Quality Standards, Opportunities and Challenges in the Waste Water Business in India

Headworks International Inc.

Presented by

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Corporate Overview

- Founded in 1993
- Headquartered in Houston, Texas
- Over 50 employees worldwide
- Fabrication facility in USA with global capability
- Integrated systems provider of environmental technology for wastewater treatment
- 1500+ installations in 40 countries
- ISO 9001 certified

Company Headquarters

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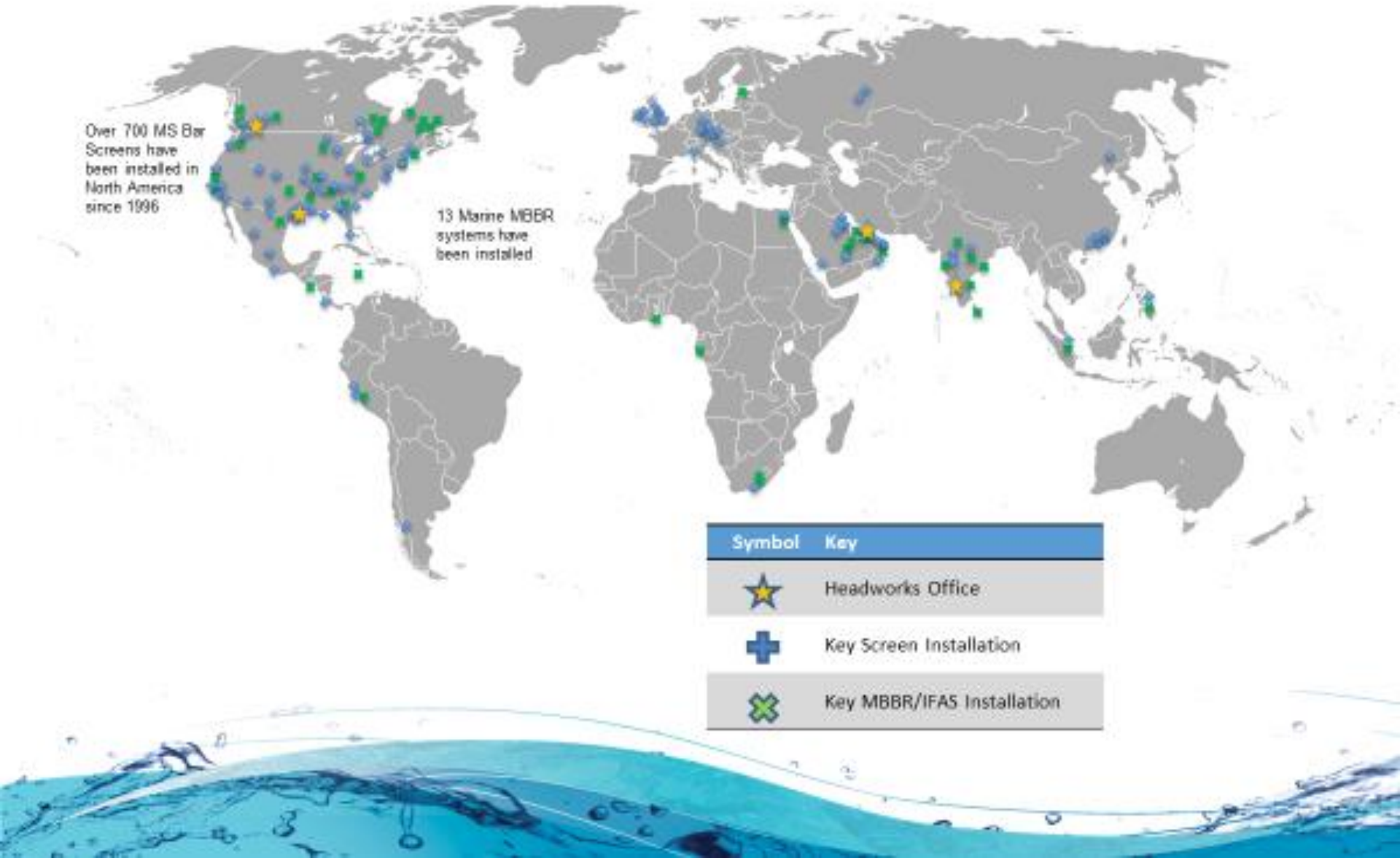
Houston, Texas

Global Footprint



History of Sewage Treatment

US got the first sewer network in 1850, the first plant was built in 1850 which was based on chemical precipitation. In 1912 the first ASP based plant was built.

