

Technical Assessment of Minerals Options

Key to symbols used in assessment matrices	
Symbol	Likely impact of option on criteria
++	The option is likely to have a very positive impact
+	The option is likely to have a positive impact
0	No significant effect/no clear link
-	The option is likely to have a negative effect
--	The option is likely to have a very negative effect

A: TRANSPORT					
Criteria	Sand and Gravel Option 1	Sand and Gravel Option 2	Sand and Gravel Option 3	Soft sand option	Crushed rock option
ACCESSIBILITY & INFRASTRUCTURE	<p>+</p> <p>Good access from Lower Windrush Valley to the strategic lorry network (to A40 via A4095). Congestion on A40 at peak times. Good proximity of EYC area to A40 and A44, although these roads already have capacity issues at peak times. Access to Radley area is poor but</p>	<p>-</p> <p>The Clanfield/Bampton area has poor access to the major road and strategic lorry network. There are some weight restrictions on bridges over the Thames. Access from Sutton/Stanton Harcourt would need to use Eynsham bypass. Sites in the south of the Warborough/Benson area have better access than in the north of this area. However, the Cholsey area has good access</p>	<p>0</p> <p>Access is largely better to existing areas of working which have had infrastructure improvements than to proposed new areas of working. The Highways Agency notes that Option 3 would require infrastructure and facilities to be</p>	<p>+</p> <p>Good access for this area to A420 although number and type of HGVs may need to be controlled. The HA would wish to see evidence that soft sand extraction along the A420 would not adversely impact the safe and efficient operation of the</p>	<p>+</p> <p>Good access to A40 at Burford, A420 from Hatford and M40 from Ardley. The HA is concerned that the proposed level of rock extraction in the area north of Bicester and east of the River Cherwell will not compromise the safe and efficient operation of junction</p>

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	possible from Nuneham Courtenay onto A4074. The Highways Agency favours extending existing sites in option 1 because existing facilities and infrastructure can be utilised. It wishes to see evidence that expanding operations in any of the areas identified in option 1 would not adversely affect the safe and efficient operation of the Peartree, Marcham and Milton interchanges.	to the A4130. The Highways Agency notes that Option 2 would require new infrastructure and facilities to be developed which may be difficult to justify and potentially problematic. The A4074 through the Warborough area passes through the villages of Shillingford & Nuneham Courtenay but is identified on the local lorry route.	developed which may be difficult to justify and potentially problematic. A number of the sites are small in option 3 and are located in areas difficult to access by HGV.	Botley interchange.	9 of the M40.
PROXIMITY TO MARKETS	+ EYC and Lower Windrush Valley in close proximity to markets in Oxford and Bicester. Sutton Courtenay in close proximity to growth area Didcot/Wantage/Grove.	0 The Clanfield/Bampton area is further from markets in central and south Oxfordshire than other areas. The Warborough/Shillingford/Benson area is closer to the central axis of demand but access is poor due to the constraints posed by the River Thames. The Cholsey area is close to Didcot. Good proximity from the eastern part of Radley area to S Oxford.	0 Dispersed pattern of working may reduce mineral miles although distance from areas to markets varies; some closer than others.	- Good access to markets in the west and north of the county. Less good to south of county.	- Good access to markets in the north and west of the county, less good for the south.
SAFETY OF ROAD USERS	- Need to divert lorries from Yarnton village;	- Proposed routes pass through small villages in	0 Dispersed pattern of working may reduce	- Concern from local residents about	0 Few issues with road safety for other

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	access across railway line may be needed.	Clanfield/Bampton area. Proposed routes in Warborough/Shillingford area pass through Nuneham Courtenay & Shillingford. Cholsey and eastern Radley unlikely to impact on road safety of local communities.	the impact of traffic on some communities, but increase it for others.	safety of A417	users.
POTENTIAL TO USE RIVER/RAIL	-- No potential to use alternative forms of transport identified	- Potential problems raised over the ability of the R Thames to transport sand and gravel for W Oxfordshire; presence of pleasure craft, small locks, weak banks. The SA notes that the Cholsey and Radley areas could be served by rail link and that sites at Radley could use the River Thames to transport aggregate; however, the rail route at Cholsey does not link to the main network	- Option 3 identifies all the areas in option 1 and option 2, with the addition of Finmere, Caversham and Faringdon. Finmere and Faringdon do not have the potential to use alternative forms of transport. There could be potential to use the R Thames to transport aggregate from Caversham, but this has not been suggested by operators.	-- No potential to use alternative forms of transport identified	-- No potential to use alternative forms of transport identified

