Oil/Water Separator Rules and Product Options

CrystalStream Technologies
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About CrystalStream

- Over 12 years of Stormwater Design and Maintenance Business
- Products installed across the North America
- Current Products
  - CrystalClean Separator
  - CrystalClean HP
  - Catch Basin Insert product options

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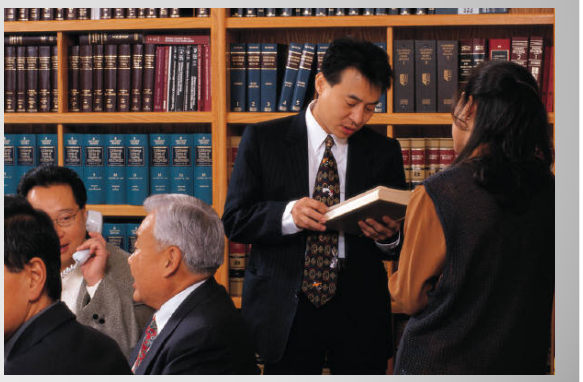
Why do we need Oil/Water Separators?

Understanding the Clean Water Act

- Established in 1977 by the EPA
- Water Quality Act in 1987
- Regulated by the NPDES Permit System
- Effluent Discharge Limit = 15ppm
- 11 Categories of Industrial Activity
- Specifically targeting facilities that store petroleum



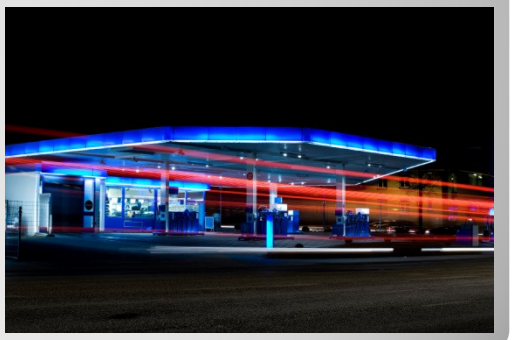
Defining a Petroleum Storage Facility

- Underground Storage Greater than 42,000 gallons
- Above ground storage capacity of…
  - Single Container storage of 660 gallons
  - An aggregate above ground storage capacity greater than 1320 gallons

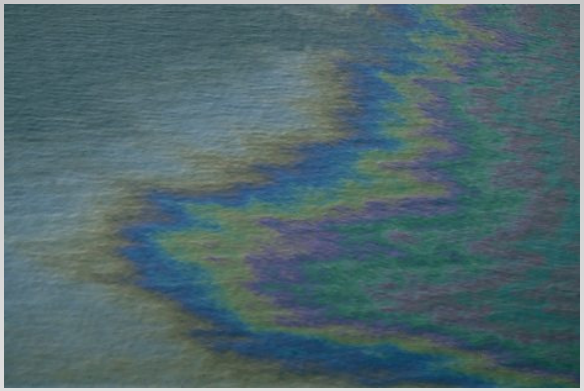
- Or a facility at a location which can expect a spill to reach a navigable waters

Types of Facilities Required to Comply

- Petroleum Marketing Facilities
- Manufacturing
- Military Installations
- Motor Pools
- Asphalt Plants
- Automotive Garages, Service facilities, etc
- Utility Companies
- Aviation Accounts
- Vehicle Maintenance Facilities



- Oil Sheen or file, or discoloration
- 15 parts per million (15 PPM) = 15mg/l



A harmful quantity is virtually any amount of oil. In fact a harmful quantity of oil, by government definition, is an oil discharge that can "cause a file or sheen upon, or a discoloration of, the surface of the water" or a discharge that can cause a sludge or emulsion to be deposited beneath the surface of the water or upon adjoining shorelines; more specifically, an oily waste having an average oil content greater than 15 parts per million (15 PPM). A navigable body of water includes just about any creek, stream, lake, river, estuary, bay ocean or adjoining body of water of the United states. The means of discharge may include discharge through a pipe, culvert, ditch, or storm sewer.

What is considered an Illicit Discharge?

Basically any facility or property which could discharge a harmful quantity of oil, or petroleum product and the water can enter a navigable body of water in the United States.

**If the storm system discharges to a stream and then to a river and into the ocean then anyone discharging into the storm system would be required to comply with the regulation.