Germany adopted sewer systems as early as 1842, it took off in a big way in 1867 after the epidemic. It got its first waste water treatment plant in 1927. It was an oxidation pond in München.

Although Japan got its modern sewer network in 1884 the first sewage treatment plant was established in 1945.

OPPORTUNITIES

The waste water business in India is very huge.

Initially the priority was for the drinking water, hence no focus on waste water. In the last two and a half decades focus on waste water treatment started.

80% of the waste water generated in India is untreated.

65% of the so called treatments plants installed over the years are defunct or not up to the mark.

The population is huge and cities have seen exponential growth. The demand for water is only increasing and consequentially contributing to the increase waste water generated as well.

Focus on new and efficient technologies

GUIDELINES in US

Most of the plants in the US were established in the 1960's. The market for new plants is saturated.

The discharge was limited to BOD less the30. No nitrification or BNR was required.

Whenever an old plant has get permission for enhanced flow, the new discharge norms kick in. This calls for rehabilitation of the plant. This will be a significant market in the future.

The current discharge norms are as follows:

BOD < 10 mg/l, TSS < 10 mg/l, NH3-N < 0.3 mg/l, TN < 3 mg/l, TP < 0.1 mg/l

This is the worst case scenario and differs state wise and where it is discharged into.

Now looks like Trump rescinded the Obama policy which protected Oceans and Large Lakes.

GUIDELINES in India

Initially there was requirement for BOD as well as Nutrient removal in the waste water treatment plants.

13 Oct 2017 Circular diluted the requirement and the treatment was limited to the following:

> **Metro Cities and all the state capitals barring some NE, NW and Union Territories had to meet discharge limit of 20 BOD, 30 TSS and 100 Coliform. All other towns and cites could go up to 30 BOD, 50 TSS and 1000 Coliform.**

Earlier the discharge limit was BOD<10, TSS < 10, TN < 5, TP < 2 Coliforms < 100 MPN/100ml.

The new law is silent on other parameters.

However some of the bids in Delhi, Bangalore and other places are with the old parameters. These probably are pre-approved bids.

Industrial units are being pushed towards ZLD

CHALLENGES

In India there is no merit for any aspects other than price. Although at times the technology is pre-decided or kept open, lowest price is what matters.

Due to price war the contractor goes in for the cheapest vendor. This poses a huge problem for the US Organizations with their state of the art technology.

Most of the vendors in India claim very tall. If you offer a state of the art product, there will be a local competition offering the same technology at a fraction of the cost.

This is across all the Municipal and Industrial projects

Cultural difference is also a huge issue.

ETHICAL ISSUES

It is almost impossible for a multinational to directly bid for the Municipal Projects. He has to piggy back on a local contractor. This has its own challenges.

Most of the waste water plants don't work. In this vicious cycle, the Owner never accepts his plant has a problem, the Contractor boasts of his state of the art plant and this goes unchallenged. And even goes on to get a certificate for successful plant and lastly the regulator is least bothered. The is true across Industrial and Municipal projects.

It is pre-decided how much a plant should cost. Every contractor works around this and bids the lowest to get a project.

This has resulted in fall of several infrastructure companies. If you skim through the restructuring costs, they are more than three times their order book and several times more than their net worth.

Most of these companies are run by banks. The banks pay salary to the employees and prevent the loan from going into NPA fold.

Case Study of a Municipal Plant

Sewer Mining the Jugad way

The existing STPs (which are in operation before 21.4.2015) will achieve these standards within 5 years. However, they need to have complete approved proposal and action plan (to meet the above standards)within two years i.e. before 21.04.2017.

These standards are applicable irrespective of the mode of disposal of the treated sewage.