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SG-32	24.4	24.4	0	0	0	0	0	0
SG-34	23.2	8.19	0	2.9	8.3	3.8		
SG-36	33.68	33.68	0	0	0	0		
SG-39	166.05	11.76	0	13.82	7.95	132.52		
SG-50	379.3	0	0	11.7	2.2	365.4		
	921.69	285.67	2.64	32.76	31.63	568.9		
Eynsham/Cassington/Yarnton								
SG-04	7	1.69	0	5.1	0	0.2		
SG-05	9.3	0	0	0	0	9.3		
SG-08	215.4	145.61	0	1.29	0	68.49		
SG-16	32.8	2.59	0	11.7	0.99	17.5		
SG-20	170.9	2.03	0	4.01	0.99	163.89		
SG-20a	77.96	0	0	0	0	77.96		
SG-20b	39.94	0	3.71	0	0	36.23		
	553.28	151.92	3.71	22.1	1.98	373.57		
Radley								
SG-41	49.21	12.69	0.84	1.869	1.67	32.13		
SG-41a	94.31	57.72	12.07	1.89	1.89	20.75		
SG-42	87	22.88	15.57	8.53	5.92	34.1		
	231	93.29	28.48	12.289	9.48	86.98		
Sutton Courtenay								
SG-06	10.53	0	0	0	0	10.53		
SG-19	34.74	0	1.01	2.81	4.2	26.72		
SG-52	49.11	2.79	0.16	0	0.14	46.02		
SG-53	26.4	26.4	0	0	0	0		
SG-56	8.23	0.4	7.613	0	0.16	0.06		
SG-62	24.07	15.36	3.63	0	0	5.08		
	155.1	44.55	12.413	2.81	4.5	88.4		
Clanfield/Bampton								
SG-15	240.8	89.8	0	27.3	0.7	123		
SG-38	446.4	174.54	0	58.03	1.34	212.49		
SG-54a/b	799.8	101.46	46.23	0	0	652.11		
SG-55a/b	1343.9	191.9	0	243.3	0	908.7		
SG-58	128.9	112.01	0	10.18	0	6.7		
SG-58a	194.8	129.15	0	10.13	0	55.52		
TOTAL	3154.6	798.86	46.23	348.94	2.04	1958.52		
Warborough/Benson/Shillingford								
SG-03	4.08	0	0.061	0.07	0.21	3.74		
SG-09	167	86.51	32.23	0	0	48.26		
SG-13	220.4	108.66	87.49	0	0	24.24		
SG-48	254.1	131.64	18.63	0	0	103.83		
SG-49	544.21	533	10.41	0	0	0.8		
SG-59	65.95	27.83	2.7	0	0	35.42		
	1255.73	887.64	151.521	0.07	0.21	216.29		
Sutton/Stanton Harcourt								

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SG-29	142.9	49.3	9.57	1.14	0	82.88
SG-31	185.5	0	0	3.38	1.12	181.04
	328.43	49.3	9.57	4.52	1.12	263.92
Cholsey						
SG-33	67	51.19	14.07	0	0	1.74
SG-46	43.08	43.08	0	0	0	0
SG-57	12.4	7.86	1.99	0	0	2.54
SG-60	15.02	1.33	4.04	3.98	1.69	3.98
	137.5	103.46	20.1	3.98	1.69	8.26
Clifton Hampden/Wittenham						
SG-17	143.7	29.03	51.59	8.91	4.31	49.86
SG-44	509.4	166.78	133.4	37.37	46.51	125.34
SG-45	248.99	140.9	46.77	0	0.9	60.42
	902.09	336.71	231.76	46.28	51.72	235.62
Fimmere						
No nominations						
Caversham						
SG-11	64.08	0	1.67	3.72	0	58.69
SG-12	51.19	0	1.23	0	4.35	45.61
	115.27	0	2.9	3.72	4.35	104.3
Faringdon						
SG-01	19.07	19.07	0	0	0	0
SG-02	14.72	14.72	0	0	0	0
	33.79	33.79	0	0	0	0

