per square foot. The total square footage of hard bottom impacted shall be calculated by multiplying the linear distance of cable laid on hard bottom by approximately twice the width of the cable (<i>i.e.</i>, four inches). The applicant has agreed that this requirement will be applied to any hard bottom impacts in federal waters to the 1,200-meter water depth.</p>
<p>Marine Resources: Water Quality</p>	<p>Issue: Vessel discharges would cause an adverse impact on water quality. Subsurface boring and installation of conduit can result in the release of bentonite, a drilling lubricant, to the marine environment. Improper terrestrial</p>

Significant Issue Area	Proposed Special Conditions and Mitigation Measures
<p>Marine Resources: Water Quality (continued)</p>	<p>construction practices could cause adverse water quality impacts in the event of a storm or flood.</p> <p>Mitigation Measures:</p> <p>Special Condition 12 prohibits the marine discharge of sewage, bilge or ballast water, or debris from vessels installing or repairing cable. The applicant has agreed to implement this requirement in federal waters out to the 1,800-meter water depth.</p> <p>Special Condition 16 requires the applicant to use water to lubricate the final three drill stems or pipes (approximately 100 feet) of the borehole. Prior to surfacing of the borehole on the seafloor, the applicant shall back-flush residual drilling fluids with water and dispose of them onshore, as described in the Drilling Fluid Release Monitoring Plan for Horizontal Directional Drilling dated June 6, 2002 ("Drilling Plan").</p> <p>Special Condition 17 requires the applicant to implement all measures identified in the Geotechnical Investigation Report prepared by Kleinfelder Inc. (dated April 26, 2002) to minimize the risk of "frac-out" and bentonite release. If offshore monitoring is not possible due to sea or weather conditions, the applicant may continue to drill through the surf zone (the area between the outermost breaker and the limit of wave uprush) according to the procedures of the Drilling Plan. The applicant shall not drill beyond the surf zone until sea conditions allow for offshore monitoring as described in Plan A of the Drilling Plan, or unless the independent monitor required by Special Condition 5, in consultation with the Executive Director, agrees that work may recommence based on a low threat of a discharge of drilling fluids.</p> <p>The applicant has prepared a Stormwater Pollution Prevention Plan to minimize water quality impacts. In addition, Special Condition 30 requires that prior to issuance of this permit, Tyco must submit to the Executive Director evidence that the Regional Water Quality Control Board has approved a new or revised 401 Certification for the project.</p>
<p>Commercial Fishing</p>	<p>Issue: Trawlers may snag their gear on project cables that are insufficiently buried or exposed and thus experience significant economic losses from abandoned gear and lost fishing time.</p> <p>Mitigation Measures: To minimize gear entanglements, the Commission is requiring Special Conditions 4, 7, 9, 15, 18, and 21, as described above under the Marine Resources issue area.</p> <p>The applicant has entered into the Southern California Cable & Fishing Agreement dated June 8, 2002 ("Fishing Agreement") with the Southern California Trawler's Association, Los Angeles Commercial Fishermen's Association, Southern California Commercial Fishing Association, and several individual fishermen not represented by an association. The Fishing Agreement requires the signatories to create a Cable Committee and a Cable Committee Liaison Officer, establishes procedures for compensation to fishermen by the applicant for preclusion impacts, gear loss, and resolution of</p>

Significant Issue Area	Proposed Special Conditions and Mitigation Measures
Commercial Fishing (continued)	<p>other potential cable-fishing conflicts.</p> <p>Special Condition 24 requires that in a manner consistent with the Fishing Agreement, the applicant shall comply with all deadlines for payment, reimbursement, and compensation of all expenses of the Cable Committee and Cable Committee representatives, as approved by the Cable Committee in its Annual Budget. The applicant shall also comply with the requirement of Section 1.1(h) of the Fishing Agreement to pay the salary of the Cable Committee Liaison Officer.</p> <p>Special Condition 25 requires that prior to issuance of this permit, the applicant shall use diligent good faith efforts to provide written notification of the Fishing Agreement to individual commercial trawlers who are not members of the Southern California Trawlers Association, the Los Angeles Commercial Fishermen's Association, or the San Pedro Purse Seine Owners Association, but are licensed by the California Department of Fish and Game to trawl in areas traversed by the cable route. The applicant shall allow trawlers 30 days, from the date of the notification, to respond prior to installing the cables.</p>
Public Access and Recreation	<p>Issue: Onshore drilling noise could impact recreation at Hermosa Beach.</p> <p>Mitigation Measure:</p> <p>Special Condition 28 prohibits onshore project construction between Memorial Day weekend and Labor Day.</p>
Air Quality	<p>Issue: Marine activities could exceed South Coast Air Quality Management District daily thresholds for NOx for five days.</p> <p>Mitigation Measure:</p> <p>Special Condition 29 requires that prior to permit issuance, the applicant shall submit to the Executive Director evidence that (a) the City of Hermosa Beach has approved Tyco's proposal to offset NOx emissions and (b) the California Air Resources Board has approved all necessary permits for portable construction equipment greater than 175 horsepower.</p>
Geology	<p>Issue: Drilling could cause a "frac-out" and drilling fluid release.</p> <p>Mitigation Measures:</p> <p>The Commission is requiring Special Conditions 16 and 17, as defined above under the Water Quality issue area.</p>

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1.0 STAFF RECOMMENDATION

1.1 Approval with Conditions

The staff recommends conditional approval of Coastal Development Permit Application No. E-01-029.

Motion:

I move that the Commission approve Coastal Development Permit Application No. E-01-029 subject to the conditions set forth in the staff recommendation dated June 27, 2002.

Staff recommends a **YES** vote on the foregoing motion. Passage of this motion will result in conditional approval of the permit and adoption of the following resolution and findings. The motion passes only by affirmative vote of a majority of the Commissioners present.

Resolution:

The Commission hereby approves coastal development permit E-01-029 and adopts the findings set forth below on grounds that the development as conditioned will be in conformity with the policies of Chapter 3 of the Coastal Act and will not prejudice the ability of the local government having jurisdiction over the area to prepare a Local Coastal Program conforming to the provisions of Chapter 3. Approval of the permit complies with the California Environmental Quality Act because either 1) feasible mitigation measures and/or alternatives have been incorporated to substantially lessen any significant adverse effects of the development on the environment, or 2) there are no further feasible mitigation measures or alternatives that would substantially lessen any significant adverse impacts of the development on the environment.

1.2 Concurrence

The staff recommends the Coastal Commission adopt the following resolution:

Motion:

I move that the Commission concur in consistency certification CC-111-01 that the project described therein is consistent with the enforceable policies of the California Coastal Management Program (CCMP).

Staff recommends a **YES** vote on the motion. Passage of this motion will result in a concurrence in the certification and adoption of the following resolution and findings. An affirmative vote of a majority of the Commissioners present is required to pass the motion.

Resolution:

The Commission hereby concurs in the consistency certification by Tyco Networks (US), Inc. on the grounds that the project described therein is consistent with the enforceable policies of the CCMP.

2.0 STANDARD CONDITIONS See Appendix A.

3.0 SPECIAL CONDITIONS

This permit is granted subject to the following special conditions:

General Conditions

1. **Scope of Project Approval.** This permit authorizes those project activities specifically described in the applicant's October 25, 2001 coastal development permit application, as amended by letters dated December 21, 2001, May 15, 2002 and June 17, 2002, and by electronic mail as indicated in Appendix B, except as otherwise modified by the conditions of this permit. Any future modifications of or additions to the project, as described in the referenced documentation, shall require an amendment to this permit.
2. **Indemnification.** In addition to any immunities provided for by law, in exercising this permit, the applicant agrees to hold harmless and indemnify the Coastal Commission, its officers, employees, agents, successors and assigns from any claims, demands, costs, expenses and liabilities for any damage to public or private properties or personal injury that may result directly or indirectly from the project.
3. **Liability for Costs and Attorneys Fees.** The applicant shall reimburse the Coastal Commission in full for all costs and attorneys fees --- including (1) those charged by the Office of the Attorney General, and (2) any court costs and attorneys fees that the Coastal Commission may be required by a court to pay --- that the Coastal Commission incurs in connection with the defense of any action brought against the Coastal Commission, its officers, employees, agents, successors and assigns challenging the approval or issuance of this permit, the interpretation and/or enforcement of permit conditions, or any other matter related to this permit.
4. **Performance Bond.** Prior to issuance of this permit, the applicant shall provide a surety bond or other security device acceptable to the Executive Director of the Coastal Commission (hereinafter "Executive Director"), for \$1,000,000 (\$500,000 per cable), and naming the Coastal Commission and the U.S Army Corps of Engineers as the assured, to guarantee the faithful observance and performance of the applicant of the terms and conditions of this permit. The surety bond or other security device shall be maintained in full force and effect at all times until both cables have been removed pursuant to Special Condition 21 of this permit.

5. **Independent Monitor.** Prior to issuance of this permit, the applicant shall hire an independent project monitor(s) approved by the Executive Director to act as project monitor and condition compliance inspector for the Coastal Commission during offshore cable installation, ocean ground bed installation and horizontal directional drilling ("HDD") project phases. The monitor, although hired by the applicant, shall work at the direction of the Executive Director and for the benefit of the Coastal Commission. The monitor(s) shall carry out a scope of work approved by the Executive Director and shall work under Tyco's standard contracting terms and conditions.
6. **Onboard Observer Plan.** At least 30 days prior to the commencement of marine cable installation operations, the applicant shall submit to the Executive Director for review and approval an Onboard Observer Monitoring Plan. The Onboard Observer Monitoring Plan shall include (a) written confirmation that the applicant and monitor (approved pursuant to Special Condition 5 of this permit) understand that the monitor, although hired by the applicant, is working at the direction of the Executive Director and for the benefit of the Coastal Commission; (b) a specific schedule of operations/events for which the monitor shall be present; (c) the format of monitoring reports (*e.g.*, daily reporting via e-mail); and (d) copies of all cable installation mitigation requirements proposed by the applicant and required by the Coastal Commission, U.S. Army Corps of Engineers and the City of Hermosa Beach.

Mitigation Measures

7. **Cable Burial Depth.** The cables shall be buried to a depth of 1.0 meter except where precluded by seafloor substrates. Where a 1.0-meter burial depth cannot be achieved, the applicant shall bury the cables to the maximum depth feasible.
8. **Notification of Exposed Cable.** During the marine cable installation phase of the project, the applicant shall submit to (a) the Executive Director, (b) the U.S. Coast Guard (for publication in a *Notice to Mariners*), and (c) the signatories of the Southern California Cable & Fishing Agreement dated June 8, 2002 and entered into between the applicant, the Southern California Trawlers Association, the Los Angeles Commercial Fishermen's Association, the Southern California Commercial Fishing Association, and individual fishermen not represented by a fishing association (hereinafter referred to as the "Fishing Agreement"), weekly notices containing preliminary as-built coordinates of any unburied or exposed sections of cable. The applicant shall also make radio broadcast announcements on the local fishers' emergency radio frequency that provide the current cable installation location and a toll-free number that can be called for additional information.
9. **As-Built Documentation.** Within 45 days of cable installation, the applicant shall submit to the Executive Director and the signatories of the Fishing Agreement: (a) as-built plans in writing (Route Position List) and on alignment or strip charts depicting bathymetry, seafloor substrates or features, seabed profile, depth of cable burial below the seafloor, and cable tension; (b) electronic as-built plans (in a format to be determined by the Cable Committee established under Sections 1.1(a) through 1.1(k) of the Fishing Agreement

(hereinafter, the "Cable Committee"); and (c) as-built cable plans overlaid on National Oceanic and Atmosphere Administration ("NOAA") navigation charts.

For purposes of Special Conditions 9-11 of this permit, the cables shall be considered installed the day after the last day of post-lay inspection burial operations. Cable locations shall be obtained by an acoustic navigation system linked to a surface differential global positioning system ("GPS"). The transponder for the acoustical navigational system shall be mounted on the equipment used for cable burial. In the event of an acoustic navigation system failure, or for cable that is surface-laid, the applicant may geometric layback calculations based on water depth and tow wire length to determine cable location. Within 45 days of completing any cable repair or maintenance work, the applicant shall submit to the Executive Director and the signatories of the Fishing Agreement updates of items "(a)-(c)" above.

10. **Cable and Conduit Installation Reports.** Within 60 days of cable installation, the applicant shall submit to the Executive Director: (a) the as-built plan and profile of the cable conduits; (b) a cable installation report containing the elements described below; and (c) an operations report describing any cable post-installation activities, including routine or non-routine post-lay surveys, repair activities, and cable inspection activities.

The cable installation report shall include, at minimum, the following: (i) a summary of pre-lay and installation operations; (ii) an as-laid position list with definitions for acronyms, time reference and locations of course alterations, repeaters and splice boxes. The information shall include: date, time, event, latitude, longitude, depth, incremental route distance, and any route deviations; (iii) a description of cable laying and burial equipment, and cable installation methods used; (iv) navigational and slack control equipment and methods; (v) identification of any areas of cable suspension greater than 1.0 meter from the seafloor; (vi) daily vessel reports and daily operations log; (vii) any additional acoustic, sub-bottom profile or other geophysical data generated that had not been previously submitted to the Executive Director; (viii) an evaluation of the consistency of cable installation with the project description and applicable special conditions of this permit; and (ix) a description of fishing activity during the pre-lay and cable installation project phases.

11. **Update NOAA Charts.** Within 60 days of cable installation and any cable segment re-route, the applicant shall submit evidence to the Executive Director that it has submitted to the National Oceanic and Atmospheric Administration ("NOAA")¹: (a) geographic coordinates of the cable as-built plans using a Differential Geographic Positioning System ("DGPS") unit or comparable navigational equipment; and (b) the applicant's point of contact and telephone number.
12. **Prohibition of Marine Discharge.** There shall be no marine discharge of sewage, bilge or ballast water, or debris from vessels installing or repairing the cable.

¹ The NOAA contact to which the information is to be submitted is currently: Ms. Lyn Preston, Chief, Nautical Data Branch, NOAA, N/CS26 Station 7350, 1315 East West Highway, Silver Spring, MD 20910. Phone: (301) 713-2737 x123.

13. **Marine Wildlife Monitors.** For purposes of Special Conditions 13-14, marine wildlife is defined as marine mammals and sea turtles. Four trained marine wildlife monitors approved by the Executive Director in consultation with the National Marine Fisheries Service ("NMFS") shall be onboard the cable installation vessel (including repair and maintenance operations), the post-lay inspection vessel, and burial vessels at all times (with two monitors working during each 12-hour shift) to monitor for marine wildlife in the work area. Two trained marine wildlife monitors approved by the Executive Director in consultation with NMFS shall be onboard all vessels used for retrieval of entangled fishing gear, and for the inspection surveys conducted every 18 to 24 months as required by Special Condition 16. During daytime observations, all monitors shall use 7 x 50 reticulated binoculars. During nighttime observations, all monitors shall use nighttime vision equipment. The applicant shall ensure that the monitors have a 360-degree view of all activities during all marine operations (*e.g.*, cable installation, post-lay inspection, burial, maintenance and repair, retrieval of entangled fishing gear, and inspection surveys).

If a marine mammal or sea turtle approaches the work area (defined as a 100-yard "safety zone"), or the monitors determine that project operations have the potential to threaten the health or safety of marine wildlife or "take" a protected species as defined by regulations implementing the federal Endangered Species Act (50 CFR § 222.102) and the Marine Mammal Protection Act (50 CFR § 216.3), the monitors shall have the authority to order cessation of all project operations until the monitors determine there is no longer a threat and/or the animal(s) transits the area. The captain shall comply with this order as soon as it is safe to do so and for as long as the order remains in effect.

If environmental conditions (*e.g.*, high sea state, fog) preclude monitors from seeing out to at least one nautical mile, the monitors shall require personnel aboard work and support vessels to maintain heightened vigilance for an approaching marine mammal or sea turtle. If environmental conditions preclude the monitors from seeing within the 100-yard safety zone, the monitors shall have the authority to order cessation of all project operations until visual conditions improve. The captain shall comply with this order as soon as it is safe to do so and for as long as the order remains in effect.

At least 10 days prior to the commencement of cable installation operations, the applicant shall provide to the approved marine wildlife monitors a document compiling all marine mammal and sea turtle mitigation measures that have been required of the applicant by the Coastal Commission, U.S. Army Corps of Engineers and the City of Hermosa Beach.

14. **Marine Wildlife Monitoring Report.** Within 30 days of the last day of all marine operations that require marine wildlife monitors onboard a vessel(s) pursuant to Special Condition 13, the applicant shall submit to the Executive Director and NMFS a marine wildlife monitoring report prepared by the approved marine wildlife monitors. The report shall include: (a) an evaluation of the effectiveness of monitoring protocols and (b) reporting of (i) marine mammal, sea turtle, and other wildlife sightings (species and numbers); (ii) any wildlife behavioral changes that may have been attributable to project operations; and (iii) any project delays or cessation of operations due to the presence in the

project area of marine wildlife species subject to protection under the terms of Special Condition 13.

15. **Avoid and Eliminate Cable Suspensions.** To address portions of the route where cable burial is infeasible due to seafloor substrates, the applicant shall develop and implement a cable slack and suspension minimization plan, incorporating "best available technology," so that the cable will conform as closely as technically possible to the contours of the seafloor. At least 30 days prior to cable installation, the applicant shall submit the cable slack and suspension minimization plan to the Executive Director for review and approval. "Best available technology" shall include but not be limited to the use, where appropriate, of cable slack control and ROV or diver repositioning of the cable to avoid or minimize cable suspensions. During cable surface-lay operations, the applicant shall also employ a ROV-follow vessel with real-time ROV video feed to the cable ship during cable installation to ensure that the slack-control program is effective and to identify areas of cable suspension. If the ROV video feed identifies a suspended segment of cable that can be eliminated or minimized by repositioning or introduction of additional cable slack, the applicant shall recover the cable and reinstall it using the above methods. During post-lay inspection and burial operations, the applicant shall use a ROV to reposition and/or bury to 1.0 meter any suspended or exposed cable segment, unless precluded by seafloor substrates.
16. **HDD Borehole Requirements.** The applicant shall use water to lubricate the final three drill stems or pipes (approximately 100 feet) of the borehole. Prior to surfacing of the borehole on the seafloor, the applicant shall back-flush residual drilling fluids with water and dispose of them onshore, as described in the Drilling Fluid Release Monitoring Plan for Horizontal Directional Drilling dated June 6, 2002 (hereinafter "Drilling Plan" in Special Conditions 16 and 17). The applicant shall use back-flushing equipment that is free of all hydrocarbons and associated contaminants (*e.g.*, gasoline, crude, toluene, BTEX, and other HC products) for any conduit flushing (*i.e.*, to back-flush the conduits prior to surfacing on the ocean floor and to flush in preparation for cable pulling). The applicant shall retrieve the drill bit after it emerges through the seafloor. If product pipe is to replace the drill stem pipe for final cable casing, it shall be free of all hydrocarbons and associated contaminants.
17. **Minimize Risk of "Frac-outs" and Bentonite Release.** The applicant shall implement all measures identified in the Geotechnical Investigation Report prepared by Kleinfelder Inc. (dated April 26, 2002) to minimize the risk of "frac-outs" and bentonite release. If offshore monitoring is not possible due to sea or weather conditions, the applicant may continue to drill through the surf zone (the area between the outermost breaker and the limit of wave uprush) according to the procedures of the Drilling Plan. The applicant shall not drill beyond the surf zone until sea conditions allow for offshore monitoring as described in Plan A of the Drilling Plan, or unless the independent monitor required by Special Condition 5, in consultation with the Executive Director, agrees that work may recommence based on a low threat of a discharge of drilling fluids.
18. **Cable Surveying and Reburial.** Every 18 to 24 months for the life of the project, the applicant shall survey the cable route to verify that the cables have remained buried

consistent with the as-built cable burial plan required by Special Condition 9. The survey shall be conducted with a remotely operated vehicle ("ROV") equipped with video and by a party approved by the Executive Director. Within 30 days of survey completion, the applicant shall submit to the Executive Director a report describing the results of the survey (including example still images) and a copy of the videotape(s) recorded during the cable survey. The videotape(s) shall include a display that identifies the date, time, position, water depth, and heading of the ROV.

If the survey shows that a segment(s) of the cable is no longer buried consistent with the as-built cable burial plan required by Special Condition 9, the applicant shall, within 30 days of survey completion, submit to the Executive Director for approval a plan to re-bury those cable segments. Upon approval of the plan by the Executive Director, the applicant shall proceed to implement the plan in accordance with the time schedule specified therein.

19. **Hard Bottom Seafloor Survey.** Within 90 days of cable installation, a video survey (displaying real-time position and water depth of the ROV) of the segments of the seafloor along the construction corridor which were identified as consisting of rocky substrate prior to or during the installation of the cable shall be completed by a qualified consultant approved by the Executive Director. At least 30 days prior to the survey, Tyco shall submit to the Executive Director for review and approval proposed survey protocols. Still-photographs of representative habitat shall be taken in any area of rocky substrate traversed by the cable. The survey shall quantify the extent of exposed rocky substrate, including type and relief along the cable corridor out to the seaward limit of the territorial waters of the State of California. The survey shall also quantify the height and length of any cable suspended at heights greater than 1.0 meter from the seafloor. Within 45 days of completing the survey, the applicant shall submit to the Executive Director a written report describing the results of the survey. The survey report shall identify the location and quantify the extent of any disturbance to hard bottom caused by project operations.
20. **Hard Bottom Mitigation Fund.** The applicant shall compensate for all project-related impacts to hard bottom habitat through payment of a compensatory hard bottom mitigation fee to be used to construct a new artificial reef or augment an existing artificial reef in State waters within the Southern California Bight. The construction of a new artificial reef, or augmentation of an existing reef, shall be carried out pursuant to a Memorandum of Agreement by and between the California Coastal Commission, the California Department of Fish and Game and the United Anglers of Southern California (Exhibit 3).

The amount of the hard bottom mitigation fee shall be calculated by multiplying the total square footage of impacted hard bottom by a compensation rate of \$27.31 per square foot. The total square footage of hard bottom impacted shall be calculated by multiplying the linear distance of cable laid on hard bottom by approximately twice the width of the cable (*i.e.*, four inches). The fee shall be paid to the United Anglers of Southern California within 30 calendar days of the results of the hard bottom survey required by Special Condition 19. The applicant shall provide evidence of this payment to the Executive Director within the same time frame.

21. **Cable Removal.** Within 90 days of either taking a cable out of service or after the expiration or sooner termination of the applicant's City of Hermosa Beach lease(s) or permit(s), the applicant shall apply for an amendment to this permit to remove the cable(s) from the territorial waters of the State of California. Upon approval by the Commission of the permit amendment, the applicant shall implement the cable removal project authorized by the amendment in accordance with the time schedule specified therein.
22. **Spill Response Contract.** Prior to commencement of offshore cable installation operations, the applicant shall submit to the Executive Director a copy of a signed contract with an oil spill response organization ("OSRO") approved by the OSPR for shoreline clean-up operations.
23. **Oil Spill Contingency Plan.** Prior to commencement of offshore cable installation operations, the applicant shall submit to the Executive Director evidence that the California Office of Oil Spill Prevention and Response ("OSPR") has approved the non-tank oil spill contingency plan ("OSCP") for the applicant's cable laying vessels, pursuant to the non-tank vessel OSCP regulations found at 14 CCR Sections 825.03 – 827.02.
24. **Compliance With Fishing Agreement Requirements.** In a manner consistent with the requirements of Sections 1.1(a) through 1.1(k) of the Fishing Agreement, the applicant shall comply with all deadlines for payment, reimbursement, and compensation of all expenses of the Cable Committee and Cable Committee representatives, as approved by the Cable Committee in its Annual Budget. The applicant shall also comply with the requirement of Section 1.1(h) of the Fishing Agreement to pay the salary of the Cable Committee Liaison Officer.
25. **Fishing Agreement Notification.** Prior to issuance of this permit, the applicant shall use diligent good faith efforts to provide written notification of the Fishing Agreement to individual commercial trawlers who are not members of the Southern California Trawlers Association, the Los Angeles Commercial Fishermen's Association, or the San Pedro Purse Seine Owners Association, but are licensed by the California Department of Fish and Game to trawl in areas traversed by the cable route. The notification, to be sent by certified mail, shall: (a) describe the proposed project (b) include a navigation chart overlaid with the exact coordinates of the proposed route, (c) contain a copy of the executed Fishing Agreement referred to in Special Condition 21, (d) explain how interested trawlers may become parties to said agreement, and (e) provide the applicant's contact information. The applicant shall allow trawlers 30 days, from the date of the notification, to respond prior to installing the cables. The applicant shall provide the Executive Director a list of trawlers contacted and those who have signed the agreement.
26. **Cable Entanglements and Gear Retrieval.** In the event that fishermen snag a cable and lose or cut gear, or that any other type of entanglement occurs (*e.g.*, whale), the applicant shall use all feasible measures to retrieve the fishing gear or object. The applicant shall notify the Executive Director within 48 hours of the applicant's knowledge of gear loss or other cable entanglement. Retrieval shall occur no later than six weeks after discovering or receiving notice of the incident, unless otherwise authorized by the Executive Director. If

full removal of gear is not feasible, the applicant shall remove as much gear as practicable to minimize harm to wildlife (e.g. fishes, birds, and marine mammals). Within two weeks of completing the recovery operation, the applicant shall submit to the Executive Director a report describing (a) the nature of and location of the entanglement (with a map) and (b) the retrieval method used for removing the entangled gear or object, or the method used for minimizing harm to wildlife if gear retrieval proves infeasible.

27. **Cable Repairs.** The applicant shall provide notice in writing to the Executive Director and in a U.S. Coast Guard *Notice to Mariners* 15 days prior to any cable repair or maintenance activity, or as soon as possible for emergency repairs.
28. **Onshore Construction Limitations.** Onshore project construction (i.e., installation of the ocean ground bed, horizontal drilling activities, and installing cable in city streets) is prohibited Memorial Day weekend (beginning the preceding Friday) through Labor Day.
29. **Air Emissions.** Prior to issuance of this permit, the applicant shall submit to the Executive Director evidence that (a) the City of Hermosa Beach has approved the applicant's proposal to offset NOx emissions and (b) the California Air Resources Board has approved all necessary permits for portable construction equipment greater than 175 horsepower.
30. **Regional Water Quality Control Board Certification.** Prior to issuance of this permit, the applicant shall submit to the Executive Director evidence that the Regional Water Quality Control Board has approved a new or revised 401 Certification for the project.

4.0 FINDINGS AND DECLARATIONS

4.1 Project Description

Tyco Networks (US) Inc. ("Tyco" or "the applicant") proposes to construct and operate two submarine fiber optic cables with a single landing at the City of Hermosa Beach in Los Angeles County (Exhibit 1). One cable (Segment 4) is transpacific with a landing in Hawaii. The second cable (Segment 5) lands in Twin Rocks, Oregon. At the Hermosa Beach landing, each cable will be brought onshore through a conduit using a horizontal directional drilling ("HDD") bore drilled from an onshore location at 2nd Street that will surface 2,640 feet (800 meters) offshore.

4.1.1 Project Schedule and Sequence of Installation Operations

ACTIVITIES	ESTIMATED DURATION
TERRESTRIAL OPERATIONS	
Conduit Installation (Cable Station to beach manhole)	3 – 4 weeks
HDD Conduit Borings	5 – 7 weeks
MARINE OPERATIONS (BEACH MANHOLE TO 1800-METER DEPTH OFFSHORE)	
Conduit Exposure and Cleaning	1 – 2 days per cable
Pre-Lay Grapnel Run	2 – 3 weeks per cable
Marine Cable Pulling and Laying	2 – 3 days per cable
Seaplow Burial Installation	3 – 4 weeks per cable
Diver Jetting Burial (conduit ends to start of plow)	2 – 3 days per cable
Post-Lay Inspection and Burial	5 – 6 weeks per cable
Note: Terrestrial and Pre-Lay Grapnel Run operations can be conducted simultaneously. Remaining marine operations are conducted in sequence by segment.	

4.1.2 Terrestrial Installation

With the exception of a 700-foot cable segment along the City of Hermosa Beach Greenbelt east of the coastal zone boundary, all onshore cable-laying activities lie within the Coastal Commission's retained permit jurisdiction, as neither the City of Hermosa Beach nor the City of Redondo Beach have a certified local coastal program ("LCP"). Within the City of Hermosa Beach, the applicant proposes to install cable conduit through public rights of way and the Greenbelt with the following route: (1) east from 2nd Street at the beach manhole and HDD bore site; and (2) south along the Greenbelt from 2nd Street to the boundary with the City of Redondo Beach at Herondo Avenue. Within the City of Redondo Beach, the cable conduit route follows the following route: (1) across Herondo Avenue; (2) south along North Francisca Avenue; and (3) south along a private drive to the cable station. The length of the terrestrial cable route within the Commission's permit jurisdiction is approximately 3,100 feet (Exhibit 2).

