

Environmental Assessment of Ogoniland Site Specific Fact Sheets

GIOR- K.DERE



This fact sheet is part of a series prepared as part of the Environmental Assessment of Ogoniland by the United Nations Environment Programme (UNEP). It provides the observations and results from one of the individual sites studied in detail, plus the specific risk reduction measures for follow-up action.

This fact sheet should be read in conjunction with the main assessment report available at: www.unep.org/nigeria.

July 2011

I - Site Description

Site Name	GIOR- K.DERE
Site Number	qc_019-020
LGA	GOKANA
Main community	DEBON BODO MOGHO
Surrounding communities	BIARA BODO BODO DEBON DEBON BODO DEBON BODO MOGHO DEBON MOGHO BODO
Investigated area (ha)	22.69
Category	SPDC Pipeline ROW
Eastings (WGS 84, Zone 32N)	309025
Northings (WGS 84, Zone 32N)	513006



<p>Recommendations for risk reduction</p>	<ul style="list-style-type: none"> - Communities should be informed in community meetings about health and safety precautions. - A community based security and surveillance system should be put in place so that there is voluntary compliance with the restrictions which are needed to protect public health. - The impacted area should be demarcated and appropriate signage put in place to indicate that the site is impacted. - Highly contaminated core areas should be fenced and guarded until emergency cleanup measures have been carried out. - Floating oil on the surface, if any, should be collected and treated off site. - Owners of hydrocarbon-contaminated community wells should be informed and alternative drinking water supply provided to them. - The site should be remodelled to prevent run off from the contaminated area into the downstream swamps. - Runoff from the area should be monitored and if necessary collected and treated while the cleanup plan is developed and implemented. - Additional soil sampling along with trial pits should be done at the contaminated site to delineate the site to be excavated for clean up. - A detailed plan should be prepared for clean up of the contaminated soil and risk reduction at site. - A system of ground water monitoring wells should be installed to act as early warning for communities which are not yet impacted by ground water contamination. - A detailed plan should be prepared for clean up of the contaminated water and risk reduction in the community. - While undertaking the clean up, management of excavation water should be handled properly to ensure that no pollutants are emitted into the environment without control.
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II - Oilfield Infrastructure Type

Wells	No
Flowstations	No
Manifolds	No
Flaresites	No
Oil pipeline in operation	24" BOMU TO BONNY TRUNKLINE 28" BOMU TO BONNY TRUNKLINE
NNPC crude line	No
NNPC product line	No

III - Spill History

Spills reported by SPDC	Incident Number 2007_00214 356474	Incident Date 20070618
Spill reported by community	Yes	

