



# A GUIDE TO NON-TECHNICAL SURVEY

FIRST EDITION



## GENEVA INTERNATIONAL CENTRE FOR HUMANITARIAN DEMINING (GICHD)

The GICHD works towards reducing risks to communities stemming from explosive ordnance, with particular focus on mines, cluster munitions, other explosive remnants of war and ammunition storage. The Centre helps develop and professionalise the sector for the benefits of its partners: national and local authorities, donors, the United Nations, other international and regional organisations, non-governmental organisations, commercial companies and academia. It does so by combining three distinct lines of service: field support focused on capacity development and advice, multilateral work focused on norms and standards, and research and development focused on cutting-edge solutions. Based at the Maison de la paix in Geneva, the GICHD employs around 70 staff members from 23 different countries. This makes it a unique and international centre of expertise and knowledge. Our work is made possible by core contributions, project funding and in-kind support from more than 30 governments and organisations.

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# ABBREVIATIONS AND ACRONYMS

## **CHA**

Confirmed Hazardous Area

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## **EO**

Explosive Ordnance

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## **EOD**

Explosive Ordnance Disposal

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## **EORE**

Explosive Ordnance Risk Education

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## **GICHD**

Geneva International Centre for Humanitarian Demining

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## **GPS**

Global positioning system

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## **IM**

Information Management

## **IMAS**

International Mine Action Standards

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## **IMSMA**

Information Management System for Mine Action

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## **LR**

Land Release

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## **LSA**

Land service ammunition

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## **NMAA**

National mine action authority

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## **NMAS**

National mine action standards

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## **NTS**

Non-Technical Survey

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## **QA**

Quality assurance

## **QC**

Quality control

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## **QM**

Quality management

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## **QMS**

Quality management system

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## **SHA**

Suspected Hazardous Area

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## **SOPs**

Standard Operating Procedures

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## **TS**

Technical Survey

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## **UAS**

Unmanned aerial system

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## **UAV**

Unmanned aerial vehicle

# EXECUTIVE SUMMARY

The aim of this guide is to provide an introduction to Non-Technical Survey (NTS) for mine action personnel who wish to learn more about the subject, but who may lack practical experience. This guide collects the lessons learnt from the development and standardisation of the Geneva International Centre for Humanitarian Demining (GICHD) Non-Technical Survey Training Course and will form part of the pre-course reading material. It aims to provide course participants with a better understanding of the theory and practice of NTS operations. The importance of the practical training cannot be overstated, and this guide is not meant to replace it, but rather to complement and support it. This guide is also intended to complement IMAS Chapter 07.11 Land Release and IMAS Chapter 08.10 Non-Technical Survey. This guide will be updated as needed in the future with a spirit of a continuous improvement process.

NTS is an important component of the Land Release (LR) process. Typically, NTS is the first operational step in implementing an LR process and, as such, it can be seen as the foundation upon which all subsequent LR activities are based. NTS consists of gathering information from desk assessments and field visits. This information forms the basis of a logical, evidence-based, decision-making process that allows surveyors to classify any area that is surveyed as either being free from any suspicion of Explosive Ordnance (EO) or being a Suspected or Confirmed Hazardous Area (SHA or CHA).

Where there is doubt about the reliability of previously identified hazardous areas based on outdated survey data, NTS is an important tool to test the evidence on which these previously identified hazardous areas may be cancelled in whole or in part.

In the context of LR, NTS is not a stand-alone process; it is closely connected to Technical Survey, clearance, post-Land Release assessment, operations quality management and Information Management. All of these activities and related processes typically follow on from NTS and can all be seen as



forms of comprehensive quality management for NTS, either confirming or not the NTS findings. The follow-on activities will either prove or disprove the reliability of the evidence collected during NTS and therefore enable the survey process to continually improve. All cancelled, reduced and cleared areas should be subject to follow-up assessment as part of the quality management system (facilitated by the Information Management [IM] system).

NTS does not involve any search or ground processing assets entering any area that is potentially hazardous, therefore it is significantly less expensive than Technical Survey (TS) and clearance operations. NTS is the most cost-efficient component of the LR process and should be prioritised over TS and clearance whenever possible.

The type and quality of evidence found during NTS will determine the overall outcome of the survey. If NTS finds direct evidence of EO contamination, the result will be a CHA associated to a polygon, or a reported spot Explosive Ordnance Disposal (EOD) task; whereas indirect evidence would produce a SHA. If no evidence is found in any part of a previously identified hazardous area based on outdated survey data, the recommendation would be made to cancel the relevant portion of the area. If no evidence is found in a newly surveyed area, that area will be recorded (geotagged) as having been surveyed but no additional LR process would be undertaken.

All information collected during the NTS process should be accurately recorded with sufficient details, and subject to internal quality controls before being entered into the IM system. The raw data itself should be retained by a competent authority, in case of any subsequent need for a review of the decision-making process. Information collected during NTS should be available in the format specified by the national mine action authority (NMAA).

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# INTRODUCTION

International Mine Action Standards (IMAS) 07.11 defines Land Release as: *“...the process of applying all reasonable effort to identify, define, and remove all presence and suspicion of Explosive Ordnance through non-technical survey, technical survey and/or clearance”*.

Land Release (LR) in humanitarian mine action is an evidence-based, decision-making process that is used to declare with confidence that land is free of Explosive Ordnance (EO) contamination according to nationally agreed norms. Once an LR policy has been approved by a state, national mine action standards (NMAS) are developed which provide specifications and guidelines regarding the implementation of the process. As mine action is a set of complex and variable activities that differ from country to country, there is no single template that can be applied to every situation.

In the majority of countries, Non-Technical Survey (NTS) is typically the first step in the LR process and as such, every mine action activity that follows is based on the accuracy of the evidence collected during NTS. NTS can be seen as the foundation upon which most subsequent mine action activities are built, and its importance cannot be overstated. Implementing NTS to the highest standards is of fundamental importance to the effectiveness and efficiency with which the remainder of the LR process is applied.

As the starting point for land assessment, NTS categorises areas based on whether or not there is any evidence that EO contamination exists within them. Areas are then recorded as either being free from any suspicion of EO contamination or as being Suspected or Confirmed Hazardous Areas (SHAs or CHAs). NTS may also identify individual items of EO and define these individual items as being spot tasks, not associated with polygons, requiring further Explosive Ordnance Disposal (EOD) action but not requiring Technical Survey (TS) or clearance.

NTS can be broken down into eight elements, as shown in the diagram at page 19. NTS begins with a desk assessment, where all requests from the community, area maps, accident reports, previous survey reports and any other information is collected and analysed to determine whether it is necessary to conduct a field visit. It is possible that the desk assessment may not result in a field visit, which may be the case if the desk assessment shows that the location in question cannot correspond to any conceivable contaminated area. An example of this might be a



Non-Technical Survey Training, Thailand, 2016

site that is several kilometres off the coast of a country, indicating that erroneous coordinates have previously been entered into the Information Management (IM) system.

Pre-deployment planning would normally follow on from the desk assessment. Deployments generally begin with a meeting with the local community, from which decisions can be taken about where to conduct specific site visits, if there is general information to suggest that EO contamination is present. The site visit primarily consists of gathering evidence and information by questioning local communities, as well as through physical inspection from a safe area. Once information is gathered from community members or any other source, it is assessed for reliability and accuracy before being entered into a standard NTS report. The NTS report is checked for any errors and omissions before being entered into the IM system.

All elements of NTS revolve around identifying, accessing, collecting, classifying, reporting and using information to help define where EO is to be found, as well as where there is no evidence of contamination. The information collected during

NTS supports the land cancellation, reduction and clearance decision-making processes. It is just as important for an NTS team to identify areas that are not showing evidence of EO contamination, as it is to identify areas that are suspected or confirmed as being contaminated.

NTS may produce enough evidence on its own to allow the determination to be made, with confidence, that the land does not contain an EO hazard. If the requirements to apply “all reasonable effort” have been met, the land can be cancelled. IMAS provides guidance on what can be considered as “all reasonable effort” for NTS but it is ultimately the responsibility of the national mine action authority to clarify and determine what that means in individual countries.

As NTS does not involve the use of any search or ground processing assets entering an area, it is significantly less expensive than TS and clearance. When compared to TS and clearance, NTS can also have the greatest impact, measured in terms of square metres of land released (cancelled). The use of NTS should, wherever possible, be the first step in the LR process.

NTS should be closely connected to any subsequent activities within the LR process. The continual improvement of NTS processes and procedures is reliant upon an analysis of the accuracy of the information collected during survey against what is actually found (or not found) during the technical processes. The longer-term monitoring of areas following handover also helps the continual improvement of the entire LR process.

It is important to understand the importance of developing NMAS that are both IMAS compliant and context specific.

This guide aims to achieve the following goals:

- a.** Ensure a comprehensive understanding of NTS (terminology, processes, and reporting).
- b.** Form the basis for continual improvement of NTS operations and NTS Standard Operating Procedures.
- c.** Form the basis for development of the NTS training curriculum/packages.
- d.** Promote the efficient implementation of NTS, which is fully NMAS compliant.

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## LAND RELEASE CONCEPT

All authorities, agencies and operators involved in Explosive Ordnance (EO) remediation should do their utmost to ensure that resources are deployed in the most operationally efficient manner possible. Operational resources are expensive and limited and their efficient deployment ensures that they offer the best return on investment for all parties, including donors and beneficiaries.

The world of EO contamination is complex, so achieving better operational efficiency can also be complex, and is highly dependent upon local circumstances. Nonetheless, one of the primary ways of achieving better operational efficiency is to implement the concepts and practices of Land Release (LR).

LR essentially involves implementing intrusive methods of inspection only when there is sufficient evidence to suggest that an EO hazard may exist. The LR process is a logical process that begins with the initial identification of an EO threat (or of the lack of an EO threat). It then seeks to define the nature and extent of any EO threat before applying all reasonable effort to show with confidence that any EO threat that did exist, has been removed.



Survey team interviewing a farmer, Colombia, 2012

The nature and level of the reasonable effort required in the framework of national mine action standards to implement the LR process is dependent upon:

- the specific local circumstances and conditions;
- what part of the LR process was last carried out and;
- the implications of any new information discovered as the process progresses.