Conduit Installation

The onshore cable will be installed by trenching and drilling, pulling the cable from manhole to manhole. The terrestrial cable conduit consists of four 4-inch diameter PVC conduits: one

conduit each for cable Segments 4 and 5 (the conduit for Segment 4 will also contain two insulated copper conductors, one for power and one for ground), a third conduit for possible future maintenance restoration, and the fourth conduit for potential future installation of another fiber optic cable system. Each of the two conduits holding cable will house three 1.25-inch HDPE innerducts. The onshore cable will be installed either in a single trench within concrete, or within a single-bored casing. Pre-cast concrete manholes will be placed along the terrestrial route at intervals of approximately 750 to 1,500 feet between the beach manhole (on 2nd Street right of way near Beach Drive) and the cable station. The main terrestrial construction staging area will be located outside the coastal zone in an as-yet-undetermined location. The applicant also proposes to install an ocean ground bed under the beach at the cable-landing site in Hermosa Beach, approximately 100 feet west of the Strand, as a part of the direct current conducting system for the cable to complete the circuit for switching equipment. The ground bed will consist of up to seven anodes constructed of cast iron and encased in a magnesium canister 10 inches in diameter by 84 inches in length. The anodes will be installed into holes drilled in the beach down to seawater level and arrayed in a line spaced at 10-foot intervals. A copper DC current ground cable will connect the tops of the anodes to each other and will connect to the cable system at the beach manhole on 2nd Street between Beach Street and Hermosa Avenue. The ground cable will be installed from the beach manhole to the beach by a small directional drill and will be installed on the beach by trenching. Ocean ground bed installation will require five days of work on the beach.

Horizontal Directional Drilling

The applicant proposes to install two cable conduits by HDD at the 2nd Street landing site. HDD is a subsurface boring technology in which the drill head is fitted with a steering tool using magnetometers and inertial devices to track the direction of advance (horizontal and vertical) and the absolute location of the drill head. HDD equipment includes a mobile drill rig, control cab, fluid mixing and cleaning system with pump, pipe trailer, generator, and tool van. Bentonite is mixed with water and used as a drilling fluid to lubricate the bore, cool the drill, and keep the hole open by sealing the outer surface of the bore.

The HDD drill rig will drill into the ground at an angle through an excavated entry pit at the onshore drill staging area. The proposed staging area is on 2nd Street between Beach Drive and Hermosa Avenue in Hermosa Beach and is approximately 3,000 square feet (275 square meters). Due to the limited size of the 2nd Street staging area and drill site, materials and supplies will be delivered daily from the main staging area. A 12-foot tall temporary sound barrier, and sand bags will surround the drill staging area and straw bales will be used to prevent or contain spillage of drilling fluid or runoff from the enclosure.

Two cable conduit bores (one for each cable), each approximately 3,270 feet (997 meters) long, will be directionally drilled from shore beyond the surf zone at a minimum depth of 100 feet below the ocean floor, descending at an angle of 10-12 degrees. During installation, the conduit is advanced in 30-foot (9.3 meter) sections through the borehole as it is drilled. Once the bore conduits reach the desired depth, the bore levels out. After the bore reaches the 43-foot (13-meter) water-depth contour, the bore will turn upward and will surface about 2,640 feet (800 meters) feet offshore. To minimize the potential for release of bentonite drilling fluid into ocean

waters, the applicant will use water as a drilling fluid during the last 30-foot section of the borehole before the punch-out location.

The HDD operations are expected to take approximately 5 to 7 weeks, including staging site preparation, drilling, and demobilization. The City of Hermosa Beach requires that work may only be conducted Monday through Friday, between 7:00AM and 8:00PM.

4.1.3 Cable Station

The applicant proposes to install cable conduit through public rights of way to a cable station in Redondo Beach, where the landed cables will meet a customer interface. Tyco proposes to re-fit the cable station within the existing Information Technology Center, located at 811 North Catalina Avenue in Redondo Beach. Tyco's improvements and construction at this site will be permitted with a separate permit amendment to the existing CDP for the site, 5-97-004. The jurisdictional boundary between this permit and the permit amendment for the cable station is where the cable route leaves the public right of way on North Francisca Avenue in Redondo Beach and enters private property (See Exhibit 2).

4.1.4 Offshore Fiber Optic Cable Installation Procedures

Offshore cable installation consists of the following phases: (1) conduit exposure and cleaning; (2) pre-lay grapnel runs, in which the cable route is cleared of debris; (3) cable burying; (4) cable laying on rocky or other substrate; and (5) post-lay cable burial using a remotely-operated vehicle ("ROV").

The marine portion of the proposed cable route extends seaward from the mean high tide line to a water depth of approximately 1800 meters (approximately 6000 feet), which corresponds to the point where the U.S. Army Corps of Engineers, Los Angeles District has asserted jurisdiction over this and other fiber optic cable projects landing in California. The marine route crosses Santa Monica Bay and several offshore basins, ridges, and escarpments located on the California borderland before reaching the edge of the continental shelf. Tyco proposes to maintain a minimum distance between the north cable route (Segment 5) and the south cable route (Segment 4) of one times the water depth or 100 meters, whichever is greater, with the exception of the nearshore approach into the 2nd Street landing site. From a point three nautical miles offshore, the cables diverge, with Segment 5 going northward toward Oregon (see Exhibit 1). At depths greater than 1200 meters, Tyco proposes to lay the cables directly on the surface of the seafloor.

The applicant states that approximately 27% of Segment 4 out to the 1,800-meter depth will be buried to the target depth of 1 meter, and approximately 20% of Segment 5 out to the 1,800 meter depth will be buried to the target depth of 1 meter. Burial is likely to be less than 1 meter for 15% of Segment 4 out to the 1,800 meter depth, and less than 1 meter burial depth for 33% of Segment 5 out to the 1,800-meter depth. Burial will be difficult or infeasible for 20% of Segment 4 out to the 1,800-meter depth, and for 13% of Segment 5 due to presence of hard bottom or steep slopes. Given that Tyco proposes to attempt to bury only to the 1,200-meter depth, 38% of Segment 4 and 34% of Segment 5 out to the 1,800 meter depth will be surface laid. (See Table 4 in Section 4.5.8 for additional detail.)

Two types of cable are proposed for marine installation in order to provide appropriate protection of the cable from environmental conditions and potential interaction with fishing gear: "double-armored" and "light-wire armored." Both designs surround a core of optical fibers with rings of wires, copper sheathing, and polyethylene insulation, and both types of cable are less than two inches in diameter. Double-armored cables provide the greatest degree of protection, and will be used in areas of rocky or coarse substrate and where protection of fishing gear may be warranted. The double-armored cable has two layers of galvanized wires coated with tar to reduce corrosion, two layers of polypropylene sheathing, and outer layer of tar-soaked nylon yarn. Light-wire-armored cable has only a single polypropylene sheath and ring of galvanized wires. The light-wire-armored cable is used where the risk of damage due to substrate conditions or fishing is reduced because the cable is buried in soft-bottom sediments by seaplow or ROV. Individual lengths of cable will be spliced together on the main cable-laying vessel.

Cables will also have amplification equipment, or "repeaters," attached approximately every 35 miles; the amplifiers use 48 volts of direct current electricity, which generates a magnetic field of 5 milligauss at one meter away from the cable, and is approximately 0.5 milligauss when 10 meters away from the cable.

Equipment to be used for the marine installation includes the cable-laying vessel, seaplow, three smaller workboats, dive team, hand-jetting tools, and buoys. A dive boat and divers will also be used within waters roughly 3300 feet from shore during horizontal directional drilling to monitor for rhodamine fluorescent dye which would indicate a possible bentonite release or "frac-out."

Conduit Exposure and Cleaning

At the "punch-out" location offshore, the conduit ends will be secured by divers, who will also retrieve drill heads, excavate around the conduit exit point, and install one-way check valves at the pipe ends. Once the main cable-laying vessel arrives and is stationed at the punch-out location, cable can be pulled through conduits. Prior to installation or pulling of the cables, the conduit portals will be exposed with a jetting tool. Approximately one to two cubic yards of sediments will be jetted to expose the conduit ends. Once the conduit ends are exposed, the divers will float the cable to the exit point and thread the cable into the conduit by attaching it to a rope. A winch onshore will pull the cable through the conduit to the manhole. During this operation, the cable ship will establish a position approximately 500-1000 feet seaward of the conduit exit points. This operation is expected to take between one and two days per landing.

A dive support vessel will be anchored during cable pulling through HDD conduits and jet-burial of cable between the end of the HDD conduits and where seaplow burial begins, a distance of 60-140 feet in length. Anchoring will occur over the HDD bore punch-out location, using a three-point mooring system with anchors as large as 2000 pounds in soft bottom substrate. The process will be repeated for the second cable segment installation. The area disturbed by the anchors will be approximately 2 meters square per anchor, per cable, for a total of approximately 12 meters square.

Pre-Lay Grapnel Run

In order to clear the two cable routes of obstacles previously undetected by sidescan sonar (e.g., discarded trawl gear) that a cable plow or ROV may encounter, a grapnel (an anchor-like hook) will be pulled along the cable route immediately prior to cable installation. The grapnel will be towed by a support vessel at a speed of approximately 1 mile per hour, causing an area of disturbance approximately 1.3 feet (0.4 meters) deep by eight inches wide. If the grapnel hooks debris, the towing will cease and the grapnel and associated debris will be retrieved and stowed on the vessel for proper disposal onshore. Grapnel operations will not take place over rocky substrates.

Cable Pulling and Laying

Cable installation will commence by threading the cables through the conduit portals to the onshore beach manhole. The cable ship will be positioned 100 meters seaward of the conduit portal as the landward end of the cable is floated towards the conduit portal. The ship will be equipped with dynamic positioning, and will therefore not require anchoring near the conduit portal. Divers will attach the cables to a wire pull rope previously installed into the conduit and into the beach manhole onshore, where they will be spliced to onshore cables. This operation is expected to last a total of two to three days.

Cable Burial by Seaplow

The start of seaplow burial will be at roughly the 15-meter water depth contour. The cable will be buried using a seaplow when substrate allows, to a 1.0-meter depth. The seaplow, which will be towed by the cable-laying vessel, uses a 12-inch wide (0.3 meter) modified hollow-share blade that penetrates the seabed and installs cable. Sediments then settle back over the cable. The seaplow has raised skids that allow the blade to dig into the seabed to the desired burial depth. Although the blade is the only portion of the seaplow that penetrates the sediments, the temporary disturbance area is 20 feet (6.1 meters) wide, encompassing the full width of the seaplow. Cable tension will be measured aboard the vessel and at the seaplow. The seaplow will be equipped with lights and a video camera, and the cable's location will be recorded as the cable is installed.

Cable Burial by Hand Jetting

From the conduit exit point to the location of the cable vessel (100 meters seaward of the conduit exit), divers will bury the cable with hand jets, consisting of pressurized water emitted from a nozzle. The jets use seawater under pressure to displace seafloor sediments creating a narrow trench beneath the cable. The cable will then drop into the trench. The disturbed sediments will naturally settle and fill in the excavation to the original grade.

Cable Burial with ROV/Post-Lay Burial

Where successful burial in soft sediments has not been achieved, an ROV will be used to bury or re-bury those cable segments to a target depth of 1 meter. A real-time video recorder installed on

the seaplow will allow the applicant to monitor burial operations and note segments that need to be re-buried. The sections of cable that require burial by ROV will be laid temporarily on the ocean floor by the cable ship and await post-lay burial attempt between one day and three weeks from when the cable was laid. The ROV is a robotic device operated remotely from and tethered to a vessel. ROV jetting tools will loosen and liquefy seafloor sediments beneath the cable and allow the cable to settle to the desired depth. The ROV will also be equipped with a depressor, which is shaped like an arm at the rear of the ROV and presses the cable into the trench of liquefied sediment. Up to three passes by the ROV may be required to achieve target burial depths, depending on sediment stiffness. The disturbed sediments will then settle back over the area to their original grade and leave the cable buried. The cable is usually left at a depth of 3-4 feet (1-1.2 meters) with this method.

Cable Surface Laying

For those areas determined by the sea route survey to be unsuitable for burial (e.g., rocky substrates or steep slopes), the cable will be laid on the surface of the seafloor. When such areas are encountered, the plow is lifted above the surface while the cable continues to be fed through the rear frame of the plow. A computerized deployment system measures cable tension aboard the cable-laying vessel and at the seaplow to continuously monitor slack as compared to water depth. Within State waters, there are no areas expected to be surface-laid. In all waters less than 1,200 meters in depth, burial will be difficult or infeasible along 32% of Segment 4 and 20% of Segment 5 (see Table 4 in Section 4.5.8 for more detail).

Tyco also proposes to surface-lay the cables directly on the seafloor in areas with water depths greater than 1,200 meters (3,960 feet), which constitutes 99.3 km (53.6 nautical miles) length for Segment 4's route, and 91.7 km (49.5 nautical miles) for Segment 5's route. Light-wire-armored cable will be laid directly on the seafloor, with slack continuously applied at various rates throughout the installation to ensure that the cable can conform to the contour of the seabed.

4.1.5 Cable Maintenance and Repair

The proposed project also includes repair and maintenance of any damaged cable. Tyco does not anticipate that any cable maintenance and repair will be required over the life of the cables (25 years) since they are designed to operate maintenance-free. However, a cable could be damaged by saltwater intrusion, or anchors or fishing gear could snag the cable and cause a "fault" – a point at which data transmission is interrupted. If a cable is damaged or a fault occurs, that cable segment would be lifted from the seafloor for repair using a standard "flatfish" grapnel rigged to penetrate the seafloor and recover cable from burial depths up to 20 inches. If the cable is buried deeper than 20 inches, Tyco will use a de-trenching grapnel, divers, or an ROV. The cable would then be repaired and reburied in its original position, as feasible.

4.1.6 Cable Removal or Abandonment

Tyco estimates the operational life of the cable to be about 25 years. Tyco proposes that within 90 days of either taking the cable out of service or the expiration of the City lease, to advise the Coastal Commission of the cable's status and apply to abandon-in-place or remove the cable in

State waters. Beyond 3 nautical miles offshore (State waters), Tyco proposes to abandon the cable in place. Removal operations are not proposed in this application.

4.2 Prior Fiber Optic Cable Projects Approved by Coastal Commission

The Coastal Commission has approved the following fiber optic cable projects:

- In January 1992, the Coastal Commission approved the installation, operation, and maintenance of one cable, HAW-5, and four conduits (#4-91-61) offshore of Montana de Oro State Park.
- In September 1994, the Coastal Commission approved two additional cables, TPC5-T1 and TPC5-G (#4-91-61-A1) offshore of Montana de Oro State Park.
- In April 2000, the Coastal Commission approved the installation of two fiber optic cables and five offshore conduits by MFS Globenet and MCI WorldCom (E-99-011) at Montana de Oro State Park.
- In May and June 2000, the Coastal Commission approved the installation of two fiber optic cables by AT&T (E-98-029) off of Montana de Oro State Park.
- In June 2000, the Coastal Commission approved the installation of three fiber optic cables and three conduits by PC Landing Corporation and PAC Landing Corporation at Grove Beach (E-98-27).
- In September 2000, the Coastal Commission approved the installation of one fiber optic cable and five conduits at Manchester State Beach, and one cable off of Montana de Oro State Park by AT&T Corporation (E-00-004).
- In December 2000, the Coastal Commission approved the installation of a festoon fiber optic cable along the California coastline landing onshore at four locations (Morro Bay, Leadbetter Beach in Santa Barbara, Manhattan Beach, and Mission Beach in San Diego) by Global West Network, Inc. (E-00-008)

Through its federal consistency authority, the Coastal Commission has also concurred with consistency certifications, consistency determinations, and negative determinations for a number of submarine fiber optic cable-related projects by, for example, the Navy, Coast Guard, Federal Aviation Administration, MCI WorldCom, AT&T, and Global West.

4.3 The Coastal Commission's Permit and Federal Consistency Jurisdiction

The Coastal Commission retains coastal permit jurisdiction over project areas on public trust lands, tidelands, and submerged lands from the mean high tide line to three nautical miles offshore. Therefore, that portion of the project that involves cable-laying within State waters (*i.e.*, seaward of the mean high tide line to three nautical miles offshore) requires issuance of a permit from the Coastal Commission and is the subject of coastal development permit application E-01-029.

Portions of the proposed onshore route in the City of Hermosa Beach and the City of Redondo Beach also lie within the Coastal Commission's retained coastal permit jurisdiction. With the exception of a 700-foot cable segment in the City of Hermosa Beach's Greenbelt (east of the coastal zone boundary), all onshore cable-laying activities lie within the Coastal Commission's

retained coastal permit jurisdiction, as neither the City of Hermosa Beach nor the City of Redondo Beach at this time have a certified local coastal program ("LCP").

The offshore component of the project also requires a federal permit from the United States Army Corps of Engineers ("Corps") and therefore requires a consistency certification pursuant to Section 307(c)(3)(A) of the Coastal Zone Management Act. For the portion of the project that lies in State waters, the consistency certification is redundant; the coastal development permit serves as a consistency certification. For the portion of the project that lies outside the coastal zone in federal waters out to the 1,000 fathom water depth (1,800 meters), the applicant has submitted a consistency certification CC-111-02 to the Coastal Commission. The applicant has certified that the proposed activity complies with California's approved coastal management program ("CCMP") and will be conducted in a manner consistent with the CCMP. This staff report is a combined coastal development permit and consistency certification.

4.4 Related Approvals

4.4.1 City of Hermosa Beach

The City of Hermosa Beach was legislatively granted the submerged lands offshore of Hermosa Beach pursuant to Chapter 479, Statutes of 1919. These lands were transferred in trust to the City by the Legislature to be used for certain limited purposes including navigation, commerce and fisheries. Additionally, because these lands were granted in trust, any revenues generated on or from these granted lands must be expended for the purpose of promoting or improving these lands. The City of Hermosa Beach therefore acted as lead agency under the California Environmental Quality Act ("CEQA") and as the lessor for the project both onshore and offshore for submerged lands to the limit of State waters.

On December 18, 2001, the City of Hermosa Beach (1) certified a Final Environmental Impact Report (hereinafter "EIR") (SCH No. 2001 061111); and (2) approved a Precise Development Plan/Planned Development Permit ("PDP") No. 01-10 and a "Fiber Optic Cable Easement and Associated Construction Easement," which serves as a lease for the proposed project. The approved project is for cable installation by trenching of two cables landing at 2nd Street.

However, on June 11, 2002, the City of Hermosa Beach approved an amendment to PDP No. 01-10 to allow for the landing of cable through the use of horizontal drilling technology ("HDD") at the 2nd Street landing site instead of trenching the beach.

4.4.2 Regional Water Quality Control Board ("RWQCB")

The Regional Water Quality Control Board ("RWQCB") for the Los Angeles region regulates waste discharges into receiving waters in the project area. On March 1, 2002, the Regional Water Quality Control Board for the Los Angeles region issued Section 401 Water Quality Conditional Certification No. 01-125 ("Certification"). The Certification notes the Best Management Practices and other safety measures proposed to be implemented by Tyco, including implementation of a Shipboard Oil Pollution Emergency Plan, critical operations and curtailment plan, and Spill Prevention and Contingency Plan; presence of oil spill response

equipment onboard work vessels; monitoring and tracking of all debris that falls into water from work vessels; and measures to prevent leakage from construction equipment and during refueling.

In addition, Certification No. 01-125 imposed the following conditions:

- Fueling, lubrication, maintenance, operation, and storage of vehicles and equipment shall not result in a discharge or a threatened discharge to waters of the state. At no time shall the Applicant use any vehicle or equipment that leaks any substance that may impact water quality. Staging and storage areas for vehicles and equipment shall be located outside of waters of the state.
- No construction material, spoils, debris or any other substances associated with this project that may adversely impact water quality standards, shall be located in a manner that may result in a discharge or a threatened discharge to waters of the state.
- The applicant shall place appropriate signs at the project site informing the public of construction activities and approximate duration of the project for a minimum of thirty days prior to project commencement through the duration of construction activities.
- The applicant shall enclose all feasible areas of construction with appropriate safety fencing.
- The applicant shall provide compensatory mitigation to offset any loss of sensitive habitat that is discovered during the construction process or in the post-construction surveys.

Tyco submitted a revised project description with installation by HDD to the RWQCB on April 29, 2002. The RWQCB is currently reviewing the submittal in order to determine whether a new or revised 401 Certification will be issued.

4.4.3 U.S. Army Corps of Engineers (“Corps”)

The U.S. Army Corps of Engineers (“Corps”) has regulatory authority over the proposed project under Section 10 of the Rivers and Harbors Act of 1899 (*33 U.S.C. 1344*), Section 404 of the Clean Water Act, and Section 4(f) of the Outer Continental Shelf Lands Act (“OCSLA”), as amended. Section 10 of the Rivers and Harbors Act regulates the diking, filling and placement of structures in navigable waterways. Section 404 of the Clean Water Act regulates fill or discharge of materials into waters and ocean waters. Section 4(f) of the OCSLA requires a permit for the construction of artificial islands, installations, and other devices on the seabed to the seaward limit of the outer continental shelf. According to the Corps, cable laying on the seafloor beyond the three-mile State limit is considered an “installation” and “other device” on the seabed.

The Corps proposes to issue Nationwide Permit 12 for discharges of dredged or fill material associated with excavation, backfill or bedding for utility lines (Corps’ Project No. 2002-00086-JLB). The Corps has determined that the proposed project is not likely to adversely affect federal listed species (*e.g.*, marine mammals) or their designated critical habitats, including Essential Fish Habitat. As required by the federal Endangered Species Act, the Corps consulted with the U.S. Fish and Wildlife Service and National Marine Fisheries Service. Both agencies concurred in the Corps’ determination.

Pursuant to Section 307(c)(3)(A) of the Coastal Zone Management Act, any applicant for a required federal permit to conduct an activity affecting any land or water use or natural resource in the coastal zone must obtain the Coastal Commission's concurrence in a certification to the permitting agency that the project will be conducted consistent with California's approved coastal management program.

4.4.4 South Coast Air Quality Management District and California Air Resources Board

The South Coast Air Quality Management District ("SCAQMD") is responsible for implementing federal and State air quality rules and regulations in the project area. SCAQMD will not require a permit for the proposed project. However, because project operations onshore and within State waters will exceed SCAQMD daily threshold limitations for NO_x emissions, the City of Hermosa Beach, through its "lead agency" status under the California Environmental Quality Act, is requiring Tyco to acquire emission offset credits for exceeding of the NO_x emission threshold. In addition, the California Air Resources Board will require permits from its Portable Equipment Registration Program for all portable construction equipment with an engine greater than 175 horsepower that is used on marine vessels for the proposed project. See Section 4.5.7 of this report for more information on air quality impacts.

4.5 Coastal Act Issues

4.5.1 Dredging and Placement of Fill in Coastal Waters

Coastal Act §30233 (a) states in part:

The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:

- (1) *New or expanded port, energy, and coastal-dependent industrial facilities, including commercial fishing facilities.*
- (2) *Maintaining existing, or restoring previously dredged depths on existing navigational channels, turning basins, vessel berthing and mooring areas, and boat launching ramps.*
- (3) *In wetland areas only, entrance channels for new or expanded boating facilities; and in a degraded wetland, identified by the Department of Fish and Game pursuant to subdivision (b) of Section 30411, for boating facilities if, in conjunction with such boating facilities, a substantial portion of the degraded wetland is restored and maintained as a biologically productive wetland. The size of the wetland area used for boating facilities, including berthing space, turning basins, necessary navigation channels, and any necessary support service facilities, shall not exceed 25 percent of the degraded wetland.*

- (4) *In open coastal waters, other than wetlands, including streams, estuaries, and lakes, new or expanded boating facilities and the placement of structural pilings for public recreational piers that provide public access and recreational opportunities.*
- (5) *Incidental public service purposes, including but not limited to, burying cables and pipes or inspection of piers and maintenance of existing intake and outfall lines.*
- (6) *Mineral extraction, including sand for restoring beaches, except in environmentally sensitive areas.*
- (7) *Restoration purposes.*
- (8) *Nature study, aquaculture, or similar resource dependent activities.*

Coastal Act § 30108.2 defines “fill” as “earth or any other substance or material ... placed in a submerged area.” The fiber optic cables that will be placed on the seafloor constitute fill under this definition. The pre-lay grapnel run will create an approximate 8-inch wide, 1.3-foot deep swath of disturbance. Burying a cable will entail plowing a 12-inch wide by 3 feet (1 meter) deep swath from a location about 2,640 feet (800 meters) west of the mean high line out to the 1,200-meter water depth. Additionally, the cable plow disturbance area is 20 feet wide (6.1 meters), the width of the seaplow. All of these activities collectively constitute a form of “dredging” for purposes of section 30233.

Coastal Act §30233(a) authorizes a project that includes dredging and/or fill of open coastal waters only if it meets three tests. The first test requires the proposed activity to fit into one of eight categories of uses enumerated in Coastal Act §30233(a)(1)-(8). The second test requires that there be no feasible less environmentally damaging alternative. The third and last test mandates that feasible mitigation measures be provided to minimize the project’s adverse environmental effects.

(1) Allowable Use Test

Coastal-Dependency

The proposed project consists of two cables, Segment 4 landing in Hawaii and Segment 5 landing in Oregon. Segment 4 landing in Hawaii is a transoceanic cable that is coastal-dependent as defined in Section 30101 because it requires “a site on, or adjacent to, the sea to be able to function at all.” The Commission thus finds that the Segment 4 portion of the proposed project meets the allowable use test of Coastal Act §30233(a).

However, Segment 5 could be placed on land that is not “on or adjacent to the sea” and is therefore not coastal-dependent. The EIR identifies a land-based route for Segment 5 along Interstate Highway 5 and other roadways as an alternative to the proposed project. Although a land-based system is not Tyco’s preference, it is feasible to locate the cable on land. Thus, the Commission finds that the proposed project’s Segment 5 does not qualify as a coastal-dependent industrial facility for purposes of section 30233(a)(1).

Incidental Public Service Purposes

Coastal Act §30233(a)(5) allows filling of open coastal waters for "Incidental public service purposes, including but not limited to, burying cables and pipes or inspection of piers and maintenance of existing intake and outfall lines." The two tests that must be met to qualify under this subsection include: (1) the use must be for incidental purposes including the burying of cables and; (2) the use must offer a public service.

Tyco proposes to bury the Segment 5 cable to a target depth of 1.0 meter out to the 1200-meter water depth, except where precluded by hard substrate or steep slopes. As expressly defined by Coastal Act §30233(a)(5), the burying of cable can be considered an "incidental public service." In addition, Segment 5 is one of a total of five cable segments (including Segment 4) that are intended by Tyco to create a trans-Pacific "ring" telecommunications system between Japan, Guam, Hawaii, California, and Oregon. Since Segment 5 is an essential part of this larger, trans-Pacific network, Segment 5 is "incidental" and necessary to the function of Tyco's telecommunications network.

According to Tyco, Segment 5 will provide a public service because the public will be able to buy telecommunications services at fair rates through common carriers that have capacity on the Tyco network. Tyco states that it plans to market its services to all telecommunications carriers without regard to common or non-common carrier status, including Internet Service Providers, application service providers, and private enterprises.

In a decision regarding a previous fiber optic cable project (E-00-008/CC-110-00), the Commission found that the issuance of a Certificate of Public Convenience and Necessity ("CPCN") by the California Public Utilities Commission ("CPUC") to a particular company was an adequate finding by the State that the public will benefit by permitting that company to offer telecommunications services to the public. The CPUC declined to grant Tyco a CPCN on the basis of a finding that Tyco would not be carrying intrastate traffic.

In another past fiber optic cable project (E-00-004/CC-078-00), the Commission found that at least partial ownership of the proposed cable segment by a common carrier also ensured a service to the public. Tyco is not at least partially owned by a common carrier. Nevertheless, in practical terms, a member of the public can make use of the project's telecommunication services by buying such services from a common carrier that either owns or leases capacity on Tyco's network. After buying services from any one of the potential common carrier customers (e.g., Pacific Bell/SBC, Quest, Nextlink, TCG, Level 3, etc.), a particular telephone call originated by a member of the public would be carried by their common carrier using its respective allocated capacity on the project's network.