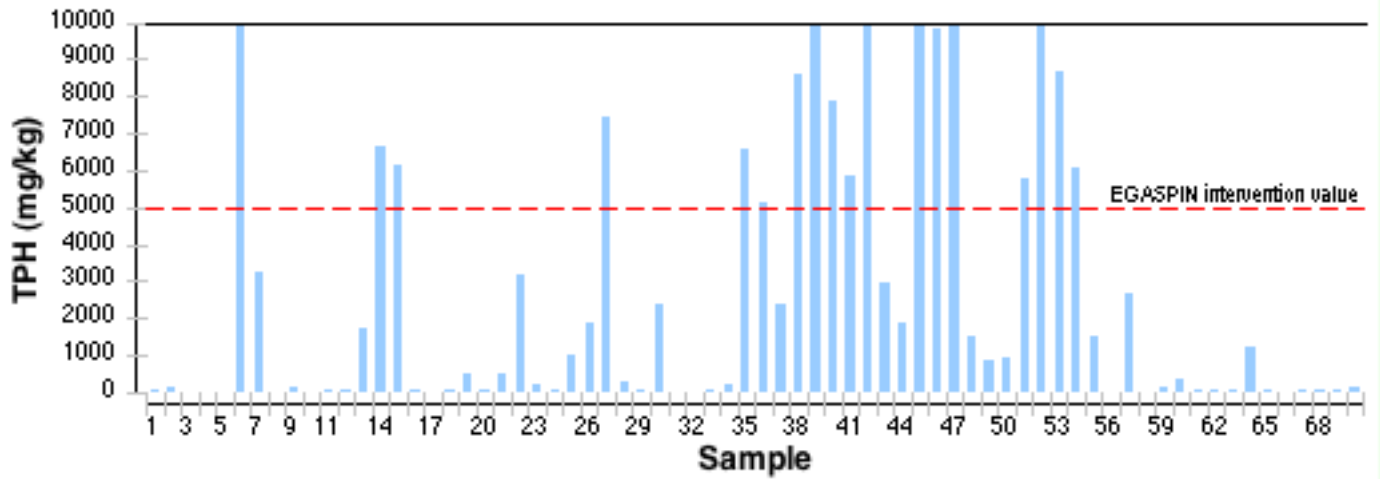
IV - Data Screening

Assessment criteria

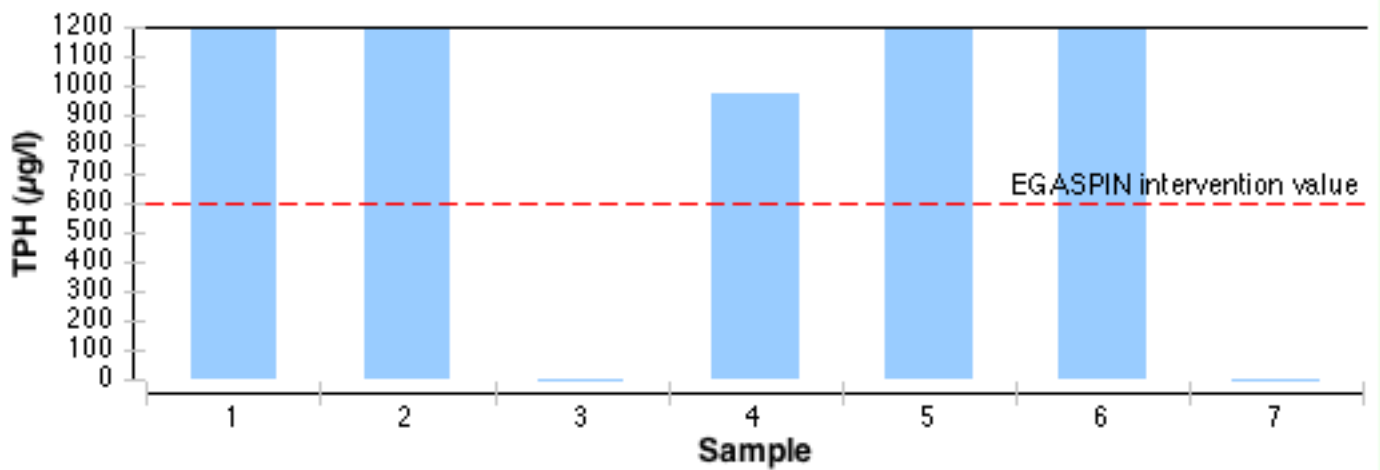
Soil contamination	Nigerian standards EGASPIN (intervention value 5000 mg/kg; target value 50 mg/kg)
Groundwater contamination	Nigerian standards EGASPIN (intervention value 600 µg/l; target value 50 µg/l)
Sediment contamination	Nigerian standards EGASPIN (intervention value 5000 mg/kg; target value 50 mg/kg)
Drinking water contamination	WHO guidelines (benzene: 10 µg/l) Nigerian drinking water standards (mineral oils: 3 µg/l)

