GENERIC SOPs

CHAPTER 3: RELEASING LAND

Date:

Making a decision over when suspected hazardous areas (or parts of suspected hazardous areas) should be released to the community can be intimidating. The procedures in this Chapter provide a set of fixed rules to be applied for the varied ways in which land may be released. If the decisions are later found to have been inappropriate, the strict application of these rules relieves those taking the decisions of any responsibility for the error.

Users of this Generic SOP must check that they agree with the parameters of the fixed rules before adopting them.

Examples are:

1. *When a rule states a distance within which some conditions must apply - that distance should be extended or reduced based on experience in the region where the SOP will be applied.*
2. *When the minimum conditions necessary for a classification are listed, those lists should be extended when that is necessary to give the end-users of the land the required confidence in the classification.*
3. *When conducting a Task Risk Assessment, the list of Task Conditions that add risk to manual procedures should be extended to include others of relevance in the specific working area.*

Making decisions over criteria by which to release land is daunting because there is no way of achieving "Total confidence" that there are no mines and ERW in an area without searching it thoroughly a number of times. This is true in any country, even if there has been no combat and there is no reason to believe that mines or ERW would be present. Even after an area has been searched using approved procedures, there is only confidence that there are no detectable mines and ERW within the depth searched. The Criteria for Releasing Land described in this Chapter are based on the desire to achieve all "Reasonable confidence" that an area presents no threat to the end user. Some residual risk remains, just as it does after an area has been formally Cleared. The aim is always to ensure that the residual risk is small enough to be "tolerable".

CHAPTER 3: RELEASING LAND

Contents

1. Introduction

The main purpose of humanitarian demining is the release of land that was formerly believed to be contaminated by mines and ERW. This must be done in a way that is as cost-efficient as possible. Unless otherwise required by conditions of contract, demining resources should only be used on the Clearance of genuinely mined areas. Because most of many Suspected Hazardous Area (SHA) is not mined, full Clearance of the entire hazardous area will normally be the last choice at any Task unless otherwise dictated by the Client.

Many areas in the world have been surveyed with a General Mine Action Assessment (GMAA or Level 1) survey and/or a secondary Landmine Impact Survey (LIS). These should have led to a Dangerous Area Report, Mined Area Report, and/or a Landmine Impact Survey report for each Suspected Hazardous Area (SHA). Following the release of the Land Release IMAS in 2009, some countries may have conducted a detailed "non-technical survey" intended to reduce the number and size of recorded SHA and name the remainder *Confirmed Hazardous Areas* (CHA). When this has been reliably conducted, it may replace some of the "Task Assessment" requirements published here.

All existing survey data must be collected and referred to when accepting a Task at a particular hazardous area, whether it be called a CHA, SHA or DHA. Unless the Programme Office has decided that the survey definitions determined by another mine action agency are completely reliable, a Task Assessment team must check and update the information before demining assets are deployed to the Task. The Task Assessment Team works under the direction of the Programme Manager. It is the responsibility of the Programme Manager to ensure that all relevant data is gathered and made available to the Task Assessment Team in a Task Folder before the Team is asked to assess the Task.

The Platoon(s) that will conduct the Task must be represented on the Task Assessment Team. The Task Assessment Team will make a written Task Release Plan that should be approved by the Programme Manager before Technical Survey or demining assets are deployed. Task Assessment is described in detail in Part 4 of this Chapter. The Task Release Plan is described in Chapter 9 of these SOPs.

2. Releasing Tasks

When there is a National Land Release strategy to which the client subscribes, *[Demining group]* will adopt the requirements of that strategy. When there is no National Land Release strategy, Tasks can be released in one of four ways:

1. Using efficient demining processes to Clear the area;
2. Using more than one procedure that do not equal full Clearance but give confidence that the area is not mined (Confidence building for Area Reduction);
3. Using a single procedure to raise confidence that the area is not mined (Verification);
4. Cancelling the area.

In efficient demining, part of many Task areas will be Reduced, Verified or Cancelled. Decisions over where it is appropriate to do this should be made during the Task Assessment and as work progresses. These decisions must be recorded in the Task Release Plan, which must be updated regularly.

After conflict, there are often large areas that may be mined or littered with ERW. It is not possible to remove all risk of mines and ERW without Clearing the entire country. But most of the country presents No Known Threat, so is not Cleared. The same is often true of recorded Suspected Hazardous Areas (SHAs) that are presented as Tasks. Often most of the SHA presents No Known Threat and does not need to be processed with full Clearance procedures. When a Task is presented as a Confirmed Hazardous Area (CHA), the area may or may not be better defined and it is often true that most of the area will still present No Known Threat and should not be Cleared unnecessarily.

By assessing the Task before deployment, some Tasks or parts of a Task may be Cancelled without any demining action taking place. By starting demining using Technical Survey techniques, the Task area can often be reduced and only a small proportion of it may need be subjected to full Clearance processes. One notable exception to this occurs when an area has compelling evidence of the presence of random or “nuisance” minefields or scattered ERW, in which case the whole area often needs to be Cleared.

2.1 Releasing land by Clearance

All parts of a Task can be released after manual or MDD demining procedures have been used over the entire area, searching it to an agreed depth using proven procedures. This is simple and effective but it often involves processing large areas of land that were not mined.

The Clearance procedures used by *[Demining group]* are:

1. Manual demining using metal-detectors;
2. Manual demining using area excavation procedures; and
3. Mine Detecting Dogs (MDD) supported by manual demining procedures.

Unless otherwise specified by the NMAA or in Task documentation, the detection depth for mines should be a minimum of 13cm. This depth has been adopted because it has been found to be the maximum depth to which modern mine detectors can reliably find minimum metal mines in electromagnetic ground conditions. When mines are believed to be deeper, the depth of search must be increased. Some ground conditions are easier to work in than others. When the target mines can be reliably found by the metal-detectors at the increased depth, the detectors may continue to be used. When the target mines cannot be reliably found by metal-detectors at the increased depth, the area must either be excavated or MDD procedures must be used. When area excavation is conducted, the soil need only be removed to the level at which the metal-detector will reliably locate the mines at the necessary depth.

The Clearance process may be assisted by preparing the area using machines. This can often increase the speed of Clearance significantly by removing undergrowth or loosening the ground.

Mechanical ground processing may leave level ground which was not level before the machine was used. This can mean that dips in the ground have been covered with loose earth under which the original ground surface remains undisturbed. Machines should not be used for area preparation in front of manual Clearance procedures when this is likely to occur.

Ground that has been processed by a machine is usually mixed with air. This leaves the ground surface higher than it was before it was processed. The Clearance depth used after the machine should be increased by the raised height of the ground surface. When this has not been measured, it should be presumed to be at least 25% of the depth to which the machine processed the ground.

2.2 Releasing land by area Reduction

Parts of a hazardous areathat have been classed as Low Threat areas at any time during the ongoing Task Assessment can be released by area Reduction after the ground has been processed in a way that gives confidence that there is no reason to believe there are mines in that part of the SHA. The use of selective procedures can give confidence that an area was never mined and that no ERW will be discovered during the normal use of the land.

The area Reduction procedures commonly used are:

1. Percentage Clearance using manual or MDD procedures;
2. Battle Area Clearance (BAC) procedures;
3. Battle Area Clearance Subsurface (BACS) procedures; and
4. Mechanically processing the ground.

These procedures may be used on their own, or in combination.

While these procedures do not result in land that is Cleared, they can result in full confidence that there is no reason to search the ground further.

2.2.1 Criteria for Reduction by percentage Clearance

In statistical terms, Clearing a part of a Task and finding nothing does not increase the probability that there is nothing in the rest of the area. In some situations, such as some border minefields, the position, orientation and types of mine can be reliably predicted. It may also be known that some areas marked as minefields were in fact "dummy" minefields. In these circumstances Clearing through the anticipated pattern(s) may give confidence that the area was not, in fact, mined. Even in these circumstances, the remainder of the area should be subjected to at least one demining procedure before it can be released as Reduced.

Percentage Clearance does not provide statistical evidence that there are no mines present but it can raise confidence that there are no predictably positioned patterns of mines present.

☠ **NOTE:** *Percentage clearance must not be relied upon in areas where the mines may be randomly placed in what are sometimes called "nuisance" minefields.*

The Task Supervisor may decide that parts of a Task that have been classed as Low Threat areas at any time during the ongoing Task Assessment can be Reduced by percentage Clearance when the following conditions apply:

1. There must have been no reports of accidents to people or livestock within 50 metres;
2. There is no record of a minefield within 50 metres;
3. No mines have been discovered within 25 metres;
4. There is no evidence of the area having been a battle area;
5. At least 20% of the total area has been processed using full Clearance procedures. The area processed must cut across the land in a grid that is designed to Clear at least four metres in every 20 metre square part of the area;
6. When there are features in the area that may be more likely to have been mined than open ground, those areas must be 100% Cleared. Examples are places where attackers may have been expected to take cover. These may be around trees, in ditches or trenches and around large rocks or abandoned buildings; and
7. After the 20% Clearance, the entire remaining area must have been processed using a ground-engaging machine and/or searched using BAC or BACS. If any of the ERW found during Clearance was beneath the surface, the remaining area must be searched using BACS.

☠ **NOTE:** *If mines or any evidence of mines (such as tripwire-stakes, tripwires, parts of mine casing or the packaging, fuze clips and arming pins associated with mines) is found during any procedure, the Task Supervisor must immediately revise the Task Release Plan so that the entire area where mines may be anticipated is Cleared using manual or MDD procedures.*

The Task Supervisor must map the area to be Reduced, indicating areas that must be processed using the varied procedures, and include that map in the Tasking Instruction given to the demining Section Leaders or MDD Team Leaders.

When the percentage Clearance has been completed, the perimeter of the Reduced area must be accurately recorded on the Task map with GPS coordinates recorded for all turning points on its perimeter.

