GUIDELINES for ELECTRONIC TRANSFER of SITE INVESTIGATION DATA

Building and Construction Authority

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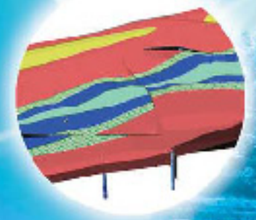
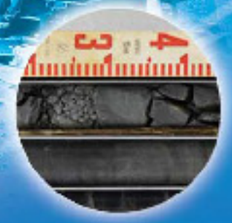
GUIDELINES
for ELECTRONIC TRANSFER of SITE INVESTIGATION DATA





Building and Construction Authority

GUIDELINES FOR ELECTRONIC TRANSFER OF SITE INVESTIGATION DATA

(Edition 2.0)
including addendum Sep 2021

Building and Construction Authority

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ACKNOWLEDGEMENT

This document has been prepared by the Building and Construction Authority (BCA) for use in accordance with the practices in Singapore. The requirements and format of electronic transfer of non-geophysical/conventional site investigation data to be adopted for Singapore, named as AGS(SG), are based on AGS (Edition 3.1) established by the Association of Geotechnical and Geoenvironmental Specialists (AGS).

BCA acknowledges the AGS for the establishment of a standard interchange format for use in the geotechnical and geoenvironmental industries, and their encouragement in allowing BCA to use the electronic transfer format and other information contained in their manual for producing this guidelines document.

Amendments

Page	Date of issue	Amendment
A4-1	Sep 2021	Added Appendix 4a & 4b

1 INTRODUCTION

1.1 Presently in Singapore, the data from site investigation works is not widely submitted or prepared in electronic format. For those who adopt electronic format, the format is not standardised as each user has a different format for the data, resulting in the lack of compatibility among various database systems to enable the sharing of geo-information.

1.2 BCA's Singapore Geological Office (SGO) has therefore prepared a standardised electronic format based on the needs and practices in Singapore. The requirements and format of electronic transfer are tailored basing on, where applicable, the AGS (Edition 3.1) established by the Association of Geotechnical and Geoenvironmental Specialists, UK (AGS). Such electronic format protocol is compatible with the standard geotechnical and geophysical electronic data formats used internationally.

1.3 The seamless transfer, interchange, storage and retrieval of site investigation data in a standardised electronic format will minimise cost and time, and enable a more efficient and greater use of the geo-information.

1.4 With a standardised electronic format, data can be used e.g. analyses and design, without time-consuming and costly re-entry of data with the associated potential for errors or incomplete data entry. It will also improve the preparation, transfer and storage of geo-information; promote education and research in engineering; and stimulate data exchange and collaboration among researchers and practitioners.

1.5 To encourage the data preparation, analysis, transfer and storage in electronic format, SGO prepares this guidelines document which presents a minimum standard for the electronic transfer of site investigation data.

1.6 The guidelines document covers two categories of data, namely non-geophysical or conventional data, and geophysical data. Basically, non-geophysical/conventional data will follow the AGS format while geophysical data follows the Log ASCII Standard (LAS), Log Information Standard (LIS) and Society of Exploration Geophysicists (SEGY) formats.

2 SCOPE

2.1 This publication is the first edition of the Singapore file format protocol and covers a standardised electronic format for the geological, geotechnical, geoenvironmental, geophysical field and laboratory testing data. It aims to standardise and encourage the use of the electronic format for site investigation data in Singapore.

3 USER SUPPORT

To help users, BCA prepares document of "Guidelines for Electronic Transfer of Site Investigation Data" which is available and may be downloaded from the BCA website at http://www.bca.gov.sg/StructuralPlan/others/Electronic_transfer_SI_data.pdf. An excel template for the preparation of AGS format can be downloaded from the BCA website.

4 SITE INVESTIGATION DATA

4.1 **Figure 1** shows the overall grouping of the data which can be obtained from the different types, methods and techniques of site investigations commonly used in Singapore. The site investigation data is broadly divided into two categories, namely non-geophysical/conventional data; and geophysical data. Details on the management of these data are described in the ensuing **Sections 5** and **6**.

5 NON-GEOPHYSICAL/CONVENTIONAL DATA MANAGEMENT

5.1 For non-geophysical/conventional data, an electronic format, named as AGS(SG), will be adopted for use in Singapore. This format version AGS(SG) is tailored using the AGS format which has been developed by the Association of Geophysical and Geoenvironmental Specialists (AGS) in UK since 1991. Based on the prevailing site investigation practices in Singapore, new groups and headings for some data are created or added, and some data groups, which are not common, have been deleted or omitted.

5.2 Unless stated otherwise this document on AGS(SG) format shall take precedence over the published AGS document.

5.3 AGS(SG) Format

5.3.1 AGS(SG) format organizes the base data in GROUPS and FIELDS. It has rules and file format characteristics; and uses abbreviations, codes and units. The definitions of all GROUPS and FIELDS; lists of abbreviations, codes and units for the format are defined in the Data Dictionary.

5.3.2 **Appendix 1** contains the Data Dictionary. **Appendix 2** has the rules for the AGS Format based on AGS 3.1 version. The lists of abbreviations, codes and units for AGS(SG) format can be found in **Appendix 3**.

5.4 Base Data

5.4.1 AGS(SG) format contains base data of a particular site investigation project such as project background, borehole records and test data which are required to be reported in accordance to the relevant Singapore Standards, British Standards and other recognized documents. Interpreted or derived data should not be transmitted as any further processing being at the discretion and under the control of the receiving user.

5.5 Groups and Fields

5.5.1 The data is organized in the respective Data GROUPS within which are subdivided into a series of FIELDS. The GROUPS relate to specific elements of data which are obtained, such as project information, borehole details, field testing records and monitoring data.

5.5.2 Every FIELD represents a specific item such as stratum description, sample depth, etc. and has been defined as having the status of KEY or COMMON. KEY FIELDS are necessary in order to define the data unambiguously. Hence, KEY FIELDS include data such as Project ID, Hole ID, for maintaining data integrity. The COMMON FIELDs contain the associated data.

5.5.3 The different status of individual Data FIELDs is presented in the Data Dictionary as shown below:

Status	Symbol
KEY	*
COMMON	Blank

5.6 Lists of Abbreviations, Codes and Units

5.6.1 For consistency in terminology and brevity, GROUPS and FIELDS use a series of the abbreviations, standard codes and default units.

5.6.2 All the abbreviations and codes used in any GROUPS are defined in the ABBR Group which is included in every submission. This applies to both standard codes given in the lists of codes and abbreviations, and user defined, project specific codes.

5.6.3 The units listed in **Appendix 3** are the units in the data dictionary definitions and shall be used wherever possible to avoid potential confusion. They are either the appropriate SI units or the unit defined by the particular Singapore or British Standards relating to that specific item of data. A “data units” field is included within the data set in accordance with the rules.

5.6.4 Non-standard data units. It is recognised that situations will occur where neither the SI unit nor the Singapore/British Standard unit is being used. In such situations, non-standard data units shall be declared in the data transfer file. Reference should be made to Rule 18 for AGS data format in **Appendix 2** for the appropriate data format rules relating to non-standard units.

5.7 Data Dictionary

5.7.1 The Data Dictionary for Singapore format AGS(SG), has been compiled to facilitate flexibility and ease of recognition. It comprises a series of tables of information on different aspects of site investigation information. Each table comprises a GROUP name, column headings, i.e., FIELDS, units, descriptions, examples, types and formats.

5.8 File Format

5.8.1 The AGS format relies on strict adherence to the rules listed in **Appendix 2**.

5.8.2 The file format of the electronic data should be transmissible using American Standard Code for Information Interchange (ASCII) files, which are text files with the data surrounded by quotes and separated by commas. All fields are text.

5.9 Group Hierarchy

5.9.1 The GROUPS are organized in a hierarchy with an inverted tree like structure.

5.9.2 At the top of the hierarchy is the HOLE Group, and all other Groups lie below this. One of the Groups immediately below HOLE is SAMP, and all laboratory testing groups lie below SAMP. HOLE is termed the "parent" Group of SAMP. Each Group has only one parent, but there can be many Groups below each parent. Each Group is linked to its parent (the Group above it in the hierarchy) by Key Fields. Equally, each Group is linked to the Group(s) below it by Key Fields. For this structure to work, and the link to be made correctly between related Groups, the data in the Key Fields should be consistent and unique. If a Data Group is included in a submission, its parent Group must also be included, and this applies all the way up the hierarchy. Therefore the HOLE Group must always be present and if there is any laboratory testing, the SAMP Group must be present. The relationship diagram for AGS(SG) is shown in **Figure 2**. The table defining the Group hierarchy by indicating the parent for each Group can be found in **Appendix 1**.

5.9.3 There are six Groups that are not part of this hierarchy. The PROJ, ABBR, CODE, DICT, FILE and UNIT Groups sit above the hierarchy, and each has a general purpose:

- The PROJ, ABBR and UNIT Groups must always be included in the AGS(SG) file as they define the project, the submission details and the abbreviations, data types & units used within the data file (See Rules 18 to 20 for AGS data format in **Appendix 2**).
- The CODE Group must be included if the CNMT Group is used for chemical test results, as the CODE Group defines the determinand codes used within CNMT.
- The DICT Group must be included if any user defined Groups or Headings are present (See Rule 21 for AGS data format in **Appendix 2**).
- The FILE Group must be included if any associated files (non-AGS format files) are included in the submission (See Rule 22 for AGS data format in **Appendix 2**).

5.10 Singapore AGS Format

5.10.1 The type of geo-information included in AGS(SG) data format is based on the site investigation methods and techniques used in Singapore (**Figure 1**). The Data Dictionary for AGS(SG) containing the modified Groups and Headings is attached in **Appendix 1**.

5.10.2 New GROUPS, which are prefixed with "?", are added to the AGS(SG) data format to provide more details on the particular site investigation techniques or tests that are not covered in the existing AGS(Version 3.1) data format. They include:

New GROUPS	Description
?BTVT	Borehole Televiewer Tests
?LEMC	Emerson Class Tests
?GMJT	Goodman Jack Tests
?ISTR	In-situ Stress Tests
?HORN	Borehole Orientation and Inclination

6 GEOPHYSICAL DATA MANAGEMENT

6.1 Types of Geophysical Data

6.1.1 The data types include geophysical techniques such as seismic techniques, electrical, gravity, etc., and any re-processing of the same. Essentially, field records and supporting documents of the original field data including survey level data, navigation data, final processed data, quality control plots/calibrations, CD-ROM lists etc., and all processed data

are required to be submitted. This is to allow an independent third party user to re-process the original data or re-interpret the data, if required. **Tables 1 to 4** provide a list of data types, media type and format.

6.2 Submission of Geophysical Data

6.2.1 Geophysical data are to be submitted in digital and hard copies. For digital files, the following data format is required:

(i) inclusion of metadata in header file,
(ii) submission of data in standard, widely used file formats, including
(iii) submission of drilling data in standard formats.

6.2.2 The data shall include all field recordings and supporting documentation necessary to allow future investigators to reprocess the original data and all processed data, including re-interpretation of the original data. The submission shall include all original field data, supporting documentation, navigation data, final processed data, quality control plots/calibrations, tape lists, etc.

6.2.3 Header data for specific data types should follow that of the Society of Exploration Geophysicists (SEG).

6.3 Metadata

6.3.1 Metadata provides information about a certain item's content and it should be included in the header of the data file. For example, an image may include metadata that describes how large the picture is, the colour depth, the image resolution, when the image was created, and other data. Metadata of a text document may contain information about how long is the document, who is the author, when was the document written and a short summary of the document.

6.3.2 These data should be presented in a file header at the top of the data and constructed in such a way as to present the information by category followed by subcategory.

6.3.3 Metadata include:

- The date when the data is produced
- The date when the data is altered
- The parameters controlling data acquisition
- The parameters controlling data alteration
- The name of the company for whom the data is produced
- The Client for which the data is produced
- The activity which produces the data, e.g. name of survey activity
- The name of the firm which produces the data
- Any translation parameters required for conversion of the data (especially location data)
- The equipment used to generate the data
- The original format of the data

6.4 Data Media

6.4.1 The following media may be accepted for electronic data submission. In recognition of ongoing improvements in technology or changes in industry standards, other media may be accepted. It must however be appropriate to both format and volume of the data being supplied.

- 650 megabytes (MB) CD
- 4.7 gigabytes (GB) DVD
- 8.5 gigabytes (GB) double-layer DVD

6.4.2 All media should be clearly labelled both on the CD or DVD and the cover (See **Section 7** for labelling).

6.5 Data Content

6.5.1 It shall be the responsibility of the party making the submission to ensure that the data is both accurate and complete.

7 MEDIA LABELLING, DATA CHECKING AND VIRUS PROTECTION

7.1 Labelling

7.1.1 Clear labelling of files media, and conventions for its security and management is important to the implementation of a practical system.

7.1.2 AGS(SG) Format Data All media should be properly labelled and clearly marked with the following:

Title 'AGS(SG) Format Data'
Project identification (PROJ_ID)
Project location (PROJ_LOC)
Number of boreholes/ CPT tests
Date of Project (PROJ_DATE)
Name of the Contractor or Firm
Name of the Client
Version: AGS (SG)
Reference number of CD-ROM (e.g. CD 1 of 1)

7.1.3 Geophysical Format Data All media should be properly labelled and clearly marked with the following:

Title 'Geophysical Data'
Project identification (PROJ_ID)
Project location (PROJ_LOC)
Number of Survey Lines
Number of drilling holes
Date of Project (PROJ_DATE)
Name of the Contractor or Firm

Name of Specialist Contractor
Name of the Client
Reference number of CD or DVD (e.g. CD 1 of 1)

7.2 Data Checking

7.2.1 The party making the submission e.g. developers, builders or contractors, site investigation firms, consultants, qualified persons or engineers, etc., shall be responsible to provide true, correct and accurate data. Data format and integrity, data completeness and data validation checks shall be carried out on each data set issued or received prior to submission. For geo-information, the party making the submission shall also validate the data and any shortfalls must be corrected accordingly.

7.3 Virus Protection

7.3.1 All electronic data files shall be virus-free. Precluding executable files from the data set reduces the risk of transfer of a virus. Appropriate and current virus scanning programmes should be used to check the files for the presence of viruses. Such virus-checking programme shall be used by the party making the submission to scan each data set medium prior to the submission.

8 DATA SUBMISSION

8.1 When making submission, the party shall provide a soft copy of the media containing electronic data which shall be the current electronic copies of all data, preliminary or final. In addition to the labelling requirement in **Section 7**, the electronic copies of data, being submitted in a CD or DVD, shall be labelled 'PRELIMINARY' or 'FINAL' as appropriate.

9 DISCLAIMER OF DATA

9.1 The data is provided to a party on an "as-is" basis without any warranty whatsoever. Any risk associated with using the data, shall be borne by the party who is using or having access to such data. BCA disclaims any and all representation or warranty regarding the data whether express or implied, including but not limited to warranties as to accuracy, timelines, completeness, merchantability or fitness for a particular purpose or compliance with a particular description or any implied warranty arising from the course of performance, course of dealing, usage of trade or otherwise, to the fullest extent permitted by law. In particular, BCA makes no warranty that the data will meet the requirements of any party or is error-free or that all errors in the data can be corrected or that the Data will be in a form or format required by the any party.

9.2 BCA, its employees or its agents shall in no event, be responsible for any errors or inaccuracies that may be contained in the data. BCA, its employees and/or its agents, shall not be liable for any damages whatsoever (including but not limited to direct, indirect, loss of profits and consequential losses) suffered or incurred by any party which may arise (whether in contract, tort, including negligence under statute or otherwise) by reason of or in connection with the access to the date, or use of the data in any manner whatsoever.

10 REFERENCE

10.1 Association of Geotechnical and Geoenvironmental Specialists (AGS), 2005. *Electronic Transfer of Geotechnical and Geoenvironmental Data (Edition 3.1)*, AGS, May 2005.

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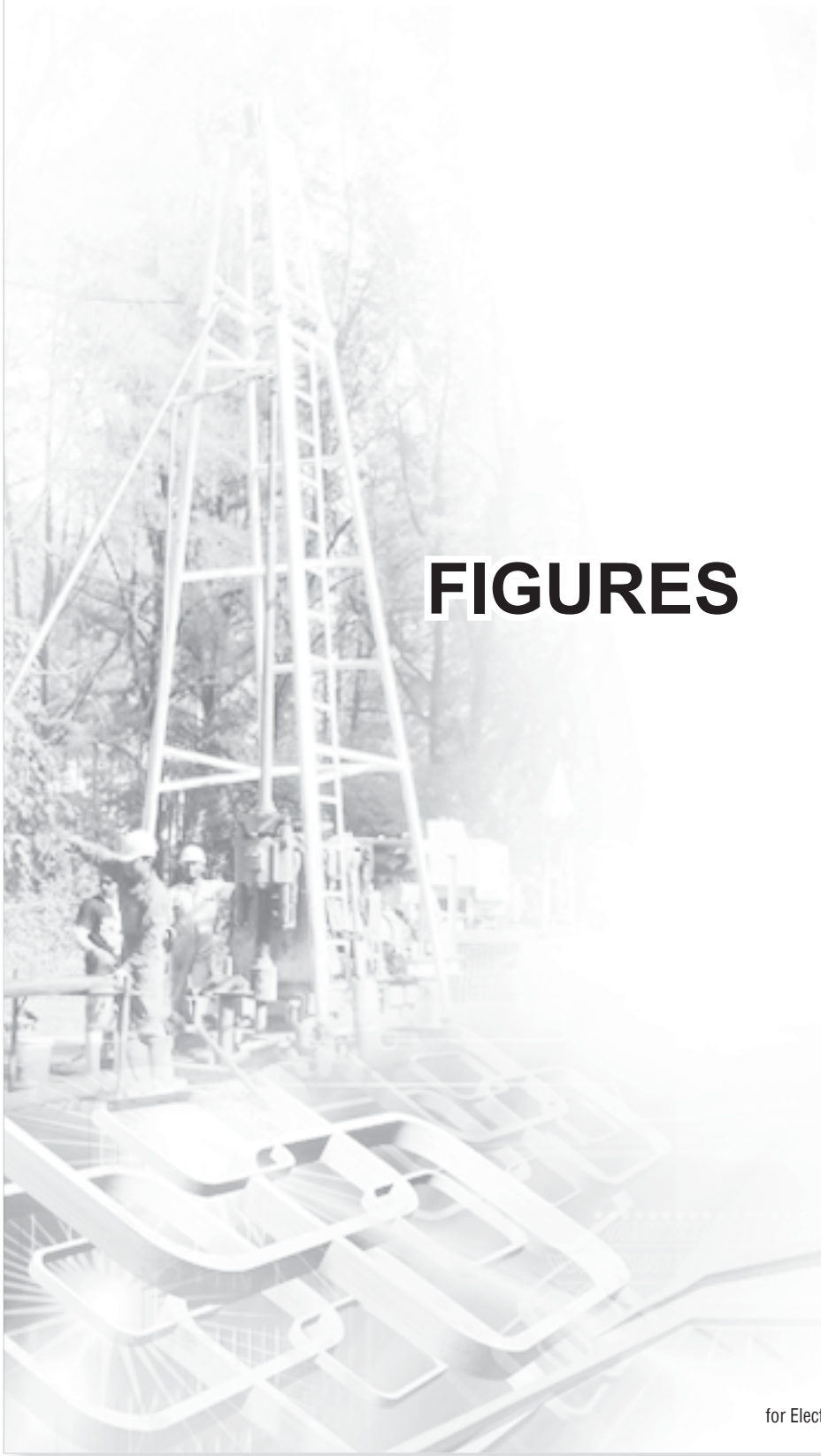