Number of soil samples	70
Deepest investigation (m)	5
Maximum soil TPH (mg/kg)	52,200.000
Number of soil measurements greater than EGASPIN intervention value	18
Deepest sample greater than EGASPIN (m)	5
Number of soil measurements below 1m	51
Number of soil measurements below 1m greater than EGASPIN intervention value	13
Number of ground water samples	7
Maximum groundwater TPH (µg/l)	29,600
Number of groundwater measurements greater than EGASPIN intervention value	5
Number of community well samples	5
Presence of hydrocarbons in community wells	Yes
Number of CL sediment samples	0
Maximum CL sediment TPH (mg/kg)	Not applicable
Number of CL sediment measurements greater than EGASPIN intervention value	0
Presence of hydrocarbons in sediment above EGASPIN intervention value	Not applicable

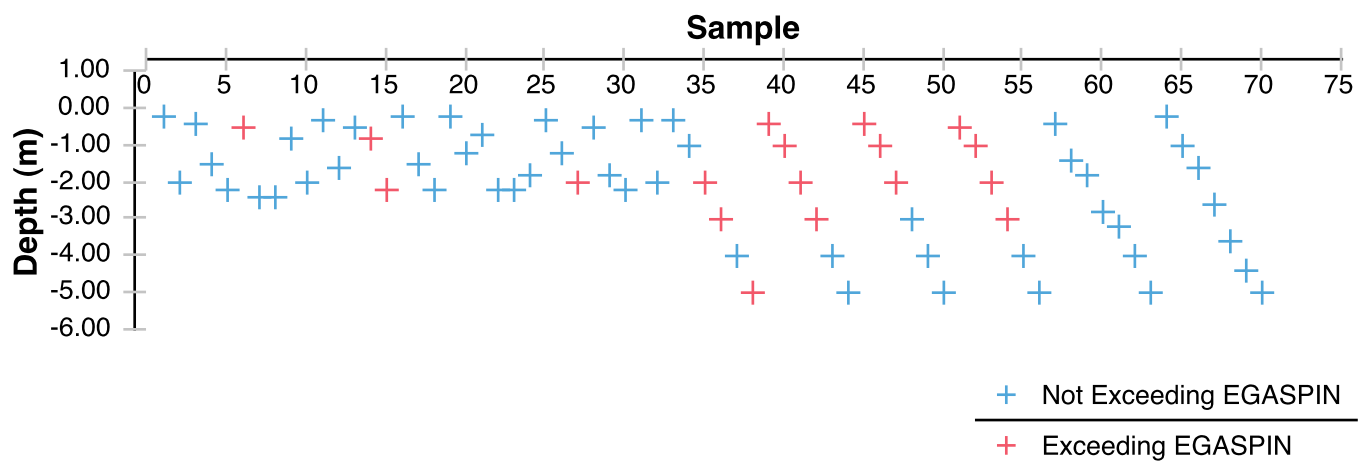
Soil Samples



Groundwater Samples



Soil Samples depth



Satellite image of the site



Sampling location map



Oil Facilities

- SPDC Right of way
- w** Wells
- Manifold
- ▲ FlowStation
- Pipeline
- NNPC Crude
- NNPC Refined product
- + SPDC Oil Pipe in operation

Soil samples

- Grassplot centroid
- Soil samples
- Soil Samples from GW monitoring well
- Grassplot sampling area
- Approximate site investigation area (that area does not correspond to contamination extent).
- Others**
- ▲ Air quality sampling
- Fish tissue sampling
- Sediment samples from Acquatic team
- Water Samples from Acquatic team