The Federal Communications Commission ("FCC") also granted landing license DA 00-2762 to Tyco with a "non-common carrier" status, based on the determination that the granting of the license serves the public to no less a degree than would be served by granting a license to a "common carrier" applicant, given the existence of adequate market competition to provide fair pricing of telecommunications services to the public. Tyco states that it will offer

telecommunications services described in FCC license DA 00-2762 to any entity, regardless of carrier status. In addition, FCC license DA 00-2762 states "Tyco will provide bulk capacity to particular users, including common carriers, carrier consortia, and other third parties who require significant amounts of capacity." The FCC's determination that the proposed project is not anti-competitive in nature provides a clear indication that the proposed project provides a public service to the same extent as would have resulted from issuance of the license to an entity with a common carrier status.

The Commission thus finds that Segment 5 of the proposed project will provide a public service and therefore, meets the "incidental public service" test. The Commission thus finds that proposed Segment 5 is an allowable use under Coastal Act §30233(a)(5). Therefore, both Segments 4 and 5 meet the first test under Coastal Act §30233(a).

(2) *No Feasible Less Environmentally Damaging Alternative*

After qualifying as an allowable use under §30233(a), the Commission must find that there is no (a) feasible and, (b) less environmentally damaging alternative to the proposed project. Coastal Act §30108 defines "feasible" as "...capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social and technological factors." In order to find that there is no less environmentally damaging alternative to the proposed project, it is necessary to investigate the three types of alternatives: (a) alternatives to the proposed landing sites; (b) land-based alternatives to the offshore route; (c) alternative offshore routes; and (d) installation method. The Segment 4 and 5 routes, as proposed, appear to be the least environmentally damaging alternatives for cable alignment due to greater potential impacts elsewhere to hard bottom habitat, onshore environmentally sensitive habitat areas, water quality, and commercial fishing operations.

It is important to note that during the course of Coastal Commission staff's review of the proposed project, Tyco has twice changed its project description to less environmentally damaging project alternatives. Tyco's original project proposal was for two landing sites at the City of Hermosa Beach, with installation in the nearshore and intertidal area by trenching instead of horizontal directional drilling ("HDD"). Subsequently, Tyco changed its project description to one landing instead of two, and to installation with HDD instead of trenching. Both of these project description changes reduced the potential or expected impacts to public access, recreation, marine resources, and water quality.

(a) *Alternative Landing Sites*

The EIR examines alternative landing sites at Redondo Beach, Manhattan Beach, Morro Bay, and El Segundo.

Redondo Beach

The EIR examines the alternative of a single landing at Redondo Beach (as opposed to the originally proposed two landing project at Redondo Beach) and concludes that a single landing would decrease impacts to public access and parking, noise, nearshore water quality, and marine

habitat. The single landing at 2nd Street in Redondo Beach was therefore the less environmentally damaging alternative. However, the EIR concludes that the single landing would not meet the project objectives, accepting Tyco's argument that two landings and the subsequent distance between the two cable landings were necessary to maintain a secure trans-Pacific cable "ring" system. However, given that Tyco subsequently proposed to change its project description to a single landing, Tyco clearly found that a single landing could still meet the project objectives, while reducing impacts.

Manhattan Beach

The EIR evaluates the alternative of two landings at Manhattan Beach, with an alternative corresponding marine route for Segment 5. Tyco states that this alternative is infeasible because the alternative marine route for Segment 5 to Oregon could conflict with utility infrastructure and pipelines, and could cross through offshore areas proposed to be included a potential future expansion of the Channel Islands National Marine Sanctuary. Tyco also asserts that the alternative landing site at Manhattan Beach and Segment 5 marine route identified in the EIR is infeasible due to the City of Manhattan Beach's lack of interest in an additional fiber optic cable landing project (a recent fiber optic cable project by Global West landed in Manhattan Beach).

Morro Bay

The EIR also examines an alternative cable landing site at Morro Bay, given that there is a de facto submarine cable corridor in Morro Bay. However, because a Morro Bay landing would fail to meet the project objective of providing the Los Angeles Basin with additional fiber-optic cable capacity, the this alternative was eliminated from consideration.

El Segundo

The EIR assesses an alternative landing site at Dockweiler State Beach at El Segundo. This site's location near Los Angeles International Airport constitutes a more compatible land use than the proposed site, but this alternative was eliminated as infeasible because the City of Los Angeles indicated that it would not allow a cable landing at El Segundo. The EIR also found that the proximity of pipelines, anchorages, and outfalls at this site would compromise the marine routes and cause significant terrestrial impacts.

(b) Land-based Alternatives to the Offshore Route

For Segment 4 to Hawaii, clearly no terrestrial routes are feasible since proposed Segment 4 extends westward across the Pacific Ocean to Hawaii. However, Segment 5 to Oregon could feasibly be constructed in a terrestrial route.

Terrestrial Route with Existing Cable Conduits

The EIR analyzes a terrestrial route using existing cable conduit between Los Angeles and Oregon, for Segment 5's route north to Oregon, through leasing of segments of existing terrestrial fiber optic cables. The EIR determined that this alternative is infeasible because it

would not meet project objectives, as Tyco would not have proprietary rights to the cable, and would not have complete control over its use.

Terrestrial Route Construction

The EIR also analyzes a land-based alternative in which Tyco would construct its own terrestrial cable route for Segment 5 to Oregon, and Tyco acknowledged that the land-based alternative is feasible. A terrestrial route would eliminate the fishing impacts and potential marine mammal impacts associated with a submarine cable route. However, the EIR notes that terrestrial cables fail as much as 10 to 100 times more frequently than submarine cables, so that a terrestrial route would require multiple redundant terrestrial cable routes in order to be technically equivalent in quality to a submarine cable route.

A terrestrial cable route would follow Interstate Highway 5 from the Oregon border through California to its intersection with Highway 405 north of Los Angeles, and then proceed south to Artesia Avenue in Redondo Beach. From Artesia Avenue, the cable would be installed by trenching through surface streets until reaching the Cable Station. This land route would be approximately 700 miles long.² The route would be within existing public rights of way along major California transportation corridors. Terrestrial construction techniques for a land-based cable installation would include clearing of vegetation, plowing and trenching, duct placement, cable pulling, backfilling, and surface restoration. Horizontal directional drilling would be used at road and waterway crossings.

The EIR concludes that impacts to air quality would be greater for a terrestrial route compared to a submarine route, because construction along the terrestrial route would add to the load of pollutants in six counties that are in non-attainment for particulate matter of 10 microns or less (PM₁₀) and nine counties that are in non-attainment for ozone, instead of only one county. The terrestrial route would cross over 53 major rivers and numerous wetlands, and that even with implementation of mitigation measures, the risk of bentonite release due to a "frac-out" during HDD would increase with the number of wetlands, streams, and rivers bored under. In addition, the presence of construction equipment and operations close to wetlands and streams would adversely impact riparian vegetation. The EIR also speculates that the terrestrial route would travel through many towns, cities and protected areas (*e.g.*, national forests) for which a cable would be an incompatible land use, and in which a cable installation and maintenance or repair activities could cause significant traffic disruption. The EIR concludes that construction of a terrestrial route for cable Segment 5 would therefore have more significant environmental impacts than a submarine route, due to impacts to air quality, terrestrial biological resources, and terrestrial water resources and water quality. These impacts would be increased if multiple redundant terrestrial conduits were constructed to address cable faulting and maintain consistent fiber optic cable service.

² This route identified in the EIR was adapted from the terrestrial alternative routes proposed in *Final Environmental Impact Report for Global West Fiber Optic Cable Project* (SAIC 2000) and *Mitigated Negative Declaration for the Consideration of a New Lease for Submarine Telecommunication Cable Systems, Grover Beach, California* (Ecology and Environment, Inc. 2000).

The impacts associated with the terrestrial cable route installation alternative would be greater than the proposed submarine route for the north-south Segment 5 to Oregon. Therefore, the Commission finds that there is no less environmentally damaging terrestrial cable route alternative for Segment 5 to Oregon.

(c) Alternatives to the Offshore Routes

Tyco conducted marine route research between the years of 1999 and 2002 to identify areas that the proposed routes should avoid and to identify preferred marine routes. The areas that were identified by Tyco for avoidance or impact minimization included: rocky substrates, marine sanctuaries, proposed marine sanctuary boundary expansion, fishing areas, explosives dumping areas, contaminated sediments, commercial outfalls and anchorages, submarine canyons and unstable substrates, as well as known significant marine cultural resources. Tyco states that extensive studies of the area's fisheries, including interviews with fishermen and fishermen participation in marine surveys, were conducted in order to choose routes with minimal potential to affect fisheries.

The EIR examines an alternative marine route for Segment 5 with a landing at Manhattan Beach (see Alternative Landing Sites, above). However, the EIR concludes that this alternative route could conflict with utility infrastructure and pipelines, and would cross through sensitive habitat areas proposed to be included a potential future expansion of the Channel Islands National Marine Sanctuary. This alternative would also disrupt more hard bottom habitat compared to the proposed project. The alternative marine route would also be much closer to whale migration corridors than the proposed route for Segment 5. In addition, the EIR notes that the alternative route would cross the Hyperion Treatment Plant sludge field, potentially causing marine resource and water quality impacts. However, the alternative route would reduce air quality impacts given that it would be shorter than the Segment 5 route.

In summary, this alternative marine route is not feasible due to the City of Manhattan Beach's refusal to consider a cable landing there, and it is also not a less environmentally damaging alternative. Therefore, the Commission finds that there is no feasible less environmentally damaging alternative marine route to the proposed project for both Segments 4 and 5.

(d) Alternative Installation Methods (Trenching vs. HDD)

Tyco originally proposed to lay cable in the nearshore area and across the beach by trenching. Trenching entails staging the cable landing and beach cable burial operations on the beach at 2nd Street in Hermosa Beach. The beach staging area would be 100 feet wide, extending from near the Strand wall to near the mean high tide line. Equipment to be used on the beach include a winch, a 'deadman' to anchor the winch, a crane, a bulldozer, an excavator, toolboxes, and rigging gear. Trenching also includes excavation of a cable slack pit 13-17 feet in diameter and 10 feet deep just seaward of the end of the conduits under the Strand. The total area of the beach staging area would have been approximately 50,000 square feet, causing significant public access and recreation impacts.

The Coastal Commission staff geologist believes that given shoreline erosion predictions, sand migration studies, extreme storm events during El Nino years, and other factors, that a trenched cable would likely be exposed at least once, if not multiple times, during the life of the project, resulting in additional public access, recreation, water quality, and marine resource impacts in the future due to repair activities.

The EIR evaluates trenching as the proposed project, and assesses HDD as an alternative installation method. The EIR states that HDD has the potential risk of "frac-out" and bentonite release, which has water quality and marine biological impacts. However, the Addendum to the EIR concludes that cable installation by HDD would eliminate visual, public access, recreation, and water quality impacts, as compared to trenching. In May 2002, Tyco changed its proposed project description to installation by HDD instead of trenching.

Accordingly, the Commission finds that the proposed project is the least environmentally damaging feasible alternative and therefore meets the second test of Coastal Act §30233(a).

(3) *Feasible Mitigation Measures*

The final requirement of Coastal Act §30233(a) is that dredging and filling of coastal waters may be permitted if feasible mitigation measures have been provided to minimize any adverse environmental impacts. In other sections of this report, the Commission has identified feasible mitigation measures that will minimize the project's adverse environmental impacts. With the imposition of the conditions of this permit, in combination with Tyco's commitment to implement similar requirements in federal waters, the Commission finds that the third and final test of Coastal Act §30233(a) has been met.

Because the three tests have been met, the Commission therefore finds the proposed project consistent with Coastal Act §30233(a).

4.5.2 Marine Resources and Water Quality

Coastal Act §30230 states:

Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.

Coastal Act §30231 states:

The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of

waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.

The EIR and its Addendum identify the following potential project-related marine resource and water quality impacts: (1) whale entanglements on unburied or suspended cable, or on abandoned fishing gear or "ghost nets"; (2) marine mammal and sea turtle collisions with project vessels; (3) impacts to hard-substrate and soft-substrate benthic species and habitat due the pre-lay grapnel run, cable installation, operation and repair; (4) impacts to filter-feeding benthic organisms due to increased turbidity and resettling of contaminated sediments within Santa Monica Bay; (5) water quality impacts from release of project vessel sewage and bilge or ballast water; (6) increased erosion and sedimentation due to terrestrial construction; and (7) impacts to benthic habitat and water quality due to a release of the drilling fluid bentonite if a "frac-out" occurs during horizontal directional drilling operations.

4.5.2.1 Marine Mammal and Sea Turtle Impacts

There are three potential types of impacts to whales and other marine wildlife due to the proposed project: entanglement with project cables, entanglement with "ghost nets" or abandoned fishing gear, and collision with project vessels.

Potential Whale Entanglement with Project Cables

Whales that migrate through coastal waters in the project area may become entangled in unburied or insufficiently buried cable, or in cable suspensions. Tyco states that approximately 27% of Segment 4 out to the 1,800-meter depth will be buried to the target depth of 1.0-meter, and approximately 20% of Segment 5 out to the 1,800-meter depth will be buried to the target depth of 1.0-meter. Burial is likely to be less than 1.0-meter for 15% of Segment 4 out to the 1,800-meter depth, and less than 1.0-meter burial depth for 33% of Segment 5 out to the 1,800-meter depth. Burial will be difficult or infeasible for 20% of Segment 4 out to the 1,800-meter depth, and for 13% of Segment 5 due to presence of hard bottom or steep slopes. Tyco estimates that 38% of Segment 4 and 34% of Segment 5 out to the 1,800-meter depth will be surface laid. (See Table 4 in Section 4.5.8 for additional detail.)

The Marine Mammal Protection Act of 1972 protects whales. In addition, the sperm whale is federally listed as an endangered species and is therefore protected by the federal Endangered Species Act. Gray whales have been delisted from the federal endangered species list due to increased population numbers. Cable entanglement with other marine mammals such as pinnipeds (*e.g.*, sea lions, harbor seals) and fissipeds (*e.g.*, sea otters), or with sea turtles, is not expected to occur because these animals do not exhibit similar diving and/or feeding behaviors in bottom sediments.

To date, whale entanglement with fiber optic cables has not been reported offshore California. Heezen (1957) documents fourteen examples of sperm whale entanglements with submarine

telegraph cables worldwide.³ Most of the entanglements evaluated by Heezen involved cases of deep-diving, bottom-feeding sperm whales that, he postulated, became entangled "...while swimming along in search of food, with their lower jaw skimming through the upper layer of sediment. It may also be that the whales attacked the cable mistaking it for prey." The report documented fourteen instances of whales entangled in submarine cables that led to death. All whales positively identified were sperm whales, with possible entanglements of baleen (*e.g.*, gray) whales in shallower water, and one humpback whale reported entangled in Alaskan waters.

Heezen's (1957) study consisted of a search of all available cable failure records of four cable companies; the record is only considered complete for those companies for the years 1930-1955. The scope of the study was somewhat limited by the fact that, prior to 1930, cable failure reports generally lacked detail or were incomplete. Current knowledge of whale entanglements is further limited by the lack of any contemporary and comparable analysis of this topic since these studies. Moreover, since many cables have been abandoned since first laid, and since the only basis for discovering entanglement is interruptions to service, which is not possible to assess for abandoned cables, and since no examination of failure rates for operational cables worldwide has been made since 1957, the present rate of whale entanglement is unknown. Interpretation of entanglement risk amounts to speculation, but entanglement risk may be affected by these factors: oceanic depth of the cables; burial depth of the cables; presence of suspended cables over submarine trenches or rocky substrates; and the relative tautness of unburied cables (more specifically, shallow, unburied, looped or suspended cables pose more of a hazard than deeply buried cables).

Gray Whales and Sperm Whales and Entanglement Risk

Of the whale species (*i.e.*, gray, humpback, blue, fin, sei, sperm) that are known to migrate past the project area, two species--the California gray whale (*Eschrichtius robustus*) and sperm whale (*Physeter macrocephalus*)--have the potential to become entangled due to, respectively, bottom-feeding behavior or deep-diving behavior.

Approximately 20,000 gray whales migrate through California waters each year between Alaskan waters and Baja California. Due to their abundance off the Pacific coast, their tendency to hug the shoreline during migration, and their bottom feeding patterns, gray whales may face the highest risk of entanglement with insufficiently buried or exposed cables. The majority of southbound (November to January) gray whales migrate within 2 nautical miles (nm) from shore, while the northbound migration occurs much closer to shore with mother and calves reported within kelp beds and sometimes only yards from the shoreline. These distances, however, vary seasonally over time, particularly due to the deterring presence of boat traffic. The number of migrating gray whales recorded near San Clemente Island suggests that a significant proportion

³At the time of the study, there were nearly a half-million miles of cable laid on the sea floor in various parts of the world (Heezen 1957). By 1928, 21 separate cables crossed the Atlantic to Canada and the United States. At present, 658,375 km of fiber optic cable is expected to be installed and operational by the year 2003 (Rampal 1998). That figure equates roughly to an additional 514,050 miles of cable in the marine environment, making a total of more than 1 million miles of cable in the marine environment, not including that which was installed between 1957 and the advent of fiber optic cable installation, and any which may have been removed since then.

of the total population crosses the project area during the southbound and northbound migrations (E&E, 2001).

Gray whales usually feed nearshore in soft-bottom sediments, and also typically feed opportunistically during migration. (MMS 1989) Gray whale seafloor foraging methods include diving, rolling onto one side on the seafloor, and sucking up sediments that the whale filters with its baleen. (E&E, 2001) One study also found sea floor gouges approximately 15 centimeters deep created by migrating gray whales offshore of Northern California, and concluded that migrating gray whales interact with the muddy part of the central marine shelf (at 60-120 meter water depths), although this behavior was determined to be secondary to their migratory objective. (Cacchione et al, 1987) Gray whales can also dive in waters from 150 to 200 meters deep, but usually prefer shallower water.

Sperm whales are much less abundant off the coast of California than gray whales, numbering only approximately 1,200 individuals. Sperm whales typically inhabit deep open waters, and are the deepest and longest diving of all cetaceans. Sperm whales regularly dive to water depths between 200 and 1,000 meters. (E&E, 2001) Sperm whales are the only species confirmed to have been entangled in a submarine cable, and their deep diving puts them at risk of entanglement with insufficiently buried, exposed, or suspended cables. However, based on aerial and boat surveys off California, sperm whales are usually found north of the project area. (Fahy 2002) In addition, unlike gray whales, sperm whales do not bottom feed; instead, they feed solely on squid and octopi found in the water column. (E&E, 2001) NMFS has therefore determined the risk of sperm whale entanglement to be very low. (Fahy 2002)

However, risk of entanglement with cables is increased if there are cable suspensions (*i.e.*, cable that is suspended above the seafloor). Tyco states that suspensions are likely in the following areas: (1) areas with high-relief exposed rocky substrates, where the seafloor topography may be sufficiently irregular in locations to prevent the cable from being in contact with the bottom; and (2) areas with steep slopes where the angles of extant slopes or abrupt slope changes may prevent the cable from being either buried (in areas above 1,200 meters in depth) or from being laid directly in contact with the seafloor (in areas below 1,200 meters in depth). Tyco estimates that there are approximately 8 km on Segment 4 and 17 km on Segment 5 in areas shallower than 1,800 meters with substrates of rock or thin veneer over rock where potential areas of high relief may be present. Identified areas occur along offshore ridges, the majority of which area also on steep slopes. Tyco identified possible suspension areas due to steep slopes along the marine routes, including seven steep slope locations along Segment 4 and eleven steep slope locations along Segment 5 in water depths ranging from 190 meters to 1,520 meters.

Given the diving depth ranges of both gray whales and sperm whales, and the bottom-foraging behavior of gray whales, the potential for cable suspensions increases the risk of whale entanglement in cables. In addition, due to the protection of these marine mammals under the Endangered Species Act and the Marine Mammal Protection Act, entanglement or injury impacts due to insufficiently buried or exposed cables would be significant. Furthermore, during the 18 to 24 month period between cable route inspections, portions of cable can become unburied, further increasing the risk of entanglement. Several conditions have been incorporated as a part

of this permit to minimize any potential for whale interaction with the project cables, and to document any future entanglements.

During cable laying, **Special Condition 13** requires four trained marine wildlife (defined as marine mammals and sea turtles) monitors approved by the Executive Director to be present (two monitors per 12-hour shift) on the cable installation vessel (including repair and maintenance operations), the post-lay inspection vessel, and burial vessels at all times to monitor the presence of marine wildlife that approaches the project area. Two trained marine wildlife monitors shall be also be onboard all vessels used for retrieval of entangled fishing gear, and for the inspection surveys conducted every 18 to 24 months as required by Special Condition 18. During daytime observations, all monitors shall use 7 x 50 reticulated binoculars. During nighttime observations, all monitors shall use nighttime vision equipment.

Tyco is to ensure that the monitors have a 360-degree view of all activities during all marine operations (*e.g.*, cable installation, post-lay inspection, burial, maintenance and repair, retrieval of entangled fishing gear, and inspection surveys). If a marine mammal or sea turtle approaches the work area (defined as a 100-yard "safety zone"), or the monitors determine that project operations have the potential to threaten the health or safety of marine wildlife or "take" a protected species as defined by regulations implementing the federal Endangered Species Act and the Marine Mammal Protection Act, the monitors shall have the authority to order cessation of all project operations until the monitors determine there is no longer a threat and/or the animal(s) transits the area. The captain shall comply with this order as soon as it safe to do so and for as long as the order remains in effect. If environmental conditions (*e.g.*, high sea state, fog) preclude monitors from seeing out to at least one nautical mile, the monitors shall require personnel aboard work and support vessels to maintain heightened vigilance for an approaching marine mammal or sea turtle. If environmental conditions preclude the monitors from seeing within the 100-yard safety zone, the monitors shall have the authority to order cessation of all project operations until visual conditions improve. The captain shall comply with this order as soon as it is safe to do so and for as long as the order remains in effect. The monitors will also be provided for project operations in federal waters to the 1,800-meter water depth. In addition, at least 10 days prior to the commencement of cable installation operations, Tyco shall provide to the approved marine wildlife monitors a document compiling all marine mammal and sea turtle mitigation measures that have been required of Tyco by the Coastal Commission, U.S. Army Corps of Engineers and the City of Hermosa Beach.

Special Condition 14 requires Tyco to submit, to the Executive Director and NMFS, within 30 days of the last day of all marine operations that require marine wildlife monitors onboard a vessel(s) pursuant to Special Condition 13, a marine wildlife monitoring report prepared by the approved marine wildlife monitors. The report shall include: (a) an evaluation of the effectiveness of monitoring protocols and (b) reporting of (i) marine mammal, sea turtle, and other wildlife sightings (species and numbers); (ii) any wildlife behavioral changes that may have been attributable to project operations; and (iii) any project delays or cessation of operations due to the presence in the project area of marine wildlife species subject to protection under the terms of Special Condition 13.

Special Condition 7 requires Tyco to bury in State waters the cables to a depth of 1.0-meter except where precluded by seafloor substrates. Where a 1.0-meter burial depth cannot be achieved, Tyco is to bury the cables to the maximum depth feasible. This depth represents a protection factor of roughly 300% when compared with the depth (15-25 cm) at which gray whales are believed to trench into bottom sediments. In federal waters to the 1,200-meter water depth, Tyco has agreed to also achieve a 1.0-meter cable burial depth. Tyco estimates that a 1.0-meter burial depth can be achieved for approximately 27% of Segment 4 route, and 20% of the Segment 5 route, out to the 1,800-meter water depth. The factors influencing whether the 1.0-meter burial depth may not be achieved include presence of hard-bottom substrate, abrupt changes in bottom slope, and variations in cable ship speed. In addition, in areas where a 1.0-meter burial depth is not achieved, Tyco has committed to re-bury those sections to 1.0-meter with a ROV. In order to ensure that cable installation consistent with Special Condition 6 is carried out, **Special Condition 9** requires Tyco to submit to the Executive Director the as-built plans, including burial depth, of both cable segments.

Special Condition 15 requires Tyco to address portions of the route where cable burial is infeasible due to seafloor substrates by developing and implementing a cable slack and suspension minimization plan, and incorporating "best available technology" so that the cable will conform as closely as technically possible to the contours of the seafloor. At least 30 days prior to cable installation, Tyco must submit the cable slack and suspension minimization plan to the Executive Director for review and approval. "Best available technology" must include but not be limited to the use, where appropriate, of cable slack control and ROV or diver repositioning of the cable to avoid or minimize cable suspensions. During cable surface-lay operations, Tyco shall also employ a ROV-follow vessel with real-time ROV video feed to the cable ship during cable installation to ensure that the slack-control program is effective and to identify areas of cable suspension. If the ROV video feed identifies a suspended segment of cable that can be eliminated or minimized by repositioning or introduction of additional cable slack, Tyco shall recover the cable and reinstall it using the above methods. During post-lay inspection and burial operations, Tyco shall use a ROV to reposition and/or bury to 1.0-meter any suspended or exposed cable segment, unless precluded by seafloor substrates. The cable slack and suspension minimization plan will also apply to Tyco's cable-laying operations in federal waters out to the 1,800-meter water depth.

Special Condition 26 provides a system for minimizing cable impacts to marine wildlife by requiring that if any type of entanglement occurs (*e.g.*, a whale), Tyco shall use all feasible measures to retrieve the entangled object as soon as possible but no later than six weeks after discovering or receiving notice of the incident. Tyco shall notify the Executive Director within 48 hours of Tyco's knowledge of gear loss or other cable entanglement. If full removal of gear is not feasible, Tyco shall remove as much gear as practicable to minimize harm to wildlife. Within two weeks of completing a recovery operation, Tyco is to submit to the Executive Director a report describing the nature and location of the entanglement and the retrieval method used. Over time, this type of monitoring may eventually contribute to an up-to-date risk assessment of entanglement impacts. Tyco will implement these same requirements in federal waters to the 1,800-meter water depth.

As a preventive measure against potential entanglement impacts, **Special Condition 18** requires that every 18 to 24 months for the life of project, Tyco is to survey the cable route in State waters to verify that the two cable segments have remained buried consistent with the as-built cable burial plan. Tyco will carry out these same requirements in federal waters to the 1,800-meter water depth. The survey shall be conducted by a ROV equipped with video and still cameras and by a party approved by the Executive Director. Within 30 days of survey completion, Tyco shall submit to the Executive Director a report describing the results of the survey and a copy of the videotape recorded during the cable survey. If the survey shows that a segment(s) of a cable is no longer buried consistent with the as-built cable burial plan required by Special Condition 9, Tyco shall, within 30 days of survey completion, submit to the Executive Director for approval a plan to re-bury those cable segments.

Further, **Special Condition 21** requires that within 90 days of either taking the cable out of service or after the expiration or sooner termination of Tyco's City of Hermosa Beach lease(s) or permit(s), Tyco is to apply for an amendment to this permit to remove the cable from the territorial waters of the State of California. Tyco has also agreed that within the same timeframe, it will apply to the ACOE for a permit to remove from federal waters to the 1,800-meter water depth the following: (1) unburied (exposed) cable segments located in water depths less than 1,000 meters; (2) unburied (exposed) cable segments in active fishing areas; and (3) any buried cable segments that over the life of the cable have become exposed, and were subsequently reburied, and are located in active fishing areas or water depths less than 1,000 meters. Tyco is to implement the cable removal project authorized by the permits in accordance with the time schedule specified therein. Removal of exposed cable in water depths less than 1,000 meters, and cable segments that were ever exposed during the life of the cable in water depths less than 1,000 meters, will eliminate potential whale entanglements.

In order to ensure compliance with this and other conditions, **Special Condition 4** requires Tyco to post a performance bond in the amount of \$500,000 per cable segment to cover its cable operations in State and federal waters out to the 1,800-meter water depth.

With these measures in place, the Commission believes that the project will minimize any risk of harm to marine mammals and sea turtles and that healthy populations of the species will be maintained as required by section 30230 of the Coastal Act.

Entanglement with Ghost Nets and Abandoned Fishing Gear

Fishermen may snag gear or nets on cables. When this occurs, fishermen generally abandon their gear or nets (creating "ghost nets"), thereby creating a risk to marine mammals and other species. Pursuant to a "Fishing Agreement" executed by Tyco with various fishermen and their representatives, when it appears that a fisherman has snagged a cable, he or she is expected to cut the gear instead of risking damage to the cable. If the fisherman was operating consistent with established procedures, Tyco will reimburse the fisherman for the lost gear. This abandoned gear and particularly the nets, however, then become a hazard to marine life, potentially entangling marine mammals and fish, preventing them from feeding and causing them to drown, over the long term.

