Environmental Assessment of Ogoniland
Site Specific Fact Sheets

AABUE- KOROKORO

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.

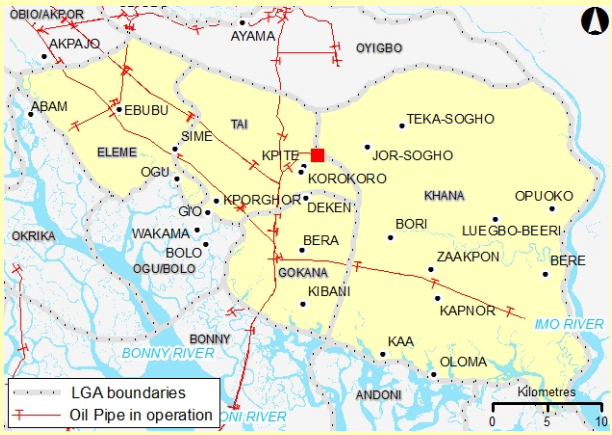
July 2011

Site fact sheet

See Guide to content and terminology on last page.

I - Site Description

Site Name	AABUE- KOROKORO
Site Number	qc_008-007
LGA	TAI
Main community	AABUE KOROKORO
Surrounding communities	AABUE KOROKORO
Investigated area (ha)	3.62
Category	SPDC remediated site
Eastings (WGS 84, Zone 32N)	312829
Northings (WGS 84, Zone 32N)	524315



Recommendations for risk reduction	- 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. - 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.

II - Oilfield Infrastructure Type

Wells	KOROKORO-003 (producing)
Flowstations	No
Manifolds	No
Flaresites	No
Oil pipeline in operation	No
NNPC crude line	No
NNPC product line	No

III - Spill History

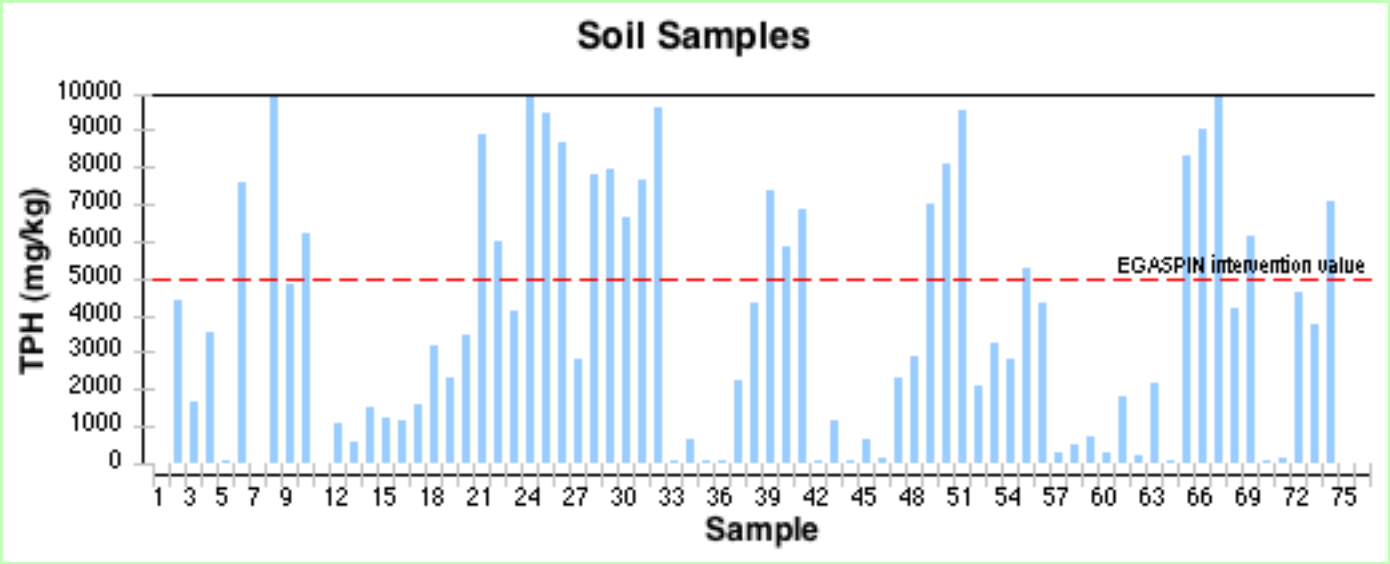
Spills reported by SPDC	Incident Number	Incident Date
	2003_00149	20030913
	2000_00230	20000912
	1992_00119	19920719
	1993_00299	19931114
Spill reported by community	Yes	

