

Environmental Assessment of Ogoniland Site Specific Fact Sheets

BARA AKPOR- BOTEM, TAI



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	BARA AKPOR- BOTEM, TAI
Site Number	qc_009-006
LGA	TAI
Main community	BARA AKPOR BOTEM
Surrounding communities	BARA AKPOR BARA AKPOR BOTEM BOTEM
Investigated area (ha)	4.75
Category	SPDC Pipeline ROW
Eastings (WGS 84, Zone 32N)	308689
Northings (WGS 84, Zone 32N)	522100



<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. - 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" NKPOKU TO BOMU TRUNKLINE 36" RUMUEKPE TO NKPOKU TRUNKLINE
NNPC crude line	No
NNPC product line	No

III - Spill History

Spills reported by SPDC	Incident Number 2008_00091	Incident Date 20080423
Spill reported by community	Yes	

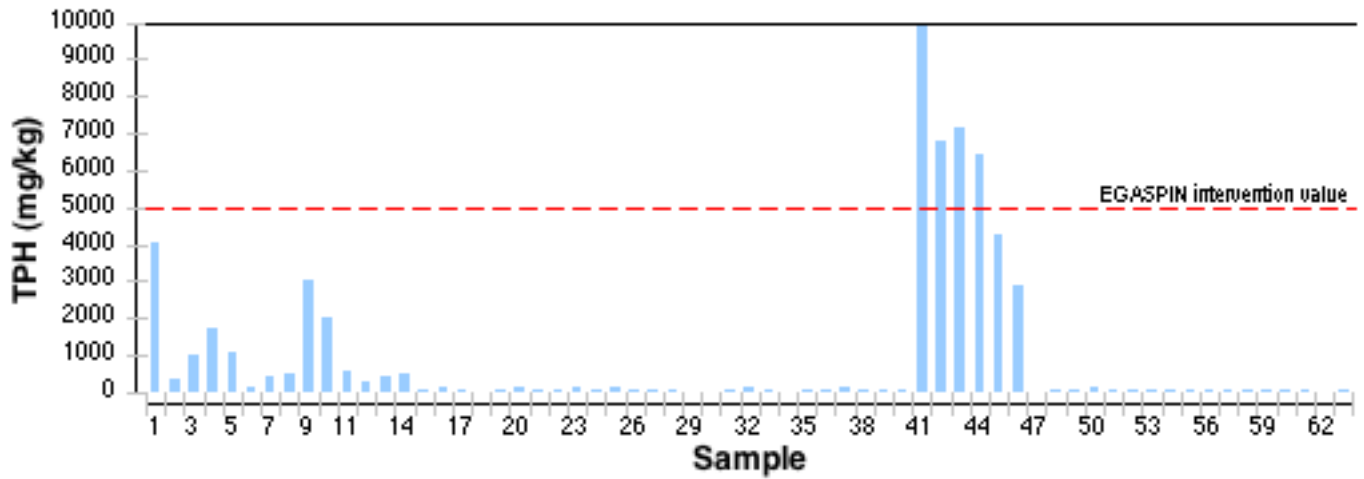
IV - Data Screening

Assessment criteria

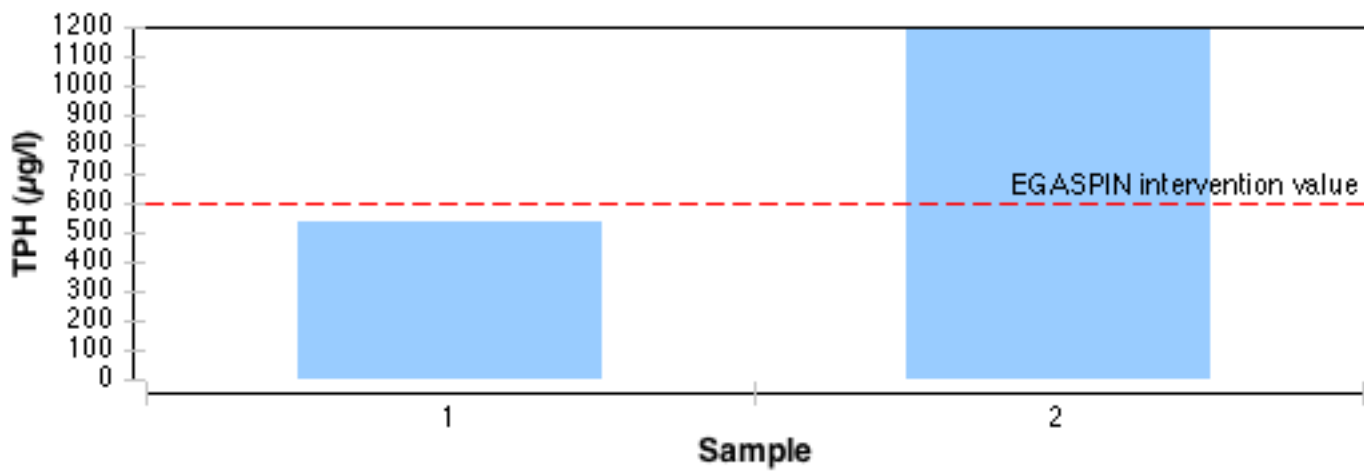
Soil contamination	Nigerian standards EGASPIN (intervention value 5000 mg/kg; target value 50 mg/kg)
Groundwater contamination	Nigerian standards EGASPIN (intervention value 600 µg/l; target value 50 µg/l)
Sediment contamination	Nigerian standards EGASPIN (intervention value 5000 mg/kg; target value 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	63
Deepest investigation (m)	5
Maximum soil TPH (mg/kg)	12,300.000
Number of soil measurements greater than EGASPIN intervention value	4
Deepest sample greater than EGASPIN (m)	3
Number of soil measurements below 1m	52
Number of soil measurements below 1m greater than EGASPIN intervention value	3
Number of ground water samples	2
Maximum groundwater TPH (µg/l)	162,000
Number of groundwater measurements greater than EGASPIN intervention value	1
Number of community well samples	1
Presence of hydrocarbons in community wells	Not found
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

