Department
for Environment
Food & Rural Affairs

Report on measures for 2014 exceedance of the Target Value for Benzo[a]pyrene in North East non-agglomeration zone (UK0036)

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1. Introduction

1.1 Context

Under the EU Directive 2004/107/EC[1], the target value (TV) for Benzo[a]pyrene (B[a]P) is an annual mean concentration of 1 nanogram (one billionth of a gram (10^{-9})) per cubic metre (m^{-3}) of ambient air or lower. The Directive requires Member States report on measures in place to address the exceedance of the TV and that all reasonable measures that do not entail disproportionate cost should be taken to ensure this target is not exceeded.

Exceedance of the TV was reported in 2013 in the North East non-agglomeration zone and a report on measures was published detailing the exceedance and the measures in place[2].

This document reports the exceedance situation for 2014 reflecting the more recent assessment and updating the 2013 report on measures.

1.2 Status of zone

This is the report on measures required for exceedances of the TV for B[a]P within the North East zone identified within the 2014 UK air quality assessment. Exceedances within this zone were identified on the basis of model results on a 1 km x 1 km grid resolution providing supplementary information for the assessment in addition to the results from fixed monitoring stations. This exceedance was reported via e-Reporting dataflow G[3] on attainment and Air Pollution in the UK[4].

Table 1 summarises the spatial extent and associated resident population for the exceedances identified in this zone, as reported via e-Reporting.

[1] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2005:023:0003:0016:EN:PDF
[2] https://uk-air.defra.gov.uk/assets/documents/reports/bap-nickel-measures/bap_northeast_UK0036_reportonmeasures_2013.pdf
[3] http://cdr.eionet.europa.eu/gb/eu/aqd
[4] http://uk-air.defra.gov.uk/library/annualreport/index

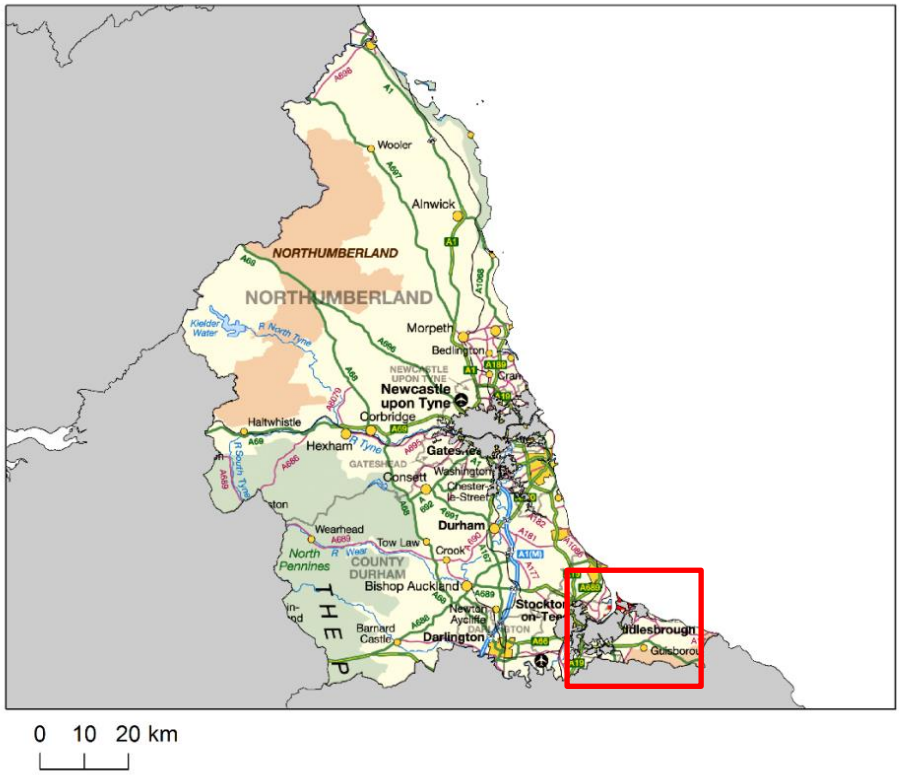
Table 1. Area exceeding B[a]P target value in 2014 and associated population for zone UK0036

Zone code	Zone Name	Area exceeding TV (km^2)	Population exceeding TV
UK0036	North East	10	5