Summary of who should comply

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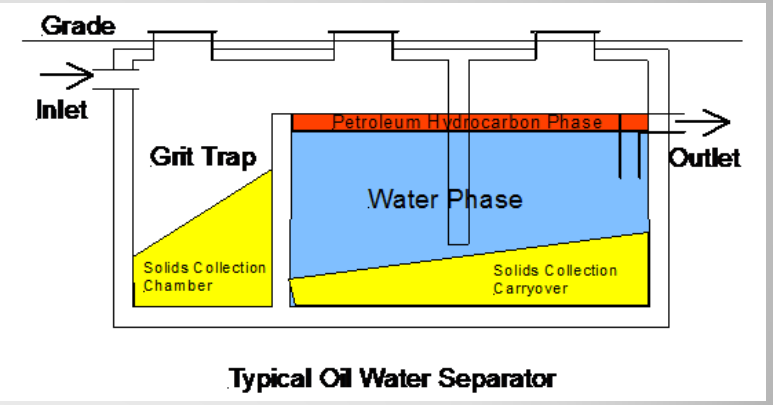
Treatment Product Options

Gravity Separators are one of the oldest design concepts with tank length to width to depth being the critical for performance.

- Typical expected effluent discharge ranges from 100PPM to 150 PPM.
- Typically include a grit chamber
- Usually sized based on storage capacity in gallons

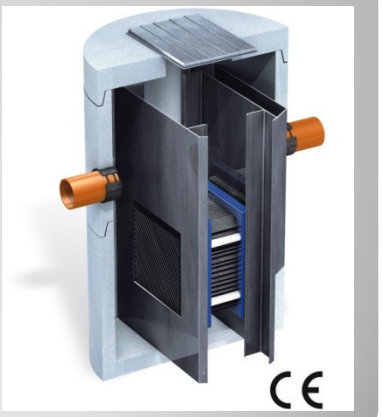


Typical Oil Water Separator

Standard Oil/Water Separator

Coalescing Pack Physics

- Coalescing can be accomplished including the use of, plates, ribs, etc.
- Typically have been designed based on a large surface area in contact with the flow.
- More Surface Area = Enhanced Separation
- Typically these types of Separators effluents range from 10-20 gpm