As discussed above, **Special Condition 26** requires Tyco to use all feasible measures to retrieve entangled nets or gear as soon as possible but no later than six weeks after discovering or receiving notice of the incident. If full removal is not feasible, Tyco is to remove as much gear as practicable to minimize harm to wildlife. Within two weeks of completing a recovery operation, Tyco is to submit to the Executive Director a report describing the nature and location of the entanglement and the retrieval method used.

Marine Mammal or Sea Turtle Collision with Project Vessels

Another potential impact to marine mammals and to sea turtles is collision with project vessels during all marine operations associated with the proposed project. Various species of whales could be present in the project area at all times of the year. Project vessels will be in the project area for up to one month for cable lay and burial of both cables, for 5-6 weeks per cable during post-lay inspection and burial, and during cable repair and maintenance activities.

The EIR observes that whales are sensitive to noise and typically avoid large vessels, and that the likelihood of whale collision with cable vessels is low due to the slow speeds of cable vessels, which range from 1.8-3.7 km/hour or 1.1-2.3 miles/hour. However, whale-vessel collisions nevertheless do occur. According to the EIR, there were 12 collisions and 6 deaths of gray whales reported off Southern California from 1974-80, and 5 whales were mortally wounded by navy vessel collisions in 2001. In addition, on January 9, 2001, one juvenile gray whale was wounded in a manner that was determined to be consistent with that of a propeller strike. Although the whale's body was never found, several marine mammal veterinarians reviewed digital images of the injured whale calf and determined that it was not likely that the calf had survived. This incident was observed within 10 meters (33 feet) of a cable-installation vessel off central California. The report on the incident also observed that young gray whales have the greatest likelihood of being hit by a vessel. (Harvey 2001) Any such take of a marine mammal is a significant impact.

The EIR identified several species of marine turtles present along the California coast during their migration, including the green turtle (*Chelonia mydas*), loggerhead turtle (*Caretta caretta*), leatherback turtle (*Dermochelys coriacea*), and olive ridley turtle (*Lepidochelys olivacea*). According to the EIR, the green turtle is a regular visitor to waters on the southwest coast of the state, and a small group of green turtles has been consistently observed in San Diego Bay near a power plant outfall for the last twenty years, apparently attracted by the warm waters due to the plant's thermal discharges. The EIR concludes that the presence of marine turtles along the cable routes is likely but only in very low densities. NMFS also determined that while sea turtles have been found in the project area, that the risk of any interaction, including collision with a project vessel, is low (Fahy 2002). Nevertheless, the EIR concluded that onboard monitoring during cable installation and repair operations should include monitoring sea turtles in addition to marine mammals in order to prevent potential collisions between sea turtles and project vessels.

The most effective way to prevent marine mammal or sea turtle collisions with project vessels is to monitor effectively for the presence of marine mammals or sea turtles in the project area. During cable laying, **Special Condition 13** (described in greater detail above) requires four

trained marine monitors that are approved by the Executive Director in consultation with the National Marine Fisheries Service, to be present (two monitors per 12-hour shift) on the cable installation vessel (including repair and maintenance operations), the post-lay inspection vessel, and burial vessels at all times to monitor the presence of marine mammals or sea turtles that approach the project area. Two trained marine wildlife monitors approved by the Executive Director in consultation with NMFS shall be also be onboard all vessels used for retrieval of entangled fishing gear, and for the inspection surveys conducted every 18 to 24 months as required by Special Condition 18.

4.5.2.2 Hard-Bottom Impacts

Hard substrate (or hard bottom) areas are exposed rocky substrates that provide habitat for a diverse group of plants and animals. Impacts (*e.g.*, crushing, displacement) to rocky substrates can occur during the pre-lay grapnel run and cable lay, burial, operation and repair. Laying of the cables on rocky substrates will disrupt associated bottom communities, likely crushing and/or dislodging small, sessile or relatively sedentary invertebrates along a narrow strip. Sessile species may experience repeated, localized disturbances throughout the life of the cables if they move due to current action. Adverse impacts to high-relief substrate in particular are significant because: (1) deepwater reefs are relatively rare along the central and southern California coast; (2) they support a diverse assemblage of epifaunal invertebrates; (3) they attract fish as a nursery ground, food source, and as shelter; and (4) epibiota residing on rocky substrates are sensitive to mechanical disturbance and increased sediment loads. During the pre-lay grapnel run, Tyco has committed to avoiding areas of rocky substrates.

Burial will be difficult or infeasible for 20% of Segment 4 out to the 1,800-meter depth, and for 13% of Segment 5 due to presence of hard bottom or steep slopes. Tyco estimates that 38% of Segment 4 and 34% of Segment 5 out to the 1,800-meter depth will be surface laid. (See Table 4 in Section 4.5.8 for additional detail.) There are approximately 8.2 km on Segment 4 and 17.1 km on Segment 5 in areas shallower than 1,800 meters with substrates of rock or thin veneer over rock where potential areas of high relief may be present.

According to the EIR, common epifaunal invertebrates occurring in the hard bottom areas near or along the proposed sea route vary based on depth and substrate relief height. Along much of the California coast, there is a strong positive association between the types of communities and the depths and substrate types in which they occur. Hard-bottom substrates, including rocky bottoms, rock outcrops, and rock crevices, provide habitat and shelter for numerous sessile organisms, demersal fishes, and mobile invertebrates such as lobsters and crabs. In shallow waters (less than 200 meters or 656 feet), algae and anemones such as *Corynactis californica* are present. In deeper waters (greater than 600 meters or 1,968 feet), hydroids provide substrate to anemones, amphipods, polychaetes, and ectopods. Gorgonians, large sponges, shrimp, crinoids, and ophiuroids, brittle stars, and seastars are also present. The EIR also identifies the California spiny lobster as an important biological and commercial resource present along the proposed cable routes.

Since there will be unavoidable impacts to hard bottom areas, the Commission is requiring Tyco in **Special Condition 19** to survey the cable routes for impacts to rocky substrate caused by

project operations. Tyco has also agreed in its consistency certification to survey the cable routes in federal waters out to the 1,200-meter water depth. Within 90 days of cable installation, a video survey (displaying real-time position and water depth of the ROV) of the segments of the seafloor along the construction corridor which were identified as consisting of rocky substrate prior to or during the installation of the cable shall be completed. Still-images of representative habitat shall be taken in any area of rocky substrate traversed by the cable. The survey is to quantify the extent of exposed rocky substrate, including type and relief along the cable corridor. The survey shall also quantify the height and length of any cable suspended at heights greater than 1.0-meter from the seafloor. Within 45 days of completing the survey, Tyco will submit to the Executive Director a written report describing the results of the survey.

Additionally, **Special Condition 20** requires Tyco to compensate for all project-related impacts to hard bottom habitat through payment of a compensatory hard bottom mitigation fee to be used to construct a new artificial reef or augment an existing artificial reef in State waters within the Southern California Bight. The construction of a new artificial reef, or augmentation of an existing reef, will be carried out pursuant to a Memorandum of Agreement ("MOA") by and between the California Coastal Commission, the California Department of Fish and Game ("CDFG") and the United Anglers of Southern California ("UASC") (Exhibit 3). Tyco has agreed in its consistency certification to compensate for project-related impacts to hard bottom habitat in federal waters based on the surveying required in Special Condition 19.

The CDFG administers the California Artificial Reef Program in part for the purposes of (1) placing artificial reefs in State waters, and (2) determining the requirements for reef siting and placement. The CDFG has agreed to assume the lead responsibility for the planning, siting, design and permit requirements for the construction of any new artificial reef or augmentation of an existing artificial reef using the monies in the hard bottom mitigation fund. The UASC, a volunteer group of recreational anglers interested in preserving, protecting and enhancing marine resources and fishing opportunities, agreed in the 1996 MOA to accept any hard bottom mitigation fees. The funds are in an interest-bearing account. These funds including all earned interest are to be expended solely for reef materials, construction costs, and the UASC's administration of the fund (not to exceed 10% of the total collected fees). The CDFG will absorb any costs associated with the planning, siting, design, and permit requirements to construct a new artificial reef or augment an existing reef.

The amount of the hard bottom mitigation fee will be calculated by multiplying the total square footage of impacted hard bottom (as determined in the survey conducted under Special Condition 19) by a compensation rate of \$27.31 per square foot (see Table 2). The total square footage of hard bottom impacted shall be calculated by multiplying the linear distance of cable laid on hard bottom by approximately twice the width of the cable (*i.e.*, four inches). The fee shall be paid to the United Anglers of Southern California within 30 calendar days of the results of the hard bottom survey required by Special Condition 19. Tyco shall provide evidence of this payment to the Executive Director within the same time frame.

Table 2. Compensatory Hard Bottom Mitigation Fee

TASK	MITIGATION FEE ESTIMATE	COMMENT
Construction of Hard Bottom Habitat (year 2000 dollars) Cost of Materials (quarry rock, engineering, transportation, deposition, and insurance)	\$19.10	Assumptions: a) Estimate based on actual construction costs for one meter high artificial reef b) Cost = \$198/ton
Project Administration	\$1.91	Overhead not to exceed 10% of total funds collected.
SUB-TOTAL	\$21.01	
Project Contingency	\$6.30	Contingency of 30% for unanticipated project-related changes in cost of design/planning/permitting, materials, labor, or transportation
TOTAL	\$27.31	

4.5.2.3 Soft-Bottom Impacts

Soft bottom areas are unconsolidated sediments (*e.g.*, gravel, coarse-grained and mixed sediments, sand, and mud) that provide habitat to epifaunal (surface living) and infaunal (below-surface living) organisms. Impacts to epifauna and infauna due to the proposed project are of concern because: (1) the proposed burial of cables will disturb their seafloor habitat; (2) many infaunal organisms have limited mobility and cannot easily escape habitat disturbance or rapidly repopulate regions of disturbance; and (3) they are a source of food for more-mobile epifaunal and pelagic marine organisms such as crabs, fin fish, and marine mammals.

Soft-bottom benthic communities in the nearshore areas of the proposed cable routes are comprised of species associated with the sand and gravel substrate typical of the high-energy and dynamic environments of the California coast. As depth increases from the shore to 200 meters (656 feet), the density of infaunal species increases, most likely because of the greater stability of the sediments. Examples of dominant species present at shallow water depths (subtidal to 30 meters or 98.4 feet) include several species of red algae and epibenthic biota such as the tube building worm (*Diopatra splendidissima*), sandstars (*Astropecten B. armatus*), short spined sea stars (*Pisaster brevispinis*), brittlestars (*Ophiuroidea sp.*), maldanid worms, sea pansies (*Renilla kollikeri*), swimming crabs (*Portunus xantusii*), and sea pens (*Stylatula californiensis*). There are also narrow bands (3-10 meters or 10-33 feet wide) of sand dollar beds (*Dendraster excentricus*) between 5-7 meter water depths along both proposed cable routes. Demersal fish present include the California halibut and other flat fish species. From 30-150 meter (98.4-410 feet) depths, species such as sea pens, ophiuroids, white urchins (*Lytechinus pictus*), and heart

urchins dominate, and flatfish are also present. At 125-600 meter (410-1,968 feet) depths, most of the epibenthic fauna are sea urchins. At deeper depths, soft substrates are generally inhabited by sea pens, octopus, sea stars, and multiple species of small polychaetes and crustaceans. However, in deep basin areas (*e.g.*, below roughly 600 meters or 1,968 feet), low oxygen conditions contribute to decreased abundance and biomass of invertebrates. However, in near-island habitats like the Santa Barbara Channel, which comprise a significant portion of the proposed cable routes, the above communities become diverse and abundant. The proposed cable routes pass outside the current boundaries of the Channel Islands National Marine Sanctuary, and are also outside proposed Sanctuary boundary expansion areas. According to the EIR, no threatened or endangered soft-bottom benthic species were identified during surveys or are known to exist in the project area.

Cable grapnel, burial, post-lay burial, and repair operations, and vessel anchoring in soft-bottom areas will cause localized, temporary disturbance of the habitat and mortality to resident infaunal and slow-moving epifaunal species. The grapnel is 0.8 meter wide and will cause a swath of disturbance approximately 1.0-meter wide, with a subsurface penetration of 0.4 meter (1.3 feet). In order to bury the cables to the target depth of 1.0-meter within the seafloor, divers with a hand-jet, seaplow, and ROV will be used. A ROV equipped with sediment jets will re-bury any cable segments that are not initially buried to 1.0-meter. The EIR estimates that the seaplow will disturb bottom sediments within a corridor at least 20 feet (6.1 meters) wide based on the combined effects of the furrow made by the plow shank plus the tracks of the plow skids, and 1.0-meter deep. Burial by ROV and hand jets will disturb a similar area of soft bottom. Repair operations in the nearshore and adjacent to hard bottom areas will require a ROV to jet the damaged section from the seafloor, assuming it is buried. Repair activities that require a seaplow will again disturb a 20 feet (6.1 meters) wide swath of soft bottom. During periodic surveying of the cable routes, as required by **Special Condition 18**, any cable segments that have become exposed will be reburied with an ROV jet pursuant to an approved re-burial plan. According to Tyco, the estimated soft substrate disturbance due to grapnel, seaplow, ROV, surface laying of cable, and anchoring is approximately 14 acres in state waters and 357 acres in federal waters, for a total of 371 acres. However, the EIR concludes that damage to species in soft-bottom habitat from cable installation and repair activities, including vessel anchoring, in soft-bottom habitats will be less than significant for the following reasons: the disturbed area will be very small; no species of special concern occur in soft bottom habitats; and most soft bottom communities would typically recolonize and recover rapidly (*i.e.*, within one year) following a short-term, localized disturbance. It is expected that invertebrates would recolonize the disturbed corridor primarily by immigration from adjoining areas. The EIR cites various studies in which recolonization of disturbed areas occurred within one year at most, although some species (polychaetes, hydroids, mollusks, ascidians, sponges and ectopods) took up to one year to recolonize.

Sand Dollar Beds and Sea Urchins

Sand dollar beds and sea urchins are important ecological resources that occur in the nearshore project area. The EIR estimates that the density of sand dollars in the nearshore area along the proposed cable routes is approximately 20-100 individuals per square meter, and that the swath of impact due to cable installation would be approximately 10 meters (33 feet) wide. Sand dollar

beds are highly ephemeral and regularly bury themselves to avoid environmental stresses and predation, after which they excavate themselves once a threat has passed. After the disturbance caused by the cable installation, sand dollars are expected to recolonize the disturbed swath within months, either by excavating themselves from burial or by migration from adjacent undisturbed areas. Sea urchins (most commonly the white sea urchin) are present in the proposed cable routes over a wide area, and the EIR estimates that they will be disturbed in a 6.8 meter (22 feet) wide swath. However, sea urchins have a rapid resettlement rate and will completely recolonize the area of disturbance within one year.

4.5.2.4 Other Sensitive Plant and Animal Species

No other sensitive plant species (*e.g.*, attached kelp beds or eelgrass), pinniped haulout areas, bird habitat, or other sensitive resource areas occur in or near the proposed offshore cable routes or adjacent to the proposed landing.

4.5.2.5 Marine Water Quality Impacts

The proposed project offshore lies in open coastal waters off of Santa Monica Bay and the Southern California Bight. The Hermosa Beach landing site is located in Santa Monica Bay, a coastal embayment between Point Dume and the Palos Verdes peninsula, located in one of the most densely populated areas on the west coast. Water quality conditions within the bay are affected by general oceanographic conditions as well as point and non-point sources of pollutants, including wet and dry weather flows through storm drains and urban runoff, and municipal and industrial wastewater discharges, the latter representing the largest source of pollutants to the bay. The Hyperion Treatment Plant alone discharges an average of 352 million gallons per day of treated sewage. Other point sources are the Joint Water Pollution Control Plant with outfalls off the Palos Verdes peninsula, the Chevron Refinery in El Segundo, the El Segundo and Scattergood Generating Stations, and the Redondo Beach L.L.C. Generating Station. In the project area, DDT and PCBs are the contaminants of highest concern in the sediments of Santa Monica Bay.

The principal potential impacts on marine water quality due to the proposed project are: (1) impacts to filter-feeding benthic organisms due to increased turbidity during cable installation (including grapnel, burial, re-burial, repair, and hand-jetting operations) and the suspension and resettling of contaminated sediments within Santa Monica Bay; (2) impacts on benthic habitat and water quality due to potential release of the drilling fluid bentonite if a "frac-out" occurs during horizontal directional drilling operations; (3) the release of sewage and bilge/ballast water from project vessels; and (4) increased erosion, sedimentation, and other potential water quality impacts related to terrestrial construction activities. The EIR considers project-related water quality impacts to be significant if: (a) a violation of water quality standards occurs for longer than 48 hours after project completion; (b) discharges of oil or grease are visible on the surface of jurisdictional waters; or (c) water quality changes occur such that the Los Angeles Basin Plan's beneficial uses for the waters near Hermosa Beach are impaired.

Turbidity Increases Due To Cable Installation and Conduit Cleaning and Jetting

Cable installation activities will suspend existing bottom sediments to form a plume with elevated particle concentrations and increased turbidity levels, relative to surrounding waters. These activities include: (1) pre-lay grapnel run to clear the plow path of debris; (2) cable burial by seaplow and ROV; and (3) cable re-burial and repair operations. The pre-lay grapnel run will disturb sediments along the planned cable routes to be plowed to the extent of the size of the grapnel, roughly 0.3 m (1 foot) wide and its subsurface penetration depth of approximately 0.4 meters (1.3 feet). In contrast, the seaplow, ROV, and hand-jetter will all disturb an area approximately 2 meters (6.0 feet) wide and 1-1.2 meters (3-3.6 feet) deep. Reburial and repair operations by ROV will re-suspend sediments over a similar area.

The size of the plume caused by cable installation activities (*i.e.*, grapnel, jetting, and burial) depends on the grain size of the bottom sediments, rates at which the suspended particles settle to the bottom or are dispersed by bottom currents, and the energy produced by the trenching equipment. Increases in turbidity can degrade water quality by reducing light penetration, discoloring the ocean surface, or interfering with filter-feeding benthic organisms sensitive to increased turbidity. The EIR states that the sediment plume caused by the seaplow will be confined to near-bottom waters, and is not anticipated to affect adjacent areas at distances from the cable route greater than the water depth of the cable. The EIR also observes that local turbidity is already high, with light penetration typically 6.1 meters (20 feet) off sandy beaches in Santa Monica Bay, and that project activities would increase turbidity for a maximum of 4 hours in any one location. The plume's duration at any one location would be temporary (*i.e.*, several hours) and its formation and dissipation would occur simultaneously. Once installed, the buried cable would not cause any subsequent alterations in suspended sediment or turbidity levels. Similar to the effects from cable installation, repair operations would cause localized and temporary sediment suspension.

The California Ocean Plan, the only water quality standard applicable to ocean turbidity impacts, defines unacceptable reductions in natural light in terms of changes to mean conditions that exceed 95% confidence limits. However, the EIR concludes that the proposed project is not likely to violate Ocean Plan prohibitions on aesthetically undesirable discoloration of the ocean surface or to significantly reduce the penetration of ambient light, as most fine sediments will be transported away from the project area by currents. In addition, the EIR concludes that the increase in turbidity caused by project operations will not exceed water quality significance criteria for longer than 48 hours after project completion, because all sediments are likely to settle out of the water column within one day of any one project operation.

Following completion of the horizontal directional drilling of the two cable conduits, the conduits will be cleaned and flushed using air pressure and potable water. This activity will disturb bottom sediments, resulting in their suspension and deposition around the opening of the conduits. No lubricants or chemicals will be used during this activity. The only materials expected in the conduits are seafloor sediments that may have entered the conduit during installation and a small amount of rust (insoluble iron oxide) from the inner surface of the pipe. In order to ensure that no chemicals are inadvertently released into the marine environment, the

Commission is requiring in **Special Condition 16** that Tyco use only flushing equipment that is free of all hydrocarbons and associated contaminants. In addition, Tyco is to use water to lubricate the final three drill stems or pipes (approximately 100 feet) of the borehole, and prior to surfacing of the borehole on the seafloor, Tyco must back-flush residual drilling fluids with water and dispose of them onshore, as described in the Drilling Fluid Release Monitoring Plan for Horizontal Directional Drilling dated June 6, 2002. This condition also requires Tyco to retrieve the drill bit after it emerges through the seafloor, and if product pipe is used to replace the drill stem pipe for final cable casing, it must be free of all hydrocarbons and associated contaminants.

Contaminated Sediment Re-suspension

As the proposed cable routes travel through Santa Monica Bay, they will disturb areas containing sediments contaminated with DDT, PCBs, and metals. The degree of sediment contamination in Santa Monica Bay is dependent on location and depth. Along the cable routes, levels of DDT range from non-detect to greater than 500 nanograms per gram and PCB levels reach 100 nanograms per gram. Due to the physiochemical nature of DDT and PCBs, they are likely to remain adsorbed to sediment particles during cable installation, burial, and repair operations, but are unlikely to enter the solution in the water column as DDT and PCB have low levels of solubility. These contaminants are already present in the water column, with the greatest concentrations in water near the seafloor, although precise measurements of existing contaminant concentrations in the project area are not available. The EIR estimates that contaminated sediments are likely to remain in suspension for no more than 24 hours, and will thereafter disperse quickly and become re-adsorbed into organic constituents of sediments. These contaminant concentrations are expected to cause adverse short-term impacts to water quality, but will not have effects lasting longer than 48 hours.

Re-suspension of contaminated sediments may also impact benthic invertebrates in the project area. However when resuspended sediments resettle on the seafloor, the incremental change in contaminant concentrations is likely to be small. Therefore, while impacts to benthic invertebrates due to re-suspension of contaminated sediments are likely to be adverse, the diluted nature of resettling contaminants will not cause adverse impacts in the long term.

Impacts from Fiber Optic Cable Operation

The proposed cables are designed for a 25-year operational life. The outer coating of the cables that can be exposed to seawater consists of asphalt, a petroleum-based product that is often used in a wet environment or as a waterproofing material. Asphalt paving materials have been used as liners for water reservoirs for decades and also have been used to line potable water pipes and on pier pilings. The EIR states that asphalt degrades slowly, so that more asphalt will enter nearby sediments and the water column over time, and that leaching chemicals contained in the asphalt may bioaccumulate, although the effects of this degradation would be limited to the area immediately surrounding the cables. The slow degradation of the asphalt is not likely to add chemicals to the water column in quantities to violate any existing marine water quality standard.

Horizontal Directional Drilling and Bentonite

Conduit installation will require the use of bentonite as a drilling lubricant. Bentonite will be mixed with water and circulated into the borehole to prevent it from caving in and to coat the wall of the hole in order to minimize fluid losses to permeable formations. Drilling fluids also act as a drill head lubricant and transport the cuttings up to the entry point. Bentonite (sodium montmorillonite), a natural clay, is inert and non-toxic, though it can cause adverse impacts to aquatic organisms by physical abrasion, clogging, or smothering when released in significant quantities. Bentonite may contain elevated concentrations of barium and other metals that are present as trace impurities in clay. However, these metals are in the form of insoluble salts and thus do not readily dissolve in seawater and are not biologically available.

During conduit drilling beneath the onshore landing and seafloor, a release of bentonite may occur if geologic fractures within a formation are encountered (further discussed in section 4.5.8). If a fracture is lateral and subterranean, lost fluids will not surface, but if a fracture is close to the seafloor surface or is aligned in a vertical or uplifted fashion, high drilling pressures may force the release of drilling fluids to the surface. Despite this risk, drilling through fractures has been a common occurrence in previous fiber optic cable projects permitted by the Commission (*e.g.*, MCI WorldCom/MFS Globenet (E-99-011), PC/PAC (E-98-027), AT&T Japan-U.S. (E-00-004), and Global West (E-00-08)). Of these projects, all experienced a "frac-out" or a loss of drilling fluid returns during offshore HDD operations, except the AT&T Japan-U.S. project. However, there are feasible measures available to prevent or minimize the risk of a "frac-out" or drilling fluid release.

The primary methods for prevention of release of drilling fluid into the marine environment are to: (1) drill in geologic strata that contain few fractures and are least susceptible to "frac-outs"; (2) carefully monitor the level and pressure of drilling fluid and stop drilling when these levels fall below prescribed minimum values (to seal and grout fractures); and (3) replace drilling fluid with water whenever conditions permit, especially as the drill bit is brought up to the seafloor at the end of the bore.

With regard to the first method of prevention, the Commission staff geologist believes that the proposed HDD bore trajectory 100 feet under the seafloor is a near-optimum bore given site-specific geotechnical characteristics. Geotechnical samples taken at Hermosa Beach showed that subsurface material consists primarily of dense sands with silts and gravels. It is possible that, in the event of drilling fluid release, some of the drilling fluids would never reach the surface given the relatively permeable and absorptive substrate type. In addition, Tyco has proposed to drill at 100 feet under the seafloor, where lower porosity and greater overburden pressure should help contain drilling fluids.

In its Drilling Fluid Release Monitoring Plan for Horizontal Directional Drilling dated June 6, 2002 (hereinafter referred to as "Drilling Plan"), Tyco proposes to continuously monitor drilling fluid returns and pressure to detect fluid loss in order to avoid or minimize potential "frac-outs" and releases of bentonite to the marine environment. If a loss of fluid volume or pressure is detected, drilling will be stopped or slowed to allow close observation for a surface release to the

ocean. If a release is discovered, Tyco will take measures to reduce the quantity of fluid released by reducing drilling fluid pressures and/or thickening the drilling fluid in order to attempt to seal the fracture causing the release.

To further minimize the risk of a release during "punch-out" at the end of a bore, **Special Condition 16** requires Tyco to use water to lubricate the final three drill stems or pipes (approximately 100 feet) of the borehole. Prior to surfacing of the borehole on the seafloor, Tyco is to back-flush residual drilling fluids with water and dispose of them onshore, as described in the Drilling Plan. It must also use back-flushing equipment that is free of all hydrocarbons and associated contaminants (e.g., gasoline, crude, toluene, BTEX, and other HC products) for any conduit flushing (i.e., to back-flush the conduits prior to surfacing on the ocean floor and to flush in preparation for cable pulling). Tyco shall retrieve the drill bit after it emerges through the seafloor, and if product pipe is to replace the drill stem pipe for final cable casing, it shall be free of all hydrocarbons and associated contaminants.

The Commission also requires in **Special Condition 17** that Tyco implement all measures identified in the Geotechnical Investigation Report prepared by Kleinfelder Inc. (dated April 26, 2002) to minimize the risk of "frac-out" and bentonite release. If offshore monitoring is not possible due to sea or weather conditions, Tyco may continue to drill through the surf zone (the area between the outermost breaker and the limit of wave uprush) according to the procedures of Drilling Plan. However, the condition prohibits Tyco from drilling beyond the surf zone until sea conditions allow for offshore monitoring as described in Plan A of the Drilling Plan, or unless the independent monitor required by Special Condition 5, in consultation with the Executive Director, agrees that work may recommence based on a low threat of a discharge of drilling fluids. These requirements will minimize the release of bentonite or other contaminants into marine waters as the drill head emerges from the seafloor.

The Drilling Plan also includes the following monitoring and mitigation measures: (1) use of the fluorescent dye rhodamine added to the drilling fluid together with a fluorometer (a dye detector) to identify any drilling fluids released into water; (2) use of side-scan sonar assist in drilling release detection if the fluorometer detects a drilling fluid release; (3) visual monitoring and inspection onshore and offshore (by boat and with divers recording suspected releases on videotape); (4) establishment of a Decision Making Team ("DMT") that consists of the drilling contractor's superintendent, Tyco's onsite representative, and a Commission onsite representative. The purpose of the DMT is to make decisions regarding the continuation of drilling operations given certain conditions, such as adverse weather conditions. The Commission representative will have the final authority for all decisions, acting with the advice of other participants; and (5) a set of contingency and response measures, and a list of drilling fluid release response equipment to be kept onsite, to address a worst-case drilling fluid release. The Commission onsite representative for the DMT must be approved by the Executive Director according to **Special Condition 5**.

Marine Vessel Discharge

Discharge of sewage or bilge/ballast water could result from marine vessels. Federal and state regulations prohibit the discharge of sewage waste and other sanitary wastes that disperse rapidly

in the water column. Resultant water quality impacts would primarily consist of an increase in organic suspended solids and the associated biological oxygen demand. Discharge of bilge or ballast water could result in the introduction of non-native species into the local marine ecosystem.

In response to the above concerns, **Special Condition 12** requires there to be no marine discharge of sewage, bilge or ballast water, or debris from vessels either installing or repairing project cables. Tyco has also committed in its consistency certification to carry out all requirements of Special Condition 12 in federal waters to the 1,800-meter water depth.

