

Environmental Assessment of Ogoniland Site Specific Fact Sheets

KWAWA



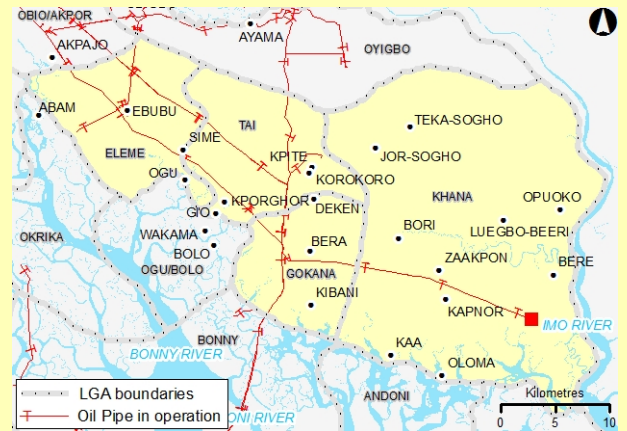
This fact sheet is part of a series prepared as part of the Environmental Assessment of Ogoniland by the United Nations Environment Programme (UNEP). It provides the observations and results from one of the individual sites studied in detail, plus the specific risk reduction measures for follow-up action.

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	KWAWA
Site Number	qc_016-001
LGA	KHANA
Main community	KWAWA
Surrounding communities	KWAWA WIIKUE KWAWA YORLA
Investigated area (ha)	65.46
Category	SPDC Legacy Site
Eastings (WGS 84, Zone 32N)	331623
Northings (WGS 84, Zone 32N)	509527



<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	YORLA-004 (abandoned) YORLA-005 (suspended)
Flowstations	No
Manifolds	No
Flaresites	No
Oil pipeline in operation	8" Yorla FS to Bomu tie-in MF Delivery line(Disused) 16" YORLA TO BOMU TRUNKLINE(DISUSED)
NNPC crude line	No
NNPC product line	No

III - Spill History

Spills reported by SPDC	Incident Number	Incident Date
	1992_00177	19921023
	1992_00207	19921209
	1993_0088	19930114
	1993_00151	19930506
Spill reported by community	Yes	

