

# ESTD/ E-18-01

## XINXIN - Gansu, CHINA

### Context

The site is located in the Province of Gansu in People's Republic of China, near the town of Qingyang. The treatment zone is in an industrial area. The contaminated soils come from various sites in the region.



### Project Description

The project is setup in a hangar on a surface of about 250m<sup>2</sup> with 9 diesel burners and a vapor treatment unit. The treatment area is impacted with various solvents. The targeted concentration at the end of the treatment is 3000 mg/kg. The treatment began on July 27th, 2017 and ended on October 27th of 2017, which gives a total treatment time from the beginning of 90 days.

Before the build-up of the pile, stability tests were done with different types of soil to select the appropriate wetness and consistency of soil to build the pile. Since the pile was build up in a hangar, the access to the pile was limited. During the building of the pile, different layers of more or less contaminated soil were setup. The ESTD treatment facility was set as shown on the picture below.



### Planning

- Installation: From 13th of July to 20th of July
- Treatment: From 27th of July to 27th of October
- Analyses & reports: 1 week
- Demobilization: From 27th of October to 10th of November

## Key words

Contaminants  
TPH

Max. concentration  
150 000 mg/kg DM

Volume  
217 m<sup>3</sup>

Tonnage  
340 Tons

Nb of Heating elements  
Burners : 9  
Exchanger Tubes: 3  
Vapor Tubes: 12

Temperature Target  
220°C

Heating duration  
33 days

Treatment targets  
3000 mg/kg DM

Location  
Xinxin, Gansu- China

Future Use  
Industrial

Client  
Vision & Action

Partner  
Vision & Action

Date  
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## Monitoring



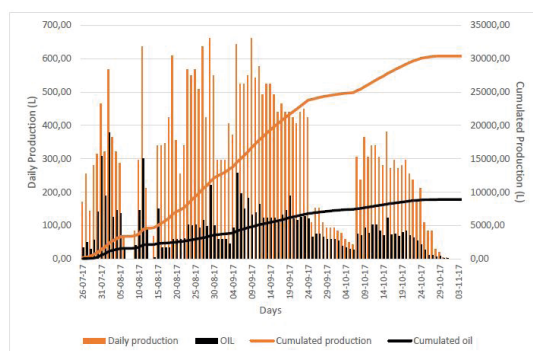
The hot sampling procedure was executed on the 29th of October. 8 samples were taken from the pile. The pile was divided in four areas where samples were done at 2 different depths in the same sampling points. The soil was analyzed in the Xinxin laboratory with infrared technology. The table summarizes the soil analysis results. The results show that the oil content in the soil is still well above the target of 0,3%.

| Oil concentration in soil samples (%) |      |             |
|---------------------------------------|------|-------------|
| Zone                                  | 1m   | 2m          |
| 1                                     | 2,62 | 3,32        |
| 2                                     | 3,76 | 3,67        |
| 3                                     | 3,98 | 4,09        |
| 4                                     | 3,33 | 3,55 (1.6m) |

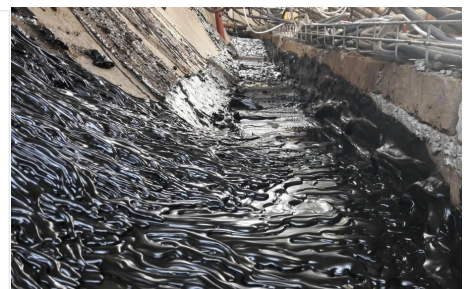
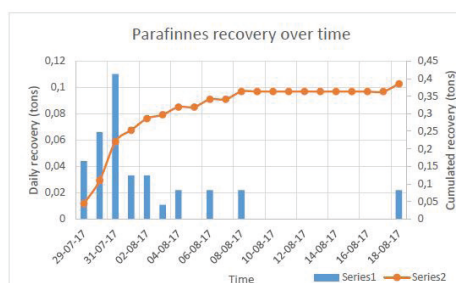
## Condensate Recovery

The contaminants extracted from the soil were recovered from 2 different knock-out setup in the vapor treatment unit. The first knock-out was installed between the vapor collector and the heat exchanger. The liquids were pumped out of the tank on a daily base. The second knock-out which was installed after the heat exchanger was emptied manually into the first knock-out. The liquids were recuperated by the client. The graph below describes the amount of condensate (water + contaminant) recovered from the soil during the heating process.

A total of 30,4m<sup>3</sup> of liquids was recovered from the soil during the heating process. With a total treatment volume of 217m<sup>3</sup> this means 14% of the liquids in the soil were recovered. The volume of liquids recovered at the end of treatment was still around 100L per day. This means that the soil was still contaminated.



During the treatment, liquids categorized as paraffines came out of the pile through the holes around the tubes. Since the amount of liquids was very important, a brick wall was built to protect the multiple networks and to recover the liquids. The graph below shows an estimation of the paraffines recovered from the pile over time..



## Conclusion

The oil content was drastically reduced. More than 70% of the contaminants were extracted from the soil. The contaminant concentration in the treated soil is below two of the three target levels of contamination (respectively 20 000, 10 000 and 3000 mg/kg). Treating the soil for a longer period and/or optimizing the treatment for heavy impacted soils such as sludges would reduce the concentration below 3000mg/kg. From challenge to success, many issues (technical, operational and communication) have been faced and answered which must be recorded as lessons learned for the next projects.