Impacts from Terrestrial Construction Activities

Terrestrial and horizontal directional drilling construction activities at the 2nd street staging site, during installation of the ocean ground bed in Hermosa Beach, and during terrestrial cable installation have the potential to cause water quality impacts due to storm water discharges, accelerated soil erosion, and sedimentation. Tyco's Stormwater Pollution Prevention Plan dated June 12, 2002 ("SWPPP") contains many construction Best Management Practices ("BMPs") to prevent or minimize such impacts.

Erosion and sedimentation BMPs in the SWPPP include: use of sedimentation fence, ditch checks, trench plugs, terraces, seeding, matting, protection of storm drain inlets, and surface revegetation where appropriate. During construction, storm water discharges will be minimized through proper maintenance of vehicles and equipment, prohibition of leaking vehicles or equipment, proper parking and storage of vehicles and equipment, proper site cleanup and waste disposal practices, and locating waste collection areas away from drainages. During directional drilling operations, no discharge of excess material or site runoff will be allowed, and a slurry recovery tank will be used to collect recovered material. The casing pipe entry and exit points will be appropriately enclosed and equipped with a sump pump to reclaim excess slurry to a recirculation or disposal tank. Any soil that is spoiled by drilling slurry will be removed and disposed of, and the site refilled with clean material and restored to preconstruction conditions. Lastly, inspections of site conditions and BMPs will be conducted prior to anticipated storm events and during regular maintenance inspections to identify areas that may contribute to sediment discharge, and corrective actions will be taken as required.

As noted in Section 4.42, Tyco already received a 401 Certification from the Regional Water Quality Control Board. However, Tyco has submitted a revised project description and is awaiting a new or revised 401 Certification. Therefore, **Special Condition 30** requires that prior to issuance of this permit, Tyco must submit to the Executive Director evidence that the Regional Water Quality Control Board has approved a new or revised 401 Certification for the proposed project.

With the above-described prevention and response measures in place, the Commission believes that water quality will be protected, as required by §30231 of the Coastal Act.

4.5.2.6 Conclusion - Marine Resources and Water Quality

Based on the reasons discussed above, the Commission finds that the proposed project, as conditioned by Special Conditions 4, 5, 7, 9, 12-21, 26 and 30, in combination with the measures agreed to by Tyco in federal waters, will be carried out in a manner that maintains marine resources and sustains the biological productivity and quality of coastal waters and is therefore consistent with Coastal Act §30230 and 30231.

4.5.3 Oil Spills

Coastal Act §30232 states:

Protection against the spillage of crude oil, gas, petroleum products, or hazardous substances shall be provided in relation to any development or transportation of such materials. Effective containment and cleanup facilities and procedures shall be provided for accidental spills that do occur.

Because the project involves the use of ships with fuel tanks, an oil spill could occur in marine waters. Tyco estimates the reasonable worst-case spill discharge as 2,286 barrels, which represents the largest single fuel tank on board the cable-laying vessel. The risk of a spill is highest if a vessel collision occurs, or if a vessel runs aground. However, the chance of a spill occurring is very low.

While cable is laid and buried, the vessels will proceed along a predetermined, linear route, at a slow speed (0.5-1.0 knots). The opportunity for collision is remote. The vessel is also equipped with a Global Positioning System ("GPS") and other navigation systems, to further reduce the chances of a collision. To avoid subsurface navigation risks, Tyco conducted a seafloor survey to select an appropriate route that avoids high-relief rocky areas.

Coastal Act § 30232 requires an applicant to undertake measures to prevent an oil spill from occurring. To minimize the chance of a vessel collision, Tyco has committed to posting notice at least 15 days in advance of cable-laying operations, in the local U.S. Coast Guard district's *Notice to Mariners*, about the pending cable-laying operations to ensure that mariners on commercial, recreational and military vessels will have prior notice. This notification is to include information such as: the vessel name and radio call sign, size of vessel, schedule for project operations for specific areas, daily work hours of vessel operations, and 24-hour phone numbers for on-site project representatives. In addition, under the federal Submarine Cable Act (47 USC 21), fishing vessels and other ships must keep their equipment and vessels at the distance of one nautical mile from a vessel engaged in laying or repairing cable, or at least ¼ of a nautical mile from buoys intended to mark the position of a cable when being laid. The cable-laying vessel(s) will be well marked and well lighted during the night so that other mariners can see them.

Notwithstanding all efforts to avoid a collision, there is the possibility of an accident that could result in a spill. To provide protection against a spill, Tyco has developed a *Shipboard Oil Pollution Emergency Plan* as required by the U.S. Coast Guard. This document contains oil spill

preventive measures as well as procedures to be followed in the event of accidental spill. Tyco will maintain 400 feet of boom on board the cable-laying vessel, at least five bales of sorbent pads, and a small powered boat for rapid deployment to contain and cleanup any small spill or sheen on the water surface. In addition, Tyco has contracted with the Marine Spill Response Corporation ("MSRC") for on-water containment and recovery. Tyco is also currently negotiating a contract for shoreline protection and cleanup. **Special Condition 22** of this permit requires Tyco, prior to commencement of marine cable installation operations, to submit to the Executive Director a copy of a signed contract with an oil spill response organization ("OSRO") approved by the California Department of Fish and Game Office of Oil Spill Prevention and Response ("OSPR") for shoreline clean-up operations.

Tyco also is required to submit to OSPR a non-tank vessel oil spill contingency plan because its work vessel is larger than 300 gross tons (14 CCR § 825.03-827.02). **Special Condition 23** requires Tyco, prior to commencement of marine cable installation operations, to submit evidence to the Executive Director that OSPR has approved the required non-tank oil spill contingency plan for this project.

With these measures in place, and the imposition of Special Conditions 22 and 23, the Commission finds the project consistent with the requirements of Coastal Act § 30232.

4.5.4 Commercial and Recreational Fishing

Coastal Act §30234.5 states:

The economic, commercial, and recreational importance of fishing activities shall be recognized and protected.

Commercial fishing is an important component of the regional economy in southern California. The major fishing ports in the project area are San Pedro and Terminal Island at the Port of Los Angeles near Long Beach, 18 miles southeast of Hermosa Beach. Commercial fishery landings at the Port of Los Angeles in 1999 were ranked 8th by poundage (194.7 million pounds) and 16th by dollar value (\$36.1 million) nationwide. Other nearby fishing ports includes Port Hueneme, Redondo Beach, and Newport Beach. The most common fishing gear types used in the project area include trawls, trolling, longlines, purse seine, trapping, and gillnets.

The gear types with the greatest potential for interacting with cables are a bottom trawls and bottom longlines. Fishing may still occur over the cables, whether buried or unburied, but in areas where the cable is not buried (*e.g.*, over rocky substrates or on steep slopes), is insufficiently buried, or becomes exposed, and where trawling or longlining occurs, the gear may be snagged, damaged, or abandoned if the fisherman is forced to cut his gear. Fishing will also be temporarily precluded during cable installation and repair operations. The principal impacts to fishing due to the proposed project therefore are: (1) preclusion from the project area during cable installation and repair; (2) fishing gear-cable conflict or entanglement; (3) and economic losses due to fishing-cable conflicts, including preclusion and gear loss.

Statistics on the top commercial fish species caught in areas south of Point Dume complied by the California Department of Fish and Game from 1996-2000 are represented in Table 3 below.

Table 3. Top Commercial Species Fished in Areas South of Point Dume

Common Species Name	Primary Fishing Gear	Average Annual Value (\$1,000)	Percent of Total Catch Value
Market Squid	Purse seine	1,888	25.6
Sea urchin	Diving	910	12.4
Pacific Sardine	Purse seine	866	11.8
Swordfish	Drift gill net	762	10.4
Skipjack tuna	Purse seine	430	5.8
Pacific mackerel	Purse seine	422	5.7
Spiny lobster	Trap	394	5.4
Albacore tuna	Jig/bait	316	4.3
Bluefin tuna	Purse seine	217	2.9
Yellowfin tuna	Purse seine	210	2.8
Other	Various	944	12.8
Total		\$7,359	99.9

Source: E&E, Tyco EIR, based on California Department of Fish and Game catch data 1996-2000.

Recreational fishermen are less likely to experience the gear conflicts with cables because their gear, if it contacts the bottom at all, is unlikely to dig into the bottom. The majority of recreational fishing is accomplished by "jigging" or trolling baited hooks or lures, depending on the species targeted. Other recreational fishing methods include road-and-reel fishing and hoop nets. The burial of cable also renders gear or anchor contact less likely, but entanglement resulting in recreational gear loss is nevertheless possible, especially if cables are suspended or exposed in hard bottom areas. Recreational fishing in the project area mostly occurs on charter or privately owned vessels in Santa Monica Bay. Recreational fishing is seasonal in nature, with peak seasons in April-September (salmon), May-September (halibut) and September-March (spiny lobster).

California's annual commercial fishing harvest statewide is worth approximately \$550 million (5th largest in the nation), with recreational fishing worth approximately \$246 million. (Weiss, 2002) In addition, secondary economic benefits of commercial and recreational fishing are substantial, and include tourism, seafood processing and the aesthetic and visitor-drawing qualities of working fishing ports.

Fishing Closures

Commercial fishing is prohibited in Santa Monica Bay, with the exception of catching live bait, trolling, lobster trapping, and shore-based hook and line fishing. There are also two cowcod closure areas just outside Santa Monica Bay in which no commercial or recreational fishing is allowed, except nearshore rockfish species that are taken in waters less than 20 fathoms deep. No trawling is allowed within 3 miles of shore, but trawling for shrimp and prawns is permitted outside the 3-mile limit in California Department of Fish and Game districts 6, 7, 10, 17, 18, and 19. (E&E, 2001)

On June 20, 2002, the Pacific Fishery Management Council ("PFMC") ordered an emergency commercial fishing ban off much of the California coast in federal water below the 60-foot water depth of multiple species of bottom-dwelling rockfish. The ban is to begin in July 2002. Rockfish is a general term that describes approximately 83 different species of fish commonly sold as red snapper, including bocaccio, canary rockfish, and yelloweye rockfish, species whose populations have fallen to a fraction of their previous populations. Rockfish catch constitutes approximately 20% of the overall statewide commercial harvest. A final decision from the PFMC on extending this ban long-term is scheduled to take place in September 2002. The PFMC is also requesting that the State of California extend the rockfish fishing ban to California's state waters (within 3 miles of the coast) and to recreational fishing, which the California Department of Fish and Game may do in the near future. (Weiss, 2002) The rockfish fish ban may be in place for decades due to the length of time needed for depleted rockfish species' populations to recover. The ban also effectively restricts fishing of other bottom-dwelling fish species such as sand dabs and halibut because fishing for these species can result in take of rockfish caught as bycatch. (Martin, 2002)

Cable Installation and Repair Preclusion Impacts

Temporary economic impacts to trawlers and recreational fishermen may result due to preclusion during cable installation and repair. Pursuant to the federal Submarine Cable Act (47 U.S.C. 21 §24), all vessels are required to maintain a distance of at least one nautical mile from a vessel laying or repairing a cable and one-quarter mile from the buoy of a vessel intended to mark the position of a cable when being laid or out of order.⁴ Preclusion areas created by all cable installation will be temporary; the EIR estimates approximately 853.5 hours of fishing preclusion for all fish blocks, or a total of 35 days. Preclusion areas are in constant motion while the cables are being laid and/or buried during installation or repair, so there will be sufficient access to other fishing and boating areas in the project area. The EIR states that following cable surface-lay but prior to burial, the cable area will not preclude fishermen by placement of buoys; rather, a guard vessel will patrol the route where the cable is awaiting post-lay burial. The EIR states that fishermen will be advised of the presence of the unburied cable and "required to exercise due caution," but they will not be precluded from fishing a particular area where the cable is present but unburied. The primary gear type for which gear conflict with an unburied cable is a concern in the project area is trawl gear. Although trawl fishermen are not formally precluded from areas of unburied cable, the presence of unburied cable awaiting burial is nevertheless likely to constitute a *de facto* preclusion until the cable is buried. Once cables are buried, preclusion zones become ineffective, allowing unrestricted access to these areas. Preclusion impacts may also result from cable repair operations. The EIR estimates that the project cables would experience no more than 1 cable fault requiring repair per year, on average. According to the EIR, cable repair typically takes no more than one month.

To minimize potential conflicts and impacts to fishing from cable installation, operation, and repair, Tyco entered into the Southern California Cable & Fishing Agreement dated June 8, 2002

⁴ Fishermen who willfully or negligently snag and damage cables can be imprisoned or be subject a maximum fine of \$5,000 under the federal Submarine Cables Act (47 U.S.C. 21).

with the Southern California Trawlers Association, the Los Angeles Commercial Fishermen's Association, the Southern California Commercial Fishing Association, and individual fishermen not represented by a fishing association (hereinafter referred to as the "Fishing Agreement" – See Exhibit 4 for the full text). The Fishing Agreement requires the signatories to create a Cable Committee made up of representatives from the fishermen's associations and from Tyco. Section 1.2 of the Fishing Agreement requires Tyco to report to the Committee at a minimum of 30 days in advance regarding the timing and method of cable installation. The Fishing Agreement also provides for a representative of the Cable Committee to be present onboard the main cable installation vessel with onboard access to a computer and GPS equipment in order to distribute preliminary cable position information to the Cable Committee and fishermen as quickly as possible.

To address the economic impacts of preclusion from the project area, in Section 1.2(f) of the Fishing Agreement, Tyco agrees to "provide reasonable compensation to Fishermen who suffer damage as a result of the acts of installing, repairing, replacing, or maintaining of the Cable Projects, or any incidental activities in connection therewith. The amount of such compensation, as well as those entitled to receive it, shall be determined by the Cable Company, implementing guidelines approved by the Committee prior to installation." This portion of the Fishing Agreement does not specify the amount of compensation to fishermen; it allows for Cable Committee input into the quantity and recipients of the compensation through "guidelines."

In order to ensure that the Fishing Agreement is as inclusive as possible and so that fishermen who are not yet signatories to the Fishing Agreement have an additional opportunity to participate, **Special Condition 25** requires that prior to issuance of this permit, Tyco is to use diligent good faith efforts to provide written notification of the Fishing Agreement to individual commercial trawlers who are not members of the Southern California Trawlers Association, the Los Angeles Commercial Fishermen's Association, or the San Pedro Purse Seine Owners Association, but are licensed by the California Department of Fish and Game to trawl in areas traversed by the cable route. The notification, to be sent by certified mail, shall: (a) describe the proposed project (b) include a navigation chart overlaid with the exact coordinates of the proposed route, (c) contain a copy of the executed Fishing Agreement referred to in Special Condition 21, (d) explain how interested trawlers may become parties to said agreement, and (e) provide Tyco's contact information. Tyco shall allow trawlers 30 days, from the date of the notification, to respond prior to installing the cables. Tyco shall provide the Executive Director a list of trawlers contacted and those who have signed the agreement.

Special Condition 8 requires Tyco to notify fishermen of areas of exposed cable during the marine cable installation phase of the project by submitting to (a) the Executive Director, (b) the U.S. Coast Guard (for publication in a *Notice to Mariners*), and (c) the signatories of Fishing Agreement, weekly notices containing preliminary as-built coordinates of any unburied or exposed sections of cable. Tyco is also required to make radio broadcast announcements on the local fishers' emergency radio frequency that provide the current cable installation location and a toll-free number that can be called for additional information. Tyco has also committed in its consistency certification to notify fishermen of areas of exposed cable in federal waters.

To further minimize potential conflicts with fishing during cable repairs, **Special Condition 27** requires Tyco to provide notice in writing to the Executive Director and in a U.S. Coast Guard *Notice to Mariners* 15 days prior to any cable repair or maintenance activity, or as soon as possible for emergency repairs. Tyco has also agreed in its consistency certification to provide notice as required in Special Condition 27 regarding repair or maintenance in federal waters out to the 1,800-meter water depth.

Bottom Trawl-Cable Entanglement

Commercial trawlers face additional impacts due to the presence of cables on the seafloor because their bottom trawls may snag cable segments that are insufficiently buried or exposed on the seafloor. Bottom trawls are designed to maintain contact with the seafloor. As they are towed over the seafloor, a rope or chain that precedes the net opening startles prey off the ocean bottom and into the net. However, the size of the trawl boards used to spread the trawl net on the largest vessels is such that they would normally skim the surface of the seafloor with an estimated maximum penetration of 0.15 to 0.3 meters (6 to 12 inches) in the softest sediments (e.g., mud); in firmer sediments, the maximum penetration is approximately .06 meters (3.5 inches). Thus, the project's target cable burial depth of 1.0 meter provides a protection factor of over 300%.

Nonetheless, if trawl gear is snagged or cut and lost, fishermen would incur financial losses from abandoned gear and lost fishing time. Tyco estimates that Segment 4 will be laid on approximately 8.2 km of potential high-relief rocky substrate, and Segment 5 will be laid on approximately 17.1 km of potential high-relief rocky substrate. Only 27% of Segment 4 and 20% of Segment 5 out to the 1,800-meter water depth is estimated by Tyco to be buried at least 1 meter deep. Tyco also identified 7 possible cable suspension areas along Segment 4, and 11 possible suspension areas along Segment 5. According to Tyco, potential suspension heights vary from 0.25 to 1.0 meter and up to 100 meters in length. (Walter, June 12, 2002) Despite the potential for gear-cable conflict, Tyco will not ask fishermen to avoid areas of exposed or unburied cable. However, due to the potential for cable suspensions or exposures, and for damage or loss to fishing gear should it become entangled in the project cables, Tyco has agreed, through the Fishing Agreement, to compensate fishermen for 100% of the gear replacement costs, providing that the individual fisherman has followed the procedures set out in Section 1.4 of the Fishing Agreement, and to pay additional claims according to Cable Committee guidelines based on the principle of "making the fisherman whole for his economic loss resulting from the Covered Cable snag." The Fishing Agreement also contains a "Fast-Track Payment alternative" which allows for expedited reimbursement of lost gear within 15 days.

Measures to Reduce Fishing Conflicts and Economic Impacts

The proposed project's cable burial rates are relatively low. Tyco proposes to bury 43% of Segment 4 and 31% of Segment 5 to a target depth of 1.0 meter out to the 1,200-meter water depth. The amount of cable burial is important, as buried cable minimizes potential gear entanglement and resultant loss experienced by fishermen. Although the proposed project will not formally preclude fishing in unburied or exposed areas of cable, failure to achieve the target 1.0 meter burial depth, or significant areas of unburied cable, could create *de facto* areas of

fishing preclusion, especially for trawlers. However, given the recently imposed rockfish ban and the fact that rockfish has historically constituted a significant amount of the catch in several of the fish blocks along the proposed routes, trawling effort in the project area and statewide is likely decrease so significantly that trawl-cable conflicts may become much less likely.

Through the Fishing Agreement, Tyco has agreed to additional mitigation and compensation measures intended to avoid or minimize potential conflicts between Tyco and the fishing industry. Tyco has committed to the following:

- Distribute as-built cable installation information in writing, electronically, and on navigational charts of cable location and burial depth after installation to assure that accurate positions and depths are known to fishermen and other interested parties;
- Establish and fund a Cable Committee with fishermen and cable company representatives to "...reduce potential conflicts between the installation, continuation, and maintenance of the Cable Projects and commercial fishing activities along the California Coast";
- Fund and hire, through the Cable Committee, a Cable Committee Liaison Officer to carry out Cable Committee activities;
- Fund a Commercial Fishing Industry Improvement Fund in the amount of \$25,000 annually, for enhancement of commercial fisheries and the commercial fishing industry and support facilities. The funds are intended to be used for fisheries research, education, management, safety, and socioeconomic purposes;
- Establish a 24-hour hotline to take calls from fishermen who believe they have snagged their gear on Tyco's cables;
- Pay 100% of the costs of gear sacrificed by fishermen as a result of snagging cable provided 1) the fisherman has informed the 24-hour toll-free telephone hotlines of its situation; and 2) the fisherman's conduct was consistent with the Fishing Vessel Operating Procedures established in the Fishing Agreement; and pay additional claims according to Cable Committee guidelines based on the principle of "making the fisherman whole for his economic loss resulting from the Covered Cable snag";
- Pay "reasonable compensation" to fishermen economically impacted by cable installation or repair activities;
- Release any claims they might otherwise have against individual fishermen and refrain from taking any administrative, legal, or other action to sanction and/or recover damages against fishermen who comply with terms and conditions of the Fishing Agreement;
- Assume all liability, responsibility, and risk for any damage which may occur to their cables resulting from their inability to construct, maintain, place, and continue those cables in a manner which does not interfere with traditional fishing operations;
- Pay \$500 for each vessel engaged in trawl fishing in the project area that is owned or operated by a fisherman who signs the Fishing Agreement for use in upgrading communication and navigation equipment; and
- Resolve disputes with fishermen according to Dispute Resolution procedures.

The Commission is requiring in **Special Condition 24** that, in a manner consistent with the requirements of Sections 1.1(a) through 1.1(k) of the Fishing Agreement, Tyco shall comply with all deadlines for payment, reimbursement, and compensation of all expenses of the Cable Committee and Cable Committee representatives, as approved by the Cable Committee in its

Annual Budget. Tyco shall also comply with the requirement of Section 1.1(h) of the Fishing Agreement to pay the salary of the Cable Committee Liaison Officer.

To ensure that Tyco notifies expeditiously both the Commission and signatories of the Fishing Agreement of each cable's location on the seafloor, **Special Condition 9** requires Tyco within 45 days of cable installation to submit to the Executive Director and the signatories of the Fishing Agreement: (a) as-built plans in writing (Route Position List) and on alignment or strip charts depicting bathymetry, seafloor substrates or features, seabed profile, depth of cable burial below the seafloor, and cable tension; (b) electronic as-built plans (in a format to be determined by the Cable Committee established under Sections 1.1(a) through 1.1(k) of the Fishing Agreement; and (c) as-built cable plans overlaid on National Oceanic and Atmosphere Administration ("NOAA") navigation charts. For purposes of Special Conditions 9-11 of this permit, the cables will be considered installed the day after the last day of post-lay inspection burial operations. Cable locations shall be obtained by an acoustic navigation system linked to a surface differential global positioning system ("GPS"). The transponder for the acoustical navigational system shall be mounted on the equipment used for cable burial. Also, within 45 days of completing any cable repair or maintenance work, Tyco is to submit to the Executive Director and the signatories of the Fishing Agreement updates of items "(a)-(c)" above. Tyco has also agreed in its consistency certification to submit as-built plans as described in Special Condition 9 for the cables located in federal waters out to the 1,800-meter water depth.

Special Condition 10 requires Tyco within 60 days of cable installation to submit to the Executive Director: (a) the as-built plan and profile of the cable conduits; (b) a cable installation report; and (c) an operations report describing any cable post-installation activities, including routine or non-routine post-lay surveys, repair activities, and cable inspection activities. The cable installation report shall include, at minimum, the following: (i) a summary of pre-lay and installation operations; (ii) an as-laid position list with definitions for acronyms, time reference and locations of course alterations, repeaters and splice boxes. The information shall include: date, time, event, latitude, longitude, depth, incremental route distance, and any route deviations; (iii) a description of cable laying and burial equipment, and cable installation methods used; (iv) navigational and slack control equipment and methods; (v) identification of any areas of cable suspension greater than 1.0 meter from the seafloor; (vi) daily vessel reports and daily operations log; (vii) any additional acoustic, sub-bottom profile or other geophysical data generated that had not been previously submitted to the Executive Director; (viii) an evaluation of the consistency of cable installation with the project description and applicable special conditions of this permit; and (ix) a description of fishing activity during the pre-lay and cable installation project phases. Tyco has also agreed in its consistency certification to submit a cable and conduit installation report as required in Special Condition 10 for the cables located in federal waters out to the 1,800-meter water depth.

The Commission is also requiring in **Special Condition 18** that every 18 to 24 months for the life of the project, Tyco is to survey the cable route to verify that the cables have remained buried consistent with the as-built cable burial plan required by Special Condition 9. The survey shall be conducted with a remotely operated vehicle ("ROV") equipped with video and by a party approved by the Executive Director. Within 30 days of survey completion, Tyco shall submit to the Executive Director a report describing the results of the survey (including example

still images) and a copy of the videotape(s) recorded during the cable survey. The videotape(s) shall include a display that identifies the date, time, position, water depth, and heading of the ROV. If the survey shows that a segment(s) of the cable is no longer buried consistent with the as-built cable burial plan required by Special Condition 9, Tyco shall, within 30 days of survey completion, submit to the Executive Director for approval a plan to re-bury those cable segments. Upon approval of the plan by the Executive Director, Tyco shall proceed to implement the plan in accordance with the time schedule specified.

To ensure up-to-date navigational charts are available to the public and to the fishing industry, **Special Condition 11** requires Tyco within 60 days of cable installation and any cable segment re-route to submit to the National Oceanic and Atmospheric Administration ("NOAA") the following items: (a) geographic coordinates of the cable as-built plans using a Differential Geographic Positioning System ("DGPS") unit or comparable navigational equipment; and (b) Tyco's point of contact and telephone number. Tyco has also agreed in its consistency certification to submit geographic coordinates of cables as required by Special Condition 11 for the cables located in federal waters out to the 1,800-meter water depth.

Within 90 days of taking either a cable out of service or after the expiration or sooner termination of Tyco's City of Hermosa Beach lease(s) or permit(s), the Commission is also requiring Tyco in **Special Condition 21** to apply for an amendment to this permit to remove the cables from the territorial waters of the State of California. Upon approval by the Commission of the permit amendment, Tyco is to implement the cable removal project authorized by the amendment in accordance with the time schedule specified therein. In addition, Tyco has agreed as part of its consistency certification to apply to the ACOE within the same timeframe described in Special Condition 21 to remove from federal waters out to the 1,800-meter water depth: (1) unburied (exposed) cable segments located in water depths less than 1,000 meters; (2) unburied (exposed) cable segments located in active fishing areas; and (3) any buried cable segments that over the life of the cable have become exposed, and were subsequently re-buried, and are located in active fishing areas or water depths less than 1,000 meters. Tyco agrees that within 6 months of obtaining its consistency certification from the Coastal Commission and its permit from the ACOE to remove the cable segments, it will commence cable removal operations.

With the above-described measures in place, in combination with Special Conditions 7, 8, 9, 10, 11, 18, 21, 24, 25, 27 of the permit, Commission believes the project will be carried out in a manner that the economic and commercial importance of fishing activities will be protected as required by Coastal Act §30234.5. The project is therefore consistent with Coastal Act §30234.5.

4.5.5 Public Access and Recreation

Coastal Act §30211 states that:

Development shall not interfere with the public's right of access to the sea where acquired through use or legislative authorization, including, but not limited to, the use of dry sand and rocky coastal beaches to the first line of terrestrial vegetation.

Coastal Act §30220 states:

Coastal areas suited for water-oriented recreational activities that cannot readily be provided at inland water areas shall be protected for such uses.

Proposed project activities may result in short-term disruption to recreational boaters and beach users.

During marine cable installation, recreational fishers and other boaters must avoid the cable installation ship. Pursuant to the federal Submarine Cable Act (47 U.S.C. 21), the master of any vessel must keep a distance of at least one nautical mile from a vessel engaged in laying or repairing a cable and at least ¼ of a mile from buoys intended to mark the position of a cable when it is being laid. Therefore, the project may cause recreational vessels to change their course. However, the preclusion zones created by cable installation and repair activities will be temporary or in constant motion as the cables are being laid and/or buried so there will be sufficient access to other fishing and boating areas in the project area. Moreover, once the cables are laid, full access will be restored. Because of the short-term nature of the preclusion zones, the disruption of fishing and boating is not significant.

Notwithstanding the above, to minimize any potential conflicts with recreational boating, fishing or diving activities, at least two weeks prior to commencement of cable-laying activities, Tyco will file an advisory of pending offshore construction operations (including all vessel activities, work locations, schedules, name and radio call signs of all working vessels) with the local U.S. Coast Guard district office for publication in the local *Notice to Mariners*. Tyco will provide this same information to the U.S. Navy, Department of Conservation, the cities of Hermosa Beach and Redondo Beach, and the Coastal Commission. During cable installation, Tyco also will submit written update notices every two weeks. To further minimize potential conflicts with fishing during cable repairs, **Special Condition 27** requires Tyco to provide notice in writing to the Executive Director and in a U.S. Coast Guard *Notice to Mariners* 15 days prior to any cable repair or maintenance activity.

The onshore installation of an ocean ground bed and HDD activities may inconvenience beach users in the short-term. Installation under the beach of an ocean ground bed (seven anodes spaced 10-feet apart) will require five days of work. For this five-day period, approximately 40,000 square feet of beach area (100' by 40'), located about 100 feet west of the Strand (between 2nd and 3rd Streets) will be fenced off and unavailable to beach users.