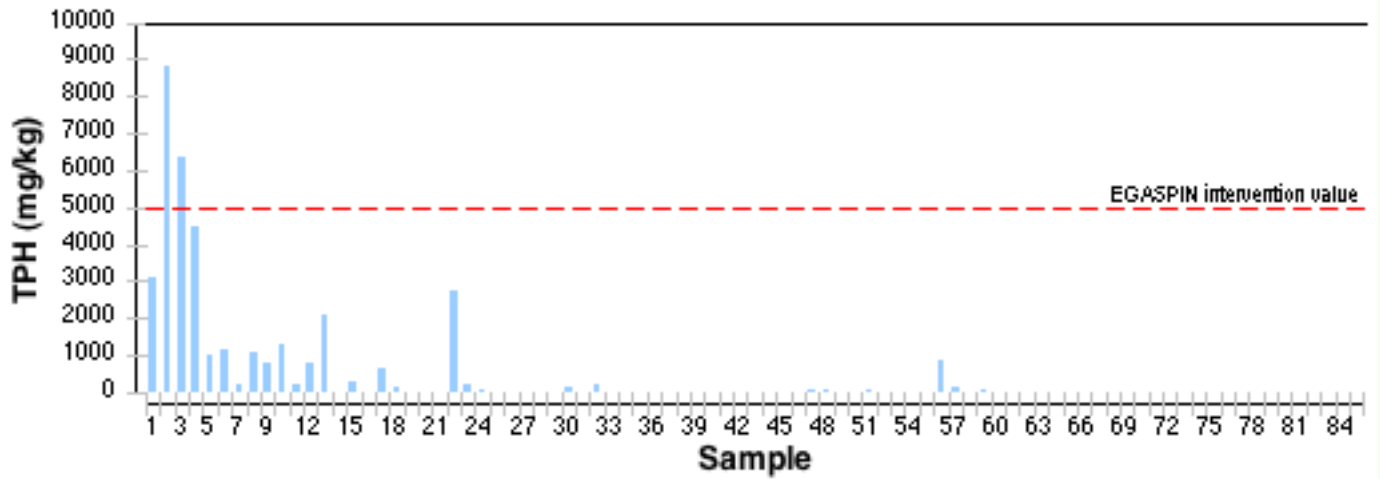
IV - Data Screening

Assessment criteria

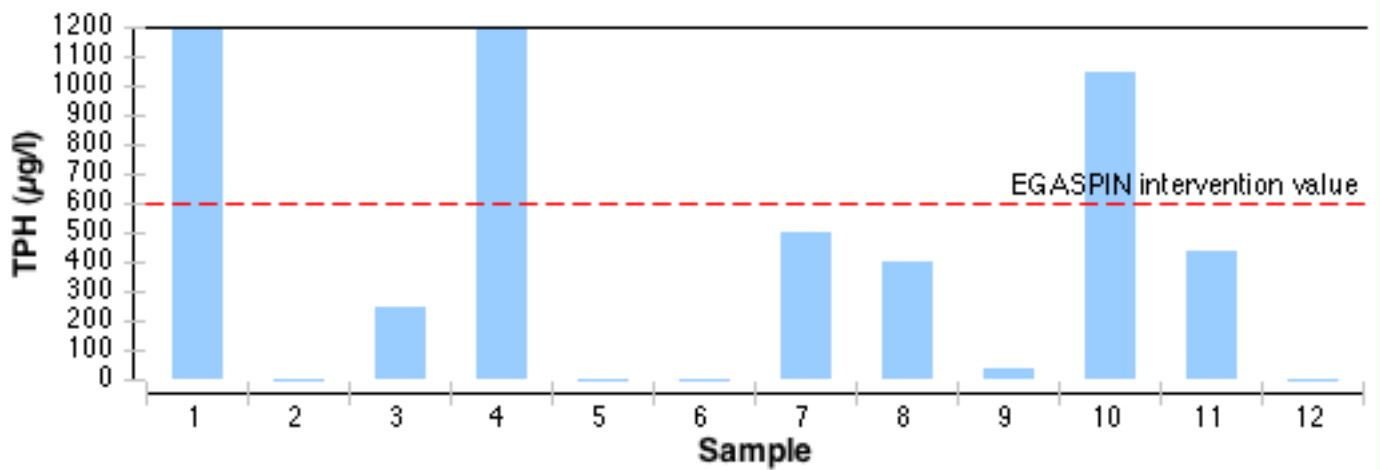
Soil contamination	Nigerian standards EGASPIN (intervention value 5000 mg/kg; target value 50 mg/kg)
Groundwater contamination	Nigerian standards EGASPIN (intervention value 600 µg/l; target value 50 µg/l)
Sediment contamination	Nigerian standards EGASPIN (intervention value 5000 mg/kg; target value 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	85
Deepest investigation (m)	5.2
Maximum soil TPH (mg/kg)	8,820.000
Number of soil measurements greater than EGASPIN intervention value	2
Deepest sample greater than EGASPIN (m)	0.4
Number of soil measurements below 1m	56
Number of soil measurements below 1m greater than EGASPIN intervention value	0
Number of ground water samples	12
Maximum groundwater TPH (µg/l)	77,000
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	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