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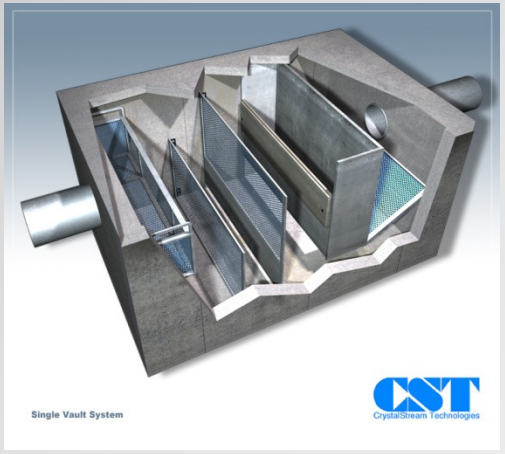
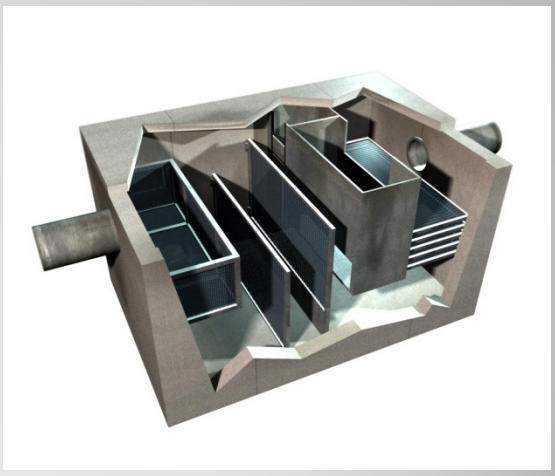
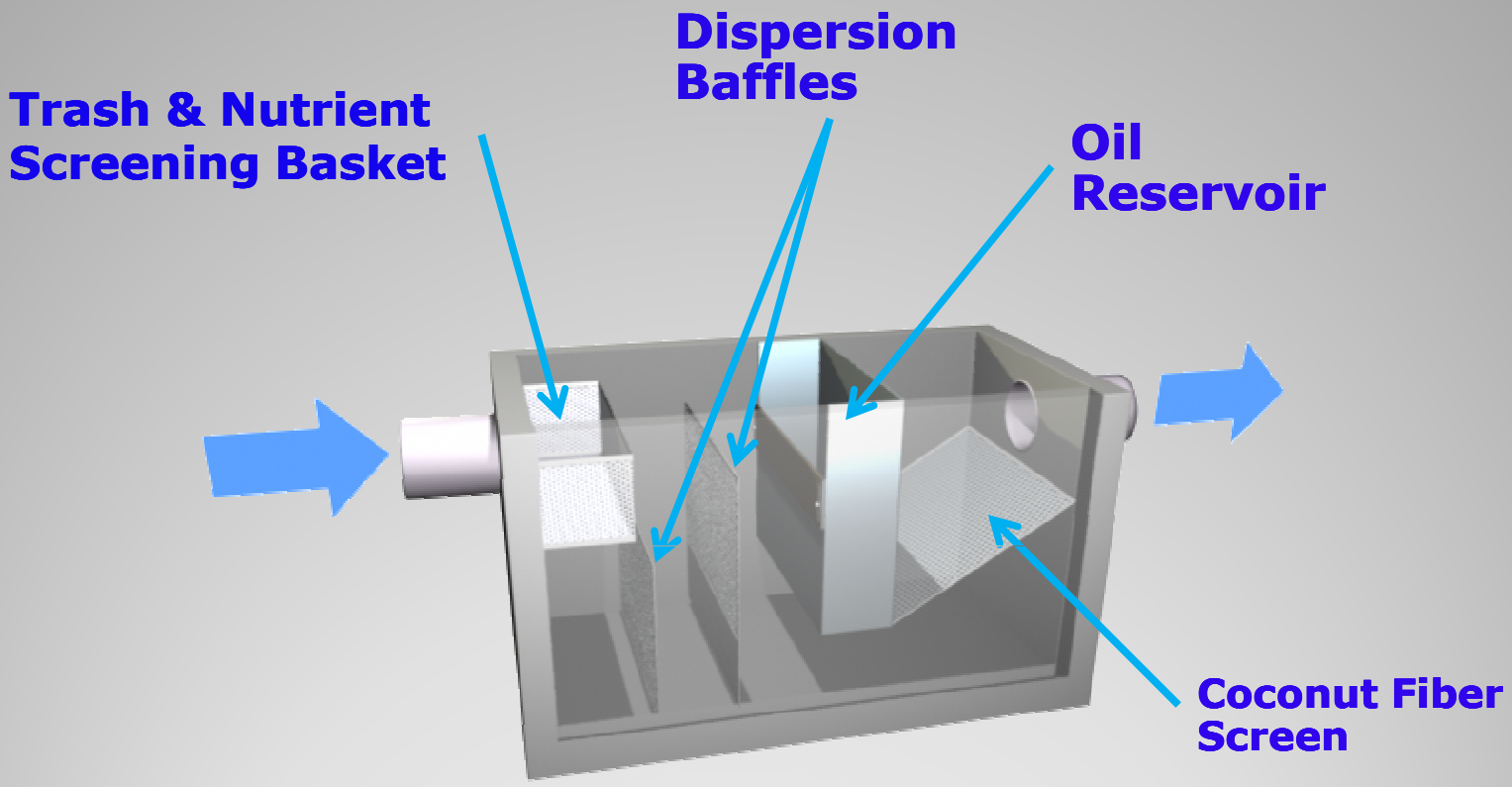


CrystalClean Separator

- Enhanced Treatment options available
- Locally Manufactured and delivered fully assembled.
- Proven 12 years of Maintenance
  - 14 million pounds removed year to date from over 400 devices under contract
- EPA-ETV Tested
  - 89% Sediment
  - 40% Phosphorus



Pretreatment-Sediment & trash



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Phases of Treatment

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ESK Koala Oil/Water Separator

Understanding how the ESK Koala Works

The separation of oil derivatives occurs during horizontal flow of polluted waters through oil-philic layer. This is called coalescence process - joining of oil micro-drops into bigger globules. They may increase their climb rate and surface. Then the cleaned water is directed to receiver.

