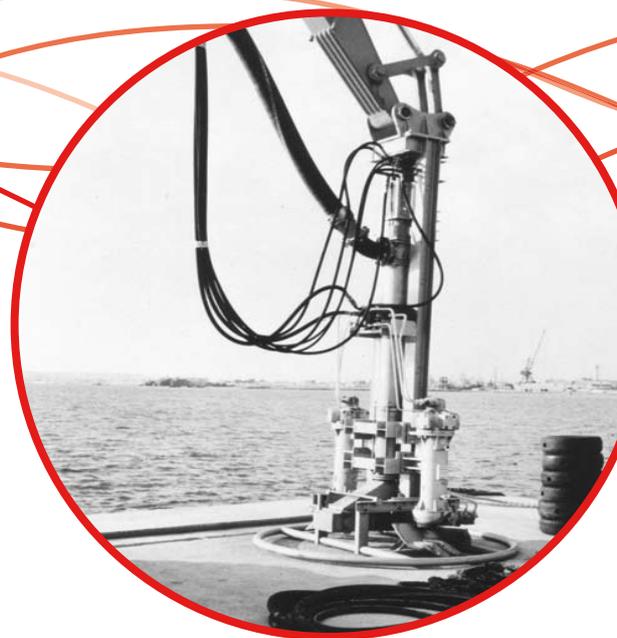


## Mono<sup>®</sup> NOV at the Cutting Edge of Drill Waste Management



Oil and Gas operators around the World are striving to meet ever toughening emissions control legislation. Mono are providing an effective solution to the problem of handling drill cuttings in environmentally sensitive areas.

Equipment from Mono is being used in a joint venture with Baroid Drilling Fluids at a state of the art facility in Kazakhstan. Baroid, part of the Halliburton Company, provides drilling fluids and services to energy companies worldwide, and is a global leader in Total Fluids Management services. The system is a fully contained closed system and uses a Mono pump for handling oil-based mud contaminated drill cuttings, providing an environmentally sound alternative to the traditional open system that uses skip and tip methods. This ensures that the operation is carried out in a truly zero discharge manner, which is essential in this shallow water area, up to only 10m deep, that forms part of the beluga sturgeon's breeding ground, the source of Kazakhstan's largest export, caviar. The offshore discharge of any oil-based cuttings or fluids is prohibited within this area. This is becoming the trend in most areas of the world.

The Mono system has been developed for the Offshore Kazakhstan International Operating Company NV (OKIOC), a consortium of nine major oil companies, currently developing prospects in the Caspian Sea off Kazakhstan. The Mono barge pump unit and high pressure pump are transferring cuttings delivered by barge from drilling operations in the Caspian Sea to an onshore supply base and treatment facility. Within the barge itself, settled drill cuttings are homogenized to obtain the desired consistency of cuttings slurry.

Mono designed the system to condition the cuttings and transfer them from the barge to a

holding tank, in preparation for pumping to a holding corral at the treatment plant.

The Mono barge pump unit is mounted vertically on the end of an excavator so that the operator can manoeuvre the equipment within the barge to ensure that all the cuttings slurry is collected and transferred to the holding tank. The barge pump unit comprises a single stage, 6 bar, E Range progressing cavity pump and a pair of low speed, mechanical agitators that slurrify the cuttings. The suction side of the pump is fitted with a Mono Series 'A' Muncher. This twin shaft, low speed, high torque grinder protects the pump and pipeline from damage by foreign objects discarded into the cuttings. A second high-pressure E Range pump, operating at pressures up to 40 bar, delivers the slurry 200m from the holding tank to a holding corral at the thermal processing unit at a rate of 50m<sup>3</sup>/h. Careful selection of the materials of construction ensure compatibility with the pumped media and the operating environment.

The system had undergone successful trials in Scotland and Oklahoma before the operation commenced in Kazakhstan. Parallel tests were carried out on numerous pump technologies comparing performance abilities, resulting in the decision that Mono's equipment provided the optimum solution. One benefit of the Mono system over other pumps tested is the ability to ensure high transfer rates, while the reliable and smooth, gentle action of the pump maintains the integrity of the cuttings.

### Barge Emptying Unit

Product:	<b>Oil-based mud contaminated drill cuttings</b>
Muncher:	<b>SA210 Series 'A' Muncher</b>
Capacity:	<b>50m<sup>3</sup>/h</b>
Drive:	<b>Hydraulically driven using marinised hydraulic motor. Rotational speed 65rpm - hydraulic oil feed rate 16.5 l/min at 170 bar</b>
Pump:	<b>Industrial Pump</b>
Capacity:	<b>50m<sup>3</sup>/h</b>
Drive:	<b>Hydraulically driven using marinised hydraulic motor. Rotational speed 200-250rpm - hydraulic oil feed rate 55-75 l/min @ 170 bar</b>
Pressure:	<b>Up to 6 bar (90psi)</b>

### Slurrification Unit

Pump:	<b>Industrial Pump</b>
Capacity:	<b>50m<sup>3</sup>/h</b>
Pressure:	<b>Up to 36 bar (550 psi)</b>
Drive:	<b>Electrically driven via 110kW motor de-rated to 86kW for use with an inverter</b>
Pump:	<b>Industrial Pump</b>
Capacity:	<b>1m<sup>3</sup>/h</b>
Pressure:	<b>Up to 48 bar (700psi)</b>
Drive:	<b>Electrically driven via 4kW motor</b>



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