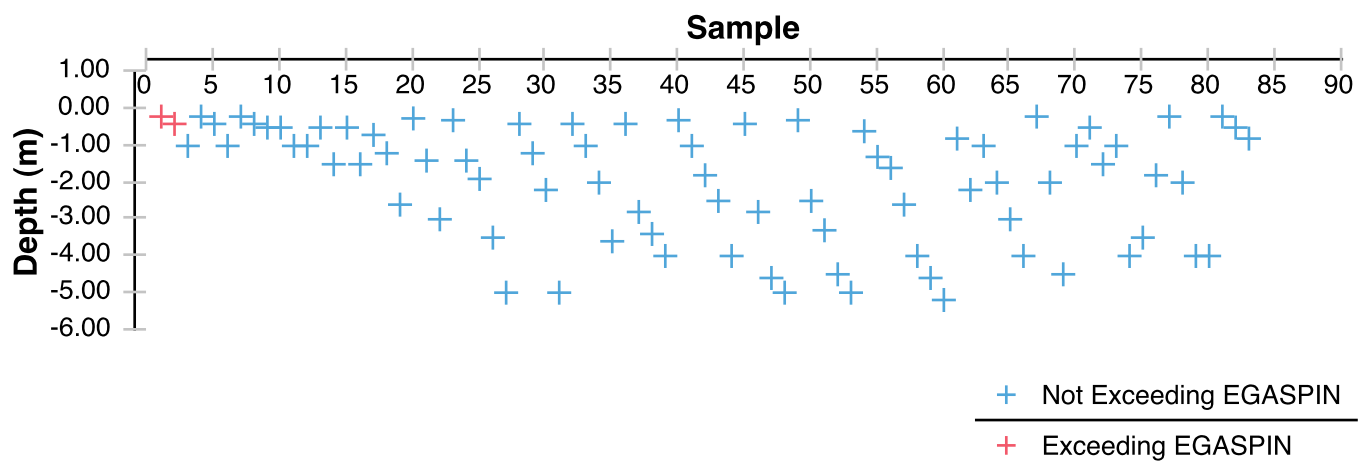
Soil Samples



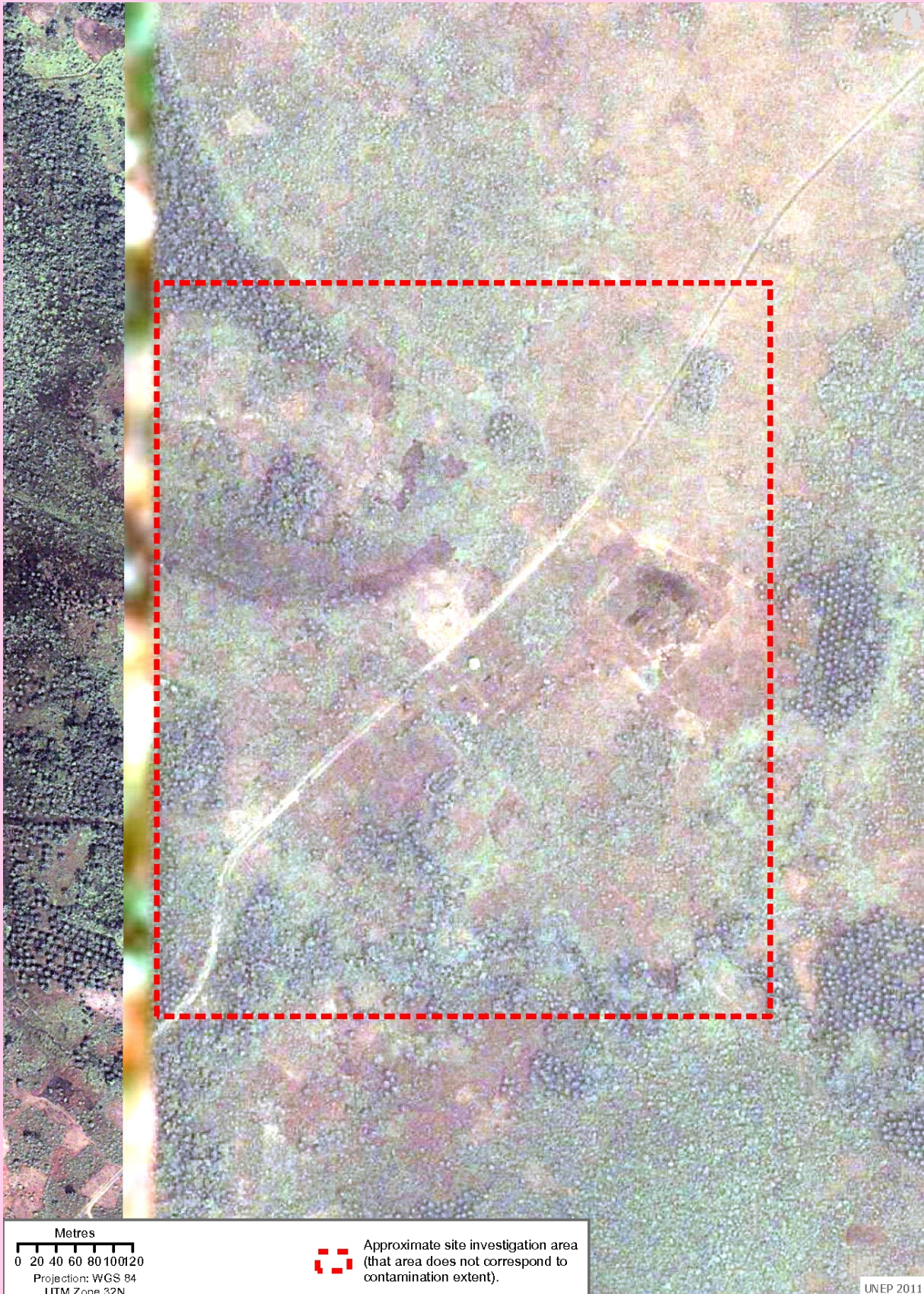
Groundwater Samples



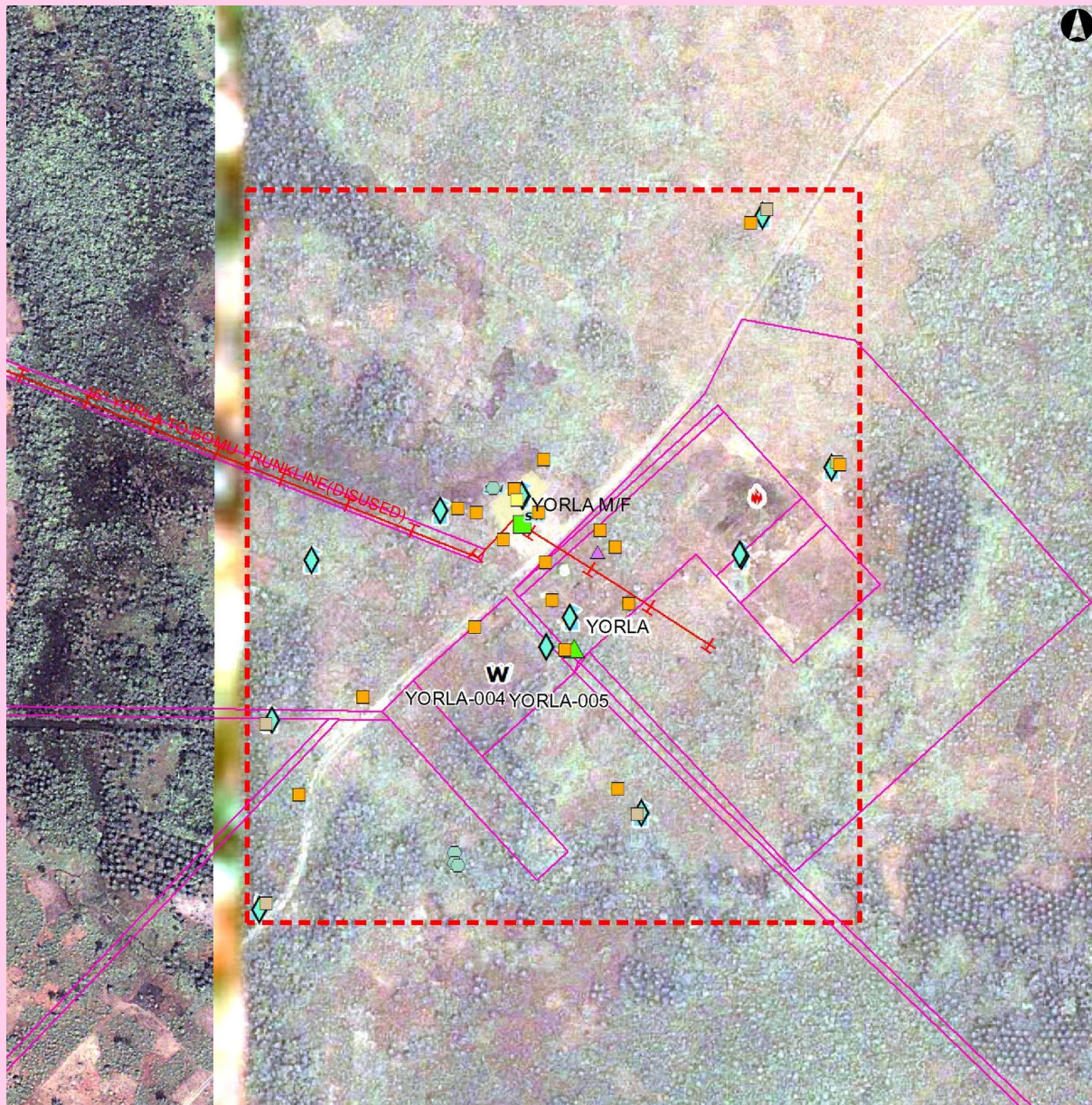
Soil Samples depth



Satellite image of the site



Sampling location map



Oil Facilities

- SPDC Right of way
- w** Wells
- Manifold
- ▲ Flow Station
- 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