FIGURES

Guidelines
for Electronic Transfer of Site Investigation Data

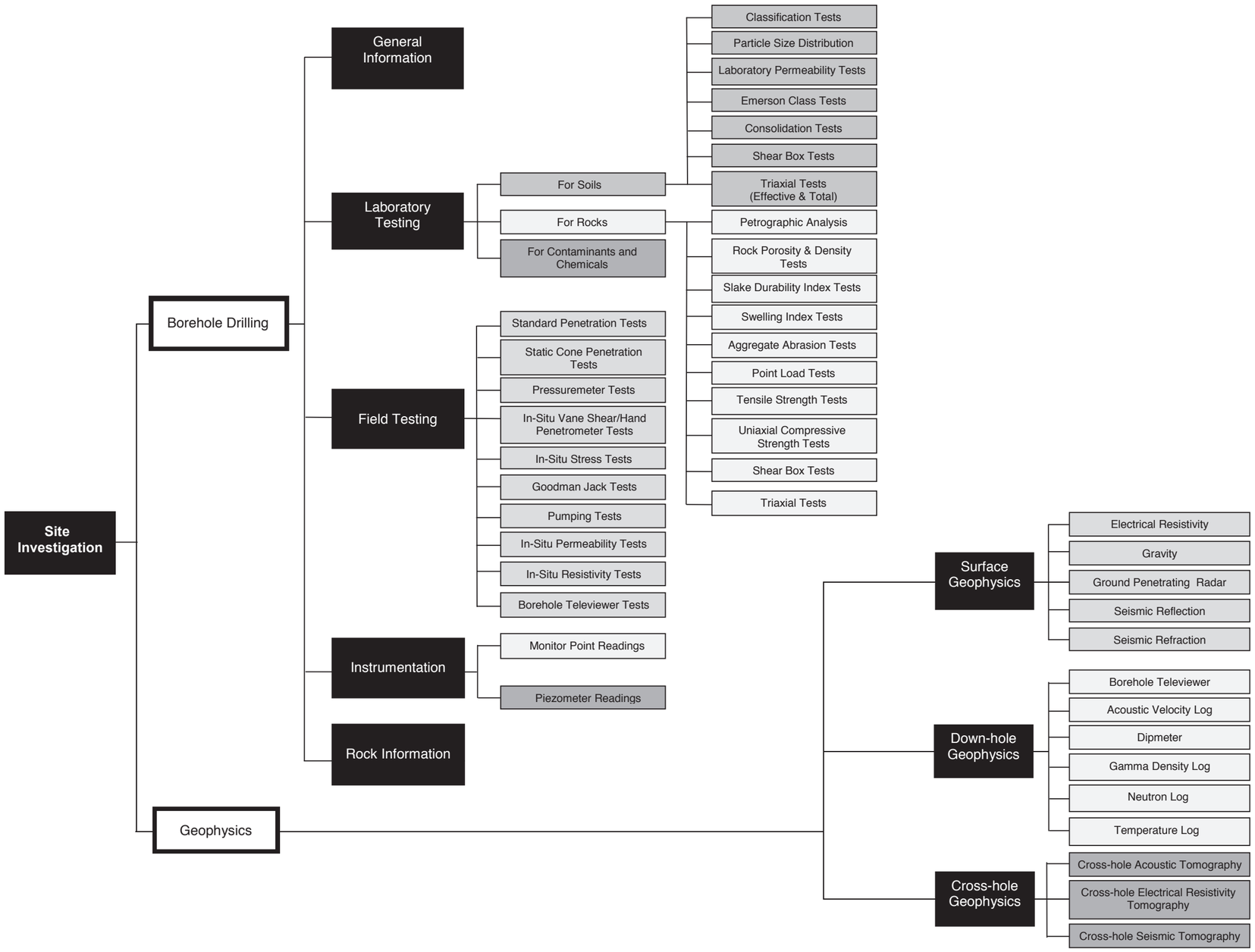

Figure 1: Relationship Diagram for Site Investigation

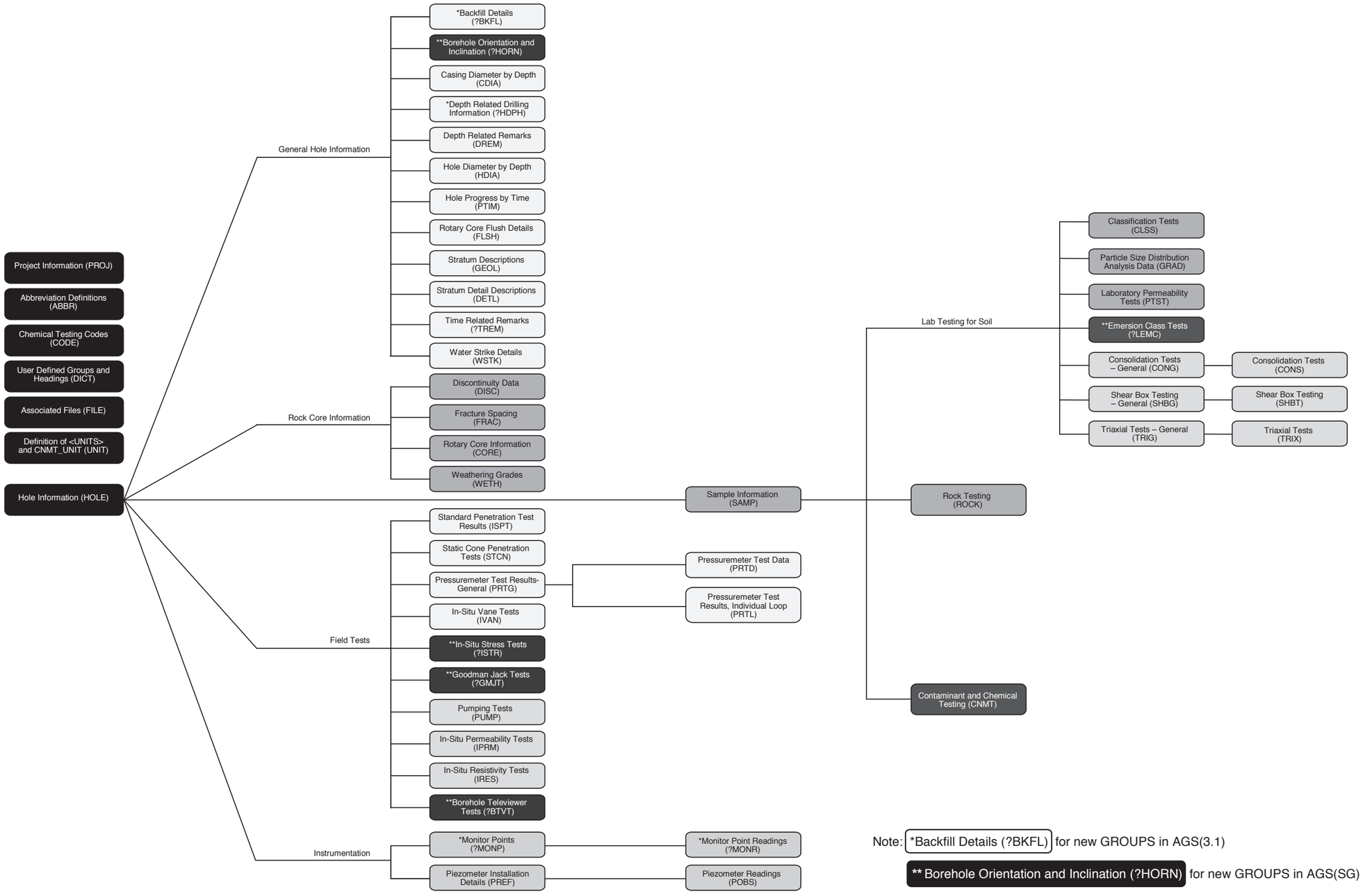

Figure 2: Relationship Diagram for AGS

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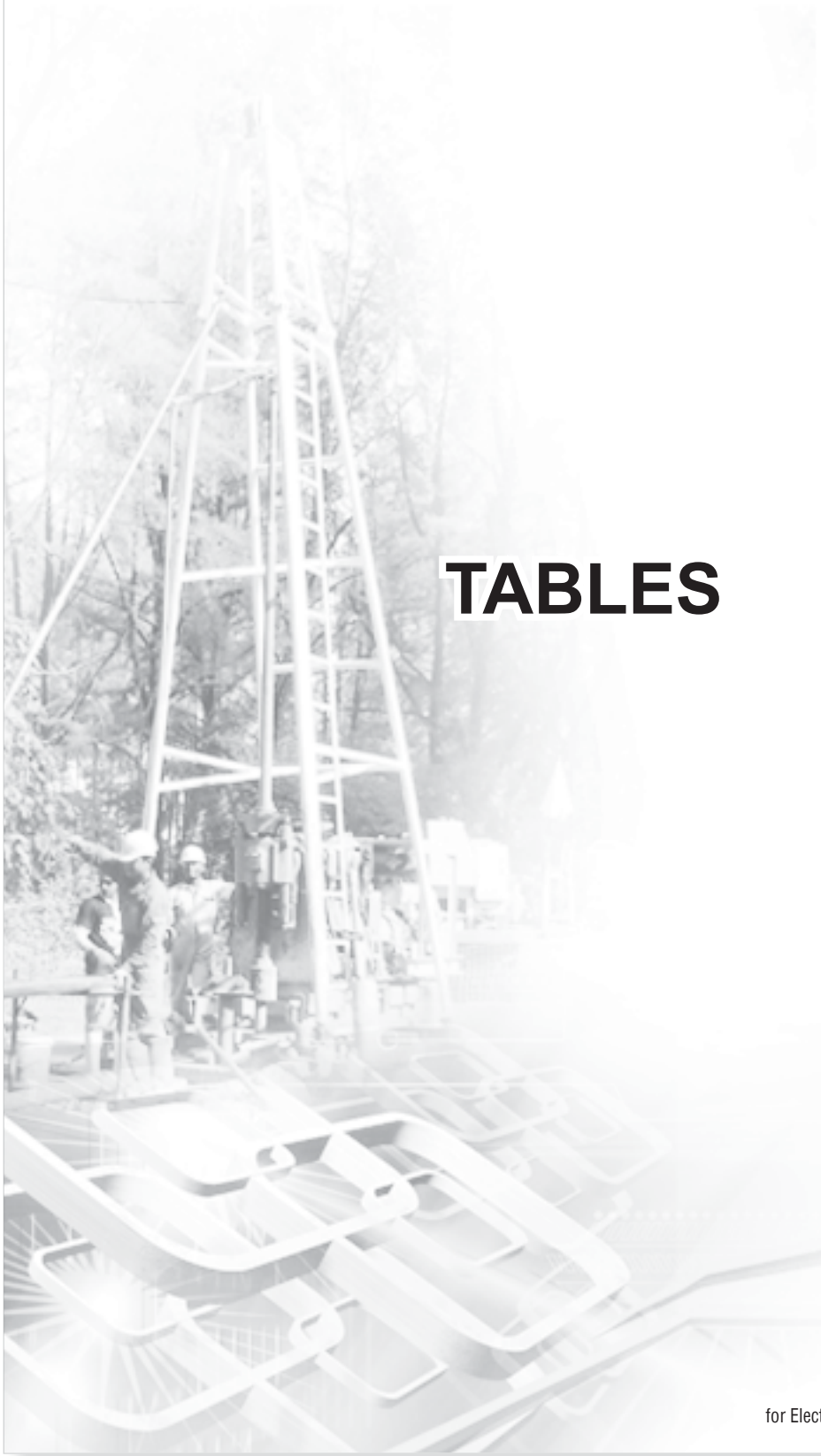


TABLES

Guidelines
for Electronic Transfer of Site Investigation Data

SUBMISSION OF GEOPHYSICAL DATA

TABLE 1: SEISMIC DATA

No.	DATA REQUIRED	FORMAT	REMARKS
	FIELD DATA 2D		
1	Shot point location data must include coordinate listings including elevation/ bathymetry data	Format with header information	▪ Format with header information of navigation/ shot point location data including elevations or bathymetry. Coordinates must be provided for source, receiver (if applicable) and CDP (common depth point) locations. ▪ All survey data shall be based on SLA's SVY21 system and height control based on PLD. One hundred metres (100m) may be added to the reduced levels of PLD for engineering survey and an explanatory note is to be included in the header information. ▪ For marine survey works, the Chart Datum established by the MPA Hydrographic Department shall be adopted as the datum for sounding and reference shall be made to MPA Tide Table.
2	Seismic field data	SEG-Y SEG-2	▪ Data submit in high density media
3	Seismic support data	Digital & hard copy	▪ Digital: Including Observers logs (ASCII or PDF or Microsoft Word or Microsoft Excel), Navigation data - Permanent Marker listings (ASCII or EXCEL) and other information as appropriate. ▪ Hard copy: Data including Observer logs, Permanent Marker details, Chainage Notes and Intersection Diagrams, to be organized in a Line basis.
4	Uphole data	ASCII & hard copy	▪ ASCII: Data to include line name, shot point numbers, date, elevation, total drill depth and coordinate details plus time depth pairs for each uphole. ▪ Hard copy: Require field plots showing trace data, time picks and bore logs.

TABLE 1: SEISMIC DATA (Continued)

No.	DATA REQUIRED	FORMAT	REMARKS
	PROCESSED DATA 2D		
1	Shot point location data must include processed coordinate listings including elevation/bathymetry data	Format with header information	▪ All survey data shall be based on SLA's SVY21 system and height control based on PLD. One hundred metres (100m) may be added to the reduced levels of PLD for engineering survey and an explanatory note is to be included in the header information. ▪ For marine survey works, the Chart Datum established by the MPA Hydrographic Department shall be adopted as the datum for sounding and reference shall be made to MPA Tide Table.
2	Stack data and migrated stack data	SEG-Y	▪ EBCDIC (Extended Binary Coded Decimal Interchange Code) header shall contain text which describes the area name, line name, shot point range, recording parameters, processing history, etc.
3	Image of processed migrated data	TIFF and hard copy	▪ Ensure there is no loss of detail through lossy data compression ▪ Hardcopy used for Quality Control
4	Shot point to common depth point relationship	ASCII	▪ Sufficient SP (Shot point) /CDP (common depth point) data for workstation loading and interpretation.
	FINAL REPORTS 2D		
1	Operation report	PDF and hard copy	
2	Interpretation report	PDF and hard copy	

TABLE 2: SEISMIC REPROCESSING DATA

No.	DATA REQUIRED	FORMAT	REMARKS
	2D DATA		
1	Final stack data	SEG-Y	▪ EBCDIC header shall contain text which describes the area name, line name, shot point range, recording parameters, processing history, etc
2	Image of processed migrated data	TIFF and hardcopy	▪ Ensure there is no loss of detail through lossy data compression ▪ Hardcopy used for QC check and plot
3	Shot point to common-depth-point relationship	ASCII	▪ Sufficient SP (Shot point) / CDP (common depth point) data for loading and interpretation.
	REPORTS		
1	Final operation report (reprocessing)	PDF and hardcopy	
2	Final interpretation report	PDF and hardcopy	

TABLE 3: GRAVITY, MAGNETIC AND OTHER SURVEY DATA

No.	DATA REQUIRED	FORMAT	REMARKS
	GRAVITY DATA		
1	Processed gravity data	ASCII Excel	▪ Must include headers detailing survey name, license, date, operators, and base station information. Data file to contain key items such as station, meter reading, observed gravity, elevation final processed gravity value etc. ▪ Data columns in the file includes headers identifying the value of each column ▪ All survey data shall be based on SLA's SVY21 system and height control based on PLD. One hundred metres (100m) may be added to the reduced levels of PLD for engineering survey and an explanatory note is to be included in the header information. ▪ For marine survey works, the Chart Datum established by the MPA Hydrographic Department shall be adopted as the datum for sounding and reference shall be made to MPA Tide Table.
	ELECTRICAL RESISTIVITY DATA		
1	Processed resistivity data	ASCII, DAT	▪ Must include headers detailing survey name, array type, electrode spacing, coordinates, etc. ▪ All survey data shall be based on SLA's SVY21 system and height control based on PLD. One hundred metres (100m) may be added to the reduced levels of PLD for engineering survey and an explanatory note is to be included in the header information. ▪ For marine survey works, the Chart Datum established by the MPA Hydrographic Department shall be adopted as the datum for sounding and reference shall be made to MPA Tide Table.

TABLE 3: GRAVITY, MAGNETIC AND OTHER SURVEY DATA (Continued)

No.	DATA REQUIRED	FORMAT	REMARKS
	MAGNETIC DATA		
1	Processed magnetic data	ASCII, SEG-Y	▪ Fixed column ASCII including SEG format including pre and post micro-levelling data. ▪ All coordinate data must clearly state the datum, spheroid, projection used and in latitude and longitude. ▪ All survey data shall be based on SLA's SVY21 system and height control based on PLD. One hundred metres (100m) may be added to the reduced levels of PLD for engineering survey and an explanatory note is to be included in the header information. ▪ For marine survey works, the Chart Datum established by the MPA Hydrographic Department shall be adopted as the datum for sounding and reference shall be made to MPA Tide Table. ▪ Transformation parameters are required where field data coordinate system is not the same as process coordinate system.
	GROUND PENETRATION RADAR		
1	Processed electromagnetic data	SEG-2	▪ To be submitted in high density media

TABLE 3: GRAVITY, MAGNETIC AND OTHER SURVEY DATA (Continued)

No.	DATA REQUIRED	FORMAT	REMARKS
	FINAL REPORTS AND IMAGES		
1	Operation report (including operations, navigation and processing)	PDF and hardcopy	
2	Interpretation report	PDF and hardcopy	
3	Geophysical maps	PDF and hardcopy	▪ Eg. TMI (Total Magnetic Intensity) map, Bouguer gravity map
4	Geophysical images	ER Mapper Grid format	▪ Digital images files of maps and data included in the Interpretation Report.

TABLE 4: BOREHOLE GEOPHYSICAL DATA

No.	DATA REQUIRED	FORMAT	REMARKS
1	Geophysical borehole data logging (including borehole televiewer and dipmeter)	LAS v 2.0 LIS DLIS Delimited ASCII Adobe Acrobat TIFF (colour) TIFF (greyscale) JPEG	▪ File Extension: .las ▪ File Extension: .lis ▪ File Extension: .lis ▪ ASCII (format must be explained) ▪ Reproducible at 300 dpi, 24 bit ▪ Reproducible at 300 dpi, 8 bit ▪ Reproducible at 300 dpi
2	Log plots	Adobe Acrobat TIFF (colour) TIFF (greyscale) JPEG	▪ File Extension: PDF ▪ Reproducible at 300 dpi, 24 bit ▪ Reproducible at 300 dpi, 8 bit ▪ Reproducible at 300 dpi
3	Processed down-hole velocity data	SEG Y, Rev. 1	▪ File Extension: .sgy
4	Cross-hole tomography	ASCII, SEG-Y	▪ File Extension: .XYZ, .dat, .cfg, .sgy

NOTES ON SUBMISSION OF GEOPHYSICAL DATA

The AGS Format does not cater for geophysical data (other than resistivity) as there are already well established international standards for the digital exchange of geophysical data. The geophysical data submission shall follow the formats described in **Tables 1 to 4**.

To include associated geophysical data files in an AGS Format, compatible submission shall:

1. For borehole wireline geophysical logs, reference the data set of geophysical files under the FILE_FSET Heading of the relevant borehole in the HOLE Group. Detail all the files contained within the data set in the FILE Group as explained in item (4).

2. For surface geophysical data sets (seismic, gravity, etc.), give a unique HOLE_ID in the HOLE Group for each data run, profile or point and then reference the data set of files under the FILE_FSET Heading of the HOLE Group. If the data set covers a linear run or profile then give the start and end co-ordinates of the line using the HOLE_NATE, HOLE_NATN, HOLE_ETRV and HOLE_NTRV Headings. The ground levels of the start and end of the line should be given using the HOLE_GL and HOLE_LTRV Headings. Detail all the files contained within the data set in the FILE Group as explained in item (4).

   The type of survey line shall be defined under the HOLE_TYPE in the following:

HOLE_TYPE	SREL	Seismic Reflection Line Survey
HOLE_TYPE	SRAL	Seismic Refraction Line Survey
HOLE_TYPE	GRAL	Gravity Line Survey
HOLE_TYPE	RESL	Resistivity Line Survey
HOLE_TYPE	MAGL	Magnetic Line Survey
HOLE_TYPE	BGP	Borehole Geophysics Survey

3. For in situ resistivity profile data, use the IRES Group of the AGS Format.

4. Referencing associated files for geophysical data sets

   Geophysical data shall be included in an AGS compatible submission by including the data in an associated file and referencing it in the AGS Format. It is preferable that associated files are not compressed; however, large files that may cause difficulties during data transfer may be compressed using the ZIP file format. Zipped files must indicate the original file format plus the zipped file format. Compressed files should only be used with permission. The AGS Format files in a submission should not be compressed.

   The associated files must have an up to 8 character file name and a 3 character file type extension. Long file names must not be used.

   The referencing procedure is in two parts:

   (a) The associated data files are collected together in data sets. Each data set must have a unique reference number and this reference number is given in the FILE_FSET field of the HOLE Group. The following shows examples of borehole geophysics survey (BGP) and seismic reflection survey (SREL) data files to be captured in HOLE Group.

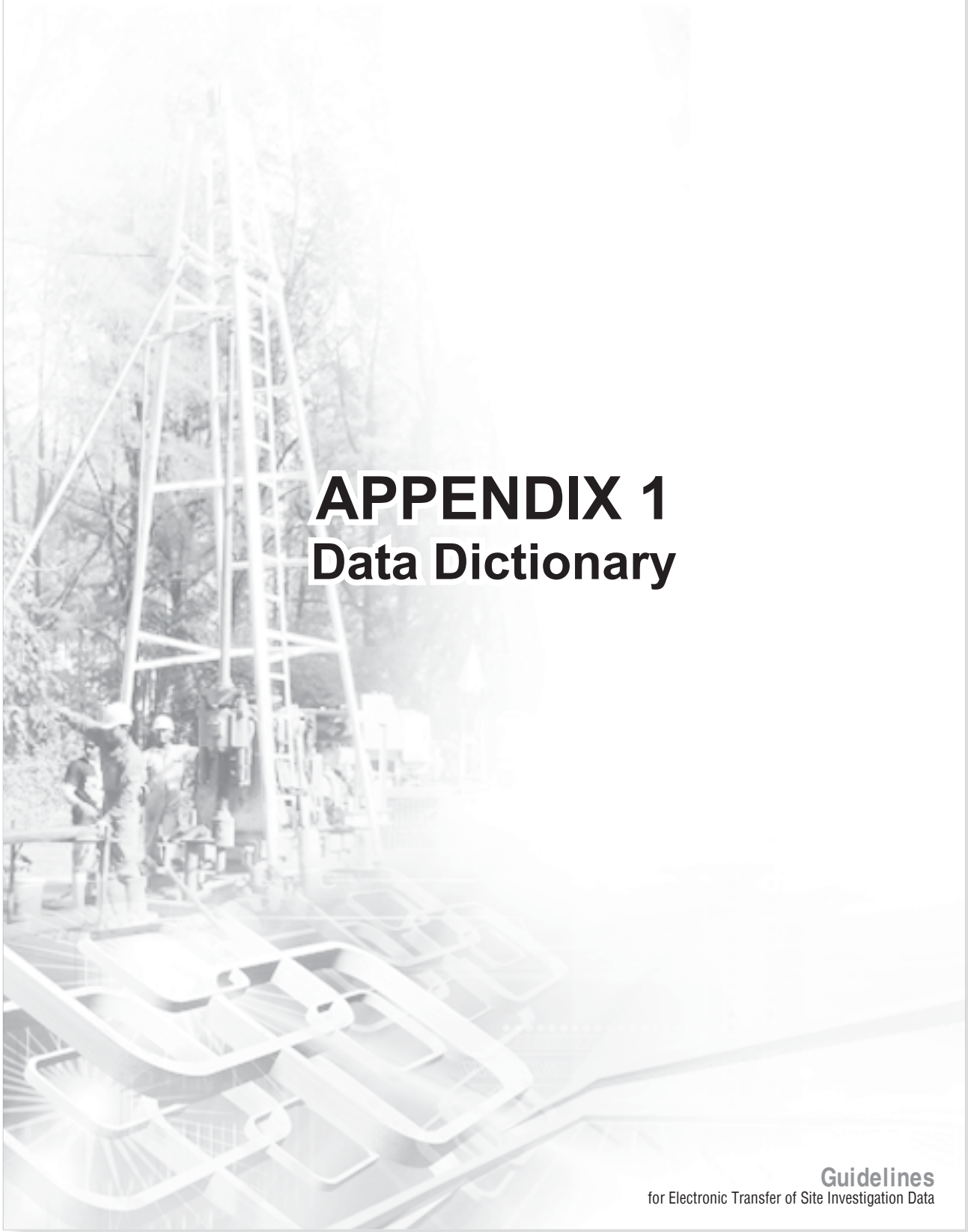
"**HOLE"
"*HOLE_ID","*HOLE_TYPE","HOLE_NATE","HOLE_NATN","*HOLE_GL","HOLE_ETRV",
"HOLE_NTRV"," HOLE_LTRV","*FILE_FSET"
"<UNITS>","","m","m","m","","","",""
"BH1","BGP","532154","176163","78.4","","","","FS1"

"**HOLE"
"*HOLE_ID","*HOLE_TYPE","HOLE_NATE","HOLE_NATN","*HOLE_GL","HOLE_ETRV",
"HOLE_NTRV"," HOLE_LTRV","*FILE_FSET"
"<UNITS>","","m","m","m", "m","m","m",""
"L1A1"," SREL","532154","176163","78.4", "632154","173123","76.4","FS2"

(b) The content of each file set is described in the FILE group. The File Name within each File Set must be unique, so that the combination of the Key Fields of FILE_FSET and FILE_NAME is unique.

"**FILE"
"*FILE_FSET","*FILE_NAME","*FILE_DESC","*FILE_TYPE","*FILE_PROG", "FILE_DATE",
"?FILE_DOCT"
"<UNITS>","","","","","","dd/mm/yyyy", ""
"FS1","BH1A1PS.las","Suspension PS Logging BH1","LAS","GLog ver 3","02/05/1999", "DATA"
"FS2","L1A1.dat","Seismic Reflection Line L1A1","SEG2","StrataVisorNZXP","02/05/1999","DATA"
"FS3","L1C1.dat","Seismic Refraction Line L1C1","SEG2","StrataVisorNZXP","02/05/1999","DATA"

Building and Construction Authority



APPENDIX 1
Data Dictionary

Guidelines
for Electronic Transfer of Site Investigation Data

DATA DICTIONARY

Data Sets
Entries of the data dictionary for the Data Groups with their associated KEY and COMMON Fields have been defined in this section. Each Field Heading has its definition as listed below:

Status	Symbol
KEY	*
COMMON	blank

Units of Measurement
The units of measurement shall be those given in the UNITS line. The preferred units are defined. The unit of measurement shall not be included in the ASCII Data Field.

Examples
Typical examples are given against most of the Data Fields to indicate the type of information which may be expected. They are not intended to be representative of any one soil or rock and hence may not be mutually compatible.

Notes
See **Appendix 3** for a list of the common standard abbreviations to be used in the indicated fields. Other abbreviations may be defined as required, see Rules 20 and 25.

