Please see Annex SW9 for supporting information, and the "Introduction" for Health and Safety considerations and advice on the use of the guidance.

1. **Is the equipment to be used for soil handling as agreed in the planning documents**

2. **Is all soil handling to be undertaken by the same contractor.**
   If not,
   a. **will this affect the timing of operations**
   b. **are they all aware of planning requirements**

3. **What ancillary machinery is intended to be used for soil bund construction or re-grading**

4. **If using backacters and dumptrucks**
   a. **are appropriate techniques being used**

5. **If using motor-scarpers**
   a. **are appropriate techniques being used**

6. **Is the machinery proposed acceptable**.
   Is it:
   a. **a proven technique**
   b. **well maintained**
   c. **clean**
   d. **capable of undertaking the task within the time constraints**
   e. **compatible with other aspects of the planning application (e.g. noise control)**
For more detailed information see:
- [Evaluation of Mineral Workings Restored to Agriculture](#) (LRA 2000)
- [Good Practice Guide for Handling Soils](#) (MAFF April 2000)

Cross references:
- AP 9
1. Is the equipment to be used for soil handling as agreed in the planning documents

The time between the granting of planning permission and the movement of soil on a site could be several years, during which time advice on good practice may change. The machinery available to the mineral operator should be considered against whether there is any detrimental effect upon the quality of the restoration.

2. Is all soil handling to be undertaken by the same contractor

If not,

a. will this affect the timing of operations
   The use of the operator’s own equipment usually means that the machinery is available to take advantage of periods of good weather for soil handling. The use of contractors tends to result in narrower windows of opportunity to strip the soil on a particular site. The contractor may be elsewhere immediately prior and post the intended stripping dates, resulting in pressure to move soil during inappropriate periods.

b. are they all aware of planning requirements
   When using contractors, operators should ensure that all the planning commitments are written into the contract. However, this does introduce a further set of personnel who need to fully understand the particular restrictions or characteristics of the individual site. The use of contractors may enable staff experienced in soil handling to undertake the task, rather than an employee who may not realise the different techniques required for the machinery handling the soil. It is for the mineral operator to ensure that the contract and supervision of contractors does not conflict with the planning conditions.

3. What ancillary machinery is intended to be used for soil bund construction or re-grading

Bulldozers fitted with a blade may be used for soil movements for short distances, such as soil removal from haul roads and storage into nearby bunds. They can be used to form windrows of soil to be picked up by other machinery. They are also used for grading soil as it is placed. The excessive trafficking and turning can cause soil structural damage. Graders are often used to keep roads maintained, but should not be used on the replaced soil because they cause severe compaction and smearing. In exceptional circumstances, their use may be justified if the newly replaced soil needs to be ‘sealed’ to prevent ingress of excessive rainfall in the soil profile before the next layer can be placed.
4. If using backacters and dumptrucks

a. are appropriate techniques being used

This soil handling method uses backacting excavators or other wheeled loaders in combination with dumptrucks (articulated or rigid bodied). An excavator is used to strip soil and load it into dumptrucks for transportation to replacement areas or to storage. The earthmoving contractor should ensure that the dumptrucks run only over mineral or overburden, and not over subsoil or topsoil. Loading machinery should stand on the lowest layer possible (i.e. overburden rather than subsoil, subsoil rather than topsoil). The guidance can be relaxed for non-wheeled equipment if the loading machinery proposed is relatively small and mainly static (i.e. a 360° excavator or backacter which may be situated on topsoil or subsoil if this is operationally more convenient). Loading shovels, if wheeled rather than tracked, should traffic only on overburden or mineral. There is a trend towards less compaction (less increase in bulk density and a smaller decrease in coarse porosity) as one moves from motor-scraper restorations to conventional dumptruck restorations and then to loose-tipped restorations. Recent research (Evaluation of Mineral Sites Restored to Agriculture (LRA 2000)) has demonstrated that deterioration in structure was least in subsoil which was loose-tipped and untrafficked. Any checks on site should ascertain both the equipment being used and the methods being employed. Full guidance is given within Good Practice Guide for Handling Soils (MAFF April 2000).

5. If using motor-scrapers

a. are appropriate techniques being used

The motor-scraper is capable of undertaking all soil handling operations - lifting soil, transporting it and laying it, either in a bund or on the area being restored. The motor-scraper has to travel over the soil that it is about to strip and on the land on which it is depositing soil. It operates by lowering an inclined blade 15-30 cm into the soil during forward motion, the power developed by the tractor unit providing the force to lift the soil into the box. This action tends to compress the soil. If each layer moved averages 30cm in thickness, the motor-scraper must travel over the soil four times to remove a 1.2 metre deep agricultural profile. Motor-scrapers of the type used for land restoration weigh 30-45 tonnes empty and up to 80 tonnes laden. Close supervision should ensure that the motor-scrapers run over the ‘lowest’ material available (i.e. overburden rather than subsoil, subsoil rather than topsoil). This can be achieved by the motor-scraper travelling to the loading point, running on the lowest possible layer, turning onto the material to be stripped, loading, then turning off as soon as practical onto the lowest possible layer. It is more important for motor-scrapers to only handle soil when dry and friable (and therefore more resistant to compaction) than it is for other soil handling machinery combinations. Full guidance is given within Good Practice Guide for Handling Soils (MAFF April 2000).
6. Is the machinery proposed acceptable

Is it:

a. **a proven technique**
   Clear guidance is given on specific stripping and replacement techniques which have proven least damaging to the soil in *Good Practice Guide for Handling Soils* (MAFF April 2000). Generally, loose-tipped restorations using backacters and dumptrucks give the best restorations, as compaction is minimised due to the restored soil not being trafficked. Some equipment, such as draglines are suitable only for loading dumptrucks or for direct movement of overburden and their use for direct movement of soil is unlikely to be feasible. However, there will be difficult conditions, perhaps due to topography, where innovative approaches will be required and it will be for the applicant to demonstrate the need to deviate from good practice.

b. **well maintained**
   The machinery has to be well maintained and capable of undertaking the task. Inappropriate or poorly maintained equipment may not be capable of completing the task within the comparatively short period of suitable soil and weather conditions.

c. **clean**
   Machinery entering and leaving the site should be checked for excess soil that may present a risk for the spread of disease from one part of the country to another.

d. **capable of undertaking the task within the time constraints**
   Some of the least damaging soil movement techniques may take longer than other methods. One argument for the use of motor-scrapers is on large sites, where faster soil replacement can take advantage of the prevailing weather conditions. However, these short-term gains have to be judged against the proven benefits of loose-tipping techniques.

e. **compatible with other aspects of the planning application (e.g. noise control)**
   When considering environmental impacts such as noise, it should be borne in mind that different equipment creates different noise levels, depending on it’s type and standard of maintenance.