HDD activities, estimated to take 4-6 weeks to complete, will be undertaken at the base of 2nd Street in Hermosa Beach, at a site located on a city street and off the beach. Accordingly, the HDD phase of the project will not displace beach users. Pedestrian access to the beach and the Strand will be maintained at all times. However, six public parking spaces located on 2nd Street will be precluded for the drilling period. The City of Hermosa Beach is requiring Tyco to develop a Traffic and Parking Management Plan to include in-kind alternative parking close by.

Directional drilling activities also could generate noise that could interfere with the recreational experience of beach users. Ambient daytime noise measurements on the beach range from 52-to

57 dBA. The two primary sources of noise are the drill rig and the mud system. Tyco estimates uncontrolled drilling noise levels to be 88 dBA at 50 feet from the drill site. To reduce noise levels by 10-15 dBA, Tyco is proposing to install a sound barrier wall, enclose the drill and pump engines, and use a muffler on the rig and pump exhaust. To further minimize any impacts to beach users due to project activities, the Commission is prohibiting in **Special Condition 28** onshore project construction (*i.e.*, directional drilling activities, and installation of the ocean ground bed and installing cable in the streets) during Redondo Beach and Hermosa Beach's peak beach use season, Memorial Day weekend through Labor Day.

With these above-described measures in place, the Commission believes that any project-related impacts to public access and beach users will be minimal and therefore finds the project consistent with Coastal Act § 30211 and 30220.

4.5.6 Cultural Resources

Coastal Act §30244 states:

Where development would adversely impact archaeological or paleontological resources as identified by the State Historic Preservation Officer, reasonable mitigation measures shall be required.

Historic and cultural resources are places or objects that possess historical, cultural, archaeological or paleontological significance and include sites, structures, or objects significantly associated with, or representative of earlier people, cultures and human activities and events. Of concern here is the potential for project-related activities to disturb or damage Native American artifacts and shipwrecks of potential cultural resources value. According to the EIR, very little formal archeological work has been conducted in the project area, and because of this lack of study, any prehistoric cultural resources discovered may be significant. Disturbance of surface and subsurface soils could directly destroy a previously unrecorded historic or archaeological resource, including human remains, or disrupt the site such that the historic or archaeological context of the resource is altered adversely.

Onshore

The segment of project located within the Commission's permit jurisdiction includes laying about 3,100 feet of cable under city streets. The EIR identifies two archeological sites containing mapped prehistoric resources within a half-mile radius of this onshore project corridor.

Although Tyco does not expect to encounter cultural resources during its cable-laying activities, it is required as part of its City of Hermosa Beach-approved Precise Development Plan/Planned Development Permit No. 01-10 to implement a number of mitigation measures to address cultural resources of potential significance that may be encountered during onshore construction activities. Tyco will have a qualified archaeologist monitor all *onshore* construction activities wherever soil-disturbing activities are undertaken. The archaeologist will record and inspect any prehistoric or historic archaeological materials that may be encountered. In the event of

unanticipated discoveries, Tyco will develop a salvage plan in consultation with Native American monitors and the City of Hermosa Beach. If human remains are discovered, Tyco will cease work immediately in and near the site, and a coroner and Native American representative will be contacted. No work will resume until authorized by the City of Hermosa Beach.

Offshore

Historically, Native Americans in the project vicinity used a wide range of watercraft for transportation and to obtain resources. Because human occupation of the Santa Barbara Channel Islands has occurred for perhaps the last 13,000 years, contact between these islands and the mainland coast would have required the use of watercraft. Some vessels presumably may have been inundated, stranded, or capsized in the project vicinity.

Although most of the recorded offshore finds of prehistoric artifacts are located in the Santa Barbara Channel and San Diego areas, several offshore discoveries of prehistoric artifacts have been made in and around the project area in the Santa Monica bay. Three vessels and a metate have been found near Redondo Beach. North of the project area at Little Point Dume, three vessels have been recovered.

In September 2001, Tyco undertook an underwater archeological remote sensing survey of the proposed marine cable routes to identify and inventory marine cultural resources that may be present along the marine route. Tyco identified the presence of 12 shipwrecks of possible cultural resource value within or near the project area. The State of California Historical Resources Commission or the U.S. Army Corps of Engineers may consider a vessel built prior to 1950 to be "culturally significant." Tyco designed its final cable marine routes so as to avoid by 100 meters these potential cultural resources.

The marine survey data also revealed five buried and filled channels, areas that could be sensitive locations for prehistoric artifacts. However, the EIR concludes that any prehistoric resources present in these channels would be protected by several meters of sediment and would not be impacted by cable-laying activities. No finds of prehistoric artifacts or other remains were encountered along the seafloor of the cable corridor. If Tyco discovers artifacts during its pre-lay grapnel runs (*i.e.*, removal of debris along each cable route), the location coordinates shall be recorded and a marine archaeologist will be notified immediately to investigate the find. If the discovery is determined by the marine archaeologist to be a potential significant cultural resource, Tyco will modify the cable route at that location to avoid the resource.

The Commission finds that with these measures in place the project will not adversely impact a cultural resource and is therefore consistent with Coastal Act § 30244.

4.5.7 Air Quality

Coastal Act §30253(3) states:

New development shall:

(3) Be consistent with the requirements imposed by an air pollution control district or the State Air Resources Control Board as to each particular development.

For regulatory purposes, air pollutants are generally recognized as "criteria pollutants" or as toxic air pollutants. Criteria pollutants include carbon monoxide ("CO"), nitrogen oxide ("NO_x"), sulfur dioxide ("SO₂"), particulate matter with a diameter of up to 10 microns ("PM₁₀"), lead and sulfates. Toxic air pollutants are those known or suspected to cause cancer, genetic mutations, birth defects, and other serious illness to people. Reactive organic gases ("ROG") are also of concern because of their role in forming ozone, a secondary pollutant. The U.S. Environmental Protection Agency and California Air Resources Board establish federal and State pollutant standards, respectively.

Air quality at a given location is described by the concentration of pollutants in the atmosphere. Concentration units are expressed in parts per million or micrograms per cubic meter. The significance of a pollutant concentration is determined by comparing the concentration to an appropriate air quality federal and/or State ambient air quality standard. The ambient air quality standards represent the allowable atmospheric concentrations at which public health and welfare are protected.

The South Coast Air Basin, including Hermosa Beach, has some of the worst air quality in the United States. This is due to many factors, but mainly because of the large population and geographical and climatic factors that inhibit atmospheric dispersion of pollutants. The South Coast Air Basin does not attain federal and State ambient air quality standards for ozone (O₃), CO and PM₁₀. The Los Angeles area is designated an extreme ozone non-attainment area under the 1990 Clean Air Act.

The South Coast Air Quality Management District ("SCAQMD") is responsible for implementing federal and state air quality standards at the Hermosa Beach landing. As part of the plan to attain the State and federal standards, the SCAQMD developed emission thresholds to determine the significance of proposed emissions under the California Environmental Quality Act.

The SCAQMD will not require a permit for the proposed project. However, the EIR and Addendum conclude that proposed project will exceed the SCAQMD daily threshold for NO_x. According to Tyco, terrestrial construction activities will exceed the SCAQMD daily threshold for NO_x for approximately 15.8 days, and marine activities in State waters will exceed the daily threshold for NO_x for approximately 6 days. Tyco estimates that the total amount of emissions over the daily threshold during the duration of the entire project is 3,239.9 pounds. The mitigation measures identified in the project EIR and Addendum, as adopted by the City of Hermosa Beach, require Tyco to acquire emission credits for exceeding the project's daily NO_x

threshold. **Special Condition 29** requires Tyco, prior to permit issuance, to submit to the Executive Director evidence that the City of Hermosa Beach has approved Tyco's proposal to offset NO_x emissions.

In addition, the California Air Resources Board will require permits from its Portable Equipment Registration Program for all portable construction equipment with an engine greater than 175 horsepower that is used on marine vessels for the proposed project. Tyco will need to obtain permits for portable construction equipment greater than 175 horsepower. Therefore, **Special Condition 29** also requires Tyco, prior to permit issuance, to submit to the Executive Director evidence that the California Air Resources Board has approved all necessary permits for portable construction equipment greater than 175 horsepower.

In addition, Tyco will implement a number of best management practices to reduce project emissions. Best management practices include: (a) fuel injection timing retard of 2° on diesel-powered vessel engines; (b) use of low-sulfur diesel fuel or acquisition of emission credits for SO₂ emissions that exceed SCAQMD threshold limits; and (c) ongoing comprehensive equipment and diesel engine maintenance to reduce CO emissions. To ensure that fugitive dust that may be released during excavation activities does not result in a significant impact, SCAQMD Rule 403 for fugitive dust requires implementation of at least one control measure applicable to earth-moving activities. These measures can include use of water on uncovered soil stockpiles, or cleaning vehicle tires to limit amount of dirt tracked on streets.

According to the EIR, these measures, together with the purchase of offsets, will reduce the project's potential air quality impacts to less than significant levels. The Commission thus finds that the proposed project, as conditioned, will be carried out consistent with the rules and requirements of the local air district and therefore is consistent with Coastal Act §30253(3).

4.5.8 Geology

Coastal Act §30253(2) states that:

New development shall:

(2) Assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs.

Geologic conditions vary widely along the terrestrial cable route, at Hermosa Beach and along the HDD bore trajectory, and along the submarine cable routes. The terrestrial portion of the cable route ranges in slope from level to gently sloping and is underlain by beach and dune sands. The onshore portions of the project do not cross any active fault, although the region is subject to strong ground shaking from faults in the region. Liquefaction of the unconsolidated beach sands may be expected during severe ground shaking. Extrapolating from an exploratory 150-foot bore near the proposed HDD bore site at Hermosa Beach, the proposed HDD bore trajectory consists of sand, gravel, and cobbles of varying densities.

Liquefaction of the upper several meters of sediments on the sea floor, in which the cable is to be installed, is possible at various locations. The bulk density of the fiber optic cable is greater than that of the liquefied sediments, and so the cable may be expected to sink within the liquefied sediments. Such sinking will serve to bury the cable to a greater depth than its installation depth, and may remove some cable slack and increase cable tension.

Tyco selected the two marine cable routes to avoid several significant geologic features that could impact the cable, including submarine canyons, unstable substrates, and rocky substrates. From the HDD "punch-out" location offshore, the marine cables pass through gravel areas through which petroleum seeps may occur, and then through sandy and clayey sediments in Santa Monica Bay. After descending the slope of the Santa Monica Basin (where the potential for liquefaction exists), the marine routes cross other ridges and basins, that alternately are underlain by soft and firm sediments and bedrock; ridges contain bedrock outcrops and firm sediments, and basins are floored by soft to firm sediments. Toward the western end of the routes, the routes cross the Patton Ridge and the steep, rocky Patton Escarpment, which marks the edge of the continental shelf. (See Exhibit 5, Depth Profile Chart)

The marine routes may cross three active fault zones: the Santa Cruz-Catalina Ridge Fault Zone, the San Clemente Fault Zone, and the Palos Verdes Fault Zone. Movement along any of these faults may result in rupture of the sea floor, and has the capacity to impact the cables.

Stability of Landing Site

There are no significant concerns with the geological stability of the landing site at Hermosa Beach in terms of shoreline retreat associated with coastal erosion or sea level rise, since there is no coastal bluff present at Hermosa Beach. Further, Tyco submitted a sand migration study demonstrating that the beach at Hermosa Beach has been stable or accreting over the past 40 years. Storm events do reduce the width of the beach, but have never approached the landing site, located east of The Strand. Hermosa Beach is approximately 100 meters wide, with a gradual slope to the shoreline. No active faults are crossed by or are located within one mile of the terrestrial portion of the project, although the Palos Verdes Fault Zone is located approximately two miles south of Hermosa Beach. The beach dune areas located at Hermosa Beach have liquefaction potential, but this area is not identified as being prone to earthquake-induced landslides. The proposed HDD bore depth of 100 feet under the seafloor avoids all such potential geological risks at the landing site.

Geologic Processes and the Submarine Cable

The safety of the submarine cables along their routes offshore is of concern because, as described in the Marine Resources Section 4.5.2, repair operations have the capacity to adversely impact marine organisms. Accordingly, the Commission must find that the cable can be maintained without adversely affecting the marine environment. In practice, this means that the potential for breaks in submarine cables should be minimized. Given submarine currents present on the continental shelf, burial to the 1.0-meter depth may not be sufficient to prevent exposure of the cable by scouring. Further, the relatively steep slopes (up to 15 %) on which the cables are to be

installed could be subject to slumping and/or sliding, which could expose or break the cables. Exposure of the cable on the seafloor could subject it to damage by anchoring or trawling operations. Therefore, **Special Condition 18** requires that every 18 to 24 months for the life of the project, Tyco shall survey the portion of the cable route from the mean high tide line to the seaward limit of the territorial waters of California to verify that the cables have remained buried consistent with the as-built cable burial plan required by **Special Condition 9**. The survey shall be conducted with a remotely operated vehicle ("ROV") equipped with video and still cameras and by a third party approved by the Executive Director. Within 30 days of survey completion, Tyco shall submit to the Executive Director a report describing the results of the survey. If the survey shows that a segment(s) of the cable is no longer buried consistent with the as-built cable burial plan required by Special Condition 9, Tyco shall, within 30 days of survey completion, submit to the Executive Director for approval a plan to re-bury those cable segments.

Table 4. Summary of Burial Feasibility in State and Federal Waters

Expected Burial	South Route (4)		North Route (5)	
	Distance	% of Route	Distance	% of Route
In State Waters				
Burial \geq 1 meter	2.5 nm (4.7 km)	78	2.4 nm (4.4 km)	77
Burial may be < 1 meter	0.7 nm (1.3 km)	22	0.7 nm (1.3 km)	23
Total in State Waters	3.2 nm (6.0 km)	100	3.1 nm (5.7 km)	100
In Waters Less than 1,200 Meters in Depth				
Burial \geq 1 meter	38.4 nm (71.2 km)	43	29.5 nm (54.6 km)	31
Burial may be < 1 meter	21.7 nm (40.2 km)	24	46.1 nm (85.4 km)	49
Burial difficult and may not be possible in certain areas	28.7 nm (53.1 km)	32	19.4 nm (36.0 km)	20
Total <1,200 meters	88.8 nm (164.5 km)	100	95.0 nm (176.0 km)	100
In Waters Between 1,200 and 1,800 Meters in Depth				
Burial not proposed	53.6 nm (99.3 km)	100	49.5 nm (91.7 km)	100
In All Waters Less than 1,800 Meters in Depth				
Burial \geq 1 meter	38.4 nm (71.2 km)	27	29.5 nm (54.6 km)	20
Burial may be < 1 meter	21.7 nm (40.2 km)	15	46.1 nm (85.4 km)	33
Burial difficult and may not be possible in certain areas	28.7 nm (53.1 km)	20	19.4 nm (36.0 km)	13
Surface Lay deeper than 1,200 meters	53.6 nm (99.3 km)	38	49.5 nm (91.7 km)	34
Total < 1,800 meters	142.4 nm (263.8 km)	100	144.5 nm (267.7 km)	100

Note: nm = nautical miles; km = kilometers

Source: Tyco Burial Feasibility Study, 2002.

With previous fiber optic cable projects, a second significant area of concern was that proposed cable routes crossed submarine canyons, which often precluded cable burial due to hard bottom substrate conditions. In addition, some submarine canyons carry high-velocity periodic turbidity water currents that have historically been the cause of submarine cable breaks in various parts of the world. However, the proposed submarine cable routes have been chosen so as to not cross submarine canyons. The Commission's staff geologist has determined that submarine canyons are not a significant risk for cable breakage in the proposed project.

Slope and Burial Feasibility

Another geological concern is the burial feasibility given substrate types present in the proposed submarine cable routes. One of the primary factors in determining burial feasibility is the slope of the seafloor, and the EIR cites a burial feasibility study prepared by Tyco which estimates that 10.1% of the southern cable route (Segment 4) and 15% of the northern cable route (Segment 5) may be on steep slopes (defined as 15% downslope or 8% cross-slope) that may preclude burial for reasons of technical infeasibility. Table 4 summarizes the estimated burial feasibility for the proposed project in state and federal waters.

Potential Impacts Related to Horizontal Directional Drilling Activities

One of the primary geologic concerns related to the proposed project is that horizontal directional drilling operations could result in release of drilling fluids (bentonite) into the nearshore or marine environment. Most likely is the release of bentonite through fractured bedrock and sediments, or as a result of a "frac-out," in which the drilling bore creates fractures that extend to the seafloor as a result of drilling fluid pressures that exceed the strength of the rocks or sediments being drilled. Such inadvertent release of drilling fluid to the seafloor results from drilling through brittle, fractured and/or poorly consolidated rocks or sediments, the maintenance of too-high fluid pressures in the bore during drilling, and drilling at too shallow a depth below the seafloor.

The primary methods for prevention of release of drilling fluid into the marine environment are: 1) drill in geologic strata that contain few fractures and are least susceptible to "frac-out"; 2) carefully monitor the level and pressure of drilling fluid and stop drilling when these levels fall below prescribed minimum values (to seal and grout fractures); and 3) replace drilling fluid with water whenever conditions permit, especially as the drill bit is brought up to the seafloor at the end of the bore.

With regard to the first method of prevention, the Commission's staff geologist has determined that the proposed HDD bore trajectory 100 feet under the seafloor is a near-optimum bore given site-specific geotechnical characteristics. Geotechnical samples taken at Hermosa Beach showed that subsurface material consists primarily of dense sands with silts and gravels. It is possible that, in the event of drilling fluid release, some of the drilling fluids would never reach the surface given the relatively permeable and absorptive substrate type. Drilling fluids could also fail to reach the surface if geological fractures are lateral and subterranean. In addition, Tyco has proposed to drill at 100 feet under the seafloor, where lower porosity and greater overburden pressure should help contain drilling fluids.

Tyco's Drilling Fluid Release Monitoring Plan for Horizontal Directional Drilling ("Plan") establishes several prevention and mitigation measures, including: monitoring for a sudden and complete loss of drilling fluid returns; use of a fluorescent tracing dye called rhodamine and a fluorometer for dye detection; visual inspection from onshore, by boat, and by divers using an underwater video system to identify and determine drilling fluid release; and use of a side scan sonar towed by the boat monitor. The Plan establishes a Decision Making Team ("DMT") that consists of the drilling contractor's superintendent, Tyco's onsite representative, and a Coastal

Commission representative as required in Special Condition 5 (referred to in the Plan as the "agency onsite representative." The purpose of the DMT is to make decisions regarding the continuation of drilling operations given certain conditions, such as adverse weather conditions. The agency onsite representative has the final authority for all decisions, acting with the advice of other participants. With these prevention and mitigation measures in place, the risk of a drilling fluid release is significantly reduced. In addition, the Plan contains a set of contingency and response measures to address a worst-case drilling fluid release, which further reduces the risk that a drilling fluid release would harm the marine environment.

To further minimize the risk of a release during "punch-out" at the end of a bore, **Special Condition 16** requires Tyco to use water to lubricate the final three drill stems or pipes (approximately 100 feet) of the borehole. The condition also requires that prior to surfacing of the borehole on the seafloor, Tyco shall back-flush residual drilling fluids with water and dispose of them onshore, as described in the Drilling Plan. Tyco must also use back-flushing equipment that is free of all hydrocarbons and associated contaminants (*e.g.*, gasoline, crude, toluene, BTEX, and other HC products) for any conduit flushing (*i.e.*, to back-flush the conduits prior to surfacing on the ocean floor and to flush in preparation for cable pulling). Tyco shall retrieve the drill bit after it emerges through the seafloor, and if product pipe is to replace the drill stem pipe for final cable casing, it shall be free of all hydrocarbons and associated contaminants.

In addition, the Geotechnical Investigation Report prepared by Kleinfelder Inc. for Tyco on April 26, 2002 makes technical recommendations for mitigation measures that will minimize the risk of "frac-out" and bentonite release. The recommendations include mitigation measures such as: monitoring of drilling fluid returns in order to minimize fluid loss; procedures that the contractor should follow while drilling such as rapid achievement of the 100-foot drilling depth and use of a mud motor; re-establishment of circulation at the beginning of each day of drilling; length of circulation time needed to allow drilling fluids to stabilize the borehole; drilling fluid selection recommendations; and selection of an experienced, specialty drilling contractor. The Commission is requiring in **Special Condition 17** that Tyco follow all recommendations made in the Kleinfelder report to minimize or avoid "frac-out" and bentonite release. Special Condition 17 also prohibits Tyco from drilling beyond the surf zone until sea conditions allow for offshore monitoring, or unless the Coastal Commission monitor required by Special Condition 5, in consultation with the Executive Director, agrees that work may recommence based on a low threat of a discharge of drilling fluids.

With the imposition of Special Conditions 16 and 17, the Commission finds the proposed project will not contribute to "structural instability" and is therefore consistent with §30253(2) of the Coastal Act.

4.6 California Environmental Quality Act

As "lead agency" under the California Environmental Quality Act ("CEQA"), the City of Hermosa Beach on December 18, 2001 certified an environmental impact report ("EIR") and approved a lease for the proposed project. On June 11, 2002, the City of Hermosa Beach certified an Addendum to the EIR that covers HDD activities.

The Commission's permit process has also been designated by the State Resources Agency as the functional equivalent of the CEQA environmental impact review process. The Commission's permit review process identified numerous impacts that were not resolved in the mitigated negative declaration. Pursuant to section 21080.5(d)(2)(A) of the CEQA and section 15252(b)(1) of Title 14, California Code of Regulations (CCR), the Commission may not approve a development project "if there are feasible alternatives or feasible mitigation measures available which would substantially lessen any significant adverse impact which the activity may have on the environment." The Commission finds that only as conditioned are there no feasible less environmentally damaging alternatives or additional feasible mitigation measures that would substantially lessen any significant adverse impact which the activity may have upon the environment, other than those identified herein. Therefore, the Commission finds that the project as fully conditioned is consistent with the provisions of the CEQA.

APPENDIX A: STANDARD CONDITIONS

1. Notice of Receipt and Acknowledgment. The permit is not valid and development shall not commence until a copy of the permit, signed by the permittee or authorized agent, acknowledging receipt of the permit and acceptance of the terms and conditions, is returned to the Commission office.
2. Expiration. If development has not commenced, the permit will expire two years from the date on which the Commission voted on the application. Development shall be pursued in a diligent manner and completed in a reasonable period of time. Application for extension of the permit must be made prior to the expiration date.
3. Interpretation. Any questions of intent of interpretation of any condition will be resolved by the Executive Director or the Commission.
4. Assignment. The permit may be assigned to any qualified person, provided assignee files with the Commission an affidavit accepting all terms and conditions of the permit.
5. Terms and Conditions Run with the Land. These terms and conditions shall be perpetual, and it is the intention of the Commission and the permittee to bind all future owners and possessors of the subject property to the terms and conditions.

APPENDIX B: SUBSTANTIVE FILE DOCUMENTS

Coastal Development Permit Application Materials

Application for Coastal Development Permit E-01-029 dated October 25, 2001, as amended on December 26, 2001, May 15, 2002, and June 17, 2002.

Brungardt Honomichi & Company, P.A. *Drilling Fluid Release Monitoring Plan for Horizontal Directional Drilling*, June 6, 2002

Kleinfelder Inc. *Geotechnical Investigation Report, Tyco Telecommunications Proposed Fiber Landing 2nd Street and Beach Drive, Hermosa Beach, California*, April 26, 2002.

Coastal Frontiers Corporation. *Beach Stability Evaluation for a Fiber Optic Cable Landing at Hermosa Beach, California*, January 4, 2001.

Drew, Steve and Catherine Creese, Tyco Telecommunications. *Route Specific Burial Engineering: Tyco Cable Burial to 1,200 meters in Southern California*, March 20, 2002.

Tyco Networks. *Anchoring Plan* (revised), June 21, 2002.

Tyco Networks. *Burial Feasibility Summary*, June 18, 2002.

Agency Permits and Orders

California Regional Water Quality Control Board, Los Angeles Region, Clean Water Act Section 401 Water Quality Certification 01-125, issued March 1, 2002.

City of Hermosa Beach, Precise Development Plan/Planned Development Permit No. 01-10, approved December 18, 2001, amended June 11, 2002.

City of Hermosa Beach, Fiber Optic Cable Easement and Associated Construction Easement, approved December 18, 2001.

Environmental Documents/Reports

Ecology and Environment (E&E) for the City of Hermosa Beach. *Draft Environmental Impact Report, prepared for the Tycom Transpacific Fiber Optic Cable and Hermosa Beach Landing Project*, September 2001.

Ecology and Environment (E&E) for the City of Hermosa Beach. *Final Environmental Impact Report, prepared for the Tycom Transpacific Fiber Optic Cable and Hermosa Beach Landing Project*, November 2001.

Harvey, James T., Moss Landing Marine Laboratories. *Second Report Regarding the Injured Gray Whale off Morro Bay*, January 25, 2001.

Published Articles and Reports

Cacchione, Drake, Field, and Tate. *Sea-floor gouges caused by migrating gray whales off northern California*, Continental Shelf Research, Vol. 7, No. 6, pp. 553-560.

Heezen, B.C. *Whales entangled in deep sea cables*. Deep-Sea Research 4:105-115. 1957.

Martin, Glen and Carol Ness. *Sea of anxiety over rockfish ban: Fishermen, distributors, coastal towns brace for hard times as species recover*, San Francisco Chronicle, June 21, 2002.

Minerals Management Service, Department of the Interior. *Gray Whale Monitoring Study: Final Report*, prepared by MBC Applied Environmental Sciences, August 1989.

Rampal, G. *Undersea Fiber-Optic Cable Systems Undergoing Unprecedented Growth*, Sea Technology, Vol. 39, No. 3, 10-19, 1998.

Weiss, Kenneth. *Commercial Fishing Banned Off California*, Los Angeles Times, June 21, 2002.

Other

Electronic communication from Rich Walter, Jones & Stokes, to Marina Cazorla, California Coastal Commission, Memo Re: Potential Reroute and Substrates Crossed, dated May 24, 2002, with attachments.

Electronic communication from Rich Walter, Jones & Stokes, to Marina Cazorla, California Coastal Commission, dated June 3, 2002, with attachments.

Electronic communication from Rich Walter, Jones & Stokes, to Marina Cazorla, California Coastal Commission, dated June 6, 2002.

Electronic communication from Eric Baker, Tyco Networks, to Alison Dettmer, California Coastal Commission, Re: Marine Cultural Resources, dated June 11, 2002.

Electronic communication from Eric Baker, Tyco Networks, to Alison Dettmer, California Coastal Commission, Re: Spill Plans, dated June 11, 2002.

Electronic communication from Rich Walter, Jones & Stokes, to Alison Dettmer and Marina Cazorla, California Coastal Commission, Re: Response to Rocky High Relief Question, dated June 12, 2002, with attachments.

Electronic communication from Eric Baker, Tyco Networks, to Marina Cazorla, California Coastal Commission, Re: Terrestrial Construction Staging Area, dated June 12, 2002.

Electronic communication from Eric Baker, Tyco Networks, to Alison Dettmer, California Coastal Commission, Re: Marine Cultural Resources, dated June 13, 2002.

Electronic communication from Rich Walter, Jones & Stokes, to Marina Cazorla, California Coastal Commission, Re: grapnel & estimated area of disturbance, dated June 20, 2002.

Electronic communication from Rich Walter, Jones & Stokes, to Marina Cazorla, California Coastal Commission, Re: soft substrate disturbance area estimates, dated June 21, 2002.

Electronic communication from Catherine Creese, Tyco Networks, to Marina Cazorla, California Coastal Commission, Re: anchoring plan text, dated June 21, 2002, with Anchoring Plan attached.

Letter from Rich Walter, Jones & Stokes, to Marina Cazorla, California Coastal Commission, dated December 21, 2001.

Letter from Rich Walter, Jones & Stokes, to Marina Cazorla, California Coastal Commission, dated February 15, 2002, with attachments.

Letter from Rich Walter, Jones & Stokes, to Marina Cazorla, California Coastal Commission, dated April 29, 2002.

Letter from Rich Walter, Jones & Stokes, to Marina Cazorla, California Coastal Commission, dated May 14, 2002.

Letter from Christina Fahy, National Marine Fisheries Service, to Joshua Burnham, Army Corps of Engineers, dated May 17, 2002.

Letter from Ronald Armstrong, Tyco Networks, to Marina Cazorla, California Coastal Commission, Re: J&S Memo/email of 24 May re: Potential Reroute and Substrates Crossed, dated June 17, 2002.

Letter from Ronald Armstrong, Tyco Networks, to Alison Dettmer, California Coastal Commission, Re: Tyco Networks (US), Inc., Federal Consistency Certification for the Tyco Transpacific Cable Project, dated June 26, 2002.