Key to Change Control Used
New New Group in AGS(SG)
Modified New Field in AGS(SG)

LIST OF GROUPS

Group Name	Contents	Parent Group	Revision
ABBR	Abbreviation Definitions	-	
?BKFL	Backfill Details	HOLE	
?BTVT	**Borehole Televiewer Tests**	**HOLE**	***New***
CDIA	Casing Diameter by Depth	HOLE	
CLSS	Classification Tests	SAMP	
CNMT	Contaminant and Chemical Testing	SAMP	
CODE	Chemical Testing Codes	-	
CONG	**Consolidation Tests - General**	**SAMP**	***Modified***
CONS	Consolidation Tests	CONG	
CORE	Rotary Core Information	HOLE	
DETL	Stratum Detail Descriptions	HOLE	
DICT	User Defined Groups and Headings	-	
DISC	Discontinuity Data	HOLE	
DREM	Depth Related Remarks	HOLE	
FILE	Associated Files	-	
FLSH	Rotary Core Flush Details	HOLE	
FRAC	**Fracture Spacing**	**HOLE**	***Modified***
GEOL	**Stratum Descriptions**	**HOLE**	***Modified***
?GMJT	**Goodman Jack Tests**	**HOLE**	***New***
GRAD	Particle Size Distribution Analysis Data	SAMP	
HDIA	Hole Diameter by Depth	HOLE	
?HDPH	Depth Related Drilling Information	HOLE	
HOLE	**Hole Information**	**-**	***Modified***
?HORN	**Borehole Orientation and Inclination**	**HOLE**	***New***
IPRM	In-Situ Permeability Tests	HOLE	
IRES	In-Situ Resistivity Tests	HOLE	
ISPT	Standard Penetration Test Results	HOLE	
?ISTR	**In-Situ Stress Tests**	**HOLE**	***New***
IVAN	In-Situ Vane Tests	HOLE	
?LEMC	**Emerson Class Tests**	**SAMP**	***New***
?MONP	Monitor Points	HOLE	
?MONR	Monitor Point Readings	?MONP	
POBS	Piezometer Readings	PREF	
PREF	Piezometer Installation Details	HOLE	

Group Name	Contents	Parent Group	Revision
PROJ	Project Information	-	
PRTD	Pressuremeter Test Data	PRTG	
PRTG	**Pressuremeter Test Results, General**	**HOLE**	***Modified***
PRTL	Pressuremeter Test Results, Individual Loops	PRTG	
PTIM	Hole Progress by Time	HOLE	
PTST	Laboratory Permeability Tests	SAMP	
PUMP	Pumping Tests	HOLE	
ROCK	**Rock Testing**	**SAMP**	***Modified***
SAMP	Sample Reference Information	HOLE	
SHBG	Shear Box Testing - General	SAMP	
SHBT	Shear Box Testing	SHBG	
STCN	Static Cone Penetration Tests	HOLE	
?TREM	Time Related Remarks	HOLE	
TRIG	**Triaxial Tests - General**	**SAMP**	***Modified***
TRIX	Triaxial Tests	TRIG	
UNIT	Definition of <UNITS> and CNMT_UNIT	-	
WETH	Weathering Grades	HOLE	
WSTK	Water Strike Details	HOLE	

GROUPS AND HEADINGS

Group Name: PROJ - Project Information						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	PROJ_ID		Project identifier	6421/A	Text	
	PROJ_NAME		Project title	Acme Gas Works	Text	
	PROJ_LOC		Location of site	London Road, Croydon	Text	
	PROJ_CLNT		Client name	Acme Enterprises	Text	
	PROJ_CONT		Contractors name	Acme Drilling Ltd	Text	
	PROJ_ENG		Project engineer	Acme Consulting	Text	
	PROJ_MEMO		General project comments	6 boreholes, field and laboratory test results	Text	
	PROJ_DATE	dd/mm/yyyy	Date of production of data	31/07/1999	Date	dd/mm/yyyy
	?PROJ_CID		Monitoring contractor identifier	KS123	Text	
	?PROJ_PROD		Data file producer	Acme Drilling Ltd	Text	
	?PROJ_RECV		Data file recipient	Acme Consulting	Text	
	?PROJ_ISNO		Issue sequence number	2	Text	
	?PROJ_STAT		Status of data within submission	Draft	Text	
	PROJ_AGS		AGS edition number	3.1	Text	
	FILE_FSET		Associated file reference	FS1	Text	

Group Name: ABBR - Abbreviation Definitions						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	ABBR_HDNG		Field Heading in Group	HOLE_TYPE	Text	
*	ABBR_CODE		Abbreviation used	TP	Text	
	ABBR_DESC		Description of Abbreviation	Trial Pit	Text	

Group Name: ?BKFL - Backfill Details						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	?HOLE_ID		Exploratory hole or location equivalent	6421/A	Text	
*	?BKFL_TOP	m	Depth to top of section	1.40	Double	0.00
	?BKFL_BASE	m	Depth to base of section	11 .40	Double	0.00
	?BKFL_LEG		Backfill legend code	904 (See Appendix 3)	Text	
	?BKFL_DATE	dd/mm/yyyy	Date of backfill	01/04/2004	Date	dd/mm/yyyy
	?BKFL_REM		Backfill remarks	Grout	Text	
	?FILE_FSET		Associated file reference	FS20	Text	

Group Name: ?BTVT - Borehole Televiewer Tests						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	?HOLE_ID		Exploratory hole or location equivalent	6421/A	Text	
*	?BTVT_TREF		Test reference	BTVT1	Text	
*	?BTVT_DPTH	m	Depth of test	34.07	Double	0.00
	?BTVT_DD	deg	Dip direction	203	Integer	0
	?BTVT_DA	deg	Dip angle	32	Integer	0
	?BTVT_APTR	mm	Joint aperture	11.08	Double	0.00
	?BTVT_RGHN		Joint roughness	Planar	Text	
	?BTVT_JCDN		Joint condition	Stained and infilling	Text	
	?BTVT_REM		Remarks	Bedding plane	Text	

Group Name: CDIA - Casing Diameter by Depth						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	HOLE_ID		Exploratory hole or location equivalent	6421/A	Text	
*	CDIA_CDEP	m	Depth achieved at CDIA_HOLE	18.55	Double	0.00
*	CDIA_HOLE	mm	Casing diameter	200	Integer	0
	CDIA_REM		Remarks	Casing stuck in 30m below ground level	Text	

Group Name: CLSS - Classification Tests						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	HOLE_ID		Exploratory hole or location equivalent	6431/A	Text	
*	SAMP_TOP	m	Depth to top of test sample	6.55	Double	0.00
*	SAMP_REF		Sample reference number	12	Text	
*	SAMP_TYPE		Sample type	U (See Appendix 3)	Text	
*	SPEC_REF		Specimen reference number	1	Text	
*	SPEC_DPTH	m	Specimen depth	6.60	Double	0.00
	CLSS_NMC	%	Natural moisture content	57	Integer	0
	CLSS_LL	%	Liquid limit	62	Integer	0
	CLSS_PL	%	Plastic limit	38	Integer	0
	CLSS_BDEN	Mg/m3	Bulk density	1.66	Double	0.00
	CLSS_DDEN	Mg/m3	Dry density	1.06	Double	0.00
	CLSS_PD	Mg/m3	Particle density	2.65	Double	0.00
	CLSS_425	%	Percentage passing 425 µm sieve	12	Integer	0
	CLSS_PREP		Method of preparation	Wet sieve etc	Text	
	CLSS_SLIM	%	Shrinkage limit	17	Integer	0
	CLSS_LS	%	Linear shrinkage	11	Integer	0
	CLSS_HVP	kN/m2	Hand vane undrained shear strength (peak)	40.00	Double	0.00

Group Name: CLSS - Classification Tests						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
	CLSS_HVR	kN/m2	Hand vane undrained shear strength (remoulded)	15.00	Double	0.00
	CLSS_PPEN	kN/m2	Pocket penetrometer undrained shear strength	40.00	Double	0.00
	CLSS_VNPK	kN/m2	Laboratory vane undrained shear strength (peak)	35.00	Double	0.00
	CLSS_VNRM	kN/m2	Laboratory vane undrained shear strength (remoulded)	25.00	Double	0.00
	?CLSS_REM		Notes on classification testing	1 point liquid limit test	Text	
	?FILE_FSET		Associated file reference	FS231	Text	

Group Name: CNMT - Contaminant and Chemical Testing						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	HOLE_ID		Exploratory hole or location equivalent	6431/A	Text	
*	SAMP_TOP	m	Depth to top of test sample	6.55	Double	0.00
*	SAMP_REF		Sample reference number	12	Text	
*	SAMP_TYPE		Sample type	ES (See Appendix 3)	Text	
*	SPEC_REF		Specimen reference number	4	Text	
*	SPEC_DPTH	m	Specimen depth	6.90	Double	0.00
*	CNMT_TYPE		Determinand	CL (See Appendix 3)	Text	
*	CNMT_TTYP		Test type	SOLID_WAT (See Appendix 3)	Text	
	CNMT_RESL		Test result	0.2	Text	
	CNMT_UNIT		Test result units	% (See Appendix 3)	Text	
	CNMT_CAS		Chemical abstract service registry number (where appropriate)		Text	
	CNMT_METH		Test method	BS 1377-3:1990:7.2	Text	
	CNMT_PREP		Sample preparation	Air dried	Text	
	CNMT_REM		Comments on test		Text	
	CNMT_LIM		Method lower detection limit		Text	
	?CNMT_ULIM		Method upper detection limit		Text	
	CNMT_NAME		Client/laboratory preferred name of determinand	Dry weight chloride	Text	
	CNMT_LAB		Name of testing laboratory/Organisation	Chemical Test House	Text	
	CNMT_CRED		Accrediting body (When appropriate)	SAC-SINGLAS / LA-2010-0422-A	Text	
	?CNMT_LBID		Laboratory Internal Reference	LB234675	Text	
	FILE_FSET		Associated file reference	FS22	Text	

Group Name: CODE - Chemical Testing Codes						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	CODE_CODE		Code	CL	Text	
	CODE_DESC		Code Description	Chloride	Text	

Group Name: CONG - Consolidation Tests - General						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	HOLE_ID		Exploratory hole or location equivalent	6431/A	Text	
*	SAMP_TOP	m	Depth to top of test sample	6.25	Double	0.00
*	SAMP_REF		Sample reference number	12	Text	
*	SAMP_TYPE		Sample type	U (See Appendix 3)	Text	
*	SPEC_REF		Specimen reference number	4	Text	
*	SPEC_DPTH	m	Specimen depth	6.29	Double	0.00
	CONG_TYPE		Oedometer or Rowe, primary or secondary consolidation	Oed, Rowe	Text	
	CONG_COND		Sample condition	Undisturbed, remoulded, etc.	Text	
	CONG_REM		Test details including method statement	Temperature 21 degrees C, sample from base of U100 sample, axis vertical	Text	
	CONG_INCM	m2/MN	Coefficient of volume compressibility over CONG_INCD	0.360	Double	0.000
	CONG_INCD	kN/m2	Defined stress range	0 to 400	Text	
	CONG_DIA	mm	Test specimen diameter	75.0	Double	0.0
	CONG_HIGT	mm	Test specimen height	19.0	Double	0.0
	CONG_MCI	%	Initial moisture content	21.00	Double	0.00
	CONG_MCF	%	Final moisture content	18.00	Double	0.00
	CONG_BDEN	Mg/m3	Initial bulk density	2.12	Double	0.00
	CONG_DDEN	Mg/m3	Initial dry density	1.75	Double	0.00
	CONG_PDEN	Mg/m3	Particle density (BS 1377) with # if assumed	2.65	Double	0.00
	CONG_SATR	%	Initial degree of saturation	98.00	Double	0.00
	CONG_SPRS	kN/m2	Swelling pressure	100.00	Double	0.00
	CONG_SATH	%	Height change of specimen on saturation as percentage of original height	1.10	Double	0.00
	FILE_FSET		Associated file reference	FS9	Text	
	?CONG_IVR		Initial voids ratio	0.80	Double	0.00
	?CONG_RCOM		Recompression index before P'o	0.121	Double	0.000
	?CONG_COM		Compression index over CONF_INCD	0.640	Double	0.000
	?CONG_PRCP	kPa	Preconsolidated pressure	68.000	Double	0.000

Group Name: CONS - Consolidation Tests						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	HOLE_ID		Exploratory hole or location equivalent	6431/A	Text	
*	SAMP_TOP	m	Depth to top of test sample	6.50	Double	0.00
*	SAMP_REF		Sample reference number	12	Text	
*	SAMP_TYPE		Sample type	U (See Appendix 3)	Text	
*	SPEC_REF		Specimen reference number	4	Text	
*	SPEC_DPTH	m	Specimen depth	6.90	Double	0.00
*	CONS_INCN		Oedometer stress increment number	3	Integer	0
	CONS_IVR		Voids ratio at start of increment	0.800	Double	0.000
	CONS_INCF	kN/m2	Stress at end of stress increment/decrement	400.0	Double	0.0
	CONS_INCE		Voids ratio at end of stress increment	0.620	Double	0.000
	CONS_INMV	m2/MN	Reported coefficient of volume compressibility over stress increment	0.320	Double	0.000
	CONS_INCV	m2/yr	Reported coefficient of consolidation over stress increment	4.120	Double	0.000
	CONS_INSC		Coefficient of secondary compression over stress increment	0.120	Double	0.000
	?CONS_CVRT	m2/yr	Coefficient of consolidation determined by the root time method	2.100	Double	0.000
	?CONS_CVLG	m2/yr	Coefficient of consolidation determined by the log time method	4.120	Double	0.000
	?CONS_REM		Remarks including method used to determine coefficients reported under CONS_INMV and selected CONS_INCV (from either of ?CONS_CVRT or ?CONS_CVLG)	Log time method reported	Text	

Group Name: CORE - Rotary Core Information						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	HOLE_ID		Exploratory hole or location equivalent	6423/A	Text	
*	CORE_TOP	m	Depth to top of core run	2.54	Double	0.00
*	CORE_BOT	m	Depth to bottom of core run	3.54	Double	0.00
	CORE_PREC	%	Percentage of core recovered in core run (TCR)	32	Integer	0
	CORE_SREC	%	Percentage of solid core recovered in core run (SCR)	23	Integer	0
	CORE_RQD	%	Rock quality designation for core run (RQD)	20	Integer	0
	CORE_REM		Rotary remarks	Rods dropped 200mm at 3.10m	Text	

Group Name: CORE - Rotary Core Information						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
	CORE_DIAM	mm	Core diameter	75.0	Double	0.0
	FILE_FSET		Associated file reference	FS5	Text	

Group Name: DETL - Stratum Detail Descriptions						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	HOLE_ID		Exploratory hole or location equivalent	6421/A	Text	
*	DETL_TOP	m	Depth to top of detail description	3.46	Double	0.00
*	DETL_BASE	m	Depth to base of detail description	3.76	Double	0.00
	DETL_DESC		Detail description	Claystone	Text	

Group Name: DICT - User Defined Groups and Headings						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	DICT_TYPE		Flag to indicate definition is a GROUP or HEADING (ie can be either of GROUP or HEADING)	HEADING	Text	
*	DICT_GRP		Group name	ISPT	Text	
*	DICT_HDNG		Heading name	ISPT_CALN	Text	
	DICT_STAT		Heading status KEY or COMMON (blank for Group)	COMMON	Text	
	DICT_DESC		Description	Corrected N value	Text	
	DICT_UNIT		Units		Text	
	DICT_EXMP		Example	20	Text	
	?DICT_PGRP		Parent group name	HOLE	Text	

Group Name: DISC - Discontinuity Data						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	HOLE_ID		Exploratory hole or location equivalent	6421/A	Text	
*	DISC_TOP	m	Depth to top in hole, or distance to start on traverse, of discontinuity zone, or discontinuity	10.26	Double	0.00
*	DISC_BASE	m	Depth to base in hole, or distance to end on traverse, of discontinuity zone	12.67	Double	0.00
*	FRAC_SET		Discontinuity set reference number	J3	Text	
*	DISC_NUMB		Discontinuity number	57	Integer	0
	DISC_TYPE		Type of discontinuity	Joint	Text	
	DISC_DIP	deg	Dip of discontinuity	08	Integer	0

Group Name: DISC - Discontinuity Data						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
	DISC_DIR	deg	Dip direction of discontinuity	247	Integer	0
	DISC_RGH		Small scale roughness (ISRM 1978)	Smooth	Text	
	DISC_PLAN		Intermediate scale planarity (ISRM 1978)	Planar	Text	
	DISC_WAVE	m	Large scale waviness, wavelength (ISRM 1978)	15.00	Double	0.00
	DISC_AMP	m	Large scale waviness, amplitude (ISRM 1978)	0.50	Double	0.00
	DISC_JRC		Joint roughness coefficient	10	Integer	0
	DISC_APP		Surface appearance	Slightly polished	Text	
	DISC_APT	mm	Discontinuity aperture measurement	2	Integer	0
	DISC_APOB		Discontinuity aperture observation	Infilled	Text	
	DISC_INFM		Infilling material	Soft clay	Text	
	DISC_TERM		Discontinuity termination (lower, upper) (ISRM 1978)	XR (See Appendix 3)	Text	
	DISC_PERS	m	Persistence measurement	10.5	Double	0.0
	DISC_STR	MPa	Discontinuity wall strength	50.0	Double	0.0
	DISC_WETH		Discontinuity wall weathering	Slightly weathered	Text	
	DISC_SEEP		Seepage rating (ISRM 1978)	VI	Text	
	DISC_FLOW	l/min	Water flow estimate	2	Double	0.0
	DISC_REM		Remarks	Cooling Joint	Text	
	FILE_FSET		Associated file reference	FS24	Text	

Group Name: DREM - Depth Related Remarks						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	HOLE_ID		Exploratory hole or location equivalent	6421/A	Text	
*	DREM_DPTH	m	Depth of DREM_REM	12.50	Double	0.00
	?DREM_BDEP	m	Base depth	13.80	Double	0.00
	DREM_REM		Depth related remark	Driving boulder ahead of casing	Text	

Group Name: FILE - Associated Files						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	FILE_FSET		File set reference number	FS128	Text	
*	FILE_NAME		File name	BH1CORO8.JPG	Text	
	FILE_DESC		Description of content	BH1 Core photo box 8	Text	
	FILE_TYPE		File type	JPG	Text	
	FILE_PROG		Parent program and version number	Paintshop Pro v 5.0	Text	

Group Name: FILE - Associated Files						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
	?FILE_DOCT		Document type	PH (See Appendix 3)	Text	
	FILE_DATE	dd/mm/yyyy	File date	31/07/1999	Date	dd/mm/yyyy

Group Name: FLSH - Rotary Core Flush Details						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	HOLE_ID		Exploratory hole or location equivalent	6421/A	Text	
*	FLSH_FROM	m	Depth to top of flush zone	10.00	Double	0.00
*	FLSH_TO	m	Depth to bottom of flush zone	20.00	Double	0.00
	FLSH_TYPE		Type of flush	Water	Text	
	FLSH_RETN	%	Flush return	50	Integer	0
	FLSH_COL		Colour of flush return	White	Text	

Group Name: FRAC - Fracture Spacing						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	HOLE_ID		Exploratory hole or location equivalent	6423/A	Text	
*	FRAC_TOP	m	Depth to top in hole, or distance to start on traverse, of the zone	31.20	Double	0.00
*	FRAC_BASE	m	Depth to base in hole, or distance to end on traverse, of the zone	33.65	Double	0.00
*	FRAC_SET		Discontinuity set reference number	J3	Text	
	FRAC_FI		Fracture index over zone (fractures per metre)	15	Integer	0
	FRAC_IMAX	mm	Maximum fracture spacing over zone	350	Integer	0
	FRAC_IAVE	mm	Average fracture spacing over zone	220	Integer	0
	FRAC_IMIN	mm	Minimum fracture spacing over zone	12	Integer	0
	FILE_FSET		Associated file reference	FS4	Text	
	?FRAC_REM		Details on fracture spacing description	Conjugate joint set	Text	

Group Name: GEOL - Stratum Descriptions						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	HOLE_ID		Exploratory hole or location equivalent	6421/A	Text	
*	GEOL_TOP	m	Depth to top of stratum	16.21	Double	0.00
*	GEOL_BASE	m	Depth to base of description	17.25	Double	0.00
	GEOL_DESC		General description of stratum	soft bluish grey Marine CLAY	Text	
	GEOL_LEG		Legend code	201 (See Rule 20 and Appendix 3)	Text	

Group Name: GEOL - Stratum Descriptions						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
	GEOL_GEOL		Geology code	M (See Appendix 3)	Text	
	GEOL_GEO2		Second geology code	C (See Appendix 3)	Text	
	?GEOL_GEO3		Third geology code	Km (See Appendix 3)	Text	
	GEOL_STAT		Stratum reference shown on trial pit or traverse sketch	1	Text	
	FILE_FSET		Associated file reference	FS4	Text	

Group Name: ?GMJT - Goodman Jack Tests						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	?HOLE_ID		Exploratory hole or location equivalent	6421/A	Text	
*	?GMJT_DPTH	m	Depth of test zone	35.00	Double	0.00
*	?GMJT_TESN		Test reference	GMJ1	Text	
	?GMJT_GMJ	GPa	Test result of modulus of deformation	60.00	Double	0.00

Group Name: GRAD - Particle Size Distribution Analysis Data						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	HOLE_ID		Exploratory hole or location equivalent	6431/A	Text	
*	SAMP_TOP	m	Depth to top of test sample	6.05	Double	0.00
*	SAMP_REF		Sample reference number	12	Text	
*	SAMP_TYPE		Sample type	U (See Appendix 3)	Text	
*	SPEC_REF		Specimen reference number	2	Text	
*	SPEC_DPTH	m	Specimen depth	6.09	Double	0.00
*	GRAD_SIZE	mm	Sieve or particle size	0.002	Double	0.000
	GRAD_PERP	%	Percentage passing/finer	25.05	Double	0.00
	GRAD_TYPE		Grading analysis test type	WS (See Appendix 3)	Text	

Group Name: HDIA - Hole Diameter by Depth						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	HOLE_ID		Exploratory hole or location equivalent	6421/A	Text	
*	HDIA_HDEP	m	Depth achieved at HDIA_HOLE	18.00	Double	0.00
	HDIA_HOLE	mm	Borehole diameter	200	Integer	0
	?HDIA_REM		Remarks	Cased to full depth	Text	

Group Name: ?HDPH - Depth Related Hole Information						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	?HOLE_ID		Exploratory hole or location equivalent	6422/A	Text	
*	?HDPH_TOP	m	Depth to top of section	1.40	Double	0.00
	?HDPH_BASE	m	Depth to base of section	3.40	Double	0.00
	?HOLE_TYPE		Type of exploratory Hole	TP (see Appendix 3)	Text	
	?HDPH_STAR	dd/mm/yyyy	Date of start of section	01/04/2004	Date	dd/mm/yyyy
	?HDPH_STAT	hhmm	Time of start of section	0930	Time	hhmm
	?HDPH_ENDD	dd/mm/yyyy	Date of end of section	01/04/2004	Date	dd/mm/yyyy
	?HDPH_ENDT	hhmm	Time of end of section	1030	Time	hhmm
	?HDPH_CREW		Name of crew	Bill Mallard	Text	
	?HDPH_LOG		The definitive person responsible for logging the section	DPG	Text	
	?HDPH_EXC		Plant used	YBM-18	Text	
	?HDPH_SHOR		Shoring/support used	None	Text	
	?HDPH_REM		Remarks	Breaker required	Text	
	?FILE_FSET		Associated file reference	FS21	Text	

Group Name: HOLE - Hole Or Location Equivalent						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	HOLE_ID		Exploratory hole or location equivalent	327/16A	Text	
	HOLE_TYPE		Type of exploratory hole	RO (See Appendix 3)	Text	
	HOLE_NATE	m	National grid easting of hole or start of traverse (based on SLA's SVY 21 system)	523145.000	Double	0.000
	HOLE_NATN	m	National grid northing of hole or start of traverse (based on SLA's SVY 21 system)	178456.000	Double	0.000
	HOLE_GL	m	Ground level relative to datum of hole or start of traverse (based on SLA's Precise Levelling Datum, PLD)	130.230	Double	0.000
	?HOLE_CDL	m	Chart datum level relative to datum of hole or start of traverse (based on MPA's Chart datum)	3.256	Double	0.000
	HOLE_FDEP	m	Final depth of hole	103.745	Double	0.000
	HOLE_STAR	dd/mm/yyyy	Date of start of excavation	18/03/1991	Date	dd/mm/yyyy
	HOLE_LOG		The definitive person responsible for logging the hole	DPG	Text	
	HOLE_REM		General remarks on hole	Vibration wire piezometer installed at 11.00mbgl / Terminated	Text	

Group Name: HOLE - Hole Or Location Equivalent						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
	HOLE_ETRV	m	National grid easting of end of traverse (based on SLA's SVY 21 system)	523195.000	Double	0.000
	HOLE_NTRV	m	National grid northing of end of traverse (based on SLA's SVY 21 system)	178486.000	Double	0.000
	HOLE_LTRV	m	Ground level relative to datum of end of traverse (based on SLA's Precise Levelling Datum, PLD)	103.000	Double	0.000
	HOLE_LETT		Ordnance survey letter grid reference		Text	
	HOLE_LOCX	m	Local grid x co-ordinate	565.000	Double	0.000
	HOLE_LOCY	m	Local grid y co-ordinate	421.000	Double	0.000
	HOLE_LOCZ	m	Level to local datum	106.600	Double	0.000
	HOLE_ENDD	dd/mm/yyyy	Hole end date	22/03/1991	Date	dd/mm/yyyy
	HOLE_BACD	dd/mm/yyyy	Hole backfill date	22/03/1991	Date	dd/mm/yyyy
	HOLE_CREW		Name of driller	A.B. Driller	Text	
	HOLE_ORNT	deg	Orientation of hole or traverse (degrees from north)	180	Integer	0
	HOLE_INCL	deg	Inclination of hole or traverse (measured positively down from horizontal)	65	Integer	0
	HOLE_EXC		Plant used	YBM-18	Text	
	HOLE_SHOR		Shoring/support used	None	Text	
	HOLE_STAB		Stability	Stable during excavation	Text	
	HOLE_DIML	m	Trial pit or logged traverse length	27.56	Double	0.00
	HOLE_DIMW	m	Trial pit or logged traverse width	1.35	Double	0.00
	HOLE_LOCM		Method of location	dGPS	Text	
	HOLE_LOCA		Location sub division within project	SubStation 1	Text	
	HOLE_CLST		Hole cluster reference number	CLSTO1	Text	
	?HOLE_OFFS		Offset	10.35	Double	0.00
	?HOLE_CNGE		Chainage	23255.55	Double	0.00
	?HOLE_STAT		Status of hole information	Preliminary	Text	
	FILE_FSET		Associated file reference	FS2	Text	
	?HOLE_FREC		Hole field description	6421/A/BH1	Text	

