

Oceanside Harbor & Modular Wetlands

Going with the Flow



The Situation

The Oceanside Harbor in northern San Diego, CA, just south of the Orange County line, features a marina lined with fine restaurants, a renowned yacht club, curious vacationers, friendly locals, experienced and novice surfers, and relaxing families. It is the destination for many who come to enjoy the sand, surf and scenery. The harbor is also a frequent stop for boats on their way up and down the Pacific coast.

The boat ramp area includes a two lane washing station and two waste dumps for RVs and boats. This area receives large amounts of traffic on a daily bases.

The continual washing of boats and jet skis produces flows of water directly into the harbor. In the peak summer months this area generates up to 4000 gallons of nuisance flows a day.

Five years ago an oil water separator was installed to capture these nuisance flows and treat them before the runoff was discharged to the harbor. While the system proved effective at removing sediments and hydrocarbons it was unable to address other pollutants of concern such as bacteria and dissolved metals.

The Challenge

The City of Oceanside has always been very proactive in improving water quality by implementing state of the art stormwater treatment systems to help protect the city's water resources.

"The wash down area is a unique situation, very different from traditional stormwater treatment situations. With continuous daily nuisance flows, large amounts of oils are flowing down the storm drain. The two dumping stations at the Oceanside Harbor area allow boats and RVs to empty their wastewater. While these areas are contained, small amounts wastewater still finds its way into the storm drain. This situation allows high amounts of bacteria to enter the existing oil water separators, which are not designed to treat and remove bacteria. We had to find an alternative technology that would be effective at removing the bacteria, including fecal coliform," explained Mo Lahsaie, Clean Water Program Coordinator, City of Oceanside Water Utilities Department.

The Solution

The City's stormwater department actively researched different methods and available technologies that could provide the best level of treatment for this area.



About Modular Wetlands

A new and revolutionizing product from Bio Clean is The Modular Wetland System (MWS). This system is the industry's first hybrid stormwater treatment system. While most systems utilize a single treatment method, the MWS incorporates a combination of many. It removes trash, floatables, oil and grease, sediments, heavy metals, nutrients and bacteria. Perfect for GREEN design and sustainable projects. For more information on MWS visit www.modularwetlands.com.



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While there are many systems out there that utilize physical and chemical filtration processes, none were designed to deal with continuous nuisance flows and high concentrations of bacteria. Biological filtration has proven to be very effective at dealing with these types of situations.

One example is bioretention systems. They have gained much popularity over the past few years for treating stormwater. While these systems proved effective in traditional stormwater treatment situations they did not have the capacity to treat continuous nuisance flows. These systems need to be allowed to drain out in order to maintain their aerobic treatment zones.

One biological treatment system that had proven effective at both stormwater and wastewater treatment situations are sub surface flow wetlands. Sub surface flow gravel wetlands have been used for hundreds of years to passively treat wastewater. Since the early 90's this same technology has been used to effectively deal with stormwater runoff. The situation at the Oceanside Harbor has characteristics of both stormwater and wastewater situations.

The innovative Modular Wetland System Linear (MWS Linear) is treatment system engineered to deal with both stormwater and low concentration wastewater applications. One of the main advantages of this system is its ability to successfully treat continuing nuisance flows.

The MWS Linear is the industry's first hybrid stormwater treatment system. "The system doesn't solely depend on the sub surface flow wetland for treatment. We have taken a natural treatment technology and integrated it with other treatment processes," said Gregory Kent, CEO and president of Modular Wetlands.

How Modular Wetlands Works

The treatment-train philosophy: Before runoff enters the sub surface flow wetland treatment cell it is moved through three pre-treatment stages: screening, sedimentation cell, and Bio-MediaGreen.

- Screening: The runoff is first screened to remove trash and debris.
- Sedimentation Cell: Then the pretreated water is directed to a sedimentation cell to allow large sediments and total suspended solids (TSS) to settle out.
- BioMediaGreen: The runoff is then directed through an innovative perimeter filter. This filter contains a revolutionary filter media called BioMediaGreen. This media physically, chemically, and biologically removes a wide array off pollutants including dissolved metals and hydrocarbons.
- Sub Surface flow wetland cell: Only after being filtered by the three pre-treatment stages does the runoff enter the sub surface flow wetland treatment cell.

This treatment-train philosophy has proven to be the most effective and feasible way in dealing with stormwater and wastewater. "It's like a miniature waste water treatment plant; each stage of treatment protects the next stage from prematurely clogging," added Kent.

Results

With the sensitivity of the high trafficked area and strong threat created by the boat washing stations and RV waste dumps, the system needs to be effective. "We are confident in the MWS Linear system and believe is the solution that the City of Oceanside needs," said Kent.



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