Percentage Clearance may also be used during QA when “sampling” the quality of the work by searching some of the ground a second time. Despite the inclusion of this method in the IMAS, it does not actually prove anything about the statistical probability of hazards remaining in the places that were not searched a second time. The knowledge that it will be conducted does, however, give deminers an incentive to work thoroughly and so its use can increase confidence in the quality of their work.

2.2.2 Criteria for Reduction by Battle Area Clearance (BAC)

The Task Supervisor may decide that parts of a Task that have been classed as Low Threat areas at any time during the ongoing Task Assessment can be Reduced by BAC when the following conditions apply:

1. There must have been no reports of accidents to people or livestock within 100 metres;
2. There is no record of a minefield within 100 metres;
3. No mines have been discovered within 50 metres.
4. There is evidence that the area was a battle-area or there are reports of surface ERW;
5. The end-use of the land will not be agriculture, or the erection of buildings;
6. The area has not been subjected to mechanical ground processing, (mechanical ground processing should not be used when the procedure may bury ERW);
7. In areas with vegetation, a machine has been used to remove the vegetation. The machine must have been adjusted so that the processing tool has not disturbed the ground in a way that could have buried ERW;
8. There is no visible evidence of mines after the vegetation has been removed; and
9. No mines or any evidence of mines (such as tripwire-stakes, tripwires, parts of mine casing or the packaging, fuze clips and arming pins associated with mines) are found during the BAC.

☠ **NOTE:** *If any evidence of mines is found, the BAC process must stop immediately. The Task Supervisor must revise the Task Release Plan so that the entire area where mines may be anticipated is Cleared using manual or MDD procedures.*

If ERW is found during BAC, the EOD Operative must organise its appropriate demolition.

The Task Supervisor must map the area to be Reduced and include that map in the Tasking Instruction given to the demining Section Leader(s) who will conduct the BAC.

When the BAC has been completed, the perimeter of the Reduced area must be accurately recorded on the Task map with GPS coordinates recorded for all turning points on its perimeter.

BAC is not Clearance but BAC will lead to the removal of all ERW and battle debris that is on the ground surface. The entire ground surface is walked over during the process and this can give full confidence that the area has No Known Threat, allowing it to be Released as “Reduced by BAC”.

2.2.3 Criteria for Reduction by Battle Area Clearance Subsurface (BACS)

The Task Supervisor may decide that parts of a Task that have been classed as Low Threat areas at any time during the ongoing Task Assessment can be Reduced by BACS when the following conditions apply:

1. There have been no reports of accidents to people or livestock within 100 metres;
2. There is no record of a minefield within 100 metres;

3. No mines have been discovered within 50 metres;
4. In areas with vegetation, a machine has been used to remove the vegetation. The machine must have been adjusted so that the processing tool did not strike the ground;
5. There is no visible evidence of mines after the vegetation has been removed;
6. There may be evidence that the area was a battle-area;
7. The deminers are equipped with suitable BACS detectors; and
8. No mines or any evidence of mines (such as tripwire-stakes, tripwires, parts of mine casing or the packaging, fuze clips and arming pins associated with mines) are found during the BACS.

☠ **NOTE:** *If any evidence of mines is found, the BACS process must stop immediately. The Task Supervisor must revise the Task Release Plan so that the entire area where mines may be anticipated is Cleared using manual or MDD procedures.*

If ERW is found during BACS, the EOD Operative organises its appropriate demolition.

The Task Supervisor must map the area to be Reduced and include that map in the Tasking Instruction given to the demining Section Leader(s) who will conduct the BACS.

When BACS has been completed, the perimeter of the Reduced area must be accurately recorded on the Task map with GPS coordinates recorded for all turning points on its perimeter.

BACS is not Clearance but BACS should lead to the removal of all ERW and large battle debris to a known depth (generally at least 30cm). The entire ground surface is walked over during the process and this can give full confidence that the area has No Known Threat, allowing it to be Released as “Reduced by BACS”.

NOTE: *When the end-use of the land will be agriculture, or buildings will be erected on the land, BACS procedures should be used rather than BAC. When deep foundations will be prepared, the search depth should be appropriate for the anticipated foundations.*

2.2.4 Criteria for Reduction by mechanical ground processing

The Task Supervisor may decide that parts of a Task that have been classed as Low Threat areas at any time during the ongoing Task Assessment can be Reduced by mechanical processing as long as the ground processing is combined with other procedures as described below.

The Task Supervisor may decide that an area can be released as Reduced by mechanical ground processing when the following conditions apply:

1. There have been no reports of accidents to people or livestock within 100 metres;
2. There is no record of a minefield within 100 metres;
3. No mines have been discovered within 50 metres.
4. A machine has been used to process the ground to the required depth at the Task and there have been no detonations or evidence of mines;
5. The machine has processed the ground twice, moving in different directions;
6. When there are features in the area that may be more likely to have been mined than open ground, those areas must be 100% Cleared using manual or MDD procedures. Examples are around trees, in ditches or trenches and around large rocks or abandoned buildings; and
7. Either a) or b) below:
    a) At least 10% of the total area has been processed using manual or MDD Clearance procedures. The area processed must cut across the land in a grid that is designed to Clear at least two metres in every 20 metre square part of the area.

b) The entire area has been processed using BACS procedures.

☠ **NOTE:** *If any evidence of mines is found, the Task Supervisor must revise the Task Release Plan so that the entire area where mines may be anticipated is Cleared using manual or MDD procedures.*

The Task Supervisor must map the area to be Reduced and include that map in the Tasking Instruction given to the Mechanical Team Leader and the MDD or manual demining assets that will follow the machine.

When the mechanical ground processing and the manual demining, MDD or BACS follow-up have been completed, the perimeter of the Reduced area must be accurately recorded on the Task map with GPS coordinates recorded for all turning points on its perimeter. The area can then be Released as "Reduced by "Mechanical processing and BACS" or "Mechanical processing and Percentage Clearance".

2.3 Releasing land by area Verification

The Task Supervisor may decide to release parts of the Task that have been classed as No Known Threat areas at any time during the ongoing Task Assessment by Verification when there is no reason to believe that there are any mines or ERW in an area but the end-users of a land lack confidence in this fact.

The area Verification procedures used are:

a. Battle Area Clearance (BAC) or BACS procedures; and

b. Mechanically processing the ground.

The Verification procedures do not result in land that is Cleared but they can result in full confidence that there is no reason to search the ground further. The land can then be Released as having been "Verified as having No Known Threat".

2.3.1 Criteria for Verification by Battle Area Clearance (BAC)

The Task Supervisor may decide to release parts of the Task that have been classed as No Known Threat areas may be Verified by BAC when the following conditions apply:

1. There have been no reports of accidents to people or livestock within 150 metres;
2. There is no record of a minefield within 150 metres;
3. No mines have been discovered within 150 metres;
4. There is no evidence that the area was a battle-area;
5. In areas with vegetation, a machine has been used to remove the vegetation. The machine must have been adjusted so that the processing tool has not disturbed the ground in a way that could have buried ERW;
6. There is no visible evidence of mines of ERW after the vegetation has been removed; and
7. BAC has been conducted over the entire area.

☠ **NOTE:** *If any evidence of mines is found, the BAC process must stop immediately. The Task Supervisor must revise the Task Release Plan so that the entire area where mines may be anticipated is Cleared using manual or MDD procedures.*

If ERW is found during BAC, the EOD Operative must organise its appropriate demolition.

The Task Supervisor must map the area to be Verified and include that map in the Tasking Instruction given to the demining Section Leader(s) who will conduct the BAC.

When the BAC has been completed, the perimeter of the Verified area must be accurately recorded on the Task map with GPS coordinates recorded for all turning points on its perimeter.

BAC is not Clearance but BAC will give the end-users full confidence that the Verified area has No Known Threat, allowing it to be Released. Land searched by BAC must not be recorded as having been Cleared. It must be recorded as having been "Verified as having No Known Threat".

2.3.2 Criteria for Verification by mechanical ground processing

The Task Supervisor may decide to release parts of the Task that have been classed as No Known Threat areas may be Verified by mechanical ground processing when the following conditions apply:

1. There have been no reports of accidents to people or livestock within 150 metres;
2. There is no record of a minefield within 150 metres;
3. No mines have been discovered within 150 metres;
4. There is no evidence that the area was a battle-area;
5. There are no features in the area that prevent the machine processing the ground; and
6. The machine has processed the ground to at least 15cm depth.

☠ **NOTE:** *If the machine detonates a device or exposes any evidence of mines or ERW, the decision to Verify the land must be immediately revoked and the Task Supervisor must prepare a new Task Release Plan for that area.*

The Task Supervisor must map the area to be Verified and include that map in the Tasking Instruction given to the Mechanical Team Leader.

When the machine has processed the ground, the perimeter of the Verified area must be accurately recorded on the Task map with GPS coordinates recorded for all turning points on its perimeter.

Mechanical ground processing is not Clearance but it can give the end-users full confidence that the Verified area has No Known Threat, allowing it to be Released. Land mechanically processed without follow-up by MMD or manual processes must be recorded as having been "Verified as having No Known Threat".

2.4 Releasing land by Technical Survey

The Task Assessment should have determined High Threat Areas, Low Threat Areas and No Known Threat areas within the Task area. Technical Survey involves Clearance of part of the Task in order to gain access to other parts and to confirm that areas identified as High Threat Areas during the Task Assessment do have a mine threat. This process is intended to establish and mark the boundary of any area that contains mines or ERW, identify the types of mines of ERW and allow an informed estimation of the number of devices that may be expected.

Because many recorded hazardous areas are much bigger than the area that is mined, Technical Survey should always be conducted when work at a Task is begun. If Technical Survey has been completed by another demining agency before the Task is accepted, the results of that survey should be confirmed on the ground. If the marking left after any previous Technical Survey cannot be located, a new Technical Survey must be conducted.

The Task Assessment Team must determine the survey pattern and the demining procedures that will be used to conduct them. The Task Supervisor must ensure that the assets required for Technical Survey are first to arrive at a Task site. Generally, they will be followed immediately by Clearance of the confirmed High Threat areas that need to be Cleared.

