

Environmental Assessment of Ogoniland Site Specific Fact Sheets

OKULUEBU OGALE



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	OKULUEBU OGALE
Site Number	qc_005-002
LGA	ELEME
Main community	OKULUEBU OGALE
Surrounding communities	OGALE OKULEBO OGALE OKULUEBU OGALE
Investigated area (ha)	17.51
Category	SPDC Pipeline ROW
Eastings (WGS 84, Zone 32N)	295231
Northings (WGS 84, Zone 32N)	534096



<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. - Impacted swamps and creeks should be demarcated and appropriate signage put in place to indicate that the area is impacted. - 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	6" Imo R1 to Ebubu tie-in MF Delivery line(DIUSED) 12" IMOR 1 TO EBUBU TRUNKLINE 12" IMO RIVER TO EBUBU TRUNKLINE 6" Obigbo North F/S to Ebubu M/F Delivery line
NNPC crude line	No
NNPC product line	NNPC TRUNKLINE

III - Spill History

Spills reported by SPDC	Incident Number 372127	Incident Date
Spill reported by community	Yes	

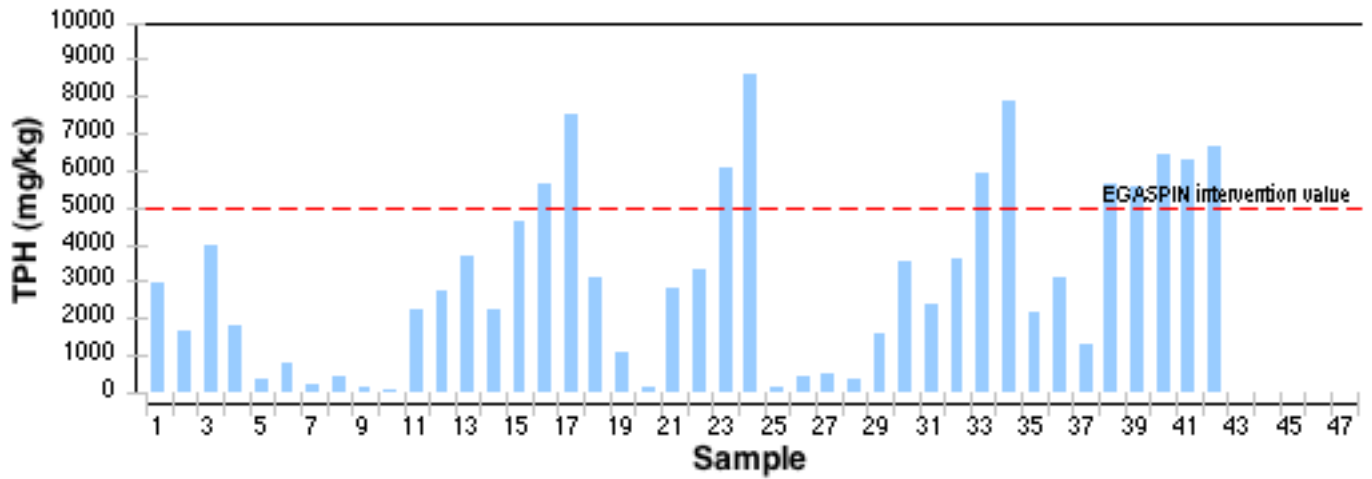
IV - Data Screening

Assessment criteria

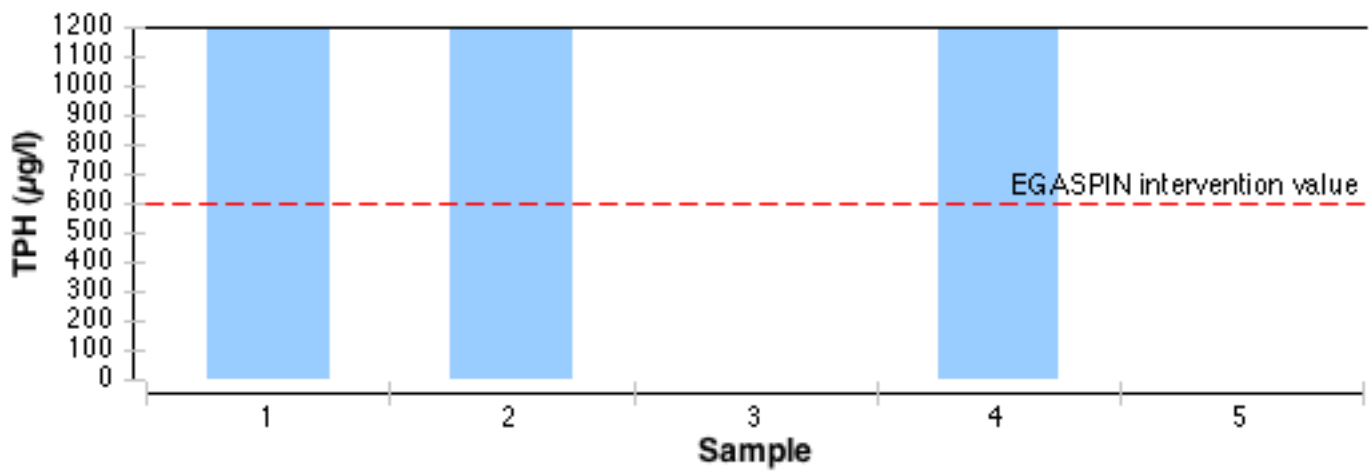
Soil contamination	Nigerian standards EGASPIN (intervention value 5000 mg/kg; target value 50 mg/kg)
Groundwater contamination	Nigerian standards EGASPIN (intervention value 600 µg/l; target value 50 µg/l)
Sediment contamination	Nigerian standards EGASPIN (intervention value 5000 mg/kg; target value 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	47
Deepest investigation (m)	11.8
Maximum soil TPH (mg/kg)	8,580.000
Number of soil measurements greater than EGASPIN intervention value	11
Deepest sample greater than EGASPIN (m)	3.08
Number of soil measurements below 1m	28
Number of soil measurements below 1m greater than EGASPIN intervention value	9
Number of ground water samples	7
Maximum groundwater TPH (µg/l)	2,740,000
Number of groundwater measurements greater than EGASPIN intervention value	3
Number of community well samples	0
Presence of hydrocarbons in community wells	Not applicable
Number of CL sediment samples	2
Maximum CL sediment TPH (mg/kg)	24,500.000
Number of CL sediment measurements greater than EGASPIN intervention value	2
Presence of hydrocarbons in sediment above EGASPIN intervention value	Yes