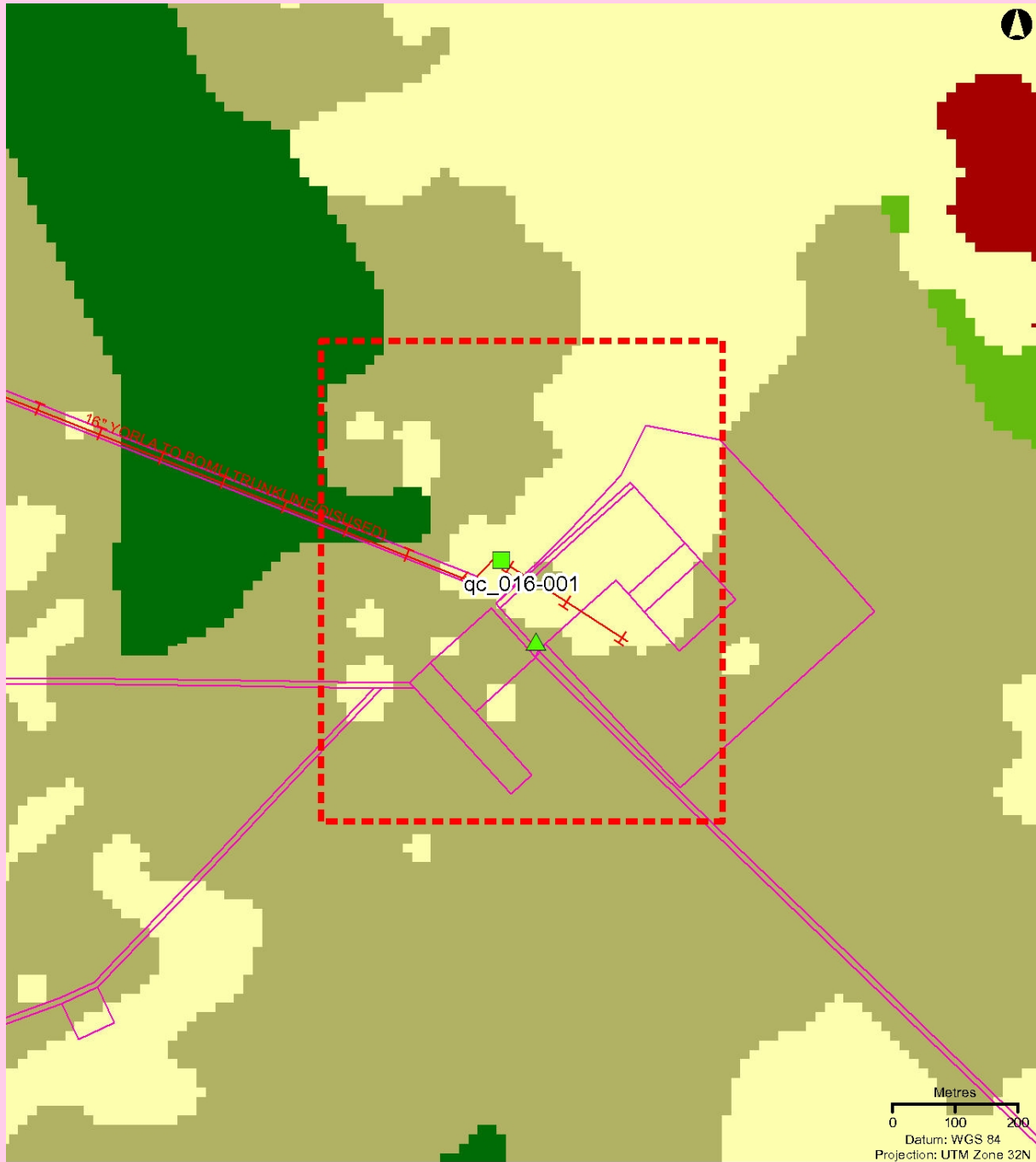
Water samples

- ▲ 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 25 50

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