The demining procedures that are used in Technical Survey depend on the demining assets that are available to be used and on whether or not a pattern of mines is anticipated.

2.4.1 Technical Survey pattern in High Threat areas

High Threat areas are parts of the Task area where the Task Assessment has shown that there is compelling reason to believe that there are mines. These may also be called “confirmed” or “defined” hazardous areas (CHA or DHA). High Threat Areas should have been identified during the Task Assessment and must be marked on the map of the Task area that is included in the Task Release Plan.

When it is not known whether the mines are randomly placed or placed in a regular pattern, begin Technical Survey with a breach pattern.

If no lines or patterns of mines are located, that does not prove that there are not randomly placed mines in the area. If single mines are located, that implies that there will be more mines in the uncleared area.

When no mines are located, the perimeter must be clearly marked on the ground. The Technical Survey Team or the subsequent demining team must extend the Cleared grid by Clearing adjacent breaches until enough of the area has been Cleared to give the Task Supervisor total confidence to walk on the remaining area. The Task Supervisor should then consider marking the remaining area for processing using the area Reduction procedures described in Part 2.2 of this Chapter.

When single mines are located, the adjacent area must be Cleared to try to find a pattern. If no pattern is located, the survey team must either Clear the entire area or record the area for subsequent Clearance. When one or more randomly placed mines are found, it is known that there are randomly placed mines in the area, so the entire area must be Cleared.

☠ **NOTE:** *No grid breaching pattern can reliably confirm the absence of mines in areas where the mine are not laid in regular patterns.*

Breach patterns can be either:

- A grid of ten metre wide breaches that are 50 metres apart; or
- A grid of two metre wide breaches that are 10 metres apart.

The grid of Cleared breaches must be made across the High Threat Area using manual demining or MDD Clearance procedures. The breaches may be mechanically prepared when appropriate. The wider breaches are often the most appropriate pattern to use when machines are available to prepare the ground in advance of manual demining.

The breaches should be 20 or 50 metres apart. When ten metre breaches are cut at 50 metre distances, 20% of the area has been Cleared. A ten metre wide breach is very likely to cut through any pattern of mines that crosses the area. When two metre wide breaches are cut at 10 metre distances, 20% of the area has been Cleared. When some mines in a pattern may have detonated or moved, a two metre wide breach is less likely to cut through any pattern of mines that crosses the area.

A combination of ten metre wide breaches and two metre wide breaches may be used as long as a total of at least 20% of the area is Cleared.

Five metre wide Cleared breaches must be made around the perimeter of the High Threat area. This will increase the percentage of the area actually Cleared to more than 20% and allow the area to be properly marked on the ground.

The grid should be designed to include any features within the High Threat Area where mines are more likely to have been placed. These include places that would offer cover to an attacker and areas surrounding defensive positions, buildings and battle-damaged equipment. When the grid does not cover these areas, two metre wide breaches must be Cleared to them and an area five metres around them must be Cleared during subsequent demining.

When the grid has been completed and no mines (or evidence of mines) have been found, the Task Supervisor must assess whether it is likely that there are randomly placed mines in the area. If there is any evidence to suggest that this is likely, either Clearance must continue or the area must be recorded for subsequent Clearance.

When an anticipated pattern of mines is discovered, that area should be Cleared or marked for subsequent Clearance. A minimum of five metres on either side of a mine pattern must be Cleared. That area must be extended in areas where mine movement or minefield “patching” may have occurred.

2.4.2 Technical Survey pattern in Low Threat areas

Low Threat areas are parts of the Task area where the Task Assessment has shown that there is no compelling reason to believe that there are mines. Low Threat Areas will have been identified during the Task Assessment and must be marked on the map of the Task area included in the Task Release Plan.

Although no mines are anticipated, Technical Survey can be used to try to locate unknown lines or patterns of mines or to confidently allow safe access to visually inspect the area. To do this, a grid of breaches should be Cleared across the area using manual demining or MDD Clearance procedures. The breaches may be mechanically prepared when appropriate.

The grid must be designed so that at least 10% of the area is Cleared. If two metre wide breaches are cut at 20 metre distances, 10% of the area has been Cleared. If five metre wide breaches are cut at 50 metre distances, 10% of the area has been Cleared.

Two metre wide Cleared breaches must be made around the perimeter of the Low Threat Area. This will increase the percentage of the area actually Cleared to more than 10%.

The grid should be designed to include any features within the Low Threat Area where mines are more likely have been placed. These include places that would offer cover to an attacker and areas surrounding defensive positions, buildings and battle-damaged equipment. When the grid does not cover these areas, two metre wide breaches must be Cleared to them and an area five metres around them must be Cleared.

If no evidence of mines is found during the Clearance but ERW is found, the area between the breaches should be recorded for subsequent processing using the area Reduction procedures described in Part 2.2 of this Chapter.

If evidence of mines is found during the Clearance, the area must be redefined as High threat and Clearance should continue to try to find a mine pattern. When no evidence of a mine pattern is found, the entire High Threat area must be Cleared, or recorded for subsequent Clearance.

2.4.3 Technical Survey pattern in No Known Threat areas

No Known Threat areas are parts of the Task area where the Task Assessment has shown that there is no reason to believe that there are any hazards. Typically these are parts of the area that local people use and believe to be safe. No Known Threat Areas should have been identified during the Task Assessment and must be marked on the map of the Task area that is included in the Task Release Plan.

Technical Survey should not be considered in No Known Threat areas until after the High and Low Threat areas have been surveyed. When access across these areas is needed to reach Low or High Threat Areas, two metre wide access lanes should be Cleared using manual or MDD procedures whenever there is any doubt about their safety.

When no evidence of mines or ERW has been found during the Technical Survey of surrounding areas (within 100 metres), the No Known Threat areas should be Verified or Cancelled using the procedures described in Parts 2.3 and 2.5 of this Chapter.

When evidence of mines or ERW has been found in the surrounding areas (within 100 metres) of the No Known Threat area, the area extending 20 metres from the mine(s) must be Cleared (or recorded for subsequent Clearance) and the remaining area recorded for subsequent Reduction using the procedures described in Part 2.2 of this Chapter.

2.4.4 Criteria for Release by Technical Survey

A Task area cannot be released after Technical Survey unless no evidence of mines or ERW are found, or the area has been processed as described above with all necessary Clearance conducted.

After Technical Survey, separate areas should be recorded as having been Cleared, Reduced, Verified or Cancelled. The perimeter of any Cleared areas must be accurately marked on the Task map with GPS co-ordinates accurately recorded for each Turning Point. When no evidence of mines or ERW are found, the Cleared area need not be permanently marked on the ground unless the conditions in Part 2.4.5 of this Chapter apply.

If any evidence of mines or ERW is found, those areas must be treated as High Threat Areas. The remaining areas of the Task must be considered for processing using the area Reduction, Verification or Cancellation procedures described in this Chapter.

2.4.5 Permanent marking after Technical Survey

The perimeter of the Task area should have been marked before work started. Any temporary marking should be replaced with permanent marking for each turning Point and Intermediate point around any Cleared areas or areas that require Clearance before the Technical Survey at the Task is completed unless it is immediately followed by the Clearance of those areas defined during the survey. When this occurs, permanent marking may occur when Clearance is completed and the Task is ready for release.

The perimeter of the areas Cleared during Technical Survey must be marked on the Task map with GPS co-ordinates accurately recorded for each Turning Point. Each Turning Point must be marked on the ground whenever:

a) A Technical Survey is suspended for more than 30 days;

b) Evidence of mines is found and the Technical Survey is not immediately followed by the full implementation of a Task Release Plan.

c) Another demining agency will continue the Task; or

d) The NMAA requires that it should be.

2.5 Releasing land by Area Cancellation

In certain circumstances, the Task Supervisor can release a Task by Cancellation without any demining assets being deployed.

When the Task Assessment Team visits a Task area and can find no reason to believe that there is a hazard in the area, the Cancellation criteria must be applied. The Cancellation criteria are designed to determine whether there is any reason to believe that the reported hazardous area contains any hazards. If there is no reason to believe that there is a hazard in an area, it can be “Cancelled as having No Known Threat”.

A recorded suspected hazardous area that has been Cancelled must not be recorded as having been Cleared. If a reason to believe that the area may be hazardous becomes known later, the status of the area must be changed and demining assets deployed.

2.5.1 Area Cancellation process

The Area Cancellation process depends on strict criteria on which a decision to cancel an area can be made. The cancellation criteria are applied to a Task by:

1. Collecting the existing information about a Task;
2. Gathering any new information with a site visit;
3. Analysing all available information; and
4. Applying the criteria for cancellation.

The Task Assessment Team may cancel Tasks or parts of Tasks during their assessment as long as the criteria for cancellation are followed and a Cancellation report is generated.

The Task Supervisor may Cancel a part of a Task as work progresses and it becomes obvious that some part or parts are not hazardous. The Task Supervisor must analyse all of the information in the Task Folder and in the Task Release Plan before completing a Cancellation Report.

2.5.2 Criteria for cancelling part of a hazardous area

The Task Supervisor can Cancel parts of a Task area that have No Known Threat without applying any demining procedures when all of the following conditions apply:

1. There have been no reports of accidents to people or livestock within 150 metres;
2. There is no military record of a minefield within 150 metres;
3. No mines have been discovered within 150 metres;
4. There is no evidence that the area was a battle-area;
5. There are no features on the land that may have been defended;
6. Local people have used the area and report no mine or ERW threat;
7. When ground between the No Known Threat area and the nearest mine found has been Reduced and no evidence of mines was found; and
8. When the Task Supervisor is entirely happy to walk over the land.

If all of these conditions are not met, area Verification should be considered.