C: WATER ENVIRONMENT					
Criteria	Sand and Gravel Option 1	Sand and Gravel Option 2	Sand and Gravel Option 3	Soft sand option	Crushed rock option
IMPACT ON FLOOD ZONES	- Two thirds of the area of the sites identified in the Lower Windrush Valley lie within flood zones 2, 3a or 3b. A third of the area of the nominated sites is therefore in flood zone 1. Three quarters of the area of the sites identified in the Eynsham/Cassington/Yarnton area lie within flood zones 2-3b; a quarter of their area is in flood zone 1. Just over half of the area of sites identified in the Radley area falls within FZ 2-3b, just under half is in FZ1. Two thirds of the area of the sites nominated in the Sutton Courtenay area lie on FZ 2-3b, one third of the area in FZ1.	- Three quarters of the area of the sites nominated in the Clanfield/Bampton area lie within FZ 2-3b; one quarter of the area lies in FZ 1. Only one third of the areas of the sites nominated in the Warborough/Benson/Shillingford area lie in FZ 2-3b, one third lies in FZ 1. Eighty five per cent of the area of the sites at Sutton/Stanton Harcourt lie in FZ 2-3b, only 15% lies in FZ 1. One quarter of the area of the sites nominated in the Cholsey area lie in FZ 2-3b, three quarters in FZ 1. Two thirds of the area of the sites identified in the Clifton Hampden/Wittenham area lie in FZ 2-3b, one third in FZ 1.	- Option 3 identifies all the areas in option 1 and option 2, with the addition of Finmere, Caversham and Faringdon. No sites have been identified in the Finmere area. The Faringdon area lies wholly in FZ 1. More than 90% of the sites identified in the Caversham area lie in FZ 3b, the functional floodplain.	+ The areas identified in this option are almost completely in flood zone 1, with the exception of one very small area at Hatford which is in flood zone 3a, adjacent to a brook and the edge of two areas identified by OCC which are adjacent to Sandford Brook and one small area of a nomination at Tubney, adjacent to an unnamed brook, in flood zone 3b.	+ The areas identified in the crushed rock option lie entirely within flood zone 1.
GROUND WATER FLOWS	- The Environment Agency notes that concentrated mineral extraction can restrict groundwater flows.	0 No specific comments on the impacts of the new areas identified on ground water.	0 The Environment Agency prefers a dispersed pattern of working to disperse the impacts on ground water flows.	0 No comments on the soft sand option and groundwater	0 No comments on the crushed rock option and groundwater.
SURFACE WATER FLOWS	--	-	0	0	0

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	Restricting ground water flows can cause low surface water flows in rivers down gradient from the working. Low flows in the Lower Windrush Valley are of particular concern. The Evenlode and Thames rivers are not subject to low flows	Surface water flows in the Clanfield/Bampton area are complicated by expanded operations at RAF Brize Norton and by expansion of Carterton.	The Environment Agency prefers a dispersed pattern of working to disperse the impacts on surface water flows.	No comments on the soft sand option and groundwater	No comments on the soft sand option and groundwater
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D: BIODIVERSITY / LANDSCAPE / AGRICULTURE					
Criteria	Sand and Gravel Option 1	Sand and Gravel Option 2	Sand and Gravel Option 3	Soft sand option	Crushed rock option
IMPACT ON NATIONAL ENVIRONMENTAL DESIGNATIONS	- The Eynsham/Cassington Yarnton area includes parts of Oxford Meadows SAC, including the component SSSI Cassington Meadow and Pixey and Yarnton Meads. It appears that this option area still covers these sites. Detailed hydrological assessments would need to be carried out to ensure that there are no detrimental impacts.	0 No impacts of the new areas included in this option have been identified. There are few SSSIs and no SACs in the new working areas.	0 Option 3 identifies all the areas in option 1 and option 2, with the addition of Finmere, Caversham and Faringdon. These areas do not have potential impacts on environmentally designated areas.	- Tubney/Marcham/Hinton Waldrist area of this option contains within it parts of Cothill Fen SAC. This site has a sensitive hydrological regime and assessments will need to be carried out to ensure that any mineral works in close proximity to the designated site will not have a detrimental effect upon it. The OCC ecology planner notes that Option 1 for sand and gravel and the soft sand option are both close to European sites (Oxford Meadows SAC and Cothill Fen SAC). Close consultation with Natural England will be required as to the level of assessment needed for the Minerals LDF if these options are taken forward. It is likely that further assessment by	0 The areas included in the crushed rock option are unlikely to have an impact on sites designated for their national environmental importance.

