Database Operational Manual

THE PROJECT ON CAPACITY DEVELOPMENT FOR MINING ADMINISTRATION IN THE KINGDOM OF CAMBODIA

Date of Revision: 28th February 2017 Date of Issue: 15th December 2015 Japan International Cooperation Agency (JICA)

Significant changes

- □ Inspection Folder, inspection report are added.
- □ Geological map of whole country, Legend is updated.
- □ National_data, River.shp is corrected fitting to WGS1984
- Template_Concession.xls, new input field of datum is added.
 - o Zones for Multiple zones of single license.
 - Datum for different datum of XY coordinates, Recent concessions are given on WGS1984, instead of previous datum of Indian1960.
- Dept_Construction, Line concession is added, and merged.
- □ Commodity code is updated, with 2 additional commodities.
- □ Template_License.xls, new input field of commodity2 is added. Construction licenses permit two commodities in cases.
- □ License data and Concession data are joined through Code_N.
- □ Revenue data and License data are joined through License_ID.

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1. General information

This is a manual for creating GDMR database. The main purpose of the database is to share data over department of GDMR to improve management of mining activity. This database is based on GIS because most data consist of spatial data such as a concession map, a province map, a geological map etc... Chapter 1 shows;

- The structure of the database, and the list of data (ch1-1),
- Responsibility to data (ch1-2),
- Required softwares to create the database (ch1-3),
- Applied coordinate system (ch1-4)
- Workflow of this manual (ch1-5).

Abbreviate the name of Departments of GDMR, as below;

Department of Geology	Dept. Geology
Department of Mineral Resources Development and Promotion	Dept. Promotion
Department of Mineral Exploration Management	Dept. Exploration
Department of Construction Materials	Dept. Construction
Department of Mining	Dept. Mining

1-1 List of data and the storage structure

Data to be shared in GDMR are listed in table below.

List of data

Category	Content	File name
License Certificate	Concession coordinates	Concession_***.xls
(of 3 Departments)	License information	License_***.xls
	Company list	Company ID/code_***.xls
Revenue data	Payment record	Revenue.xls
Operation data	Mines data	Mines_***.xls
Company report	Report, Data	Information only uploaded
ASM information		Information only uploaded
Remote Sensing data	Airphoto dataset	Printed (No digital file)
	ASTER dataset	GeoTIFF images for 18 areas
National data	Admin map	Province_boundary.shp
		District_boundary.shp
		Commune_boundary.shp

Category	Content	File name
	Topographic map	River_system.shp
		Elevation_contour.shp
	Transportation map	Code_Road.xls
		Road.shp
		Airport.shp
		Port.shp
	Protected area map	Protected_area.shp
	CMAC¥Bombing	b52.shp
		b52dot.shp
	CMAC¥Mine_Field	ordnance_kh.shp
		Completion_Minefield.shp
		Confirmed_Minefield.shp
		Residual_Minefield.shp
		Suspected_Minefield.shp
Geological data	Geological_map_750k	Geological_map_750k.shp
		Fault.shp
	Geological_map_200k	Kampong_kngeo.shp
	(14sheets)	KamponSom_ksgeo.shp
		Kampot_kpgeo.shp
		KohKong_kkgeo.shp
		KrochChhma_krgeo.shp
		Mondulkiri_mrgeo.shp
		PhnomPenh_ppgeo.shp
		Pursat_psgeo.shp
		Ratanikiri_rrgeo.shp
		Siemreap_srgeo.shp
		Sisophon_sisgeo.shp
		StrungTreng_stgeo.shp
		SvayRieng_svgeo.shp
		TbengMeanchey_tbgeo.shp
	Mineral resource map	Cambodia_minerals.shp
Inspection data		Inspection_P.shp
	InspectionReport	REPORT.pdf

*** : short name of managing department (Geology, Promotion, Exploration, Construction, Mining)

1-1-1 Structure of this database

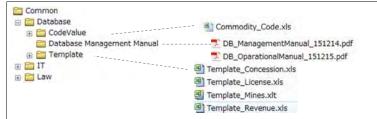
Since including spatial data like concession map, this database based on GIS. The map is shown by ArcMap of ArcGIS, one of GIS softwares. The ArcMap file, "GDMR_Database.mxd", is stored at the top of main folders. Individual data are stored in the folders of each department. ArcMap file itself has never contain the actual data, just has connecting paths of data and map setting. So when backup, you have to copy the all files and sub-folders which compose a map.





"Common" folder

Common folder contains this manual document and a diagram of folder structure, commodity code which is input in license.xls, and template files for starting to input data.



"National_data" folder

ArcMap file "GDMR_Database.mxd" connects toporaphic data such as "Elevation_contour.shp", "River_system.shp", and transportation data of "Road.shp", "Port.shp", "Airport.shp" and admin boundaries such as "Province_boundary.shp".



"Dept_Geology" folder

ArcMap file "GDMR_Database.mxd" connects geological data of "Geological_map_750k", 14sheets of local geological maps of 200k (1:200,000), and mineral resource map of "Cambodia_minerals.shp".



"Dept_Promotion" folder

ArcMap file "GDMR_Database.mxd" connects table data of "Revenue.xls", which consists of three sheets .



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"Dept_Exploration" folder

ArcMap file "GDMR_Database.mxd" connects spatial data of "Concession_Exploration_Polygon.shp", and table data of "License_Exploration.xls". The folder "*_Indian60" is an intermediate work-folder for create a concession polygon shapefile.

L Company_report	
L Concession_Exploration	 Concession_Exploration_Polygon.shp
L Concession_Exploration_Indian60	
License_Exploration	 License_Exploration.xls

"Dept_Construction" folder

ArcMap file "GDMR_Database.mxd" connects spatial data of "Concession_Construction_Polygon.shp", and table data of "License_Construction.xls". The folder "* Indian60" is an intermediate work-folder for create a concession polygon shapefile.

Company_report	
Concession_Construction	 Concession_Construction_Polygon.shp
Concession_Construction_Indian60	The second s
License_Construction	 License_Construction.xls

"Dept_Mining" folder

ArcMap file "GDMR_Database.mxd" connects spatial data of "Concession_Mining_Polygon.shp", and table data of "License_Mining.xls" and "Mines_Mining.xls". The folder "*_Indian60" is an intermediate work-folder for create a concession polygon shapefile.



"Inspection" folder

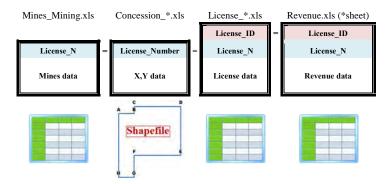
Mine safty inspection data should be stored here. Inspection site is shown on map by point shapefile. When you click the point of inspection site after hyperlink is active, jump to the PDF-format report.

Inspection	
InspectionReport Inspection.lyr	 🗾 Special Inspection Report (October 2016).pdf
Inspection_P.shp	

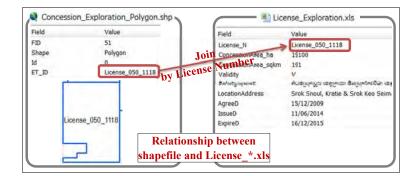
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Relationship between data

License data and concession, mines data are joined by License number, within each department. However, revenue data, which cover licenses of all departments, are joined by License ID. License ID is assigned by Department of Promotion.



*: Name of department in charge of license

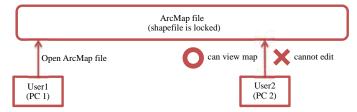


1-1-2 Accessibility to the database

The accessibility of this database is limited within GDMR.

Limitation of sharing an ArcMap file

When one user is using the ArcMap file (GDMR_Database.mxd), other users can open the same ArcMap file and view the map. However, to edit the shapefile, or to save (not as another filename) is impossible, during someone open the ArcMap file. One solution enable to edit by users at same time, is to create geodatabase (file geodatabase) from shapefiles, raster images and table data of Excel.



1-1-3 File type in this database

This database is composed of spatial data, table data, and document files, as listed below.

	Kind of data	File type
Spatial data	Vector data Shapefile (shp)	
(GIS data)		GoogleEarth file (kmz, kml)
		GPS file (gpx)
	Raster data	GeoTIFF file (tif)
Non-spatial data	Tabular (Table) data	Microsoft Excel file (xls, xlsx)
	Document	PDF file (pdf)
		Microsoft Word file (doc, docx)
	Image/scanned document	PDF file (pdf)
		Image file (jpg, tif, gif, png,)
	Information (list of data)	Microsoft Excel file (xls, xlsx)
	Memo/log for update	Text file (txt)

Database Operational Manual (GDMR)

About shapefile

One shapefile consists of several files, as listed below. Do NOT delete one of them.

SHP		The main file that stores the feature geometry (required)
DBF		The dBASE table that stores the attribute information of features (required)
SHX	9	The index file that stores the index of the feature geometry (required)
PRJ		The file that stores the coordinate system information

Shapefiles shall be separated by feature type.

Point		Mineral occurrence location, Mining site location
Polyline (Line)	+	Road, River
Polygon (Area)	M	Concession area, Provinces

1-2 Responsibility to data

1-2-1 Responsible department

Data are stored in 7 main folders. Responsibility to data, including update and backup is assigned as below.

Folder name	Responsible office for the containing data
Common	Database administrators
National_data	Any officer to obtain latest data
Dept_Geology	Officers of Department of Geology
Dept_Promotion	Officers of Department of Promotion
Dept_Exploration	Officers of Department of Exploration
Dept_Construction	Officers of Department of Construction
Dept_Mining	Officers of Department of Mining

1-2-2 Backup

Hard disk of Server or PC has a risk to be broken unexpectedly. Data should be back up in other computers or hard disks. Copy each department data (under each department folder) to another

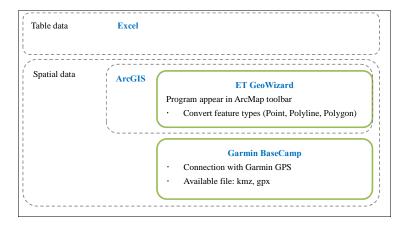
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storage. The schedule of backup is shown below.

Data for backup	Time to backup	Responsible person
Whole database	End of month	Database administrators
(except National_data)		
National_data	End of Year	Database administrators
(80GB of data size)	(& Time to be updated)	
Folders of each department	Decided by each department	Each department officers

1-3 Software required

This database is build based on the policy to use common software to GDMR. Such a GIS software is ArcGIS. For software handling tabular/table data, Microsoft Excel is chosen because of availability to many PC. Other required softwares are free downloadable and trusted ones.



1-3-1 Microsoft office (Excel)

For Table data, Microsoft Excel is one of common softwares already installed in many PC. That's why we use Excel at the starting database system. Other softwares for table data are usable to ArcGIS-based database system, such as Microsoft Access, database software like SQL Server.