If all of these conditions are met, a Cancellation report should be completed and included in the Task Folder along with a detailed map of the area that has been Cancelled. The perimeter of the Cancelled area must be marked on the Task map with GPS co-ordinates accurately recorded for each turning point. When demining assets have been deployed at the Task, the perimeter of the Cancelled area should have been permanently marked with Turning Points and Intermediate marking when the Task perimeter was mapped at the start of the Task. Any temporary marking should be replaced with permanent marking before the Task is completed.

An example of the Cancellation report format is included in Chapter 12 of these SOPs.

2.5.3 Criteria for entire Task area Cancellation

The Task Assessment Team may Cancel an entire Task area when all of the following conditions apply:

1. All available information about the Task has been collected, local people and authorities have been interviewed and :

a) There have been no reliable reports of accidents to people or livestock in the Task area;
b) There is no reliable military record of a minefield in the Task area;
c) There are no reliable reports of mines or ERW being discovered in the Task area;

2. The Task site has been visited by the Task Assessment Team and:
   a) There is no evidence that the area was a battle-area;
   b) There are no features on the land that may have been defended;
   c) There is no strategic reason for the Task area to have been mined;
3. Local people have been interviewed and have used the area and report no mine or ERW threat;
4. The Task Assessment Team is entirely happy to walk over the land.

A Task area may also be Cancelled if the Task Assessment Team find that the GPS coordinates of the Task area have been incorrectly recorded and the description of the area in Task documentation included in the Task Folder does not match the conditions on the ground <u>in any way</u>. When this occurs, the Task Assessment Team must:

1. Review the Task Folder and try to identify the real position of the recorded hazardous area;
2. Interview local people and local authorities to try to identify the real position of the recorded hazardous area;
3. Accurately record the boundaries of the area to be Cancelled using GPS and produce a detailed map of the area.
4. Walk over the area to be Cancelled.
5. If the real position of the hazardous area is discovered, a Landmark and Bench-mark for the real position must be recorded and their coordinates reported to Programme Manager and the NMAA.

   The Programme Manager should ask the NMAA whether the real co-ordinates are recorded as a separate Task area. If they are, all details recorded for that area must be collected by HQ and forwarded to the Task Assessment Team. The Task assessment should then be conducted on the correct area and demining conducted as necessary.

When the above conditions are met, a Cancellation report should be completed and included in the Task Folder along with a detailed map of the area that has been Cancelled. The perimeter of the Cancelled area must be marked on the Task map with GPS co-ordinates accurately recorded for each turning point. The Cancelled area need not be permanently marked on the ground unless the NMAA requires it to be. An example of the Cancellation report format is included in Chapter 12 of these SOPs.

2.5.4 End-user acceptance

The use of all land released depends on the end-user's confidence in the approach. If end-users do not agree with the Cancellation of a Task, something must be done to the land in order to raise their confidence to an acceptable level. This may be achieved by using area Reduction or area Verification procedures in the area.

When the Task Assessment Team or Task Supervisor is confident that an area has No Known Threat but the users of the land lack confidence, a ground processing machine may be used over the land to raise the user's confidence and "Verify" that the area is safe. The machine need not be followed by manual of MDD assets despite the fact that it does not Clear land on its own. This is because the land has No Known Threat, so it does not need to be Cleared.

If any detonations or evidence of mines or ERW is found during Verification, the decision to Verify the Land must be revoked and the Task release plan revised to include Clearance where necessary.

A suspected hazardous area that is Released without any of the land having been Cleared using manual or MDD procedures must be released as Cancelled and a Cancellation Report completed. An example of the Cancellation report format is included in Chapter 12 of these SOPs. Cancelled land must never be recorded as “Cleared”.

2.6 Post-clearance Area Reduction (PAR)

Area Reduction is often thought of as an activity that should occur before Clearance. With the new terminology, area Cancellation may occur before Clearance but area Reduction will generally occur after High Threat Areas have been appropriately processed, so allowing details learned during that processing to be included in a revised Task Assessment. In areas with patterned minefields, for example, it is only possible to assess possible mine movement or pattern reinforcement after Clearance of the mine pattern(s). At that time, parts of areas previously considered Low Threat may need to be reclassified and Cleared. Similarly, if the anticipated minefield is not where expected, adjacent areas may need to be reclassified as work progresses.

Generally, when Technical Survey and Clearance are appropriately targeted on High Threat Areas, PAR should occur after the High Threat Areas have been processed.

3. Task Assessment Team

A Task Assessment Team should be sent to each Task area before demining assets are deployed.

The Task Assessment Team should include, as a minimum:

- a Programme Office representative;
- the Platoon Supervisor from a Platoon scheduled to undertake the Task;
- and Platoon MRE officer of a Platoon scheduled to undertake the Task;
- two Technical Survey trained deminers.

A specialist Task Assessment Team may be formed to replace the above.

The Programme Manager will issue each Task Assessment Team with a Task Folder containing all information about the Task that is available. The Task Folder should include aerial pictures or satellite imagery (using Google Earth when no better is available).

4. Making a Task Assessment

A Task Assessment is conducted in the six stages shown below:

STAGE	TASKS	RESPONSIBLE
1. Information gathering	Information from existing survey data and the NMAA must be collected into a Task Folder.	Programme Manager
2. Preliminary analysis of information	Analyse the available information to identify missing or conflicting information and decide the level of confidence that can be given to recorded details. List people who should be interviewed and plan questions to ask during the visit to the Task area.	Task Assessment Team (QA by Programme Manager)
3. Visit to the general area	Check existing information and gather new information from all available sources.	Task Assessment Team (QA by Programme Manager)
4. Visit to the Task area	Gather detailed information about the	Task Assessment Team

	Task area. Assess the Task in terms of threat areas. Gather information that will make deployment efficient.	(QA by Programme Manager)
5. Assessment of the available information and assigning Threat levels	The new information should be added to the existing information and the details reassessed. The Task area should be divided and an appropriate Threat category assigned to each part. The boundary between Threat areas must be marked on a sketch map of the Task site.	Task Assessment Team (QA by Programme Manager)
6. Documentation	Write a Task Risk Assessment and a preliminary Task Release Plan. Copies of these documents must be sent to the Programme Manager and kept in the Task Folder.	Task Assessment Team (QA by Programme Manager)

4.1 Information gathering

The information about the hazardous area that is available before starting a Task varies in quality and quantity. In order to make informed decisions over the most efficient approach to the Task, it is necessary to gather and check the information that is already available. The gathering of existing information is the responsibility of the Programme Office.

Before they make a site visit, the Task Assessment Team must be given a Task Folder containing all existing Survey data including how, when and why the information was gathered. The Task Folder should be provided by the NMAA. Other details, such as Satellite images should be added by staff in the Programme Office.

4.2 Preliminary analysis of information

The Task Assessment Team must meet to review the content of the Task Folder to identify:

- discrepancies or contradictions;
- unanswered questions; and
- people likely to have relevant information.

Background information about the context of the survey (which may have been conducted quickly or when security prevented staff movement) should also be gathered, along with information about the people who conducted the survey and whether they are available for interview.

Cross referencing information from different informants is essential. Only informants who appear credible should be used.

Making use of former military combatants as informants at community, provincial and national level should be a natural part in the information gathering process. The cost of finding reliable informants should be carefully weighed against their value in terms of more accurate and relevant information. Decisions over the temporary employment of former combatants must be made by the Programme Manager.

Adequate time and resources must be allowed for the Task Assessment Team to gather new information. The cost of their work will usually be far less than the cost of deploying assets to areas that do not need to be Cleared.

4.3 Visit to the Task area

The Task Assessment Team must visit the communities in the Task area and the Local Authorities responsible for the administration of that area. The visit will check the recorded details of the Task, gather new information about the Task and identify new individuals who may have information of relevance. When previous surveys listed names of local informants, they should be located and questioned.

The following interviews must be conducted, whenever possible:

- all persons named in the Task Folder;
- representative(s) of the local administrative Authority;
- representatives of the local community;
- people living within 500 metres of the Task area; and
- former combatants in the area.

Interviews must be formally conducted using a prepared list of questions that is designed to check existing information and answer questions arising from the study of the Task Folder. Questions and responses must be recorded in writing and added to the Task Folder.

Men, women and children should be interviewed because they use the land in different ways and may have different knowledge of the Task area.

Interviews should be conducted so that the people interviewed are not aware of the answers provided by others.

4.4 Visiting the Task area

The Task Assessment team must make a site visit to the recorded Task area. The Task Assessment Team will not normally be equipped to enter a hazardous area, so must keep to known safe-areas when making their assessment. Their site assessment must do the following:

1. confirm or correct the approximate location and extent of the Task;
2. record GPS coordinates of the approximate perimeter of the Task, taking care not to enter it;
3. identify and mark one or more landmarks outside the Task area;
4. identify and take GPS co-ordinates for the Task Bench-mark;
5. record details of the local terrain with digital photographs;
6. estimate the likely soil contamination with minerals or scrap metal (by using a metal-detector near to the perimeter of the Task);
7. describe ground conditions and the vegetation that is present;
8. determine whether it is likely that any parts of the Task site will be waterlogged;
9. determine whether it is likely that any parts of the Task site will have one or more of the following obstructions:
    - Rocks
    - Fences and wire
    - Vehicle wrecks
    - Ditches/trenches
    - Abandoned or destroyed buildings
    - Fallen trees
10. identify the easiest access route to the site;
11. list the suspected mine and ERW types and density;
12. estimate the probable depth of Clearance required;
13. identify possible Platoon campsites with suitable water supply;
14. identify nearby sources of food and consumables;
15. identify one or more possible CASEVAC routes from the Task to the nearest hospital(s);
16. identify schools, churches or local residents where the Platoon MRE specialist will explain what is happening and meet local MRE needs; and
17. draft a detailed sketch map of the Task site.

A written record covering all of the above (and anything else of relevance) must be included in the Task Folder.