Group Name: ?HORN - Borehole Orientation and Inclination						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	?HOLE_ID		Exploratory hole or location equivalent	6421/A	Text	
*	?HORN_TOP	m	Depth to top of exploratory hole section	10.00	Double	0.00
*	?HORN_BASE	m	Depth to base of exploratory hole section	10.15	Double	0.00
	?HORN_ORNT	deg	Orientation of exploratory hole section or traverse (degrees from north)	210	Integer	0
	?HORN_INCL	deg	Inclination of exploratory hole section or traverse (measured positively down from horizontal)	65	Integer	0
	?HORN_REM		Remarks relating to orientation and inclination of hole section	Inclined borehole cross dyke body at 5m bgl	Text	
	?FILE_FSET		Associated file reference (e.g. test result sheets)	As-built Location Plan.pdf	Text	
	?HORN_EAST	m	Easting for the top of inclined section	11299.245	Double	0.000
	?HORN_NOTH	m	Northing for the top of inclined section	26732.243	Double	0.000
	?HORN_ELEV	m	Elevation/ depth for the top of inclined section	-4.972	Double	0.000

Group Name: IPRM - In-Situ Permeability Tests						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	HOLE_ID		Exploratory hole or location equivalent	6471/A	Text	
*	IPRM_TOP	m	Depth to top of test zone	12.20	Double	0.00
*	IPRM_BASE	m	Depth to base of test zone	12.95	Double	0.00
*	IPRM_STG		Stage number of multistage packer test	1	Text	
*	?IPRM_TESN		Test number	2	Text	
	IPRM_TYPE		Type of test	Rising, Falling, Constant Head	Text	
	IPRM_PRWL	m	Depth to water in borehole or piezometer immediately prior to test	10.06	Double	0.00
	IPRM_SWAL	m	Depth to water at start of test	5.45	Double	0.00
	IPRM_TDIA	m	Diameter of test zone	0.15	Double	0.00
	IPRM_SDIA	m	Diameter of standpipe or casing	0.019	Double	0.000
	IPRM_IPRM	m/s	Permeability	5.00E-09	Double	0.00
	IPRM_REM		Test remarks	Test performed in 7 days after hole completion	Text	
	IPRM_FLOW	l/s	Average flow during packer test stage	2.35	Double	0.00
	IPRM_AWL	m	Depth to assumed standing water level	10.25	Double	0.00
	IPRM_HEAD	m	Applied total head of water during test stage at centre of packer test zone	20.25	Double	0.00
	?IPRM_DATE	dd/mm/yyyy	Test date	20/02/2003	Date	dd/mm/yyyy
	FILE_FSET		Associated file reference	FS26	Text	

Group Name: IRES - In-Situ Resistivity Tests						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	HOLE_ID		Exploratory hole or location equivalent	6421/A or RES/12	Text	
*	IRES_DPTH	m	Depth range to which in-situ resistivity test relates	0 to 10.00	Double	0.00
*	?IRES_TESN		Test number	2	Text	
	IRES_TYPE		Type of resistivity test	Soil resistivity test (Wenner array)	Text	
	?IRES_DATE	dd/mm/yyyy	Test date	20/02/2003	Date	dd/mm/yyyy
	IRES_IRES	ohm cm	Result	2000.25	Double	0.00
	IRES_REM		Details of test e.g. electrode spacing and configuration	Wenner 4 pin method	Text	
	GEOL_STAT		Stratum reference shown on trial pit or traverse sketch	1	Text	

Group Name: ISPT - Standard Penetration Test Results						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	HOLE_ID		Exploratory hole or location equivalent	6421/A	Text	
*	ISPT_TOP	m	Depth to top of test	13.50	Double	0.00
	ISPT_SEAT		Number of blows for seating drive	14	Integer	0
	ISPT_MAIN		Number of blows for main test drive	35	Integer	0
	ISPT_NPEN	mm	Total penetration for seating drive and test drive	450	Integer	0
	ISPT_NVAL		SPT 'N' value	35	Integer	0
	ISPT_REP		SPT reported result	6,8/8,9,9,9 N=35	Text	
	ISPT_CAS	m	Casing depth at time of test	12.00	Double	0.00
	ISPT_WAT	m	Depth to water at time of test	2.50	Double	0.00
	ISPT_TYPE		Type of SPT test	S (See Appendix 3)	Text	
	?ISPT_SWP	mm	Self-weight penetration	25	Integer	0
	ISPT_REM		Remarks relating to the test	Borehole topped up with water prior to test	Text	
	ISPT_INC1		Number of blows for 1st increment (Seating)	6	Integer	0
	ISPT_INC2		Number of blows for 2nd increment (Seating)	8	Integer	0
	ISPT_INC3		Number of blows for 1st increment (Test)	8	Integer	0
	ISPT_INC4		Number of blows for 2nd increment (Test)	9	Integer	0
	ISPT_INC5		Number of blows for 3rd increment (Test)	9	Integer	0
	ISPT_INC6		Number of blows for 4th increment (Test)	9	Integer	0
	ISPT_PEN1	mm	Penetration for 1st increment (Seating Drive)	75	Integer	0
	ISPT_PEN2	mm	Penetration for 2nd increment (Seating Drive)	75	Integer	0
	ISPT_PEN3	mm	Penetration for 1st increment (Test)	75	Integer	0

Group Name: ISPT - Standard Penetration Test Results						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
	ISPT_PEN4	mm	Penetration for 2nd increment (Test)	75	Integer	0
	ISPT_PEN5	mm	Penetration for 3rd increment (Test)	75	Integer	0
	ISPT_PEN6	mm	Penetration for 4th increment (Test)	75	Integer	0

Group Name: ?ISTR - In-Situ Stress Tests						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	?HOLE_ID		Exploratory hole or location equivalent	6421/A	Text	
*	?ISTR_TOP	m	Depth to top of test zone	81.00	Double	0.00
*	?ISTR_TESN		In-situ test number	2	Text	
	?ISTR_BASE	m	Depth to base of test zone	167.00	Double	0.00
	?ISTR_METH		Test method/instrument type	ISRM Part III: 2003: 3.2-3.3	Text	
	?ISTR_MASH	MPa	Maximum horizontal principal stress, S_H (Calculated from equation)	10.01	Double	0.00
	?ISTR_MISH	MPa	Minimum horizontal principal stress, S_h (Calculated from equation)	20.01	Double	0.00
	?ISTR_SY	MPa	Vertical principal stress, S_v (Calculated from equation)	30.01	Double	0.00
	?ISTR_DIR	deg	Direction angle range of the acting maximum horizontal principal stress, S_H	N10~13	Text	
	?ISTR_TEN	MPa	Hydraulic fracturing rock tensile strength	9.01	Double	0.00
	?ISTR_REM		Notes on stress-depth relations/test remarks	Test zone is highly fractured	Text	
	?FILE_FSET		Associated file reference	Field Testing report.pdf	Text	
	?GEOL_STAT		Stratum reference shown on trial pit or traverse sketch	1	Text	

Group Name: IVAN - In-Situ Vane Tests						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	HOLE_ID		Exploratory hole or location equivalent	6421/A or VAN 15	Text	
*	IVAN_DPTH	m	Depth of vane test	13.50	Double	0.00
*	IVAN_TESN		Vane test number	2	Text	
	IVAN_REM		Details of vane test, vane size, vane type	Blade size= 65/130, Genor	Text	
	IVAN_IVAN	kN/m2	Vane test result	60.00	Double	0.00
	IVAN_IVAR	kN/m2	Vane test remoulded result	45.00	Double	0.00
	IVAN_IPEN	kN/m2	Hand penetrometer result	23.00	Double	0.00
	?IVAN_DATE	dd/mm/yyyy	Test Date	20/02/2003	Date	dd/mm/yyyy
	GEOL_STAT		Stratum reference shown on trial pit or traverse sketch	1	Text	

Group Name: ?LEMC - Emerson Class Tests						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	?HOLE_ID		Exploratory hole or location equivalent	6421/A	Text	
*	?SAMP_TOP	m	Depth to top of sample	24.55	Double	0.00
*	?SAMP_REF		Sample reference	TW1	Text	
*	?SAMP_TYPE		Sample type	TW (See Appendix 3)	Text	
*	?SPEC_REF		Specimen reference	1	Text	
*	?SPEC_DPTH	m	Specimen depth	24.59	Double	0.00
	?SPEC_DESC		Specimen description	Very soft, greenish grey CLAY	Text	
	?SPEC_PREP		Details of specimen preparation including time between preparation and testing	Representative samples are obtained by selecting 3 air-dry aggregates, 5mm - 10mm diameter.	Text	
	?LEMC_LEMC		Emerson class number	Class 1 to Class 8 (See Appendix 3)	Text	
	?LEMC_WTYP		Type of water used	Deionised	Text	
	?LEMC_TEMP	DegC	Temperature of water used	27.5	Double	0.0
	?LEMC_METH		Test method	AS 1289.3.8.1-1997	Text	
	?LEMC_LAB		Name of testing laboratory/organisation	ABC Laboratory	Text	
	?LEMC_CRED		Accrediting body and reference number (when appropriate)	SAC-SINGLAS / LA-2010-0422-A	Text	
	?LEMC_STAT		Test status	Draft	Text	
	?FILE_FSET		Associated file reference	FS6	Text	

Group Name: ?MONP - Monitor Points						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	?HOLE_ID		Exploratory hole or location equivalent	6422/A	Text	
*	?MONP_DIS	m	Distance of monitoring point from HOLE_ID	2.03	Double	0.00
*	?MONP_ID		Monitoring point identifier	ZT102	Text	
	?MONP_DATE	dd/mm/yyyy	Installation date	01/02/2003	Date	dd/mm/yyyy
	?MONP_TYPE		Instrument type	TS (See Appendix 3)	Text	
	?MONP_TRZ	m	Distance to start of response zone from HOLE_ID datum	5.25	Double	0.00
	?MONP_BRZ	m	Distance to end of response zone from HOLE_ID datum	7.25	Double	0.00
	?MONP_BRGA	deg	Bearing of monitoring axis A (compass bearing)	190	Integer	0
	?MONP_BRGB	deg	Bearing of monitoring axis B (compass bearing)	180	Integer	0
	?MONP_BRGC	deg	Bearing of monitoring axis C (compass bearing)	NA	Integer	0
	?MONP_INCA	deg	Inclination of instrument axis A (measured positively down from horizontal)	80	Integer	0

Group Name: ?MONP - Monitor Points						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
	?MONP_INCB	deg	Inclination of instrument axis B (measured positively down from horizontal)	70	Integer	0
	?MONP_INCC	deg	Inclination of instrument axis C (measured positively down from horizontal)	NA	Integer	0
	?MONP_RSCA		Reading sign convention in direction A	Displacement to East +ve	Text	
	?MONP_RSCB		Reading sign convention in direction B	Displacement to South +ve	Text	
	?MONP_RSCC		Reading sign convention in direction C	Displacement up +ve	Text	
	?MONP_REM		Remarks	Behind wall	Text	
	?FILE_FSET		Associated file reference	FS27	Text	

Group Name: ?MONR - Monitor Point Readings						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	?HOLE_ID		Exploratory hole or location equivalent	6422/A	Text	
*	?MONP_DIS	m	Distance of monitoring point from HOLE_ID	2.30	Double	0.00
*	?MONP_ID		Monitoring point identifier	ZT102	Text	
*	?MONR_DATE	dd/mm/yyyy	Date of reading	20/02/2003	Date	dd/mm/yyyy
*	?MONR_TIME	hhmmss	Time of reading	134000	Time	hhmmss
	?MONR_DSTA	m	Distance A from HOLE_ID (slip indicator top rod)	2.73	Double	0.00
	?MONR_DSTB	m	Distance B from HOLE_ID (slip indicator top rod)	11.56	Double	0.00
	?MONR_DSPA	mm	Displacement in direction A	24.25	Double	0.00
	?MONR_DSPB	mm	Displacement in direction B	12.27	Double	0.00
	?MONR_DSPC	mm	Displacement in direction C	-10.842	Double	0.000
	?MONR_PRES	kN/m2	Pressure	20.64	Double	0.00
	?MONR_ANGA	deg	Rotation/Tilt in direction A	0.023	Double	0.000
	?MONR_ANGB	deg	Rotation/Tilt in direction B	-0.284	Double	0.000
	?MONR_ANGC	deg	Rotation in direction C	2.420	Double	0.000
	?MONR_STRA	%	Strain in direction A	-1.87	Double	0.00
	?MONR_STRB	%	Strain in direction B	1.09	Double	0.00
	?MONR_STRC	%	Strain in direction C	1.23	Double	0.00
	?MONR_FORC	kN	Force	62.18	Double	0.00
	?MONR_TEMP	DegC	Temperature	21.12	Double	0.00
	?MONR_WDEP	m	Depth to water from HOLE_ID datum	6.42	Double	0.00
	?MONR_EAST	m	Absolute position (Easting)	523145.215	Double	0.000
	?MONR_NRTH	m	Absolute position (Northing)	178963.236	Double	0.000
	?MONR_LEV	m	Absolute position (Level)	103.256	Double	0.000

Group Name: ?MONR - Monitor Point Readings						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
	?MONR_WHD	m	Head of water above tip	2.01	Double	0.00
	?MONR_GAUG	m	Gauge length	0.55	Double	0.00
	?MONR_FLOW	l/s	Flow	20.15	Double	0.00
	?MONR_REM		Details for instrument reference, probe logger, serial numbers		Text	
	?FILE_FSET		Associated file reference	FS28	Text	

Group Name: POBS - Piezometer Readings						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	HOLE_ID		Exploratory hole or location equivalent	6421/A	Text	
*	PREF_TDEP	m	Depth to reference level of piezometer tip	7.25	Double	0.00
*	POBS_DATE	dd/mm/yyyy	Date of piezometer reading	26/03/1991	Date	dd/mm/yyyy
*	POBS_TIME	hhmmss	Time of piezometer reading	164000	Time	hhmmss
	POBS_DEP	m	Depth to water below ground surface	6.45	Double	0.00
	POBS_HEAD	m	Head of water above piezometer tip	0.85	Double	0.00
	POBS_REM		Remarks	Reading taken during heavy rain	Text	

Group Name: PREF - Piezometer Installation Details						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	HOLE_ID		Exploratory hole or location equivalent	6421/A	Text	
*	PREF_TDEP	m	Depth to reference level of piezometer tip	7.25	Double	0.00
	PREF_DATE	dd/mm/yyyy	Piezometer installation date	22/03/1991	Date	dd/mm/yyyy
	PREF_TYPE		Piezometer type	PPIE (See Appendix 3)	Text	
	PREF_TRPS	m	Depth to top of response zone	6.55	Double	0.00
	PREF_BRPS	m	Depth to base of response zone	7.55	Double	0.00
	PREF_REM		Details of type and depths of grouting and readout arrangements/locations	Grout (Cement,1: Bentonite,0.5:Water,4)	Text	
	FILE_FSET		Associated file reference	FS6	Text	

Group Name: PRTD - Pressuremeter Test Data						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	HOLE_ID		Exploratory hole or location equivalent	6431/A	Text	
*	PRTD_TREF		Reference number of test	1	Text	
*	PRTD_DPTH	m	Depth of test	2.57	Double	0.00
*	PRTD_SEQ		Sequence number	1	Text	
	PRTD_DATE	dd/mm/yyyy	Date of test	22/12/1993	Date	dd/mm/yyyy
	PRTD_TYPE		Pressuremeter type	SBP (See Appendix 3)	Text	
	PRTD_DIA	mm	Uninflated diameter of pressuremeter	82.09	Double	0.00
	PRTD_ARM1	mm	Arm (pair) 1 displacement	1.05	Double	0.00
	PRTD_ARM2	mm	Arm (pair) 2 displacement	1.05	Double	0.00
	PRTD_ARM3	mm	Arm (pair) 3 displacement	1.05	Double	0.00
	PRTD_TPC1	kN/m2	Total pressure/arm (pair) 1	54.24	Double	0.00
	PRTD_TPC2	kN/m2	Total pressure/arm (pair) 2	54.24	Double	0.00
	PRTD_TPC3	kN/m2	Total pressure/arm (pair) 3	54.24	Double	0.00
	PRTD_PPA	kN/m2	Pore pressure cell A	2.09	Double	0.00
	PRTD_PPB	kN/m2	Pore pressure cell B	2.09	Double	0.00
	PRTD_REM		Remarks	6 arms used indetermination of average	Text	
	PRTD_PRES	kN/m2	Total pressure in test cell	60.10	Double	0.00
	PRTD_VOL	cm3	Volume change in test cell	2.26	Double	0.00

Group Name: PRTG - Pressuremeter Test Results, General						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	HOLE_ID		Exploratory hole or location equivalent	6431/A	Text	
*	PRTD_TREF		Reference number of test	1	Text	
*	PRTD_DPTH	m	Depth of test	2.75	Double	0.00
	PRTD_DATE	dd/mm/yyyy	Date of test	22/12/1993	Date	dd/mm/yyyy
	PRTD_TYPE		Pressuremeter type	SBP (See Appendix 3)	Text	
	PRTD_DIA	mm	Uninflated diameter of pressuremeter	82.9	Double	0.0
	PRTG_HA1	kN/m2	Estimated horizontal stress, arm (pair) 1	700.5	Double	0.0
	PRTG_HA2	kN/m2	Estimated horizontal stress, arm (pair) 2	700.5	Double	0.0
	PRTG_HA3	kN/m2	Estimated horizontal stress, arm (pair) 3	700.5	Double	0.0
	PRTG_HAA	kN/m2	Estimated horizontal stress, average	700.5	Double	0.0
	PRTG_GIA1	MN/m2	Initial shear modulus, arm (pair) 1	70.5	Double	0.0
	PRTG_GIA2	MN/m2	Initial shear modulus, arm (pair) 2	70.5	Double	0.0
	PRTG_GIA3	MN/m2	Initial shear modulus, arm (pair) 3	70.5	Double	0.0
	PRTG_GIAA	MN/m2	Initial shear modulus, average	70.5	Double	0.0

Group Name: PRTG - Pressuremeter Test Results, General						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
	PRTG_CUA1	kN/m2	Undrained shear strength, arm (pair) 1	420.3	Double	0.0
	PRTG_CUA2	kN/m2	Undrained shear strength, arm (pair) 2	420.3	Double	0.0
	PRTG_CUA3	kN/m2	Undrained shear strength, arm (pair) 3	420.3	Double	0.0
	PRTG_CUAA	kN/m2	Undrained shear strength, average	420.3	Double	0.0
	PRTG_PLA1	kN/m2	Limit pressure, arm (pair) 1	3400.2	Double	0.0
	PRTG_PLA2	kN/m2	Limit pressure, arm (pair) 2	3400.2	Double	0.0
	PRTG_PLA3	kN/m2	Limit pressure, arm (pair) 3	3400.2	Double	0.0
	PRTG_PLAA	kN/m2	Limit pressure, average	3400.2	Double	0.0
	PRTG_AFA1	deg	Angle of friction, arm (pair) 1	39	Integer	0
	PRTG_AFA2	deg	Angle of friction, arm (pair) 2	39	Integer	0
	PRTG_AFA3	deg	Angle of friction, arm (pair) 3	39	Integer	0
	PRTG_AFAA	deg	Angle of friction, average	39	Integer	0
	PRTG_ADA1	deg	Angle of dilation, arm (pair) 1	10	Integer	0
	PRTG_ADA2	deg	Angle of dilation, arm (pair) 2	10	Integer	0
	PRTG_ADA3	deg	Angle of dilation, arm (pair) 3	10	Integer	0
	PRTG_ADAA	deg	Angle of dilation, average	10	Integer	0
	PRTG_AFCV	deg	Angle of friction at constant volume (ϕ_{cv}) used	35	Integer	0
	PRTG_REM		Remarks	OYO-E2	Text	
	FILE_FSET		Associated file reference	FS11	Text	
	?PRTG_CRP	kN/m2	Creep pressure	3500.05	Double	0.00
	?PRTG_MPMI	kN/m2	Menard pressure modulus (Natural)	42835.08	Double	0.00
	?PRTG_MPMR	kN/m2	Menard pressure modulus (Reload)	83543.09	Double	0.00

Group Name: PRTL - Pressuremeter Test Results, Individual Loops						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	HOLE_ID		Exploratory hole or location equivalent	6431/A	Text	
*	PRTD_TREF		Reference number of test	1	Text	
*	PRTD_DPTH	m	Depth of test	2.70	Double	0.00
*	PRTL_LNO		Unload/Reload loop number	1	Text	
	PRTD_DATE	dd/mm/yyyy	Date of test	22/12/1993	Date	dd/mm/yyyy
	PRTD_TYPE		Pressuremeter type	SBP (See Appendix 3)	Text	
	PRTD_DIA	mm	Uninflated diameter of pressuremeter	82.9	Double	0.0
	PRTL_GA1	MN/m2	Unload/reload shear modulus, arm (pair) 1	70.25	Double	0.00
	PRTL_GA2	MN/m2	Unload/reload shear modulus, arm (pair) 2	70.25	Double	0.00
	PRTL_GA3	MN/m2	Unload/reload shear modulus, arm (pair) 3	70.25	Double	0.00
	PRTL_GAA	MN/m2	Unload/reload shear modulus, average	70.25	Double	0.00

Group Name: PTIM - Hole Progress by Time						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	HOLE_ID		Exploratory hole or location equivalent	6421/A	Text	
*	PTIM_DATE	dd/mm/yyyy	Date of progress reading	20/03/1991	Date	dd/mm/yyyy
*	PTIM_TIME	hhmm	Time of progress reading	1435	Time	hhmm
	PTIM_DEP	m	Hole depth at PTIM_TIME	22.13	Double	0.00
	PTIM_CAS	m	Depth of casing at PTIM_TIME	20.25	Double	0.00
	PTIM_WAT	m	Depth to water at PTIM_TIME	16.56	Double	0.00
	PTIM_REM		Remarks at PTIM_TIME	Stopped drilling on client's instruction	Text	

Group Name: PTST - Laboratory Permeability Tests						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	HOLE_ID		Exploratory hole or location equivalent	6411/A	Text	
*	SAMP_TOP	m	Depth to top of test sample	6.50	Double	0.00
*	SAMP_REF		Sample reference number	12	Text	
*	SAMP_TYPE		Sample type	U (See Appendix 3)	Text	
*	SPEC_REF		Specimen reference number	2	Text	
*	SPEC_DPTH	m	Specimen Depth	6.90	Double	0.00
*	PTST_TESN		Permeability test number	2	Text	
	PTST_REM		Permeability test method	Constant head permeability test	Text	
	PTST_COND		Sample condition	Undisturbed	Text	
	PTST_SZUN	mm	Size cut off of material too coarse for testing	5.0	Double	0.0
	PTST_UNS	%	Proportion of material too coarse for testing - BS 1377 Part5 cl 5.7	36.0	Double	0.0
	PTST_DIA	mm	Diameter of test sample	102.0	Double	0.0
	PTST_LEN	mm	Length of test sample	200.0	Double	0.0
	PTST_MC	%	Initial moisture content of test sample	20.0	Double	0.0
	PTST_BDEN	Mg/m3	Initial bulk density of test sample	2.24	Double	0.00
	PTST_DDEN	Mg/m3	Dry density of test sample	1.87	Double	0.00
	PTST_VOID		Void ratio of test sample	0.37	Double	0.00
	PTST_K	m/s	Coefficient of permeability	4.00E-06	Double	0.00
	PTST_TSTR	kN/m2	Mean effective stress at which permeability measured (when measured in triaxial cell)	112.0	Double	0.0
	PTST_ISAT	%	Initial degree of saturation	72.0	Double	0.0
	PTST_FSAT	%	Final degree of saturation	98.0	Double	0.0
	PTST_PDEN	Mg/m3	Particle density, measured or **(#)** assumed	2.65	Double	0.00
	FILE_FSET		Associated file reference	FS28	Text	

Group Name: PUMP - Pumping Tests						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	HOLE_ID		Exploratory hole or location equivalent	6431/A	Text	
*	PUMP_DATE	dd/mm/yyyy	Date of reading	16/03/1991	Date	dd/mm/yyyy
*	PUMP_TIME	hhmmss	Time of reading	143500	Time	hhmmss
	PUMP_DPTH	m	Depth to water below ground	12.50	Double	0.00
	PUMP_QUAT	l/s	Pumping rate from hole	0.8	Double	0.0
	PUMP_REM		Remarks	Double packer	Text	
	FILE_FSET		Associated file reference	FS29	Text	