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				OCC will be required, which may be time-consuming and expensive. An alternative would be to ensure that the boundaries of these option areas are sufficiently far away from the SACs to negate the need for detailed assessments by OCC at the Minerals LDF stage.	
IMPACT ON NATIONAL LANDSCAPE DESIGNATIONS	0 The existing working areas are not in close proximity to sites designated for their national landscape importance.	- The eastern extent of the Clifton Hampden/Wittenham area falls within the Chiltern Area of Outstanding Natural Beauty. The area at Cholsey could potentially affect the setting of the Chilterns AONB, as could the Warborough/Shillingford/Benson area.	0 Option 3 identifies all the areas in option 1 and option 2, with the addition of Finmere, Caversham and Faringdon. These areas do not have potential impacts on sites designated for their national landscape importance, although potentially the Caversham area could have an impact on the setting of the Chilterns AONB.	0 The soft sand option is unlikely to have any impact on sites designated for their national landscape importance.	- OCC ecology planner notes that the area south of Burford is adjacent to the Cotswold AONB and could have an impact on its setting. Although option 2 for sand and gravel and the crushed rock option could both impact on AONBs, these impacts will be temporary, provided that the restoration scheme is appropriate to the area.
BEST AND MOST	0	-	-	0	0

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<p>VERSATILE AGRICULTURAL LAND</p>	<p>The existing areas of working are mostly on grades 2, 3 and 4 agricultural land</p>	<p>Some of the area around Warborough is Grade 1 agricultural land, which potentially constrains some of the available resource but other parts of the Warborough area and of the other areas lie in lower grade agricultural land. OCC ecology planner notes that provided BMV is safeguarded, it will not necessarily prevent minerals working. As long as the sub and topsoil is stored during extraction and then restored appropriately, the BMV will be safeguarded.</p>		<p>No impacts on BMV land identified</p>	<p>No impacts on BMV land identified</p>
<p>POTENTIAL FOR RESTORATION FOR HABITAT CREATION</p>	<p>++ Natural England encourages new working in existing areas . Option 1 is therefore a preferred option for Natural England from a potential for restoration perspective. The biodiversity group also notes that option 1 and 2 potentially offer the greatest opportunity for landscape scale restoration as they result in the most concentrated mineral workings and therefore</p>	<p>++ Natural England encourages new working in new strategic areas of extraction. Option 2 is therefore a preferred option for Natural England from a potential for restoration perspective. The biodiversity group also notes that option 1 and 2 potentially offer the greatest opportunity for landscape scale restoration as they result in the most concentrated mineral workings and therefore the opportunity to create joined up areas restored for nature conservation at a landscape scale. The LDF is an opportunity to achieve great biodiversity enhancement in</p>	<p>- Dispersing working may not enable strategic, planned restoration at a landscape scale.</p>	<p>0 Restoration is planned at the site level rather than at the strategic option level.</p>	<p>0 Restoration is planned at the site level rather than at the strategic option level.</p>

	the opportunity to create joined up areas restored for nature conservation at a landscape scale.	Oxfordshire for wildlife and people and it would be a shame for this opportunity to be wasted.			
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E: ARCHAEOLOGY					
Criteria	Sand and Gravel Option 1	Sand and Gravel Option 2	Sand and Gravel Option 3	Soft sand option	Crushed rock option
SCHEDULED ANCIENT MONUMENTS	0 The Lower Windrush Valley, Radley and Sutton Courtenay each contains approximately three Scheduled Ancient Monuments and some other areas that are potentially of national importance, which should not be considered for extraction. EH notes that this is particularly the case south of Hardwick. However, these constraints should not preclude other parts of this area being considered for future extraction. In the Eynsham/Cassington/Yarnton area, there is a remnant of an Iron Age Fort. EH recommends that further assessment of this area be undertaken before it is included in the strategy. No specific constraints in the Radley area. EH notes the presence of extensive crop marks in the Sutton Courtenay area.	- A number of the areas identified in this option contain SAMs: Clanfield/Bampton has approx 11 (and extensive crop marks), Warborough/Shillingford /Benson has approx 7(EH notes presence of significant complexes in the south of this area around Dorchester), there are two in Sutton/Stanton Harcourt and three in Clifton Hampden/Wittenham. These do not preclude other parts of these areas being considered for extraction. There are no sites of archaeological significance in the Cholsey area.	- Option 3 identifies all the areas in option 1 and option 2, with the addition of Finmere, Caversham and Faringdon. There are no sites of national importance in any of these three additional areas and EH notes that they do not have extensive cropmark evidence, so further work should be carried out to determine significance.	0 The area south and east of Faringdon and the Tubney/Marcham/Hinton Waldrist area both have one SAM, which should not be considered for extraction but do not preclude development in other parts of these areas. There are no specific sites of national importance in the Duns Tew area.	0 The area east of the River Cherwell/North of Bicester contains 4 SAMs and some other areas that are of potentially national importance. The area south and east of Faringdon contains one SAM. These constraints should not preclude development in other parts of these areas. There are no sites of national importance south of Burford.
NATIONAL PARKS AND GARDENS	- The setting of Nuneham Courtenay house and Sutton	- The setting of Fair Mile hospital, to the south of	- Option 3 identifies all the areas in option 1	- The setting of Hinton House needs to be	- The setting of Buckland and Pusey