4.5 The Task Assessment

When the suspected hazardous area, local authorities and any people living nearby have been visited, the Task Assessment team must make a Task Assessment based on all of the available information. To ensure that previous assumptions and conclusions are verified or adjusted according to the updated information, the entire Task Assessment Team must analyse the revised information. After analysis, it may be necessary to question people again or find new informants. The Team must strive to reach agreement and evaluate the information objectively.

The experience of the Task Assessment Team is important. Their experience of previous demining operations and knowledge about how mines were typically used in the conflict can be very valuable. Their detailed knowledge of the mines and ERW previously found, the condition of these devices, the areas where they were found, and the depth at which they were concealed, all add value to the assessment.

When their assessment is completed, they must produce the following documents:

1. A sketch map of the hazardous area showing Threat levels for different areas and the GPS co-ordinates for the proposed position for the Task Bench-mark;
2. A Task Risk Assessment; and
3. A preliminary Task Release Plan.

These documents must be added to the Task folder before it is given to the Task Supervisor who will control the demining at the Task or the separate Technical Survey team when one is sent in advance.

4.5.1 Sketch map showing threat levels

A sketch map of the hazardous area must divide the area into one or more of the three categories shown below. In many cases the Task area can be divided into parts with different Threat Levels, but when not, the entire area can be given a single Threat Level.

Threat Levels	
High threat area	These are areas that have a confirmed presence of mines or ERW.
Low threat area	These are areas where the information is conflicting and the reliability of information is not conclusive. The presence or absence of mines and ERW needs to be confirmed by the use of appropriate procedures.
No Known Threat	These are areas where there is no indication that any hazard is present.

NOTE: *No Known Threat areas do not have to be known to be safe, but there must be no reason in the available information to believe that there are mines and ERW there.*

The Sketch map should also show the Landmark and the proposed Bench-mark.

The Sketch map should also show the location of the Task Start-line.

4.5.2 Task Risk Assessment

The Task Assessment Team must write a Task Risk Assessment for the Task. This helps to identify the appropriate demining procedures and assets to use.

Task Risk Assessments must follow a formal procedure that is described in Part 6 of this Chapter.

The Task Assessment Team must write a preliminary Task Release Plan for the Task. The preliminary Task Release Plan will include a detailed sketch map showing all of the Task area and the Threat levels assigned to the separate parts.

Task Release Plans are described in detail in Part 8 of this Chapter.

Planning to Clear as little of the Task area as is necessary for its safe Release, the Task Assessment Team must decide:

1. The demining procedures to be used in each Threat Level area; and
2. The sequence in which demining procedures must be used.

The procedures and the sequence in which they are used are critical for cost-efficiency and to avoid wasting time.

In addition to the above, the Preliminary Task Release Plan must include:

a) The place where the Task bench-mark must be positioned.

b) A sketch of the safe-area site layout, taking account of all features on the ground.

   When demining machines will be used, the safe-area site layout must be adjusted to include the wide access lanes and the machine Inspection and parking areas that machines require.

   When MDD will be used, the safe-area site layout must be adjusted to include an MDD training area and MDD rest areas that meet the MDD Coordinator's requirements.

c) A detailed list of all equipment and consumables that will be needed.

   This must cover the predictable needs of the manual demining Platoon(s) and should cover the predictable needs of the other demining assets that will be used.

d) An estimate of the time that will be needed to complete the Task.

   This should presume that the entire High and Low threat areas will need to be processed using manual or MDD Clearance procedures and so will usually be more time that is actually needed.

5. Technical survey

Unless a reliable Technical Survey has already been conducted at a Task area before the Task is accepted, Technical Survey will be combined with demining. This promotes efficiency by preventing having to deploy assets to the same Task twice.

The demining procedures recommended in the Task Release Plan should begin with Technical Survey to define those parts of the Task that are hazardous and must be processed using Clearance procedures. The Task Release Plan must include the positions of one or more start-lines that will allow a direct approach to the area(s) where mines are most likely to be.

The Technical Survey should try to determine the following:

1. where any mine pattern is located;
2. the types of mine and ERW and their condition;
3. the depth of concealment of buried mines; and
4. any revisions to the Task Evaluation and Task Release Plan that are needed.

The Task Release Plan is described in Part 8 of this Chapter.

If Technical Survey is conducted separately from demining, a Technical Survey report must be generated. This must include an accurate Task map. The areas Cleared during the Technical Survey must be marked on the ground. The perimeter of the area(s) defined for Clearance must be marked on the ground at all Turning Points and Intermediate Points. Hazardous-area signs must be placed at a spacing that ensures that people will always see them before entering these areas. The maximum spacing is generally 25 metres.

If Technical Survey does not confirm the need for demining at the Task, the principles detailed in Part 2.5 of this Chapter should be followed.

5.1 Technical Survey teams

Generally, Technical Survey teams are not deployed separately because Technical Survey is a part of every Task. This means that a Technical Survey Team is usually a demining Platoon with two or more Sections. Sometimes a single Section may be sent to a Task in advance of other assets.

When this occurs, a Technical Survey Team comprises one or more demining Sections accompanied by an EOD Operative, and a Paramedic with ambulance vehicle. The team must be led by either a Platoon Commander or a Platoon Supervisor and supported by drivers. A cook may also provide support when the Team camps separately from the rest of the Platoon.

No staff can be used in Technical Survey Tasks until they have successfully passed the examination at the end of the internal First Aid course.

Assets deployed on Technical Survey must follow the demining SOPs detailed in these SOPs.

The following rules must be applied:

1. All members of the team must be first aid trained;
2. All deminers in the team must be deminer trained;
3. At least one Level 3 EOD Operative must accompany the Team;
4. The Team must be led by a fully trained Platoon Commander or Platoon Supervisor who is appointed Task Supervisor by the Programme Manager;
5. The team must be accompanied by a Paramedic and ambulance;
6. Before starting work, a Landmark and bench-mark must be marked and recorded; and
7. Before starting work, a CASEVAC plan must have been made in writing and be known by the Paramedic and Ambulance driver.

If there may be a significant time lapse between the Technical Survey and any subsequent demining, the recording of detailed and accurate maps is essential.

When a Technical Survey finds nothing, they need to know when to stop. The criteria for this must be given in the Task Folder for that specific Task. When the Task Assessment has already defined the High Risk Areas with compelling evidence, it may be necessary for the Technical Survey to Clear the entire High Threat area(s) in order to achieve confidence that there are no mines present. Generally, if no mines are found in the High Threat Area(s), no more than half of the area comprising Low Threat Areas should be Cleared, and the areas with No Known Threat should not be Cleared at all.

Technical Survey must be conducted using the procedures detailed in Part 5 of this Chapter.

The Technical Survey team must ensure that the local people and the appropriate authorities understand that the land has not been Cleared when they leave.

6. Step by step Task Risk Assessment (TRA)

At each Task, the Clearance depth that is necessary to give confidence that any residual risk to the end-users of the land is tolerable must be decided. After that, the risks to the staff while using the available procedures at each Task must be assessed.

This Task Risk Assessment only applies to manual and MDD procedures. It does not apply to mechanical procedures that are intended to detonate mines or ERW.

A Task Risk Assessment is conducted following these Steps:

Step 1: list the mines and ERW that are likely to be at the Task. These are the “hazards”;

Step 2: list each of the available procedures that may be used at the Task;

Step 3: assess the probability of detonation (PoD) for each hazard when using each of the available procedures;

Step 4: assess the Severity of Consequence (SoC) if an unintended detonation occurs;

Step 5: assess additional risk presented by Task Conditions (TC);

Step 6: calculate Risk Numbers; and

Step 7: compare Risk Numbers and select appropriate procedures to use.

The Steps are described below.

6.1.1 Step 1 – Listing the hazards

Using the information in the Task Folder and information gained during the Task Assessment:

1. list the mines and ERW that are believed to be at a Task. Common mines and ERW are listed in the Table in Part 7.11 of this Chapter;
2. find out how the anticipated devices work and their hazardous content; and
3. write down a list of the mines and ERW anticipated.

6.1.2 Step 2: Listing the available procedures

List all of the procedures that could be used at the Task. These may include:

1. Manual demining using metal-detectors and signal investigation;
2. Manual demining using area excavation with hand tools;
3. Manual demining using area excavation with REDS rakes;
4. Manual deminers conducting BAC;
5. Manual deminers conducting BACS; and
6. Using MDD for detection (with manual demining of MDD indications).

Write the available procedures down in a list.

6.1.3 Step 3: Assess the probability of detonation (PoD)

Each of the hazards listed must be compared with all of the available procedures to decide how likely it is that the procedure will cause a detonation.

The Probability of Detonation (PoD) is assessed and given a number from the following list.

Probability of detonation (PoD) for a given hazard and procedure		
4	Frequent	Could occur often with this procedure
3	Probable	Could occur if the procedure is used correctly
2	Occasional	Could occur if the procedure is used incorrectly
1	Improbable	Very unlikely to occur even if the procedure is used incorrectly

TRA Table 1 below can be used for this. Write in the Hazard identified in Step 1 and circle a PoD for each of the available procedures.

TRA Table 1: Probability of Detonation (PoD) during available procedures				
Hazard:…………………………………………………………………………………………	PoD			
Procedure 1: Manual demining using metal-detectors and signal investigation	1	2	3	4
Procedure 2: Manual demining using area excavation with short hand tools	1	2	3	4
Procedure 3: Manual demining using area excavation with REDS rakes	1	2	3	4
Procedure 4: Using MDD for detection (with manual demining of MDD indications)	1	2	3	4
Procedure 5: Manual demining conducting BAC	1	2	3	4
Procedure 6: Manual demining conducting BACS	1	2	3	4
Hazard:…………………………………………………………………………………………	PoD			
Procedure 1: Manual demining using metal-detectors and signal investigation	1	2	3	4
Procedure 2: Manual demining using area excavation with short hand tools	1	2	3	4
Procedure 3: Manual demining using area excavation with REDS rakes	1	2	3	4
Procedure 4 Using MDD for detection (with manual demining of MDD indications)	1	2	3	4
Procedure 5: Manual demining conducting BAC	1	2	3	4
Procedure 6: Manual demining conducting BACS	1	2	3	4
Hazard:…………………………………………………………………………………………	PoD			
Procedure 1: Manual demining using metal-detectors and signal investigation	1	2	3	4
Procedure 2: Manual demining using area excavation with short hand tools	1	2	3	4
Procedure 3: Manual demining using area excavation with REDS rakes	1	2	3	4
Procedure 4 Using MDD for detection (with manual demining of MDD indications)	1	2	3	4
Procedure 5: Manual demining conducting BAC	1	2	3	4
Procedure 6: Manual demining conducting BACS	1	2	3	4
Continue this Table for all the anticipated Hazards at the Task.				