1.	pH	6.5 to 9.0
2	BOD	≤10mg/l
3	COD	≤50mg/l
4	TSS	≤10mg/l
5	Feacal Coliform	≤230/100mg/l
6	PO_4-P	≤2mg/l
7	Ammonical Nitrogen as N	≤5mg/l
8	N-total	≤10mg/l

State of the art STP

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Case Study of an Industrial Plant

The National Green Tribunal was formed in 2010 to look into environmental issues and deliver speedy justice by taking the load of the over burdened courts.

The is headed by a former chief justices of India. Although at present it is headless and has a acting chair person.

The judgements passed from time to time ended up becoming kind of laws and strictures.

They categorized industries by color code Red namely Orange Yellow and Green and thereafter went after them asking them to adopt ZLD Plants.

The Industries somehow managed to cook the data. Then a law was passed to implement online meters for Air and Treated Water which were connected in real time data up to PCB with graduated alerts. Even here the industries tried to get around. The latest direction was to install a live camera opposite to the meter.

NGT Initiatives

The NGT pushed majority of the industries into the red category there by forcing them to adopt safe discharge practices.

They closed several industries and have put on notice the Municipal corporations to fall in line or face action.

The judgement in case of infamous Bellandur Lake saw all the Industrial Units shut that were discharging to the lake indirectly.

What Ails the Environmental Industry

Lowest bidder wins the project - This has led to sever competition and at end delivery of poor quality material.

No political will for reforms - The law makers are ignorant and have other priorities than burning issues.

Poor decision makers - The Engineers at the implementation level will not take any decisions and would rather go by the book irrespective of the consequences.

Poor and complex legal system - This has often let the defaulting contractors to get away

Forced gratitude - Vested interest end up in proposing a technology irrespective of its merits.

Case study of the Delhi Interceptor Project

In 2008 the Delhi Government came out with a grand scheme to intercept and divert all the waste water from the storm water drains to the sewage treatments plants (to be set up subsequently) there by avoiding the dumping of the Sewage into Yamuna.

CH2MHill along with EIL were appointed as the consultants. In a Boston conference we were informed about this project and we stared to work on these projects.

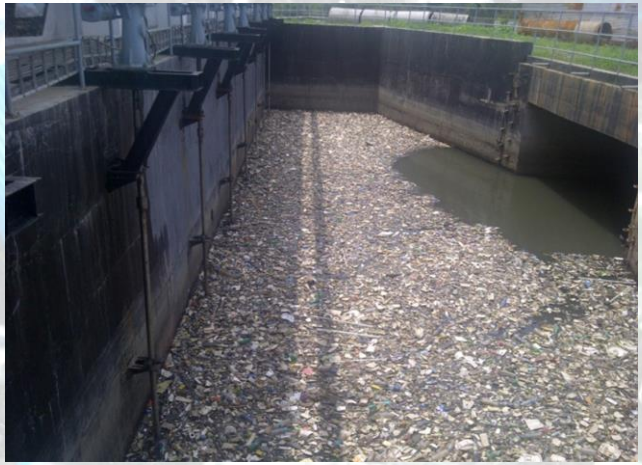
Initially there were just 6 contractors short listed and the best makes were approved. After the bidding process was started and even after the first pre bid meeting took place, due to political pressure, several other contractors got. This let to vendors from all walks of life to lobby and get their product also approved. Finally the specifications were diluted and one contractor even ran away.

Case Study of Irla Pumping Station

Mumbai is famous for its monsoon floods and the 2005 fiasco was an international news maker.

The floods occur mainly due to poor evacuation of water from the storm water drains which get clogged due to debris in the drain which more or less is like a CSO.

We had suggested a system which would solve this problem. Although everyone was in favor of our system. The question was who will bell the cat.



