

7.12 under
Schaefer

FACILITIES FOR CLEANING OUT RESIDUAL
SLUDGE IN FIELD SCALE TANKS

It has been proposed to handle the problem of cleaning out residual sludge in Fluid scale tanks in the field by means of a truck pumping outfit.

In view of the very short time to prepare data on this proposal it has been impossible to work out a complete design but a general picture of these facilities has been assembled herewith.

From our experience in cleaning about 24 tank cars at the plant within the last three months, it has been found that if the sludge is slurried with water it can be removed conveniently by means of a vacuum sewage pump. The Nash Pump Company manufacture a vacuum pump which would be very suitable for handling the sludge. It would be possible to mount this pump in a truck as a very convenient portable outfit. The truck should be of a substantial make, such as a Buick truck, which would permit rapid transportation at reasonably good road speeds, from point to point, and at the same time be comfortable enough as to accommodations for transportation of the crew. The Nash Pump could be driven either directly from the engine shaft by means of a special transmission and clutch installed on the chassis or could be driven from an explosion-proof motor. Since the service current at refineries may be different from point to point, it would be possible to use a special 110-Volt Universal Motor which could be connected to a special transformer which would permit voltage from AC to AC or DC in stages from 550-V, 440-V, 220-V, to 110-V.

It might be preferable to equip the pump with both the motor and special transmission to permit greater flexibility of operation. Perhaps in certain refineries the running of the automobile engine as a means of motive power for the pump may not be permissible through safety regulations, etc., and therefore under these conditions the explosion-proof electric motor taking the current from the refinery service lines would be available.

In the problem of handling the sludge the most important feature would be proper sewage disposal. The suction side of the pump could be connected directly to the eductor standpipe in the scale tank. Water could be introduced to the tank through the manhole and the crew could keep the sludge in a slurried suspension by agitating the tank with wooden paddles. Meanwhile, of course, before the introduction of the water, the tank could be rinsed, closed, with several portions of gasoline which would remove the soluble volatile lead compounds, directly through the eductor system in the usual way. The sludge-water could be discharged through the exhaust end of the pump through a long flexible hose to the nearest closed sewer outlet at the refinery. While the sludge may be somewhat dangerous, it is felt that after cleansing with gasoline, the dangerous constituent content would be minimized.

The KMYL crew working on the job of course must have special clothing and be provided with gas masks. Accordingly a small air compressor has been considered as a part of the equipment on the truck. This compressor can either be driven by 110-V one-half Horse-Power motor or directly from the truck engine shaft. This will permit the use of air masks which are more positive and more convenient to the operators.

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The truck would also be equipped with lockers, hose racks, tool boxes, and a bunk for sleeping quarters.

It is felt that a crew of two men minimum, and three men maximum, would be sufficient for handling the work. At the present time it is proposed to select the plant as headquarters for this equipment, sending it from Penns Grove to various points in the country where and whenever necessary. Since the work is potentially dangerous it would not be advisable to keep the same crew on the job indefinitely. Four experienced men have been considered as a nucleus for the crew, augmented by two new men. The actual road group would be divided by two experienced men and one new man and each of the crews would alternate at some definite time interval such as every six weeks, etc., depending upon the conditions and circumstances as they appear when the work is further developed.

This would permit a frequent and definite check-up at the hospital on the men and would minimize any health hazard for this work.

It is felt that this method of handling the cleaning of sludge from the tanks would be quite suitable, at least for the first year. Experience would dictate changes. If the proposition was still found to be the best, undoubtedly other crews could be trained and put into service at various strategic points in the field such as the Tulsa office, the Chicago office, etc. The present crew with the experience behind them, after the first year could probably train the new men. The initial outfit with the two new men could then probably be used for handling the work reasonably close to the plant, such as the Pennsylvania, Bayonne, Marcus Hook, etc., areas.

A high spot figure of about \$4600.00 has been estimated for the purchase of this special equipment. The details are outlined herewith:

1 - Automobile Chassis	\$ 1,200.00
1 - Body	500.00
1 - Special Transmission	450.00
1 - Pump & Base (Motor or Pulley drive)	225.00
1 - Pump Motor - 1 H.P. - AC or DC (Ex. Proof)	90.00
1 - Transformer	250.00
1 - Control Wiring - Panel Box	100.00
Misc. - Bunk - Lockers - Rack	75.00
Tools & Box	80.00
Hose - 500 Ft. - 2" Armored	250.00
1 - Jet Eductor Outfit	175.00
1 - Air Compressor Outfit & Air Masks	300.00
Misc. Rack & Containers	50.00
	\$ 3,825.00
Contingencies	
Accessories - 20%	765.00
	\$ 4,590.00
	\$ 4,600.00

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The question of the special transmission has not been gone into very definitely but it is believed such can be obtained. In all probability the design of the chassis and body could be undertaken by the General Motors Corporation, upon information from us giving the exact specifications of the other equipment necessary to install in the body.

A special steam jet eductor outfit has also been included in the estimate, as it might be more favorable to use under special circumstances.

J. H. Schaefer

Nov. 19, 1934

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