1-3-2 ArcGIS 10.0

ArcGIS has three kinds of products; ArcView, ArcEditor, and ArcInfo. This manual is described based on ArcView, the basic type. ArcGIS Desktop 10.0, for stand alone PC, is composed of ArcCatalog and ArcMap, with a tool, namely ArcToolbox which is accessible from both programs. Version 10.0 of ArcMap can open the older version (Ver.9) of MXD file. But it can NOT open the

Database Operational Manual (GDMR)

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later version (Ver.10.1, Ver.10.2, Ver.10.3). Check your software version, in help menu of either ArcCatalog or ArcMap.

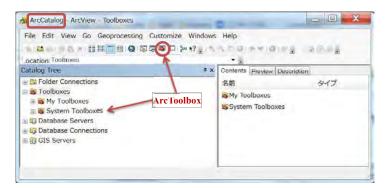
ArcMap File version	Available Software version
Version 9 (mxd file)	ArcGIS 9
	ArcGIS 10.0
	ArcGIS 10.1
	ArcGIS 10.2
	ArcGIS 10.3
Version 10.0 (mxd file)	ArcGIS 10.0
	ArcGIS 10.1
	ArcGIS 10.2
	ArcGIS 10.3
Version 10.1 (mxd file)	ArcGIS 10.1
	ArcGIS 10.2
	ArcGIS 10.3
Version 10.2 (mxd file)	ArcGIS 10.2
	ArcGIS 10.3
Version 10.3 (mxd file)	ArcGIS 10.3

	Typical function
ArcCatalog	File managing (copy & paste)
	Create a new shapefile
- Contraction of the second se	View Vector & Raster data, Table data
	Convert vector file to shapefile (with ArcToolbox)
ArcMap	Edit a shapefile, Calculate geometry of objects
	Georeference of raster image, create GeoTIFF file
	Convert vector file to shapefile (with ArcToolbox)
	Create & Layout a map
	Search and Spatial analysis of objects
	Print out a map

1-3-2-1 ArcCatalog

ArcCatalog is used for file managing like copy and paste, move, and to create new shapefile. Shapefile is composed of several types of file in a windows folder. In ArcCatalog a series of these files appear as one shapefile so easily to handle. ArcCatalog is a useful viewer for shapefile and other vector files like DXF file, image file, table data like Excel file, and some relational databases like Access,SQL Server. With ArcToolbox, ArcCatalog can run various functions such as a conversion between different file type or different coordinate system.

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Check your software Version

Help > about ArcCatalogue...



1-3-2-2 ArcMap

ArcMap is used for creating a map, by overlay of layers of vector and raster files. Another function is to edit of shapefiles, create GeoTIFF file from raster image by georeferenced, spatial search or calculation for objects in map. With ArcToolbox, ArcMap can run various functions such as a conversion between different file type or different coordinate system.

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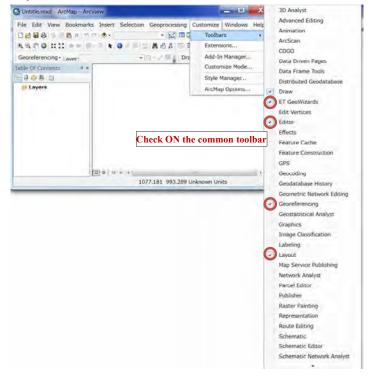
Untitle.mxd - ArcMap - ArcView			X
File Edit View Bookmarks In:	ert Selection Geoprocessing Custo	omize Windows Help	
Desalingxinne			
8820 III == 0-=	NO COLORAS CON	GW Help - Editor -	the Hillson & P. William
	Georeferencing - Layer:	-10 III	
Table Of Contents * x		1	
14 6 4 1		1	
E Layers	Ar	cToolbox	E
	Ta su e	m	
		2848.404 5.319	Unknown Units

Help > about ArcMap

About Arc	Map
0	ESRI® ArcMap [*] 10.0 Version (Build 2414) OK
	License Type: ArcView
	Copyright ©1999-2010 ESRI Inc. All Rights Reserved
1	This work is protected by copyright law and international treaties. Unauthorized reproduction or distribution of this program, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.
2	View the ArcGIS 10.0 Copyright and Trademarks
2	View the ArcGIS 10.0 Acknowledgements
1	Visit our Web site: http://www.esri.com

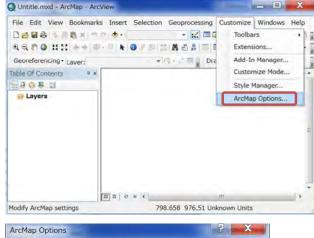
1-3-2-3 Setup your ArcMap

Setup toolbars shown on window.



Database Operational Manual (GDMR)

Setup Relative paths, for creating new ArcMap file.



	r	CAD	Display C	ache
General	Data View	Layout View	Metadata	Tables
Startup				
Show Ge	lash screen etting Started dialo ately <u>a</u> dd data t map on startup	^{ig} <u>S</u> tartup Scrip Map.Start	ot:	
General				
Make ne	wly added layers y	isible by default		
Return to	o last used location	n when Add Data dial	og first used	
	izards when availa			
V Make rel	ative nathe the de			
- ake rei	iauve paulo ule de	fault for new map do	cuments	
Too	k ON about ' ke usable to	*Relative path move/copy to	s",	folder.
Check Too to ma	k ON about ' ke usable to r for the hyperlink tool is	Relative path	s", a different f	*
Check to ma Default Laye	k ON about ' ke usable to r for the hyperlink tool is	"Relative path move/copy to	s", a different f	*
Too to ma Defaurt Laye	k ON about ' ke usable to a rol gaenary cool, e Hyperlink tool is	*Relative path move/copy to rop most	s", a different f atures containing	*
Too to ma Defaurt Laye	k ON about ' ke usable to a rol gaenary cool, e Hyperlink tool is	"Relative path move/copy to	s", a different f atures containing	*
Too to ma Defaurt Laye	k ON about ' ke usable to a rol gaenary cool, e Hyperlink tool is	*Relative path move/copy to rop most	s", a different f atures containing	*

Database C	perational Manual	(GDMR)	

1-3-3 ET GeoWizard (Add-in of ArcMap)

ET GeoWizard is an add-in tool of ArcMap. This appear on ArcMap toolbar. This is a free software with limited function such as conversion of a shapefile between point, line, and polygon. http://www.ian-ko.com/



Download a zip file in your PC, then unzip it, run "setup.exe".

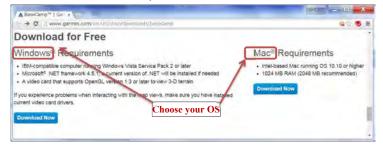
One of free unzip softwares is available from the website <u>http://www.7-zip.org/download.html</u>

1-3-4 Garmin BaseCamp

This software is used for GPS data exchange, described in chapter 9-2. Garmin BaseCamp can export spatial data to GPS, or to import data from GPS. This is a free software of Garmin product. The download site is

http://www.garmin.com/en-US/shop/downloads/basecamp

Choose either one download file as of your OS

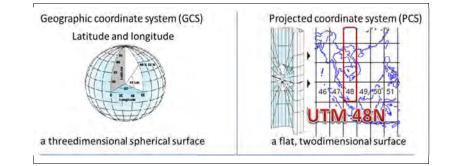


1-4 Applied coordinate system to this database

The coordinate system is composed of map projection and datum.

1-4-1 Map projection

Most common in worldwide is a geographic coordinate system (GCS), shown by latitude and longitude. Other common is a projected coordinate system (PCS), shown by X and Y value on 2-dimensinal grid. UTM is the typical one used over the world. Cambodian country is located in 48N zone of UTM.



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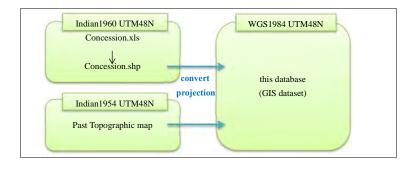
1-4-2 Map datum

In Cambodian land, two kinds of datum are commonly used; Indian 1954 is used commonly in past topographic maps. Indian 1960 is officially used in license certificate of GDMR.

1-4-3 Coordinate system in this database

When applying the coordinate system to spatial data in ArcGIS, follow the step to choose ; 1) Map projection ---> 2) Region ---> 3) Name of coordination system

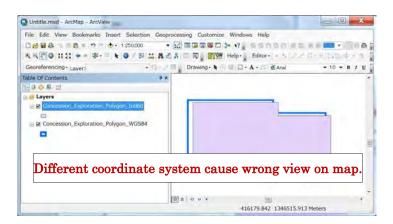
Map projection	Region	Name of coordinate system	Example
Geographic	World	GCS_WGS_1984	GoogleEarth file
Coordinate Systems	Asia	GCS_Indian_1954	Past topographic map
(Latitude,Longitude)		GCS_Indian_1960	
Projected	Asia	Indian_1954_UTM_Zone_48N	Past topographic map
Coordinate Systems		Indian_1960_UTM_Zone_48N	Coordinates on License
(UTM)	WGS 1984	WGS_1984_UTM_Zone_48N	In this database



1-4-4 Alert about coordinate system in ArcMap

Do NOT mix the layers of different coordinate system in the same map (same data frame). Otherwise ArcMap shows wrong location, or wrong special analysis.

Database Operational Manual (GDMR)



1-5 Workflow of this manual

This manual consists of nine chapters.

	For Editors (to create database)	For Users in GDMR
Ch1	General (Architecture of database)	General (Architecture of database)
	Install additional tools	Install additional tools
Ch2	Input into Excel	
Ch3	Create concession shapefile (from Excel)	
	Convert Coordinate system	
	Convert from Point to Polygon	
	Edit/draw shapefile	
Ch4	Convert DXF/ KML to shapefile	
	Convert JPG to GeoTIFF (Georeference)	
Ch5	ArcMap (Layer control, Symbology, Save)	
Ch6	Update data	
Ch7		ArcMap (View map, Join table data, Search
		concessions)
Ch8		ArcMap (Layout, print)
Ch9		GoogleEarth data
		GPS data

Chapter 1 is about database architecture and software setup information. Chapter 2 to chapter 6 is

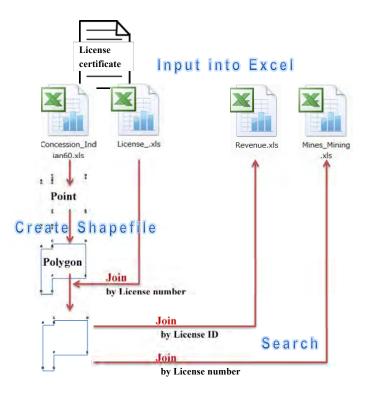
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for editors of this database. For data input, see chapter 2. For creating a shapefile, see chapter 3. For use existing data of other file format, see chapter 4. For creating a map, see chapter 5. For updating data, see chapter 6.