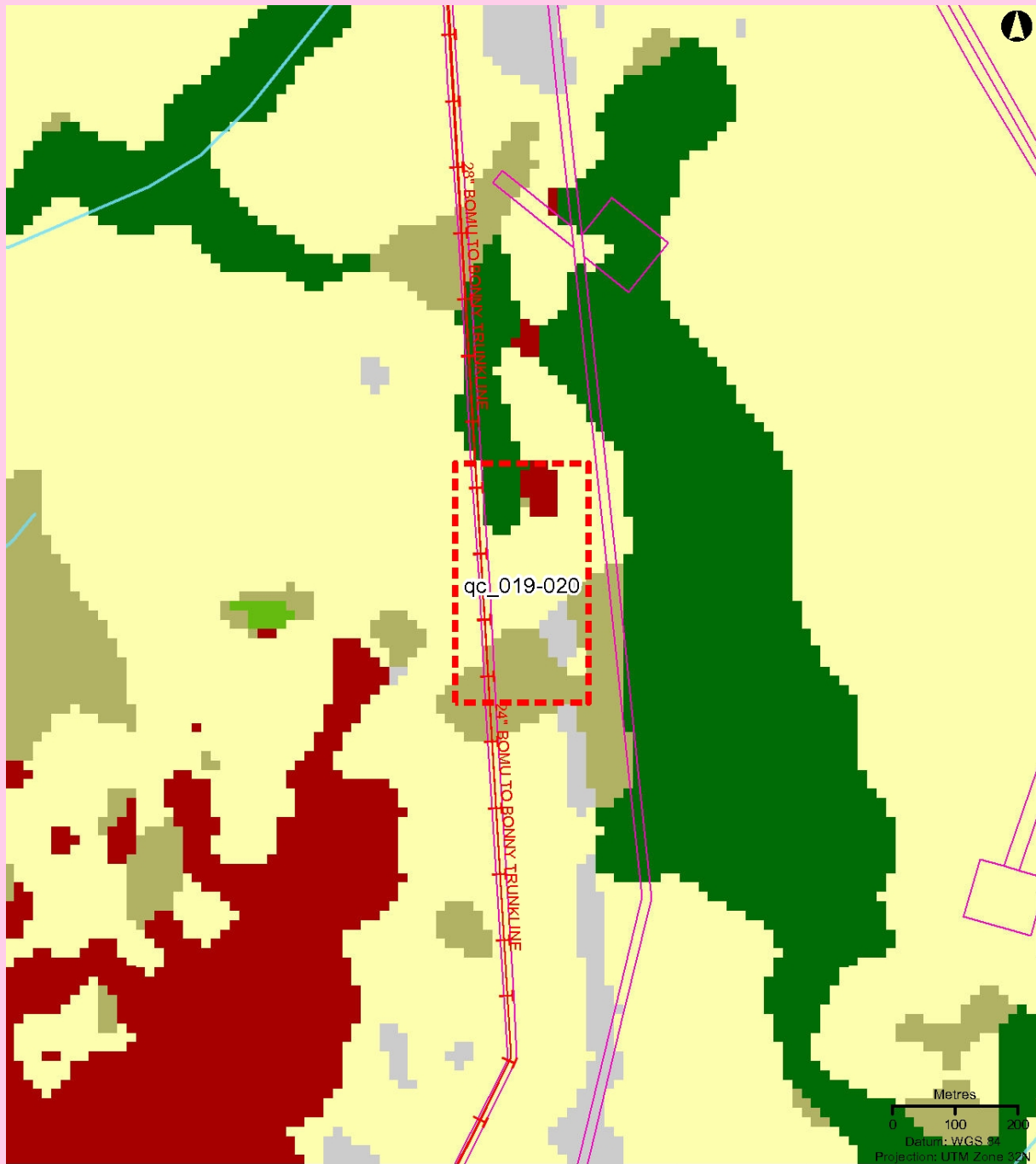
Water samples

- ▲ Rainwater samples (Community)
- ★ Bore-well (community)
- ★ Hand-dug well (community)
- Free-Phase samples
- ◆ Groundwater sample
- s w Surface water
- w Water sample taken from an oil well
- ⚓ Drilling well

Metres
0 1020

Datum: WGS 84
Projection: UTM Zone 32N

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Oil Facilities

- SPDC Right of way (ROW)
- w** Wells
- Manifold
- FlowStation
- Pipeline**
- NNPC Crude
- NNPC Refined product
- SPDC Oil Pipe in operation