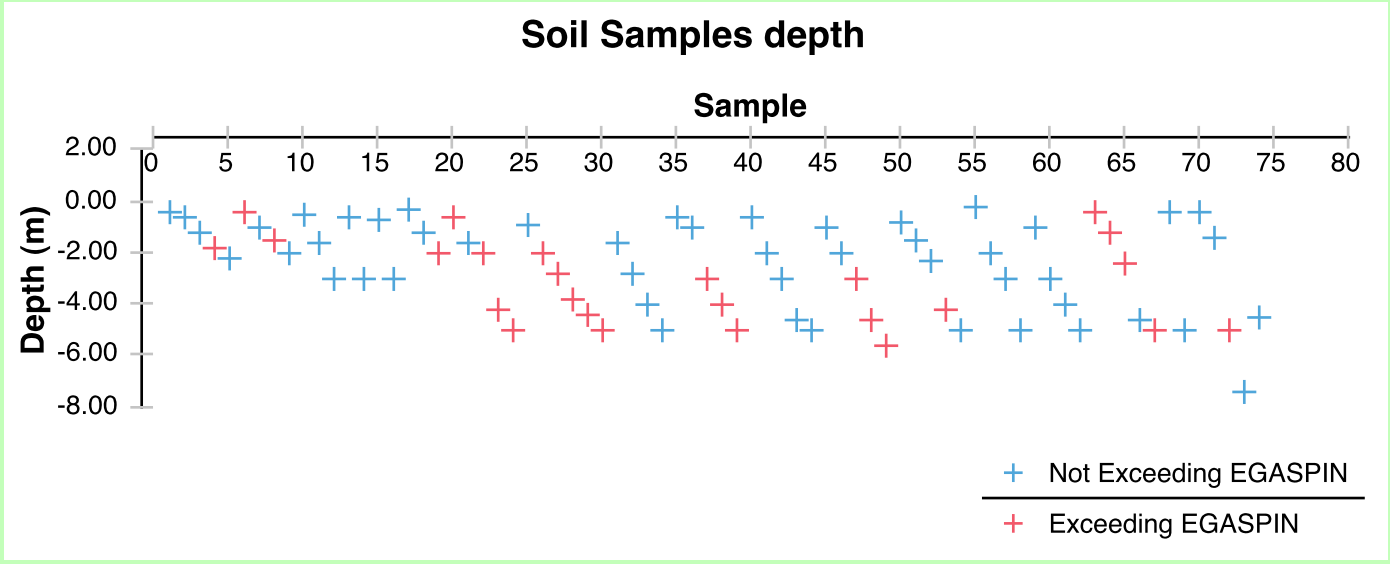
IV - Data Screening

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	76
Deepest investigation (m)	7.4
Maximum soil TPH (mg/kg)	11,200.000
Number of soil measurements greater than EGASPIN intervention value	25
Deepest sample greater than EGASPIN (m)	5.6
Number of soil measurements below 1m	58
Number of soil measurements below 1m greater than EGASPIN intervention value	22
Number of ground water samples	1
Maximum groundwater TPH (µg/l)	Not applicable
Number of groundwater measurements greater than EGASPIN intervention value	0
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