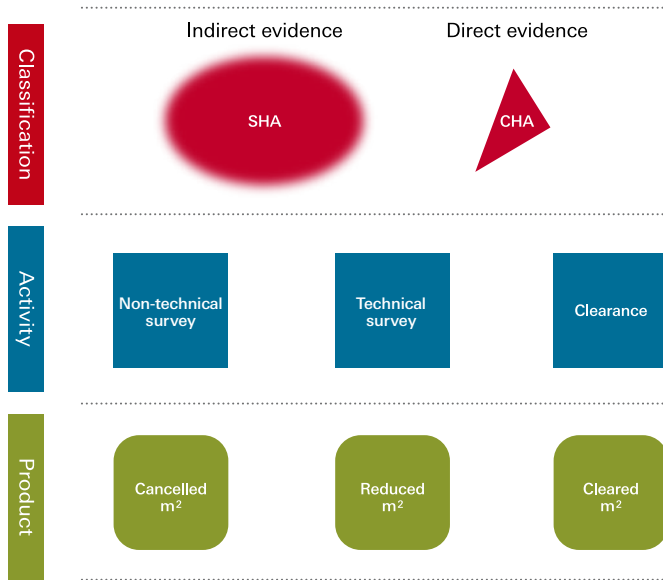
As previously discussed, it is possible that the desk assessment alone may indicate that a previously identified hazardous areas based on outdated survey data cannot exist in a given location. In this instance, the desk assessment could be defined as constituting all reasonable effort, once it has been subject to the relevant quality management (QM) processes.

Practical effort is applied through Non-Technical Survey (NTS), Technical Survey (TS) and clearance. The process typically begins with NTS and then progresses on to TS and then on to clearance, but there is no requirement for it to follow any set sequence, as each set of circumstances is different. Operational decision makers should keep the idea of operational efficiency at the forefront of all planning and ensure that they retain the flexibility to react to new information as it becomes available. It is not uncommon for a single task to go through multiple stages of NTS, TS and clearance before it is concluded that all reasonable effort has been made and the land can be released.

NTS typically establishes whether or not there is evidence of an EO hazard, its general nature and approximate location, through the creation of a Suspected Hazardous Area (SHA), or Confirmed Hazardous Area (CHA) if there is direct evidence of the existence of EO contamination. TS typically follows NTS and tries to gather more evidence, with the goal of establishing the precise nature of the hazard, the precise area the hazard is contained in and any factors that may affect the operational decisions relating to the clearance process. If TS confirms the presence of an EO hazard, or other kinds of direct evidence within an SHA, a CHA report would be produced. The CHA would normally be expected to be smaller and better defined than the preceding SHA. Clearance builds on the information from NTS and TS and ensures that the EO hazard has been removed from a specified area to a specified depth or other agreed parameters, as stipulated by the national mine action authority (NMAA)/Tasking Authority. However, in some cases, the CHA may be larger than the initial SHA, as the result of new evidence discovered through TS. This is important to note, as it is a common operational mistake to assume that new evidence would always reduce the size of the area that needs to be processed.



**FIGURE 1** ELEMENTS OF THE LAND RELEASE PROCESS



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The LR process should be supported by an effective Information Management (IM) system that:

- ensures that data are collected accurately and consistently;
- facilitates reporting in compliance with all required formats and schedules;
- ensures that information is entered correctly into databases, after having been subjected to quality checks;
- analyses the data to provide reliable IM services to an organisation's programme and operation management units and any other stakeholders requiring the information and;
- disseminates the information in a timely manner to those that require it.

Authorities and operators should actively identify, access and use all relevant sources of data, information and analysis in support of the LR process.

In addition to the details of “what was found where” that are collected, recorded and reported, authorities and agencies should ensure that the information is analysed to help identify trends, patterns or other characteristics that can help decision makers make valid, efficient decisions based on actual evidence, thereby increasing confidence in the LR process.

Where data indicate shortcomings in the LR process, those data should be used to support continual improvement of procedures, practice and policies.

The LR process requires decisions to be made in real world situations, which frequently do not offer simple, clearly defined circumstances. The nature of an EO hazard and the way in which it is distributed is key to determining how to maximise the efficiency and effectiveness of the LR process.

International Mine Action Standards (IMAS) contain guidance on all aspects of the LR process:

- IMAS 07.10 (Guide for the management of Land Release and Residual Contamination Operations) provides a broad overview of the stages of an LR operation
- IMAS 07.11 (Land Release) outlines the entire process of LR
- IMAS 08.10 (Non-Technical Survey) provides specific guidance on the principles of NTS
- IMAS 08.20 (Technical Survey) provides specific guidance on the principles of TS, the conduct of TS, and outlines how land can be reduced through TS
- IMAS 09.10 (Clearance requirements) provides the requirements for the conduct of clearance and the release of land through clearance
- IMAS 09.11 (Battle Area Clearance) provides the requirements for the conduct of Battle Area Clearance and the release of land through Battle Area Clearance

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# NON-TECHNICAL SURVEY – GENERAL PRINCIPLES

Non-Technical Survey (NTS) aims to provide accurate, evidence-based information regarding the presence or absence of Explosive Ordnance (EO) contamination. NTS further aims to provide detailed information on context-adapted reporting forms about the nature of a Suspected Hazardous Area (SHA) or Confirmed Hazardous Area (CHA), including its exact location, its size, the nature of expected EO hazards, patterns of EO, special features (trenches, river banks, fox holes, etc.), security, medical support, local environment and infrastructure. NTS is often carried out jointly with Community Liaison teams, in which case the NTS teams are also responsible for collecting impact-related data, which can be used in task prioritisation.

The Standard Operating Procedures (SOPs) for each operator should be in compliance with national mine action standards (NMAS) and contain as much clarity as possible on what constitutes direct and indirect evidence in the specific country context, as this can vary considerably between countries. It is strongly suggested that national mine action authorities (NMAAs) and operators develop country-specific evidence guides consistent with the national reporting forms. The operator's SOPs should also emphasise the training, qualifications and competencies that NTS staff are required to have. In addition, the SOPs should specify how these requirements will be quality assured and recorded. NTS is a specific discipline within LR, which requires specific training in both hard and soft skills; it should only be undertaken by suitably qualified, trained and equipped teams.

SOPs and NMAS should specify how NTS is incorporated into the overall Land Release (LR) concept and processes. They should also ensure that NTS is incorporated into both internal and external quality management systems and Information Management.

If dealing with previously identified hazardous areas based on outdated survey data, NTS has the potential to cancel those areas, or parts thereof, if the evidence justifies doing so.

There should never be a requirement for NTS teams to enter a potentially hazardous area. The entire NTS process should be carried out from safe ground, including site visits and interaction with informants. Likewise, informants should

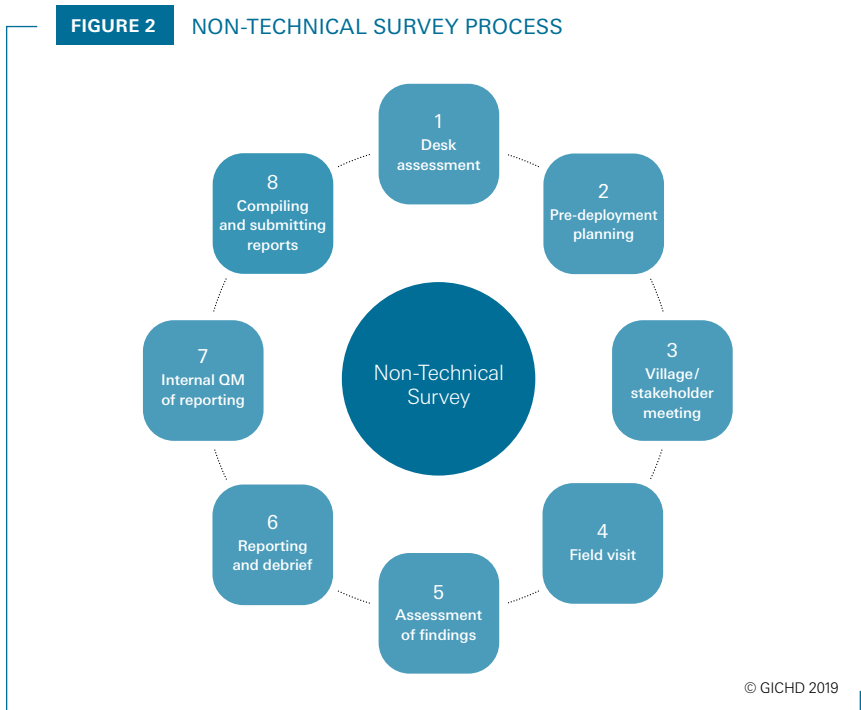
always be asked to indicate the area from safe ground, rather than taking the NTS team into any potentially hazardous area. Informants may include local authorities, local community members, ex-combatants and local security forces.

In circumstances where the primary evidence source is the local population, but that local population is no longer present, there is little to be gained from carrying out a field visit. If a field visit were to be implemented, it would almost invariably result in the need to return at a later date. There may, however, be circumstances where the desk study alone, in the absence of any local population, has produced sufficient evidence, such as aerial photography or minefield records, to justify the decision to implement Technical Survey (TS) operations.

Some operators have embedded a small TS or Explosive Ordnance Disposal (EOD) component within NTS teams, as determined by local circumstances. This is especially relevant in areas where single items of EO have been moved by local people and placed out of context. The TS or EOD component is often able to deal with single items (spot tasks), therefore increasing the efficiency of operations by negating the need for any other future LR process. This refers to IMAS 08.20 (Technical Survey) and 09.30 (Explosive Ordnance Disposal – EOD), respectively, and are outside the scope of this guide. NTS teams may be tasked with delivering Explosive Ordnance Risk Education (EORE) collecting data on victims and similar tasks, where appropriate.

Once an area has undergone any form of intrusive intervention, the results of that intervention should be compared to the evidence collected during NTS. This will indicate the reliability (or otherwise) of NTS and allow for any revisions to the NTS process as a whole to be undertaken, including NTS staff training. The results of any subsequent technical intervention can be seen as validation of the NTS process, creating a feedback loop and leading to continual improvement of the NTS process.