Group Name: ROCK - Rock Testing						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	HOLE_ID		Exploratory hole or location equivalent	6423/A	Text	
*	SAMP_TOP	m	Depth to top of test sample	2.54	Double	0.00
*	SAMP_REF		Sample reference number	12	Text	
*	SAMP_TYPE		Sample type	C (See Appendix 3)	Text	
*	SPEC_REF		Specimen reference number	2	Text	
*	SPEC_DPTH	m	Specimen depth	2.9	Double	0.00
	ROCK_PLS	MN/m2	Uncorrected point load (I_s)	2.3	Double	0.0
	ROCK_PLSI	MN/m2	Size corrected point load index (I_s 50)	2.5	Double	0.0
	ROCK_PLTF		Point load test type (A, D, L or P)	A+L (See Appendix 3)	Text	
	ROCK_UCS	MN/m2	Uniaxial compressive strength (size corrected)	16.8	Double	0.0
	ROCK_REM		Remarks	Slightly weathered rock	Text	
	ROCK_PREM		Details additional to ROCK_PLTF	Saturated specimen	Text	
	ROCK_UREM		Notes on uniaxial compressive strength test, including sample dimensions	ISRM 76mm diameter 205mm high	Text	
	ROCK_E	MN/m2	Elastic modulus	220.0	Double	0.0
	ROCK_MU		Poisson's ratio	0.3	Double	0.0
	ROCK_BRAZ	MN/m2	Tensile strength by the Brazilian method	50.0	Double	0.0
	ROCK_BREM		Notes on Brazilian tensile strength test including sample dimensions	ISRM 76mm diameter 32mm thick	Text	
	ROCK_PORO	%	Rock porosity	17.0	Double	0.0
	ROCK_PORE		Notes on type of porosity test	ISRM Calliper method	Text	
	ROCK_MC	%	Natural moisture content	18.0	Double	0.0
	ROCK_BDEN	Mg/m3	Rock bulk density	2.22	Double	0.00
	ROCK_DDEN	Mg/m3	Rock dry density	1.88	Double	0.00
	ROCK_PDEN	Mg/m3	Aggregate particle density	2.53	Double	0.00

Group Name: ROCK - Rock Testing						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
	ROCK_DREM		Aggregate particle density test method and notes	BS812 Gas jar method. Saturated, surface dried 10mm aggregate	Text	
	ROCK_WTAB	%	Aggregate water absorption	2.6	Double	0.0
	ROCK_WREM		Aggregate water absorption test method and notes	BS812 Gas jar method 10mm aggregate	Text	
	ROCK_SDI	%	Slake durability index	23.2	Double	0.0
	ROCK_SREM		Slake durability test method and notes	ISRM 2nd cycle tap water at 20 degC	Text	
	ROCK_SOUN	%	Aggregate soundness test	95.0	Double	0.0
	ROCK_MREM		Aggregate soundness test method and notes	BS812 magnesium sulphate 10-14mm aggregate 5 cycles % retained	Text	
	ROCK_ACV	%	Aggregate crushing value	16.5	Double	0.0
	ROCK_CREM		Aggregate crushing value test method and notes	BS812 10-14mm aggregate	Text	
	ROCK_AIV	%	Aggregate impact value	15.0	Double	0.0
	ROCK_IREM		Aggregate impact value test method and notes	BS812 10-14mm aggregate, saturated 15 blows	Text	
	ROCK_LOSA	%	Aggregate Los Angeles abrasion	15.0	Double	0.0
	ROCK_LREM		Aggregate Los Angeles abrasion test method and notes	ASTM C131 9.5-19mm aggregate 500 revolutions	Text	
	ROCK_AAV		Aggregate abrasion value	8.32	Double	0.00
	ROCK_PSV		Aggregate polished stone value	67.0	Double	0.0
	ROCK_FI	%	Aggregate flakiness index	9.0	Double	0.0
	ROCK_EI	%	Aggregate elongation index	12.0	Double	0.0
	ROCK_DESC		Specimen description	Mudstone	Text	
	ROCK_SHOR		Shore hardness	29.7	Double	0.0
	ROCK_PWAV	m/s	P-wave velocity	3000.0	Double	0.0
	ROCK_SWAV	m/s	S-wave velocity	1800.0	Double	0.0
	ROCK_EMOD	GPa	Dynamic elastic modulus	20.0	Double	0.0
	ROCK_SG	GPa	Shear modulus derived from ROCK_SWAV	8.0	Double	0.0
	ROCK_SWEL	kN/m2	Rock swelling index	50.0	Double	0.0
	FILE_FSET		Associated file reference	FS10	Text	
	?ROCK_SCT	deg	Saw cut test	14.0	Double	0.0
	?ROCK_GSB		Golder shear box test	7.0	Double	0.0
	?ROCK_ACST		Abrasion cutter steel test	15.0	Double	0.0
	?ROCK_CERA		Cerchar abrasivity test	4.0	Double	0.0
	?ROCK_BRIV		Brittleness value test	52.0	Double	0.0
	?ROCK_SJV		Sivers' J-value test	5.0	Double	0.0
	?ROCK_PTRO		Petrographic analysis (Yes/No)	Yes	Text	

Group Name: SAMP - Sample Reference Information						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	HOLE_ID		Exploratory hole or location equivalent	6421/A	Text	
*	SAMP_TOP	m	Depth to top of sample	24.55	Double	0.00
*	SAMP_REF		Sample reference number	24	Text	
*	SAMP_TYPE		Sample type	U (See Appendix 3)	Text	
	SAMP_DIA	mm	Sample diameter	100.0	Double	0.0
	SAMP_BASE	m	Depth to base of sample	25.50	Double	0.00
	SAMP_DESC		Sample description	Stiff brown very silty CLAY	Text	
	SAMP_UBLO		Number of blows required to drive sampler	35	Text	
	SAMP_REM		Sample remarks	60% recovery	Text	
	SAMP_DATE	dd/mm/yyyy	Date sample taken	26/3/1991	Date	dd/mm/yyyy
	SAMP_TIME	hhmmss	Time sample taken	092800	Time	hhmmss
	SAMP_BAR	kPa	Barometric pressure at time of sampling	99.1	Double	0.0
	SAMP_WDEP	m	Depth to water below ground surface at time of sampling	4.50	Double	0.00
	SAMP_TEMP	DegC	Sample temperature at time of sampling	8.0	Double	0.0
	SAMP_PRES	kPa	Gas pressure (above barometric)	0.2	Double	0.0
	SAMP_FLOW	l/min	Gas flow	0.2	Double	0.0
	?SAMP_PREP		Details of sample preparation	Preservative added	Text	
	GEOL_STAT		Stratum reference shown on trial pit or traverse sketch	1	Text	
	FILE_FSET		Associated file reference	FS3	Text	

Group Name: SHBG - Shear Box Testing - General						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	HOLE_ID		Exploratory hole or location equivalent	6331/A	Text	
*	SAMP_TOP	m	Depth to top of test sample	6.50	Double	0.00
*	SAMP_REF		Sample reference number	12	Text	
*	SAMP_TYPE		Sample type	U (See Appendix 3)	Text	
*	SPEC_REF		Specimen reference number	2	Text	
*	SPEC_DPTH	m	Specimen depth	6.90	Double	0.00
	SHBG_TYPE		Test type e.g. small shear box, large shear box, ring shear	Small shear box	Text	
	SHBG_REM		Test notes e.g. undisturbed, pre-existing shear, recompacted, rock joint, cut plane	Undisturbed	Text	
	SHBG_PCOH	kN/m2	Peak cohesion intercept	5.00	Double	0.00
	SHBG_PHI	deg	Peak angle of friction	26	Integer	0

Group Name: SHBG - Shear Box Testing - General						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
	SHBG_RCOH	kN/m2	Residual cohesion intercept	1.00	Double	0.00
	SHBG_RPHI	deg	Residual angle of friction	13	Integer	0
	FILE_FSET		Associated file reference	FS18	Text	

Group Name: SHBT - Shear Box Testing						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	HOLE_ID		Exploratory hole or location equivalent	6331/A	Text	
*	SAMP_TOP	m	Depth to top of test sample	6.50	Double	0.00
*	SAMP_REF		Sample reference number	12	Text	
*	SAMP_TYPE		Sample type	U (See Appendix 3)	Text	
*	SPEC_REF		Specimen reference number	2	Text	
*	SPEC_DPTH	m	Specimen depth	6.90	Double	0.00
*	SHBT_TESN		Shear box stage number	1	Text	
	SHBT_BDEN	Mg/m3	Bulk density	1.96	Double	0.00
	SHBT_DDEN	Mg/m3	Dry density	1.63	Double	0.00
	SHBT_NORM	kN/m2	Shear box normal stress	100.00	Double	0.00
	SHBT_DISP	mm/min	Displacement rate	0.10	Double	0.00
	SHBT_PEAK	kN/m2	Shear box peak shear stress	65.50	Double	0.00
	SHBT_RES	kN/m2	Shear box residual shear stress	47.20	Double	0.00
	SHBT_PDIS	mm	Displacement at peak shear strength	2.35	Double	0.00
	SHBT_RDIS	mm	Displacement at residual shear strength	12.41	Double	0.00
	SHBT_PDEN	Mg/m3	Particle density - measured or, **(#)** assumed	2.65	Double	0.00
	SHBT_IVR		Initial void ratio	0.5	Double	0.0
	SHBT_MCI	%	Initial moisture content	20.00	Double	0.00
	SHBT_MCF	%	Final moisture content	18.00	Double	0.00
	?SHBT_REM		Remarks on test stage	Reached end of travel	Text	

Group Name: STCN - Static Cone Penetration Tests						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	HOLE_ID		Exploratory hole or location equivalent	6421/A	Text	
*	STCN_DPTH	m	Depth of result for static cone test	12.10	Double	0.00
	STCN_TYP		Cone test type	PC (See Appendix 3)	Text	
	STCN_REF		Cone identification reference	C10CFIIP.C09012	Text	
	STCN_RES	MN/m2	Cone resistance	20.0000	Double	0.0000
	STCN_FRES	kN/m2	Local unit side friction resistance	1000.0000	Double	0.0000
	STCN_PWP1	kN/m2	Porewater pressure	15.00	Double	0.00
	STCN_PWP2	kN/m2	Second porewater pressure	15.00	Double	0.00
	STCN_PWP3	kN/m2	Third porewater pressure	15.00	Double	0.00
	STCN_CON	uS/cm	Conductivity	0.01	Double	0.00
	STCN_TEMP	DegC	Temperature	10.0	Double	0.0
	STCN_PH		pH reading	7.2	Double	0.0
	STCN_SLP1	deg	Slope indicator no. 1	4.1	Double	0.0
	STCN_SLP2	deg	Slope indicator no. 2	6.3	Double	0.0
	STCN_REDX	mV	Redox potential reading	13.3	Double	0.0
	STCN_FFD	%	Fluorescence intensity	96.3	Double	0.0
	STCN_PMT	counts/s	Photo-multiplier tube reading	26.0	Double	0.0
	STCN_PID	uV	Photo ionization detector reading	3650.0	Double	0.0
	STCN_FID	uV	Flame ionization detector reading	151260.0	Double	0.0
	FILE_FSET		Associated file reference	FS12	Text	

Group Name: ?TREM - Time Related Remarks						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	?HOLE_ID		Exploratory hole or location equivalent	G12	Text	
*	?TREM_DATE	dd/mm/yyyy	Date of remark	16/05/2001	Date	dd/mm/yyyy
*	?TREM_TIME	hhmmss	Time of remark	120000	Time	hhmmss
	?TREM_REM		Time related remark	Completion of concrete pour for slab G12	Text	
	?FILE_FSET		Associated file reference	FS28	Text	

Group Name: TRIG - Triaxial Tests - General						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	HOLE_ID		Exploratory hole or location equivalent	6431/A	Text	
*	SAMP_TOP	m	Depth to top of test sample	6.50	Double	0.00
*	SAMP_REF		Sample reference number	12	Text	
*	SAMP_TYPE		Sample type	U (See Appendix 3)	Text	
*	SPEC_REF		Specimen reference number	3	Text	
*	SPEC_DPTH	m	Specimen depth	6.80	Double	0.00
	TRIG_TYPE		Test type	UU (See Appendix 3)	Text	
	TRIG_COND		Sample condition	Undisturbed	Text	
	TRIG_REM		Test method, additional information, failure criteria	Sample contained shell fragments	Text	
	TRIG_CU	kN/m2	Value of undrained shear strength	75.0	Double	0.0
	TRIG_COH	kN/m2	Cohesion intercept associated with TRIG_PHI	2.0	Double	0.0
	TRIG_PHI	deg	Angle of friction for effective shear strength triaxial test	32.0	Double	0.0
	FILE_FSET		Associated file reference	FS7	Text	
	?TRIG_PBT	m/s	Coefficient of permeability at 20 degC	4.00E-06	Double	0.00

Group Name: TRIX - Triaxial Tests						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	HOLE_ID		Exploratory hole or location equivalent	6431/A	Text	
*	SAMP_TOP	m	Depth to top of test sample	6.50	Double	0.00
*	SAMP_REF		Sample reference number	12	Text	
*	SAMP_TYPE		Sample type	U (See Appendix 3)	Text	
*	SPEC_REF		Specimen reference number	3	Text	
*	SPEC_DPTH	m	Specimen depth	6.80	Double	0.00
*	TRIX_TESN		Triaxial test/stage number	1	Text	
	TRIX_SDIA	mm	Specimen diameter	38.00	Double	0.00
	TRIX_MC	%	Specimen initial moisture content	15.00	Double	0.00
	TRIX_CELL	kN/m2	Total cell pressure	100.00	Double	0.00
	TRIX_DEVF	kN/m2	Deviator stress at failure	360.00	Double	0.00
	TRIX_SLEN	mm	Sample length	76.00	Double	0.00
	TRIX_BDEN	Mg/m3	Initial bulk density	2.120	Double	0.000
	TRIX_DDEN	Mg/m3	Initial dry density	1.840	Double	0.000
	TRIX_PWPF	kN/m2	Porewater pressure at failure	60.00	Double	0.00
	TRIX_PWPI	kN/m2	Porewater pressure at start of shear stage	50.00	Double	0.00
	?TRIX_CU	kN/m2	Value of undrained shear strength	180.00	Double	0.00
	TRIX_STRN	%	Strain at failure	9.000	Double	0.000
	TRIX_MODE		Mode of failure	Brittle, plastic	Text	

Group Name: UNIT - Definition of <UNITS> and CNMT_UNIT						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	UNIT_UNIT		Unit Used	ohm cm	Text	
	UNIT_DESC		Description	Ohm centimetre	Text	

Group Name: WETH - Weathering Grades						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	HOLE_ID		Exploratory hole or location equivalent	6421/A	Text	
*	WETH_TOP	m	Depth to top of weathering subdivision	3.50	Double	0.00
*	WETH_BASE	m	Depth to base of weathering subdivision	3.95	Double	0.00
	WETH_GRAD		Material weathering grade	IV	Text	
	WETH_REM		Remarks, weathering system used	BS 5930	Text	

Group Name: WSTK - Water Strike Details						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	HOLE_ID		Exploratory hole or location equivalent	6421/A	Text	
*	WSTK_DEP	m	Depth to water strike	17.20	Double	0.00
*	WSTK_NMIN	min	Minutes after strike	20	Time	mm
	WSTK_CAS	m	Casing depth at time of water strike	15.70	Double	0.00
	WSTK_DATE	dd/mm/yyyy	Date of water strike	19/03/1991	Date	dd/mm/yyyy
	WSTK_TIME	hhmm	Time of water strike	1640	Time	hhmm
	WSTK_POST	m	Depth to water after WSTK_NMIN minutes	10.23	Double	0.00
	WSTK_FLOW		Flow rate remarks	Steady flow of water into hole	Text	
	WSTK_SEAL	m	Depth at which water strike sealed by casing	19.10	Double	0.00

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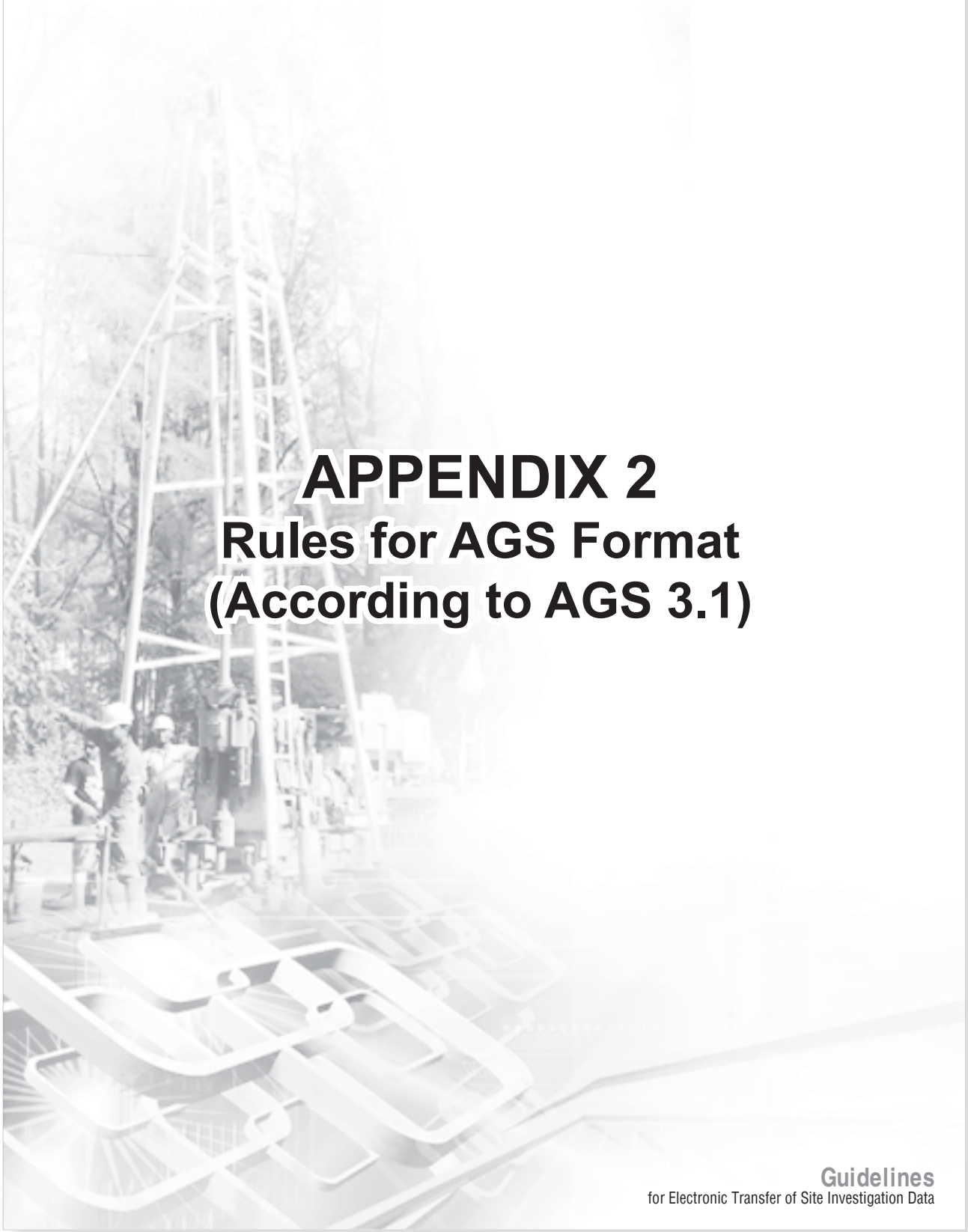

APPENDIX 2
Rules for AGS Format (According to AGS 3.1)

Guidelines
for Electronic Transfer of Site Investigation Data

RULES

The Rules are set to explain the overall framework which AGS data files are formulated. The data files do not replace the printed reports which they accompany. However, the layout does allow data items to be readily identified should the need arise.

The rules as per AGS 3.1 must be used when creating an AGS data files and they are reproduced below for easy of reference.

Rule 1
The data file shall be entirely composed of ASCII characters. The extended ASCII character set must not be used.

Rule 2
Each data file shall contain one or more data GROUPs. Each data GROUP contains related data.

Rule 3
Within each GROUP, data items are contained in data FIELDs. Each data FIELD contains a single data VARIABLE. Each line of the AGS Format file can contain several data FIELDs.

Rule 4
The order of data FIELDs on each line within a GROUP is defined at the head of each GROUP by a set of data HEADINGs.

Rule 5
Data HEADINGs and GROUP names must be taken from the approved Data Dictionary for data covered by these. In cases where there is no suitable entry, a user-defined HEADING may be used in accordance with Rules 21, 22 and 23.

Rule 6
The data HEADINGs fall into one of 2 categories: KEY or COMMON

KEY fields must appear in each GROUP, but may contain null data (see Rule 15)
KEY fields are necessary to uniquely define the data.

The following sub-rules apply to KEY fields and are required to ensure Data Integrity. (See Note 3)

Rule 6a
*HOLE_ID should always be the first field except in the **PROJ GROUP, where *PROJ_ID should be the first field. *HOLE_ID is also omitted from the **ABBR, **DICT, **UNIT and **FILE GROUPs.

Rule 6b
There must not be more than one line of data in each GROUP with the same combination of KEY field entries.

Rule 6c
Within each project every data entry made in the KEY fields in any GROUP must have an equivalent entry in its PARENT GROUP.

e.g. All HOLES referenced in any GROUP must be defined in the **HOLE GROUP. See GROUP HIERARCHY in Section 5.9.

Rule 7
All data VARIABLEs can contain any alphanumeric data (i.e. both text and numbers). Numerical data should be in numerals. e.g. 10 not TEN. (See also Note 2).

Note that all numerals must be presented as a text field.

Rule 8
Data GROUP names, data field HEADINGs and data VARIABLEs must be enclosed in double quotes ("...").

e.g. for inches or seconds, (") must not appear as part of the data variable.

Rule 9
The data field HEADINGs and data VARIABLEs on each line of the data file should be separated by a comma (,).

Rule 10
Each GROUP name shall be preceded by 2 asterisks (**).

e.g. "**HOLE"

Rule 11
HEADINGs shall be preceded by 1 asterisk (*).

e.g. "*HOLE_ID"

Rule 12
No line of data HEADINGs or data VARIABLEs shall exceed 240 characters. The character count should include delimiting quotes and commas.

e.g. "*HOLE_ID","*HOLE_NATE" = 23 characters

Rule 13
A line of data HEADINGs exceeding 240 characters can be continued on immediately following lines. A data HEADING must not itself be split between lines. A comma must be placed at the end of a HEADINGs line that is to be continued.

e.g."*HOLE_ID","*SAMP_TOP","*SAMP_REF","*SPEC_REF","*CLSS_LL","*CLSS_PL","*CLSS_BDEN"

Rule 14
A line of data VARIABLEs exceeding 240 characters must be continued on immediately following lines. Data VARIABLEs can be split between lines. A VARIABLE continuation line shall begin with the special name <CONT> in place of the first data VARIABLE (PROJ_ID or HOLE_ID). The continued data is then placed in the correct field order by inserting the appropriate number of Null data VARIABLEs before it. Note that each line of data in a GROUP should contain the same number of VARIABLEs. (See also Note 4).

e.g."**GEOL","*HOLE_ID","*GEOL_TOP","*GEOL_BASE","*GEOL_DESC","*GEOL_LEG"
"<UNITS>","m","m","",""
"501","1.2","2.4","Very stiff brown CLAY with",""
"<CONT>","","","extremely closely spaced fissures","CLAY"

Rule 15
Null data VARIABLEs must be included as 2 consecutive double quotes (“”).
e.g."",

Rule 16
Data GROUPs can be repeated within a file with different HEADINGs.

Rule 17
The number of data HEADINGs per GROUP shall not exceed 60.

Rule 18
A UNITS line must be placed immediately after the HEADINGS line in all GROUPs except **ABBR, **CODE, **DICT and **UNIT. An entry must be made for each data VARIABLE. Null entries ("") must be used for data VARIABLES that are unit-less, e.g. text. The line must begin with the special name <UNITS> in place of the first data variable (PROJ_ID or HOLE_ID). (See also Note 5)

e.g. "**GEOL"
"*HOLE_ID","*GEOL_TOP","*GEOL_BASE","*GEOL_DESC"
"<UNITS>","m","m",""

Rule 18a
A line of UNITS exceeding 240 characters can be continued on immediately following lines. A UNIT must not itself be split between lines. A comma must be placed at the end of a UNITS line that is to be continued.

e.g. "**GEOL"
"*HOLE_ID","*GEOL_TOP","*GEOL_BASE","*GEOL_DESC"
"<UNITS>","m","m",""

Rule 18b
Each data file shall contain the **UNIT GROUP. See Section 11 for the **UNIT GROUP defining the units used. This GROUP uses units defined in the ‘pick’ list in **Appendix 3** which contains all the standard SI units used in all other AGS GROUPs, as well as some common non-SI equivalents. Every UNIT entered in a <UNITS> line of a GROUP, the CNMT UNIT field of the CNMT GROUP and the ?ICCT_UNIT field in the ?ICCT GROUP must be defined in the **UNIT GROUP. Both standard and non-standard UNITS must be defined in the **UNIT GROUP.

Rule 19
Each data file shall contain the **PROJ GROUP

Rule 20
Each data file shall contain the **ABBR GROUP to define any data abbreviations where these have been used as data entries in the data GROUPs. This applies to standard abbreviations selected from the lists of codes and abbreviations in **Appendix 3** and user defined abbreviations.