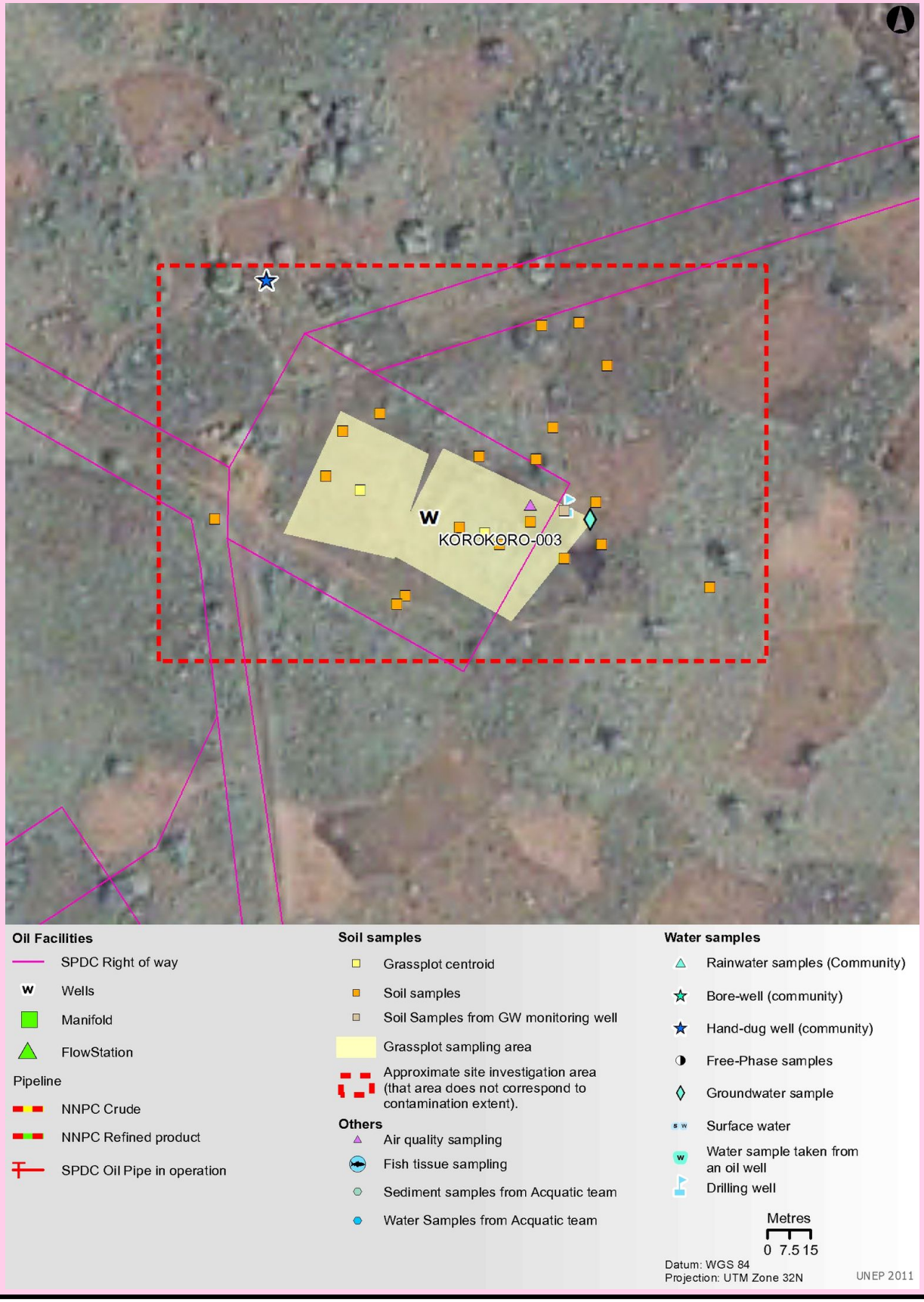

Soil Samples
TPH (mg/kg)
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
EGASPIN intervention value
1 3 5 7 9 12 15 18 21 24 27 30 33 36 39 42 45 48 51 54 57 60 63 66 69 72 75
Sample


Soil Samples depth
Sample
Depth (m)
2.00
0.00
-2.00
-4.00
-6.00
-8.00
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80
Not Exceeding EGASPIN
Exceeding EGASPIN