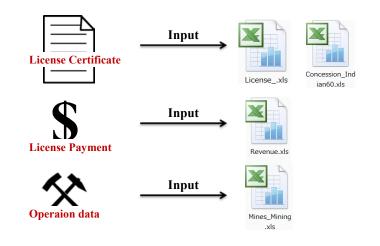
For all users to view a map and to search related data, see chapter 7. To print out including layout, see chapter 8. For exchange data with GoogleEarth or GPS, see chapter 9.

Workflow to create database is shown in below chart.



2. Input new data

The work to building database is initiated with inputting into Excel file. Chapter 2 shows the list of new data to be input. Also the relationship between data is shown. Note some rules when inputting into Excel.



2-1 List of data to be input

The fundamental data for management of mining are of license. They consist of ;

(1) License data	Data about license condition			
(2) Concession data	X,Y data for concession shapefile			
(3) Mines data	Operation data at mining site, which will be updated by provincial officers, inspector, company reporting			
(4) Revenue data	Payment records for licenses of Exploration, Construction matirial, Mining. Data shall be stored in the separated sheet by department, in order to join with concessions of each department.			

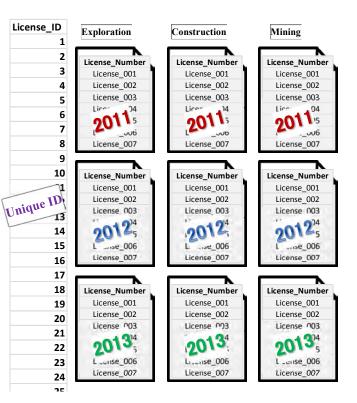
2-1-1 License data

The content of license data is listed below.

Field name	Description	Data Type
License_ID	Unique ID over department	TEXT(Primary Key)
License_N	License number in department	TEXT(Foreign Key)
Issuer	Ministry to issue	TEXT
ConcessionArea_ha	Area(ha) on document	TEXT
ConcessionArea_sqkm	Area(ha) on document	TEXT
Validity	Validity of license	TEXT(Code)
ទីតាំងស្វែងរុកកេដី	Address at site	TEXT
LocationAddress	Address of license area	TEXT
AgreeD	Date of agreement	DATE(dd/MM/yyyy)
IssueD	Date of issue	DATE(dd/MM/yyyy)
ExpireD	Date of expire	DATE(dd/MM/yyyy)
SuspendedD	Date of temporary stop of operation	DATE(dd/MM/yyyy)
ReturnD	Date of returning license by owner	DATE(dd/MM/yyyy)
RevokeD	Date of revoking license by government	DATE(dd/MM/yyyy)
Cancel_Reason	Reason above three events	TEXT
Relinquishment_sqkm	Decrease area of exploration concession	TEXT
Commodity_Code	Commodity code	TEXT(Code)
Company_Code_DptXX	Company code in department	TEXT
Company_Name	Company name	TEXT
Representative_Name	Representative person name	TEXT
Nationality	Nationality	TEXT
JV_structure	Joint venture	TEXT
អាសយដ្ឋានក្រុមហ៊ុន (ភ្នំពេញ)	Address at office (PhnomPenh)	TEXT
Address_Office	Address of company office	TEXT
Email	Email address	TEXT
Phone	Phone number	TEXT
Website	Website	TEXT
Contact	Contact person	TEXT

About "License_ID"

License ID is unique number for connecting License data with Revenue data. License ID is provided by Department of Promotion, every year.



2-1-2 Concession (X,Y) data

In license certificate, the coordinates (X,Y) of permitted concession are described. At first input into Excel file, in order to create shapefiles of concession in chapter 3.

Field name	Field name Description	
License_Number License number in department		TEXT(Foreign Key)
Ref_Mark	Connecting order of point	TEXT
Easting	Indian1960 UTM 48N	NUMBER (Integer)
Northing	Indian1960 UTM 48N	NUMBER (Integer)

2-1-3 Mines data

These data are operation data of mining site. This kind of data may be brought by Department of Mining, and Department of Construction, and Provincial offices. The content of data is listed in below. The data shall stored in database, so that all GDMR officers can share these information.

Field name	Description	Data Type
License_N	License number in department	TEXT(Primary Key)
Issuer	Ministry to issue	TEXT
Name_Mines	Name of mine	TEXT
Operator	Name of company	TEXT
Stage	Stage for mining	TEXT
MineLocation	Location of mine	TEXT
MiningArea_sqkm	Area of mining	TEXT
StartMineD	eD Start date of operation DATE(dd/MM/y	
CloseMineD	MineD Close date of operation DATE	
Female_Worker	Number of female workers	NUMBER (Integer)
Male_Worker	Male_Worker Number of male workers NUMBER (Int	
Commodity_Code	de Commodity TEXT(Code)	
Monthly_Production	Monthly production	TEXT
Annual_Production	Annual production	TEXT
Sales	Quantity of sales	TEXT
MineLife_years	Mine life time	NUMBER (Integer)
Ore_Resource_ton	Volume of Ore resources	NUMBER (Double)
Ore_Reserve_ton	Volume of Ore reserves	NUMBER (Double)

2-1-4 Revenue data

Department of Promotion has a management of payment of all licenses over department. The data to be sotred in the database is listed below.

Field name	Description	Data Type
License_ID	Unique ID over department	TEXT(Primary Key)
CompanyName	Company name	TEXT
License_N	License number in department	TEXT(Foreign Key)
Issuer	Ministry to issue	TEXT
Department	Department to manage license	TEXT
PayYear	Year of paying	NUMBER (Integer)
DueD_LandFee	Due date for land fee	DATE(dd/MM/yyyy)
LandFeePay	Status of payment for Land fee	TEXT("non")
PaidD_LandFee	Paid date for land fee	DATE(dd/MM/yyyy)
DueD_Royalty (S1)	Due date for royalty (1 st Semester) DATE(dd/MM/yy	
RoyaltyPay(S1)	Status of payment for Royalty (1st Semester)	TEXT("non")
PaidD_Royalty (S1)	Paid date for royalty (1st Semester)	DATE(dd/MM/yyyy)
DueD_Royalty (S2)	Due date for royalty (2nd Semester)	DATE(dd/MM/yyyy)
RoyaltyPay(S2)	Status of payment for Royalty (2nd Semester)	TEXT("non")
PaidD_Royalty (S2)	Paid date for royalty (2nd Semester)	DATE(dd/MM/yyyy)
DueD_Royalty (S3)	Due date for royalty (3rd Semester)	DATE(dd/MM/yyyy)
RoyaltyPay(S3)	Status of payment for Royalty (3rd Semester)	TEXT("non")
PaidD_Royalty (83)	Paid date for royalty (3rd Semester)	DATE(dd/MM/yyyy)
DueD_Royalty (S4)	Due date for royalty (4th Semester)	DATE(dd/MM/yyyy)
RoyaltyPay(S4)	Status of payment for Royalty (4th Semester)	TEXT("non")
PaidD_Royalty (S4)	Paid date for royalty (4th Semester)	DATE(dd/MM/yyyy)

If payment is outstanding, fill in "non" in "LandFeePay" field or in each "RoyaltyPay" field.



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2-2 Relationship between the data

This database has table data which are stored into Excel files. These data can be connected each other with concession map. The relationship between table data is shown below, by each department. Key fields for connecting are the two; License ID, and License number.

2-2-1 Data related to license of Exploration

Concession_Exploration.xls

License_Exploration.xls Revenue.xls

Concession_ Exploration.xis			_	
		License_ID	=	License_ID
License_Number	=	License_N		License_N
Ref_Mark		Issuer		CompanyName
Easting		ConcessionArea_ha		Issuer
Northing		ConcessionArea_sqkm		Department (=Exploration)
		Validity		PayYear
		LocationAddress		DueD_LandFee
		AgreeD		LandFeePay
		IssueD		PaidD_LandFee
		ExpireD		DueD_Royalty (S1)
		SuspendedD		RoyaltyPay(S1)
		ReturnD		PaidD_Royalty (S1)
		RevokeD		DueD_Royalty (S2)
		Cancel_Reason		RoyaltyPay(S2)
		Relinquishment_sqkm		PaidD_Royalty (S2)
		Commodity_Code		DueD_Royalty (S3)
		Company_Name		RoyaltyPay(S3)
		Representative_Name		PaidD_Royalty (S3)
		Nationality		DueD_Royalty (S4)
		JV_structure		RoyaltyPay(S4)
		Address_Office		PaidD_Royalty (S4)
		Email		
		Phone		
		Website		
		Contact		

2-2-2 Data related to license of Construction materials

License_Construction.xls

Revenue.xls

Concession_Construction.xls

		License_ID	=	License_ID
License_Number	=	License_N		License_N
Ref_Mark		Issuer		CompanyName
Easting		ConcessionArea_ha		Issuer
Northing		ConcessionArea_sqkm		Department (=Construction)
		Validity		PayYear
		ទីតាំងស្វែងរុករការី		DueD_LandFee
		LocationAddress		LandFeePay
		AgreeD		PaidD_LandFee
		IssueD		DueD_Royalty (S1)
		ExpireD		RoyaltyPay(S1)
		SuspendedD		PaidD_Royalty (S1)
		ReturnD		DueD_Royalty (S2)
		RevokeD		RoyaltyPay(S2)
		Cancel_Reason		PaidD_Royalty (S2)
		Relinquishment_sqkm		DueD_Royalty (S3)
		Commodity_Code		RoyaltyPay(S3)
		Company_Name		PaidD_Royalty (S3)
		Representative_Name		DueD_Royalty (S4)
		Nationality		RoyaltyPay(S4)
		JV_structure		PaidD_Royalty (S4)
		អាទាជានីវិនណ៍ន (ដីពេយ៌)		
		Address_Office		
		Email		
		Phone		
		Website		
		Contact		

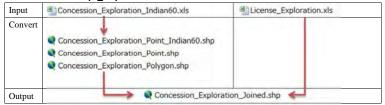
2-2-3 Data related to license of Mining

				License_ Mining.xls		Revenue.xls
Mines_Mining.xls		Concession_ Mining.xls				
				License_ID	=	License_ID
License_N	=	License_Number	=	License_N		License_N
Name_Mines		Ref_Mark		Issuer		CompanyName
Operator		Easting		ConcessionArea_ha		Issuer
Stage		Northing		ConcessionArea_sqkm		Department (=Minin
MineLocation				Validity		PayYear
Location_ID_DoG				LocationAddress		DueD_LandFee
MiningArea_sqkm				AgreeD		LandFeePay
StartMineD				IssueD		PaidD_LandFee
CloseMineD				ExpireD		DueD_Royalty (S1)
Female_Worker				SuspendedD		RoyaltyPay(S1)
Male_Worker				ReturnD		PaidD_Royalty (S1)
Commodity_Code				RevokeD		DueD_Royalty (S2)
Monthly_Production				Cancel_Reason		RoyaltyPay(S2)
Annual_Production				Relinquishment_sqkm		PaidD_Royalty (S2)
Sales				Commodity_Code		DueD_Royalty (S3)
MineLife_years				Company_Name		RoyaltyPay(S3)
Ore_Resource_ton				Representative_Name		PaidD_Royalty (S3)
Ore_Reserve_ton				Nationality		DueD_Royalty (S4)
				JV_structure		RoyaltyPay(S4)
				Address_Office		PaidD_Royalty (S4)
				Email		
				Phone		
				Website		
				1		

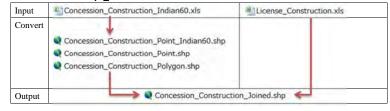
2-3 File list to be created

All data about the management of licenses and activites, are stored into Excel files. Only concession data are converted into shapefiles, to view map. The file lists of each department is shown below.