Memorandum from Rich Walter, Jones & Stokes, to Alison Dettmer and Marina Cazorla, California Coastal Commission, Re: Air Quality Mitigation, dated June 25, 2002.

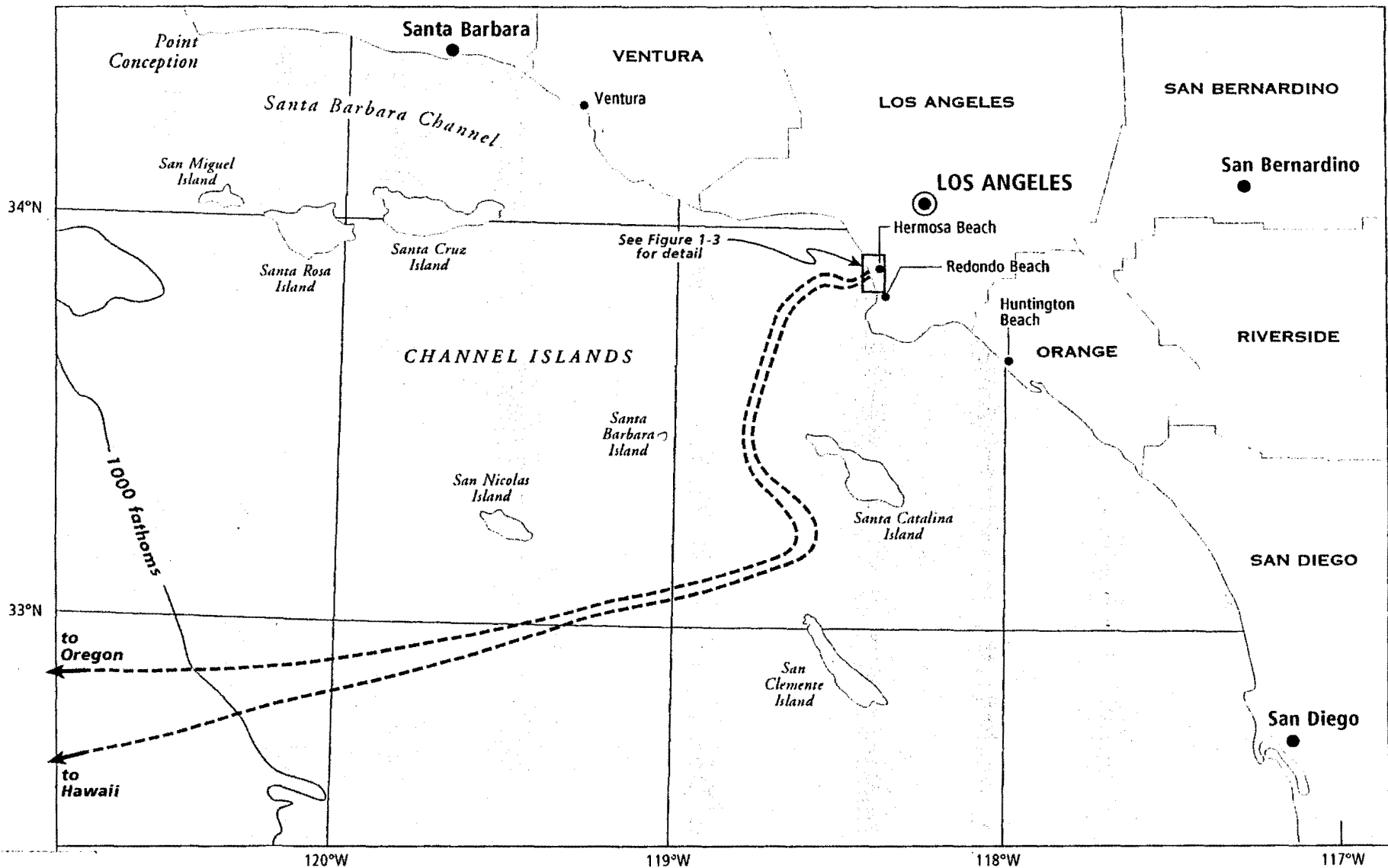


EXHIBIT NO. 1
 APPLICATION NO.
 E-01-029 & CC-111-



----- Proposed offshore cable routes

ty and Environment, Inc.

Dr No: 001346.HB02.06.g Date: 09/21/2001 File: Z.63

TyCom Transpacific Fiber Optic Cable and Hermosa Beach Landing

- NOTES:
1. FOR OSP CABLE INSTALLATION INFORMATION, SEE CABLE RECORD DRAWINGS, TGN-101 AND TGN-102.
 2. FOR OSP CONDUIT INSTALLATION INFORMATION, SEE DETAIL CONSTRUCTION DRAWINGS TGN-301 TO TGN-304.
 3. FOR MARINE CABLE INSTALLATION AND SHORE END DRAWINGS, SEE SHORE END DRAWINGS PROVIDED BY OTHERS.



PREPARED FOR RECORD
APPROVED FOR: _____ DATE: _____
OUTSIDE PLANT ENGINEER DATE: _____



I HEREBY CERTIFY THAT THE DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A duly Licensed Professional Engineer under the laws of the State of California.

DATE: _____ REC: 001

PROPRIETARY
USE ONLY BY CONTRACTOR NUMBER 100-1

SPECIFICATION
ESTIMATE
OWNERSHIP:
LINE CODE:
CABLE CLL:

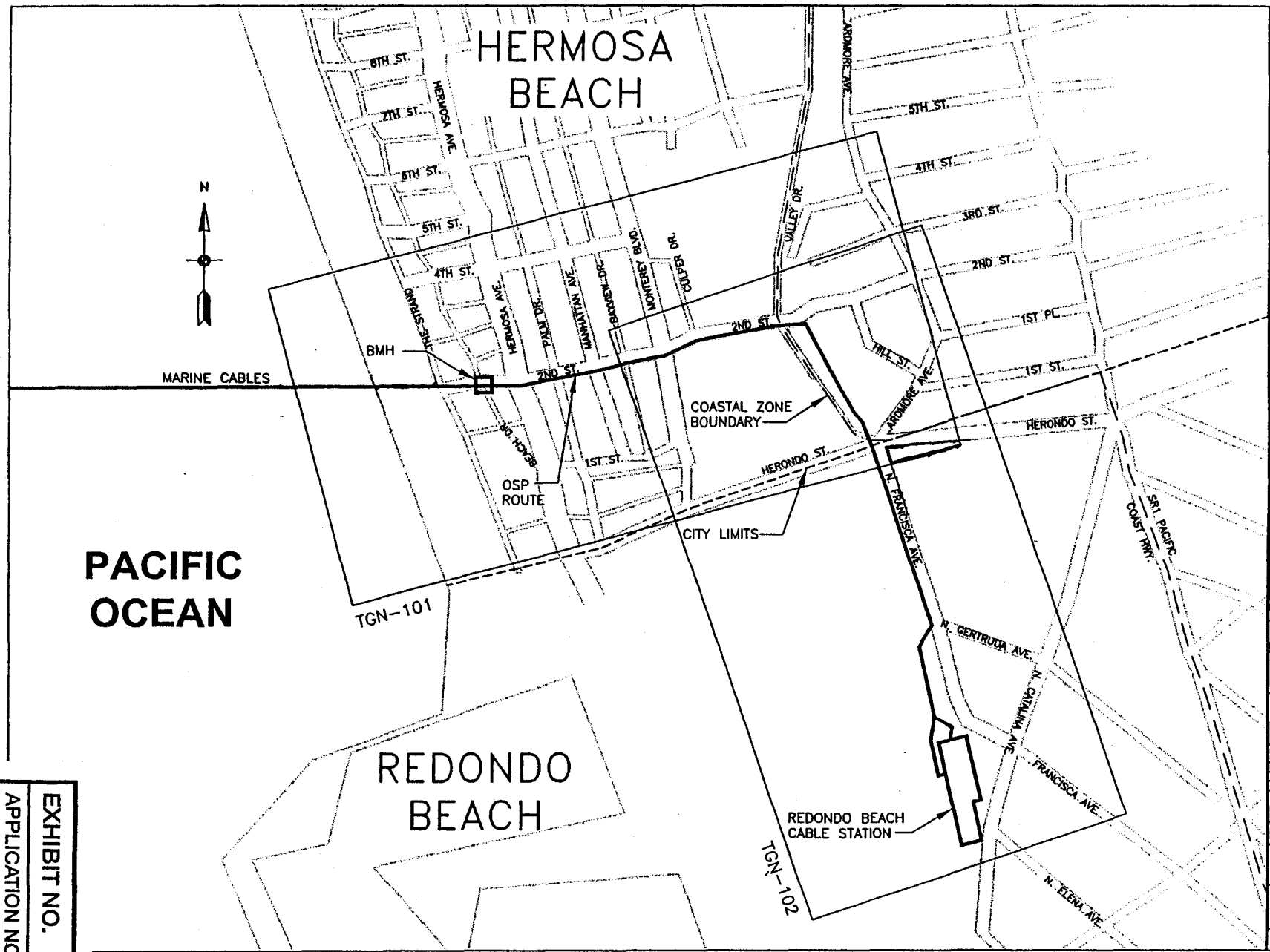
SCALE: 0' 200' 400'

TGN TRANSPACIFIC
HERMOSA BEACH, CA

TERRESTRIAL OPERATIONS
OSP CABLE AND CONDUIT
KEY LOCATION MAP

TGN-051

EXHIBIT NO. 2
APPLICATION NO.
E-01-029 & CC-1111-01



CALIFORNIA COASTAL COMMISSION

45 FREMONT, SUITE 2000
SAN FRANCISCO, CA 94105-2219
VOICE AND TDD (415) 904-5200
FAX (415) 904-5400



**Memorandum of Agreement
Between the
California Coastal Commission,
California Department of Fish and Game
and
United Anglers of Southern California**

This Memorandum of Agreement (Agreement or MOA) is by and between the California Coastal Commission (the Commission), the California Department of Fish and Game (DFG), and the United Anglers of Southern California (UASC), sometimes referred to as the Parties. The Parties agree as follows:

WHEREAS, Phillips Petroleum Company, Union Oil Company of California, ARCO Oil and Gas Company, CalResources LLC/Shell Western Exploration and Production, Inc. (SWEPI), Chevron U.S.A. Production Company and Texaco Exploration and Production, Inc. (hereinafter referred to collectively as "the Permittees") have applied to the Commission to obtain individual coastal development permits (CDPs) to abandon permanently a combined total of 23 subsea oil and gas completion wells and abandon-in-place/remove associated flowlines in State waters in the Santa Barbara Channel offshore of Santa Barbara County ("The Santa Barbara Channel Subsea Well Abandonment Program").

WHEREAS, on March 13, 1996, the Commission granted to Phillips Petroleum Company CDP E-95-9 to abandon permanently five subsea completion gas wells and abandon-in-place/remove associated flowlines in State waters in the Santa Barbara Channel offshore of Santa Barbara County.

WHEREAS, on April 9, 1996, the Commission granted to Union Oil Company of California, ARCO Oil and Gas Company, CalResources LLC/Shell Western Exploration and Production, Inc. (SWEPI), Chevron U.S.A. Production Company and Texaco Exploration and Production, Inc. individual CDPs (E-95-10, E95-11, E-95-12, E-95-13, E-95-14 and E-95-17) to abandon permanently a combined total of 18 subsea oil or gas completion wells and abandon-in-place/remove associated flowlines in State waters in the Santa Barbara Channel offshore of Santa Barbara County.

WHEREAS, MCI WorldCom, AT&T Corporation, PC Landing Corporation, PAC Landing Corporation, Global West Network Inc. and Tyco Networks (US), Inc. (hereinafter referred to collectively as "the Permittees") applied to the Coastal Commission to obtain individual coastal development permits and submitted consistency certifications to install fiber optic cables in State and federal waters offshore of California.

EXHIBIT NO. 3
APPLICATION NO.
E-01-029 & CC-111-01

WHEREAS, on April 14, 2000, the Commission granted to MCI WorldCom CDP E-99-11 and concurred with consistency certification CC-028-00 to install two fiber optic cables offshore San Luis Obispo County in State and federal waters out to the 1,000 fathom depth contour.

WHEREAS, on May 11, 2000 (S7 cable) and June 13, 2000 (E1 cable), the Commission granted to AT&T Corporation CDP E-98-29 and concurred with consistency certification CC-059-00 to install two fiber optic cables offshore San Luis Obispo County in State and federal waters out to the 1,000 fathom depth contour.

WHEREAS, on September 12, 2000, the Commission granted to AT&T Corporation CDP E-00-4 and concurred with consistency certification CC-078-00 to install two fiber optic cables offshore Mendocino County and San Luis Obispo County in State and federal waters out to the 1,000 fathom depth contour.

WHEREAS, on June 13, 2000, the Commission granted to PC Landing Corporation and PAC Landing Corporation CDP E-98-027 and concurred with consistency certification CC-041-00 to install three fiber optic cables offshore Grover Beach, San Luis Obispo County in State and federal waters out to the 1,000 fathom depth contour.

WHEREAS, on December 12, 2000, the Commission granted to Global West Network, Inc. CDP E-00-008 and concurred with consistency certification CC-110-00 to install a festoon fiber optic cable in State and federal waters paralleling the California coastline and landing onshore at Morro Bay (San Luis Obispo County), Leadbetter Beach (City of Santa Barbara), Manhattan Beach (City of Manhattan Beach), and Mission Beach (City of San Diego).

WHEREAS, on _____, the Commission granted to Tyco Networks (US), Inc. CDP E-01-029 and concurred with consistency certification CC-111-01 to install two fiber optic cables offshore of Hermosa Beach, County of Los Angeles in State and federal waters out to the 1,000 fathom depth contour.

WHEREAS, as a condition of its permit approval, the Commission has required each Permittee to compensate for all project-related adverse impacts to hard bottom habitat through payment of a compensatory mitigation fee (hereinafter "the fee") which will be used to fund the construction of a new artificial reef or augmentation of an existing artificial reef in State waters within the Southern California Bight. In CDPs E-95-9, E-95-10, E-95-11, E-95-12, E-95-13, E-95-14 and E-95-17, the condition provides that the amount of the fee shall be calculated by multiplying by a compensation rate of \$6.57 per square foot the total area of disturbed or lost hard bottom. In CDPs E-98-27, E-98-29, E-99-11, E-00-4, E-00-8 and E-01-029 the condition provides that the amount of the fee shall be calculated by multiplying by a compensation rate of \$27.31 per square foot the total area of disturbed or lost hard bottom in State waters. In consistency certifications C-028-00, CC-041-00, CC-059-00, CC-078-00, and CC-111-00 each Permittee has agreed to pay a compensation rate of \$27.31 per square foot of total area of disturbed or lost hard bottom in federal waters (west of State waters to the 1,000-fathom depth contour in federal waters).

WHEREAS, each permit and consistency certification further requires that, should impacts to hard bottom habitat occur, as determined in writing by the Commission's Executive Director

based on the results of the Hard Bottom Seafloor Survey, the Permittee shall pay its fee to the UASC within 30 calendar days of the Executive Director's determination.

WHEREAS, the DFG is the principal State agency responsible for the establishment and control of fishery management programs. The DFG is the State trustee agency with jurisdiction over the conservation, protection and management of fish, and habitat necessary for biologically sustainable populations of fish species (Fish and Game Code, sections 1802, 711.7).

WHEREAS, the DFG administers the California Artificial Reef Program for the purposes of (1) placing artificial reefs in State waters; (2) studying existing artificial reefs and all new reefs to determine the design criteria needed to construct artificial reefs capable of increasing fish and invertebrate production in waters of the State; and (3) determining the requirements for reef siting and placement (Fish and Game Code, sections 6420-6425).

WHEREAS, the DFG desires to assume the lead responsibility for the planning, siting, design and permit requirements for the construction of any new artificial reef or augmentation of an existing artificial reef in State waters using the fee(s) obtained from the Applicants.

WHEREAS, the UASC are a volunteer group of recreational anglers interested in preserving, protection and enhancing marine resources and fishing opportunities.

WHEREAS, the UASC desires to secure and enter into construction contract with a contractor to construct any new artificial reef or augment an existing artificial reef using the fee(s) obtained from the Applicants.

NOW, THEREFORE, in consideration of the benefits to marine resources of the State of California, the Commission, the DFG and the UASC agree as follows:

1. The UASC agrees to receive any fees paid by the Permittees. Within 30 calendar days of receipt of any fee, the UASC shall deposit the funds in an interest-bearing account ("the compensatory hard bottom mitigation fund" or "fund"). These funds including all earned interest shall be expended by the UASC solely for reef materials, construction costs, and the UASC's administration of the fund (not to exceed 10% of the total collected fees).
2. Within 180 days of the date on which all fees have been paid to the UASC, the DFG shall develop and submit for review and approval by the Commission's Executive Director, a plan to spend the monies within the fund on the construction within the Southern California Bight of either 1) a new artificial reef or 2) augmentation of an existing artificial reef.
3. Within one year of approval by the Commission's Executive Director of a plan to spend the compensatory hard bottom mitigation fund, the DFG shall secure all necessary governmental approvals, including a coastal development permit, to construct a new artificial reef or augment an existing artificial reef within the Southern California Bight.
4. Within 90 days of either: (1) the granting of all necessary governmental approvals to construct a new artificial reef or augment an existing reef, or (2) approval by the

Commission's Executive Director of a plan to spend the monies in the fund, whichever occurs later, the UASC shall secure and enter into a construction contract (the "Contract") with a contractor to construct either a new artificial reef or augment an existing artificial reef within the Southern California Bight. The Commission's Executive Director may for good cause grant an extension of the time deadline imposed by this section.

5. The Contract shall: (1) provide that the contractor will assume all liability for the reef material (e.g., quarry rock) until its placement in the designated location(s), and (2) specify that when the reef material touches the ocean floor at such location(s), the reef material shall become the property of the DFG.
6. Within two years of approval by the Commission's Executive Director of a plan to spend the monies in the fund, the UASC shall spend these monies to complete the construction of either a new artificial reef or augmentation of an existing artificial reef within the Southern California Bight.
7. The UASC and the contractor(s) must maintain Generally-Accepted Accounting Principles (GAAP), financial management, and accounting system and procedures which provide for (1) accurate, current and complete disclosure of all financial activity for the reef project, (2) effective control over, and accountability for all funds, property and other assets, related to the project, (3) comparison of actual outlays with budgeted amounts, and (4) accounting records supported by source determination. Annual financial reports showing current and cumulative financial activity must be provided to the Commission. All project records must be made available at any time for examination by the Commission.

The UASC shall retain all pertinent books, documents and papers, including financial transactions and supporting documents, and policies and procedures for the general accounting system, internal controls, and management practices for a period of three years following the date(s) of all final payment(s) under the Contract.

8. A failure on the part of any of the Parties to carry out the terms of this Agreement shall result in the following process. The party that believes another party is failing to carry out the terms of the Agreement shall bring the issue to the Executive Director of the Commission. If the Executive Director of the Commission cannot resolve the issue, the matter shall be referred to the Commission for resolution. The Commission may choose to seek (1) judicial enforcement of the terms of this MOA; (2) a full refund of any unexpended funds; or (3) other appropriate remedies.
9. This Agreement may be amended only in writing executed by all Parties.

IN WITNESS WHEREOF, the Parties have executed this MOA to this effect as of the date last signed below.

By: _____
PETER M. DOUGLAS
Executive Director
California Coastal Commission

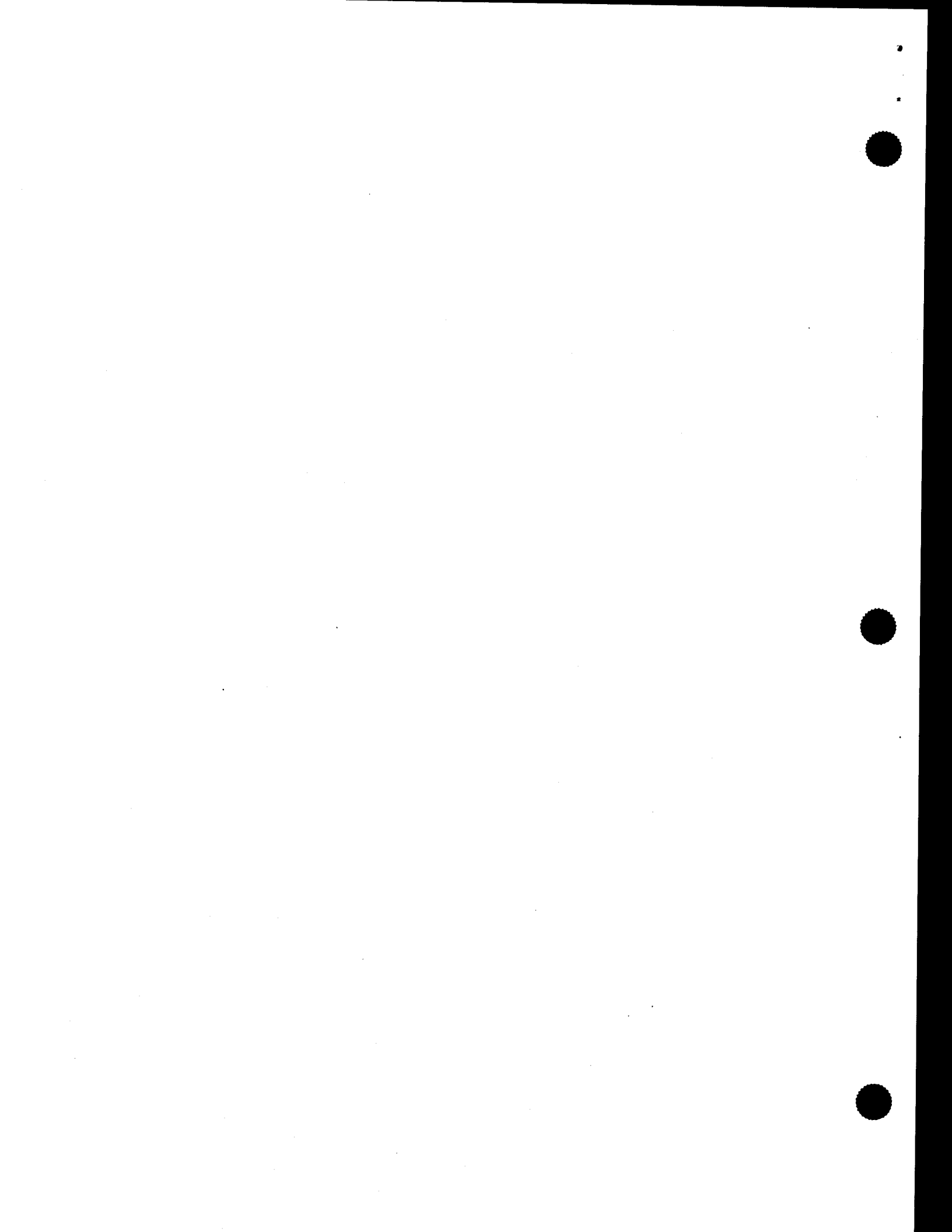
Date

By: _____
ROBERT HIGHT
Executive Director
California Department of Fish and Game

Date

By: _____
TOM RAFTICAN
President
United Anglers of Southern California

Date



SOUTHERN CALIFORNIA CABLE & FISHING AGREEMENT

THIS AGREEMENT ("Agreement") dated as of this 8th day of June, 2002, is made by and among the following parties:

- (i) the Southern California Trawlers' Association, the Los Angeles Commercial Fishermen's Association, and the Southern California Commercial Fishing Association (collectively, the "Associations");
- (ii) Tyco Networks (US) Inc. (the "Cable Company"); and
- (iii) individual commercial fishermen and fishing vessel owners licensed to fish along the California coast who fish in the Covered Area and sign this Agreement (collectively, the "Fishermen").

RECITALS

WHEREAS, the Cable Company has applied to the City of Hermosa Beach, California Coastal Commission, and to the United States Army Corps of Engineers (ACOE), in addition to other governmental agencies having jurisdiction thereover (the "Governmental Agencies"), for approval to construct, install, and maintain telecommunications cable networks along the California coast (the "Cable Project"), and

WHEREAS, the Governmental Agencies are responsible for preparing and certifying environmental review documents in compliance with the requirements of the California Environmental Quality Act ("CEQA") and the National Environmental Policy Act ("NEPA"), to assess the potential environmental impacts of the Cable Projects, the cumulative impacts of such projects, alternatives to such projects, and appropriate mitigation measures for such projects; and

WHEREAS, this Agreement is intended to identify, establish, and confirm certain mitigation measures and monitoring programs which are intended to facilitate environmental review of the Cable Projects, reduce potential conflicts between the installation, continuation, and maintenance of the Cable Projects and commercial fishing activities along the California coast; and

WHEREAS, the parties acknowledge that commercial fishing activities are coastal dependent uses receiving the highest priority under the California Coastal Act, and the Federal Coastal Zone Management Act, the continuing viability of which is of critical importance to maintaining historic fishing activity along the California coast; and

WHEREAS, Cable Company's Cable Project, consisting of the Tyco Pacific Cable System, is intended to be installed in the areas identified on Exhibit A hereto; and

WHEREAS, each of the Tyco Pacific cables depicted on Exhibit "A," is a "Covered Cable"; and

WHEREAS, the "Covered Area" is the marine area within one nautical mile on either side of a "Covered Cable" route from 32° 30' North (the latitude of Cortes Bank) to 34° 00' North (the latitude of Point Dume) and from the California shore out to the 1000 fathom curve; and

WHEREAS, the parties acknowledge that the commercial fishing industry and the submarine cable industry are subject to substantial economic pressures, are vulnerable from a variety of regulatory, economic, and market sources, and that their continuing viability is subject to cumulative impacts which they may have on each other; and

WHEREAS, it is the intent of this Agreement to provide an enforceable agreement, and the Associations, Fishermen and Cable Company acknowledge that in entering into this Agreement, the Associations, Fishermen and Cable Company are relying upon the good faith and representations by each other that the provisions of this Agreement are enforceable and will be implemented in conjunction with the Covered Cable; and

WHEREAS, as a result of the environmental review by the Governmental Agencies, the Cable Project may be conditioned and modified in order to appropriately mitigate potential impacts upon the commercial fishing industry.

NOW, THEREFORE, the Associations, the Cable Company and the Fishermen hereby agree as follows:

ARTICLE 1 GENERAL PROVISIONS

1.1. Committee

(a) Formation. A Committee will be formed within 30 days of the execution of this Agreement and prior to cable installation for the purposes described in this Agreement.

(b) Name. The Committee (hereinafter "Committee") will select a name for itself within 20 days after its formation.

(c) Representation. The Committee will be governed by a Board of Directors consisting of six (6) voting Directors: three (3) Association representatives and three (3) Cable Company representatives. In order to ensure appropriate representation, additional fishermen's associations may join the Committee, and Directors may be added by a vote of sitting Directors. The number of voting Directors representing the fishing industry (including Associations and Fishermen) shall be the same as the number of voting Directors representing the Cable Company. A Director may delegate his responsibilities to an alternate. The fishing industry representatives shall be selected in a manner specified in the Bylaws and drawn from the harbors which are home ports of fishermen who work in the Covered Area.

The Committee shall adopt Bylaws to implement all aspects of this Agreement. The Bylaws shall provide that in the event that the Directors of the Committee are deadlocked on any issue, then the deadlock shall be resolved by a designated mediator mutually agreeable to the parties, and appointed to serve as mediator within thirty (30) days of the date of the first deadlock being declared, and who shall continue serving as mediator until replaced by a majority vote of the Directors.

(d) Committee Jurisdiction. The Committee activities shall relate to the Covered Cables within the Covered Area and the activities within the Covered Area of the Associations, the Cable Company and the Fishermen.

(e) Committee/Liaison Activities Funding. The Cable Company shall pay for and reimburse Committee activities and Committee representatives as approved by the Committee. Before cable installation, and before each anniversary of the start of cable installation, the Committee shall establish an annual budget for all Committee activities, and the Cable Company shall make funding available for such budgets. The organizational budget shall include, but shall not be limited to, reasonable amounts for the activities described in Sections 1.1 (f) through (k). When payment is due for any Committee organizational budget item, administrative expense, or other expense for Committee operation and management approved by the Committee, the Cable Company shall pay that sum within 45 days of its becoming due.

(f) Compensation for Committee Activities. Committee Fishing Industry Representatives shall be compensated for time and travel expenses reasonably incurred for approved committee activities, including attendance at Committee meetings. The rate of compensation shall be Fifty Dollars (\$50) per hour, capped at no more than Five Hundred Dollars (\$500) per day plus reasonable travel expenses. All such compensation shall be paid by Cable Company within 45 days of receipt of invoices from Representatives, unless there is a question or dispute concerning an invoice.