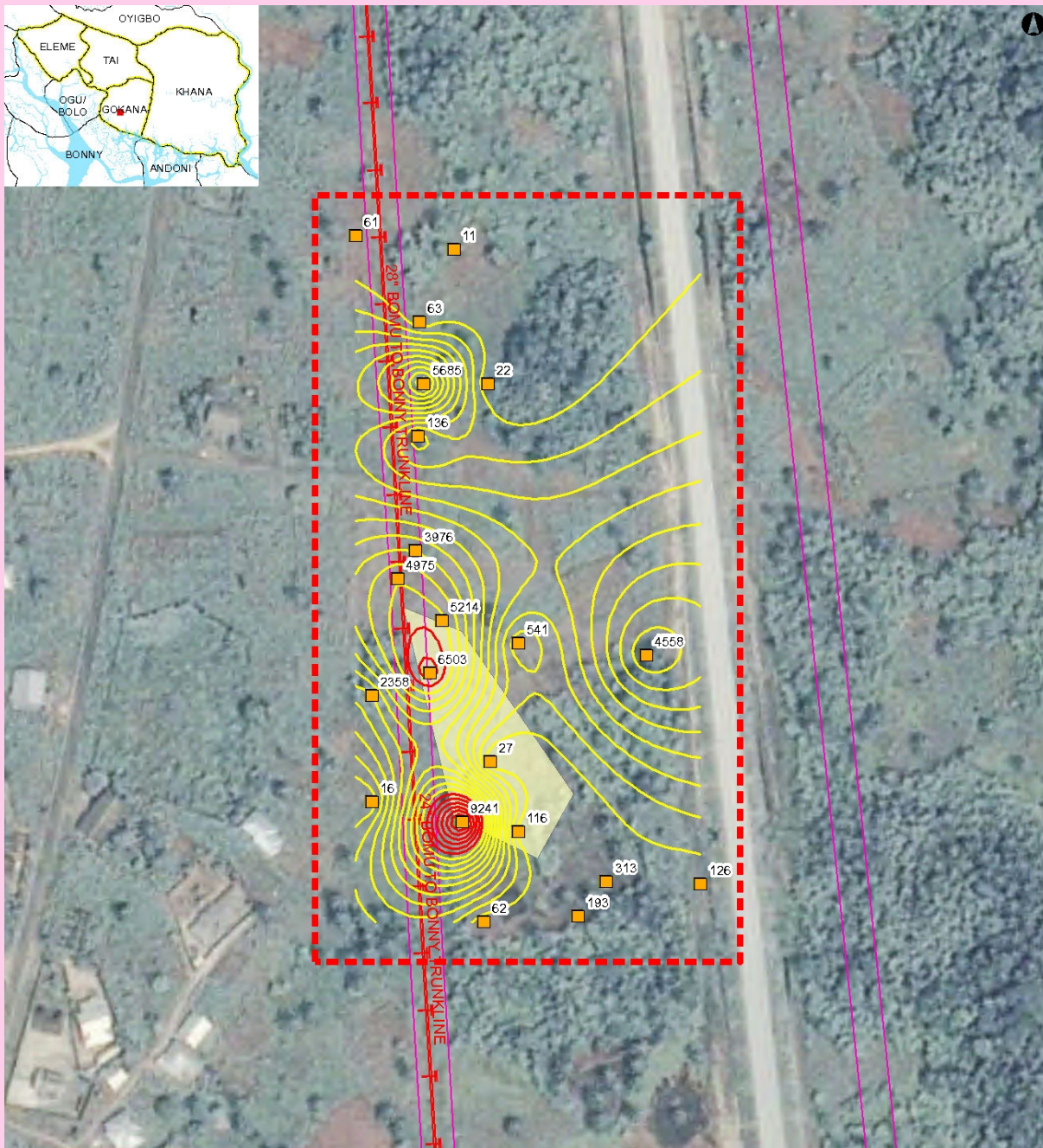
Approximate site investigation area (that area does not correspond to contamination extent).