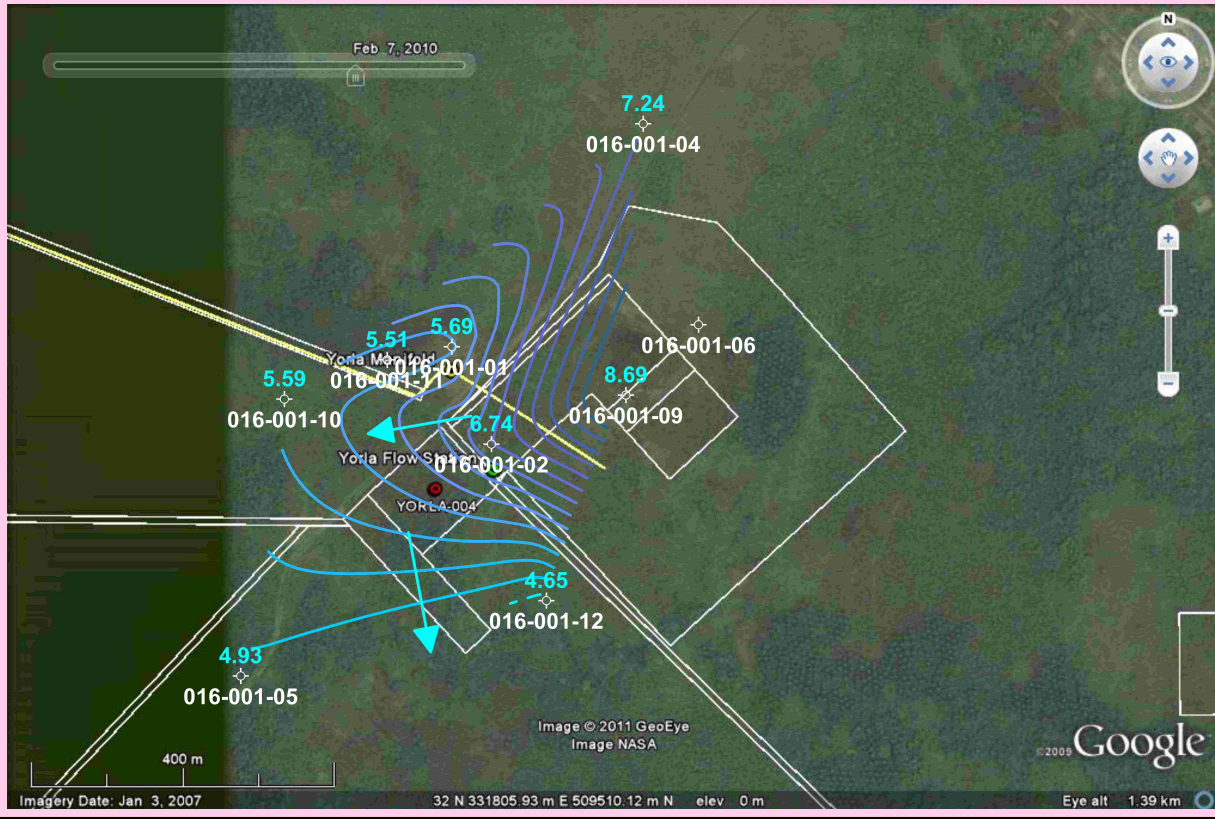
- - - Approximate site investigation area
(that area does not correspond to
contamination extent).