6.1.4 Step 4: Assessing the Severity of Consequences (SoC)

The procedure that is being used affects the severity of the consequences of the detonation of each hazard. Either choose a SoC number for the hazard from the Table in Part 7.11 of this Chapter, or use the following general rule for manual demining procedures.

General rule for SoC numbers for manual procedures	
Small AP blast mines (under 50g HE)	2
Large AP blast mines	3
POMZ 2 and 2M AP frag mines	3
All other AP frag mines	4
All AT mines	4
Separate AP mine fuzes	2
All other separate fuzes	3
All submunitions	4
All other ERW	4

Then fill in TRA Table 2 below by writing in the Hazard name and circling its SoC number.

TRA Table 2: SoC for the detonation of each hazard during manual procedures				
Hazard name /description				
	1	2	3	4
	1	2	3	4
	1	2	3	4
	1	2	3	4
	1	2	3	4
Extend this Table when there are more Hazards than lines.				

6.1.5 Step 5: Assess additional risk presented by Task Conditions (TC)

The Task Conditions are the combination of the terrain, ground conditions, vegetation and any other obstructions there may be at a Task. The additional risk presented by Task Conditions depends on the type of hazard that is at the Task.

Task Conditions that are known to increase risk of an unintended detonation during manual demining procedures are listed in the left hand column of the TRA Table 3 below. Ways to reduce the risk of an unintended detonation that is added by the Task Conditions are listed on the right.

TRA Table 3: Task Conditions and ways to reduce risk of detonation	
Task Conditions (TC)	**Ways to reduce risk of detonation**
When searching for AP blast mines	
Hard/rocky ground	Use of blast resistant and long tools, and/or use mechanical ground preparation.
Soft/wet ground	Allow to dry.
Cut or dead vegetation on ground	Use of metal-detectors, then long-handled light rakes, then metal-detectors.
Dense undergrowth	Cut vegetation using a machine, or cut carefully by hand until ground surface is visible and metal-detector can be moved close to ground.
Roots on ground surface	Mechanical ground preparation.
More than 7 fragments in every m^2	Use of powerful magnets (where no magnetic influence fuzes are expected).
Steep incline	Work uphill and ensure employees have slip-resistant boots.
Wire obstructions	Issue wire cutting and pulling tools and conduct refresher training in their use at the Task.
Wrecked vehicles	Clear up to then wreck, then use armoured machine to move the wreck into the Cleared area. Then Clear where the wreck was.
Ditches, trenches or canals	Use marking. Train in a similar situation and increase depth of search inside the obstruction and/or use mechanical excavation and sifting.
Presence of livestock	MRE officer to liaise with owners to arrange absence of livestock.
When searching for AP fragmentation mines (stake mounted)	
Cut or dead vegetation on ground	Use metal-detectors, then use again after vegetation is removed by hand.
Dense undergrowth	Cut undergrowth using a machine, or cut vegetation from the top in short lengths, sweeping with metal-detector after each cut. Use tripwire feeling procedure before each cut when tripwires may be present.
More than 7 fragments in every m^2	Use of powerful magnets (where no magnetic influence fuzes are present).
Steep incline	Work uphill and ensure employees have slip-resistant boots.
Wire obstructions	Issue cutting and pulling tools and conduct training. Pull using an armoured machine if tripwires or mines may be among the obstructions.
Wrecked vehicles	Clear up to wreck, the then use armoured machine to move the wreck into the Cleared area. Then Clear where the wreck was.
Presence of livestock	MRE officer to liaise with owners to arrange absence of livestock.
When searching for AP bounding fragmentation mines	
Cut or dead vegetation on ground	Use metal-detectors, then use again after vegetation is removed by hand.
Dense undergrowth	Cut undergrowth using a machine or cut vegetation from the top in short lengths, sweeping with metal-detector after each cut. Use a tripwire feeling procedure before each cut when tripwires may be present.

More than 7 fragments in every m^2	Use of powerful magnets (where no magnetic influence fuzes are present).
Steep incline	Work uphill and ensure employees have slip-resistant boots.
Wire obstructions	Issue cutting and pulling tools and conduct training. Pull using an armoured machine if tripwires or mines may be among the obstructions.
Ditches and canals	Use marking. Train in a similar situation. Also increase depth of search inside the canal/ditch.
Wrecked vehicles	Clear up to the wreck, then use an armoured machine to move the wreck into the Cleared area. Then Clear where the wreck was.
Presence of livestock	MRE officer to liaise with owners to arrange absence of livestock.
When searching for AT mines	
Hard/rocky ground	Do not use heavy hand tools such as mattocks and picks.
Presence of livestock	MRE officer to liaise with owners to arrange absence of livestock.
When searching for general ERW	
Hard/Rocky ground	Use distinct area marking and metal-detectors.
Soft/wet ground	Use distinct marking and metal-detectors. Do not rely only on visual search.
Significant undergrowth	Cut vegetation from the top sweeping with detector after each cut below 40cm.
Steep incline	Conduct Clearance uphill and ensure employees have slip-resistant boots.
When searching for submunitions	
Hard/Rocky ground	Use distinct marking and metal detectors. Do not rely only on visual search.
Soft/wet ground	Allow to dry and search to greater depth.
Cut or dead vegetation on ground	Use metal-detectors. Do not rely on visual search. Do not use ferrous locators.
Dense undergrowth	Cut undergrowth using a machine or cut vegetation from the top in short lengths, sweeping with metal-detector after each cut.
Steep incline	Conduct Clearance uphill and ensure employees have slip-resistant boots. Presume munitions may have moved downhill.
Wire obstructions	Issue cutting and pulling tools and conduct training. Pull using a suitably armoured machine if munitions may be among the wire obstruction(s).
Ditches and canals	Use Clear marking, train in a similar situation and increase depth of search inside the canal/ditch.
Presence of livestock	MRE officer to liaise with owners to arrange absence of livestock.

TRA Table 4 below shows how to assess the additional risk presented by the TC at each Task.

TRA Table 4: Assessing risk presented by Task Conditions (TC)

Increased risk posed by the Task Conditions

Hazard type	Hard/rocky ground	Soft/wet ground	Cut or dead vegetation on ground	Dense undergrowth	Roots on ground surface	More than 7 metal pieces p/m^2	Steep incline	Wire obstructions	Wrecked vehicles	Ditches, trenches or canals	Presence of livestock	TC number
AP blast mines	+2	+1	+1	+1	+1	+1	+1	+1	+2	+1	+1	
	+1	0	0	0	0	0	0	0	0	0	0	
AP frag mines (stake mounted)	-	-	+1	+2	-	+1	+1	+1	-	-	+1	
	-	-	0	0	-	0	0	0		-	0	
AP bounding fragmentation mines	-	-	+2	+3	-	+1	+1	+1	-	+1	+1	
	-	-	0	0	-	0	0	0		0	0	
AT mines	+1	-	-	-	-	-	-	-	-	-	+1	
	0	-	-	-	-	-	-	-	-	-	0	
Ordnance	+2	-	-	+2	-	-	+2	-	-	-	-	
	+1	-	-	0	-	-	0	-	-	-	-	
Submunitions	+2	+3	+1	+2	-	-	+1	+1		+1	+1	
	0	0	0	0	-	-	0	0		0	0	

The additional risk presented by the hazard is the number with a yellow background. In most cases, the measures in TRA Table 3 can be taken to reduce that risk. When those measures have been taken, the numbers with a green background should be used.

To assess the additional risk presented by Task Conditions:

1. For each hazard, check whether the measures to reduce the additional risk presented by Task Conditions will be taken.
2. For each type of hazard at the site and for each of the Task Conditions listed, select the yellow or green number depending on whether the measures to reduce the additional risk will be taken. Add the numbers for the hazard and write the total in the right hand column.

6.1.6 Step 6: Calculating the Risk Numbers

For each hazard expected at the Task, you now have a Probability of Detonation number (PoD), a Severity of Consequences number (SoC) and a number for the additional risk presented by the Task conditions at the Task.

Write each hazard into TRA Table 5, then calculate the total Risk Number for that hazard and that procedure at this Task by multiplying the PoD by the SoC number, then adding the TC number.

TRA Table 5: Calculating Risk Numbers

	PoD	x	SoC	+	TC	=	Total Risk Number
Hazard:							
Procedure 1		x		+		=	
Procedure 2		x		+		=	
Procedure 3		x		+		=	
Procedure 4		x		+		=	
Procedure 5		x		+		=	
Hazard:							
Procedure 1		x		+		=	
Procedure 2		x		+		=	
Procedure 3		x		+		=	
Procedure 4		x		+		=	
Procedure 5		x		+		=	
Hazard:							
Procedure 1		x		+		=	
Procedure 2		x		+		=	
Procedure 3		x		+		=	
Procedure 4		x		+		=	
Procedure 5		x		+		=	
Hazard:							
Procedure 1		x		+		=	
Procedure 2		x		+		=	
Procedure 3		x		+		=	
Procedure 4		x		+		=	
Procedure 5		x		+		=	
Extend this table for the number of Hazards at the Task.							

6.1.7 Step 7: Comparing Risk Numbers

With the Risk numbers prepared, you must select the appropriate procedures to use at the Task.

The Risk Number calculated for a particular hazard and procedure at a Task must then be evaluated using TRA Table 6 below.