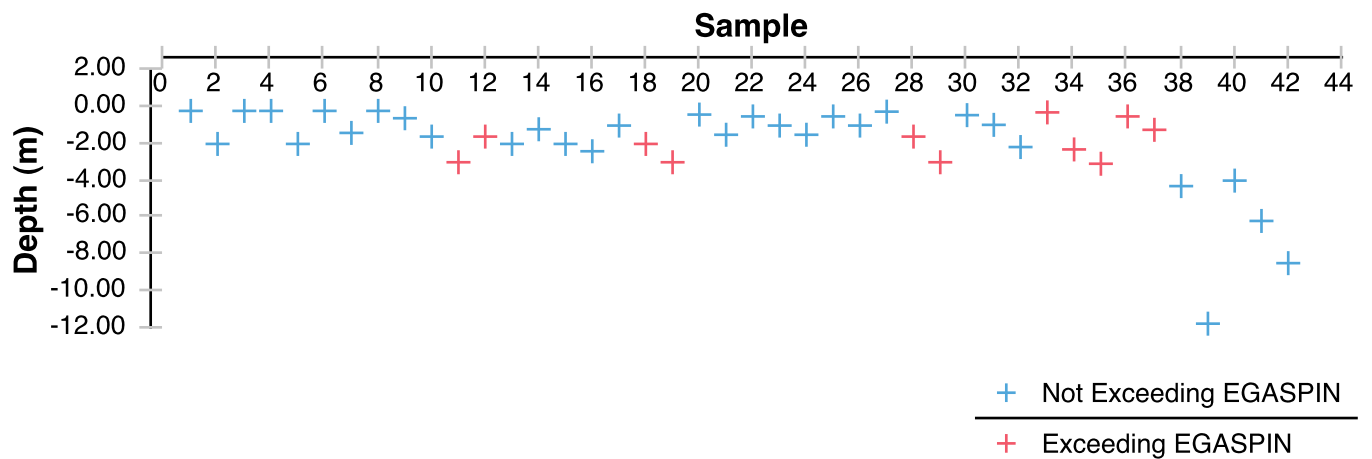
Soil Samples



Groundwater Samples



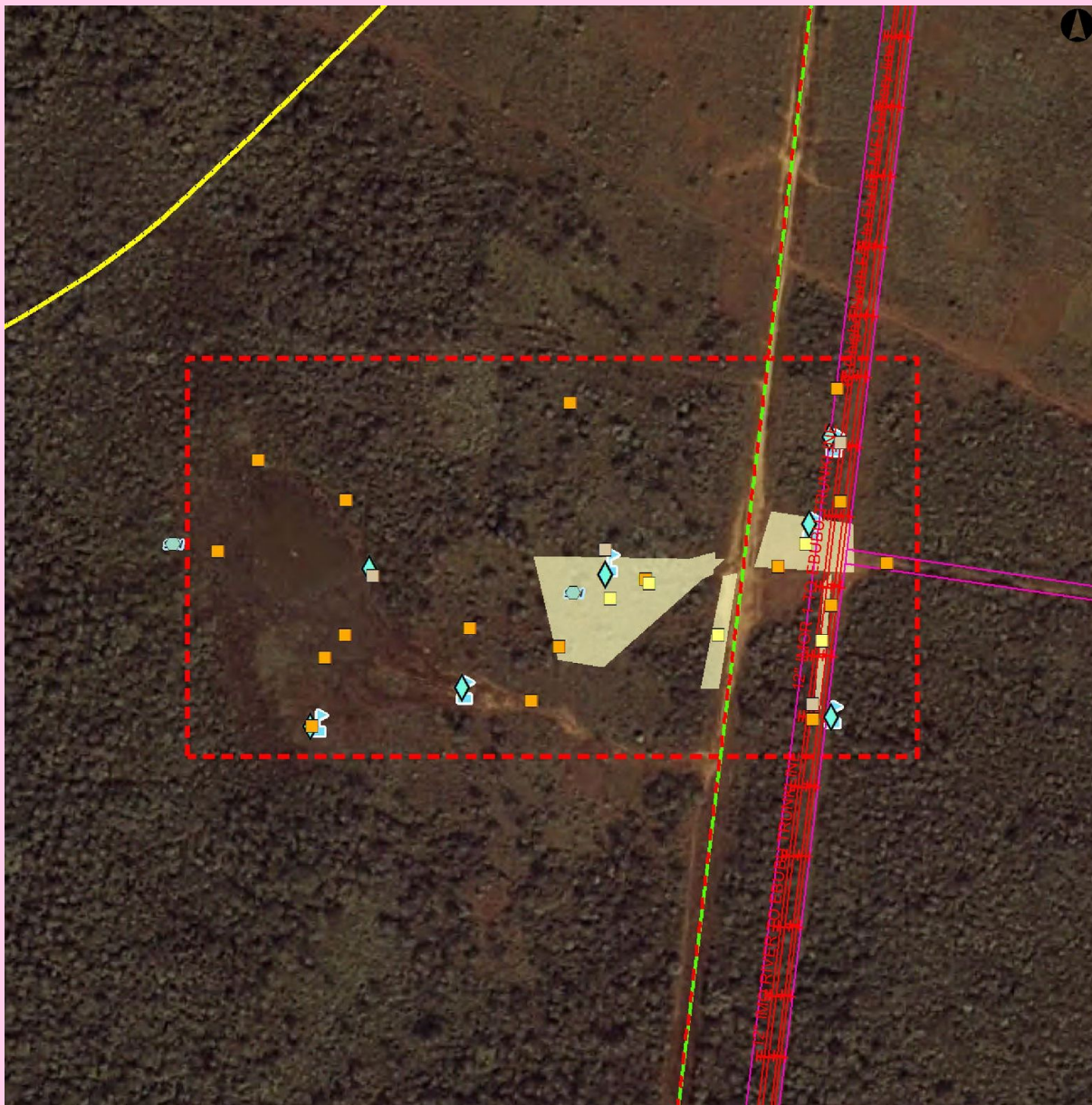
Soil Samples depth