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

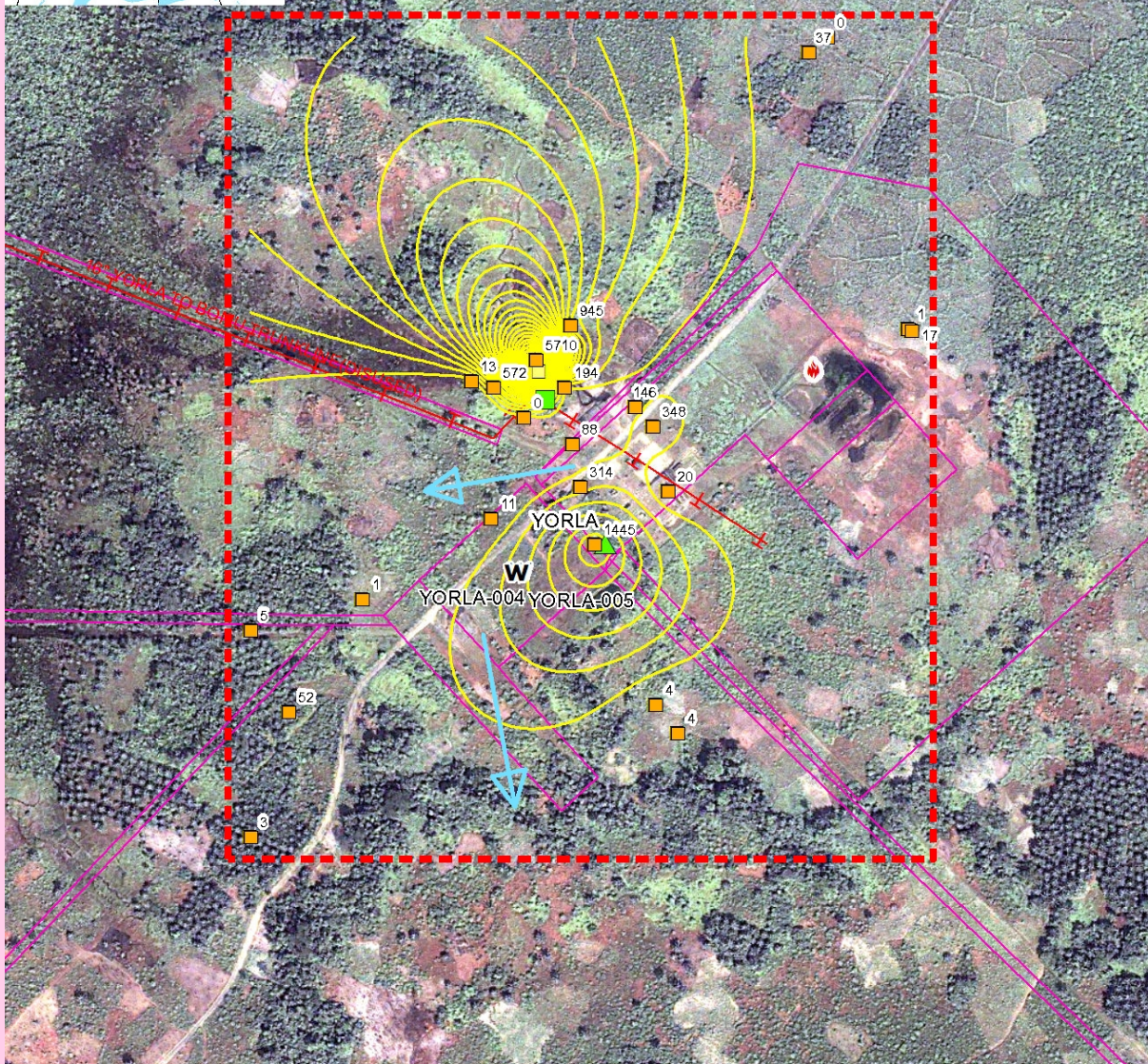
Source:
land cover 2007
from Aster imagery

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Ground Water Elevation Map



Soil Contamination Map



Oil Facilities

- SPDC Right of way (ROW)
- 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.

