



Water



Submitted by
AECOM
Scott House
Alençon Link
Basingstoke
Hampshire
RG21 7PP
United Kingdom

Oxfordshire County Council Minerals and Waste SFRA GIS Inspection

Final Report
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Prepared by: Danielle Skilton
Flood Risk Consultant

Checked by: Gemma Hoad
Senior Water Consultant

Approved by: Carl Pelling
Associate

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Scott House, Alençon Link, Basingstoke, Hampshire, RG21 7PP, United Kingdom
Telephone: 01256 310 200 Website: <http://www.aecom.com>

Job No : 47073843

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1 Introduction

1.1 Project Background

A Level 1 study was first undertaken in April 2009 in conjunction with Cherwell and West Oxfordshire District Councils. A second Level 1 study was published in October 2010, identifying flood risk associated with future minerals and waste proposed development sites and areas across Oxfordshire. All potential sources of flooding were assessed in both of the SFRA's. Both of the SFRA's mentioned were carried out by Scott Wilson (now part of AECOM). However, since their publication, the Environment Agency has updated its fluvial, surface water and groundwater maps.

Oxfordshire County Council is currently preparing its Minerals and Waste Core Strategy (informed by the aforementioned SFRA studies). A draft Proposed Submission Document was presented in a report to Cabinet on 25th November 2014. Further adjustments to the Proposed Submission Document are now being made and will be considered at a special meeting of Council on 24th March 2015.

Oxfordshire County Council is therefore seeking to identify the extent to which a full update of the SFRA is required. An initial assessment for each of the mineral and waste sites and areas is required to establish the extent of any additional risk from fluvial and surface water flooding and the potential risk from groundwater flooding, through a comparison of the 2010 and 2015 datasets.

1.2 Proposed Works

In order to identify the extent to which the flood risk at the mineral and waste sites has changed as a result of the availability of new data, Geographic Information System (GIS) software was used to complete a number of interrogations. Details of the data sets and methodologies used are covered within the following chapters.

A summary spreadsheet has been prepared to detail the fluvial, surface water and groundwater flood risk to each site and area based on the 2010 and 2015 GIS datasets. Any significant changes in flood risk to a site are highlighted. The results are presented in the attached Excel Spreadsheet.

2 Methodology

2.1 Overview

The flood risk to the mineral and waste sites has been informed through the interrogation of a range of GIS datasets. These have then been assessed to determine if the flood risk to a site has changed significantly since the last completion of the SFRA in 2010.

Analysis was completed using MapInfo Vertical Mapper version 3.7 and MapInfo Professional version 12.0.

Following the data assessment, the results were exported into Microsoft Excel to provide the functionality to filter the results given specific criteria.

Within the attached excel spreadsheet, the comparison of the change in flood risk has been made by calculating the difference in flood extent from each source between the corresponding 2010 and 2015 datasets. This has been done using the difference between the percent of each site at risk of flooding. Due to high level of this assessment, it is considered that where there is a difference of 5% or more, the change in risk is considered to be significant. In these instances, the sites have been highlighted.