2-3-1 Files in "Dept_Exploration" folder



2-3-2 Files in "Dept_Construction" folder





2-3-3 Files in "Dept_Mining" folder



Input/ Mines_Mining.xls

Output

Contact

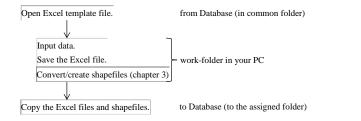
2-3-4 Files in "Dept_Promotion" folder

Department of Promotion has revenue data of all licenses of three departments. They are stored into separate sheets by department.

Input/	Revenue.xls
Output	Sheet "Exploration"
	Sheet "Construction"
	Sheet "Mining"

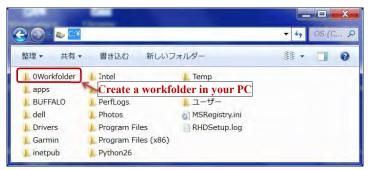
2-4 Prepare the work-files in your PC

According to the flow chart below, prepare work-folder in your PC. The template files to be input is available in "Common" folder of the database.



2-4-1 Work-folder

Create a work folder in your PC. For example, C:¥0Workfolder



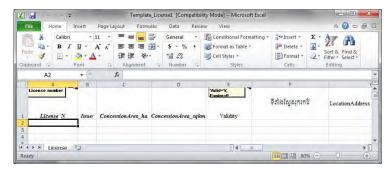
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2-4-2 Template files

Template files are stored in "Common" folder of the database.

Open the folder; GDMR_Database¥Common¥Database¥Template





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🔾 - 🚈 🕨 Computer	Local Disk (C:)	-	Search Local Disk (C:	
Organize New folder			93	•
🌛 Music 🔹 🔺	Name		Date modified	Туре
Pictures (0Workfolder)	12/9/2015 8:41 AM	File folde
Videos	Intel		11/25/2015 7:29 AM	File fold
	PerfLogs		7/14/2009 10:20 AM	File fold
Nomegroup	Program Files		11/27/2015 7:47 PM	File fold
1 A A A A A A A A A A A A A A A A A A A	📙 Program Files (x86)		12/6/2015 9:28 PM	File fold
Computer	📙 Users		11/23/2015 9:19 PM	File fold
Local Disk (C:)	📕 util2		11/25/2015 8:14 AM	File fold
(a) reev voidine (bi) + 4		an		
File <u>n</u> ame: Templa	te_License1			
Save as type: Excel We	orkbook			
Authors: Add an a	uthor	Tags: Add	i a taq	
S []	ave Thumbnail			
 Hide Folders 		Tools	• Open	Cancel

3 🖉 🕈 🚺 🖉 🕹	cal Disk (C:) 🕨 0Workfolder	+ ++	Search OWorkfol	der	4
Organize 🕶 Ne	w folder		_	· =	
 Documents Music Pictures Videos Homegroup 	* Name	No items match you	Date modified ur search,	Туре	
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Local Disk (C:)) +	.W.	Ĩ		
and the second se	License_Construction	m,			
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Local Disk (C:) File <u>n</u> ame: Save as <u>t</u> ype:	License_Construction	''' Tags: Add a ta	j g		_
Local Disk (C:) File <u>n</u> ame: Save as <u>t</u> ype:	License_Construction Excel Workbook		9		_

Database Operational Manual (GDMR)

2-5 Input into the Excel files

Before starting to input, remember some rules in Excel.

2-5-1 Rules for input in Excel files

To use as table data in ArcGIS, some rules in Excel are shown below.

Otherwise ArcGIS cannot show the table data.

ackaging Error.	
The name of the Field is invalid: valid names m or underscores.	nay contain letters, numbers
	ок

Number of header line

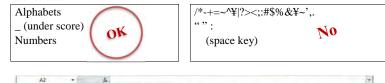
the first line (only 1 row) in Excel sheet.

Column name (Field name)

Number of characters Within 10 characters

Permitted characters

The header line does not accept space and most of symbols. So please use underscore _ with alphabet and numbers.



	14										- 1
_	A	R	Ø	D.	E	E	G	H	T	1	1
,	License_N	ConcessionArea_ha	ConcessionArea_sqkm	Validity	ទីកាំងស្វែងក្រោះជ័	LocationAddress	AgreeD	IssueD	ExpireD	SuspendedD	1
2	H	eader use the	e first line (rov	w) on	ly.						1
3	"	Space" and n	nost symbolic	chara	icters are n	ot allowed	for l	head	er.		
4	В	ut "undersco	re" is usable.								
5	С	olumn name	(field name) s	hould	l be within	10 charac	ters.				

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Data type of a column (except a header row of Excel sheet)

In this database which is based on ArcGIS, 3 kinds of data type are used. When table data are brought into ArcGIS, data types of Excel are assigned into 3 categories.

(1) Text (254 characters of text)

(2) Double

(3) Date

Excel		
- General		
- Text	>	
- Number		
- General (if number data only)	>	
- Date	>	

	ArcGIS
>	Text (254 characters)
>	Double
>	Date

Database Operational Manual (GDMR)

About DATE format

At first check the default setting of your PC, about the order of day (dd), month (MM), year (yyyy). ArcGIS follows your PC setting, regarding the order of dd/MM/yyyy.

Open control panel, then select "locale and language"



X Megion and Language Formats Location Keyboards and Languages Administrative Format: English (United Kingdom) • Date and time formats dd/MM/yyyy Short date: dd/MM/ Long date: dd/MM/yy d/M/yy Short time: d.M.yy yyyy-MM-dd Long time: X Megion and Language First What Formats Location Keyboards and Languages Administrative Exam Format: Short English (United Kingdom) • Long Short Date and time formats Long dd/MM/yyyy Short date: dd MMMM yyyy Long date: * Go onli Short time: HH:mm -Long time: HH:mm:ss -First day of week: Monday + What does the notation mean? Examples Short date: 09/12/2015 Long date: 09 December 2015 08:48 Short time: Long time: 08:48:20 Additional settings... Go online to learn about changing languages and regional formats OK Cancel Apply

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How to identify wrong data-type in Excel.

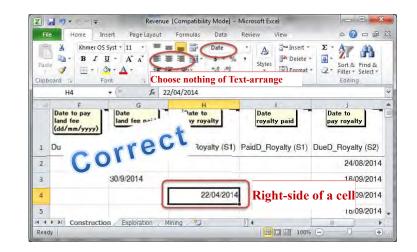
Wrong data-type about DATE (or NUMBER) always appears at left-side of a cell, with no option o indent (text-arrangement).

Another solution to correct to DATE format is;

(1) Once save as CSV file.

(2) Open the CSV file on Excel (Just drag it into Excel window)

(3) Excel automatically identify as DATE.



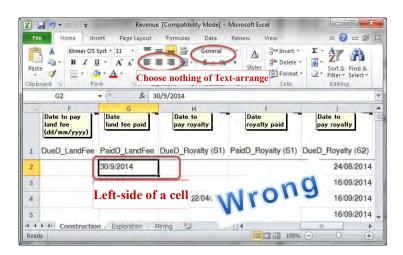
- 0 × 🔀 🚽 🤊 • 🖙 Revenue [Compatibility Mc 🔏 Cut a 🕜 🗆 🖶 🖾 File DI LA SOPY Home Insert. PageLayout Formulas Dat Paste Options: -100 X Khmer OS Syst + 11 -7 8 ŝ 新 田 田 田・ \$ ila . R II v Sort & Find & Filter * Select * Paste 1 課課 歌… 田• 31. +.0 Paste Special... Clipboard II Font Alignment E Ne Editing Insert... f= 22/04/2014 H4 + (** Delete ... F G H Clear Contents 3 Date to pay Date Date to Date to Filter land fee land fee paid pay royalty pay royalty (dd/mm/yyyy) Sort Insert Comment 1 DueD LandFee PaidD LandFee DueD Royalty eD_Royalty (S2) Format Cells... 2 30/9/2014 24/08/2014 Pick From Drop-down 30/9/2014 16/09/2014 3 Define Name ... 22/04 B Hyperlink... 4 16/09/2014 Right-click on a cell. 5 H + + H Construction Exploration Mining B I 🗟 🌆 - 🛕 - 🖽 - 🐄 🖧 🥑 📃 🔹 Ready (4)

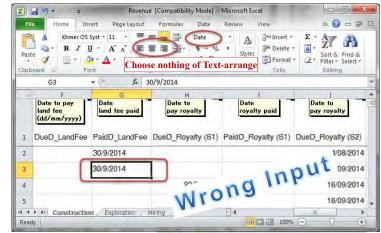
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Number	Alignment	Font	Border	Fill	Protection		
Category:							
General Number Currency		100	le 4/2014				
Accounts Date	-	Type:	_	_			
Time			3/2001	Date	e format (dd/MM/y	yyy)
Percenta Fraction Scientific Text Special Custom		14/03 14/03 14/3/ 14.3.	01				E
		Locale	(location):				
		Englis	h (U.K.)				0
asterisk (*	ats display da *) respond to system. Fo	te and tim	orr	eC	es. Da 9s that by op	te formats th are specified croting syste	at begin with a d for the m settings.

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2-5-2 Input license data

Prepare a license certificate.