Rule 21
Each file shall contain the **DICT GROUP to define non-standard GROUP and HEADING names where these have been used in the data GROUPs.

Rule 22
Each non-standard GROUP name shall contain the prefix **?.
A GROUP name shall not be more than 4 characters long excluding the **? prefix and shall consist of uppercase letters only.

e.g. “**?TESX”

Rule 23
Each non-standard HEADING shall contain the prefix *?. A HEADING name shall not be more than 9 characters long excluding the *? prefix and shall consist of uppercase letters, numbers or the underscore character only. HEADING names shall start with the GROUP name followed by an underscore character, except for HEADINGs which duplicate a HEADING in another GROUP, in which case this HEADING shall be used instead.

e.g. “*?ISPT_CALN”

Rule 24
Miscellaneous computer files (e.g. digital images) may be included with a data file. Each such file should be defined in a FILE GROUP. File names shall not contain more than 8 characters in the main body and not more than 3 characters in the extension.
Correct example: FNAME.XLS
Incorrect example: A LONG NAME.XYZ

Rule 25
Every data file that contains a **CNMT or **?ICCT GROUP for chemical test results must also contain a **CODE GROUP that defines the codes used for each determinand given in the CNMT_TYPE field of the **CNMT or **?ICCT GROUP. This applies to standard codes selected from the ‘pick’ lists in **Appendix 3** and user defined codes

Notes on the Rules
The following notes explain some points of detail in the Rules:

Note 1 – ASCII 'CSV' Files
The Rules define ASCII data files of a type commonly referred to as CSV (Comma Separated Value). This type of file is produced and read by some spreadsheet (and other) systems. The data items are separated by commas and are surrounded by quotes (").

Note 2 – Numeric and Character Data - Delimiters
The Rules permit any Data Field to contain text, since this allows characters in numeric fields and caters for those countries which use the comma in place of the decimal point. For these reasons ALL Data Fields must be surrounded by quotes.

Note that most spreadsheet and database systems provide a VALUE ( ) function (or similar) to convert text data to numeric data. This function can be used where calculations need to be carried out on data imported from AGS files.

Note 3 – Key and Common Fields
The Data Fields defined by the Format fall into one of two categories:

KEY Fields must be included every time a Data Group appears in a data file.
COMMON Fields are all other fields.

KEY Fields are important for maintaining data integrity. Without this the receiving software may not be able to use the data in a meaningful way.

For the purpose of creating AGS files this means that data entered into KEY Fields must be unique in each GROUP and that the corresponding entries are made in the PARENT GROUP. See GROUP HIERARCHY TABLE in **Appendix 1.**

Note 4 – Continuation Lines
It should be noted that some spreadsheets impose a finite limit (e.g. 240) on the number of characters within a single Data Field. The Rules define a scheme for producing continuation lines where there are long Data Fields. Although the scheme may seem complex at first sight, it is the system automatically produced by spreadsheets if the long data items are continued on additional rows IN THE SAME DATA COLUMN. Similarly, these Data Files will read into spreadsheets and preserve the long data items in their correct column order, for any length of data. The special <CONT> symbol must appear in the HOLE_ID Field, and thus <CONT> should never be used as a HOLE_ID.

Note 5 – Units
Note that a UNITS line must be included in every GROUP (except ABBR, DICT and UNIT) **even where the default units are used.**

Details of the default units to be used for each of the Data Fields are given in the Data Dictionary. These are the preferred units for each of the data dictionary definitions and should be used wherever possible.

They will either be the appropriate SI units or the unit defined by the particular British Standard relating to that specific item of data. It is recognised that situations will occur where neither the SI unit nor the British Standard unit are being used. All entries in the <UNITS> line must be defined in the **UNIT GROUP.

Note 6 – Associated files
Where other digital files or file sets are associated with data, the file association should be made with the relevant data type and record.

For example:

- Site location plans would be associated with the PROJ group.
- Photographs of core should be recorded against the core run records within the CORE group.
- Sample logging sheets if included with the data file would be associated with the SAMP group and against the relevant sample.
- Logging files from in situ tests should be associated with the appropriate test group.

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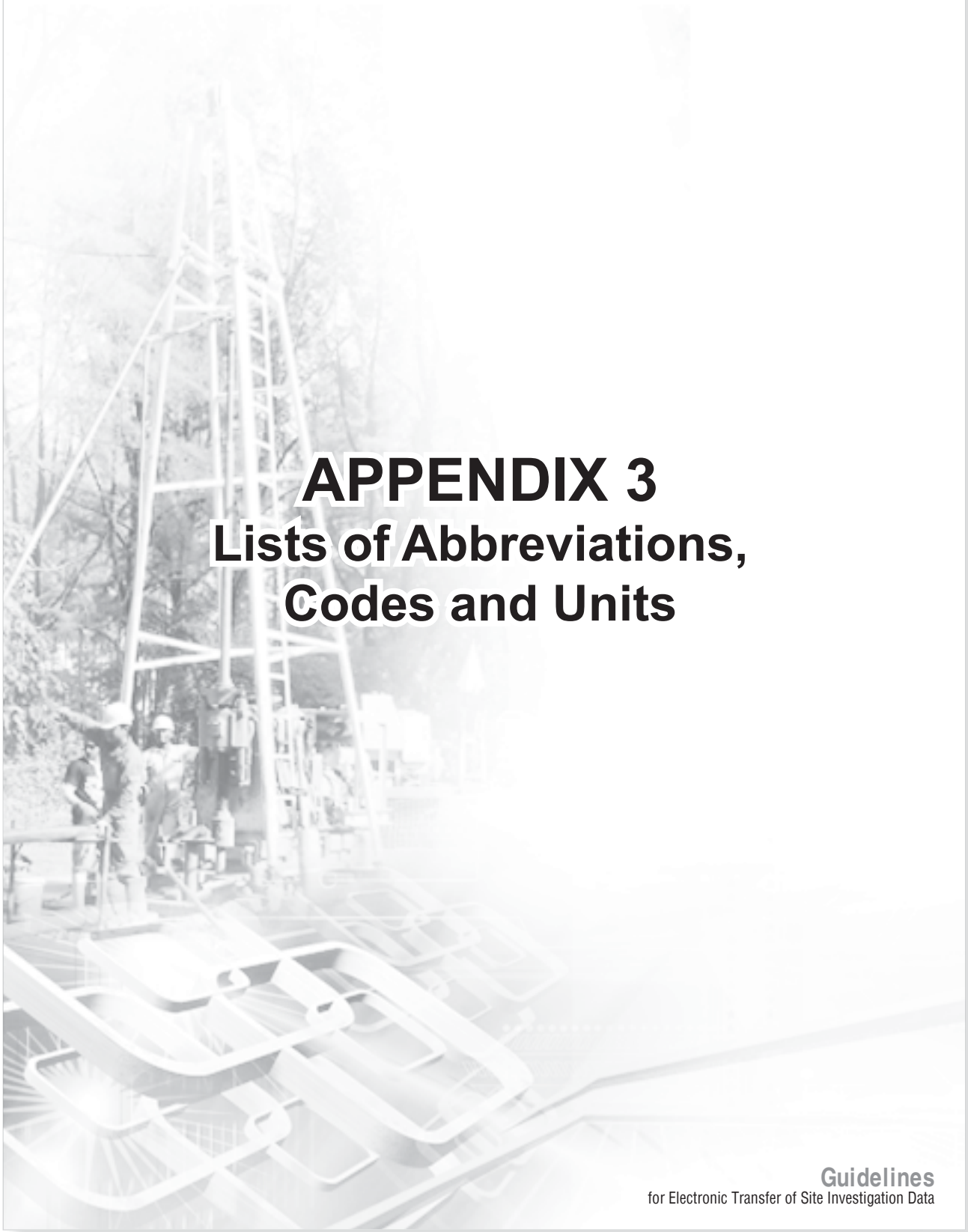

APPENDIX 3
Lists of Abbreviations, Codes and Units

Guidelines
for Electronic Transfer of Site Investigation Data

Group Name: ABBR - Abbreviation Definitions		
ABBR_HDNG	**ABBR_CODE**	**ABBR_DESC**
BKFL_LEG	901	Sand backfill
BKFL_LEG	902	Gravel backfill
BKFL_LEG	903	Bentonite
BKFL_LEG	904	Grout
BKFL_LEG	905	Arisings
BKFL_LEG	906	Concrete
CNMT_TTYP	GAS	Gas
CNMT_TTYP	LIQUID	Liquid
CNMT_TTYP	SOLID	Solid
CNMT_TTYP	SOLID_11WAT	Solid (1:1 Soil/Water extract)
CNMT_TTYP	SOLID_21WAT	Solid (2:1 Soil/Water extract)
CNMT_TTYP	SOLID_ACID	Solid (Acid extract)
CNMT_TTYP	SOLID_AVAIL	Solid (Available)
CNMT_TTYP	SOLID_DRY	Solid (Dry weight)
CNMT_TTYP	SOLID_EDTA	Solid (EDTA extract)
CNMT_TTYP	SOLID_FREE	Solid (Free)
CNMT_TTYP	SOLID_PRES	Solid (Presence of)
CNMT_TTYP	SOLID_TOT	Solid(Total)
CNMT_TTYP	SOLID_WAT	Solid (Water extract)
CNMT_TTYP	WATER	Water
CNMT_TTYP	WATER_ACIDHY	Water (Acid hydrolysable)
CNMT_TTYP	WATER_DISS	Water (Dissolved)
CNMT_TTYP	WATER_ELEM	Water(Elemental)
CNMT_TTYP	WATER_FREE	Water (Free)

ABBR_HDNG	ABBR_CODE	ABBR_DESC
CNMT_TTYP	WATER_ORG	Water (Organic)
CNMT_TTYP	WATER_PRES	Water (Presence of)
CNMT_TTYP	WATER_TOT	Water (Total)
CNMT_TTYP	LEACHATE	Leachate
CNMT_TTYP	LEACHATE_TOT	Leachate (Total)
CNMT_TTYP	LEACHATE_FREE	Leachate (Free)
CNMT_TTYP	LEACHATE_DISS	Leachate (Dissolved)
DISC_TERM	D	Terminates against another discontinuity
DISC_TERM	R	Terminates within rock
DISC_TERM	X	Extends beyond exposure
FILE_DOCT	CR	Construction record
FILE_DOCT	CAL	Calibration data
FILE_DOCT	DRAW	Drawing
FILE_DOCT	GEN	General
FILE_DOCT	MS	Method statement
FILE_DOCT	PH	Photograph
FILE_DOCT	RAW	Raw data
FILE_DOCT	REP	Report
FILE_DOCT	TECH	Technical paper
FILE_DOCT	VI	Video clip
GEOL_GEOL	FILL	BACKFILL
GEOL_GEOL	B	Beach (Littoral)
GEOL_GEOL	E	Estuarine(Transitional)
GEOL_GEOL	F	Fluvial or Alluvial soil part of Kallang or Tekong
GEOL_GEOL	F1	Alluvial soil (Granular)
GEOL_GEOL	F2	Alluvial soil (Non-granular)

ABBR_HDNG	ABBR_CODE	ABBR_DESC
GEOL_GEOL	M	Marine Clay
GEOL_GEOL	O(A)	Old Alluvium (Unweathered)
GEOL_GEOL	O(B)	Old Alluvium (Partially weathered)
GEOL_GEOL	O(C)	Old Alluvium (Distinctly weathered)
GEOL_GEOL	O(D)	Old Alluvium (Destructured)
GEOL_GEOL	O(E)	Old Alluvium (Residual soil)
GEOL_GEOL	FC	Fort Canning Boulder Bed
GEOL_GEOL	S(VI)	Sedimentaries (rocks & associated soils) Residual soil
GEOL_GEOL	S(V)	Sedimentaries (rocks & associated soils) Completely weathered
GEOL_GEOL	S(IV)	Sedimentaries (rocks & associated soils) Highly weathered
GEOL_GEOL	S(III)	Sedimentaries (rocks & associated soils) Moderately weathered
GEOL_GEOL	S(II)	Sedimentaries (rocks & associated soils) Slightly weathered
GEOL_GEOL	S(I)	Sedimentaries (rocks & associated soils) Fresh
GEOL_GEOL	G(VI)	Granite (rocks & associated soils) Residual soil
GEOL_GEOL	G(V)	Granite (rocks & associated soils) Completely weathered
GEOL_GEOL	G(IV)	Granite (rocks & associated soils) Highly weathered
GEOL_GEOL	G(III)	Granite (rocks & associated soils) Moderately weathered
GEOL_GEOL	G(II)	Granite (rocks & associated soils) Slightly weathered
GEOL_GEOL	G(I)	Granite (rocks & associated soils) Fresh
GEOL_GEO2	AS	Asphalt
GEOL_GEO2	BF	BACKFILL
GEOL_GEO2	BE	Bedrock
GEOL_GEO2	BO	BOULDER
GEOL_GEO2	BR	Brick
GEOL_GEO2	C	CLAY
GEOL_GEO2	GC	CLAYEY GRAVEL

ABBR_HDNG	ABBR_CODE	ABBR_DESC
GEOL_GEO2	PtC	CLAYEY PEAT
GEOL_GEO2	SC	CLAYEY SAND
GEOL_GEO2	CON	CONCRETE
GEOL_GEO2	G	GRAVEL
GEOL_GEO2	CG	GRAVELLY CLAY
GEOL_GEO2	PtG	GRAVELLY PEAT
GEOL_GEO2	SG	GRAVELLY SAND
GEOL_GEO2	MG	GRAVELLY SILT
GEOL_GEO2	CO	ORGANIC CLAY
GEOL_GEO2	GO	ORGANIC GRAVEL
GEOL_GEO2	SO	ORGANIC SAND
GEOL_GEO2	MO	ORGANIC SILT
GEOL_GEO2	Pt	PEAT
GEOL_GEO2	CPt	PEATY CLAY
GEOL_GEO2	GPt	PEATY GRAVEL
GEOL_GEO2	SPt	PEATY SAND
GEOL_GEO2	MPt	PEATY SILT
GEOL_GEO2	S	SAND
GEOL_GEO2	CS	SANDY CLAY
GEOL_GEO2	GS	SANDY GRAVEL
GEOL_GEO2	PtS	SANDY PEAT
GEOL_GEO2	MS	SANDY SILT
GEOL_GEO2	M	SILT
GEOL_GEO2	GM	SILTY GRAVEL
GEOL_GEO2	PtM	SILTY PEAT
GEOL_GEO2	SM	SILTY SAND

ABBR_HDNG	ABBR_CODE	ABBR_DESC
GEOL_GEO2	TB	TIMBER
GEOL_GEO2	AGGLOM	AGGLOMERATE (VOLCANIC BRECCIA)
GEOL_GEO2	AK	ARKOSE (FELDSPATHIC-ARENITE)
GEOL_GEO2	ANDE	ANDESITE
GEOL_GEO2	BA	BASALT
GEOL_GEO2	BREC	BRECCIA
GEOL_GEO2	CAMU	CALCAREOUS MUDSTONE
GEOL_GEO2	CASA	CALCAREOUS SANDSTONE
GEOL_GEO2	CASH	CALCAREOUS SHALE/MARL
GEOL_GEO2	CASI	CALCAREOUS SILTSTONE
GEOL_GEO2	CATA	CATACLASITE
GEOL_GEO2	CH	CHERT
GEOL_GEO2	CHALK	CHALK
GEOL_GEO2	CNG	CONGLOMERATE
GEOL_GEO2	CNGSA	CONGLOMERATIC SANDSTONE
GEOL_GEO2	COAL	COAL
GEOL_GEO2	CSTUFF	CRYSTAL TUFF
GEOL_GEO2	DI	DIORITE
GEOL_GEO2	DLM	DOLOMITE
GEOL_GEO2	DLR	DOLERITE (DIABASE in UK)
GEOL_GEO2	DOMB	DOLOMITIC MARBLE
GEOL_GEO2	FBREC	FAULT BRECCIA
GEOL_GEO2	GB	GABBRO
GEOL_GEO2	GND	GRANODIORITE
GEOL_GEO2	GRPOR	GRANITE PORPHYRY
GEOL_GEO2	GR	GRANITE

ABBR_HDNG	ABBR_CODE	ABBR_DESC
GEOL_GEO2	GWK	GREYWACKE
GEOL_GEO2	LAPIL	LAPILLISTONE
GEOL_GEO2	LI	LIMESTONE (MICRITC LIMESTONE)
GEOL_GEO2	LICA	CARBONACEOUS LIMESTONE
GEOL_GEO2	LIMU	LIME-MUDSTONE (ARGILLACEOUS MICRITIC LIMESTONE)
GEOL_GEO2	LIPA	LIME-PACKSTONE
GEOL_GEO2	LISA	SANDY LIMESTONE (ARENACEOUS MICRITIC LIMESTONE)
GEOL_GEO2	LITUFF	LITHIC TUFF
GEOL_GEO2	LIWA	LIME-WACKESTONE
GEOL_GEO2	MARBLE	MARBLE
GEOL_GEO2	MEMU	METAMUDSTONE
GEOL_GEO2	MESA	METASANDSTONE
GEOL_GEO2	MESI	METASILTSTONE
GEOL_GEO2	MGR	MICROGRANITE
GEOL_GEO2	MU	MUDSTONE
GEOL_GEO2	MUSA	MUDDY SANDSTONE
GEOL_GEO2	MY	MYLONITE
GEOL_GEO2	NR	NORITE
GEOL_GEO2	NRGAB	NORITIC GABBRO
GEOL_GEO2	OODLI	OOID-LIMESTONE (OOLITIC LIMESTONE)
GEOL_GEO2	QTZMON	QUARTZ MONZONITE (ADAMELLITE)
GEOL_GEO2	QUART	QUARTZITE
GEOL_GEO2	RH	RHYOLITE
GEOL_GEO2	SA	SANDSTONE (ARENITE)
GEOL_GEO2	SCH	SCHIST
GEOL_GEO2	SH	SHALE

ABBR_HDNG	ABBR_CODE	ABBR_DESC
GEOL_GEO2	SI	SILTSTONE
GEOL_GEO2	SL	SLATE
GEOL_GEO2	SPI	SPILITE
GEOL_GEO2	TUFF	TUFF (VITRIC TUFF)
GEOL_GEO2	TUFFCONG	TUFFACEOUS CONGLOMERATE
GEOL_GEO2	TUFFMU	TUFFACEOUS MUDSTONE
GEOL_GEO2	TUFFSA	TUFFACEOUS SANDSTONE
GEOL_GEO2	VOID	VOID
GEOL_GEO2	VOLCONG	VOLCANICLASTIC-CONGLOMERATE
GEOL_GEO2	VOLMUD	VOLCANICLASTIC-MUDSTONE
GEOL_GEO2	VOLSA	VOLCANICLASTIC-SANDSTONE
GEOL_GEO3	FILL	BACKFILL
GEOL_GEO3	Kr	Kallang Formation (Reef Member)
GEOL_GEO3	Kt	Kallang Formation (Transitional Member)
GEOL_GEO3	Kl	Kallang Formation (Littoral Member)
GEOL_GEO3	Ka	Kallang Formation (Alluvial Member)
GEOL_GEO3	Km	Kallang Formation (Marine Member) Marine Clay
GEOL_GEO3	T	Tekong Formation
GEOL_GEO3	HC	Huat Choe Formation
GEOL_GEO3	OA	Old Alluvium
GEOL_GEO3	FC	Fort Canning Boulder Bed
GEOL_GEO3	J	Jurong Formation
GEOL_GEO3	MS	Murai Schist
GEOL_GEO3	Jt	Tengah Facies
GEOL_GEO3	Jsj	St. John Facies
GEOL_GEO3	Jr	Rimu Facies

ABBR_HDNG	ABBR_CODE	ABBR_DESC
GEOL_GEO3	Jp	Pandan Facies
GEOL_GEO3	Jac	Ayer Chawan Facies
GEOL_GEO3	Jj	Jong Facies
GEOL_GEO3	Jq	Queenstown Facies
GEOL_GEO3	D	Dyke Rock
GEOL_GEO3	BT	Bukit Timah Granite
GEOL_GEO3	R	Rafted bodies
GEOL_GEO3	PV	Palaeozoic Volcanics
GEOL_GEO3	GN	Gombak Norite
GEOL_GEO3	S	Sajahat Formation
GEOL_LEG	101	TOP SOIL
GEOL_LEG	102	MADE GROUND
GEOL_LEG	103	Asphalt, Tar, Bituminous Material
GEOL_LEG	104	CONCRETE
GEOL_LEG	105	BACKFILL
GEOL_LEG	106	BRICK
GEOL_LEG	107	TIMBER
GEOL_LEG	201	CLAY
GEOL_LEG	202	Silty CLAY
GEOL_LEG	203	Sandy CLAY
GEOL_LEG	204	Gravelly CLAY
GEOL_LEG	205	Cobbly CLAY
GEOL_LEG	206	Bouldery CLAY
GEOL_LEG	207	Silty sandy CLAY
GEOL_LEG	208	Silty gravelly CLAY
GEOL_LEG	209	Silty cobbly CLAY

ABBR_HDNG	ABBR_CODE	ABBR_DESC
GEOL_LEG	210	Silty bouldery CLAY
GEOL_LEG	211	Silty sandy gravelly CLAY
GEOL_LEG	212	Silty sandy cobbly CLAY
GEOL_LEG	213	Silty sandy bouldery CLAY
GEOL_LEG	214	Silty sandy gravelly cobbly CLAY
GEOL_LEG	215	Silty sandy gravelly bouldery CLAY
GEOL_LEG	216	Silty sandy gravelly cobbly bouldery CLAY
GEOL_LEG	217	Silty sandy organic CLAY
GEOL_LEG	218	Silty sandy gravelly organic CLAY
GEOL_LEG	219	Silty organic CLAY
GEOL_LEG	220	Sandy gravelly CLAY
GEOL_LEG	222	Sandy cobbly CLAY
GEOL_LEG	223	Sandy bouldery CLAY
GEOL_LEG	224	Sandy gravelly cobbly CLAY
GEOL_LEG	225	Sandy gravelly bouldery CLAY
GEOL_LEG	226	Sandy gravelly cobbly bouldery CLAY
GEOL_LEG	227	Sandy organic CLAY
GEOL_LEG	228	Sandy gravelly organic CLAY
GEOL_LEG	229	Organic CLAY
GEOL_LEG	230	PEATY CLAY
GEOL_LEG	301	SILT
GEOL_LEG	302	CLAY/SILT
GEOL_LEG	303	Sandy SILT
GEOL_LEG	304	Gravelly SILT
GEOL_LEG	305	Organic SILT
GEOL_LEG	310	Sandy gravelly SILT

ABBR_HDNG	ABBR_CODE	ABBR_DESC
GEOL_LEG	314	Clayey sandy gravelly organic cobbly SILT
GEOL_LEG	316	Sandy cobbly SILT
GEOL_LEG	317	Sandy bouldery SILT
GEOL_LEG	318	Sandy organic SILT
GEOL_LEG	319	Sandy gravelly organic SILT
GEOL_LEG	320	Sandy gravelly cobbly SILT
GEOL_LEG	321	Sandy gravelly organic cobbly SILT
GEOL_LEG	322	Gravelly cobbly SILT
GEOL_LEG	323	Gravelly bouldery SILT
GEOL_LEG	324	Gravelly organic SILT
GEOL_LEG	325	Gravelly organic cobbly SILT
GEOL_LEG	326	Cobbly SILT
GEOL_LEG	327	Cobbly bouldery SILT
GEOL_LEG	328	Organic cobbly SILT
GEOL_LEG	331	Bouldery SILT
GEOL_LEG	332	PEATY SILT
GEOL_LEG	401	SAND
GEOL_LEG	402	Clayey SAND
GEOL_LEG	403	Silty SAND
GEOL_LEG	404	Gravelly SAND
GEOL_LEG	405	Cobbly SAND
GEOL_LEG	406	Bouldery SAND
GEOL_LEG	410	Clayey gravelly SAND
GEOL_LEG	411	Clayey gravelly cobbly SAND
GEOL_LEG	412	Silty gravelly SAND
GEOL_LEG	413	Silty gravelly cobbly SAND

ABBR_HDNG	ABBR_CODE	ABBR_DESC
GEOL_LEG	414	Silty gravelly cobbly bouldery SAND
GEOL_LEG	415	Gravelly cobbly SAND
GEOL_LEG	416	Gravelly cobbly bouldery SAND
GEOL_LEG	417	Gravelly bouldery SAND
GEOL_LEG	418	Cobbly bouldery SAND
GEOL_LEG	430	SAND and GRAVEL
GEOL_LEG	431	Organic SAND
GEOL_LEG	433	Silty organic SAND
GEOL_LEG	434	Gravelly organic SAND
GEOL_LEG	435	Cobbly organic SAND
GEOL_LEG	436	Bouldery organic SAND
GEOL_LEG	437	PEATY SAND
GEOL_LEG	501	GRAVEL
GEOL_LEG	502	Clayey GRAVEL
GEOL_LEG	503	Silty GRAVEL
GEOL_LEG	504	Sandy GRAVEL
GEOL_LEG	505	Organic GRAVEL
GEOL_LEG	506	Cobbly GRAVEL
GEOL_LEG	507	Bouldery GRAVEL
GEOL_LEG	509	Clayey sandy GRAVEL
GEOL_LEG	510	Clayey cobbly GRAVEL
GEOL_LEG	511	Clayey bouldery GRAVEL
GEOL_LEG	512	Clayey organic GRAVEL
GEOL_LEG	517	Clayey sandy organic GRAVEL
GEOL_LEG	520	Silty sandy GRAVEL
GEOL_LEG	521	Silty cobbly GRAVEL