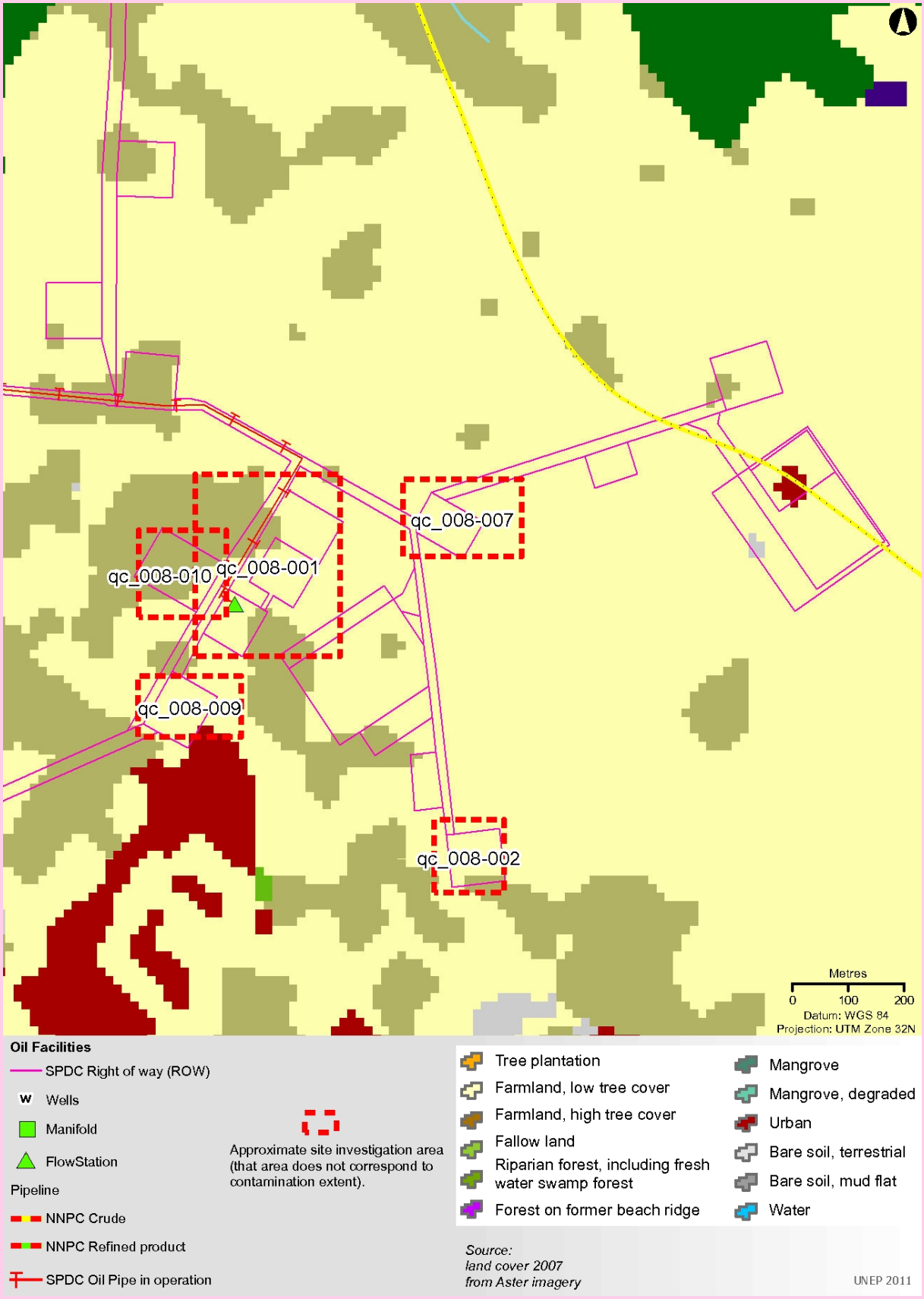
V - Maps

Satellite image of the site

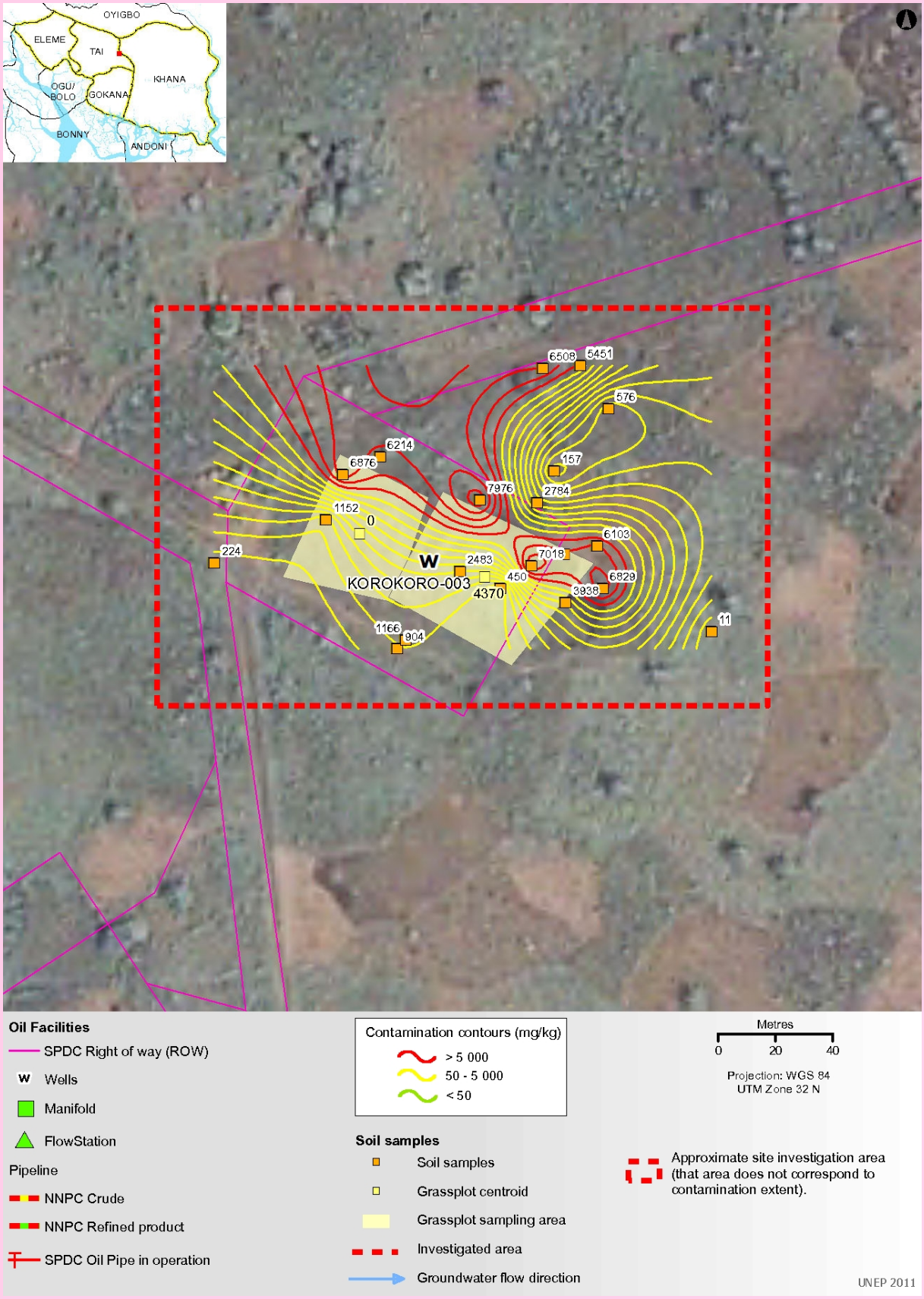
Sampling location map



Landcover 2007



Soil Contamination Map



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

VI - Photos

Ground photograph

VII - Sample List

Soil sample list

Sample Identifier	Total petroleum hydrocarbon (mg/kg)	Depth (m)	Easting	Northing
1664692	not analyzed for TPH	7.40	312865	524298
1664777	not analyzed for TPH	4.50	312865	524298
1956279	11.100	2.00	312916	524271
1956295	4,830.000	1.00	312878	524286
1956310	10,600.000	0.40	312878	524286
1956336	3,550.000	0.60	312828	524292
1956353	7,580.000	1.80	312828	524292
1956377	6,210.000	1.50	312878	524286
1956401	3,150.000	3.00	312855	524316
1956426	8,880.000	2.00	312870	524364
1956456	1,580.000	0.70	312855	524316
1956495	3,450.000	1.20	312870	524364
1956606	2,310.000	0.30	312870	524364
1956656	50.700	1.20	312828	524292
1956659	not analyzed for TPH	2.20	312828	524292
1956701	1,650.000	0.40	312828	524292
1956729	1,090.000	0.50	312781	524310
1956749	599.000	1.60	312781	524310
1956763	1,150.000	3.00	312809	524268
1956774	1,230.000	0.60	312809	524268