# NON-TECHNICAL SURVEY PROCESS



As seen in the diagram above, the NTS process consists of eight steps:

- Desk assessment
- Pre-deployment planning
- Village/stakeholder meeting
- Field visit
- Assessment of findings
- Reporting and debrief
- Internal quality management (QM) of reporting
- Compiling and submitting reports

## Desk assessment

Desk assessment is the collection of all possible, relevant data that are available. It can be considered to be a broader analysis of the NTS context, including the type and likely usage of Explosive Ordnance (EO) hazards likely to be encountered, but also historical and socio-economic data. It is carried out in advance of the field visit and is part of the planning process for the field visit. Typically, desk assessments involve a review of any previous mine action reports from in and around the area to be visited. This includes previously recorded Suspected Hazardous Areas (SHAs)/ Confirmed Hazardous Areas (CHAs), clearance or suspension reports and accident reports. Clearly, there will be a requirement to access any existing information that is available in the Information Management System for Mine Action (IMSMA), or its local equivalent.

Desk assessments should also gather topographical information from any available maps and satellite imagery. This information is to be used, not only to get an idea of the area to be visited, but also to plan routes in and out. If the past conflict involved the creation of defensive works, satellite or unmanned aerial vehicle (UAV) imagery can indicate the position of these, which can greatly assist an NTS team to narrow down the likely locations of minefields. Large defensive positions are also more likely to have been the target of air-delivered weapons and/or land service ammunition (LSA), so there is the possibility that these locations may have both mine and other EO contamination.

There are sometimes country-specific sources of information that may be available during the desk assessment phase. For example, in some countries, local newspapers often have stories of mine accidents that have not been reported elsewhere. Some countries may also have access to minefield records or bombing data which, if reliable, can provide a very effective starting point for a desk study.

An organisational or programme-wide gender and diversity analysis should also be included as input to the desk assessment stage. This helps to ensure that the team composition reflects the gender and diversity balance in the community and, therefore, results in the team accessing the most complete information possible.

It is entirely possible, especially when dealing with previously identified hazardous areas based on outdated survey data, that the desk assessment may determine that there is no need for a field visit to take place, and the SHA may then be cancelled. Reasons for this may be as simple as duplicate entries entered into the Information Management (IM) system, or incorrect coordinates for the previously identified erroneous SHA, placing it in an unlikely area, such as out to sea.



## Pre-deployment planning

If the desk assessment establishes that there is enough information to justify a field visit, pre-deployment planning needs to be carried out, in coordination with or at the request of the national mine action authority. This involves planning routes in and out and trying to establish, wherever possible, advance communication with the location to be visited. If this communication can be established, the team can request suitable dates and times to visit to ensure that there is the maximum possible community involvement.

The team's equipment needs to be checked to ensure that it is all in working order and that the team is in possession of spare batteries, etc. There are countries where it would also be appropriate to ensure that the security situation allows NTS teams to operate.

## Village/stakeholder meeting

On arriving in a new community, a meeting should be organised to try to involve as many community members as possible, including the head of the community and representatives from different social and gender/age groups and ethnicities, where relevant. Cultural sensitivity also plays an important role in ensuring the success, or failure, of the field visit. An effective gender and diversity analysis



Community meeting with NPA, Democratic Republic of the Congo, 2014

helps to build trust between the NTS team and the local community, by ensuring that the survey team adequately responds to the requirements presented by the cultural context. In many cultures it is vital that the NTS team visits the head of the community and other prominent community members to explain the purpose of NTS and to ask for permission. If the leader is supportive of the goal of the NTS team, the NTS process can be expected to go much more smoothly than would otherwise be the case. Several visits may be required to build up confidence with the informants and further individual meetings may take place.

The community meeting seeks to identify those community members that have information about any local EO hazards and the approximate location(s) of such hazards. If the community agrees that there is no local EO hazard, this information should be recorded, and community representatives asked to confirm that they agree with this assessment with their signatures. Finding no evidence of EO contamination is as important as finding evidence of contamination and should be recorded in accordance with national mine action standards (NMAS) minimum data requirements.

The NTS team should be trained to recognise that many types of EO are not typically found individually, these include cluster sub-munitions and mines. In instances where the NTS team finds evidence of an individual cluster sub-munition or a mine, this would strongly imply that more are present. However, when individual items of EO are found, they are not to be recorded as Confirmed Hazardous Areas. Instead, they should be recorded and reported as Explosive Ordnance Disposal (EOD) spot tasks.

## Field visits

Typically, when the community meeting has concluded and informants have been identified, the field visits begin. In the absence of informants but with a positive desk assessment, rigorous safety and security conditions should apply and ground processing assets should be available. It is likely that each possible SHA will involve a separate field visit but this depends on the size of the SHAs and how close they are to each other. The field visits seek to confirm the accuracy, or otherwise, of all the information collected during the desk assessment and to gather new evidence from informants with which to determine whether an area is contaminated with EO, or not. If previous mine action reports of SHAs/CHAs exist, the field visit will compare the situation on the ground to that previously reported and note any changes that may have occurred since the reports were made. It is during this process that land would typically be cancelled, if appropriate. The cancellation criteria should be established in national standards and Standard Operating Procedures (SOPs).



Survey team interviewing members of the local community, Cambodia, 2005

## Assessment of findings

Once the field visit is completed the team is to cross-check all collected information, assess and critically analyse all findings, including information gathered during the desk assessment, discussions with the local authority, military, police, village meeting/community discussions, key informant interviews and field visits.

If there are no previous reports of evidence of EO contamination then it is not possible to cancel any land. Land can only be cancelled if it was previously reported as being contaminated with EO. Land can also be cancelled when information gathered during the survey indicates that there is in fact no evidence of EO contamination in previously suspected areas, and if the process is prescribed in national standards, regulations or law. For example, some national standards stipulate that reclaimed land, which has been ploughed a minimum of three times since the last evidence of a mine was recorded, can be cancelled.

If an SHA/CHA has been identified, it should be marked, mapped as a polygon, recorded and the local population debriefed before leaving the site. If for whatever reason the access to an area is restricted, the use of aerial imagery could be used to gather further evidence.

On returning to the office, the initial report and the maps produced should be subject to a quality check, prior to being entered into the Information Management (IM) system.

## Reporting and debriefing

Detailed documentation of the information and evidence is a crucial element of NTS. Without a sufficiently accurate and robust reporting system, the survey itself may be good but planning and priority setting will fail.

## Internal QM of reporting

The national mine action authority (NMAA) establishes report forms and formats that conform to minimum data requirements and are compatible with the national mine action Information Management system. Each form, report and map must be carefully checked several times to ensure its accuracy and quality. The documentation should be reviewed and signed off by senior operational and IM staff before being entered into the IM system and before being submitted to the NMAA and any relevant administrative levels of authority.

## Compiling and submitting reports

Once a larger geographical area has been surveyed and documents completed and checked, a relevant summary should ideally be sent to a higher administrative level of authority, such as district or provincial authorities. These higher-level authorities may be able to identify possible errors and omissions in the reports. The involvement of higher-level authorities in the process can help to improve the relationship with the operator.

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# SOURCES OF INFORMATION

NTS is often seen as a simple process that is purely focussed on collecting information from the field, prior to any form of technical intervention. In fact, NTS is a more complex, dynamic undertaking that involves the eight-step process, followed by ongoing communication with the teams undertaking technical interventions.

Other mine action activities, such as Risk Education and Community Liaison, can also prove to be useful sources of information regarding Explosive Ordnance (EO) contamination.

## Data collection and analysis

As previously discussed, data collection begins with the desk assessment. Once this has been completed, the field visit should be scheduled. The field visit should be structured in such a way that both male and female informants with knowledge about potentially EO-contaminated areas are interviewed. As determined by an analysis of the context and previous experience, separate meetings should be arranged with households, family groups, female informants and children respectively, as these groups might be prevented from participating fully in mixed group meetings. The NTS team should be made up of diverse individuals and of mixed gender, to ensure that information from different gender and ethnic groups in the community can be gathered and cross referenced. Part of the pre-deployment planning will be to ensure that the NTS team knows the safe routes to the location and that it is equipped with a reliable means of communication, to ensure that it can contact the organisation's headquarters in case of any problems. Many countries have seasons during which access to certain areas is not possible, due to adverse weather conditions. NTS field visits should take these times of year into account when scheduling field visits.

The initial stage of the NTS visit should include a meeting with a local administrator or community leader/representative, depending on the social and government structures in the area of operations. This can facilitate cooperation with the affected community when done in a culturally-sensitive manner.

The NTS field visit should gather information from a number of sources, rather than just one person. Standard Operating Procedures (SOPs) will normally



Data analysis and report checking, NTS training in Lebanon, 2018

specify that a certain minimum number of sources is required, to ensure confidence that the community overall supports the findings of NTS. The gender and age of informants should also be recorded, so that quality management (QM) can determine whether or not NTS teams are effectively reaching both genders and all ages. The names and contact details of all sources should be recorded in the NTS report, so that any future follow-up can, if required, confirm the information.

Once the field visit has been concluded, it is important that representatives of the local community actually sign the NTS forms to indicate that they are in agreement with the information provided.

The NTS process does not end with the field visit; it is an ongoing process of collecting and confirming evidence to help with the continual improvement of the Land Release (LR) process. NTS and any technical intervention team must share information, so that the NTS team can find out how reliable the evidence that they have collected is and how it can be improved in the future.

It should be stressed that it is just as important for the NTS team to collect and record evidence that supports the conclusion that there is no EO contamination in a given area, as it is to find evidence of EO contamination. The documentation process for determining that there is no Explosive Ordnance should be as rigidly adhered to as for those areas where EO contamination is suspected or confirmed. The report form will testify to how information was cross-checked, and provides evidence of lack of contamination gathered, with the support of the local community. If there is any future adverse event in a location where the NTS process concluded that there was no evidence of EO contamination, it is important to document why that decision was made, so that lessons may be learned.

## **Data collection in urban areas**

Conflicts in urban areas present additional challenges for NTS, as collapsed buildings and other infrastructure often conceal EO contamination, meaning that local people are unaware of its existence. Recent conflicts have seen the extensive use of improvised explosive devices in urban areas, which pose a hazard to NTS teams as well as to local people.

These conflicts often produce large population movements into urban areas, which results in a lack of local knowledge among the newly-arrived residents, thereby creating a challenge for NTS teams. Some parts of cities may have been subjected to a greater degree of EO contamination than other parts, which leads to population displacement within the same urban environment. As a result, displaced people may know more about the EO contamination in the immediate areas of their former homes than they do about their current surroundings.