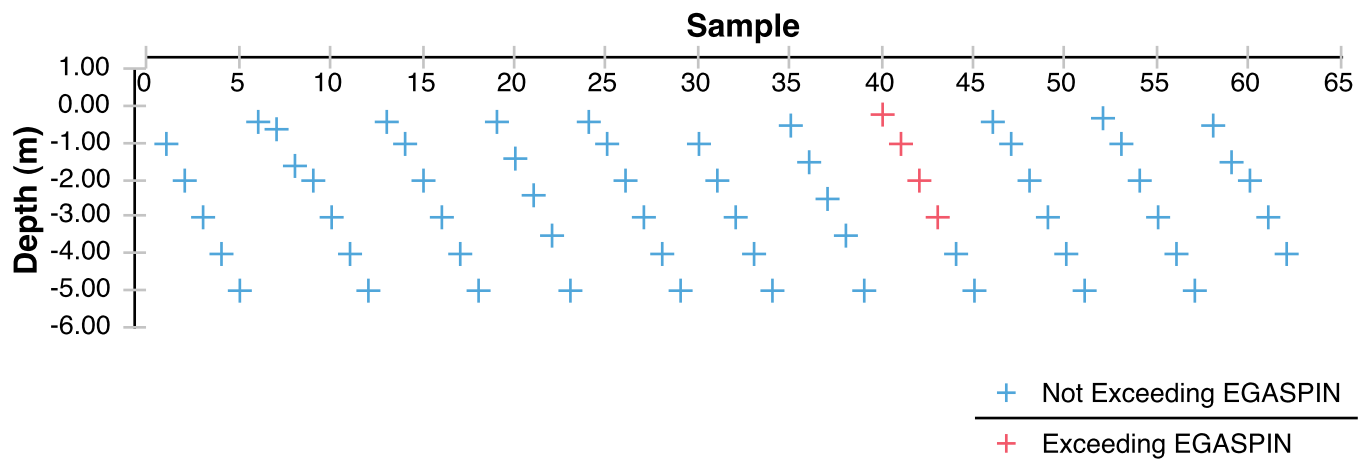
Soil Samples



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

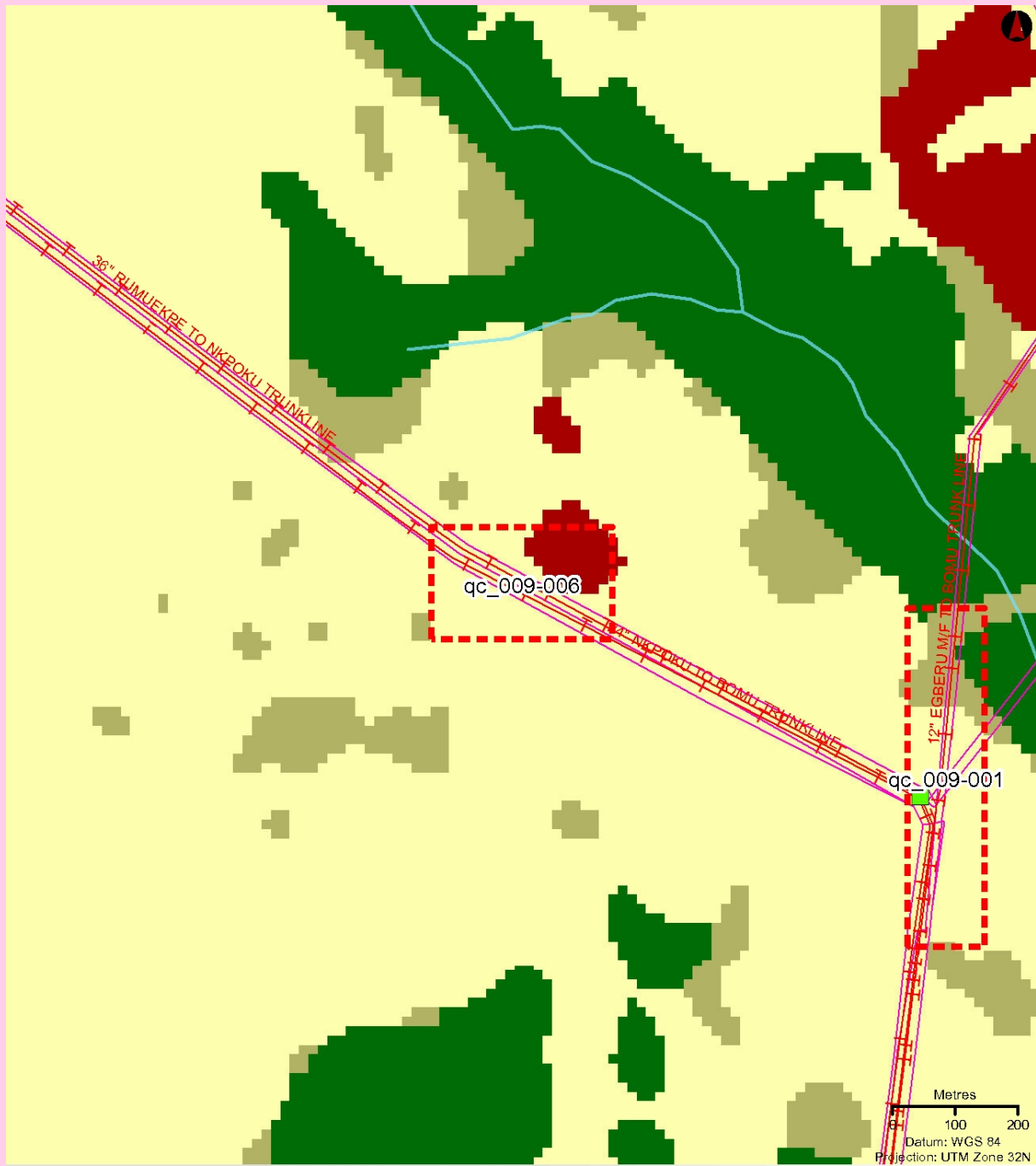
- Grassplot centroid
- Soil samples
- Soil Samples from GW monitoring well
- Grassplot sampling area
- Approximate site investigation area (that area does not correspond to contamination extent).
- Others**
- ▲ Air quality sampling
- Fish tissue sampling
- Sediment samples from Acquatic team
- Water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



