On 7 November 1996, an accidental explosion occurred at an oil storage facility in the Thaptong village area, Pluak Daeng district, Rayong Province in the eastern part of Thailand. More than 200,000 litres of oil penetrated the unconfined aquifer. Site characterization and assessment were investigated three years after the spillage. It is estimated that 70,000-100,000 m$^3$ of groundwater and 50,000-70,000 m$^3$ of sandy soil were contaminated. By using the US EPA's Hydrocarbon Spill Screening Model (HSSM), it is shown that the non-aqueous phase liquid (NAPL) penetrated to the groundwater level within ten days of the spillage. The lens profile showed that the radius of the polluted area increased rapidly and was stable at a radius of 70 m after one year. The residual non-aqueous phase liquids were trapped in the vadose and saturated zones, providing a continuous source of dissolved chemical constituents. After 1.5 years, natural attenuation is effectively limiting the migration of the NAPLs in the groundwater.