Ground photograph



VII - Sample List

Soil sample list

Sample Identifier	Total petroleum hydrocarbon (mg/kg)	Depth (m)	Easting	Northing
1811647	6,380.000	0.40	331582	509597
1811693	1,150.000	0.40	331543	509572
1811748	4,450.000	1.00	331582	509597
1811769	264.000	0.50	331615	509520
1811792	999.000	0.20	331543	509572
1811799	8,820.000	0.20	331582	509597
1811826	3,070.000	-	331585	509586
1811838	1,090.000	0.20	331613	509628
1811857	1,280.000	-	331613	509628
1811880	800.000	0.40	331613	509628
1811940	BDL	1.50	331615	509520
1812238	2,770.000	0.25	331688	509536
1812254	21.300	1.20	331702	509477
1812266	223.000	1.40	331688	509536
1812293	BDL	1.00	331571	509544
1812379	15.000	2.60	331702	509477
1812420	27.900	0.70	331702	509477
1812468	2,070.000	1.00	331635	509429
1812488	659.000	0.50	331622	509481
1812528	141.000	1.50	331622	509481
1812543	820.000	0.50	331635	509429
1812561	194.000	0.50	331608	509572
1812832	59.400	3.00	331688	509536
1812868	237.000	1.00	331543	509572
2294877	182.000	2.20	331357	509277
2294933	27.800	0.40	331541	509452
2294945	BDL	1.00	331424	509379
2294973	5.480	0.40	331424	509379
2294990	14.100	2.80	331541	509452
2295000	BDL	5.00	331357	509277
2295012	35.400	0.80	331322	509163
2295028	BDL	2.20	331322	509163
2295049	15.300	1.20	331357	509277
2295054	17.900	1.00	331322	509351
2295064	BDL	2.00	331322	509351
2295073	BDL	3.00	331322	509163
2295081	BDL	3.50	331691	509283
2295095	14.100	1.40	331691	509283
2295111	BDL	4.00	331322	509163
2295126	BDL	5.00	331691	509283

Sample Identifier	Total petroleum hydrocarbon (mg/kg)	Depth (m)	Easting	Northing
2295301	11.300	0.30	331691	509283
2295320	BDL	4.00	331541	509452
2295344	BDL	2.00	331424	509379
2295359	BDL	3.40	331541	509452
2295379	9.650	0.20	331322	509163
2295419	BDL	2.00	331711	509257
2295444	BDL	3.60	331424	509379
2295460	2.380	4.50	331322	509351
2295486	BDL	1.00	331322	509163
2295501	BDL	0.50	331322	509163
2295518	161.000	0.40	331357	509277
2295534	BDL	1.50	331322	509163
2295562	BDL	1.90	331691	509283
2295575	13.800	1.00	331711	509257
2295589	BDL	4.00	331711	509257
2304419	0.937	3.50	331847	509890
2304456	BDL	1.80	331847	509890
2304797	13.500	0.20	331920	509625
2304975	BDL	2.00	331920	509625
2304993	BDL	4.00	331920	509625
2305001	BDL	4.00	331847	509890
2305109	BDL	0.20	331847	509890
2305200	BDL	0.50	331920	509625
2305217	BDL	0.80	331847	509890
2306057	10.500	1.80	331523	509577
2306091	140.000	1.30	331672	509554
2306120	not analyzed for TPH	4.60	331672	509554
2306141	32.300	1.00	331523	509577
2306205	897.000	0.60	331672	509554
2306240	28.200	0.30	331523	509577
2306303	34.900	1.60	331672	509554
2306325	19.000	4.60	331830	509876
2306354	64.000	2.60	331672	509554
2306379	15.100	2.50	331924	509623
2306425	51.300	0.40	331830	509876
2306458	13.700	3.30	331924	509623
2306491	31.200	5.00	331830	509876
2306546	24.000	5.00	331924	509623
2306594	not analyzed for TPH	5.20	331672	509554
2306638	BDL	4.50	331924	509623

Sample Identifier	Total petroleum hydrocarbon (mg/kg)	Depth (m)	Easting	Northing
2306678	34.300	4.00	331672	509554
2306767	99.800	0.30	331924	509623
2306804	BDL	4.00	331523	509577
2306834	50.100	2.80	331830	509876
2306879	19.200	2.50	331523	509577

Groundwater sample list

Sample Identifier	Total petroleum hydrocarbon (µg/l)	Easting	Northing
1822909	BDL	331616	509432
1822980	50,800	331591	509590
1955917	241	331821	509527
2575307	394	331328	509355
2575331	32	331370	509523
2575374	1,040	331505	509575
2575411	498	331315	509157
2575452	77,000	331590	509591
2575500	BDL	331641	509463
2575941	BDL	331819	509529
2576001	429	331716	509258
2576069	BDL	331843	509884

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