In this context, adapted standards and SOPs for NTS operations in urban areas are required to ensure that staff involved follow special training and deployment, and implement specifically designed operational procedures for which they are accredited. NTS specific requirements for operations in urban areas are outside the scope of this guide.





[Survey team conducting operations in West Mosul, Iraq, 2018](#)

## Classification of sources

Not all sources are equally reliable and some may have different motives when giving information to the NTS team. For example, some landowners may claim that their land is affected by EO contamination because they think that the land is worth more money once clearance has been done. In these instances, it is vital that information is sought from other sources to confirm that the community in general believes that the land is contaminated and not just the landowner. The requirement to consult confirmatory sources is often set out in SOPs and national mine action standards (NMAS).

When dealing with sources, the NTS team should always verify that the source lives in the relevant location and has lived there for long enough to possess useful knowledge of the local area.

Sources are often classified by the perceived reliability of the evidence that they are able to provide. In many cases, SOPs will classify sources and specify that the NTS teams should seek out specific types of sources, such as current or former combatants with direct knowledge of the nature and location of EO contamination.

Relevant experience in the country/region will help to determine how information sources are classified. This relevant experience often comes from comparing the information received with the actual results of previous technical interventions, which will indicate the previous level of reliability of similar sources elsewhere.

Once a classification system has been established, it should be reviewed at suitable intervals to ensure that it reflects current findings from the field.

## **Confidence in sources and evidence**

It is not unusual to find that there is conflicting information about the status of a particular area of land, with one person claiming that it is contaminated and another claiming that it is not. In these cases, it is important to analyse why these people have conflicting views about the same piece of land.

The NTS team needs to be able to critically analyse the information that they collect. For instance, if an informant claims that a road is not used, owing to the suspicion of mines, but the NTS team member can see multiple tyre tracks or footprints on the road, there would be little confidence in the informant, or the information provided.

The use of land, roads or other infrastructure by local communities is an important factor to be taken into account when assessing the accuracy and reliability of new information. If, for example, a landowner claims that his land is mined and requires clearance, but the land shows clear signs of being used (e.g. It has been planted with crops or grazed by animals) the physical evidence suggests that the information provided by the landowner is unreliable and further investigation is required.

The use of land, roads or other infrastructure should also be considered when cancelling parts of or whole existing hazardous areas. The precise criteria for cancellation vary from country to country and should be specified in both national standards and operator SOPs.

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## LAND USE CATEGORIES/ PRIORITISATION

The NTS team will collect information from the local community about the different land use in the area. This is often achieved by the use of a locally produced community map that shows the areas that are used for different types of activity, such as cultivation, grazing, hunting, water collection, firewood collection, etc.

The different land uses will help to identify those areas to be prioritised for NTS and any subsequent technical interventions. For example, Explosive Ordnance (EO) contamination around a vital water source would typically be prioritised over EO contamination in an area used for hunting, when many other hunting areas exist.

The community map can also indicate areas that were previously reported to be contaminated with EO but are now in use. This is very useful evidence that constitutes the first step when considering any possible cancellation of the area.



The Bosnia and Herzegovina Civil Protection team analysing completed operations and future prioritisation with the national mine action centre, 2014

When considering the cancellation of areas that are in use, it is important to adopt a systematic approach that is clearly documented, so that any decision can be shown to be evidence-based and reviewed in the future. A systematic approach should consider the following:

- a. an understanding of the type, nature and distribution of any EO contamination in the region and especially within the immediate vicinity of the suspected area;
- b. a clear and accurate definition of the precise boundaries of the area being used and any area not being used;
- c. how the area has been used, including the depth of any intrusive activities, and the density and intensity of human and mechanical traffic;
- d. how long the area has been used for what, if at all, and which activities have been undertaken at different times;
- e. the results of the monitoring of other areas that have been similarly assessed and previously cancelled.



Clearance activity in Sri Lanka during the rainy season. Working on previously cultivated land will make people wonder about the quality of the initial survey

It may be possible to divide the area into subsidiary zones that have been subjected to different usages over different lengths of time, which could result in different levels of confidence about whether or not some subsidiary zones can be considered eligible for cancellation. Suspected or Confirmed Hazardous Areas (SHAs/CHAs) can also be subdivided when different contamination types are identified in different subsidiary zones and when different technical methodologies

may be deployed in different subsidiary zones. For example, metal fragmentation mines with tripwires have been seen in one subsidiary zone and large, partially-buried anti-vehicle mines in another.

The implementation of subsidiary zones during NTS should be further reviewed during the conduct of technical interventions, in order to continually improve the NTS process.

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## EVIDENCE

The evidence collected by NTS teams falls into two broad categories: indirect evidence and direct evidence.

National standards should define what constitutes indirect and direct evidence and these definitions should also be reflected in the relevant organisational Standard Operating Procedures (SOPs). Each country should ensure that its definitions of indirect and direct evidence are appropriate for its own context and not copied verbatim from International Mine Action Standards (IMAS). Generally speaking, indirect evidence is second-hand, more informal information about possible Explosive Ordnance (EO) contamination. Direct evidence is first-hand evidence that strongly indicates the presence of EO contamination.



Survey team collecting information immediately post conflict, Sri Lanka, 2009





Interview with farmers, Colombia, 2012

## Indirect evidence

Verbal indirect evidence comes from second-hand sources of information. Second-hand sources are people that did not actually see the Explosive Ordnance being placed/used and did not have any role in its placement or use.

Another source of indirect evidence is one more stage removed from the second-hand source. These are sources that have not actually seen the EO being placed/used but have been told about the hazard by a third party who may only be repeating what they have heard. Indirect evidence may come from informants who have, for example, heard that there was once an accident in the area but don't know exactly where it was.

The third source of indirect evidence could also be the information that comes from historical sources and records, that have either previously been proven to be unreliable or their reliability and accuracy have yet to be assessed.

IMAS 08.10 (Non-Technical Survey) provides some examples of what may constitute indirect evidence:

- Potentially productive land not in use;
- Second or third-hand verbal reports from local population/former combatants;
- EO records, where the reliability of such records remains open to doubt or has not been assessed;
- Analysis of other known contamination areas, tactics and historical sources;



- Known former combat zones;
- Existence of trenches and barbed wire;
- Reports from previous surveys, which are not supported by direct evidence of the presence of contamination;
- EO accidents or incidents where the location of the event cannot be accurately identified;
- The presence of components that could potentially be used in the construction of improvised explosive devices (IEDs), which is specific to the local context.

## Direct evidence

The best form of direct evidence is EO that can be observed and recorded by the NTS team. A traditional NTS team would have to observe this evidence from a safe area, without entering the hazardous area. The team may be equipped with an unmanned aerial vehicle (UAV), which could be flown over any area of interest. The UAV would seek visual confirmation of any threat, without requiring any NTS team member to physically enter the area. If the NTS team also has a Technical Survey (TS) component, the TS component may enter the area and seek further confirmation of the EO contamination. The implementation of TS requires a significantly greater level of deployment than NTS. It also requires full medical and casualty evacuation support to be on hand.

Photo: Colin King/Femix Insight Ltd



The characteristic signature from the detonation of a BLU-97 in Kosovo. It is likely that unexploded submunitions will be found nearby

Another form of direct evidence would be items that are associated with EO contamination. In the case of mines or cluster submunitions, this might be packaging materials observed in the vicinity. In certain contexts, where previous experience has shown it to be the case, the physical identification of military positions could indicate the presence of EO. In these cases, the NTS team should try to identify which side of the military position was most likely to have been approached by enemy forces, because this side is more likely to have been protected with mines.

NTS teams should be trained not only to recognise the most common items of EO that they are likely to encounter in the area but also some of the most recognisable component parts of the EO. Members of local communities will often pick up parts of EO; this practice should, of course, be discouraged and risk education training for the communities be provided in these instances. However, if some parts of EO have been collected, the NTS team can gain valuable evidence about the nature of the threat from these parts.

Some examples of this would be the tell-tale small parachutes and spider-like end caps associated with BLU-97 cluster strikes or the very distinctive springs that are found at the front of the BL-755 submunition. Likewise, local communities may have gathered pieces from locations where mines have previously detonated; these pieces can indicate the precise model of mine that was used.



Photo: Colin King/Fenix Insight Ltd

Abandoned bombs in Mozambique, where surrounding undergrowth increases the risk from bush fires

If the threat comes from tripwire-activated mines, those placing the mines may have left empty wire spools in the vicinity. The spools would have been used to store the tripwires prior to unwinding them and then discarded after use. The tripwires associated with mines are often tied to either metal or wooden stakes, and if the mines themselves are not visible, it may be possible to make out these tether stakes. At certain times of the year, the tripwires themselves are more likely to be visible in the early morning, when dew has settled on them during the night, thus making them appear as a line of water drops.

NTS teams should not remove any physical evidence from the location it was found in, as the evidence may be hazardous. It is not the role of the NTS team to make technical judgements about what evidence may or may not pose a hazard. Physical evidence should not be handled as this could present a threat to the team members and set a bad precedent for local communities. If it is safe to do so, physical evidence should be photographed with a scale beside it and then included in the NTS report.

In certain cases, direct evidence may also come from historical sources and records that have previously been shown to be accurate and reliable. This would be the case if any minefield records existed and those minefield records had been shown to be accurate in other locations.

The most common form of direct evidence comes from people with first-hand knowledge of the location and type of EO. This includes former and serving military who may have been involved in the emplacement of the EO or any subsequent clearance efforts. Direct evidence can also come from individuals who have ventured into areas not normally used by other people, such as woodcutters or subsistence farmers, who may have observed items that would otherwise have been missed. Likewise, any victims of EO will be able to provide information about the location of their accident and perhaps information about what it was that injured them.

IMAS 08.10 also highlights some examples of direct evidence:

- EO records, where the reliability of such records has been confirmed during previous operations
- Visual observation of EO, EO parts, fragmentation or craters
- Detonations by burning or by animals
- Mine signs, fencing, ancillary equipment (boxes, cannisters), etc. associated with contamination

- EO accidents or incidents where the location of the event can be accurately determined
- Information from military or former military who laid mines in the area
- Information from local population who have seen EO contamination
- Bombing data from proven and reliable sources
- Tactical assessment based on previous experience of EO hazards in comparable areas
- Wreckage of vehicles that have been damaged/destroyed by anti-vehicle mines

In some contexts, it may also be appropriate to consider any visible evidence of IEDs, which could include the following: partially exposed wires, pressure plates, locally manufactured main charges, etc. Nationally developed, evidence-based guidelines are highly recommended to support the Land Release process.