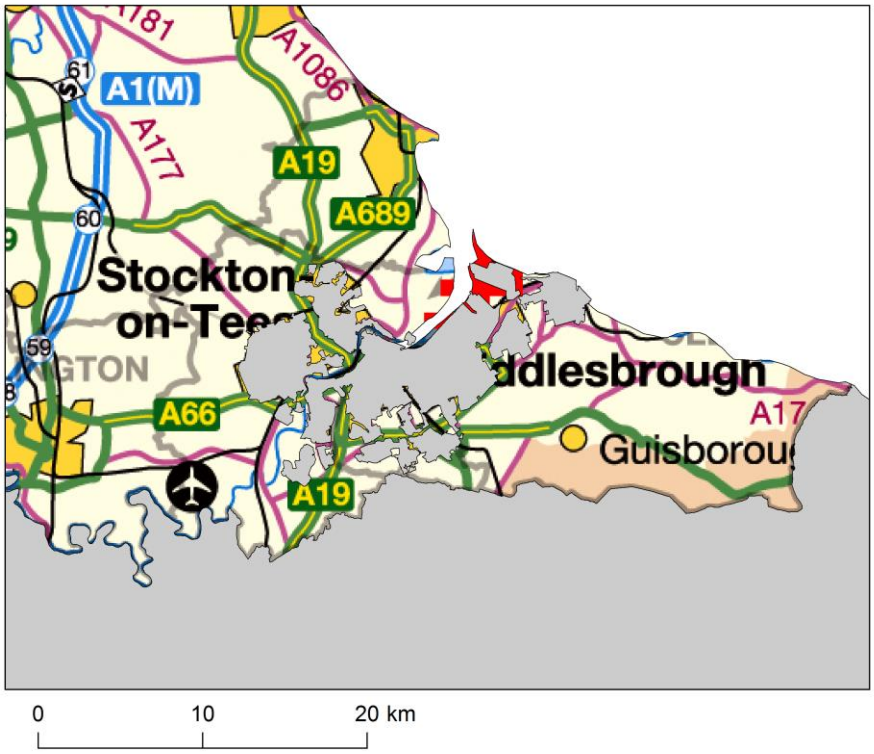
Figure 1a shows the locations of the exceedances in the context of the zone as a whole. Figure 1b shows the part of the zone including the exceedances in more detail.

Figure 1. Location of exceedance of the B[a]P target value on 2014 in zone UK0036 North East. Areas of the zone in exceeding grid squares are marked red.

a) The whole zone



b) The exceedance locations at higher spatial resolution



An initial source apportionment was carried out and this analysis has identified a single exceedance situation in this zone:

- North East [B[a]P_UK0036_2014_1] related to industrial emissions (area of exceedance 10 km^2)

This report includes a description of the exceedance situation, including maps, information on source apportionment and a list of measures already taken or to be taken. Information on measures is reported within e-Reporting dataflow K[5].

