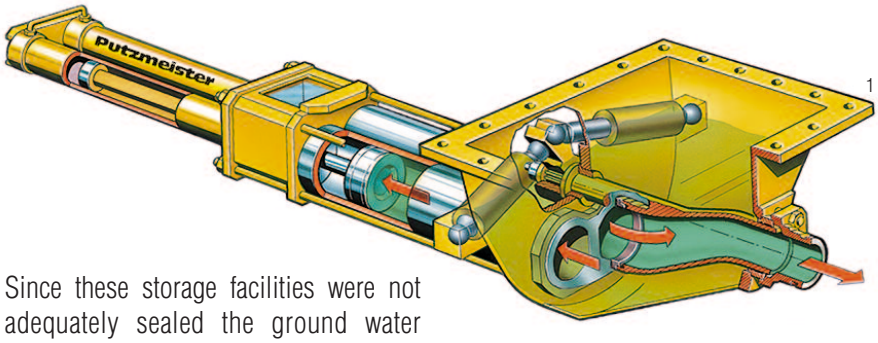
Site report

High-density solids pump disposes of tar lake

Putzmeister



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Tar storage facilities at Schwarze Pumpe are cleaned up. The Terpe tar storage facility and the Zerre tar lake at Schwarze Pumpe represent over half a million tonnes of tar residue disposed of at Schwarze Pumpe (Brandenburg) as a by-product of city gas production. The decision was taken to rehabilitate these locations on account of a level of ground-water contamination which was assessed as requiring remediation.

Since the mid-1960s city gas has been manufactured at Schwarze Pumpe from brown coal. This activity also created tar oil residues which were dumped since the quantity in question did not make energy recovery feasible. Over an area of around 50,000 m² in all, this resulted in the Terpe dump with about 150,000 tonnes of residues and the Zerre tar lake with about 380,000 tonnes.

Since these storage facilities were not adequately sealed the ground water became contaminated, predominantly with BTX (**B**enzene, **T**oluene, **X**ylene) and phenols. Cottbus district council therefore decided that Terpe and Zerre should be cleaned up. These locations thus joined the list of high-priority rehabilitation projects in the new German states which is maintained by Federal Ministry of the Environment, Nature Conservation and Reactor Safety. As part of a campaign of national 'ecological reconstruction' it should serve as an example of inherited industrial contamination. Due to the toxic nature of the surroundings a technically complex solution was decided on. There were 178,000 tonnes of solid residues to deal with here and also 202,000 tonnes of pumpable residues. The machine used was the **Putzmeister Dredgemaster.**

This unit consists of a floating dredge and a **high-volume KOS 2180 high-density solids pump** which was installed with material feeder unit, mixing trough, screening unit and foreign bodies separator and also the diesel power unit. The dredge removes the mixture of tar oil solids from the lake and passes it on to the vibrating screen where any foreign bodies larger than 80 x 80 mm, such as branches or car tyres and

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A complete unit – the dredgemaster, consisting of the floating dredge and a KOS 2180 high-density solids pump

File under: A 1.00, BP 1.03, A 4.00, BP 4.03

so on, are separated out. The tar sludge is then fed into a mixing trough with a capacity of 3 m³ where it is homogenized; the trough also serves as a buffer reservoir for the continuous pumping line.

The high density solids pump is designed to handle 47 m³/h. It consists of a hydraulically powered 2-cylinder piston pump with the pumping pistons working in push-pull operation such that the suction and pressure strokes alternate with each other. An unusually long stroke length of 2100 mm allows 130 l to be pumped per stroke, which in turn means extremely smooth pumping action. The so-called 'S transfer pipe' connects the two pumping cylinders to the delivery line. The floating delivery pipe, nominal width 200, has a maximum length of 150 m. From here the pipe is routed to the fuel processing unit 200 m away.

The pumping pressure is 70 bar maximum. Local operation of the dredgemaster is not possible on account of the operating conditions and so a remote control unit with a joystick was used at a central control location on the bank of the tar lake. With the aid of 2 video cameras on board and the corresponding monitors on land the operating personnel could supervise all operations from a safe distance.

The sticky consistency of the material being pumped meant that the sludge pump and pipe had to be cleaned regularly. For this purpose a scraper lock was used. The sludge pump, water pipes and shut-off valve required for cleaning operations were located on the floating dredge itself. The virtually 100% automation of all operations (including cleaning) and the possibility of unmanned operation thanks to the remote control unit meant that all conditions were fulfilled for clearing storage facilities of this type without any problems.

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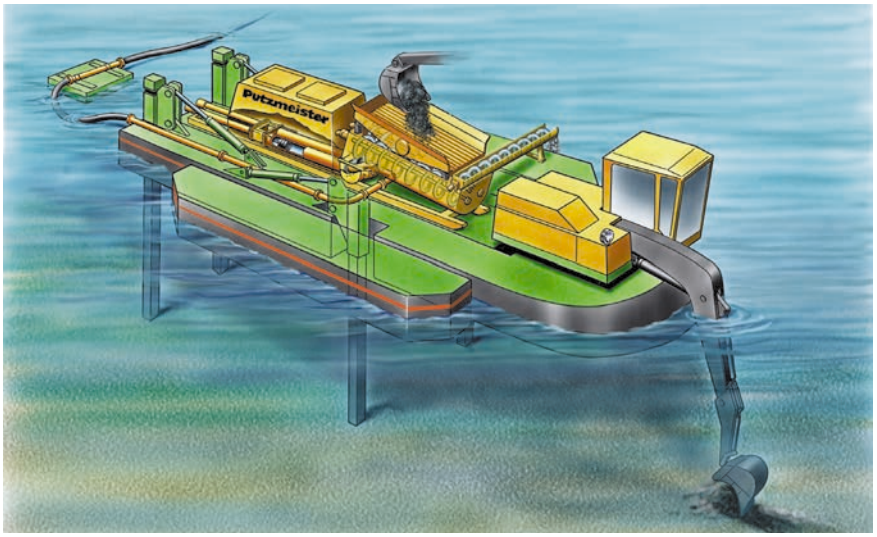

Easy to clean with all of the equipment needed mounted on the dredge

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The video cameras and the automatic control system allow remote control from the shore

Putzmeister Dredgemaster

KOS 2180
Pumping cylinder, dia. 280 mm
Pump stroke 2.100 mm
Pumping capacity 50 m³/h
Pumping pressure 70 bar
JT 5000
Mixture volume 50 m³/h
Mixer capacity 3 m³
Oil-hydraulic powered
HA 300 D
Rating 300 kW
6-cyl. diesel engine
Air-cooled

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