ESK Koala Physics

- Coalescing Media-
- Tested under European DIN Standards
- Certified to effluent concentrations of 2-5 PPM with droplets as small as 10-20um
- Built in shutoff valve
- Flows from 5 to 4700 GPM in a single manhole
- Custom Designs for flows greater than 4700 GPM
- CST is an licensed distributor of the ESK Koala

ESK Koala High Efficiency Oil/Water Separator by Ecol-Unicon

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ecol Leader in rainwater separation

- Developed and Tested in Europe
- By providing smaller openings encourages finer droplets through single opening.
- More surface area than standard plate separators
- Greater surface area = greater performance
- Forms larger droplets by directing smaller droplets together

ESK Media

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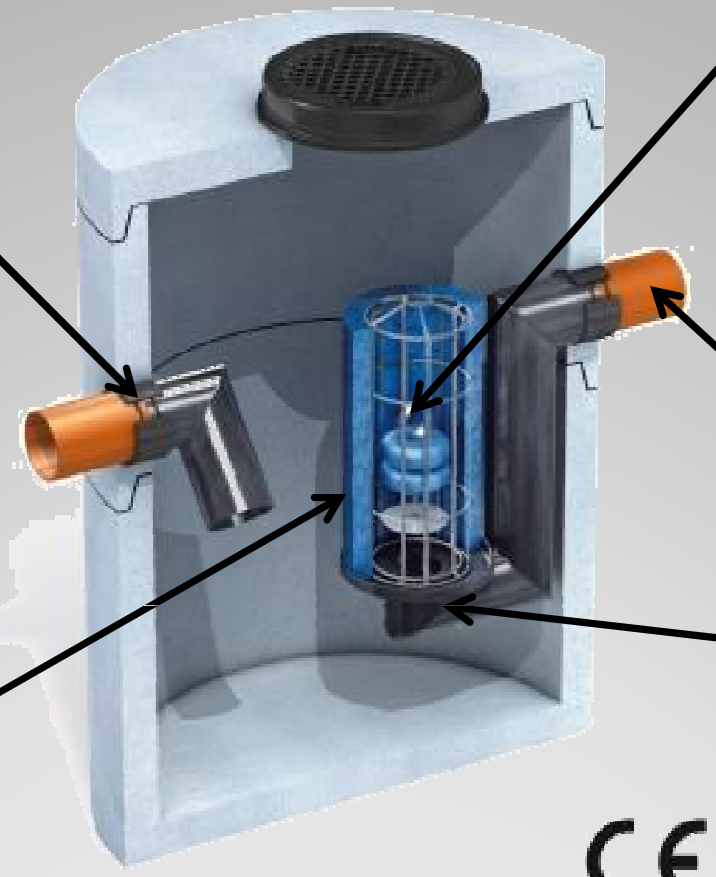
ESK Anatomy



Inlet Elbow

Reduces disturbance of collected hydrocarbons that have separated and sit on the water surface

Shutoff Float

The shutoff float stops the outlet flow when the oil being stored in the unit reaches maximum capacity

Outlet Pipe

Connects to site piping using a standard coupler

Coalescing Media

Provides a larger surface area to direct the oil droplets together allowing them to rise faster

Bottom Drawoff

Final stage of separation as water exits from bottom of structure where working against the physics of the oil separation increasing the level of protection.

ESK Model	Max. Flow (gpm)	Structure ID (in)	Sump Depth(in)	Inlet Min Cover Depth(in)	Outlet Min Cover Depth(in)	Outlet Pipe OD Dia(in)	Total Volume(gal)	Oil Storage Volume(Gal)
1.5	**24**	48	32	19	20	6	251	72
3	**48**	48	32	19	20	6	251	72
6	**95**	48	32	19	20	6	251	72
10	**159**	48	32	19	20	6	251	72
15	**238**	48	38	24	25	8	298	133
20	**317**	48	38	24	25	8	298	133
30	**476**	60	48	26	27	12	588	269
40	**634**	60	48	26	27	12	588	269
50	**793**	72	68	25	26	12	1199	426
65	**1030**	72	68	25	26	12	1199	426
80	**1268**	72	68	25	26	12	1199	426
100	**1585**	96	68	25	26	12	2131	758
110	**1744**	96	78	36	37	16	2444	988
120	**1902**	96	78	36	37	16	2444	988
130	**2061**	96	78	36	37	16	2444	988
140	**2219**	96	78	36	37	16	2444	988
150	**2378**	96	78	36	37	16	2444	988
160	**2536**	96	78	36	37	16	2444	988
170	**2695**	96	78	36	37	16	2444	988
180	**2853**	96	78	36	37	16	2444	988
190	**3012**	96	78	36	37	16	2444	988
200	**3170**	96	78	36	37	16	2444	988
225	**3566**	120	88	37	38	20	4308	2144
250	**3963**	120	88	37	38	20	4308	2144
275	**4359**	120	88	37	38	20	4308	2144
300	**4755**	120	88	37	38	20	4308	2144

ESK Model Table

Questions???

For more information on CrystalStream products please visit

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Or Call

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Leader in rainwater separation