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

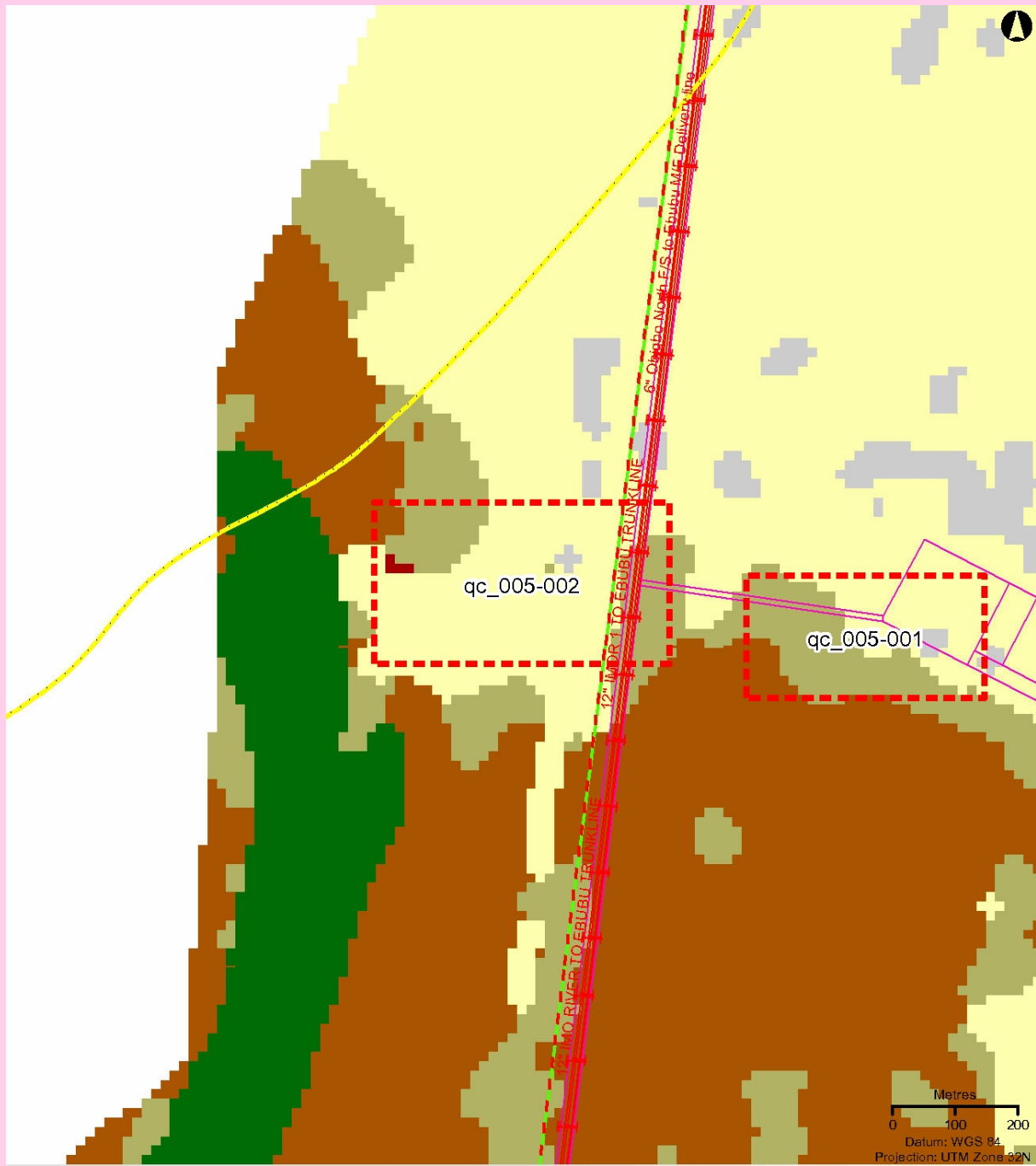
Water samples

- ▲ 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 10 20