TRA Table 6: Tolerable and unacceptable Risk Numbers		
Above 10	Not acceptable	This represents an intolerable risk: alternative procedures to reduce risk must be selected.
9	Tolerable, but undesirable	A number 9 can only be accepted if no alternative procedures are available.
5-8	Tolerable	The level of risk means that an unintended detonation may occur but a severe injury or fatality is unlikely
1-4	Normal	The level of risk means that any injury or fatality is very unlikely.

Use the results to select which procedures are appropriate to use at the Task.

7. Principles behind Task Risk Assessment

Task Risk Assessment (TRA) allows estimates of the risk involved in varied demining procedures to be made. Risk must be estimated to allow the informed selection of a combination of demining procedures that keep the risk of severe injury at a tolerable level at a Task. The method described here should be applied at all demining Task sites, including EOD spot Tasks.

Task risks are determined by assessing the probability of an unintended detonation occurring and the severity of the consequences if a detonation does occur. The ultimate purpose of a TRA is not to reduce risk, which may be very low anyway. It is to assess the level of risk involved in all the combinations of hazards and procedures that are at a particular Task.

No human activities are risk-free, so risk cannot be totally eliminated. This procedure ensures that the risk to employees and end-users of the land is kept to a tolerable level.

The risks covered in a TRA are not only concerned with the risks to the employees. Because the purpose of humanitarian demining is to release safe land to end-users, the primary risk to be kept to a tolerable level is the risk of leaving mines or ERW behind. The secondary risk to be assessed is that of unintended detonations causing injury to employees. A third risk that should always be considered is that of unnecessarily using resources in areas where there are no mines or ERW.

When possible, recorded information is used in the TRA. While the recorded data can reliably show trends and generalisations, the conditions in which the data was gathered vary widely and the results will not apply in all circumstances so an intelligent evaluation is always necessary.

Task Risk Assessments (TRAs) are made to control risk at a demining Task. The first TRA at any Task must be conducted by the Task Assessment Team before deminers are deployed.

As work progresses at a Task, the information on which the first TRA was based must be updated and the TRA repeated when relevant new information becomes available.

7.1 Risk factors at a Task

Task Risk Assessments take account of the risk factors introduced below.

- human error;
- procedural error;
- the anticipated Hazards;
- Task Conditions; and
- technology failure.

The potential for all but one of these factors occurring is covered in the TRA process. The exception is technology failure. It is excluded because it must be minimised by the implementation of appropriate maintenance and testing regimes.

7.1.1 Human error

Human error may be deminer error, an error in training or in supervision, or a combination of these. It may be deliberate, through ignorance or curiosity, or it may be accidental, through lack of attention or sickness. Most recorded demining accidents involve an element of error in training, supervision or the judgment of the employee(s).

The behaviour of the employees is ultimately the responsibility of the Task Supervisor who controls the Task.

7.1.2 Procedural error

Procedural error may occur because an inappropriate procedure is used. It may also occur when there is a mistake in the way that an appropriate procedure is performed.

To prevent procedural errors occurring, training must be appropriate and accessible, supervisors must be experienced and responsible, and employees must understand why they must work in the required way.

7.1.3 Hazards

The hazards are the mines and ERW at a Task and their condition when they are found. The condition is important because all mines and ERW age to some extent and some decay quickly in harsh environments. Corrosion and other degradation can significantly alter the degree of risk presented by a device. Normally, it is the condition of the fuzing system that is of greatest concern and the need to avoid initiating the firing train is most important. However, in some cases other parts of a munition than the fuze may present the greatest hazard.

The condition of mines and ERW must always be assessed by EOD Operatives with extensive relevant experience who have access to appropriate reference works.

7.1.4 Task Conditions (TC)

The Task Conditions (TC) are different at each Task. They can affect the probability of an unintended detonation occurring with any of the demining procedures that may be used.

For example, if a Task is covered with dense vegetation and there are bounding fragmentation mines that are in working condition, there is a high risk of an unintended detonation if the vegetation is cut manually. But, if the Task is on an open hillside with sparse grasses and the mines include bounding fragmentation mines in working condition, there is a low risk of an unintended detonation if the vegetation is cut manually.

The selection of an appropriate procedure to use at a Task can be dictated by the conditions that are present.

7.1.5 Technology failure

Technology failure is the failure of equipment and machines to perform as they were designed. This may include mechanical or electrical breakdown.

A breakdown may not cause an unintended detonation, but it can increase the risk of that occurring. For example, if a breakdown leaves machine Operators stranded inside the hazardous area, or leaves a deminer searching the ground with an unreliable metal-detector, the risk of an unintended detonation is increased.

The chance of technology failure happening must be reduced by ensuring that testing and maintenance regimes are devised and implemented at intervals that:

- reduce failure to the minimum; and
- ensure that any failure is most likely to occur outside a hazardous area.

The significance of any technology failure is reduced by including failure scenarios in training to ensure that all employees know how to respond safely when a machine failure occurs.

7.2 Assessing probability and consequences

Assessing the Probability of an unintended Detonation (PoD), the Severity of the Consequences (SoC) and assessing the probability of leaving a hazard behind are introduced separately below.

7.2.1 Assessing the Probability of Detonation (PoD)

The PoD should be assessed as a combination of the characteristics of the identified hazards, the procedures that will be used to Clear them, and the context in which the work will be conducted.

The UNMAS supported Database of Demining Accidents provides records of unintended detonations from demining programmes around the world. Common features can be compared and trends identified with a degree of statistical reliability that is more reliable than any individual's experience.

In the past, risk assessment for demining has presumed that there is a risk of unintended detonation of the largest or most potentially dangerous device present. The accident record indicates that this is not the case. The device most likely to be detonated during manual demining is usually not the largest device.

7.2.2 Assessing the Severity of Consequences (SoC) of a detonation

An unintended detonation has often been presumed to cause either severe injury or death. On that basis, many risk control strategies have been designed to avoid all unintended detonations. When the combination of a hazard and the procedures used at the time mean that the risk of severe injury from an unintended detonation is low, it can be acceptable for the risk of an unintended detonation happening to be higher. The SoC is what matters, not the fact of a detonation.

7.2.3 Assessing the probability of leaving mines behind

This should be assessed as a combination of the depth of the mines, the procedures that are used to Clear them and the context in which the work is conducted. As work progresses and devices are located, it may be found that the original depth of Clearance was more or less than necessary. For example, when all mines are found close to the surface, it may not be necessary to process the ground to the depth originally anticipated. But, when some mines or ERW are found deeper than anticipated, it may be necessary to process the ground to a greater depth than was originally anticipated.

When these circumstances occur, the TRA must be revised and any changes to the Task Release Plan discussed with the Programme Manager or the NMAA as a matter or urgency. Clearance depth can always be increased without approval.

7.2.4 Assessing the consequences of leaving mines behind

The aim of humanitarian demining is to remove all risk from mines and ERW at a Task. Procedures designed to achieve this must be conducted on any land that is released as Cleared. No injuries to end-users because of mines or ERW left in Cleared areas within the working depth are tolerable. Mines or ERW concealed beneath the working depth and later discovered are the “tolerable risk” for Cleared land.

7.3 Assessing hazard(s)

The degree of hazard presented by a type of mine or ERW should be determined. This is achieved by reference to its original design. The sensitivity of its firing train is usually the main factor when assessing the hazard it presents to employees.

For example, most AT mines require a force to be applied on their top surface in excess of the force applied by a deminer walking in the field, so they may present a very low risk of initiation during manual demining or MDD Clearance procedures. This is confirmed by reference to the accident record in which there are no instances of accidents occurring as a result of a deminer stepping on an AT mine. However, AT mines have been initiated by deminers using inappropriate tools to uncover them and while attempting to disarm or arm them.

NOTE: *AT mines may have been fitted with anti-lift devices, booby trapped, or laid with AP mines on top of them. If this may have occurred, the combined hazard presents a greater risk than the AT mine alone. The likelihood of this occurring should be assessed by staff with relevant experience of the conflict in the Task area.*

NOTE: *If an AT mine is designed so that its pressure plate is crushed as part of the firing train, the mine may have been partly crushed in the past and might be later initiated with a lower pressure than its designers intended. The likelihood of this happening should be assessed with reference to likely vehicle traffic over the area.*

A few mines and ERW are very sensitive and more readily triggered in one way than another, or their filling may present an alternative hazard. The EOD Operatives must know the anticipated devices, the way they operate, and their hazardous content. The condition of the devices found at the Task may mean that the estimate has to be reviewed after examples have been found.

After the hazards at a Task have been identified or estimated, they must be assessed alongside the available demining procedures and Task conditions. This allows a numerical comparison to be made between the relative risks associated with each procedure at that Task.

7.4 Probability of Detonation (PoD) during varied procedures

For each demining procedure and for each hazard, a Probability of Detonation (PoD) must be estimated. Using Table A below, the PoD is defined and given the number in the left column.

Table A: Probability of detonation (PoD) for a given hazard and procedure		
4	Frequent	Could occur often with this procedure
3	Probable	Could occur if the procedure is used correctly
2	Occasional	Could occur if the procedure is used incorrectly
1	Improbable	Very unlikely to occur even if the procedure is used incorrectly

A high PoD does not always mean that the procedure is inappropriate. If the likelihood of an injury occurring in an unplanned detonation is very low, a high probability of an unplanned detonation need not be significant.

7.5 Severity of Consequences (SoC)

The Severity of the Consequences (SoC) must be estimated. To assess the SoC of a detonation, it is always presumed that the device is in a functional condition.

Using Table B below, the SoC for each hazard must be estimated and given one of the numbers from the column on the left.

Table B: Severity of Consequences (SoC)		
4	Catastrophic	Death
3	Severe	Severe or disabling injury
2	Minor	Minor injury
1	Negligible	No injurious consequences

NOTE: *The SoC should be estimated presuming that PPE is worn properly.*

Severity of Consequence (SoC) numbers for common mines detonated during any manual procedure are listed in Part 7.11 of this Chapter. The most likely SoC number should be selected.