[5] http://cdr.eionet.europa.eu/gb/eu/aqd

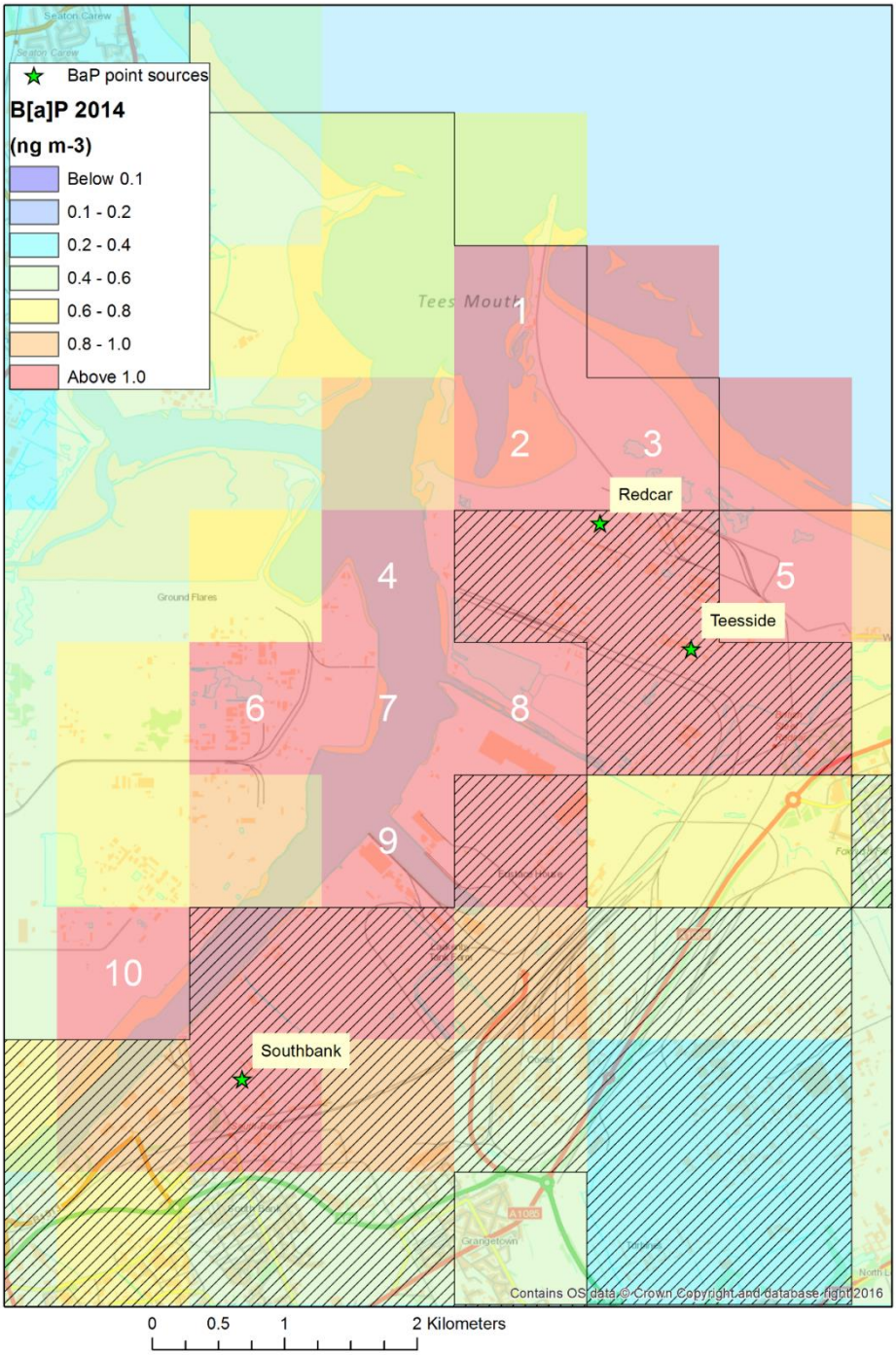
2 Exceedance situation North East [B[a]P_UK0036_2014_1] related to industrial emissions

2.1 Description of exceedance

This exceedance situation has an area of exceedance of 10 km^2 and consists of grid squares adjacent to part of exceedance situation Teesside Urban Area [B[a]P_UK0013_2014_1] close to Redcar, in Redcar and Cleveland. Figure 2 shows the location of the exceedance situation in detail. The exceeding grid squares are numbered in Figure 2 and in subsequent tables for easy reference. There is no resident population in eight of the grid squares, which are largely or wholly within the SSI Redcar steelworks industrial complex area, the river, open land with no population or other industrial areas. The grid square identified as exceeding grid square 1 has a resident population of 3 and includes car parks and a harbour for small boats. The grid square identified as exceeding grid square 5 has a resident population of 2 and also includes part of a golf course. This exceedance situation is adjacent to and shares common sources with the exceedance situation Teesside Urban Area [B[a]P_UK0013_2014_1] .

Figure 2 also shows the locations of the key industrial sources. The area shown on this map includes grid squares assigned to both the Teesside Urban Area (UK0013) and North East (UK0036) zones. The grid squares assigned to the Teesside Urban Area zone are shown as hatched. Thus the hatched red grid squares correspond to exceedance situation Teesside Urban Area [B[a]P_UK0013_2014_1] and the non-hatched red grid squares correspond to exceedance situation North East [B[a]P_UK0036_2014_1]. The exceeding grid squares within this exceedance situation are numbered and the numbers correspond to those in subsequent tables.

Figure 2. Exceedance situation North East [B[a]P_UK0036_2014_1]. Exceeding grid squares are marked red. Locations of coke works at Redcar and South Bank and sinter plant at Teesside are also shown. Non-hatched grid squares are those assigned to North East Zone UK0036. Hatched grid squares are assigned to Teesside Urban Area Zone UK0013 and do not form part of this exceedance situation.



2.2 Source apportionment

Table 2 provides a breakdown of the main emission sources (source apportionment) that have contributed to the grid squares in this exceedance situation. It is clear that industrial sources are the main source associated with this exceedance situation. The penultimate column is the total from all emission sources. The values in this column have been rounded to 1 decimal place for consistency with the values used in the compliance assessment. The values in the other columns have not been rounded. The other shaded columns are the subtotals for the regional, urban background and local contributions. Table 3 gives a more detailed source apportionment indicating how the separate industrial processes contribute to the total industrial figure and show that the coke ovens at Redcar are the main source associated with this exceedance situation. The coke ovens at South Bank also contribute, for example, in exceeding grid square 10.