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## CRITERIA FOR THE DEFINITION OF AN SHA AND CHA

The precise criteria used to define the status of an area as being either free from any suspicion of Explosive Ordnance (EO) contamination, suspected of being contaminated (SHA) or confirmed as being contaminated (CHA) should be defined in national standards and, by extension, in operators' Standard Operating Procedures (SOPs).

Some national standards specify that an area needs to have been ploughed for at least three years, with nothing found, before it can be considered for cancellation. This is merely an example; different criteria will need to be established for different countries and conditions.

National standards, evidence-based guidelines and SOPs should provide a list of sources of both indirect and direct evidence that can be used to determine the classification of the information and how that then leads to the classification of the associated hazardous area.

The criteria to be used for creating, refining, differentiating between, and partially or wholly cancelling SHAs and CHAs should be clear, agreed and understood by



Direct evidence would generally lead to the creation of a CHA in the form of a polygon, the starting point for clearance operations. This shows a minefield control point in Angola, 2007

all involved. The criteria are typically developed through a process of discussion and agreement between stakeholders.

The national mine action authority (NMAA) should develop criteria to:

- a. promote consistent definitions of what constitutes SHAs and CHAs;
- b. promote the recording of spot Explosive Ordnance Disposal (EOD) tasks, where appropriate;
- b. promote uniform application of land cancellation, reduction and clearance processes amongst operators;
- c. simplify the management of land cancellation, reduction and clearance processes;
- d. provide a framework for states that needs to document and demonstrate compliance with international conventions; and
- e. provide an auditable trail of documented decisions that may assist with resolving questions relating to any future liability in the case of EO incidents.





NTS training course, Lebanon, 2018

Indirect evidence would generally lead to the creation of an SHA and direct evidence would generally lead to the creation of a CHA. Once a hazardous area has been defined as either an SHA or a CHA, the NTS team should carefully and accurately delineate the boundaries of the area.

One key condition for the cancellation of any area through Non-Technical Survey is that “all reasonable effort” has been applied throughout the process. What constitutes “all reasonable effort” should be defined in the appropriate national standards but for cancellation to be considered appropriate, the NTS team must be able to demonstrate that there is no evidence of EO contamination in the area.

For the absence of evidence to be taken as justification for cancellation it must be shown that, had contamination been present, all of the efforts applied could have been reasonably expected to have found that contamination.

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# EVIDENCE-BASED, DECISION-MAKING PROCESS

Any decisions related to the definition of Explosive Ordnance Disposal spot tasks, SHAs, CHAs and areas to be cancelled should be taken on the basis of available evidence. The quality and quantity of the available evidence is the foundation upon which the quality and reliability of decisions will be made. As these decisions could potentially result in death or serious injury if incorrect, it is vital that they are not taken lightly and that they are subject to continual review and, wherever possible, improvement.

All evidence needs to be continually compared and reviewed, in order to provide the mine action community with the best information available.

NTS teams should be aware of the types of Explosive Ordnance (EO) contamination they are likely to encounter in their specific areas of operation and how that EO contamination is likely to have been used. Any finds of previously unknown EO or previously unknown methods of deployment should be fed back into the system, in order for NTS teams to continually improve their knowledge base.

If appropriate, NTS teams should be trained to understand the effects of the passage of time on the sensitivity of EO, the distribution of EO and its detectability. For example, over a period of time springs and safety pins are likely to rust, and containers may become deformed after exposure to hot and cold temperatures. Likewise, mines planted on a slope could start sliding downhill once subject to sufficient environmental exposure.

The evidence collected during NTS should be compared with the evidence, or lack thereof, collected during any subsequent technical interventions. This acts as a form of quality management for the NTS process and helps to build confidence that the process is continually improving. It also helps to establish evidence about the respective reliability of different information sources.

Should there be any adverse events involving EO in land that was previously cancelled, reduced or cleared, it is vital to review the evidence-based decision-making process to look for means of improvement and to minimise the possibility of any more adverse events.

It is vital that the use of all appropriate evidence in support of decision-making is documented, in order to establish and maintain confidence in Non-Technical Survey and in the overall land release process. Such evidence should also be transparent and made available to support any investigations into matters relating to liability.

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## BASIC IDENTIFICATION OF EXPLOSIVE ORDNANCE

Non-Technical Survey (NTS) teams should always be trained to recognise the most common types of Explosive Ordnance (EO) that they are likely to encounter during operations. At the very minimum, NTS teams should be able to identify the different classifications of EO. For example, every member of an NTS team should be able to distinguish between a mine, a hand grenade, an artillery projectile and a missile. Whilst ideal, it is not always a requirement that an NTS team member should know the precise model of the EO that has been found but the team member should be able to make a generic identification.



Bounding fragmentation mine



NTS team members should never handle EO and should instruct informants never to handle or disturb EO. Even if the NTS team member knows that the EO is safe to move, doing so sets a precedent in affected communities that may lead members of those communities to handle EO in the future.

## Photos of EO or suspicious objects

NTS team members should be trained to take clear photographs of Explosive Ordnance items and suspicious objects. These photographs should always be taken from safe ground and it should be remembered that, although having photographs of an item is ideal, safety should not be compromised in order to take those photographs.



Identification of EO items, NTS training course, Lebanon, 2018

It is often difficult to tell the size of items on digital images without using some sort of scale. However, for NTS teams it is not always possible to place a ruler or other object beside the item, without compromising their safety. On those occasions where it is safe to do so, the NTS team may place a ruler beside the item to provide approximate dimensions for those interpreting the images.

Should the NTS team be equipped with an unmanned aerial vehicle (UAV) this would generally be the preferred method of recording images of the item.

## GPS coordinates of EO or suspicious objects

The location of the EO item or the suspicious object should be accurately recorded using a global positioning system (GPS). National standards and Standard Operating Procedures (SOPs) should specify which GPS map datum system should be used and all GPS units should be configured to operate on the same system. Generally speaking, the map datum used on the GPS should be the same as the map datum used on any physical or digital maps that exist of the area, otherwise significant errors may arise between the position shown on the GPS unit and the map. Different areas of the world use different map data, so it is important to verify with the national mine action authority (NMAA) which map datum should be used in a specific country.

Organisations conducting NTS should implement appropriate quality management processes for the collection, recording and reporting of information. Senior operational personnel should review NTS reports, prior to those reports being submitted for data entry. After that, database managers should provide survey team leaders with copies of database entries, including maps, for review before they are formally accepted in the database. This helps to prevent erroneous entries from being disseminated further.

If a Suspected Hazardous Area (SHA)/Confirmed Hazardous Area (CHA) is established, its perimeter should be recorded using GPS. In order to assist other teams to locate the area in the future, a benchmark and/or a reference point will need to be identified and these locations recorded using GPS.



NTS field accreditation, Colombia, 2013



Global Non-Technical Survey course, Germany, 2016

## Marking of SHA/CHA/EO

The temporary marking of any identified SHA/CHA/EO is normally the role of the NTS team that has identified it. Marking is carried out in accordance with the organisation's SOPs and national standards. If there are no national standards in use, the organisation shall ensure that its SOPs conform to IMAS 08.40 (Marking Mine and UXO Hazards).

The perimeter of the SHA/CHA is normally marked with warning tape and/or hazard signs that clearly warn people not to enter the area. If the follow-up technical intervention is likely to occur after a considerable delay, it may be necessary to visit the marked location periodically to maintain the marking. Local populations should be briefed about the meaning of the marking system that has been used.

Individual items of EO should be marked in accordance with SOPs. These will specify the distance around the item that should be maintained during the marking process. Items of EO should never be moved or otherwise disturbed during the marking process.

It will be necessary for the NTS team to mark the location of the benchmark and any reference points, so that the location can be easily identified in the future.



This is generally achieved using spray paint on identifiable points. Buildings are often used as both benchmarks and reference points, in which case permission from the building's owner should be sought prior to spray painting.



Example of a hazard sign

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## REPORTING REQUIREMENTS

The information that is collected, recorded and reported by NTS teams is the foundation upon which the Land Release (LR) process rests. Therefore, it is imperative that the information is of the highest quality possible and that it is recorded and reported as accurately as possible.

All stakeholders should ensure that the NTS documentation satisfies quality requirements and reflects the needs of all information users. The information should be collected in a systematic manner and should conform to a common

reporting standard, which should be established in the national mine action standards. Should any shortcomings or nonconformities be found in the quality of the information collected during NTS, appropriate corrective and preventive action should be taken. The constant re-evaluation of evidence should be part of the LR process.

Whatever the reporting standard that is established, all of the raw evidence that has been collected during NTS should be retained by a competent authority. In the case of any future problem regarding the decisions made as a result of NTS, the raw evidence may help to establish if there was any discrepancy between the raw evidence and the NTS reporting system.

The information collected during NTS will form a key part of the documentation that is to be handed over to those teams that will carry out future technical interventions and it will be included in the documentation required for the subsequent handover of the land.

Location maps should be used when reporting the boundaries of Suspected Hazardous Areas (SHAs) or Confirmed Hazardous Areas (CHAs). These maps may be physical or digital maps and should include all turning points of the polygon, in addition to the location of the benchmark and any reference points. The maps should be produced to scale and include a north marker and a unique identifier. Wherever possible, the maps should be detailed enough to show the location of any direct evidence of Explosive Ordnance contamination.

Turning points are normally recorded by global positioning systems (GPS) and when overlaid on a map, care should be taken to ensure that the precise location of the polygon is accurately represented on the map. Some older maps lack the accuracy commonly associated with GPS, so although the GPS coordinates may be correct, once overlaid on an inaccurate map, the SHA/CHA may be shown to be in the “wrong” location. If this is the case, it should be brought to the attention of the Information Management department.

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## NTS TEAM REQUIREMENTS

The composition, equipment and training of NTS teams varies from country to country and also from organisation to organisation. NTS teams are rarely formed to only conduct NTS and will usually be expected to fulfil other functions, such as Mine Risk Education, marking, Community Liaison and, in some cases, Technical Survey (TS). Therefore, there is a considerable variation in the composition, equipment and training required for each team.