- Tree plantation
- Farmland, low tree cover
- Farmland, high tree cover
- Fallow land
- Riparian forest, including fresh water swamp forest
- Forest on former beach ridge
- Mangrove
- Mangrove, degraded
- Urban
- Bare soil, terrestrial
- Bare soil, mud flat
- Water

Source:
land cover 2007
from Aster imagery

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Soil Contamination Map



Oil Facilities

- SPDC Right of way (ROW)
- w** Wells
- Manifold
- ▲ FlowStation
- Pipeline
 - NNPC Crude
 - NNPC Refined product
 - ⊥ SPDC Oil Pipe in operation

Contamination contours (mg/kg)

- ~ > 5 000
- ~ 50 - 5 000
- ~ < 50

Soil samples

- Soil samples
- Grassplot centroid
- Grassplot sampling area
- Investigated area
- Groundwater flow direction

Metres
0 20 40
Projection: WGS 84
UTM Zone 32 N

 Approximate site investigation area (that area does not correspond to contamination extent).

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The values shown next to soil sample points represent the average TPH value for all samples taken from the borehole at that location.

Aerial photograph



Ground photograph



VII - Sample List

Soil sample list

Sample Identifier	Total petroleum hydrocarbon (mg/kg)	Depth (m)	Easting	Northing
2077139	6,650.000	0.80	308982	512985
2077412	1,760.000	0.50	308982	512985
2077417	13.200	2.00	308947	512895
2077434	53.500	2.20	309006	512915
2077443	6,140.000	2.20	308982	512985
2077452	514.000	0.20	309111	512854
2077470	48.000	1.20	309111	512854
2077496	14,900.000	0.50	308973	513103
2077512	2,410.000	2.20	309020	512974
2077536	106.000	0.20	309006	512915
2077552	7,420.000	2.00	308969	513020
2077573	1,900.000	1.20	308969	513020
2077593	30.700	0.30	308947	512895
2077600	3,260.000	2.40	308973	513103
2077604	139.000	2.00	308970	513077
2077629	149.000	0.80	308971	513134
2077653	1,020.000	0.30	308969	513020
2077672	305.000	0.50	309020	512974
2077696	193.000	2.20	309050	512838
2077708	532.000	0.70	308947	512948
2077720	9.480	0.40	308988	513170
2077730	105.000	0.20	308970	513077
2077742	21.500	2.40	309005	513103
2077793	62.100	1.80	309003	512835
2077814	7.080	1.50	308988	513170
2077859	59.400	0.30	308939	513177
2077913	18.400	2.20	308988	513170
2077929	56.400	1.80	309020	512974
2077946	3,210.000	2.20	308947	512948
2078075	not analyzed for TPH	1.50	309006	512915
2078252	6.070	2.00	308971	513134
2078303	60.800	1.60	308939	513177
2351038	77.000	0.30	309084	512968
2351059	209.000	1.00	309084	512968
2351094	8,570.000	5.00	309084	512968
2352930	5,120.000	3.00	309084	512968
2352964	6,560.000	2.00	309084	512968
2353537	2,370.000	4.00	309084	512968
2555433	52,200.000	0.40	308992	512885
2555434	7,860.000	1.00	308992	512885

