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Effluent discharges from offshore oil platforms to the outer continental shelf of southern California in 2005

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ABSTRACT

Twenty-three offshore oil platforms produce oil and gas from the federal waters of the outer continental shelf off southern California Activities associated with offshore petroleum extraction result in the regular discharge of contaminants to the Southern California Bight (SCB) Discharges from oil platforms can be grouped into three main categories based on their source: 1) platform operations, 2) oil and gas production (i.e., produced water), and 3) well drilling discharges Produced water is extracted with the oil and gas and is the primary source of contaminant loading from all oil platform waste streams The ratio of water produced increases as oil and gas reserves are extracted over time; currently over three barrels of water are produced for every barrel of oil from southern California platforms, and produced water volume is increasing over time Changes in the historical requirements and procedures in platform monitoring requirements complicate efforts to compare produced water discharges from year to year, and prevent calculation of total loads from all platforms for most constituents A special monitoring study was conducted in 2005 as part of a reasonable potential analysis that provided a unique opportunity to assess discharges from all oil platforms under the same monitoring requirements Of the 23 platforms in federal waters off southern California, 13 discharged produced water in 2005, 4 discharged drilling fluids and cuttings, and 20 discharged operational wastes Total volume of operational discharges in 2005 was 60 L x 109, consisting primarily of cooling water Drilling-related discharges have decreased in each assessment period since 1996, with both fluids and cuttings discharges down by at least 80% since 1996 Produced water discharges totaled 9.4 L x 109 in 2005, representing an increase of 68% since 2000 Three platforms contributed 73% of the total produced water volume and similar contaminant load contributions in 2005 Discharges of most contaminant loads from oil platforms are relatively minor, except for several petroleum based organic contaminants, including benzene, toluene, ethylbenzene, and polycyclic aromatic hydrocarbons (PAHs) Changes in monitoring requirements following the 2005 special monitoring study would impact assessment of nearly all constituent loads Comparison of 2005 loads under the current and future requirements indicates that many of the constituent loads will be underrepresented in future assessments due to the results of the reasonable potential analysis and the subsequent change in Environmental Protection Agency (EPA) monitoring requirements These underrepresented loads include some of the most significant contributions from oil platform discharges, including toluene, ethylbenzene, phenols, naphthalene, and other PAHs Only volume and oil/grease estimates would be unchanged under the new monitoring program Changes in monitoring requirements will make it very difficult to assess trends in contaminant loading into the future

Full Text

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