Datum: WGS 84
 Projection: UTM Zone 32N
 UNEP 2011



Oil Facilities

- SPDC Right of way (ROW)
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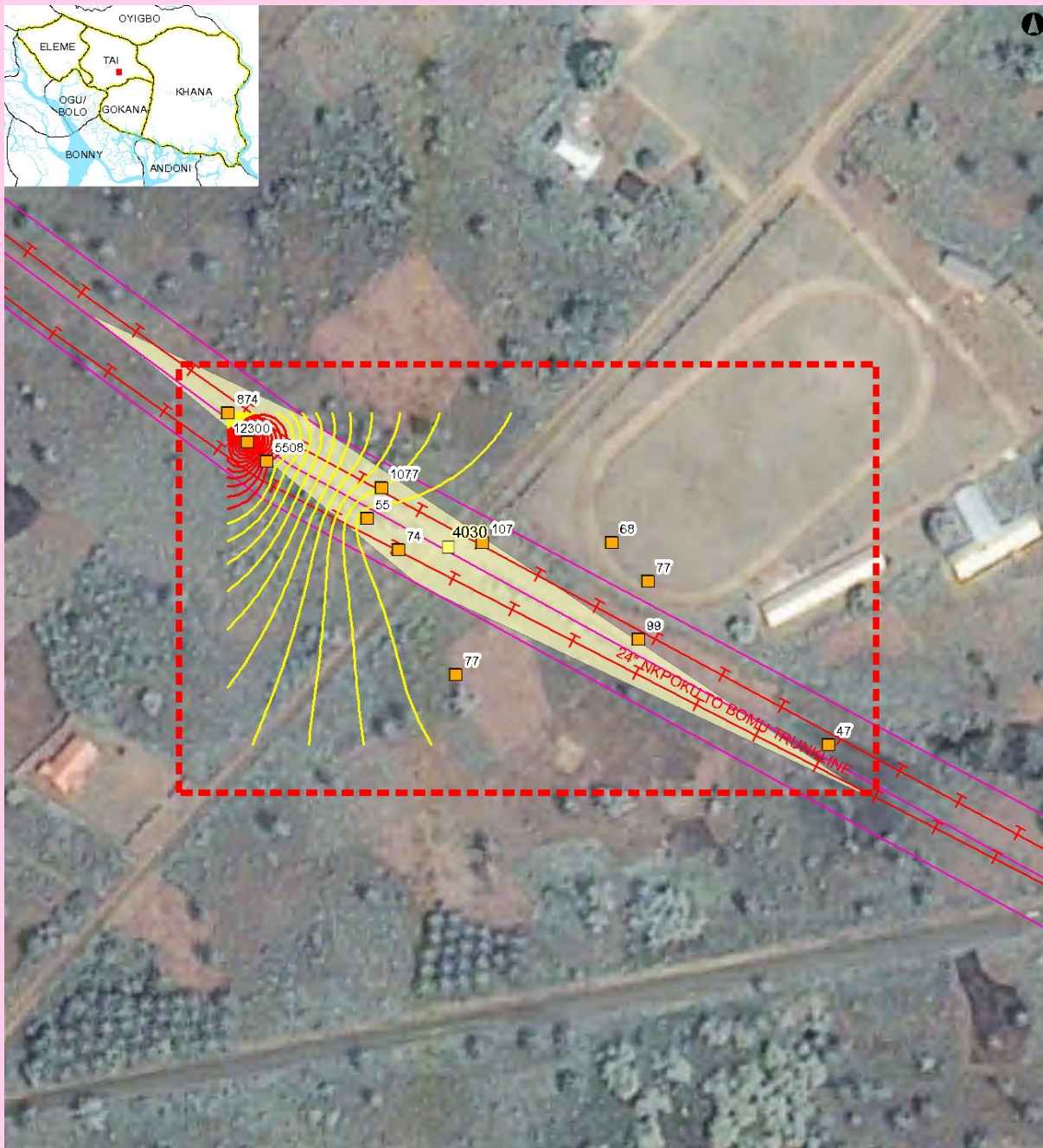
Approximate site investigation area (that area does not correspond to contamination extent).