NPA NTS team, Zimbabwe, 2013

NTS teams need to possess a combination of both interpersonal and technical skills. The interpersonal skills assist with gaining the confidence of the local population, in order to gather the relevant information. The technical skills required fall into three different skill sets:

- the requisite knowledge about the Explosive Ordnance (EO) found in the region and how it was used;
- the ability to critically analyse the information collected to make informed decisions about the location of EO contamination and;
- the ability to accurately record and map the information.

## Team composition and training

The precise composition of any NTS team will vary in accordance with the additional roles that the team may also be tasked with. Most organisations establish NTS teams composed of 4-6 members, which includes a team leader, driver and surveyors.

Wherever possible, the NTS team leader should be an experienced deminer, with a good background in the nature and methods of use of EO in the region. The team leader should also have good interpersonal and technical skills. In mature programmes, where appropriate individuals are available, someone such as a former demining team leader with the requisite skills should be considered for the role of NTS team leader.

If NTS teams are also tasked to implement some form of limited TS, as some organisations do, a dedicated medic and a casualty evacuation vehicle will also be required. If the NTS team is not undertaking any form of intrusive intervention, there may be no requirement for a dedicated medic but it is good practice to ensure that the team members have received first-aid training. Of course, those NTS teams implementing limited TS will need to include trained deminers.

The NTS team should, whenever possible, incorporate members of both genders, which allows for a more culturally-sensitive approach and should enable a better quality of information to be collected, once the different gender perspectives have been taken into account. Having a team with both genders is especially important when the cultural context makes it inappropriate for different genders to interact with one another. The different genders may have different and complementary/contradictory information about EO contamination, so it is important that they are both consulted. In addition to gender, there may be other diversity considerations to bear in mind; this is especially the case when dealing with distinct ethnic minorities, who may feel more comfortable talking to members of their own ethnicity, rather than to members of the main ethnic group.

Team members should be culturally sensitive and able to fluently communicate with the population that they are working with. When populations are ethnically or linguistically diverse, care should be taken to ensure that this diversity is reflected within the NTS team.

NTS team members will need to be able to critically analyse the information they are given and then accurately record it, both on the ground and in the required reporting format.

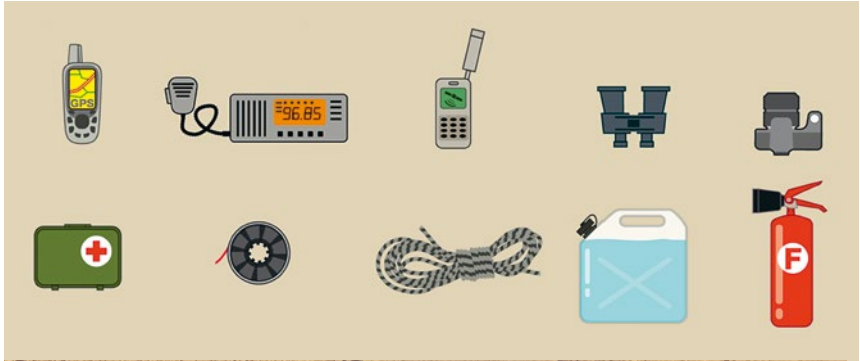
## Team equipment

As with the team composition, the team equipment will vary from organisation to organisation and from country to country, as it is dependent upon whatever additional roles the NTS team may be asked to fulfil.

The basic level of equipment that any NTS team should carry will be specified in the appropriate Standard Operating Procedure (SOP), however, a suggested list is as follows:

- a. Minimum of 2 GPS units with spare batteries
- b. Laser rangefinder
- c. Appropriate equipment for environmental conditions (rain gear, warm clothes, sun hat etc.)
- d. Handheld VHF radios (for communication between team members)
- e. Reliable means of communication with HQ (mobile/satellite phone, etc.)
- f. Camera
- g. First aid kit
- h. Mine marking signs, hammer and nails
- i. Compass (preferably prismatic)
- j. Ruler
- k. Measuring tape
- m. Paint for benchmark
- n. Mine marking tape
- o. A4 millimetre paper for sketch map
- p. A0 paper for community map
- q. Required paperwork (task folder, travel authorisation, notebook, data entry forms/reports etc.)
- r. Pens, pencils, markers
- s. Emergency food and water (as appropriate)
- t. Vehicle(s) appropriate for the terrain and large enough to transport all team members and equipment
- u. Photographs of the most commonly encountered EO
- v. Unmanned aerial vehicles (drones), as deemed necessary





NTS team equipment

Many organisations are moving towards equipping NTS teams with electronic means of recording and transmitting the information received. However, NTS teams should still take paper forms as a backup, in case of any technical problems.

If the team is also trained and tasked to undertake TS, it should also be equipped with the appropriate detectors, a dedicated medic, a medical trauma pack and a casualty evacuation vehicle.

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# TRAINING REQUIREMENTS FOR NTS TEAMS

Good quality training and recruitment of NTS teams is vital to ensure high quality NTS. Wherever possible, some NTS team members should be experienced deminers with good knowledge of the nature of local Explosive Ordnance (EO) contamination.

NTS teams should be trained in both soft (interpersonal) and hard (technical) skills required to carry out their role.

Some suggested topics for an NTS training syllabus are as follows:

1. Five pillars of mine action
2. Introduction to mine action in the relevant country (current situation, coordination, other actors)
3. Land Release concept and processes
4. NTS standards, from IMAS to NMAS to SOPs
5. Basic identification of EO
6. History of the conflict
7. Mine laying and military tactics in the country
8. Identifying/managing sources of information
9. Critical thinking – managing, classifying and recognising evidence
10. Datum and coordinates system (i.e. latitude/longitude and Universal Transverse Mercator – UTM)
11. Map scales
12. Map reading (topographical, satellite, aerial photo, Google Earth)
13. Use of GPS (set up and logging and retrieving waypoints)
14. Use of compass (normal and prismatic)
15. Bearings and distance (tape measure, rangefinder, distance estimations)
16. Mapping (hand-drawn sketch map and ArcGIS)
17. Delivery of basic risk education

18. Interview techniques and communication skills (avoidance prepping, closed or leading questions, interviews during community meetings and individual interviews)
19. Cultural and customary understanding, and behaviour and gender roles
20. First aid and MEDEVAC
21. Communications
22. Reporting
23. Vehicle driving and maintenance (daily checks, tyre changes, use of fire extinguisher, etc.)
24. Information Management systems



[NTS training course, Lebanon, 2018](#)

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# INFORMATION MANAGEMENT PRINCIPLES FOR NTS

Information Management (IM) involves the collection, storage, analysis of data and use of information. Non-Technical Survey (NTS) is a key component in the collection of information. All IM processes and procedures should be implemented in accordance with International Mine Action Standards (IMAS) 05.10 (Information Management for Mine Action), national mine action standards (NMAS) and Standard Operating Procedures (SOPs).

The IM system should have the capability to analyse the information provided by NTS teams and look for both commonalities and outliers in the data provided.

The responsibility for good IM is the responsibility of the whole organisation, rather than just the IM department itself. Organisations should try to ensure that IM is embedded in the awareness and training of operational staff and is seen as an integral part of the overall mine action team, rather than being a stand-alone entity. Both operational staff and IM staff should have a good understanding of the roles and requirements of both sides, to allow them to work together to establish optimal solutions.

The national mine action authority (NMAA) shall establish a national standard for the format of NTS reporting, which is to be used by all organisations accredited to undertake NTS. Wherever possible, this national standard should be in compliance with IMAS minimum data requirements. Individual organisations may have to collect additional information as part of their requirements for donors, but the additional information should not be interspersed with the information required by the NMAA.

The information gathered by NTS should be subject to quality management prior to being entered into the organisation's IM system. Once entered into the Information Management system, the NTS team leader should verify that the entry corresponds to the base documentation. The information will be further checked by the IM manager and the operations officer prior to being sent to the NMAA for entry into the national database.

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## RELATIONSHIP BETWEEN NTS AND TS

The Land Release (LR) process generally starts with NTS and then leads on to TS and clearance, if warranted by the evidence found at each stage. All of these elements involve the collection, analysis and verification of evidence. NTS is normally the default first element in the LR process because it is more cost efficient and gives a logical evidence-based approach upon which to decide if any technical intervention is needed.

NTS and TS complement each other in the LR process and some organisations embed a TS capability within NTS teams. The aim of using TS elements in support of NTS is to immediately verify or disprove the evidence produced by NTS. This either leads to a more accurate definition of the perimeters of Confirmed Hazardous Areas (CHAs) or more areas being cancelled, or if they are new areas, not being recorded in the first place.

If an organisation embeds a TS component within an NTS team, this component generally consists of trained and experienced manual deminers equipped with detectors. Owing to the small size of the TS component, the TS carried out will be limited and targeted at specific areas. The aim of the TS is to either confirm



NTS training course, Thailand, 2016

that evidence of Explosive Ordnance contamination exists or to build confidence that areas are safe to be used.

In addition to the TS component, NTS teams may also have an Explosive Ordnance Disposal (EOD) component, which is able to deal with spot Explosive Ordnance Disposal tasks. When there is a Multi-Tasking Team, it is crucial that the reporting is clear, and no double entries or incorrect attributions of LR methodologies are linked with certain activities (e.g. cancellation of area should always be through NTS and not TS, etc).

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## COMMUNICATION IN NTS

The skills required for effective NTS can be divided into hard and soft skills. Hard skills are those associated with the technical aspects of NTS, such as identifying Explosive Ordnance (EO) contamination and recording hazardous areas. Soft skills for NTS are those skills involved in establishing interpersonal and culturally appropriate connections that encourage sources to want to provide information to the NTS team.

The NTS team should always dress and behave in a culturally appropriate manner.

The NTS team should identify all relevant sources of information in a community and ensure that information from these sources is appropriately collected and recorded. NTS teams rely on the goodwill of the communities and it is vital to maintain that goodwill.

NTS teams should be aware that repeated visits to the same informant may result in an increasing level of “survey fatigue”, so this should be avoided whenever possible.

### Interview techniques

When asking questions, always be polite and appreciative of the information that is received. The informants are under no obligation to provide any information at all, so NTS teams should try to create an atmosphere of mutual assistance; the community is helping the NTS team to do its job and the NTS is helping the community to deal with whatever EO contamination problem may exist.