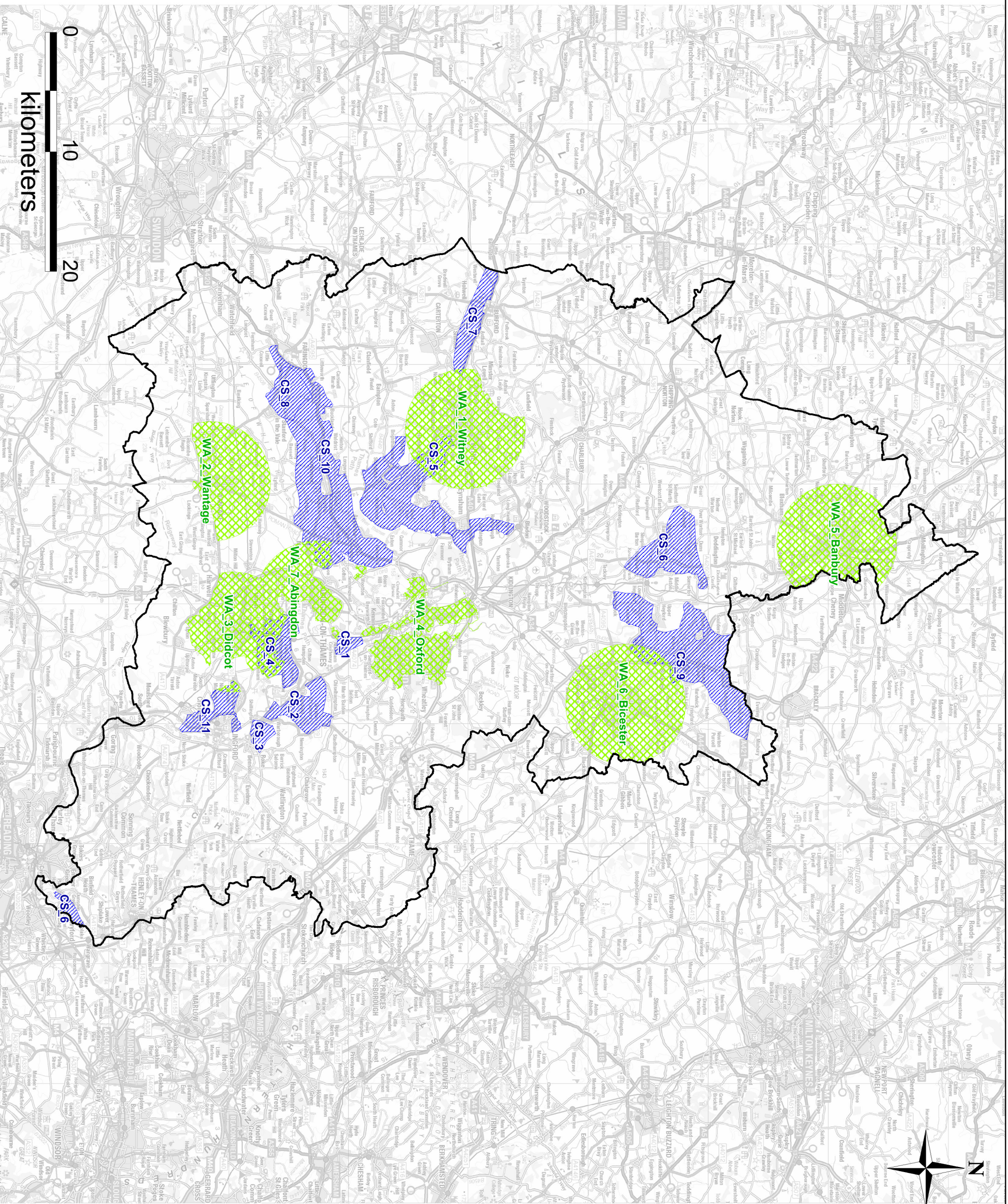
2.2 Data Used

The following datasets were provided and used:




Data	2010 Data	2015 Data
Mineral Areas	Mineral areas used within the original SFRA (Mineral_Resource_Area_2010.TAB)	As supplied by OCC. The sites are mapped in Figure 1. (CoreStrategy_region.tab)
Mineral Sites	Mineral sites used and mapped within the original SFRA (SFRA Minerals_Sites_OCC.TAB)	Same as 2010 dataset
Waste Areas	N/A	Waste areas supplied by OCC. The sites are mapped in Figure 1. (Preferred_areas_for_waste_facilities.TAB)
Waste Sites	Waste sites as supplied in the SFRA: (SFRA Waste_Sites_OCC_100413.TAB)	Waste sites supplied by OCC, including updated sites. (All_Waste_Sites.tab)
Flood Zones	Environment Agency Flood Zones 2009 Flood Zone 2 (OCC_FZ_2.TAB) Flood Zone 3 (OCC_FZ_3a.TAB)	Environment Agency Flood Zones 2014 Flood Zone 2 (Floodzone2_2014.tab) Flood Zone 3 (Floodzone3_2014.tab)

Data	2010 Data	2015 Data
Surface Water Data	<p>Area Susceptible to Surface Water Flooding (AStSWF)</p> <p>This is based on a single rainfall even with a 1 in 200 year return period. The model outputs classify the maximum indicative depths into three thresholds</p> <p>More susceptible: >1.0m (EAGEOSTORE_ASTSWF_more_April_09)</p> <p>Intermediate susceptible: 0.3m – 1.0m (<i>data set is not available</i>)¹</p> <p>Less susceptible: 0.1m – 0.3m (EAGEOSTORE_ASTSWF_less_April_09)</p>	<p>Updated Flood Map for Surface Water (uFMfSW)</p> <ul style="list-style-type: none"> - High risk: 1 in 30 year (uFMfSW_EXTENT_30.tab) - Medium Risk: 1 in 100 year (uFMfSW_EXTENT_100.tab) - Low Risk: 1 in 1000 year (uFMfSW_EXTENT_1000.tab)
Groundwater Data	<p>The 2010 SFRA outlined the sources of groundwater flooding through provision of aquifer types and details of the depth to groundwater. The related risk of groundwater flooding was not deduced. For this reason, the datasets have not been used to compare the change in flood risk.</p>	<p>Areas Susceptible to Groundwater Flooding (AStGWF)</p> <p>This details the proportion of each 1km² area that is susceptible to groundwater emergence.</p> <ul style="list-style-type: none"> - No data - Less than 25% risk - 25 – 50% risk - 50 – 75% risk - 75% or greater risk <p>All layers contained in the following file: All_Astgwf.TAB</p>