1956955	not analyzed for TPH	-	312793	524305
1956980	4,370.000	-	312837	524290
1956993	1,520.000	3.00	312781	524310
2343355	2,240.000	0.60	312876	524301
2343541	5,280.000	4.20	312865	524281
2343577	6,890.000	5.00	312876	524301
2343611	5,880.000	4.00	312876	524301
2343670	134.000	5.00	312880	524349
2343714	8,310.000	0.40	312853	524294
2343759	6,120.000	5.00	312853	524294
2343785	303.000	5.00	312842	524286
2343821	500.000	2.00	312842	524286
2343869	6,020.000	0.60	312835	524317
2343895	8,640.000	5.00	312835	524317
2343933	2,060.000	0.80	312865	524281
2343950	2,850.000	2.30	312865	524281
2343968	4,310.000	5.00	312865	524281
2343998	3,260.000	1.50	312865	524281
2344039	654.000	2.80	312742	524295
2344075	83.000	4.00	312742	524295

Sample Identifier	Total petroleum hydrocarbon (mg/kg)	Depth (m)	Easting	Northing
2344122	1,160.000	2.00	312880	524349
2344141	67.900	3.00	312880	524349
2344182	679.000	4.60	312880	524349
2344226	4,600.000	0.40	312800	524332
2344465	3,740.000	1.40	312800	524332
2344487	7,080.000	5.00	312800	524332
2344570	9,050.000	1.20	312853	524294
2344596	10,700.000	2.40	312853	524294
2344628	4,200.000	4.60	312853	524294
2344684	2,330.000	1.00	312857	524363