Sample Identifier	Total petroleum hydrocarbon (mg/kg)	Depth (m)	Easting	Northing
2555437	5,850.000	2.00	308992	512885
2555438	9,880.000	3.00	308992	512885
2555439	2,990.000	4.00	308992	512885
2555441	1,890.000	5.00	308992	512885
2555442	5,770.000	0.50	308960	513006
2555443	11,500.000	1.00	308960	513006
2555445	8,650.000	2.00	308960	513006
2555447	6,070.000	3.00	308960	513006
2555448	1,520.000	4.00	308960	513006
2555449	not analyzed for TPH	5.00	308960	513006
2555451	12,800.000	0.40	308976	512959
2555452	9,820.000	1.00	308976	512959
2555453	18,100.000	2.00	308976	512959
2555454	1,550.000	3.00	308976	512959
2555457	895.000	4.00	308976	512959
2555459	958.000	5.00	308976	512959
2555460	1,250.000	0.20	309020	512880
2555461	54.700	1.00	309020	512880
2555462	26.100	1.60	309020	512880
2555464	39.100	2.60	309020	512880
2555465	80.700	3.60	309020	512880
2555466	66.600	4.40	309020	512880
2555467	161.000	5.00	309020	512880
2556219	2,660.000	0.40	309064	512855
2556220	not analyzed for TPH	1.40	309064	512855
2556221	133.000	1.80	309064	512855
2556222	351.000	2.80	309064	512855
2556223	41.900	3.20	309064	512855
2556224	41.900	4.00	309064	512855
2556226	47.500	5.00	309064	512855

Groundwater sample list

Sample Identifier	Total petroleum hydrocarbon (µg/l)	Easting	Northing
2555480	7,400	308992	512885
2555481	29,600	308976	512959
2555482	BDL	309020	512880
2724346	5,870	308974	513129
2724350	971	309006	512895
2724351	BDL	308983	513165
2724355	23,700	309003	512904

Community well sample list

Sample Identifier	Total petroleum hydrocarbon (µg/l)	Easting	Northing
2555486	BDL	308817	512589
2555488	BDL	308826	512643
2724347	BDL	308803	512720
2724348	BDL	308841	512621
2724356	4,240.000	308887	513109

Guide to content

The Site Fact Sheets present more detailed data from UNEP's environmental assessment of Ogoniland on a site-by-site basis. Note that all data is based on the analysis of samples taken during the fieldwork period. The period of most intensive fieldwork ran from April to December 2010. The final sampling visit was completed in January 2011.

Here is a guide to the terms and abbreviations used. Please refer to the Environmental Assessment of Ogoniland report for details of EGASPIN target and intervention values.

Terminology

Site number	Reference number allocated by UNEP to identify a study site
Area (ha)	Estimated surface area (in hectares) of a given study site
Well	Oil well, also referred to as a production well
Fugro well	New well installed by Fugro at UNEP's request to enable scientific sampling and monitoring
Community well	Wells belonging to communities which are used to collect water for drinking and sanitation needs
Contamination contour	Maps that display the geographical distribution of oil contamination concentrations in an analyzed receptor
Flare site	Indicates whether the burning of unwanted gas through a pipe (or flare) takes place at a given site
Flow station	Separation facilities (also called gathering centres) which separate natural gas and water from crude oil extracted from production wells
Incident number	Numbers as supplied from the SPDC oil spills database
Manifold	An arrangement of piping or valves designed to control, distribute and often monitor fluid flow

Abbreviations

BDL	Below Detection Limit
CL	Contaminated Land
EGASPIN	Environmental Guidelines and Standards for Petroleum Industries in Nigeria
GW	groundwater
LGA	Local Government Area
mbgs	metre/s below ground surface
NNPC	Nigerian National Petroleum Corporation
SPDC	Shell Petroleum Development Company of Nigeria
TPH	total petroleum hydrocarbons
UNEP	United Nations Environment Programme

Explanatory Note

1. The recommendations given are for initial risk reduction. Final clean up would need significant additional site specific engineering as well as consultation work.
2. Spill reported by SPDC has the date format YYYYMMDD
3. Assessment is done based on a screening of the measured value against a Nigerian or international standard
4. In the soil sample maps, the highest value has been cut-off to 2 times the intervention value. This was done to visually express the exceedences above intervention values. Actual values are given in the sample tables.
5. The values of soil contamination listed in the Soil Contamination Maps are average values of all samples taken at that sampling location