¹ The AStSWF Intermediate Dataset is not available for this assessment as the dataset has become corrupt since the original completion of the SFRA. It should also be noted that the AStSWF dataset is no longer available to download from the EA Geostore.



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- Legend**
-  Oxfordshire County Council Boundary
 -  Waste Areas
 -  Mineral Areas

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Client

OXFORDSHIRE COUNTY COUNCIL
www.oxfordshire.gov.uk

Project Title
OXFORDSHIRE COUNTY COUNCIL MINERALS & WASTE SFRA GIS REVIEW

Drawing Title
OVERVIEW OF OXFORD COUNTY COUNCIL MINERAL AND WASTE AREAS

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ACCOM
6-8, Gower Street
London
SW1P 3PL
Telephone 44 (0)207 786000
Fax +44 (0)207 786001

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3 Summary of Results

3.1 Fluvial Flood Risk

Following the analysis of the change in flood risk, a number of sites have been highlighted to have increased or decreased in fluvial flood risk coverage by 5% or more. In summary:

- Flood Zone 2:
 - 13 sites and areas increased in risk from 2009 to 2015
 - 13 sites and areas have decreased in risk from 2009 to 2015

- Flood Zone 3:
 - 5 sites and areas increased in risk from 2009 to 2015
 - 18 sites and areas decreased in risk from 2009 to 2015

In a number of instances such as at site 163, Cowley Marsh Depot, Oxford, there is a considerable change in the percentage of the site at risk of flooding. The 2015 flood zone mapping shows that the site is now almost completely out of fluvial flood zones 2 and 3. In these instances, it is recommended that further investigation into the different modelling approaches used should be completed in order to justify the considerable change in extents.

3.2 Surface Water Flood Risk

Due to the differences with the two datasets to represent surface water flood risk, the AStSWf dataset has been produced using only the 1 in 200 year storm event, whilst the uFMfSW dataset has been produced for the 1 in 30, 100 and 1000 year storm events, it is not possible to make any direct comparison.

The 2015 uFMfSW dataset provides considerable refinement to the modelling of surface water flood risk and this dataset should be used to undertake any surface water flood risk analysis for sites and areas. Using the uFMfSW 18 sites and areas have been highlighted to have a high risk (1 in 30 year) of surface water flooding, where 5% or more of the site area is affected by surface water flooding.

3.3 Groundwater Flood Risk

Due to the large variations in the datasets to represent groundwater flood risk, no direct comparison has been made.

Further information on the AStGWf dataset can be found in the Environment Agency Areas Susceptible to Groundwater Flooding Guidance. Within the guidance note, it is noted that

“Unless an area identified as ‘susceptible to groundwater flooding’ is also identified as ‘at risk from surface water flooding’, it is unlikely that this location would actually experience groundwater flooding to any appreciable depth, and therefore it is also unlikely that the consequences of such flooding would be significant.”

As part of this assessment, a query has been completed to determine the site area that is at both a high risk of surface water flooding (using the uFMfSW dataset) and with a 75% or greater risk of groundwater flooding (using the AStGWF dataset).

This analysis identified three sites at significant risk of groundwater flooding, where 5% or more of the site area is covered both datasets. These sites are:

- Site 28B, Smith & Sons, Ducklington
- SG-42 Land at Nuneham Courtenay
- SG-13 Land at Shillingford

It is recommended that the local geology and surface water risk for these sites is examined in further detail.

3.4 Summary

The results show that the updated flood risk information has implications on the flood risk for a number of the mineral and waste sites and areas. The SFRA will need to be updated to include the most up to date flood risk information and to identify sites that require further assessment as part of a Level 2 SFRA.

It is recommended that Oxfordshire County Council present these results to the Environment Agency to determine the programme for updating the SFRA.

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Scott House
Alençon Link
Basingstoke
Hampshire
RG21 7PP
United Kingdom
+44 1256 310200