

# Assessment of NORM contaminated waste associated with oil and gas production from Ghanaian oilfields

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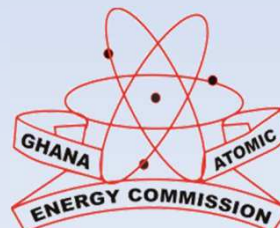
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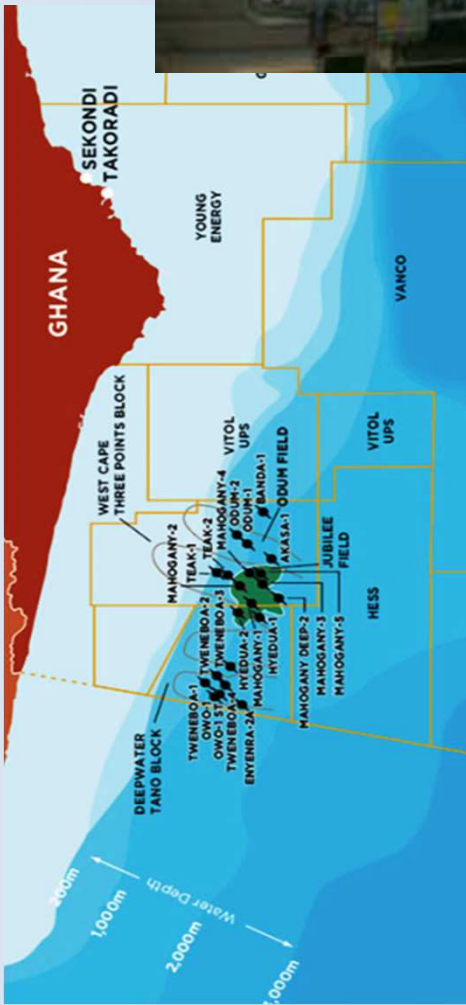
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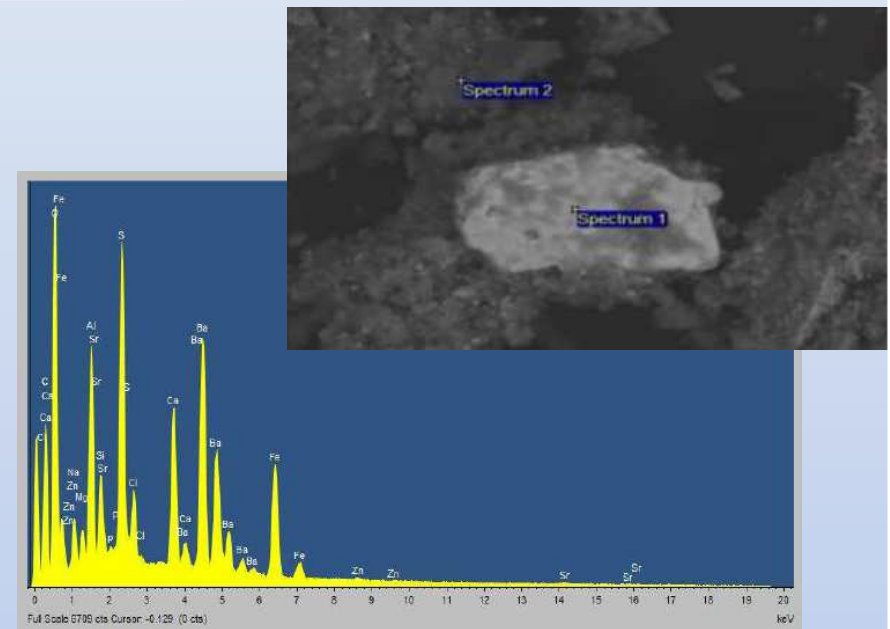




## Produced Waters

Sample ID	Concentration Bq/l					$^{228}\text{Ra}/^{226}\text{Ra}$	
	$^{226}\text{Ra}$	$^{228}\text{Ra}$	$^{228}\text{Th}$	$^{40}\text{K}$	$^{224}\text{Ra}$		
JF1	6.7 ± 0.2	6.6 ± 0.2	0.82 ± 0.01	6.3 ± 0.5	0.82 ± 0.01	0.99	
JF 2	7.6 ± 0.3	6.9 ± 0.1	1.22 ± 0.03	8.3 ± 0.8	1.43 ± 0.04	0.91	
JF 3	6.2 ±	Sample ID	Concentration mBq/l				
JF 4	6.6 ±		$^{234}\text{U}$	$^{238}\text{U}$	$^{210}\text{Po}$	$^{230}\text{Th}$	$^{232}\text{Th}$
JF 5	6.8 ±	JF1	6.1 ± 2.1	5.5 ± 2.2	22 ± 2	6.4 ± 1.3	2.1 ± 0.8
SF 6	20.1	JF 2	2.5 ± 0.5	2.3 ± 0.5	43 ± 4	4.6 ± 1.3	1.7 ± 0.5
SF7	22.2	JF 3	1.6 ± 0.5	1.5 ± 0.5	39 ± 4	8.0 ± 1.2	1.6 ± 0.5
SF 8	19.5	JF 4	5.5 ± 2.3	5.0 ± 2.1	40 ± 3	6.8 ± 1.0	5.6 ± 1.2
SF 9	22.1	JF 5	4.8 ± 1.7	4.3 ± 1.8	48 ± 5	5.6 ± 1.3	2.7 ± 0.5
SF 10	19.7	SF 6	<DL	2.9 ± 0.5	82 ± 7	5.6 ± 0.8	4.2 ± 0.7
SF 11	22.3	SF 7	2.8 ± 0.5	4.2 ± 1.2	46 ± 3	4.7 ± 0.7	3.6 ± 0.5
SF 12	19.6	SF8	2.5 ± 0.5	<DL	35 ± 11	2.9 ± 1.0	2.4 ± 0.5
SF 13	18.7	SF 9	2.1 ± 0.9	<DL	82 ± 12	8.0 ± 1.1	3.4 ± 0.6
		SF 10	3.2 ± 0.6	2.9 ± 0.4	135 ± 12	11.9 ± 1.8	2.1 ± 0.5
		SF 11	<DL	2.7 ± 0.2	139 ± 9	12.0 ± 1.4	3.0 ± 0.9
		SF 12	4.1 ± 0.6	3.8 ± 0.5	145 ± 14	15 ± 2.0	5.1 ± 0.5
		SF 13	2.5 ± 0.5	2.7 ± 0.2	55 ± 11	7.0 ± 1.5	3.4 ± 1.7

\*JF-Jubilee Field



## Scales, Sludges, muds,.....