Table 2. Source apportionment for exceedance situation North East [B[a]P_UK0036_2014_1]. Annual mean B[a]P concentration (ngm^{-3})

Grid square number	OS easting (m)	OS Northing (m)	Zone	**a) Regional background: Total**	**b) Urban background increment: Total**	Urban background increment: Traffic	Urban background increment: Industry including heat and power production	Urban background increment: commercial and residential	Urban background increment: Shipping	Urban background increment: Off road mobile machinery	Urban background increment: Other	**c) Local increment: Total**	Local increment: Industry including heat and power production	**Total for all emission sources (a+b+c)**	Resident population
1	455500	527500	36	n/a	0.113	0.003	0.061	0.014	0.007	0.002	0.026	1.064	1.064	1.2	3
2	455500	526500	36	n/a	0.115	0.002	0.069	0.011	0.009	0.002	0.022	2.133	2.133	2.2	0
3	456500	526500	36	n/a	0.128	0.003	0.076	0.014	0.005	0.002	0.028	8.640	8.640	8.8	0
4	454500	525500	36	n/a	0.228	0.003	0.140	0.015	0.036	0.003	0.031	0.941	0.941	1.2	0
5	457500	525500	36	n/a	0.177	0.003	0.133	0.011	0.002	0.003	0.024	1.330	1.330	1.5	2
6	453500	524500	36	n/a	0.621	0.003	0.559	0.012	0.009	0.006	0.032	0.587	0.587	1.2	0
7	454500	524500	36	n/a	0.242	0.003	0.177	0.016	0.009	0.003	0.035	0.936	0.936	1.2	0
8	455500	524500	36	n/a	0.170	0.003	0.121	0.012	0.004	0.002	0.028	1.320	1.320	1.5	0
9	454500	523500	36	n/a	0.158	0.003	0.109	0.012	0.003	0.002	0.028	0.917	0.917	1.1	0
10	452500	522500	36	n/a	0.667	0.006	0.593	0.017	0.002	0.004	0.046	0.625	0.625	1.3	0

Table 3. Detailed source apportionment for industrial sources only for exceedance situation North East [B[a]P_UK0036_2014_1]. Annual mean B[a]P concentration (ngm^{-3})

Grid square number	OS easting (m)	OS Northing (m)	Zone	Redcar coke ovens	South Bank coke ovens	Teesside sinter plant	Local increment: Industry including heat and power production
1	455500	527500	36	1.001	0.054	0.009	1.064
2	455500	526500	36	2.050	0.077	0.006	2.133
3	456500	526500	36	8.541	0.092	0.007	8.640
4	454500	525500	36	0.844	0.093	0.003	0.941
5	457500	525500	36	1.192	0.131	0.008	1.330
6	453500	524500	36	0.453	0.129	0.005	0.587
7	454500	524500	36	0.764	0.167	0.006	0.936
8	455500	524500	36	1.096	0.218	0.006	1.320
9	454500	523500	36	0.502	0.408	0.007	0.917
10	452500	522500	36	0.242	0.377	0.006	0.625

Footnote to Table 3: South Bank Coke Ovens stopped production during September 2015. Redcar Coke Ovens and Teesside sinter plant stopped production during October 2015.

A revised modelling methodology incorporating a finer spatial scale for dispersion modelling of all coke ovens in the UK and revision to the emissions rate for the coke ovens at Scunthorpe have been adopted for the 2015 compliance assessment for B[a]P that were not incorporated into 2014 reporting.

2.3 Measures

The installation relating to the identified exceedance was the Sahaviriya Steel Industries (SSI UK) owned steelworks near Redcar and its associated coke ovens. SSI UK placed the steelworks into liquidation in early October 2015 and the Official Receiver announced on 12th October 2015[6] that the steelworks and its coke ovens would be closed down. Future modelled assessments of this zone will reflect the closure of the plant and the zone will be expected to show compliance with the TV.

The measures set out in Table 4 reflect the changes at the Teesside industrial site.

[6] https://www.gov.uk/government/news/redcar-coke-ovens-to-be-closed

Table 4: Table of measures taken at Teesside industrial site

Measure code	Description	Classification	Implementation dates	Other information		Comment
SSI1	Closure of Teesside Integrated Steel Works	Permit systems and economic instruments: other measure	Start: 2015 Expected end: 2015 Status: Implementation	Source affected:	Industry including heat and power production	South Bank Coke Ovens stopped production during September 2015. Sahaviriya Steel Industry (SSI UK) near Redcar and its associated Coke Ovens and Teesside sinter plant stopped production during October 2015.
				Spatial scale:	Local	
				Cost:		
				Indicator:		
				Target emissions reduction:		