2344725	8,060.000	4.60	312857	524363
2344757	9,510.000	5.60	312857	524363
2344822	2,920.000	2.00	312857	524363
2344880	2,180.000	4.00	312806	524265
2344900	246.000	3.00	312806	524265
2344919	1,800.000	1.00	312806	524265
2344951	49.800	5.00	312806	524265
2345000	11,200.000	2.00	312835	524317
2345028	9,440.000	4.20	312835	524317
2345087	7,650.000	4.40	312787	524326
2345128	9,590.000	5.00	312787	524326
2345158	2,790.000	0.90	312787	524326
2345191	7,790.000	2.00	312787	524326
2345202	6,630.000	3.80	312787	524326
2345209	7,910.000	2.80	312787	524326
2345320	6,990.000	3.00	312857	524363
2345381	163.000	5.00	312861	524327
2345409	88.400	0.40	312861	524327
2345444	690.000	3.00	312842	524286
2345482	91.300	1.60	312742	524295
2345526	4,110.000	1.60	312835	524317
2345600	7,340.000	3.00	312876	524301
2345622	4,300.000	1.00	312876	524301
2345654	87.600	5.00	312742	524295
2345681	78.500	0.60	312880	524349
2345706	280.000	0.20	312842	524286

Groundwater sample list

Sample Identifier	Total petroleum hydrocarbon (µg/l)	Easting	Northing
1854120	not analyzed for TPH	312874	524295

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 excedences 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