ABBR_HDNG	ABBR_CODE	ABBR_DESC
GEOL_LEG	522	Silty bouldery GRAVEL
GEOL_LEG	523	Silty organic GRAVEL
GEOL_LEG	524	Silty organic sandy GRAVEL
GEOL_LEG	525	Sandy cobbly GRAVEL
GEOL_LEG	526	Sandy bouldery GRAVEL
GEOL_LEG	527	Sandy organic GRAVEL
GEOL_LEG	528	Silty sandy cobbly GRAVEL
GEOL_LEG	529	PEATY GRAVEL
GEOL_LEG	601	PEAT
GEOL_LEG	602	Clayey PEAT
GEOL_LEG	603	Silty PEAT
GEOL_LEG	604	Sandy PEAT
GEOL_LEG	605	Gravelly PEAT
GEOL_LEG	606	Cobbly PEAT
GEOL_LEG	608	Clayey sandy PEAT
GEOL_LEG	609	Clayey gravelly PEAT
GEOL_LEG	612	Silty sandy PEAT
GEOL_LEG	613	Silty sandy gravelly PEAT
GEOL_LEG	614	Sandy gravelly PEAT
GEOL_LEG	701	COBBLES
GEOL_LEG	702	Clayey COBBLES
GEOL_LEG	703	Silty COBBLES
GEOL_LEG	704	Sandy COBBLES
GEOL_LEG	705	Gravelly COBBLES
GEOL_LEG	706	Organic COBBLES
GEOL_LEG	708	Clayey sandy COBBLES

ABBR_HDNG	ABBR_CODE	ABBR_DESC
GEOL_LEG	709	Clayey gravelly COBBLES
GEOL_LEG	713	Silty sandy COBBLES
GEOL_LEG	714	Silty gravelly COBBLES
GEOL_LEG	715	Silty organic COBBLES
GEOL_LEG	716	Silty gravelly sandy COBBLES
GEOL_LEG	717	Silty sandy organic COBBLES
GEOL_LEG	718	Silty sandy gravelly organic COBBLES
GEOL_LEG	719	Sandy gravelly COBBLES
GEOL_LEG	720	Sandy organic COBBLES
GEOL_LEG	721	Gravelly organic COBBLES
GEOL_LEG	725	COBBLES and BOULDERS
GEOL_LEG	730	BOULDERS
GEOL_LEG	731	Gravelly cobbly BOULDERS
GEOL_LEG	801	MUDSTONE
GEOL_LEG	802	SILTSTONE
GEOL_LEG	803	SANDSTONE
GEOL_LEG	804	LIMESTONE
GEOL_LEG	805	CHALK
GEOL_LEG	806	COAL
GEOL_LEG	807	BRECCIA
GEOL_LEG	808	CONGLOMERATE
GEOL_LEG	809	Fine grained IGNEOUS
GEOL_LEG	810	Medium grained IGNEOUS
GEOL_LEG	811	Coarse grained IGNEOUS
GEOL_LEG	812	Fine grained METAMORPHIC
GEOL_LEG	813	Medium grained METAMORPHIC

ABBR_HDNG	ABBR_CODE	ABBR_DESC
GEOL_LEG	814	Coarse grained METAMORPHIC
GEOL_LEG	815	Pyroclastic (volcanic ash)
GEOL_LEG	816	Gypsum, Rocksalt
GEOL_LEG	817	SHALE
GEOL_LEG	818	ARKOSE
GEOL_LEG	819	GREYWACKE
GEOL_LEG	820	MUDDY SANDSTONE
GEOL_LEG	821	CONGLOMERATIC SANDSTONE
GEOL_LEG	822	CHERT
GEOL_LEG	823	CALCAREOUS SANDSTONE
GEOL_LEG	824	CALCAREOUS SILTSTONE
GEOL_LEG	825	CALCAREOUS MUDSTONE
GEOL_LEG	826	CALCAREOUS SHALE/MARL
GEOL_LEG	827	METASANDSTONE
GEOL_LEG	828	METASILTSTONE
GEOL_LEG	829	METAMUDSTONE
GEOL_LEG	830	DOLOMITE
GEOL_LEG	831	OOID_LIMESTONE (OOLITIC LIMESTONE)
GEOL_LEG	832	LIME-WACKESTONE
GEOL_LEG	833	LIME-PACKSTONE
GEOL_LEG	834	SANDY LIMESTONE (ARENACEOUS MICRITIC LIMESTONE)
GEOL_LEG	835	LIME_MUDSTONE (ARGILLACEOUS MICRITIC LIMESTONE)
GEOL_LEG	836	CARBONACEOUS LIMESTONE
GEOL_LEG	840	GRANITE
GEOL_LEG	841	QUARTZ MONZONITE (ADAMELLITE)
GEOL_LEG	842	GRANODIORITE

ABBR_HDNG	ABBR_CODE	ABBR_DESC
GEOL_LEG	843	DIORITE
GEOL_LEG	844	GABBRO
GEOL_LEG	845	NORITIC GABBRO
GEOL_LEG	846	NORITE
GEOL_LEG	847	RHYOLITE
GEOL_LEG	848	ANDESITE
GEOL_LEG	849	BASALT
GEOL_LEG	850	SPILITE
GEOL_LEG	851	AGGLOMERATE (VOLCANIC BRECCIA)
GEOL_LEG	853	LITHIC TUFF
GEOL_LEG	854	CRYSTAL TUFF
GEOL_LEG	856	VITRIC TUFF
GEOL_LEG	857	LAPILLISTONE
GEOL_LEG	858	TUFFACEOUS CONGLOMERATE
GEOL_LEG	859	TUFFACEOUS SANDSTONE
GEOL_LEG	860	TUFFACEOUS MUDSTONE
GEOL_LEG	861	VOLCANICLASTIC CONGLOMERATE
GEOL_LEG	862	VOLCANICLASTIC SANDSTONE
GEOL_LEG	863	VOLCANICLASTIC MUDSTONE
GEOL_LEG	870	MARBLE
GEOL_LEG	871	DOLOMITIC MARBLE
GEOL_LEG	872	SLATE
GEOL_LEG	873	SCHIST
GEOL_LEG	874	QUARTZITE
GEOL_LEG	880	FAULT BRECCIA
GEOL_LEG	881	CATACLASITE

ABBR_HDNG	ABBR_CODE	ABBR_DESC
GEOL_LEG	882	MYLONITE
GEOL_LEG	890	MICROGRANITE
GEOL_LEG	891	GRANITE PORPHYRY
GEOL_LEG	892	DOLERITE (DIABASE in UK)
GEOL_LEG	999	Void
GRAD_TYPE	DS	Dry sieve
GRAD_TYPE	HY	Hydrometer
GRAD_TYPE	PP	Pipette
GRAD_TYPE	WS	Wet sieve
HOLE _TYPE	ABS	Automatic Ballast Sampler
HOLE_TYPE	CH	Slope surface protection stripping
HOLE_TYPE	CP	Cable percussion (shell and auger)
HOLE_TYPE	DCP	Dynamic cone penetrometer
HOLE_TYPE	DP	Dynamic probe sampling
HOLE_TYPE	EXP	Logged exposure
HOLE_TYPE	GCOP	GCO probe
HOLE_TYPE	HA	Hand Auger
HOLE_TYPE	INST	instrument
HOLE_TYPE	IVAN	in-situ penetration vane test
HOLE_TYPE	IRES	in-situ resitivity
HOLE_TYPE	OP	Observation pit/trench
HOLE_TYPE	PM	Pressuremeter test hole
HOLE_TYPE	RC	Rotary cored
HOLE_TYPE	RCG	Rotary drilling in common ground
HOLE_TYPE	RO	Rotary open hole
HOLE_TYPE	S	Shaft

ABBR_HDNG	ABBR_CODE	ABBR_DESC
HOLE_TYPE	SCP	Static cone penetrometer
HOLE_TYPE	TP	Trial pit/trench
HOLE_TYPE	TRAV	Linear logging traverse or scanline survey
HOLE_TYPE	VC	Vibrocore
HOLE_TYPE	W	Wash boring
HOLE_TYPE	WLS	Dynamic (windowless) sampler
HOLE_TYPE	WS	Window Sampler
HOLE_TYPE	SREL	Seismic Reflection Line survey
HOLE_TYPE	SRAL	Seismic Refraction Line survey
HOLE_TYPE	GRAL	Gravity Line survey
HOLE_TYPE	RESL	Resistivity Line survey
HOLE_TYPE	MAGL	Magnetic Line survey
HOLE_TYPE	BGP	Borehole Geophysic survey
ISPT_TYPE	C	Cone
ISPT_TYPE	S	Split spoon
LEMC_LEMC	Class 1	Emerson Class 1
LEMC_LEMC	Class 2	Emerson Class 2
LEMC_LEMC	Class 3	Emerson Class 3
LEMC_LEMC	Class 4	Emerson Class 4
LEMC_LEMC	Class 5	Emerson Class 5
LEMC_LEMC	Class 6	Emerson Class 6
LEMC_LEMC	Class 7	Emerson Class 7
LEMC_LEMC	Class 8	Emerson Class 8
MONP_TYPE	DM	Discontinuity monitoring
MONP_TYPE	TMU	Tiltmeter - Uniaxial
MONP_TYPE	TMB	Tiltmeter - Biaxial

ABBR_HDNG	ABBR_CODE	ABBR_DESC
MONP_TYPE	ICM	Inclinometer - Manual
MONP_TYPE	ICE	Inclinometer - Electronic
MONP_TYPE	LC	Load cell
MONP_TYPE	ETR	Rod Extensometer
MONP_TYPE	ETM	Magnetic Extensometer
MONP_TYPE	ETT	Tape Extensometer
MONP_TYPE	EPCE	Embedment pressure cell - electronic
MONP_TYPE	EPCH	Embedment pressure cell - hydraulic
MONP_TYPE	EPCP	Embedment pressure cell - pneumatic
MONP_TYPE	IPCE	Interface pressure cell - electronic
MONP_TYPE	IPCH	Interface pressure cell - hydraulic
MONP_TYPE	IPCP	Interface pressure cell - pneumatic
MONP_TYPE	PPCE	Push in pressure cell - electronic
MONP_TYPE	PPCH	Push in pressure cell - hydraulic
MONP_TYPE	PPCP	Push in pressure cell - pneumatic
MONP_TYPE	MSET	Levelling point or plate
MONP_TYPE	TS	Total station point
MONP_TYPE	ESET	Electronic settlement cell/gauges
MONP_TYPE	HSET	Hydraulic settlement cell/gauges
MONP_TYPE	PSET	Pneumatic settlement cell/gauges
MONP_TYPE	SP	Standpipe
MONP_TYPE	SPIE	Standpipe piezometer
MONP_TYPE	HPIE	Hydraulic piezometer
MONP_TYPE	PPIE	Pneumatic Piezometer
MONP_TYPE	EPIE	Electronic Piezometer
MONP_TYPE	SG	Strain gauge

ABBR_HDNG	ABBR_CODE	ABBR_DESC
MONP_TYPE	TP	Temperature measuring point
MONP_TYPE	GWMP	Groundwater monitoring point
MONP_TYPE	GMP	Gas monitoring point
MONP_TYPE	SLIP	Slip indicator
PREF_TYPE	SP	Standpipe
PREF_TYPE	SPIE	Standpipe piezometer
PREF_TYPE	HPIE	Hydraulic piezometer
PREF_TYPE	PPIE	Pneumatic piezometer
PREF_TYPE	EPIE	Electronic piezometer
PRTD_TYPE	SBP	Self boring pressuremeter
PRTD_TYPE	HPD	High pressure dilatometer
PRTD_TYPE	WRSBP	Weak rock self boring pressuremeter
PRTD_TYPE	MPM	Menard type pressuremeter
PRTD_TYPE	PIP	Push-in pressuremeter
ROCK_PLTF	A	Axial
ROCK_PLTF	D	Diametral
ROCK_PLTF	L	Parallel to planes of weakness
ROCK_PLTF	P	Perpendicular to planes of weakness
ROCK_PLTF	I	Irregular lump
ROCK_PLTF	B	Block
SAMP_TYPE	AMAL	Amalgamated sample (see note 3)
SAMP_TYPE	B	Bulk disturbed sample
SAMP_TYPE	BLK	Block sample
SAMP_TYPE	C	Core sample
SAMP_TYPE	CBR	CBR mould sample
SAMP_TYPE	D	Small disturbed sample

ABBR_HDNG	ABBR_CODE	ABBR_DESC
SAMP_TYPE	G	Gas sample
SAMP_TYPE	LB	Large bulk disturbed sample (for earthworks testing)
SAMP_TYPE	M	Mazier type sample
SAMP_TYPE	P	Piston sample
SAMP_TYPE	SPTLS	Standard penetration test liner sample
SAMP_TYPE	TW	Thin walled push in sample
SAMP_TYPE	U	Undisturbed sample - open drive
SAMP_TYPE	W	Water sample
SAMP_TYPE	ES	Soil sample for environmental testing
SAMP_TYPE	EW	Water sample for environmental testing
STCN_TYP	CC	Conductivity cone
STCN_TYP	EC	Electric cone
STCN_TYP	FFD	Fuel fluorescence cone
STCN_TYP	MC	Mechanical cone
STCN_TYP	PC	Piezo cone
STCN_TYP	TC	Temperature cone
TRIG_TYPE	CADC	Anisotropically consolidated drained compression with pwp measurement
TRIG_TYPE	CADE	Anisotropically consolidated drained extension with pwp measurement
TRIG_TYPE	CAUC	Anisotropically consolidated undrained compression with pwp measurement
TRIG_TYPE	CAUE	Anisotropically consolidated undrained extension with pwp measurement
TRIG_TYPE	CD	Consolidated drained (single stage)
TRIG_TYPE	CDM	Consolidated drained (multi-stage)
TRIG_TYPE	CIDC	Isotropically consolidated drained compression with pwp measurement
TRIG_TYPE	CIDE	Isotropically consolidated drained extension with pwp measurement
TRIG_TYPE	CU	Consolidated undrained with pwp measurement (single stage)
TRIG_TYPE	CUM	Consolidated undrained with pwp measurement (multi-stage)

ABBR_HDNG	ABBR_CODE	ABBR_DESC
TRIG_TYPE	CKoU	Ko-consolidated undrained triaxial test
TRIG_TYPE	UNC	Unconfined Compressive test
TRIG_TYPE	UU	Unconsolidated quick undrained (single stage)
TRIG_TYPE	UUM	Unconsolidated quick undrained (multi-stage)
TRIG_TYPE	UUP	Unconsolidated undrained with porewater measurement

Group Name: CODE - Chemical Testing Code	
CODE_CODE	**CODE_DESC**
11BIP	1,1- Biphenyl
11DEA	1,1- Dichloroethane
11DEE	1,1- Dichloroethene
11DCP	1,1- Dichloropropene
111TCE	1,1,1- Trichloroethane
1112TCE	1,1,1,2- Tetrachloroethane
112T122T	1,1,2- Trichloro-1,2,2-Trifluoroethane
112TCE	1,1,2- Trichloroethane
1122TCE	1,1,2,2- Tetrachloroethane
12BIP	1,2- Biphenyl
12D3C	1,2- Dibromo-3-Chloropropane
12DIB	1,2- Dibromoethane
12DB	1,2- Dichlorobenzene
12DEA	1,2- Dichloroethane
12DP	1,2- Dichloropropane
123TCB	1,2,3- Trichlorobenzene
123TCP	1,2,3- Trichloropropane
124TCB	1,2,4- Trichlorobenzene
124TMB	1,2,4- Trimethylbenzene
13DB	1,3- Dichlorobenzene
13DP	1,3- Dichloropropane
135TCB	1,3,5- Trichlorobenzene
135TMB	1,3,5- Trimethylbenzene
14DB	1,4- Dichlorobenzene
2BUT	2- Butanone
2CNAP	2- Chloronaphthalene
2CP	2- Chlorophenol
2CT	2- Chlorotoluene
2MNAP	2- Methylnaphthalene
2MP	2- Methylphenol
2NA	2- Nitroaniline
2NP	2- Nitrophenol

CODE_CODE	CODE_DESC
22DP	2,2- Dichloropropane
2346TCP	2,3,4,6- Tetrachlorophenol
24DCP	2,4- Dichlorophenol
24DMP	2,4- Dimethylphenol
24DNP	2,4- Dinitrophenol
24DNT	2,4- Dinitrotoluene
245TCP	2,4,5- Trichlorophenol
246TCP	2,4,6- Trichlorophenol
26DCP	2,6- Dichlorophenol
26DNT	2,6- Dinitrotoluene
3NA	3- Nitroaniline
33DCBZDNE	3,3'-Dichlorobenzidine
34MP	3,4- Methylphenol
4BPPE	4- Bromophenylphenyl ether
4C3MP	4- Chloro-3-Methlphenol
4CA	4- Chloroaniline
4CP	4- Chlorophenol
4CPPE	4- Chlorophenyl phenyl ether
4CT	4- Chlorotoluene
4IPT	4- Isopropyltoluene
4MP	4- Methylphenol
4NA	4- Nitroaniline
4NP	4- Nitrophenol
44DDD	4,4- DDD
44DDE	4,4- DDE
44DDT	4,4- DDT
46DN2MP	4,6-Dinitro-2-methylphenol
ACNEN	Acenaphthene
ACNAP	Acenaphthylene
ACET	Acetaldehyde
AIMS	Acid insoluble matter
ACIDW	Acidity as Calcium carbonate
ACALW	Acidity/Alkalinity
ADSC	Aerobic dip slide colonies

CODE_CODE	CODE_DESC
ALCO	Alcohols
ALD	Aldrin
ALKBW	Alkalinity- Bicarbonate as CaCO3
ALKCW	Alkalinity- Carbonate as CaCO3
ABHC	alpha- BHC
AHCH	alpha- HCH
AL	Aluminium
AMET	Ametryn
AMMOW	Ammonia
AMMNS	Ammoniacal nitrogen
ABC	Anaerobic bacteria count
AIDW	Anionic detergents
ANTHNN	Anthanthrene
ANTHN	Anthracene
ANTHS	Anthrax (Presence of)
SB	Antimony
A1016	Aroclor1016
A1221	Aroclor1221
A1232	Aroclor1232
A1242	Aroclor1242
A1248	Aroclor1248
A1254	Aroclor1254
A1260	Aroclor1260
A1262	Aroclor1262
HYDRS	Aromatic hydrocarbons
AS	Arsenic
ASB	Asbestos
ATZ	Atrazine
AVF	Aviation fuel
AZPE	Azinphos-ethyl
AZPM	Azinphos-methyl
AZB	Azobenzene
BA	Barium
BENZ	Benzene

CODE_CODE	CODE_DESC
BENA	Benzo(a) anthracene
BENAP	Benzo(a) pyrene
BENB	Benzo(b) fluoranthene
BENGI	Benzo(ghi) perylene
BENK	Benzo(k) fluoranthene
BENEP	Benzo(e) pyrene
BENZACID	Benzoic Acid
BENZALC	Benzylalcohol
BE	Beryllium
BBHC	beta- BHC
BHCH	beta- HCH
BICS	Bicarbonate
BICAW	Bicarbonate
BICPB	Bichlorobiphenyl
BIOXW	Biochemical oxygen demand
BPHENYL	Biphenyl
B2CEE	bis (2 - chloroethoxy) ether
B2CEM	bis (2 - chloroethoxy) methane
B2CEYE	bis (2 - chloroethyl) ether
B2CIPE	bis (2 - chloroisopropyl) ether
B2EHP	bis (2 - ethylhexyl) phthalate
B	Boron
BROMW	Bromide
BROMBE	Bromobenzene
BROMCM	Bromochloromethane
BROMO	Bromodichloromethane
BROMF	Bromoform
BROMM	Bromomethane
GBUT	Butane
BUTA	Butanoic acid, 1-methyloctyl ester
BBP	Butyl benzyl phthalate
BUTP	butylphenol
CPERF	C.Perfringens
CD	Cadmium

CODE_CODE	CODE_DESC
CA	Calcium
CACOS	Calcium carbonate
HARDW	Calcium hardness as Calcium carbonate
CALOS	Calorific value
CARB	Carbaryl
CBZ	Carbazole
CARF	Carbofuran
CARBON	Carbon
GCARD	Carbon dioxide
CDS	Carbon Disulphide
GCARM	Carbon monoxide
CTET	Carbon tetrachloride
COS	Carbonate
CATE	Catechol
CATIS	Cation exchange capacity
CATW	Cationic detergents
CHOXW	Chemical oxygen demand
CFP	Chlorfenvinphos
CL	Chloride
CLHYS	Chlorinated hydrocarbons
CHLOW	Chlorine
CHDW	Chlorine demand
CBENZ	Chlorobenzene
CETH	Chloroethane
CHETH	Chloroethene
CFM	Chloroform
CMN	Chloromethane
CNAP	Chloronaphthalene
CNA	Chloronitroaniline
CPHE	Chlorophenols(Total)
CPYR	Chlorpyrifos
CR	Chromium
CRYN	Chrysene
C13DP	cis- 1,3-Dichloropropane

CODE_CODE	CODE_DESC
12DEE	cis 1,2 -Dichloroethene
13DCPE	cis 1,3 -Dichloropropene
COALS	Coal tar derivatives
CO	Cobalt
COLO	Coliform organisms
COMBS	Combustibility
CNCOMP	Complex Cyanide
CU	Copper
CRES	Cresols
CN	Cyanide
CYPYRN	Cyclopenta (cd) pyrene
DECPB	Decachlorobiphenyl
DECA	Decane
DBHC	delta- BHC
DEMS	Demeton- S
DNOP	Di- n-octyl phthalate
DIAZ	Diazinon
DIABN	Dibenzo (ah) anthracene
DBF	Dibenzofuran
DIBM	Dibromochloromethane
DBE	Dibromoethane
DIBROM	Dibromomethane
DBT	Dibutyl tin
DCHLB	Dichlorobenzene(Total)
DCFM	Dichlorodifluoromethane
DICM	Dichloromethane
DCPHE	Dichlorophenol(Total)
DCV	Dichlorvos
DIEL	Dieldrin
DRO	Diesel range organics
DEP	Diethyl phthalate
GDIES	Diethyl sulphide
DMETH	Dimethoate
DIMP	Dimethyl phthalate

CODE_CODE	CODE_DESC
DIMPH	Dimethylphenols
DNBP	Di-n-butyl phthalate
DPE	Diphenyl ether
DO	Dissolved oxygen
DST	Disulfoton
DOCS	Docosane
DOD	Dodecane
DOTC	Dotriacontane
EICO	Eicosane
CONDW	Electrical conductivity
EHW	Electrolytic potential
ENDOI	Endosulfan I
ENDOII	Endosulfan II
ENDSUL	Endosulfan sulphate
ENDR	Endrin
ENDALD	Endrin aldehyde
ESCC	Escherichia Coli
GETHA	Ethane
GETHE	Ethene
EPAR	Ethyl parathion
ETHYL	Ethylbenzene
EGLW	Ethylene glycol
ETRP	Etrimphos
FCOL	Faecal Coliforms
FSTP	Faecal Streptococci
FTT	Fenotrothion
FENT	Fenthion
FERCS	Ferricyanide
FERFS	Ferro-ferricyanide
FLNN	Fluoranthene
FLN	Fluorene
FLS	Fluoride
FORMA	Formaldehyde
FTU	Formazin Turbidity Units

CODE_CODE	CODE_DESC
FCAM	Furancarboxaldehyde methyl-
GBHC	gamma- BHC
GHCH	gamma- HCH
GPS	Gram Positive Spore
HALO	Halogenated compounds
GHEL	Helium
HEPC	Heptachlor
HEPEPO	Heptachlor epoxide
HEPPB	Heptachlorobiphenyl
HEPD	Heptadecane
HEPTE	Heptene
HEPP	Heptenophos
HCHLB	Hexachlorobenzene
HEXPB	Hexachlorobiphenyl
HEXBUT	Hexachlorobutadiene
HCCP	Hexachlorocyclopentadiene
HCE	Hexachloroethane
HEXAC	Hexacosane
HEXD	Hexadecane
CRVI	Hexavalent Chromium
HDTS	Hydrocarbons(Total)
GHYD	Hydrogen
GHYDC	Hydrogen cyanide
GHYDS	Hydrogen sulphide
INDP	Indeno(1,2,3 -cd) pyrene
IOW	Iodide
IODP	Iodofenphos
FE	Iron
IPB	iso- Propylbenzene
ISOD	Isodrin
ISOP	Isophorone
IPP	Isopropyl phenol
NITRS	Kjeldahl nitrogen (Total)
PNEU	L Pneumophila bacterium
LANGW	Langelier Index