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

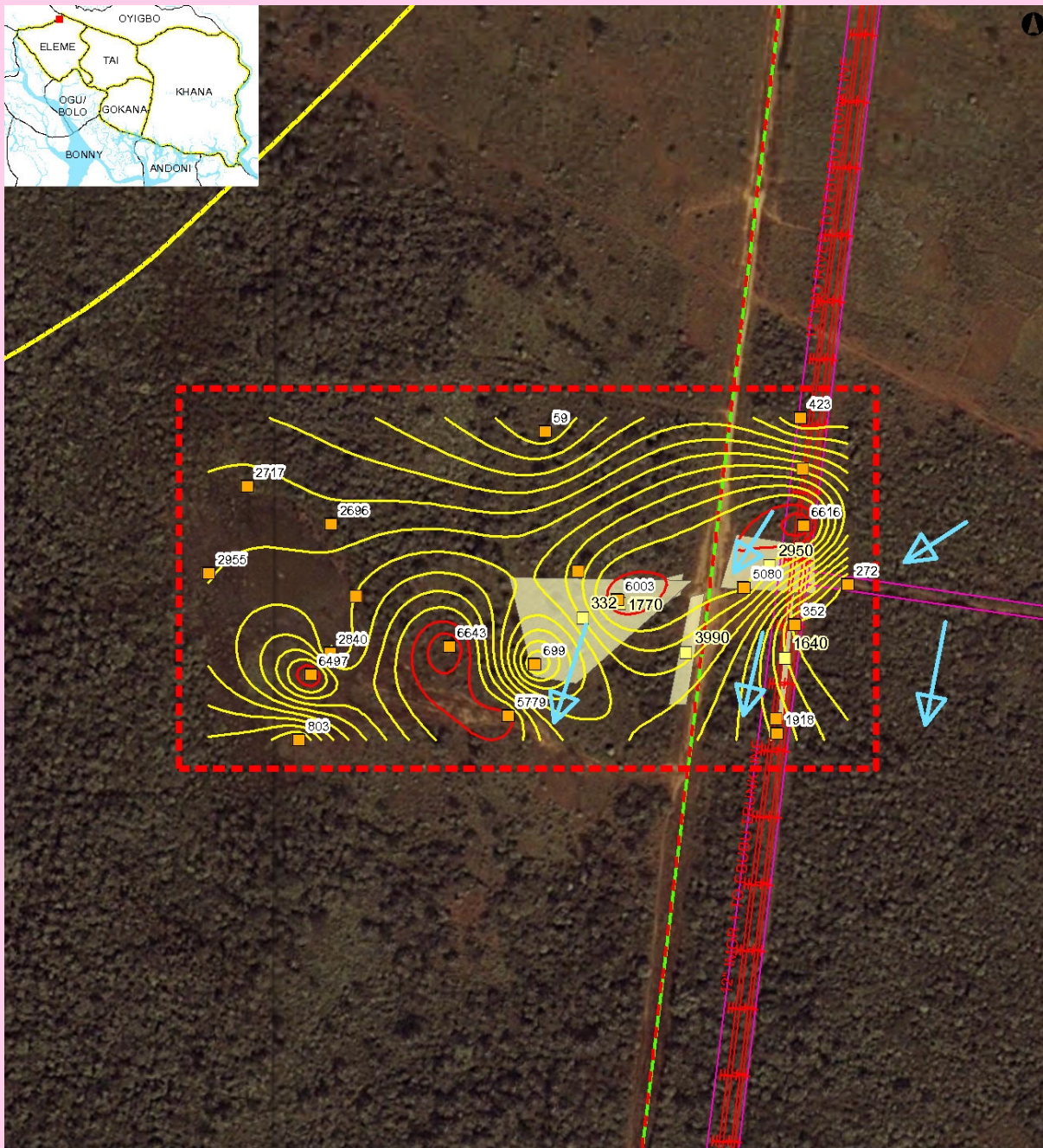
Source:
land cover 2007
from Aster imagery