Interview technique learning, global Non-Technical Survey course, Germany, 2016

Prior to beginning the interview, the interviewee should be made aware of the purpose of the NTS and asked if s/he is willing to cooperate. The interview should be carried out in a friendly, informal manner that encourages the interviewee to offer relevant information. Care should be taken to avoid making the interviewee feel uncomfortable and also to avoid the interview resembling any kind of interrogation.

Effective interviewing requires a structured approach that is both professional and efficient. The PRICE model of interviewing is recommended as being an approach that is ethical, fair and achieves consistent results.

PRICE is a mnemonic standing for:

- Planning and preparation
- Rapport
- Information
- Clarifying and confirming
- Evaluation

## Planning and preparation

Effective interviewing is based on good preparation and planning. A list of questions should be prepared that can be used to gather information from all prospective informants. These questions establish the criteria required for a successful interview. There will also be a requirement to assess the reliability of each prospective informant and not only the information that they provide.

## Rapport

At the start of the interview the aim should be to establish the right level of rapport with informants. The aim of the interview is to obtain good quality information. Putting informants at ease means that they are much more likely to talk freely. In some cases, several meetings might be required to ensure a good level of confidence is established with the informants.

## Information

Think of the interview as a structured conversation. The role of the interviewer is to give direction to that conversation by asking appropriate questions and steering it in the right direction. The aim should be for the informant to do most of the talking and the interviewer to do most of the listening.

## Clarifying and confirming

Encourage a free flow of information from the interviewee, let them tell their story. Try not to interrupt, take note of questions you want to ask after the interviewee has finished. Informants must be given the opportunity to ask any questions of their own. At the end of the interview the interviewer should explain the next steps in the mine action process.

## Evaluation

After the interview the interviewer needs to evaluate the information collected against the criteria established during the preparation phase. For example, whether the interviewer feels that s/he has all of the information required to establish the perimeter of any hazardous area and the contact details of the informant in case any follow-up information is required.

Patience is a worthy attribute and it may be necessary to politely listen to other concerns voiced by the community, while gently trying to steer the interview back on topic.

Although the actual questions themselves may be presented in list form, the way they are asked should be as neutral and open as possible, without trying to lead the interviewee into making certain statements. The NTS team should avoid the possibility of implying that some answers would be preferred over others.



Whenever possible, questions should be open rather than closed. This means that questions with either a yes or a no answer should be discouraged. People should be encouraged to discuss their knowledge of EO contamination in the local area in a general way to begin with before asking them for any specific locations.

The NTS team will require the ability to think critically about the information they are receiving, in order to evaluate the reliability of both the information and the informant. For example, if an informant tells the team that a certain path has not been used for years, yet there is no vegetation on it and footsteps are clearly visible, it is clear that this information is incorrect. However, it is important to verify as the informant may actually be discussing a different path, so the error may be with the NTS team rather than the informant.

### **Cross-cultural communication**

In post-conflict situations involving different ethnicities speaking different languages, it is often helpful to have an NTS team made up of the different ethnicities. This would also be the case in areas where ethnic minorities are present.

In addition to always dressing and behaving in a culturally appropriate manner, NTS teams should research, if required, the appropriate cultural behaviour in the different contexts they are likely to be working in.



Interviewing a member of the local community, Colombia, 2013

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# GENDER AND DIVERSITY

Mainstreaming gender in NTS ensures that the contributions, concerns and needs of all members of affected communities are acknowledged and addressed without bias. This also benefits the whole community by ensuring a more coherent, holistic, multidimensional response to the different needs of mine-affected women, girls, boys and men. Gender mainstreaming in NTS is not only about equality, it is also about quality.

In addition to gender and age, there are other criteria that characterise different groups of people. These need to be taken into account to ensure that mine action benefits everyone equally. Roles, mobility patterns and knowledge of contamination differ due to gender and age, but are also influenced by other aspects, such as class, job, language, race, ethnicity, political affiliation, religion, education, sexual orientation, literacy, disability, residency status/migration history, etc. These and other aspects are referred to as “diversity”.

The NTS team should be made up of both male and female members, so that, if cultural norms require, male and female participants may be interviewed separately by members of their own gender.

The survey should be structured in such a way that both male and female informants with specific knowledge about potentially EO-contaminated areas are interviewed as part of the process.

## Equality and inclusion considerations for NTS

It should always be borne in mind that once those in leadership positions have spoken, those in less fortunate positions are often unwilling to say anything that could be considered to be against the “party line”.

Where appropriate, separate meetings should be arranged with households, family groups, female informants and children respectively, as these groups might be prevented from participating fully in mixed group meetings.

Additionally, the times and venues of meetings should take into account the roles and responsibilities of each group, to avoid inadvertently excluding one group because of their occupation or because of their different level of mobility.

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# QUALITY MANAGEMENT

Like any mine action activity, Non-Technical Survey (NTS) should be subject to quality management (QM), with the goal of continual improvement. QM will occur both internally (within the organisation) and externally (by the national mine action authority or a suitably qualified and accredited proxy).

NTS should be seen as part of the Land Release process, rather than as a stand-alone activity, and therefore subject to the same demanding quality management process applying to all operations. This is important because the best quality management of NTS is to compare the evidence it has gathered to the evidence collected during any subsequent technical intervention or to any adverse event post-cancellation.

## Internal process

QM of NTS, as in other mine action activities, can be divided into quality assurance (QA) of the processes of NTS and quality control (QC) of the product of NTS.

The internal QA process will focus on ensuring that:

- a. Standard Operating Procedures (SOPs) have been followed;
- b. relevant, logical and clear decisions have been made;
- c. necessary evidence has been collected and correctly documented in report forms designed with an agreed level of detail and;
- d. the most relevant and reliable information sources have been found and used.

The internal QC process is focussed on the quality of the product of NTS, which is the information (evidence) and the decisions made on the basis of that evidence. As such, the QC process should ensure that the information produced by NTS is:

- a. Relevant;
- b. Complete and;
- c. Accurate.

The above points should include such questions as:

- a.** Were the correct GPS coordinates given for the location in question?
- b.** Does the sketch map correspond to the electronic map?
- c.** Does the sketch map contain all relevant information?
- d.** Was the type of Explosive Ordnance (EO) contamination correctly recorded?
- e.** Was the perimeter of the hazardous area correctly identified and marked?
- f.** Were the names and contact details of sources correctly recorded?
- g.** If land has been cancelled, has the local community indicated their confidence that the cancelled land may be used?

In addition to the information produced by NTS, the internal QC process should verify the quality of the decisions made on the basis of that evidence:

- a.** Were the decisions made in accordance with the criteria laid down in SOPs and national mine action standards (NMAS)?
- b.** Are the decisions that have been made logical in this particular context?
- c.** Is there consistency between the decisions made by different teams or by the same team in different areas?

Although there is generally no technical sampling conducted of land cancelled by NTS, the subsequent use of that land will indicate the quality of the decisions made during NTS. Any adverse event could indicate that the decision made to cancel the land needs to be reviewed. This is not always the case, as findings of individual items of EO would not generally indicate that a review is required. Individual items of EO would generally be determined to constitute residual risk.

If the NTS team has recommended the cancellation of an area, it is vital that the recommendation is endorsed by a series of senior actors within the organisation before the recommendation is acted upon. The QC system should ensure that this process has been rigorously followed and documented.

The most informative method of internal QC occurs when the polygon defined by NTS is then subject to technical interventions. The locations and characteristics of any actual contamination discovered during technical interventions will be compared with the expected results of NTS. This will provide a clear relationship between the actual situation and the accuracy and completeness of the evidence that was described in the survey.

Any subsequent technical intervention will demonstrate if NTS was correct about the type of EO contamination and how closely the boundaries of the polygon were drawn in relation to the boundaries of the actual hazardous area.

## External process

External quality management of the NTS teams should be undertaken by the national mine action authority (NMAA) or a suitably qualified and accredited organisation on behalf of the NMAA.

Just like the internal QM processes described in the previous section, external QM will involve both quality assurance (QA) and quality control (QC). QA will examine the quality of the processes, which examines whether or not NTS was implemented in accordance with the relevant SOPs. This involves ensuring that the team is carrying all of the correct team equipment and that the equipment is functioning correctly, in addition to ensuring that the team is implementing the NTS process in accordance with SOPs.

With the field report forms, the QC process will examine the quality of the outputs from the NTS teams, which are the evidence gathered and the decisions made, based on that evidence. External QM will compare the evidence produced by the NTS teams to the evidence produced by any future technical interventions, or future adverse event, for indications of accuracy or inaccuracy.

It is possible that the organisation conducting a technical intervention after NTS is not the same organisation that conducted the survey. In these instances, the NMAA should ensure that the results of the technical interventions are shared with the organisation conducting the NTS, so that the process may benefit from the feedback.

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## SAFETY AND SECURITY IN THE FIELD



As in all mine action activities, safety and security are paramount in the conduct of NTS. The NTS team leader should detail a brief CASEVAC plan on arrival at every new site.

The risks to NTS teams are not limited to the risks associated with Explosive Ordnance (EO) but also include such aspects as driving in developing countries and the prevailing security situation in the areas of operation.

NTS is typically an activity that does not require any team members to enter hazardous areas. As such, there should not be a requirement for a dedicated medic in an NTS team. However, NTS team members should be trained in basic first aid and the team should be equipped with a basic first aid kit. This is not intended for the treatment of casualties caused by EO but rather for the treatment of everyday injuries that may occur.

The NTS team should always inform headquarters (HQ) of the location to be visited and the route to be taken. It may also be appropriate that the NTS team checks in with HQ at regular intervals throughout the day. This will require a reliable means of communication with HQ; this should be a mobile phone, satellite phone or HF radio, depending upon the local circumstances.

The NTS team should be aware of any movement restrictions that may be in place in the area of operations and coordinate with the relevant authorities to ensure compliance with these restrictions.

The NTS team should be aware of the location of the nearest medical facility and the route to it. In more remote locations, there may be a requirement to research the location of nearby airstrips or possible helicopter landing sites, if applicable.

NTS team members should only walk or drive in areas where there is no evidence of EO contamination and significant evidence of previous use of such areas.

If following an informant towards a potentially hazardous area, team members should only travel on well-used paths or areas that have been cultivated. When following an informant, it is important to ask that informant to stop some distance from the potentially hazardous area and to indicate the area from afar.

Informants should be dissuaded from walking into or throwing any objects into potentially hazardous areas.

If the NTS team contains an embedded TS component, all of the relevant Standard Operating Procedures specifying the safety precautions to be taken, should be followed.