Open template file (Template_License.xlt) from "Common" folder ;

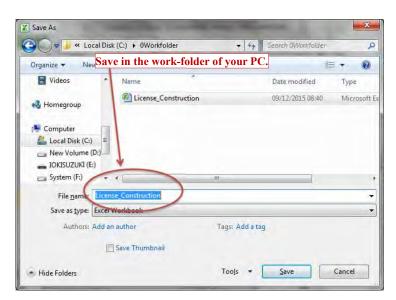
¥Common¥Database¥Template¥ Template_License.xlt

Paste	Calibri + 1 B Z U + Z E + 3 + A Font	A' A' ≣ ≣ ≣				Σ 27* III 2* Editing
A4	*(*	$f_{\rm x}$				
License	В	C	D		E Valid=V, Expire=E	F ទីតាំងស្វែងកេរកជ័
1 License_1	t Issuer	ConcessionArea_ha	ConcessionArea_	sqkm		-មតាធរល្វធរុករការ
	N Issuer MME.DMEM.L	ConcessionArea_ha		sqkm 0.5	Validity	A-town, B-city, C-pa
1 License_1	MME DMEM L			-	Validity V	

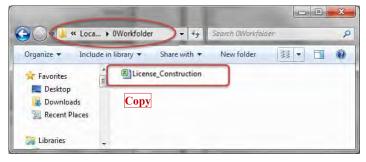
Iput one license data to one row of Excel sheet.

Save in a work-folder of your PC. Give to the filename the department name in suffix.

Database Operational Manual (GDMR)



Upload the file to the database



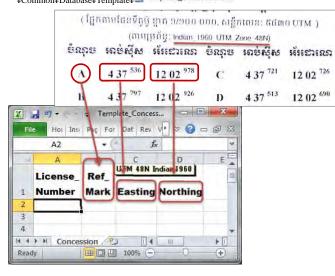


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2-5-3 Input Concession coordinates

Prepare the license certificate. Note the coordinates are based on Indian1960 UTM48N. Open template file (Template_Concession.xlt) from "Common" folder ; ¥Common¥Database¥Template¥ Template_Concession.xlt



👔 🛃 🖅 + 🖙 😓 Example_Conces... - B X Hoi Insi Pag For Dat Rev 🕨 🕫 🕝 📼 🗊 🔀 File G7 * (* fx В C A D UTM 48N Indian 1960 License_ Ref_ 1 Number Mark Easting Northing 493000 License 1 1314940 А в 493100 1314940 License_1 С 493100 1314985 License 1

Database Operational Manual (GDMR)

P.	License_1	D	493400	1314985	
6	License_1	E	493400	1314670	
7	License_1	F	493100	1314670	
8	License_1	G	493100	1314530	
9	License_1	Н	493000	1314530	/
	License_2				
11	License_2	Licens	e 1" give	es	
	License_2	Licens	e_1" give	es	
12	License_2				
12 13	License_2		e_1" give		
12 13 14	License_2 License_2				
12 13 14 15	License_2 License_2 License_2	points	of a con	cession.	
12 13 14 15 16	License_2 License_2 License_2 License_2	<mark>points</mark> F	of a con 494078	cession. 1315187	

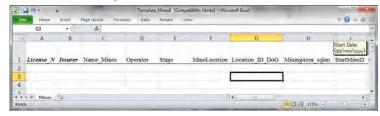
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2-5-4 Input Mines data

Input mines data (operation data).

Open template file (Template_Mines.xlt) from "Common" folder ;

¥Common¥Database¥Template¥ 🗐 Template_Mines.xlt



File	Home	Insert Page Layou	it Formulas	Data Review	View	v 🕜 🗆 🗟	5
	G3	• (* fx	XXXXX				2
J	A	В	C	D	E	F	E
1	License_N	Issurer	Name_Mines	Operator	Stage	MineLocation	100
2	License_1	MME.DMEM.L	A mine	A company	Mining	xxx,Kampot	
3	License_2	MME.DMEM	ne license –	- one row	data ^{ration}	xxx,Kratie	
4	License_3	MME.DMEM	e_mine	e company	suspend	xxx,Preah Vihe	•
5	Liganea 4	MAR DMEMI	D Mine	D company	Close	vvv Dureat	1

Database Operational Manual (GDMR)

2-5-5 Input Revenue data

Input data as below.

	File	lome	Insert	Fage Layout	Formul	at Data	Review.	View			0	000 10 12
	42	+ (***	€ Co	elistruction								
-21	A		B		9	<u>D</u> .	E	E	Date to pay band fee fat/mm/yyer)	H Nin Payment	Oute tand fee paid	Dute to pay mysity
ε.,	License 1D		Company	Name	Lirense N	liner	Department	PayVear	DueD LandFee	LandfeePay	PaidD LandFee	DueD_Royalty (SI)
	100	SHUKAR	KU INC		017 5	119-01-140	Centradies	3012				00.05-201
1	002	SHUKAS	KU INC.		017.5	UH.LAL OH	Contraction	2012				
4	4.00		Plary Co. L		019 1	UR INTER	Mining	2012				
	904	เหน่าที่ส	o Construction ເໜັນຢູ່) st) Template		021 4	UR.IALDI	Mining.	2012				18:04/201

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2-6 Code list and data validation

The code data and available range of number are shown for some fields (column name) in excel files.

2-6-1 Commodity Code (in License_*.xls)

	-	lically code (in Eleci	130
Code		Description	Department
11		Sand for construction	Construction
	111	River sand	
	112	Inland sand mining	
	113	Sea sand mining	
12		Sand for filling materials	
	121	River sand	
	122	Sea sand mining	
13		Gravel	
14		Crushed stone mining	
15		Dimension stone mining	
	151	Sandstone	
	152	Laterite	
	153	Granite	
	154	Stone Calcite	
	155	Diorite	
	156	Andesite	
	157	Marble	
16		Ornamental stone	
	161	Pagodite	
	162	Chalcedony	
17		Soil	
18		Red soil(Laterite)	
21		Metalic material	Exploration/Mining
	211	Iron	
	212	Gold	
	213	Copper	
22		Industrial mineral	
	221	Limestone	
	222	White sand	
23		Gem	Mining
	231	Corundum	
24		Fuel minerals	Exploration/Mining
	241	Coal	
99		ASM	Provincial
	991	Gem	
	992	Gold	
	993	Crush stone	
	994	Gravel	
	995	Sand	
	996	Soil	

2-6-2 Validity (in License_*.xls)

Code	Description
V	License is Valid
E	License is Expired

2-6-3 Stage (in Mines_Mining.xls)

Datalist	Description
Mining	Mining
EIA	Environmental Imapct Assessment
Developing	Under construction before production
Revoke	Stop by government
TemporaryStop	Stop for short time (by seasonal or sales reason)

*Other stage can be added to the Datalist, when needed.

2-6-4 Coordinates values (in Concession_*.xls)

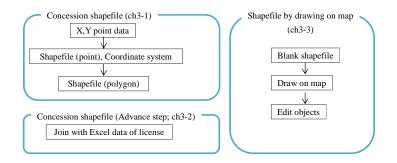
Easting (UTM48N)	Northing (UTM48N)
200,000 (minimum)	1100,000 (minimum)
800,000 (maximum)	1700,000 (maximum)

* Range of value should be located within or around Cambodian land

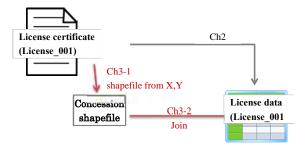
JICA Project

3. Create a shapefile

Chapter 3 shows two methods to create a shapefile.1) For concession polygon shapefile, from X,Y data (ch3-1. ch3-2)2) Direct drawing into a blank shapefile (ch3-3)



As advance step ch3-2, to join Concession polygon with license data, one by one.



D

3-1 Create a Concession shapefile from X,Y data

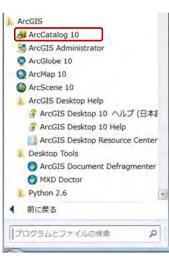
There are 3 steps for concession polygon shapefile.1) To create a Point shapefile from X,Y data.2) To convert coordinate system of the shapefile, to WGS1984 UTM.

3) To convert the feature type of shapefile, from Point to Polygon.

.4	A		В	С	D		C	
				UTM 48N I	ndian1960	å	80	
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4	License_1	1 , 1	point	uata p	1314985			
5	License_1		D	493400	1314985		5	
6	License_1		E	493400	1314670			
7	License_1		F	493100	1314670	H	G	L .
8	License_1		G	493100	1314530	0	0	
9	License_1		н	493000	1314530		C	
10	License_2		A	493707	1315526	A	8	
11	License_2		В	494073	1315518		,	
17	License 2		C	494080	1315342		Poly	an

Point shapefile E B B C Polygon shapefile F F

3-1-1 Create shapefile from X,Y data Start ArcCatalog

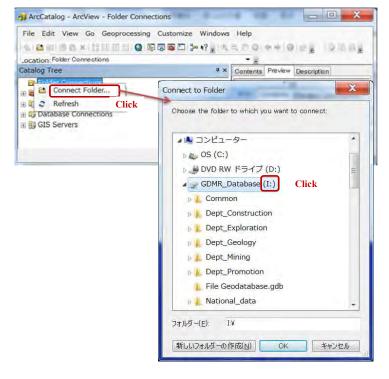


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Connect to Concession.xls

Click "Folder Connections", select "Connect Folder ... ".

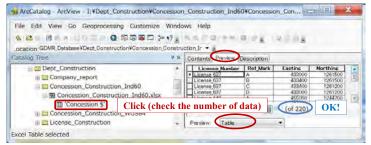


Database Operational Manual (GDMR)

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Database Connections	Dept_Promotion	Folder
E GIS Servers	Cept_Mining	Folder
	EDept_Geology	Folder
	Dept_Exploration	Folder
	Dept_Construction	Folder
	Common	Folder

Find a concession excel sheet, containing the coordinates of concessions.

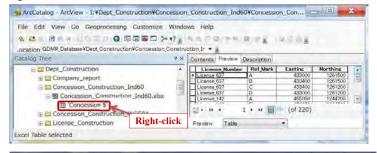
Click the sheet (not the excel file), the coordinates data appear in Preview tab.



If wrong (too many) number of data is shown, close ArcCatalog and open this excel file. Try to delete the blank rows/columns of Excel sheet.

JICA Project

Right-click on the sheet, select "Create Feature Class", "From XY Table ... "



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Assign coordinates to X,Y of a new shapefile



Give coordinate system of Indian1960 UTM

Give the coordinate system of X,Y data from license certificate.

It is based on "Indian1960 UTM 48N". So later we need to convert to WGS1984 UTM 48N, as instructed in chapter 3-1-2.