The SoC when the staff are protected inside a machine or behind an armoured shield will be very much lower than the SoC during manual procedures. Manual procedures include MDD, BAC, BACS and all manual Clearance procedures.

The risks added by the conditions at the Task must then be considered.

7.6 Risk(s) added by the Task Conditions (TC)

The Task Conditions (TC) are a combination of the terrain, ground conditions, vegetation and any other obstructions that are present at a Task. The slope of the ground and the presence of vegetation, ditches and other obstructions all affect the ease of work and supervision. Some conditions also affect the choice of Task marking system. For example, the use of painted rocks may be appropriate on a bare hillside or a road, while in dense undergrowth pickets and marking tape will be more appropriate.

The TCs affect the choice of appropriate procedures to use and the site supervision that is necessary. More Supervision may be necessary when vision is limited.

7.7 Combining all relevant factors

The calculations for each hazard and procedure are combined as shown in Table D below.

When both probability and severity of consequences (Tables A and B) have been estimated for a procedure, the numbers are multiplied together and the additional risks posed by Task Conditions are added. This gives Risk Numbers for procedures that can be easily compared.

Table D: Calculating a Risk Number		
Table A: Probability of Detonation (PoD)		
4	Frequent	Could occur often with this procedure
3	Probable	Could occur when the procedure is used correctly
2	Occasional	Could occur if the procedure is used incorrectly
1	Improbable	Very unlikely to occur even if the procedure is used incorrectly
Table B: Severity of Consequences (SoC)		
4	Catastrophic	Death
3	Severe	Severe or disabling injury
2	Minor	Minor injury
1	Negligible	No consequence
Increased risk in varied Task Conditions (TC)		
?	The total increased risk should be added.	
Total		

The result from Table A is multiplied by the result from Table B and the additional risk number for the Task Conditions is added. The total will be a number 1 – 30 which is the Risk Number for that hazard and that procedure at that Task.

7.8 Evaluating the Risk Numbers for each hazard and procedure

The Risk Number calculated for a particular hazard and specific procedure at a Task should then be evaluated using Table E below.

Table E: Tolerable and unacceptable Risk Numbers

Above 10	Not acceptable	This represents an intolerable risk: alternative procedures to reduce risk must be selected.
9	Tolerable, but undesirable	Can only be accepted if no alternative procedures can be deployed.
5-8	Tolerable	The level of risk means that an unintended detonation may occur but a severe injury or fatality is unlikely
1-4	Normal	The level of risk means that any injury or fatality is very unlikely.

Generally, procedures with a Risk Number lower than 10 should be selected for the Task.

If a procedure has a risk number of 10 or above, ways should be found to reduce the risk of injury before the procedure is conducted. This may be achieved by protecting employees with enhanced PPE, armour or distance. Procedures with a Risk Number of 10 or more should only be used when the risk of severe injury or death has been reduced to a tolerable level.

7.9 Comparing Risk Numbers

The Risk Numbers for all the different procedures and hazards at the Task should be calculated to allow the selection of demining procedure(s) that have a tolerable or normal risk. The selected procedure(s) may not always be the procedure(s) with the lowest Risk Number because working efficiency and the experience of the employees should also be considered. When the lowest Risk Number is not selected, the reason for using the procedure that is preferred should be recorded in the Task Risk Assessment .

NOTE: *TRAs must be reviewed and their content updated as new information becomes available. The need for revision is unavoidable. It does not imply any failing in those carrying out the assessment as long as the revision is made as soon as possible after new information becomes available.*

7.10 PoD and SoC data from demining accidents

Some observations of value about the threat presented by types of mines and ERW to employees can be gathered from the UNMAS supported Database of Demining Accidents.

7.10.1 Mines and ERW involved in demining accidents

More than 2/3rds of all demining accidents involve AP blast mines. The remaining 1/3rd involve other mines and ERW. Devices involved in accidents are listed below in order of frequency, starting with the most frequent.

1. AP blast mines;
2. AP bounding fragmentation mines;
3. AT mines;
4. Submunitions;
5. Fuzes (unidentified);
6. AP fragmentation mines (stake mounted);
7. Other ERW;

8. Grenades (hand);
9. IED;
10. Mortar bombs (HE);
11. Phosphorous; and
12. Propellant.

7.10.2 Identifying procedures with the most risk

Accidents can happen at any time but they are more likely to happen at some times than others. With the exception of ‘missed mine’ accidents, the activity at the time of the accident can be relevant to the TRA. The order of frequency shown below starts with the most frequent activity at the time of recorded accidents.

1. Excavation accidents (signal investigation and area excavation).
2. Handling accident (moving, defuzing or rendering safe).
3. Vegetation removal accident (with cutting tools in hand)
4. Detection accident (with metal-detector in hand).
5. Demolition accident (before, during or after a planned demolition).

There are more than twice as many recorded *excavation accidents* as the total of all the others added together.

7.11 Severity of Consequence (SoC) numbers

Table F lists SoC numbers for some mines and ERW when conducting any manual procedure (including MDD, BAC and BACS).

NOTE: *The SoC number presumes that PPE is worn correctly and that appropriate medical treatment is immediately available.*

The hazards in the table are listed in alphabetical order. When a hazard is not listed, the SoC number for a hazard with similar properties should be used.

Table F: Severity of Consequence (SoC) numbers for common mines and ERW

Hazard: Mine/ERW	Recommended *severity of consequence* number	Hazard: Mine/ERW	Recommended *severity of consequence* number
APM-1 AP d/frag	4	PMD-6/M AP blast	3
APPM-57 AP blast	3	PMN AP blast	3
C-3-A/B AT blast	4	PMN-2 AP blast	3
Cuban AT blast	4	POMZ-2 AP frag	3
Cuban box AP blast	3	POMZ-2M AP frag	3
DM-11 AP blast	3	PP Mi-D AP blast	4
DM-31 AP b/frag	4	PP Mi-Sr AP b/frag	4
FBM AT blast	4	PPM-2 AP blast	3
FFV 013 AP d/frag	4	PRB M3/A1 AT blast	4
GYATA-64 AP blast	4	PRB-M35 AP blast	2
Hamdy AP d/frag	4	PROM-1 AP b/frag	4
LI-12 AP d/frag	4	P-S-1 AP b/frag	4
M14 AP blast	2	Pt Mi Ba III AT blast	4
M15 AT blast	4	PT Mi-D AT blast	4
M16 and M16A1 AP b/frag	4	R2M1/2 AP blast	3
M16A2 AP b/frag	4	SA No.8 AT blast	4
M18A1 AP d/frag	4	Shrapnel No 2 AP d/frag	4
M19 AT blast	4	SPM limpet	4
M24 AT HEAT blast	4	TM-46 AT blast	4
M6A2 AT blast	4	TM-57 AT blast	4
M7A2 AV blast	4	TM-62B AT blast	4
MAI-75 AP blast	3	TM-62M AT blast	4
MAPS/M/411 AP blast	3	TMA-2 AT blast	4
MAT-76 AT blast	4	TMA-3 AT blast	4
MI AP DV 59 AP blast	3	TMA-4 AT blast	4
Mini MS-803 AP d/frag	4	TMA-5 AT blast	4
Mk 2 AP b/frag	4	TMD-44 AT blast	4
Mk 5 AT blast	4	TMD-B AT blast	4
Mk 7 AT blast	4	TMK-2 AT blast	4
MON-100 AP d/frag	4	Type 66 AP d/frag	4
MON-200 AP d/frag	4	Type 72(a) AP blast	3
MON-50 AP d/frag	4	Valmara 69 AP b/frag	4
MPM limpet	4	VAR/40 AP blast	3
No.4 AP blast	3	VS-50 AP blast	3
NR409 AP blast	3	VS-MK2 AP blast	3
OZM 3 / 4 AP b/frag	4		
OZM 72 b/frag	4		
OZM-160 AP b/frag	4		
P3 Mk 2 AT blast	4	Fuzes (separated)	3
P4 Mk 1 AP blast	3	Grenade (hand)	4
PMA-1 AP blast	3	IED	4
PMA-2 AP blast	2	Mortar HE (various)	4
PMD-6 AP blast	3	Phosphorus	3

7.12 Re-evaluating risk in the event of an accident

After any accident, the TRA should be reviewed to find out whether the risk assessment should be revised because of the accident. Changes in procedures and tools may be required in order to prevent a repetition of the accident. Changes must be made if the procedures or tools made an unintended detonation more likely than expected. Changes may involve retraining or the use of other procedures and tools at the Task, or part of the Task, where the accident occurred.

If an unintended detonation results in injury, all work in the hazardous area must stop until the review of the TRA has been conducted and the accident has been investigated in accordance with the requirements of the NMAA and internal accident investigation requirements (see Chapter 12 of these SOPs).

The available accident records imply that, in a worst-case scenario, an injurious demining accident may be expected to occur once in every 33 person-years of work. A severely disabling or fatal accident may be expected to occur once in 50 person-years of work. An accident once in every 33 years means that for a team of 33 deminers, one injurious accident a year might be expected. This represents a worst-case situation and so includes a margin of error that overstates the risk rather than underestimates it. If there are accidents with greater frequency in any one year (measured in months leading up to the latest accident), remedial action must be taken.

8. Releasing the land

The final release of the land is generally the responsibility of the National Mine Action Authority or other government body. The NMAA should conduct any external QC work that they require and arrange for the issue of a handover certificate in a timely manner. When that may take some time, the Task Supervisor should ensure that the local community know that the deminers are leaving the Task and what they have done. The Task Supervisor must emphasise the residual risk of devices beneath the depth processed and in areas where full Clearance was not conducted. When appropriate, the demining staff should demonstrate their confidence in their work by walking across the area in front of community representatives.

It must be clearly declared that any liability for residual risk in the area becomes the responsibility of the NMAA from the time of their receipt of the Completion Report.