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Ground Water Elevation Map



Soil Contamination Map



Oil Facilities

- SPDC Right of way (ROW)
- 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.

Ground photograph



VII - Sample List

Soil sample list

Sample Identifier	Total petroleum hydrocarbon (mg/kg)	Depth (m)	Easting	Northing
1540798	not analyzed for TPH	4.30	295417	534170
1540805	not analyzed for TPH	11.80	295399	534001
1664655	not analyzed for TPH	4.00	295114	534084
1664660	not analyzed for TPH	8.50	295265	534101
1693958	5,540.000	2.30	295217	534003
1693980	2,140.000	0.43	295399	533991
1694012	3,080.000	0.96	295399	533991
1694037	3,120.000	2.00	295417	534132
1694061	487.000	0.50	295075	533987
1694085	173.000	2.00	295235	534038
1694108	5,610.000	0.28	295217	534003
1694118	7,490.000	1.60	295417	534132
1694136	1,330.000	2.17	295399	533991
1694154	3,590.000	0.24	295177	534050
1694182	815.000	0.20	295447	534092
1694204	6,460.000	3.08	295217	534003
1694216	1,050.000	1.20	295235	534038
1694238	5,930.000	1.60	295177	534050
1694243	4,590.000	1.60	295377	534090
1694269	50.100	2.00	295242	534196
1694310	5,640.000	3.00	295377	534090
1694322	6,100.000	2.00	295291	534082
1694330	2,840.000	2.40	295096	534046
1694359	2,390.000	1.00	295014	534100
1694376	2,770.000	1.40	295097	534133
1694428	2,950.000	-	295395	534105
1694481	212.000	2.00	295447	534092
1694516	3,330.000	1.00	295291	534082
1694551	8,580.000	3.00	295291	534082
1694592	3,650.000	0.20	295040	534159
1694627	2,250.000	0.20	295097	534133
1694651	1,560.000	1.50	295075	533987
1694672	138.000	0.20	295242	534196
1694684	1,770.000	-	295293	534079
1694702	2,250.000	0.60	295040	534159
1694726	135.000	0.40	295411	534065
1694751	431.000	1.50	295411	534065
1694907	3,990.000	-	295338	534046
1694943	423.000	0.20	295415	534205
1694967	7,860.000	3.00	295177	534050

Sample Identifier	Total petroleum hydrocarbon (mg/kg)	Depth (m)	Easting	Northing
1694992	1,640.000	-	295405	534042
1695025	6,660.000	1.23	295083	534031
1695064	3,520.000	0.50	295014	534100
1695132	332.000	-	295268	534069
1695293	362.000	1.00	295075	533987
1695322	6,260.000	0.50	295083	534031

Groundwater sample list

Sample Identifier	Total petroleum hydrocarbon (µg/l)	Easting	Northing
1866778	2,740,000	295410	534174
1866782	749,000	295397	534118
1866790	0	295265	534085
1866791	0	295112	534089
1866792	not analyzed for TPH	295411	533993
1866797	not analyzed for TPH	295172	534012
1866799	974,000	295074	533987

Sediment sample list

Sample Identifier	Total petroleum hydrocarbon (mg/kg)	Easting	Northing
1695042	24,500.000	294985	534105
1695100	6,660.000	295244	534073

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