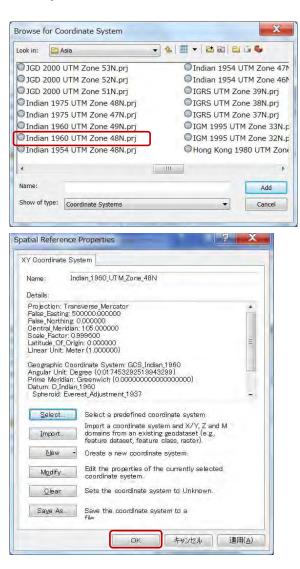
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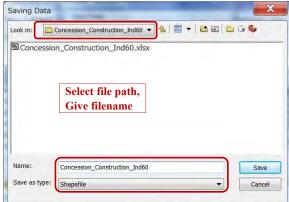


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Give filename and output folder to new shapefile

Output filename shall include also the name of applied coordinate system such as Ind60. The location of output shall be the same folder as an original excel file. Click "Coordinate System of Input Coordinates…", button





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Database Operational Manual (GDMR)

Click "OK". Shortly a shapefile will be created.

Preview the new created shapefile

Right-click on the folder, select "Refresh", then the created file appear.



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JICA Project

Database	Operational	Manual ((GDMR)	

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3-1-2 Convert coordinate system

Using a "Project" tool from ArcToolbox, convert coordinate system from Indian1960 UTM to WGS1984 UTM.

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ArcToolbox - ----× MarcToolbox 3D Analyst Tools Analysis Tools Cartography Tools Sconversion Tools Solution Data Interoperability Tools Data Management Tools 🗄 🗞 Data Comparison 🗄 🗞 Database 🗄 🗞 Domains 🗄 🗞 Feature Class + S Features 🗄 🗞 Fields 🗄 🗞 File Geodatabase 🗄 🗞 General 🗄 🗞 Generalization 🕀 🗞 Graph 🗄 🗞 Indexes 🗄 🗞 Joins E Stayers and Table Views 🕂 🗞 Package Sections and Transformations Feature S Batch Project **Double-click** 🗄 🗞 Raster Convert Coordinate Notation K Create Custom Geographic Transformation K Create Spatial Reference Raster Project _ 🗆 🗙 Input Dataset or Feature Class Input Dataset or Feature Class Click The feature class, feature layer, or feature dataset to be projected. Input Coordinate System (optional) 13

JICA Project

Database Operational Manual (GDMR)

Output Dataset or Feature Class

Output Coordinate System

6

OK Cancel Environments... << Hide Help

- (2)

Tool Help

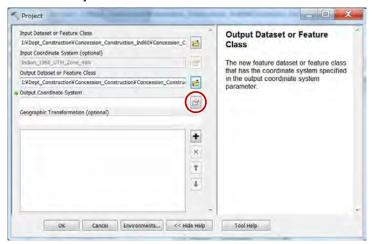
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nput Dataset or Feature Class	X
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Output Dataset or Feature Class	re dataset to be projected.
Output Coordinate System	-
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Name: Concession_Construction_Polygon_WGS84.shp	Save
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JICA Project

Give coordinate system of WGS1984 UTM

Database Operational Manual (GDMR)

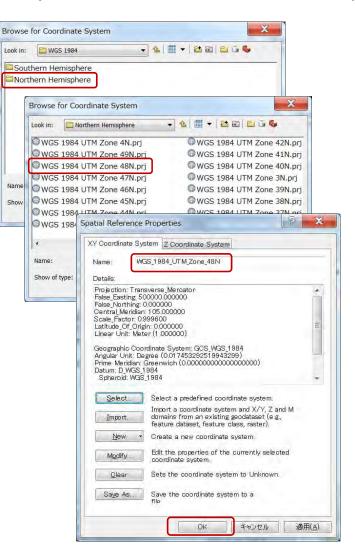


JICA Project

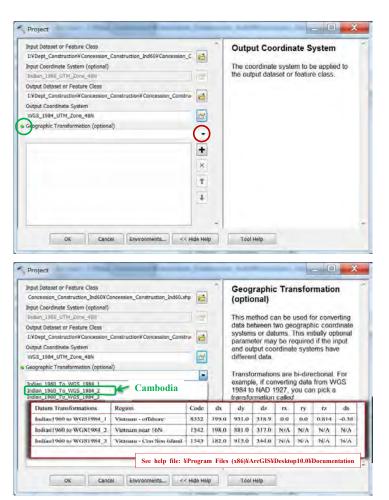
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Database Operational Manual (GDMR)

JICA Project

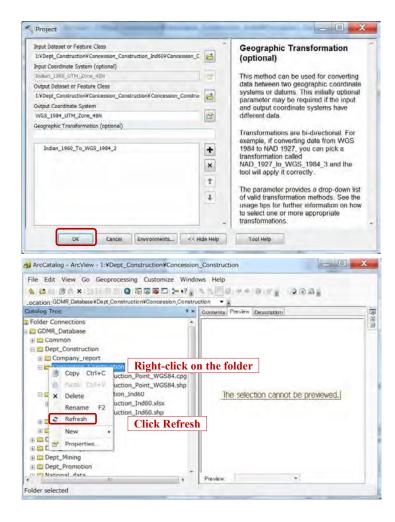


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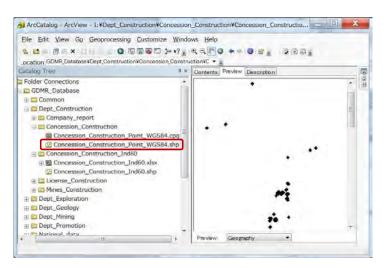


Database Operational Manual (GDMR)

JICA Project

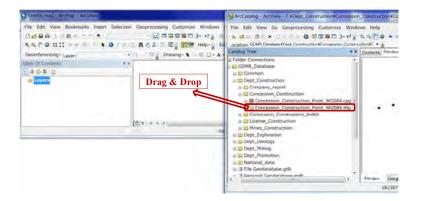


JICA Project



3-1-3 Convert a shapefile from point to polygon

Add a point shapefile into ArcMap



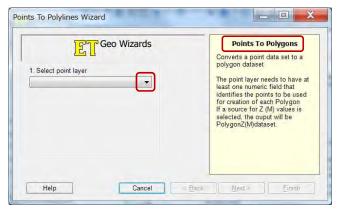
Q Untitle.mxd - ArcMap - ArcView - O X **Right-click** Eile Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help 3D Analyst 역 역 🕐 🕒 🖽 🖗 + 🔍 🖌 🔕 🖉 🕮 🐇 🖉 🖉 🖉 🚰 🕅 Help- 🔒 Editor Advanced Editing Georeferencing - Laver: - - - - - - Drawing- + - - A - 10 Animation Table Of Conten ArcScan 0.04.0 . . 0000 a Layers 88 Data Driven Pages Data Frame Tools Distributed Geodatabase . 4 Draw 10 a a a a 43397. Edit Vertices Editor Effects Start ETGeoWizards Feature Cache Feature Construction Right-click on ArcMap menu-bar (any space), GPS to show dropdown list. Geocoding Geodatabase History Check "ET GeoWizards" from the dropdown list, Geometric Network Editing then "ETGW" toolbar appears. Georeferencing **Geostatistical Analyst** Graphics Click the button "ETGW". Image Classification then the wizard start as follows; Labeling Layout Map Service Publishing Network Analyst Parcel Editor Publisher Raster Painting Representation Route Editing Schematic Schematic Editor Schematic Network Analyst

JICA Project

Database Operational Manual (GDMR)

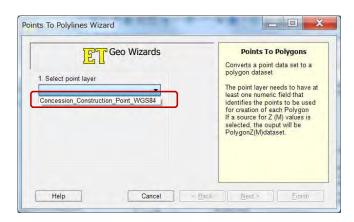
JICA Project Database Operational Manual (GDMR) X GeoWizards E Geo Wizards Point To Polygon Go to ToolBox Implementation Go to .NET Implement Point Converts a point data set to a polygon feature class. Attaches to the polygon Polyline attribute table the values of the attributes for the first and last point that form a single polygon Polygon Convert Inputs: 1 . Polygon to Polyline Polygon to Point 1 A point feature layer Polyline to Point 1 O REQUIRED: an ID field which value defines the points to be used for creation of each polygon Polyline to Polygon O OPTIONAL: an Order field that defines in what sequence the Polyline To Multipoint points describe the polygon. If no Order field is used the order is defined by the record number of the points Point to Polyline O OPTIONAL: a Link field. The values for the first and last point Point to Polygon Click that will form a single polygon will be added to the polygon Point to Multipoin attribute table. OPTIONAL: Z Value field. If specified a PolygonZ feature class will be created. The values in this field will be set as Z -----Overlay values for the vertices. If the input points have Z values, the Spatial Releations and Allocation user can specify the Z values of the input points to ve used by selecting "Features" for Z Value field. Sampling O OPTIONAL: M Value field. If specified a PolygonM feature Fields class will be created. The values in this field will be set as M values for the vertices. If the input points have M values, the Import/Export user can specify the M values of the input points to ve used by selecting "Features" for M Value field. Miscellaneous Basic Outputs: Surface - -------Linear Referencing Click Go Help « View Log Settings Request key Register About

Choose "Point to Polygon", then click "Go".



Database Operational Manual (GDMR)

JICA Project



Select point layer Concession_Construction_Point_WGS Specify output feature class or shanef	Points To Polygons Converts a point data set to a polygon dataset The point layer needs to have at least one numeric field that identifies the points to be used for creation of each Polygon If a source for Z (M) values is selected, the ouput will be PolygonZ(M)dataset.
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Database	Operational	l Manual	(GDMR))

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Database Operational Manual (GDMR)

JICA Project

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Points To Polygons Converts a point data set to a polygon dataset The point layer needs to have at
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is To Polylines Wizard	Points To Polygons Converts a point data set to a polygon dataset The point layer needs to have at least one numeric field that identifies the points to be used for creation of each Polygon If a source for Z (M) values is

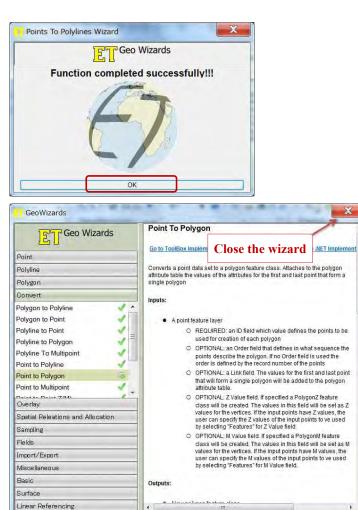
Click "Finish", polygon shape is created in the output folder, then automatically added to layers.

