



HEAVY OIL

Odour Eliminator

Oil-tank-cover technology offers quick solution to foul-smelling emissions problem

With controversy over odours from heavy oil operations in the Peace River area of north-western Alberta having led to a provincial order to take action quickly, a vapour control technology developed by a company based in Innerkip, Ont., is likely to be viewed as at least part of the solution.

In a ruling released on March 31, the Alberta Energy Regulator (AER) demanded that one of the operators in question install pollution-control equipment within a four-month period.

Greatario Engineered Storage Systems, which since 1986 has designed and installed 400 tanks and 100 dome covers in eastern Canada (mostly over-top of water and waste-water storage systems), was mentioned at the hearings as a company that has the technology to control hydrocarbon emissions.

Baytex Energy Corp., the target of most of the complaints from residents about odours from its heavy

oil production and storage operations, was ordered by the AER to take steps to reduce its emissions because of possible health concerns.

The AER panel that issued the order held public hearings in the Peace River area in January, at which Baytex, one of the larger producers in the Peace River area, was singled out as the company responsible for most of the odour-causing emissions.

"Odours caused by heavy oil operations in the Peace River area need to be eliminated to the extent possible as they have the potential to cause some of the health symptoms of area residents," the AER panel said in its ruling.

About seven families have moved away from the rural area in the last two or three years after complaining about dizziness, headaches, fatigue and cognitive impairment.

Baytex spokesperson Andrew Loosley says the company promised at the January hearings to install vapour >

COVER UP

Greatario's Hexa-Cover tank-capping solution uses hexagonal tiles made from recycled plastic designed to interlock and form a coherent cover.

recovery units (VRUs) at its Reno field operation, and it will go ahead with those and other plans to contain emissions, although he says "it might be challenging" to meet the four-month deadline.

Baytex, like other producers in the area, uses the cold heavy oil production with sand (CHOPS) process to extract the heavy oil. CHOPS is used widely in Alberta, but emissions with a higher sulphur content appear to be the source of the odour problem in the Peace River area.

because the majority of its 86 tanks at Reno are open-vented, with only 29 being connected to VRUs, the most commonly used technology in the industry.

In a detailed description of steps that it and other CHOPS operators in the area have taken to contain emissions, which include the use of casing gas conservation and tank vapour management systems as well as VRUs, Baytex mentions it is considering the use of Greatario tank covers for "enhanced vapour management."

tanks used in the industry by municipalities or in agriculture.

Greatario went on to describe how the tiles—manufactured from recycled plastics and without the use of harmful materials—would work. "The tiles are hexagonal elements with symmetrical ribs on both sides," it said in a press release. "The ribs make the floating elements distribute themselves naturally and uniformly on the liquid surface without overlapping. The unique design makes them interlock by wind pressure, ensuring that they mechanically constitute a coherent cover."

It went on to further describe how the Hexa-Covers could cover 99 per cent of a tank or lagoon's total surface, eliminating 95 per cent of evaporation.

"The floating tiles can simply be poured onto the surface and, under the effects of the wind and movement of the liquid, will form themselves into a cover," the company continued in describing the technology. "They are so designed that the tile edges will key into each other."

It went on to say there would always be free access to the liquid in a tank for measuring, emptying or observing. In addition, the company said, once installed, there are no operational costs attached to the Hexa-Cover system. There would be a reduction in total costs, with energy savings and a reduction in water consumption. The covers have a life expectancy of 25 years.

At the time the company, which had never worked in the oilpatch, didn't realize the systems would play such a growing role in western Canada's oil industry. The Hexa-Cover technology was first developed in Denmark to reduce odours from farmers' manure tanks.

Greatario first started testing the technology for a company with extensive heavy oil operations. (It will not identify the company.) That company has since ordered several hundred of the units.

Frank, who testified at the Peace River hearings, tells *New Technology Magazine* that it costs about five per cent of the cost of a VRU to install. Most oil storage tanks hold about 1,000 barrels of crude.

With VRUs costing several hundred thousand dollars each, he argues that wide use of the covers could "dramatically reduce" the need for VRUs and could be used on their own as an interim solution or in combination with VRUs.

At the hearings, the "ultimate solution" identified by him and others was a combination of a Hexa-Cover installed



LIMITING EMISSIONS

A Greatario crew installs Hexa-Covers atop heavy oil tanks. The covers offer one solution to the problem of odours escaping from the heated tanks in northern Alberta.

In the CHOPS process, bitumen is heated on the surface in storage tanks, causing the hydrocarbon emissions that were being vented by Baytex and others. In the more widely used steam assisted gravity drainage (SAGD) and cyclic steam stimulation processes, steam is injected underground to liquefy the bitumen, allowing emissions to be better contained.

The AER panel said operational changes must be implemented to eliminate venting and reduce flaring. It also ordered all excess gas from tank tops or gas co-produced with bitumen to be captured. It wants operators, either collectively or individually, to produce solutions to the odour problem by October.

Although there are other operators in the area—including Shell Canada Limited, Penn West Petroleum Ltd. and Husky Energy Inc.—Baytex has been the target of much of the criticism, largely

If it does so, it would certainly not be the first heavy oil producer to do so.

At the hearings, Terry Frank, vice-president of sales and marketing for Greatario Covers Inc., a wholly owned division of the parent company, said the company had received orders for more than 1,300 of its tank covers since introducing the technology to Alberta and Saskatchewan producers in April 2013. He said 949 of those had already been installed.

The genesis of the technology came from a distribution agreement the parent company signed with a Danish-based company for its Hexa-Cover technology. When Greatario announced the deal, it said the floating-tile system could be used on all kinds of liquids and would eliminate evaporation, organic growth, emissions and odours. It said it could be used on all forms of basins, lagoons, reservoirs, containers, ponds and water

over a floating roof, tanks with fixed-roof systems, VRUs and a collection or destruction system for vapours.

Frank said the use of Greatario's technology could help suppress petroleum-based emissions such as benzyne, toluene, ethylbenzene and xylenes, and water vapours at the source. "We reduce overall emissions by two-thirds," he said.

The covers, installed by an experienced crew brought to western Canada from Ontario, can be in operation in less than 30 minutes. The units are installed through a "thief hatch" opening in the storage tanks, which is an opening created for observation and other purposes.

Given the activity levels in the oil-patch and the sophistication of VRUs, it can take six months or more to have one installed. Meanwhile, a Greatario cover can be in place and can be substantially reducing emissions.

At the hearings, Frank also said that once the covers are installed, they "dramatically reduce the amount of hydrocarbon and water-vapour emissions that need to be collected by the VRU," meaning less VRU freezing or upset conditions will occur. This can reduce the need for flaring.

Frank, who noted that the company's new petroleum division is growing so rapidly it has opened an office in downtown Calgary, said it is also working on a cover that might be applicable to the SAGD sector of the oilsands business.

The cover would be installed overtop storage tanks used for condensates, which is used to dilute bitumen (producing dilbit) for transport by pipeline, and would reduce vapour loss to the atmosphere. Since companies need to capture the vapours, it would reduce a cost for the industry.

While SAGD is not as large a market as the CHOPS sector of the heavy oil industry, it would still represent a significant opportunity for the small company, which has 60 employees overall, five of whom work for the petroleum division.

The company is awaiting the granting of patents in the United States and Canada for its covers.

■ *Jim Bentein*

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the potential to cause some of the health symptoms of area residents."

— *Alberta Energy Regulator*

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