- 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

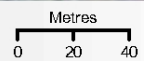
■ Soil samples

■ Grassplot centroid

■ Grassplot sampling area

— Investigated area

→ Groundwater flow direction



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.

Ground photograph



VII - Sample List

Soil sample list

Sample Identifier	Total petroleum hydrocarbon (mg/kg)	Depth (m)	Easting	Northing
2331468	4,030.000	-	308656	522113
2529198	44.600	5.00	308635	522112
2529199	509.000	0.40	308670	522115
2529200	139.000	3.50	308735	522075
2529201	1,040.000	2.00	308564	522169
2529202	26.000	3.00	308622	522125
2529203	70.900	2.40	308735	522075
2529206	72.600	3.50	308739	522099
2529207	76.000	1.00	308670	522115
2529209	56.700	1.50	308622	522125
2529210	58.200	0.50	308739	522099
2529211	28.400	4.00	308635	522112
2529212	97.700	1.40	308735	522075
2529213	484.000	0.60	308628	522138
2529215	57.400	4.00	308724	522115
2529218	169.000	5.00	308564	522169
2529219	71.200	1.00	308635	522112
2529220	119.000	2.00	308635	522112
2529221	462.000	5.00	308628	522138
2529223	64.600	2.00	308724	522115
2529224	260.000	4.00	308628	522138
2529225	402.000	0.40	308628	522138
2529226	124.000	1.50	308739	522099
2529230	87.400	1.00	308724	522115
2529231	50.000	0.50	308622	522125
2529233	2,890.000	5.00	308580	522149
2529234	1,080.000	4.00	308564	522169
2529236	15.000	0.40	308724	522115
2529237	83.500	5.00	308735	522075
2529238	2,030.000	2.00	308628	522138
2529239	3,040.000	1.60	308628	522138
2529243	102.000	2.50	308739	522099
2529252	106.000	3.00	308635	522112
2529255	71.900	3.00	308670	522115
2529256	119.000	2.00	308670	522115
2529257	1,700.000	3.00	308564	522169
2529258	4,280.000	4.00	308580	522149
2529259	79.600	2.00	308622	522125
2529260	7,180.000	2.00	308580	522149
2529261	58.500	5.00	308670	522115

Sample Identifier	Total petroleum hydrocarbon (mg/kg)	Depth (m)	Easting	Northing
2529262	120.000	0.40	308735	522075
2529263	6,790.000	1.00	308580	522149
2529264	12,300.000	0.20	308572	522157
2529265	382.000	1.00	308564	522169
2529266	109.000	3.00	308724	522115
2529267	38.900	5.00	308739	522099
2529269	555.000	3.00	308628	522138
2529270	48.100	5.00	308724	522115
2529271	73.300	4.00	308622	522125
2529272	35.100	4.00	308670	522115
2529273	6,400.000	3.00	308580	522149
2549222	122.000	0.40	308814	522031
2549223	73.800	1.00	308814	522031
2549225	53.600	2.00	308814	522031
2549226	67.800	3.00	308814	522031
2549227	9.960	4.00	308814	522031
2549228	11.700	5.00	308814	522031
2549229	62.200	0.30	308659	522060
2549230	78.300	1.00	308659	522060
2549233	94.100	2.00	308659	522060
2549234	102.000	3.00	308659	522060
2549236	40.200	4.00	308659	522060
2549237	77.300	5.00	308659	522060

Groundwater sample list

Sample Identifier	Total petroleum hydrocarbon (µg/l)	Easting	Northing
2759617	532	308672	522103
2759619	162,000	308592	522147

Community well sample list

Sample Identifier	Total petroleum hydrocarbon (µg/l)	Easting	Northing
2529275	BDL	308795	522423

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