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RAY of HOPE

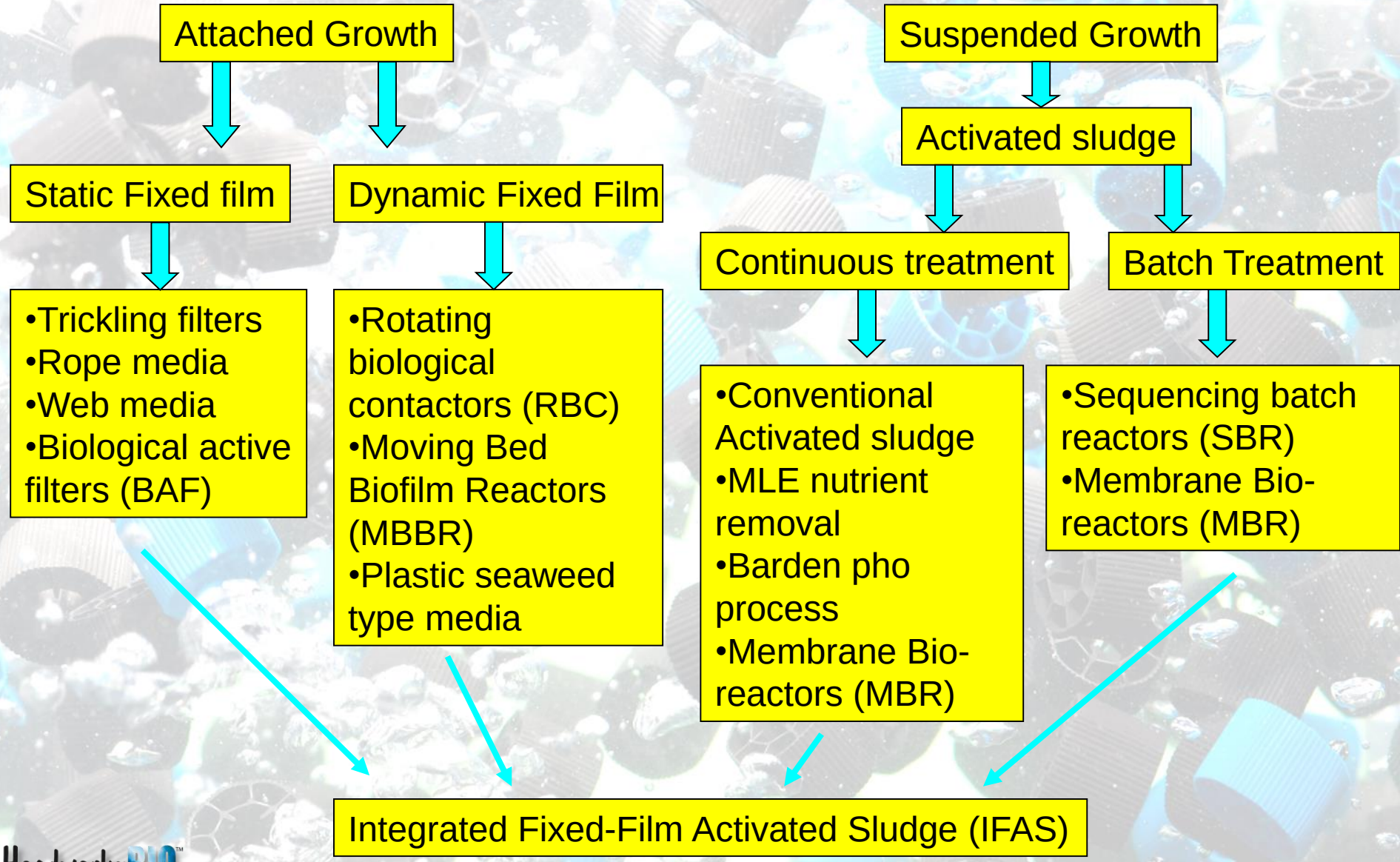
The new plants that are coming up are with the state of the art technology.

Where the technology has failed the vendor is done away with and international technology suppliers are preferred.

The new contracts are bundled with long term O&M there by necessitating the contractor to go in for good and reliable technologies.

National Green Tribunal is continuously innovating to plug leaks in the system and hounding the Industries and Municipal bodies for quality discharge

Wastewater Technologies



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NEW TECHNOLOGIES

There predominantly 3 new technologies that are prevalent in the Indian Market

SBR

This is a very good technology as all the operations like BOD, Nitrification and clarification happens in one tank. Most of the Municipal and many industrial plants have adopted this technology.

MBR

This technology is very good and delivery high quality water. But the drawback is cost and maintenance. Very few Municipal plants have adopted this technology. Many a Industrial plants have adopted this technology.

MBBR

This technology is the only resort when the plant has to be upgraded or when a new plant has to be established with limited space. Has seen a good success in Industrial Projects. It is catching up in the Municipal segment now.

Questions?

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