(g) Fishing Industry and Association Representatives' Compensation and Attorneys' Fees for Negotiating Agreement. The Associations' and the Fishermen's compensation and attorneys' fees shall be paid by the Cable Company for time and travel expenses reasonably incurred to achieve execution of this Agreement at rates and in amounts approved by the Committee. Such time charges and expenses reasonably incurred by Association representatives, Fishermen and attorneys representing the Fishing Industry in the preparation and review of this Agreement shall be paid for their inputs in developing this agreement by the Cable Company up to a cumulative total of \$5,000.

(h) Cable Committee Liaison Officer. The Committee shall develop procedures to select, hire and oversee a Committee Liaison Officer to carry out Committee activities as necessary and approved by the Committee. The Committee Liaison Officer shall be paid by the Cable Company. The Committee Liaison Officer shall be paid at rates and in amounts approved by the Committee, unless the Liaison Officer selected by the Committee is an employee of Cable Company.

(i) Committee Procedures. The Committee shall establish policies and procedures, to review claims, to publicize and advance the goals of this Agreement and to conduct other activities consistent with the provisions of this Agreement. In cases where comments, information, or votes are required for Committee decisions or actions pursuant to this Agreement, a Director may request a vote of Directors and/or other comments or information from members or Directors. If a Committee member or Director does not provide such comments, information, or vote, or request an extension within ten business days of receiving a written or email request from a Director for such input, the Committee may take the decision or action without this input and treat this vote as an abstention.

(j) Fishing Vessel Operating Procedures. The Committee shall adopt operating procedures, which shall be followed by Fishermen to guide operation of commercial fishing vessels in the vicinity of cables. The procedures should address requirements to use up-to-date charts and navigational aids, and procedures to follow if a trawler's forward motion slows or stops. The procedures should

include reasonable measures that the vessel operator may employ to avoid damage to the cable. A copy of the draft Procedures to be considered for adoption by the Committee is attached and incorporated as Exhibit B.

(k) It is not the intent of this Agreement to create any liability of any kind or nature for any Directors of the Committee. The Cable Company shall make arrangements acceptable to the Committee to address the potential liability of voting Directors resulting from their participation in the Committee. Such arrangements may include indemnification of Directors by the Cable Company for Directors' actions on the Committee, provision of liability insurance covering Directors for their actions on the Committee, reimbursement for reasonable insurance premiums incurred by Directors for Committee participation, or other arrangements acceptable to the Committee.

1.2 Cable Installation, Inspection and Information

(a) The Cable Company shall have its Covered Cables installed at a depth of at least 1.0 meter beneath the seabed where feasible. The burial and inspection requirements of this Agreement shall apply only in water depths less than 650 fathoms (approximately 1200 meters) where California State and Federal authorities have jurisdiction over submarine cables. Each Covered Cable is intended to be buried to the extent reasonably possible and to remain buried, except in locations where, due to geophysical constraints, that is infeasible. The Cable Company shall report to the Committee at a minimum of 30 days in advance regarding the timing and method of construction and installation of its cable project. A video camera and instruments on the plow shall be used to record the burial operation. The video shall display real-time position and water depth. This shall serve as evidence, to be provided to the Committee within 60 days after cable installation, of burial and will also indicate if the need exists to carry out post lay burial operations using a Remotely Operated Vehicle (ROV). In all instances, the most modern technology in general commercial use shall be utilized in the cable burial and documentation process including ROV inspection for problematic regions as soon as practicable following installation, and ROV post-lay burial as required. In all crossings of its Covered Cables over existing undersea cable or pipelines, the Cable Company shall employ the latest industry standard protection techniques, and ROV and/or diver inspection shall be utilized as required. If any length of cable or cable crossing cannot be completely buried after the inspection and burial procedure, the precise location will be identified in "as-built" coordinates to be provided by the Cable Company to the Associations and the Fishermen. In the course of any repair or maintenance, the Covered Cable shall be buried to the extent feasible to the same depth as it originally was buried. It is the intent of the parties to achieve the Cable Project's objectives with minimal impacts upon the viability of the commercial fishing industry and minimal effects upon the extent and historic areas in which the commercial fishing industry is able to operate, and the practices and procedures used by the commercial fishing industry.

(b) Installation Observation and Guard Ship Assignments.

(1) An observer selected by the Committee as described below shall be on board the Cable Company's main installation vessel to observe cable installation within the Covered Area. The observer's reasonable fees and expenses shall be paid by the Cable Company involved in the installation. The compensation shall be in addition to any funds provided in Sections 1.1(f) and 1.7 of this Agreement. The rate of compensation shall not exceed Five Hundred Dollars (\$500.00) per day, plus reasonable travel expenses.

(2) Upon request of the Committee, the Cable Company shall equip the observer with a laptop computer and GPS equipment or other portable devices that will permit the observer to record the approximate position of the cable being installed. Cable position information recorded by the observer may be distributed to the commercial fishing industry by the Committee as quickly as reasonably possible. The Cable Company shall bear no responsibility for the accuracy of the information recorded by the observer. The Committee shall inform recipients of the position information that the information is not the responsibility of the Cable Company but is being provided by the Committee. Recipients shall be required to sign a release in which they agree to use the information at their own risk and to release the Committee and the Cable Company from any and all claims that may arise from the use of the information.

(3) The Committee shall obtain from the Cable Company the requirements applicable to any fisherman observer. The Committee shall compile a list of all bottom contact fishermen with experience in the Covered Area who wish to be considered for observer duty and who meet the requirements of the Cable Company. Names shall be listed in random order. When a Cable Company is required by this Agreement to have a fisherman observer aboard a cable vessel, the Cable Company shall inform the Committee where and when an observer may board the cable ship. The Committee shall select an observer from the list compiled. Observer positions shall be offered to individuals in the order in which they appear on the list. If the Committee fails to select an observer or the individual selected is not available or for any reason cannot be available to meet the operation schedule of the cable ship (such operation schedule to be determined at the sole discretion of the master of the cable ship) then the Cable Company shall have the option to proceed without an observer.

(4) Before the start of any cable project involving the use of guard vessels, the Committee shall provide the Cable Company with a list of commercial fishing vessels with experience in the Covered Area that may be available for guard vessel duty. The list shall include information about the vessel's gear type, characteristics and operating status, as well as the owners' contact information. The Cable Company shall select guard vessels from the Committee list taking into consideration the cost, technical characteristics, insurance coverage of the vessel, size, gear type, and area of experience, if the Cable Company elects to employ local vessels for guard duty. The Cable Company shall encourage their contractors to change guard vessels from time to time. Payment terms shall be negotiated between the contractors and the owners of the guard vessels employed.

(c) Post-Installation Information. The Cable Company shall provide cable as-built information, latitude and longitude in WGS 84 datum coordinates, including specification of cable sections thought to be exposed, to the Associations and the Fishermen as soon as reasonably possible, but no later than 60 days, after the installation of the cable. For the purposes of this Agreement, a cable is considered installed after the last day of post-lay inspection burial (PLIB) operations. This data shall be provided in writing, electronically, and on navigational charts.

(d) Post-Installation Inspections. The Cable Company shall conduct ROV Burial verification as and when required by permits to determine whether any buried sections of its Covered Cables have become exposed. Copies of videotapes recording the verification shall be provided to the Committee within 45 days of such inspection upon request.

(e) Unforeseen Consequences. The economic impacts of the Cable Project and the appropriate level of mitigation shall be reviewed by the Committee after each of the first two years following the

completion of installation of the Cable Project and adjusted, if necessary, for unforeseen consequences arising from the installation, assignment, operation, use, repair, replacement, continuation, and maintenance of the Cable Project.

(f) Construction and installation. The timing and methods of construction and installation of the Cable Projects shall be reported to the Committee at a minimum of 30 days in advance of installation, with the goal of minimizing any adverse impacts upon the commercial fishing industry. The Cable Company agrees to provide reasonable compensation to Fishermen who suffer damage as a result of the acts of installing, repairing, replacing, or maintaining of the Cable Projects, or any incidental activities in connection therewith. The amount of such compensation, as well as those entitled to receive it, shall be determined by the Cable Company, implementing guidelines approved by the Committee prior to installation. Such compensation shall be in addition to any funds provided in Sections 1.1(f) and 1.7 of this Agreement.

1.3 24-Hour Telephone Hotline

Thirty (30) days before cable installation, the Cable Company shall provide and maintain a 24-hour, toll-free telephone hotline to receive calls from Fishermen who believe they have snagged their gear on a Covered Cable owned and/or operated by the Cable Company. Furthermore, the Cable Company will endeavor to include all Covered Cables on one 24-hour toll-free hotline. There shall be a representative on duty at all times who has the authority, background, and experience to advise the Fisherman whether the reported position is in the vicinity of a Covered Cable owned and/or operated by the Cable Company. Reporting procedures when using the hotline shall be developed by the Committee.

1.4 Gear Replacement Costs/Claims

The Cable Company shall pay 100% of the costs of gear sacrificed by a fishing vessel as a result of being snagged on a Covered Cable owned and /or operated by the Cable Company, provided 1) the vessel has informed the 24-hour, toll-free telephone hotline of its situation at the time of, or immediately following being snagged and 2) the vessel's conduct was consistent with the Fishing Vessel Operating Procedures established pursuant to this Agreement. Within 3 business days of receiving a report of sacrificed gear, the Cable Company shall inform the fisherman of a) the Committee guidelines for processing such claims and b) the information and documentation required from the fisherman in order to have the claim processed. Within 45 days of receiving the required information and documentation from the fisherman, the Cable Company shall disburse payment to the Fisherman for the gear replacement costs and claims or, in case part or all of the claim was denied, inform the fisherman about the reasons for this determination. The guidelines to be applied by the Cable Company for processing claims shall be developed by the Committee prior to cable installation and shall be based on the principle of making the Fisherman whole for his economic loss resulting from the Covered Cable snag. These guidelines shall require that the Fisherman take reasonable measures to minimize such loss, and provide substantial evidence of the extent of such loss.

Fast-track Payment alternative

A fisherman who has sacrificed gear to avoid damaging a cable may submit a claim for fast-track payment for the cost of the gear. Within 15 days of receiving a reasonable claim for Fast-Track Payment from a fisherman for sacrificed gear, the Cable Company shall pay the claim. This does

not relieve the fisherman of the responsibility for submitting the documentation required by the guidelines for payment of all claims. If this documentation and the Cable Company's investigation fail to substantiate the amount paid within 60 days of the fast-track payment, the Cable Company may request reimbursement from the recipient of the payment. If the recipient fails to reimburse the Cable Company within 30 days of such request, the amount of the unsubstantiated payment will be deducted from future payments due under section 1.7 of this Agreement for fishery improvement.

1.5 Cable Damage Claims/Release of Liability/Dispute Resolution

(a) The Cable Company agrees to release any claims for cable damage it might otherwise have, either individually or collectively, against Fishermen and refrain from taking any administrative, legal, or other action to sanction and/or recover damages against Fishermen who comply with the Fishing Vessel Operating Procedures established by the Committee. The Cable Company further agrees to encourage all administrative, legal, judicial and other authorities to respect the terms and conditions of this Agreement, and the procedures established by the Committee for the resolution of any cable damage claims. The Cable Company hereby agrees to assume all liability, responsibility, and risk for any damage which may occur to its Covered Cables resulting from its inability to construct, maintain, place, and continue Covered Cables in a manner which does not interfere with fishing conducted in conformity with the Fishing Vessel Operating Procedures.

(b) A three-step procedure shall be provided for resolution of all disputes, including disputes concerning claims by a Cable Company for damage to its Cable Project ("cable damage claims") and disputes concerning the following claims of Fishermen: (1) claims regarding a Fisherman's entitlement to the compensation provided in Section 1.4 above for the sacrifice of fishing vessel gear to avoid injuring any Covered Cable or related facilities being constructed or operated by the Cable Company; (2) claims arising from any incident involving conduct by any Cable Company that negligently damages the Fisherman's fishing gear and the fish contained in such gear, (3) claims arising from any conduct by the Cable Company that removes or damages, or tampers with the Fisherman's fishing gear and the fish contained in such gear without authorization from the Fisherman, and (4) claims regarding a Fisherman's entitlement to compensation provided in Section 1.2(f) above.

(c) Pursuant to the procedure: (1) the parties shall meet with the Committee in an effort to settle the dispute; (2) if the parties are unable to settle the dispute within a reasonable period of time with the assistance of the Committee, the parties shall request the Committee to select an independent mediator to assist in the resolution of the dispute; (3) if the parties are unable to settle the dispute within a reasonable period of time with the assistance of the mediator, the parties shall submit to binding arbitration all disputes over Fishermen's claims and any dispute over cable damage claims that the parties mutually agree to submit to binding arbitration. With respect to disputes over cable damage claims, unless the parties agree within seven days of the end of mediation to submit the dispute to binding arbitration, the Cable Company shall be free to pursue any legal remedies available to it and the vessel owner and operator shall be free to assert any legal defenses available. Any arbitration shall be determined in Santa Barbara, Los Angeles, or another nearby location. Unless the parties agree to have the dispute resolved with the assistance of a single arbitrator, each party to the arbitration shall appoint an independent arbitrator. If the two arbitrators so appointed cannot agree within 30 working days after their appointment, they shall select a third arbitrator. The decision in writing of the three arbitrators, or any two of them, shall be final and binding upon the parties therein, who shall conform to and abide by said decision. If either party fails to appoint his arbitrator within seven days after notice in writing requiring him to do so, the arbitrator

appointed by the other party shall act for both, his decision in writing shall be final and binding upon both parties, as if he had been appointed by consent, and both parties thereto shall conform to and comply therewith. The expenses for the process described in this paragraph (b) shall be paid by the Cable Company in addition to any other payments that are required under this Agreement.

In cases where a Committee vote is required to assist in the resolution of disputes, the fishing industry Directors and Cable Company Directors shall have an equal number of votes. When a claim before the Committee involves a bottom trawl vessel, the non-trawl representatives on the Committee shall not have a vote. When a claim before the Committee involves a vessel that is not a bottom trawl vessel, the non-trawl representatives shall have a vote and the trawl representatives shall not have a vote.

1.6 Out-of-Service Cables

To the extent required by any governmental approvals, the Cable Company agrees to abandon and remove out-of-service Covered Cables as necessary so as not to interfere with commercial fishing activities in the areas where such cables were previously installed.

1.7 Commercial Fishing Industry Improvement Fund

The Cable Company shall annually deposit a total of Twenty-Five Thousand Dollars (\$25,000) in a special fund or funds as directed by the fishing industry Directors on the Committee, for enhancement of commercial fisheries and the commercial fishing industry and support facilities, in relation to the two cables comprising the Tyco Pacific Cable System Project. This payment obligation shall commence and the payment shall be due within thirty (30) days of the start of cable installation in the Covered Area. Annually thereafter, the Cable Company shall deposit Twenty-Five thousand dollars (\$25,000) to said fund or funds as directed by the fishing industry Directors on the Committee, within 45 days of receipt of an invoice from the Committee, which shall be issued on the anniversary of the start of cable installation in the Covered Area. The Cable Company shall not have the authority to control the utilization of moneys from the fund or funds receiving moneys pursuant to this paragraph. The Associations and the Fishermen agree that the moneys described in this paragraph shall be used for fisheries research, education, management, safety, socioeconomic or development purposes, shall not be utilized for any illegal or immoral purpose, and shall in no event be utilized to oppose the activities of the Cable Company. Notwithstanding Article 1 Section 1.11 of this Agreement, priority shall be given to navigational aids, i.e. plotters, for trawlers and set gillnetters in determining the allocation of funds.

Lease applications for projects in addition to the Project specified in paragraph 1.9 shall constitute new projects for the purpose of this paragraph. For each cable installed as part of a new project (after the initial two cables), the Cable Company shall annually contribute an additional \$20,000 in this manner.

In the event that any mitigation intended for the commercial fishing industry is ordered by action of a governmental agency, the payment of such ordered mitigation shall offset funds required to be paid pursuant to this paragraph.

1.8 Parties

(a) This Agreement shall be by and between and for the benefit of the Associations, the Cable Company and individual commercial fishermen and fishing vessel owners licensed to fish along the California coast who fish in the Covered Area and sign this Agreement (collectively, the "Fishermen").

(b) Each of the parties to this Agreement represents that it has the power to enter into this Agreement and to perform its obligations as set forth in this Agreement.

1.9 Covered Cables

This Agreement shall cover the following telecommunications cable project of the Cable Company: Tyco Pacific Cable System segments 4 and 5 in the Covered Area. This project is depicted in Exhibit A attached hereto.

1.10 Assignment

This Agreement shall be binding on the Parties and their respective successors and assigns.

1.11 Upgrading of Communications and Navigation Equipment

A one-time payment of Five Hundred Dollars (\$500) shall be made by the Cable Company to each vessel engaged in trawl fishing in the Covered Area that is owned or operated by a Fisherman for use in upgrading communication and navigation equipment for such vessel. This payment shall be provided within 45 days of the start of cable installation in the Covered Area or within 45 days of receipt of an invoice from the Fisherman, whichever date is later.

ARTICLE 2 MISCELLANEOUS

2.1 Governing Law

This Agreement, and the rights and duties of the parties arising hereunder shall be governed by and construed in accordance with the laws of the State of California except provisions of that law referring governance or construction to the law of another jurisdiction.

2.2 Counterparts

This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which constitute but one Agreement.

2.3 Miscellaneous

(a) Unless specifically agreed in writing, no party may commit the other parties to any agreement or undertaking.

(b) Nothing in this Agreement shall be construed to create or constitute a partnership, agency or similar relationship or to create joint or several liability on the part of any of the parties.

(c) All correspondence should be directed to the addressees and individuals indicated next to the signature of each party, or to such other address or individuals as a party may request in writing from time to time.

(d) This Agreement shall terminate as to any Cable Company or its successors at such time as it ceases to operate commercial fiber optic cables within the Covered Area or if the Cable Company does not place a Covered Cable in service before December 31, 2003.

(e) This Agreement may be amended only by vote of the Board of Directors of the Committee.

IN WITNESS WHEREOF, the parties have entered into this AGREEMENT by their duly authorized representative as of the day and year first above written.

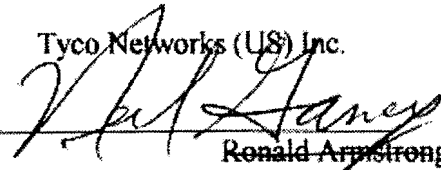
CABLE COMPANY

Tyco Networks (US) Inc.

Dated:

6-8-02

2002 By:



Ronald Armstrong
Vice President

Neil Gravey
President

FISHERMEN'S ASSOCIATIONS

Southern California Trawlers' Association
Box 713
Summerland, CA 93067

Dated:

6-8-02

2002 By:



Mike McCorkle
Authorized Representative

Southern California Commercial Fishing Association
Berth 73/Fisherman's Wharf
San Pedro, CA 90731

Dated:

10 June 02

2002 By:



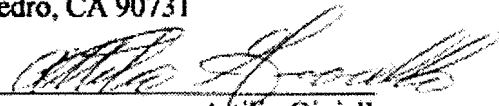
Orlando Amoroso
Authorized Representative

Los Angeles Commercial Fishermen's Association
Berth 73/Fisherman's Wharf
San Pedro, CA 90731

Dated:

6/10

2002 By:



Attilio Gioiello
Authorized Representative

FISHERMEN

Dated: 6-9-02, 2002 By: [Signature]
Name Sashay
Vessel Name [Signature]

Dated: 6-9-02, 2002 By: [Signature]
Name Cecelia
Vessel Name [Signature]

Dated: 6-9-02, 2002 By: [Signature]
Name ALAMO
Vessel Name [Signature]

Dated: 6/09/02, 2002 By: [Signature]
Name Stal Fin II
Vessel Name [Signature]

Dated: 6/9/02, 2002 By: [Signature]
Name New HAZARD
Vessel Name [Signature]

Dated: 6/9/02, 2002 By: [Signature]
Name Gloria Marie
Vessel Name [Signature]

Dated: 6/9/02, 2002 By: [Signature]
Name PACM
Vessel Name [Signature]

FISHERMEN

Dated: 6-9-02, 2002 By: Leir Nilson
Name SV SEABIRD
Vessel Name

Dated: 6-9, 2002 By: Paul Samuel
Name SV "C"
Vessel Name

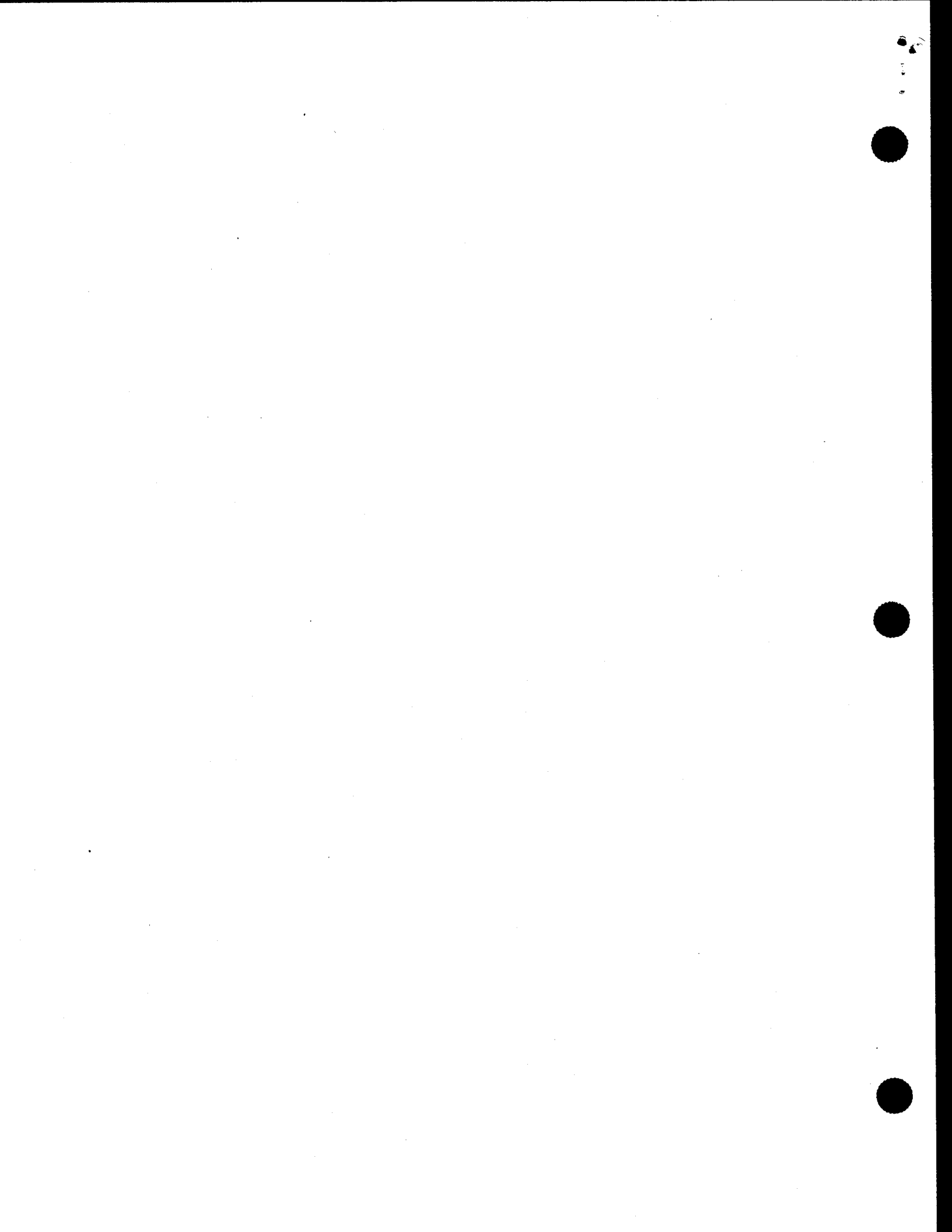
Dated: 6-9, 2002 By: [Signature]
Name SV Six BBS
Vessel Name

Dated: _____, 2002 By: _____
Name _____
Vessel Name _____

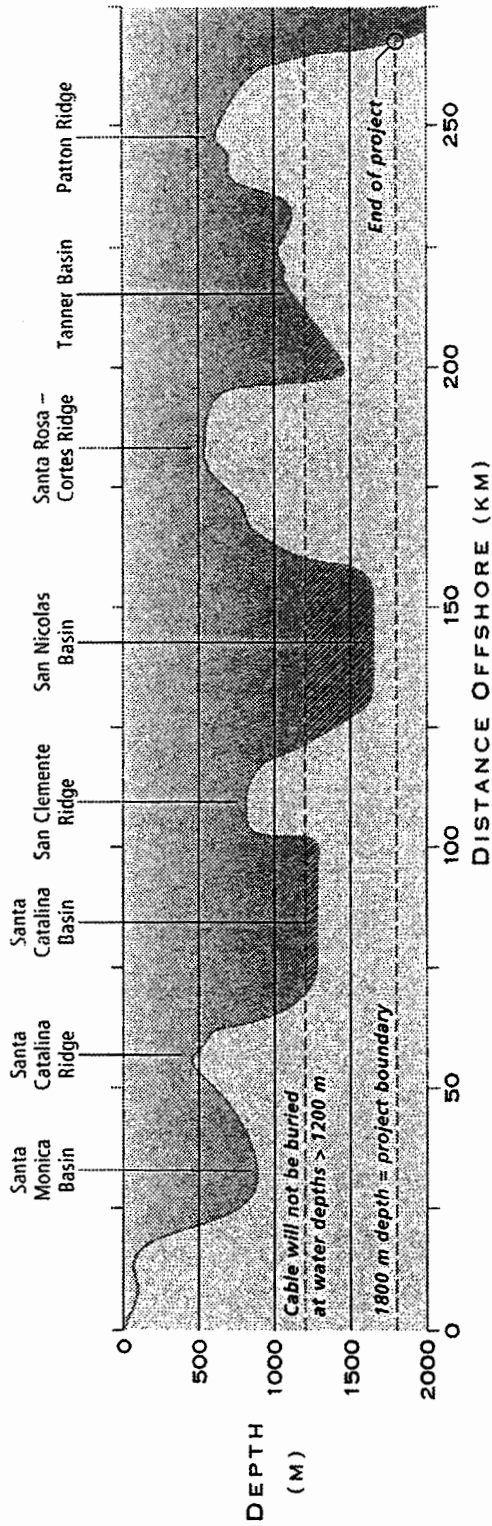
Dated: _____, 2002 By: _____
Name _____
Vessel Name _____

Dated: _____, 2002 By: _____
Name _____
Vessel Name _____

Dated: _____, 2002 By: _____
Name _____
Vessel Name _____



Segment 5 Depth Profile



Segment 4 Depth Profile

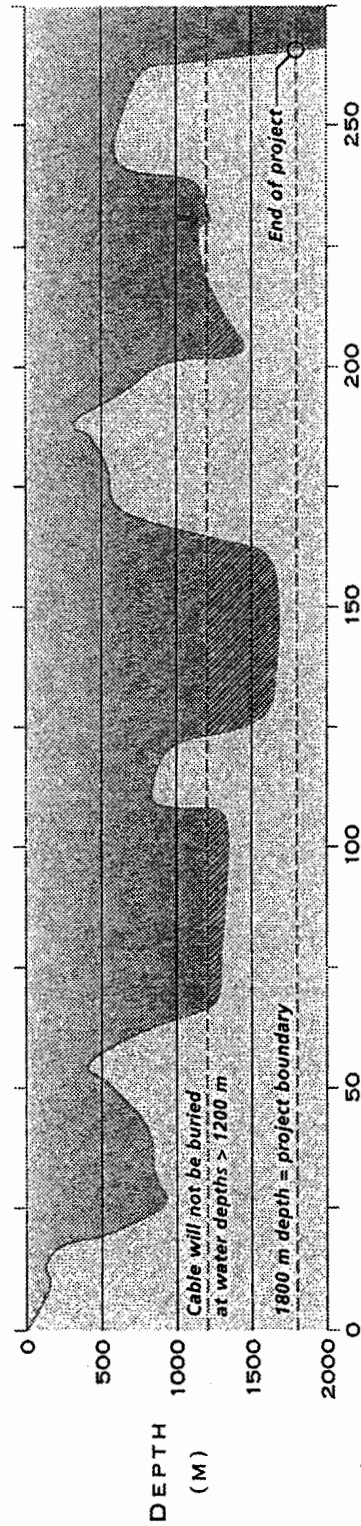


EXHIBIT NO. 5
APPLICATION NO.
E-01-029 & CC-111-01

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