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TECHNICAL MEMORANDUM ON ADDITIONAL VEGETABLE OIL INJECTION AT STUDY
AREA 36 AND 39 NTC ORLANDO FL
11/7/2001
CH2M HILL

Additional Vegetable Oil Injection at Study Area 36 and Study Area 39, Naval Training Center, Orlando

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This technical memorandum presents the activities related to the additional vegetable oil injection for the enhanced bioremediation Interim Remedial Action (IRA) at Study Areas (SA) 36 and 39, Orlando Naval Training Center (NTC Orlando). This work is being performed under the Remedial Action Contract No. N62467-98-D-0995, Contract Task Order (CTO) No. 0017 at Naval Training Center Orlando.

The objective of the enhanced bioremediation IRA is to improve groundwater quality so that VOC concentrations in groundwater meet regulatory Groundwater Cleanup Target Levels (GCTLs). The *Work Plan for Enhanced Biodegradation IRA at SA-36* (CH2M Hill, November 2000) and *Work Plan for Enhanced Biodegradation IRA at SA-39* (CH2M Hill, October 2000) details the activities and implementation of the vegetable oil injection.

Vegetable oil was injected into fifteen stainless steel injection points in January 2001 at SA-36 to enhance the biodegradation process and remediate the contaminated groundwater in aquifer zones A, B and C. A total of 360 gallons were injected into aquifer zone A, 360 gallons were injected into aquifer zone B and 180 gallons were injected into aquifer zone C.

Vegetable oil was injected into sixteen stainless steel injection points in December 2000 at SA-39. A total of 540 gallons were injected into aquifer zone A and 420 gallons were injected into aquifer zone B.

Groundwater at SA-36 and 39 has been monitored since the vegetable oil injections at regular intervals. The groundwater data, natural attenuation evaluation, and recommendations have been documented in the respective Treatment Efficiency Reports (TER) which were submitted after each groundwater sampling/monitoring event.

The TERs for SA-36 recommended that additional vegetable oil injection be performed at SA-36 due to the demand on the initial injections by the sulfate present in the groundwater. The injections should be concentrated only in the B zone and C zone aquifer areas which are showing the least amount of TCE reduction, which includes areas in the vicinity of wells OLD-36-10B, OLD-36-29B, OLD-36-11C, and OLD-36-31C. It is estimated that a total of 540 gallons of vegetable oil will be injected into OLD-36-inj- 07 through OLD-36-inj-15 (60

gallons per injector location). Vegetable oil is not required to be injected into aquifer zone A at this time.

The TERs for SA-39 recommended that additional vegetable oil injection should be performed at SA-39 due to the demand on the initial injections by the sulfate and iron present in the groundwater. In order for the PCE to be reduced in the groundwater, the sulfate and iron must be reduced first which will require additional TOC. The sulfate and iron will most likely be reduced with an additional round of vegetable oil injection if the Fe III concentrations are not too elevated. It is estimated that a total of 960 gallons of vegetable oil will be injected into OLD-39-inj-01 through OLD-39-inj-16 (60 gallons per injector location). Vegetable oil will be injected into all three aquifer zones (A, B and C).

The additional vegetable oil injection at SAs 36 and 39 is scheduled to commence on November 14, 2001 and last for 3 days. Implementation and proper injection procedures, as detailed in the approved Work Plans referenced above, will be followed.