Go

Help «

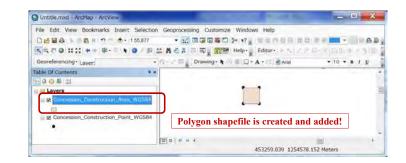
JICA Project

Register About

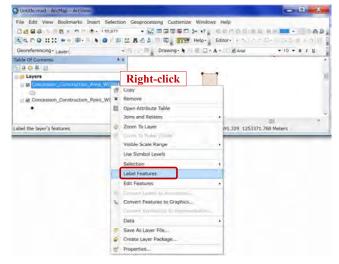


Database Operational Manual (GDMR)

JICA Project



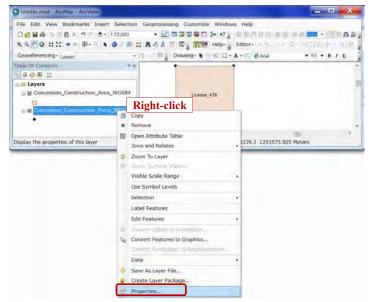
Show labels of concessions



View Log Settings Request key

JICA Project





Database Operational Manual (GDMR)



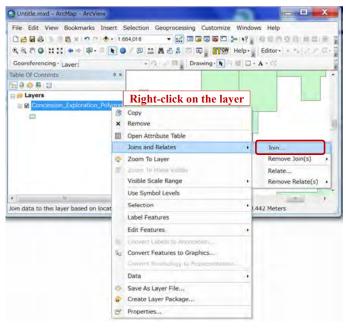


Database Operational Manual (GDMR)

3-2 Advance step to complete a concession shapefile

Join concession polygon shapefile with license data by license number.

3-2-1 Join with the license data of Excel file by license number



Database Operational Manual (GDMR)

or example, symbolize the lay	data to this layer's attribute table so you can, er's features using this data.	
Vhat do you want to join to thi	is layer?	
Join attributes from a table		
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3. Choose the field in the ta	able to base the join on:	
	-	5
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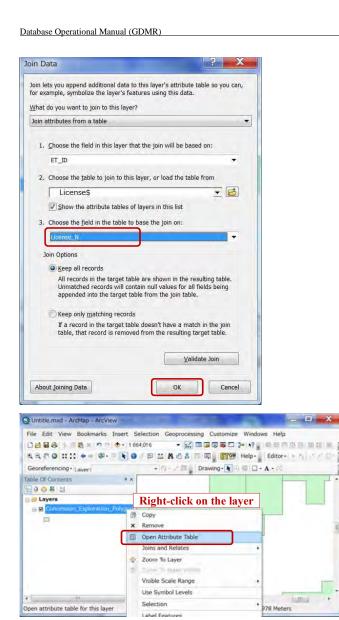
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Database Operational Manual (GDMR)

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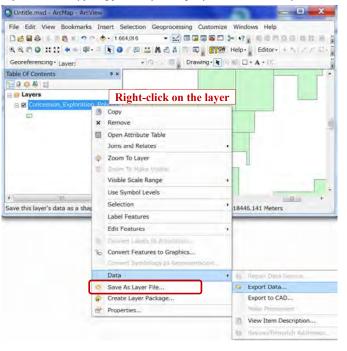
Database Operational Manual (GDMR)

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3-2-2 Save the joined result as a layer file

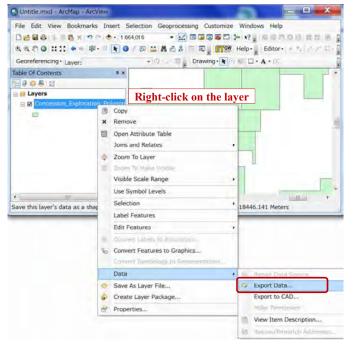
The layer which has joined data can save as a layer file. In this case the original shapefile has still no joined data. Only joining path and layer setting only shall be saved into a layer file.



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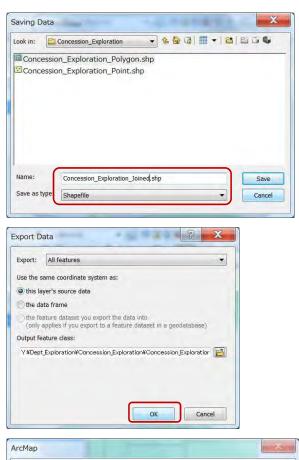
3-2-3 Save the joined result as another shapefile

Joined data can stored into a new shapefile. But note it may lose the part of data of Khmer Unicode character, which depends on the default setting of operating PC.



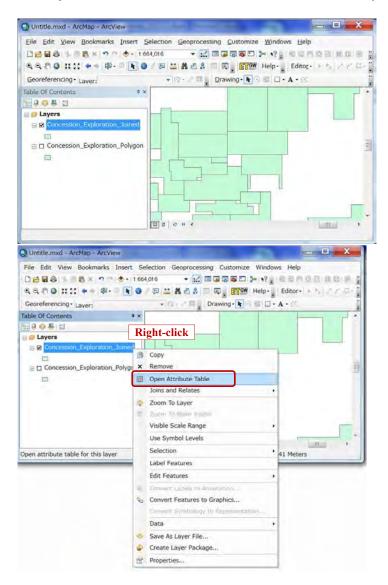
Database Operational Manual (GDMR)

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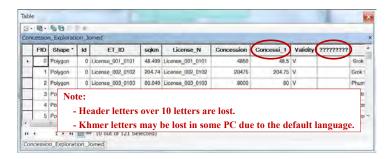


ArcMap Do you want to add the exported data to the map as a layer? (はい(Y) いいえ(凶)





Database Operational Manual (GDMR)



3-3 Create a blank shapefile and draw on map

How to draw object and edit in ArcMap, is instructed. At first add layer of a shapefile to draw in. If you want to draw POLYLINE objects, add a POLYLINE shapefile to layer. For POLYGON objects, add a POLYGON shapefile. For POINT object, add a POINT shapefile.

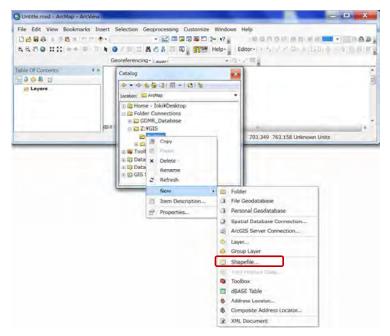
3-3-1 Create a blank shapefile

Start ArcMap and connect the folder.



Right-click on the folder of path of a new shapefile, from Folder Connections (See ch___)

Database	Operational	Manual ((GDMR)	



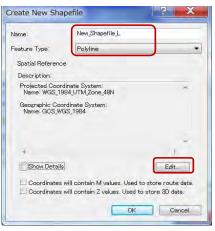
Select from the pulldown list, click "New", "Shapefile ... ".

lame:	New Shapefile	
Feature Type:	Point	
Spatial Reference		
Description:		
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Database Operational Manual (GDMR)

JICA Project

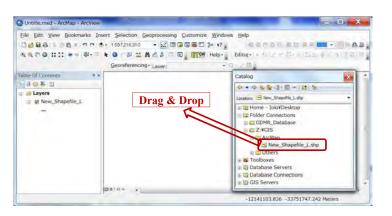
Give filename. Choose feature type (For example; Polyline).



Select special reference (such as WGS1984 UTM 48N) by click "Edit" button. Click OK, then shortly a new shapefile is created in Catalog window.

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🖃 🔁 ArcMap	
Mew_Shapefile_L.shp	
🗄 🛅 Others	
🗄 📷 Toolboxes	
🗄 🗊 Database Servers	
🗄 🛱 Database Connections	
🗄 🗊 GIS Servers	

At the same time the created shapefile is uploaded on ArcMap Layers window. If not, drag the shapefile of Catalog window to ArcMap window.



JICA Project

3-3-2 Draw new objects

Start editing

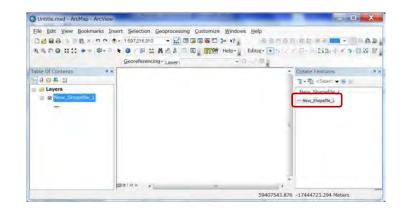
Right-click on the layer.

Select "Edit Features", "Start Editing".

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Database Operational Manual (GDMR)

JICA Project

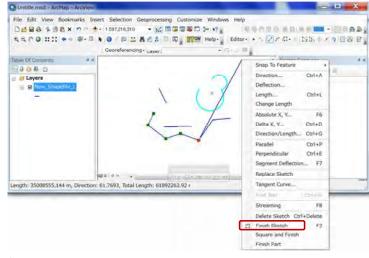


Draw objects

Click the line appearing in "Create Feature" window.

Draw a polyline.

Finish a drawing by right-click to select "Finish Sketch" from the pulldown list.



Save and stop editing

Click"Editor" in toolbar, select "Save Edits", then select "Stop Editing".

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JICA Project

For Editor tool to appear, right-click any free space for toolbar, then check ON "Editor".



3-3-3 Edit objects Start editing Right-click on the layer. Select "Edit Features", "Start Editing".

Database Operational Manual (GDMR)

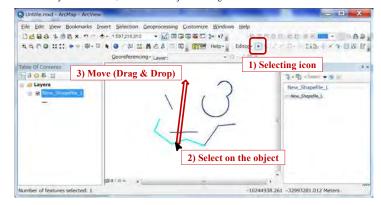
JICA Project

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Edit objects

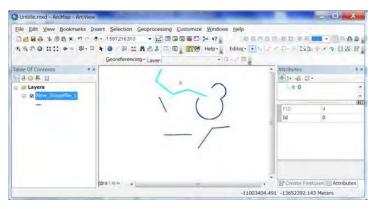
Select the arrow mark in Editor toolbar.

Click the object to be edited, then color of object is changed to the defined color of selection.



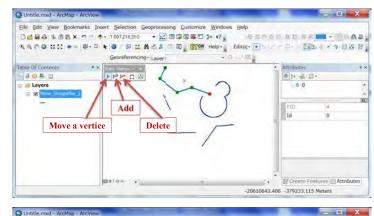
91

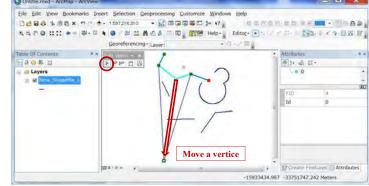
JICA Project





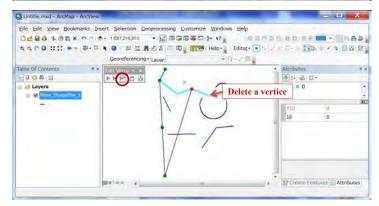
Database Operational Manual (GDMR)





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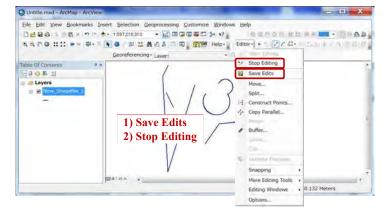
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Database Operational Manual (GDMR)

Save and stop editing

Click"Editor" in toolbar, select "Save Edits", then select "Stop Editing".