CODE_CODE	CODE_DESC
PB	Lead
LEG	Legionella bacterium
LIND	Lindane
LI	Lithium
IGNIS	Loss on ignition
MXYL	m & p-Xylene
MG	Magnesium
MALTH	Malathion
MANE	Maneb(ACN)
MN	Manganese
HG	Mercury
METC	Methacriphos
GMETH	Methane
METXC	Methoxychlor
METP	Methyl parathion
METHP	Methylphenols
MEVP	Mevinphos
MOILS	Mineral oils
MOIST	Moisture content
MO	Molybdenum
MCHLB	Monochlorobenzene(Total)
MONPB	Monochlorobiphenyl
MCPHE	Monochlorophenol(Total)
MTBE	MTBE
NBUT	n- Butylbenzene
NNNP	n- Nitrosodi-n-Propylamine
NNDPA	N- Nitrosodiphenylamine
NPB	n- Propylbenzene
NAPTHH	Naphthalene
NAP1M	Naphthalene1 -methyl-
NAP12D	Naphthalene1,2 -dimethyl-
NAPHOLS	Naphthols
NI	Nickel
NIRS	Nitrate
NIIS	Nitrite

CODE_CODE	CODE_DESC
NITB	Nitrobenzene
GNIT	Nitrogen
NONPB	Nonachlorobiphenyl
NIDW	Nonionic detergents
NONP	Nonylphenol
NSOS	NSO/Resins
OCP	o- Cresol
OXYL	o- Xylene
OCTPB	Octachlorobiphenyl
OCTC	Octacosane
OCTD	Octadecane
OMS	Organic matter
PBLS	Organo lead
TIOS	Organo tin
ORGS	Organosulphur compounds
ORTHS	Orthophosphate
GOX	Oxygen
PCP	p- Cresol
PAHS	Polynuclear aromatic hydrocarbons(Total)
PARTH	Parathion
PCB101S	PCB101
PCB118S	PCB118
PCB138S	PCB138
PCB153S	PCB153
PCB156S	PCB156
PCB180S	PCB180
PCB28S	PCB28
PCB31S	PCB31
PCB52S	PCB52
PCHLB	Pentachlorobenzene(Total)
PENPB	Pentachlorobiphenyl
PNCP	Pentachlorophenol

CODE_CODE	CODE_DESC
PRO	Petrol range organics
PHS	pH
PPENN	Phenanthrene
PHE	Phenol
PHEMS	Phenol(Monohydric)
PHETS	Phenol(Total)
PHEIDX	Phenol Index
PHOR	Phorate
POSPM	Phosphamidon
PHOS	Phosphate
PHOTS	Phosphorous
PHTH	Phthalates(Total)
PIRIM	Pirimiphos
PT	Platinum
PCBS	Polychlorinated biphenyls
K	Potassium
PPTDE	ppTDE
PROM	Prometryn
GPROP	Propane
PROPZ	Propazine
PROPP	Propetamphos
PGLW	Propylene glycol
PYRN	Pyrene
PYR	Pyridine
RDN	Radon
REPTW	Redox potential
RESO	Resorcinol
SALM	Salmonellae excluding S typhi
GSATH	Saturated hydrocarbons
SECB	sec- Butylbenzene
SE	Selenium
SILS	Silica
SI	Silicon
AG	Silver

CODE_CODE	CODE_DESC
SIMZ	Simazine
SIMT	Simetryne
NA	Sodium
SOLVS	Solvent extractable matter
STONE	Stone content
SR	Strontium
STY	Styrene
SO3	Sulphate as SO3
SO4	Sulphate as SO4
SULIS	Sulphide
SULES	Sulphur
TECZ	Tecnazene
TE	Tellurium
TERB	Terbutryn
TERTB	tert- Butylbenzene
4CB	Tetrachlorobenzene(Total)
TETPB	Tetrachlorobiphenyl
TCE	Tetrachloroethane
TETC	Tetrachloroethene
TR4MS	Tetrachloromethane
4TCP	Tetrachlorophenol(Total)
TETRC	Tetracosane
TETRD	Tetradecane
THF	Tetrahydrofuran
THT	Tetrahydrothiophene
TTC	Tetratriacontane
TL	Thallium
TCOL	Thermotolerant Coliforms
THIOS	Thiocyanate
SN	Tin
TI	Titanium
TOL	Toluene
TCC	Total Coliform count
DISS	Total dissolved solids

CODE_CODE	CODE_DESC
THW	Total hardness
TIC	Total inorganic carbon
ORGCW	Total organic carbon
TONIW	Total oxidised nitrogen
TPH	Total petroleum hydrocarbons
TPC	Total plate count
SUSP	Total suspended solids
TVC	Total viable count
T12DE	Trans- 1,2-Dichloroethene
T13DP	Trans- 1,3-Dichloropropene
TCONT	Triacontane
TRIZP	Triazophos
TBM	Tribromomethane
TBT	Tributyl tin
TCHLB	Trichlorobenzene(Total)
TRICPB	Trichlorobiphenyl
TRCE	Trichloroethene
TCFE	Trichlorofluoromethane
TR3MS	Trichloromethane
TCPHE	Trichlorophenol(Total)
TRIZ	Trietazine
TRIF	Trifluralin
TMPHE	Trimethylphenols
TPT	Triphenyl tin
TURBW	Turbidity N T U
UREA	Urea
V	Vanadium
VCHL	Vinyl chloride
VFATW	Volatile fatty acids
VSOLW	Volatile suspended solids
VOLS	Volatiles
XYL	Xylenols
XEP	Xylenols & Ethylphenols
ZN	Zinc

Group Name: UNIT - Definition of <UNITS>, CNMT_UNIT	
UNIT_UNIT	**UNIT_DESC**
Length	
mm	millimetre
cm	centimetre
m	metre
km	kilometre
Area	
cm2	square centimetre
m2	square metre
km2	square kilometre
Volume	
cm3	cubic centimetre
m3	cubic metre
l	litre
Force	
N	Newton
kN	kiloNewton
MN	megaNewton
Mass	
g	gram
kg	kilogram
Mg	megagram
Pressure	
kN/m2	kiloNewtons per square metre
kPa	kiloPascal
MN/m2	megaNewtons per square metre

UNIT_UNIT	UNIT_DESC
Pressure	
MPa	megaPascal
GPa	gigaPascal
kg/cm2	kilograms per square centimetre
bar	bar
Density	
kN/m3	kiloNewtons per cubic metre
Mg/m3	megagrams per cubic metre
g/cm3	grams per cubic centimetre
kg/m3	kilograms per cubic metre
kg/m	kilograms per metre run
Time	
s	second
min	minute
hr	hour
day	day
month	month
yr	year
hhmm	hours minutes
hhmmss	hours minutes seconds
dd/mm/yy	day month year
Velocity	
mm/s	millimetres per second
mm/min	millimetres per minute
cm/s	centimetre per second
m/s	metres per second
km/hr	kilometres per hour

UNIT_UNIT	UNIT_DESC
Flow	
l/s	litres per second
l/min	litres per minute
m3/s	cubic metres per second
Concentration	
ug/l	micrograms per litre
mg/l	milligrams per litre
g/l	grams per litre
ug/kg	micrograms per kilogram
mg/kg	milligrams per kilogram
ppb	parts per billion
ppm	parts per million
ppmv	Parts per million volume
%	percentage
% dry weight	percentage of dry weight
% vol	percentage volume
Miscellaneous	
m2/MN	square metres per megaNewton
m2/yr	square metres per year
Nm	Newton metre
deg	degree (angle)
DegC	degree Celsius
uV	microVolt
mV	milliVolt
ohm	Ohm
ohm cm	Ohm centimetre
ohm m	Ohm metre

UNIT_UNIT	UNIT_DESC
Miscellaneous	
uS/cm	microSiemens per centimetre
kJ/kg	kiloJoules per kilogram
counts/s	counts per second
Yes	Yes
No	No

APPENDIX 4a

Summary page of the new additions

The new guidance and addendum of the AGS(SG) Format are :

Note for Guidance. Additional notes for guidance have been added for field instrumentation and field testing.

1.Guidance on field instrumentation

2. Guidance on field testing

3. Addendum on Abbreviation
   3.1 NEW ABBR_CODE for GEOL_GEO3
   3.2 NEW ABBR_CODE for GEOL_GEO2
   3.3 NEW ABBR_CODE for GEOL_LEG
   3.4 NEW ABBR_CODE for GEOL_GEOL
   3.5 NEW Chemical Testing Code for CODE_CODE

Pick List. A new standard pick list has been added for the geology stratigraphic code (GEOL_GEO3), geology material code (GEOL_GEO2), simplified geology code (GEOL_GEOL), geology legend code (GEOL_LEG) and chemical testing code (CODE_CODE).

APPENDIX 4b

Guidance on Data Dictionary and Addendum on Lists of Abbreviations and Codes

1 Guidance on Field Instrumentation

1.1 Water Standpipe Data in AGS(SG)

?MONP – Monitor Points and ?MONR to be used for Water Standpipe Installation and Readings.

Group Name: ?MONP - Monitor Points						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	?HOLE_ID		Exploratory hole or location equivalent	BH1/WSP	Text	
	?MONP_DATE	dd/mm/yyyy	Installation date	17/5/2005	Date	dd/mm/yyyy
	?MONP_TYPE		Instrument type	SP	Text	
	?MONP_TRZ	m	Distance to start of response zone from HOLE_ID datum	0.30	Double	0.00
	?MONP_BRZ	m	Distance to end of response zone from HOLE_ID datum	15.00	Double	0.00

Group Name: ?MONR - Monitor Point Readings						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	?HOLE_ID		Exploratory hole or location equivalent	BH1	Text	
*	?MONR_DATE	dd/mm/yyyy	Date of reading	18/5/2005	Date	dd/mm/yyyy
*	?MONR_TIME	hhmmss	Time of reading	103000	Time	hhmmss
	?MONR_WDEP	m	Depth to water from HOLE_ID datum	3.37	Double	0.00
	?MONR_WHD	m	Head of water above tip	107.56	Double	0.00

The ABBR_CODE for different piezometer of monitoring types (MONP_TYPE) is not applicable (i.e. can delete).

Group Name: ABBR - Abbreviation Definitions			
ABBR_HDNG	**ABBR_CODE**	**ABBR_DESC**	
MONP_TYPE	SP	Standpipe	
~~MONP_TYPE~~	~~SPIE~~	~~Standpipe piezometer~~	**Delete**
~~MONP_TYPE~~	~~HPIE~~	~~Hydraulic piezometer~~	**Delete**
~~MONP_TYPE~~	~~PPIE~~	~~Pneumatic Piezometer~~	**Delete**
~~MONP_TYPE~~	~~EPIE~~	~~Electronic Piezometer~~	**Delete**

1.2 PREF and POBS Groups to be used for Piezometer installation and Readings. The ABBR_CODE for water standpipe type (PREF_TYPE) is deleted.

Group Name: ABBR - Abbreviation Definitions			
ABBR_HDNG	**ABBR_CODE**	**ABBR_DESC**	
~~PREF_TYPE~~	~~SP~~	~~Standpipe~~	**Delete**
PREF_TYPE	SPIE	Standpipe piezometer	
PREF_TYPE	HPIE	Hydraulic piezometer	

2 Guidance on Field Testing

2.1 PBP (Pre-bored Pressuremeter) to be used for Pressuremeter Type and PRTG_REM can be used for pressuremeter not found in the current list (e.g. Oyo).

Group Name: ABBR - Abbreviation Definitions		
ABBR_HDNG	ABBR_CODE	ABBR_DESC
PRTD_TYPE	SBP	Self-boring pressuremeter

PRTD_TYPE	HPD	High pressure dilatometer
PRTD_TYPE	WRSBP	Weak rock self-boring pressuremeter
PRTD_TYPE	MPM	Menard type pressuremeter
PRTD_TYPE	PIP	Push-in pressuremeter
PRTD_TYPE	PBP	Pre-bored pressuremeter **NEW**

Group Name: PRTG - Pressuremeter Test Results, General						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
	PRTG_REM		Remarks	OYO-E2	Text	

2.2 ISPT_REM to be used for input of SPT Hammer serial number and energy ratio.

Group Name: ISPT - Standard Penetration Test Results						
Status	**Heading**	**Unit**	**Description**	**Example**	**Type**	**Format**
*	HOLE_ID		Exploratory hole or location equivalent	6421/A	Text	
*	ISPT_TOP	m	Depth to top of test	13.50	Double	0.00
	ISPT_SEAT		Number of blows for seating drive	14	Integer	0
	ISPT_MAIN		Number of blows for main test drive	35	Integer	0
	ISPT_NPEN	mm	Total penetration for seating drive and test drive	450	Integer	0
	ISPT_NVAL		SPT 'N' value	35	Integer	0
	ISPT_REP		SPT reported result	6,8/8,9,9,9 N=35	Text	
	ISPT_CAS	m	Casing depth at time of test	12.00	Double	0.00
	ISPT_WAT	m	Depth to water at time of test	2.50	Double	0.00
	ISPT_TYPE		Type of SPT test	S (See Appendix 3)	Text	
	?ISPT_SWP	mm	Self-weight penetration	25	Integer	0
	ISPT_REM		Remarks relating to the test	HSN123, ER65	Text	

SPT Hammer Serial Number & Energy Ratio

3 Addendum on Abbreviation

3.1 NEW ABBR_CODE for GEOL_GEO3

Group Name: ABBR - Abbreviation Definitions		
ABBR_HDNG	**ABBR_CODE**	**ABBR_DESC**
GEOL_GEO3	Ksf	Semakau Formation
GEOL_GEO3	Kkf	Kranji Formation
GEOL_GEO3	Ktf	Tekong Formation
GEOL_GEO3	Kjbf	Jalan Besar Formation
GEOL_GEO3	Krf	Rochor Clay Formation (Upper MC)
GEOL_GEO3	Kmsm	Marina South Member (desiccated stiff clay layer)
GEOL_GEO3	Ktrf	Tanjong Rhu Clay Formation (Lower MC)
GEOL_GEO3	KG	Kallang Group (undifferentiated)
GEOL_GEO3	Bdf	Bedok Formation
GEOL_GEO3	Fcf	Fort Canning Formation
GEOL_GEO3	Bbf	Bukit Batok Formation
GEOL_GEO3	Kusf	Kusu Formation
GEOL_GEO3	Bvf	Buona Vista Formation
GEOL_GEO3	STsf	Fort Siloso Formation
GEOL_GEO3	STrf	Tanjong Rimau Formation
GEOL_GEO3	STG	Sentosa Group (undifferentiated)
GEOL_GEO3	Pgf	Pengerang Formation

GEOL_GEO3	Jcm	Clementi Member
GEOL_GEO3	Jblf	Boon Lay Formation
GEOL_GEO3	Jkrm	Kent Ridge Member
GEOL_GEO3	Jpf	Pandan Formation
GEOL_GEO3	Jnm	Nanyang Member
GEOL_GEO3	Jacf	Pulau Ayer Chawan Formation
GEOL_GEO3	Jtf	Tuas Formation
GEOL_GEO3	JG	Jurong Group (undifferentiated)
GEOL_GEO3	Sjf	Sajahat Formation
GEOL_GEO3	Sqmp	Pulau Sekudu Quartz-monzonite Pluton
GEOL_GEO3	Sbad	Singapore Basalt–andesite Dyke-swarm
GEOL_GEO3	BTsp	Simpang Granite Pluton
GEOL_GEO3	BTup	Pulau Ubin Granite Pluton
GEOL_GEO3	BTdpm	Dairy Farm Granite–microgranite Pluton (microgranite)
GEOL_GEO3	BTdpg	Dairy Farm Granite–microgranite Pluton (granite)
GEOL_GEO3	BTCum	Mafic intrusive rock, undifferentiated
GEOL_GEO3	BTgp	Gombak Gabbro–granite Pluton
GEOL_GEO3	BTcp	Choa Chu Kang Granodiorite–tonalite Pluton
GEOL_GEO3	BTC	Bukit Timah Centre (undifferentiated)
GEOL_GEO3	Ug	Granitic rocks of unknown affinity

3.2 NEW ABBR_CODE for GEOL_GEO2

Group Name: ABBR - Abbreviation Definitions		
ABBR_HDNG	**ABBR_CODE**	**ABBR_DESC**
GEOL_GEO2	LATUFF	LAPILLI TUFF
GEOL_GEO2	TUFFBRE	TUFF-BRECCIA
GEOL_GEO2	FGOU	FAULT-GOUGE
GEOL_GEO2	TUFFSI	TUFFISITE
GEOL_GEO2	SYNGR	SYENOGRANITE
GEOL_GEO2	QSYN	QUARTZ SYENITE
GEOL_GEO2	SYN	SYENITE
GEOL_GEO2	MONGR	MONZOGRANITE
GEOL_GEO2	MON	MONZONITE
GEOL_GEO2	TONL	TONALITE
GEOL_GEO2	QMONDI	QUARTZ MONZODIORITE
GEOL_GEO2	QDI	QUARTZ DIORITE
GEOL_GEO2	QMONGB	QUARTZ-MONZOGABBRO
GEOL_GEO2	QGBR	QUARTZ-GABBRO

GEOL_GEO2	QANTS	QUARTZ-ANORTHOSITE
GEOL_GEO2	MONDI	MONZODIORITE
GEOL_GEO2	MONGB	MONZOGABBRO
GEOL_GEO2	ANTS	ANORTHOSITE
GEOL_GEO2	GBNR	GABBRO-NORITE
GEOL_GEO2	DAC	DACITE
GEOL_GEO2	FLSI	FELSITE
GEOL_GEO2	MAFI	MAFITE
GEOL_GEO2	LTTE	LATITE
GEOL_GEO2	DLMLI	DOLOMITIC LIMESTONE
GEOL_GEO2	CADLM	CALCITIC DOLOMITE
GEOL_GEO2	LIGRS	LIME-GRAINSTONE
GEOL_GEO2	LIBOS	LIME-BOUNDSTONE
GEOL_GEO2	LIFRS	LIME-FRAMESTONE
GEOL_GEO2	LIPSS	LIME-PSEUDOSPARSTONE
GEOL_GEO2	LISPS	LIME-SPARSTONE
GEOL_GEO2	LIMCSP	LIME-MICROSPARSTONE

GEOL_GEO2	LIMIC	LIME-MICROSTONE
GEOL_GEO2	LIDIM	LIMESTONE-DIAMICTITE
GEOL_GEO2	LIMUDIM	LIMESTONE AND MUDSTONE DIAMICTITE
GEOL_GEO2	DIM	DIAMICTITE
GEOL_GEO2	REEF	REEF
GEOL_GEO2	QARE	QUARTZ ARENITE
GEOL_GEO2	LARE	LITHIC-ARENITE
GEOL_GEO2	SLARE	SUBLITHIC-ARENITE
GEOL_GEO2	FARE	FELDSPATHIC-ARENITE
GEOL_GEO2	SFARE	SUBFELDSPATHIC-ARENITE
GEOL_GEO2	LWK	LITHIC-WACKE
GEOL_GEO2	FWK	FELDSPATIHC-WACKE
GEOL_GEO2	QWK	QUARTZ WACKE
GEOL_GEO2	CAST	CLAYSTONE
GEOL_GEO2	SAMU	SANDY MUDSTONE
GEOL_GEO2	SACNG	SANDY CONGLOMERATE
GEOL_GEO2	MUCNG	MUDDY CONGLOMERATE

GEOL_GEO2	PESA	PEBBLY SANDSTONE
GEOL_GEO2	PEMU	PEBBLY MUDSTONE

3.3 NEW ABBR_CODE for GEOL_LEG

Group Name: ABBR - Abbreviation Definitions		
ABBR_HDNG	**ABBR_CODE**	**ABBR_DESC**
GEOL_LEG	864	LAPILLI TUFF
GEOL_LEG	865	TUFF-BRECCIA
GEOL_LEG	883	FAULT-GOUGE
GEOL_LEG	884	TUFFISITE
GEOL_LEG	893	SYENOGRANITE
GEOL_LEG	894	QUARTZ SYENITE
GEOL_LEG	895	SYENITE
GEOL_LEG	896	MONZOGRANITE
GEOL_LEG	897	MONZONITE
GEOL_LEG	898	TONALITE
GEOL_LEG	899	QUARTZ MONZODIORITE
GEOL_LEG	900	QUARTZ DIORITE

GEOL_LEG	901	QUARTZ-MONZOGABBRO
GEOL_LEG	902	QUARTZ-GABBRO
GEOL_LEG	903	QUARTZ-ANORTHOSITE
GEOL_LEG	904	MONZODIORITE
GEOL_LEG	905	MONZOGABBRO
GEOL_LEG	906	ANORTHOSITE
GEOL_LEG	907	GABBRO-NORITE
GEOL_LEG	852	DACITE
GEOL_LEG	920	FELSITE
GEOL_LEG	921	MAFITE
GEOL_LEG	922	LATITE
GEOL_LEG	940	DOLOMITIC LIMESTONE
GEOL_LEG	941	CALCITIC DOLOMITE
GEOL_LEG	942	LIME-GRAINSTONE
GEOL_LEG	943	LIME-BOUNDSTONE
GEOL_LEG	944	LIME-FRAMESTONE
GEOL_LEG	945	LIME-PSEUDOSPARSTONE

GEOL_LEG	946	LIME-SPARSTONE
GEOL_LEG	947	LIME-MICROSPARSTONE
GEOL_LEG	948	LIME-MICROSTONE
GEOL_LEG	949	LIMESTONE-DIAMICTITE
GEOL_LEG	950	LIMESTONE AND MUDSTONE DIAMICTITE
GEOL_LEG	951	DIAMICTITE
GEOL_LEG	952	REEF
GEOL_LEG	960	QUARTZ ARENITE
GEOL_LEG	961	LITHIC-ARENITE
GEOL_LEG	962	SUBLITHIC-ARENITE
GEOL_LEG	963	FELDSPATHIC-ARENITE
GEOL_LEG	964	SUBFELDSPATHIC-ARENITE
GEOL_LEG	965	LITHIC-WACKE
GEOL_LEG	966	FELDSPATIC-WACKE
GEOL_LEG	967	QUARTZ WACKE
GEOL_LEG	968	CLAYSTONE
GEOL_LEG	969	SANDY MUDSTONE

GEOL_LEG	970	SANDY CONGLOMERATE
GEOL_LEG	971	MUDDY CONGLOMERATE
GEOL_LEG	972	PEBBLY SANDSTONE
GEOL_LEG	973	PEBBLY MUDSTONE

3.4 NEW ABBR_CODE for GEOL_GEOL

Group Name: ABBR - Abbreviation Definitions		
ABBR_HDNG	**ABBR_CODE**	**ABBR_DESC**
GEOL_GEOL	RF	REEF

3.5 NEW CHEMICAL TESTING CODE for CODE_CODE

Group Name: CODE - Chemical Testing Code	
CODE_CODE	**CODE_DESC**
11BP2FL	1,1-biphenyl,2-fluoro
12DEE	cis 1,2 - Dichloroethene
246TBP	2,4,6-Tribromophenol
ALD	Aldrin
44DDD	4,4 - DDD

44DDE	4,4 - DDE
44DDT	4,4 - DDT
DIEL	Dieldrin
ENDO	Endosulfan
ENDR	Endrin
DHCH	D-HCH
DP	Dichloropropanes
HCH	Hexachlorocyclohexane
PH2FL	Phenol,2-fluoro
PBFLB	p-Bromofluorobenzene
PHD5	Phenol-d5
PYR	Pyridine
TP	Total Phosporous
TOD8	Toluene-d8
TN	Total Nitrogen
PTPD14	p-Terphenyl-d14
XYL	Xylene
TAMN	Total Ammoniacal nitrogen

BOD	Biochemical oxygen demand	New
COD	Chemical oxygen demand	New
TOC	Total Organic Carbon	New
~~BIOXW~~	Biochemical oxygen demand	Delete
~~CHOXW~~	Chemical oxygen demand	Delete
~~ORGCW~~	Total Organic Carbon	Delete

3.6 NEW UNIT CODE for CNMT_UNIT

Group Name: UNIT – Definition of <UNITS>, CNMT_UNIT	
UNIT_UNIT	**UNIT_DESC**
Concentration	
CFU/ml	colony forming units per millilitre
CFU/g	colony forming units per gram