VACUUM AIRLIFT

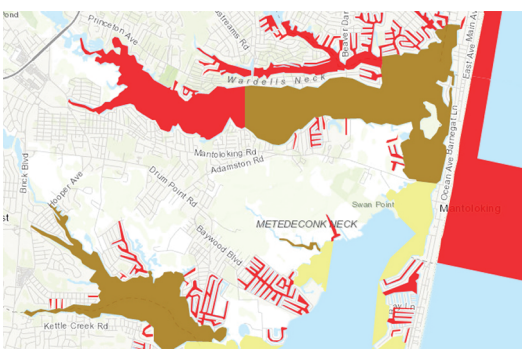
SHELLFISH PURIFICATION

A Case Study in Pathogen and Suspended Solids Removal

Situation

As filter feeders, bivalve molluscan shellfish concentrate contaminants from the water in which they are reared. When the shellfish are eaten these contaminants can pose a risk for humans, ranging from off-flavor to illnesss. The result is a biosecurity issue that must be addressed in the farming and harvesting of shellfish.

Contamination with bacteria and viruses in the growing area determines the processing that the shellfish need to undergo in order to comply with safe sanitary standards before consumption. The risk is considerably reduced by depuration treatment that purge the impurities from the shellfish.



Example : Barnegat Bay, NJ

Approved | Conditionally Approved | Restricted | Prohibited

Requirements

In the US, classification of harvesting areas is specified in regulations detailed in Chapter XV of the Model Ordinance of the National Shellfish Sanitation Program (NSSP; US FDA 2006).

The table below provides the US requirements.

US National Shellfish Sanitation Program Shellfish Harvesting Area Classification Criteria

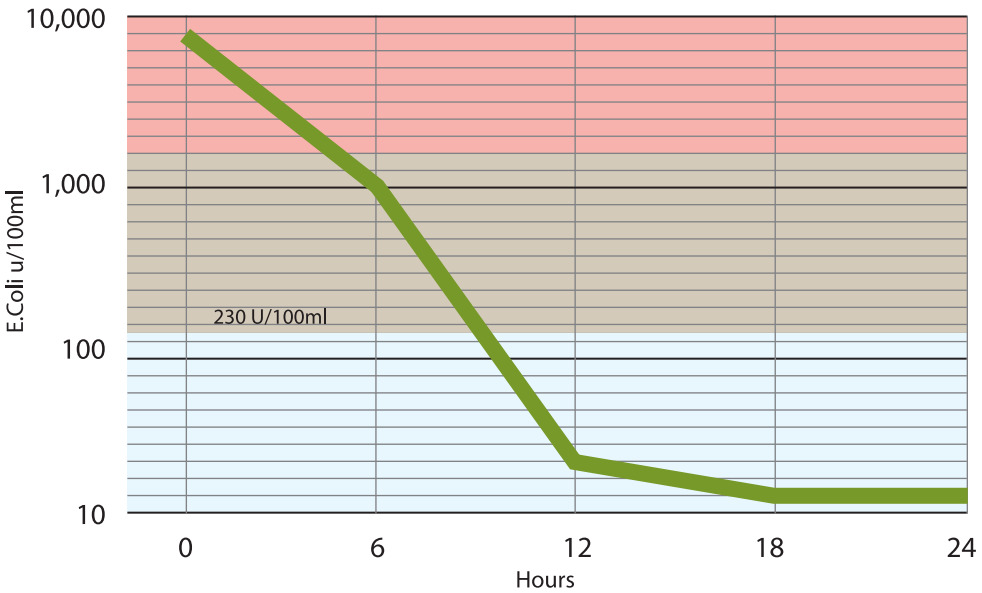
	Total coliforms (100 ml water)		Faecal coliforms (100 ml water)		
Classification	**Geometric Mean**	**90 % compliance**	**Geometric Mean**	**90 % compliance**	**Treatment required**
Approved Areas	≤70	≤230	≤14	≤43	None
Restricted Areas	≤700	≤2300	≤88	≤260	Purification or relaying in an approved area
Prohibited Areas	No sanitary survey or conditions for approved/restricted areas not met				Harvesting not permitted

Our Solution - The Vacuum AirLift™ (VAL™) is a simple and multi-functional, solution to water treatment

The patented VAL™ technology performs water circulation, gas exchange and particulate extraction in a reliable and energy efficient device.

The VAL™ extracts micro-particulates and pathogens that contaminate shellfish rearing water. If left untreated this contamination leads to off flavor, biosecurity issues and risk for adverse human health effects.

Oyster Depuration with the VAL™



100 gpm Oyster Depuration System

1300 gpm Oyster Depuration System

Results - Trial illustrating the VAL's™ effectiveness in shellfish purification.

This trial was conducted with a VAL600™, on a tank containing 1,300 gallons of sea water and live oysters. The test results were validated by the certified AQMC laboratory (COFRAC #1-1366).

Starting with an E. coli concentration 30 times the allowable limit, the VAL™ reduced the concentration to the 230 U/100ml threshold in approximately 9 hours. After an additional 9 hours the level had stabilized below 20 U/100ml, less than 1/10 the allowable limit. This test validates the VAL™ as a highly effective tool in addressing depuration and other aquaculture biosecurity issues. Our wide range of VAL™ models can treat 10 to 1,000 gpm of water, from purification tanks that contain 500 to 50,000 gal. of water with shellfish.

Please contact us to find the perfect VAL™ to fit your shellfish purification need.

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