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## RISK EDUCATION AFTER NTS

Non-Technical Survey (NTS) teams may have to be double-hatted and required to perform risk education, in addition to the NTS role. In this instance the NTS team will perform both NTS and risk education.



Risk education in Laos, 2008



For NTS teams that are not formally tasked with implementing the risk education role, there could still be a requirement to provide a basic level of risk education to affected communities, this includes a clear explanation of which areas have been marked as hazardous.

- Affected communities need to understand the requirement to stay out of those areas that have been temporarily marked as hazardous.
- Adult members of the community should ensure that children are made aware of the meaning of the marking and of the requirement to respect it.
- Affected communities should be made aware of the requirement to leave the marking in place and not to remove it.



[Risk education in Iraq, 2018](#)

Affected communities should be told that if any future suspected items of Explosive Ordnance (EO) are found they are not to be moved or otherwise disturbed. A reporting mechanism for any suspected items of EO should be established, to allow the affected community to report any future finds.

# TECHNOLOGY IN NTS

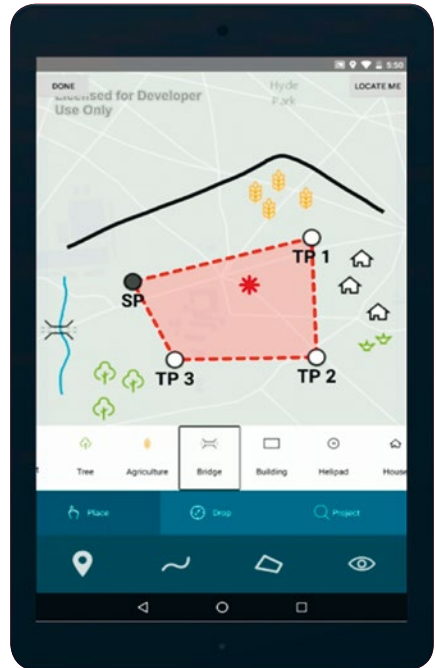
As in other areas of mine action, technology is playing a valuable role in the modernisation and increased effectiveness and efficiency of NTS. The two most meaningful contributions that technology has made to NTS are in the use of mobile applications and unmanned aerial systems (UAS). UAS are often referred to as drones.

## Mobile applications

Mobile applications allow the NTS teams to digitally collect data during field visits. The mobile application will be in the same format as the paper NTS forms but the data fields can be completed using a tablet or similar device. The advantage of using mobile applications is that the data can be remotely transmitted to the Information Management section whenever a mobile phone data connection is available. This saves a great deal of time and eliminates the possibility of data-inputting errors that are associated with manually entering paper forms into databases.

However, mobile applications do not eliminate the data inputting errors that may be made by the original NTS team. As such, it is vital that strong internal quality management (QM) controls are put in place to ensure that the data collected by the NTS team are accurate before they are entered into the database.

The use of mobile applications can be used as a management/quality management tool to verify the activities of the team at given times and locations.



The mine action reporting system (MARS) developed by the GICHD bridges the information gaps in mine action programmes and replaces paper forms with digital data collection tools. Above: making polygons and adding other sketch features

## Unmanned aerial systems

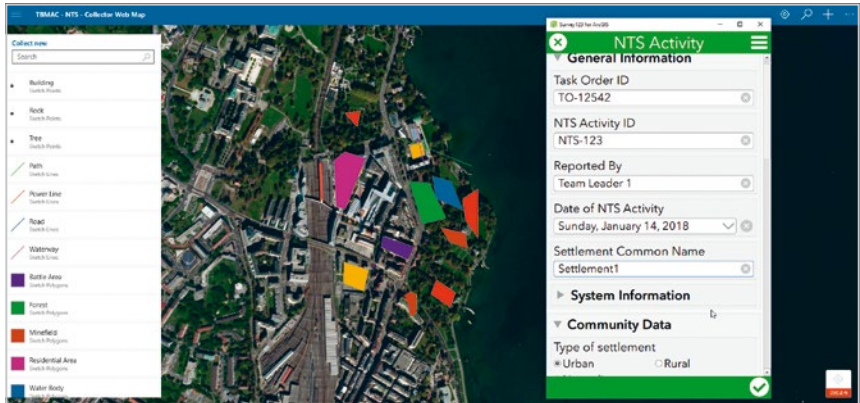
UAS have proved to be a very valuable tool for NTS teams. The UAS may be fitted with high definition cameras or thermal imaging sensors. However, a balance has to be found between the cost of high-end technical systems and the number of systems that are available to be used by NTS teams.

Cameras can show evidence or the lack of evidence in real-time, although the recording may require a more detailed analysis to verify details. Thermal imaging systems can show the difference in temperature that exists between the natural environment and any metal components. Thermal imaging sensors are more effective at the beginning of the day, when any metal components would heat up faster than the surrounding environment.

If UAS are to be used by NTS teams, there will be a requirement to train team members in their operation and in the maintenance and interpretation of the data that are produced.



The HALO Trust had this SHA recorded in the national database. The survey team noticed that it is actively used for agriculture (already for several years) so HALO Trust used UAS high temporal resolution imagery as proof for cancellation and attached it to the cancellation report



IMSMA Core is based on ESRI leading geographical information system (GIS) technology, thus benefiting from the latest developments; this includes 3D mapping, UAV imagery integration and data sharing

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## VISITORS TO NTS OPERATIONS

Any visitors to NTS operations must be thoroughly briefed on all safety aspects prior to deploying with the team.

- Visitors must agree to stay with the team during operations and not to unilaterally wander off.
- Visitors should agree to follow the instructions of NTS team members.
- Visitors from outside the organisation may have to sign a waiver absolving the organisation from any legal responsibility for any accident or injury of any kind.
- If the NTS team members feel that safety is being compromised in any way, the visitor should be escorted back to the vehicle and the visit shall end.

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# RESPONSIBILITIES AND OBLIGATIONS

Any organisation undertaking NTS has a number of responsibilities and obligations that it must undertake prior to and during the carrying out of NTS operations. These responsibilities and obligations are as follows:

- a. The organisation must be accredited by the national mine action authority (NMAA or equivalent) to undertake NTS;
- b. National standards should be applied. In the absence of national standards, International Mine Action Standards (IMAS) should be applied;
- c. The organisation must develop and apply accredited Standard Operating Procedures (SOPs) for NTS;
- d. The organisation must collect all necessary information as required by the NTS documentation;
- e. Where applicable, the organisation shall conduct a formal handover of assessed sites to those organisations conducting subsequent technical interventions;
- f. All required documentation shall be maintained and made available to the NMAA on request;
- g. The local community, of both genders and all age groups, shall be consulted with regards to key decisions made by NTS; and
- h. Report recipients should provide feedback about the quality, timeliness and content of the NTS reports, to support the continual improvement of the process.





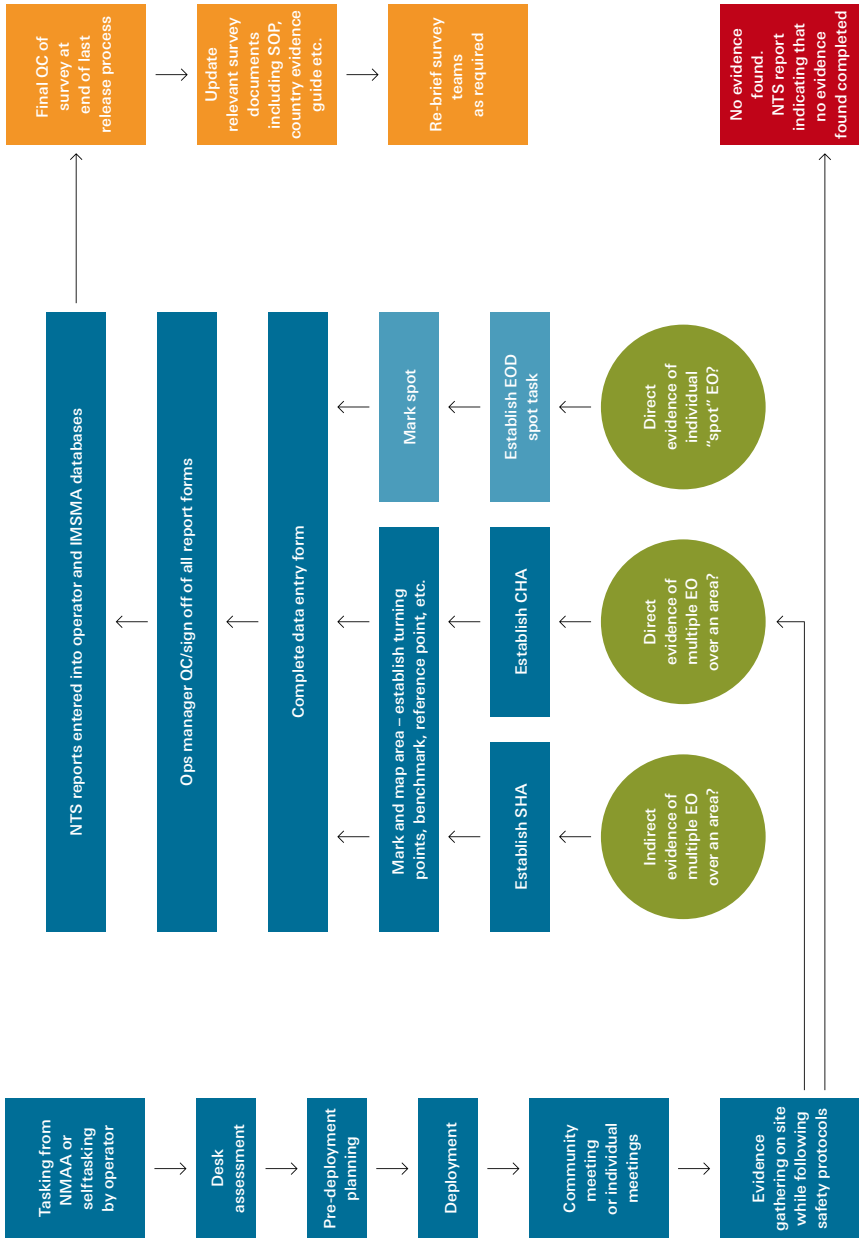


## ANNEX A

## NTS PROCESS MAP



# NTS PROCESS MAP



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