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	Courtenay manor needs to be taken into account.	the Cholsey area, and Ascott House, east of Stadhampton need to be taken into account	and option 2, with the addition of Finmere, Caversham and Faringdon. There are no sites on the Register of Parks and Gardens in any of these three additional areas.	taken into account.	Houses need to be taken into account.
CROP MARK COMPLEXES	0 There are some cropmarks and others may be beneath the alluvium.	- There are a number of crop mark complexes in the Warborough/Shillingford, Clanfield/Bampton area which may be indicative of significant sites. Others may survive beneath alluvium.	0 As Options 1 & 2. Other archaeological sites may be present under the alluvium.	0	0

F: SAFEGUARDING					
Criteria	Sand and Gravel Option 1	Sand and Gravel Option 2	Sand and Gravel Option 3	Soft sand option	Crushed rock option
IMPACT ON MOD AIRFIELDS	- The MOD prefers Option 1 for sand and gravel. However, further clarification is required regarding proposed restoration. It proposes that in option 1, OCC should concentrate on the areas identified to the centre and east of the option area. All areas fall within safeguarding zones but this does not preclude development.	-- The MOD notes that the main 'show stopper' is the large area identified between Clanfield and Bampton, in the vicinity of RAF Brize Norton. The MOD is concerned with the cumulative impact of an expected wetland restoration in the vicinity of key military air bases, which have a negative effect on aviation. It is important that information regarding the restoration and after use is established as early as possible. All new areas have potential implications for birdstrike which need to be considered but do not preclude working.	-- The MOD notes that the main 'show stopper' is the large area identified between Clanfield and Bampton, in the vicinity of RAF Brize Norton. The MOD is concerned with the cumulative impact of an expected wetland restoration in the vicinity of key military air bases, which have a negative effect on aviation. It is important that information regarding the restoration and after use is established as early as possible.	0 The MOD does not have any concerns about the soft sand option.	0 The MOD does not have any concerns about the crushed rock option.
IMPACT ON CIVIL AIRFIELDS	-- Oxford Airport expressed concern about continued	0 No comment	0 No comment	0 No comment	0 No comment

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	working in the Lower Windrush Valley, Stanton Harcourt and Eynsham/Cassington/Yarnton because of the attraction of birds and the possible presence of physical structures over 45m in height				
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G: IMPACT ON COMMUNITIES & ECONOMY					
Criteria	Sand and Gravel Option 1	Sand and Gravel Option 2	Sand and Gravel Option 3	Soft sand option	Crushed rock option
CUMMUNLATIVE IMPACT OF DEVELOPMENT	- Some areas of the Lower Windrush Valley and villages in the Sutton Courtenay area have experienced working for many years; the SA notes the cumulative impact of impacts on local communities especially with regard to traffic and amenity issues	- New areas of working will impact on communities which have not previously experienced mineral working, although in the SA, these are judged to be less significant than for communities which have experienced many years of working. The cumulative impact of new development may be increased in some areas where other forms of development are taking place, such as in W Oxfordshire where development is also taking place at Carterton and RAF Brize Norton	0 Dispersing working will spread the effects on communities more widely, lessening it for some areas but increasing it for others	0 Continued working in the existing areas could result in cumulative effects over time on the local communities including on landscape and local amenity – noise, air, dust and traffic impacts	0 Continued working in the existing areas could result in cumulative effects over time on the local communities including on landscape and local amenity – noise, air, dust and traffic impacts. However, it is envisaged that there will be no significant increase in working in any particular area (based on the information provided by the County Council), and so no significant negative cumulative effects are expected
LOCAL ECONOMY	0 Potential economic benefits of continuing existing working is likely to be marginal as many areas have already been restored for recreational use	0 The SA notes that there could be some positive economic benefits in terms of providing employment in the new areas of working. There is also potential to	0 The SA notes that there could be some positive economic benefits in terms of providing employment in the new areas of working. There is also potential to	0 The SA notes that this option allows the current pattern of extraction of two different quality sands to be continued which has a positive economic	0 No benefits or disbenefits of continuing the current pattern of extraction on the local economy are identified

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		create recreational facilities which could enhance local tourism. However, local residents are concerned about the impacts of mineral working in W Oxfordshire on tourism	create recreational facilities which could enhance local tourism. However, local residents are concerned about the impacts of mineral working in W Oxfordshire on tourism	benefit. Continued extraction may also provide a limited amount of local employment	
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