Database	Operational	Manual	(GDMR))

4. Using existing data

Chapter 4 treats how to use other file-types, some of which may have different coordinate system or no spatial information. Raster images can be added to a map by georeference.

Example of existing data of other file-type

Kind of data	File type	Example	Conversion software
Vector data	DXF file	Transport data	ArcCatalog
		(Road, port,)	
	KML/KMZ file	GoogleEarth data	ArcToolbox
	GPX file	GPS data	BaseCamp
Raster data	JPG file	Scanned map	ArcMap
	PDF file		(georeference)
	TIFF file		

Note: ArcCatalog cannot show some file-types, such as KML/KMZ file, GPX file.

4-1 Vector data

Examples of vector file type are shapefile, DXF file, KML file and so on. These can be converted to shapefiles. Some files may have different coordinate systems, or no spatial information. We need to convert to or give the coordinate system based on WGS1984 datum.

4-1-1 Check the coordinate system of vector data

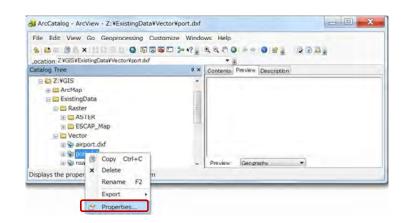
Spatial data of this database are designed based on WGS1984 UTM48N coordination system. So you have to check whether that is WGS1984 datum or not. If not, you have to convert the coordinate system.

Open ArcCatalog

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Right-click on "Folder Connections", to connect folders.

Database Operational Manual (GDMR)



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	from an existin class, raster). Create a new	coordinate system.	
Import	from an existin class, raster). Create a new		

4-1-2 Convert coordinate system of vector data

Use "Project" tools of ArcToolbox (See Chapter 3-1-8).

4-1-3 Convert DXF file to shapefile

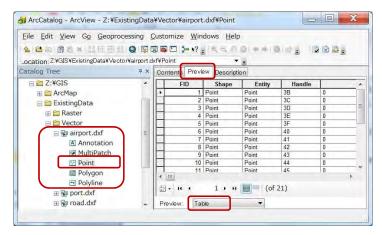
airport.dxf	Make sure the coordination system applied in DXF file.
port.dxf	These objects (road, airport,) in DSF files are drawn on Indian1954
k road.dxf	UTM48N system.



Open ArcCatalog.

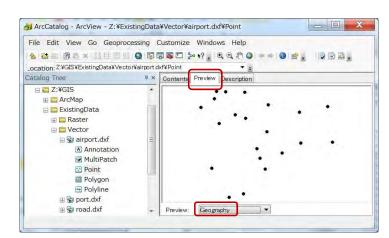
Click the DXF file, which shows a set of several feature types. Select one type of feature to be converted to a shapefile. Give original coordinate system where object is drawn in DXF. Database Operational Manual (GDMR)

Right-click on the selected feature. From the pulldown menu, select property to give coordinate system. Right-click on the selected feature again. From the pulldown menu, select Export to create a shapefile. **Convert point objects of DXF file in ArcCatalog**



In Catalog Tree window, find the DXF file. Click each segment inside the DXF file. Click Preview tab, and choose "Geography" at the bottom.

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See the content of data, then right-click on the segment "Point" of airport.DXF Right-click on "Point" segment.

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Select "Export", "To Shapefile(single) ... "

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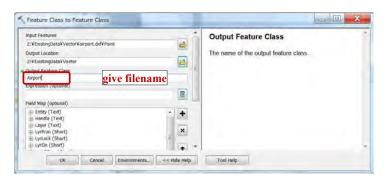
JICA Project



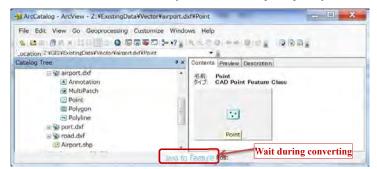
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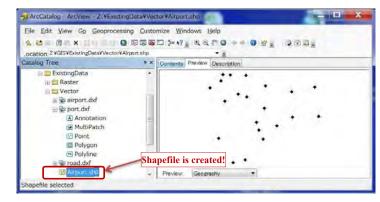


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Click "OK", then it start to create the new shapefile (Wait until creating message dissapear).





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Polygon Right-click

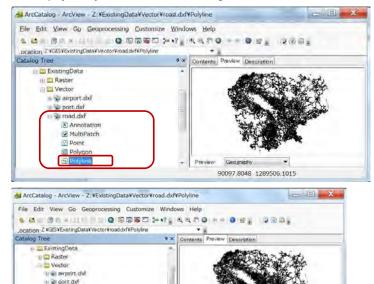
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Convert polyline objects of DXF file in ArcCatalog



- Preview Geography

To Geodatabase (single)...

To Geodatabase (multiple)...

To Shapefile (single)

To Shapefile (multiple) ...

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Right-click on the folder of new files, then select "Refresh" for new files to appear,

Give the coordinate system to new shapefile.

Right-click on new file "Airport.shp".

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JICA Project

4-1-4 Convert KML/KMZ file to shapefile

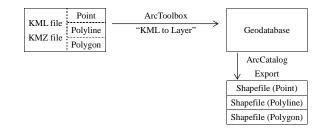
KMZ is a compressed file containing KML file. You can create KML file anytime from KMZ file.

KMZ file	Unzip	KML file

If you do not have any unzip software, free download from 7z website ;

www.7-zip.org/download.html





Start ArcMap or ArcCatalog Open ArcToolbox

Database Operational Manual (GDMR)

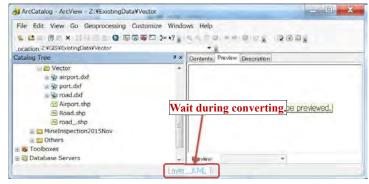
ArcToolbox × 📷 ArcToolbox . 3D Analyst Tools Analysis Tools Cartography Tools Conversion Tools From KML KML To Layer From Raster + S From WFS 🗄 🗞 Metadata To CAD 🗄 🗞 To Collada 🗄 🗞 To Coverage To dBASE 🗄 🗞 To Geodatabase 🖻 🗞 To KML - Layer To KML Map To KML 🗄 🗞 To Raster To Shapefile Data Interoperability Tools

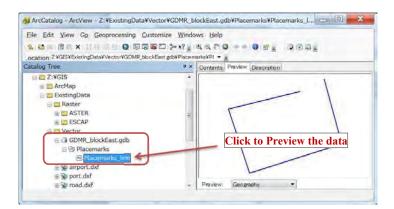
Double-click "KML To Layer", in Conversion Tools

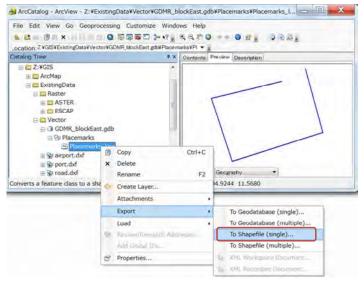


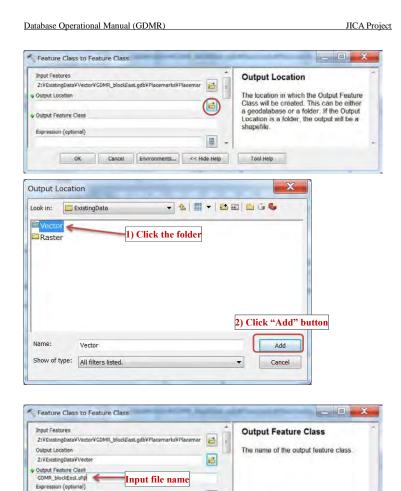
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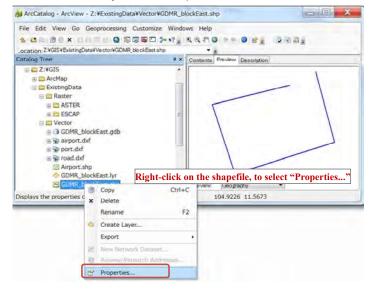




JICA Project



Check the coordinate system of new shapefile.



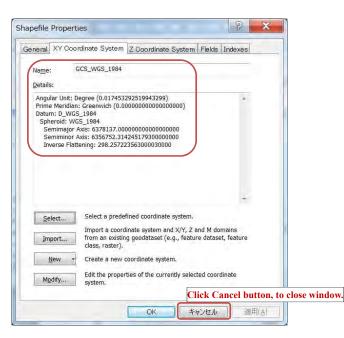
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Tool Help

Cancel Environments... << Hide Help

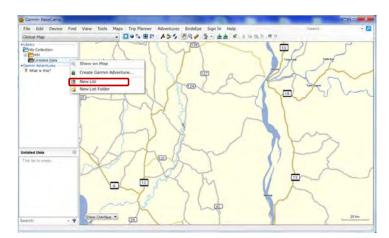
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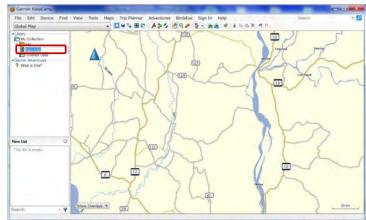




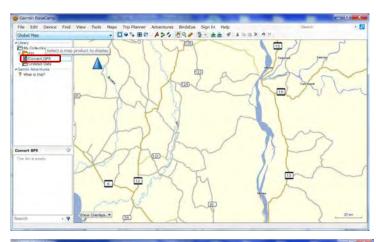
4-1-5 Convert GPX file to shapefile Convert GPX file to KML file in BaseCamp Start BaseCamp software

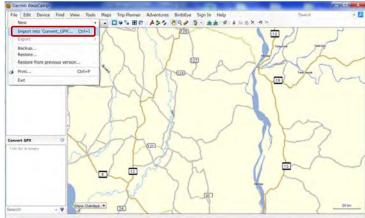
Database Operational Manual (GDMR)



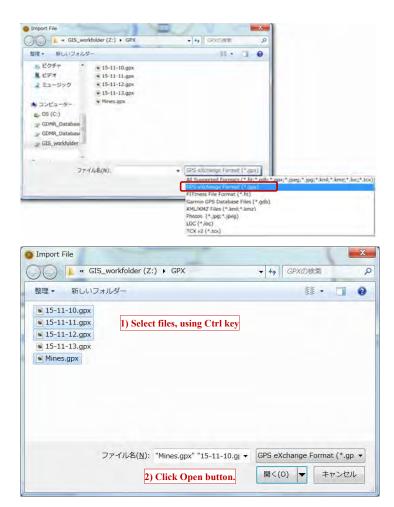


JICA Project

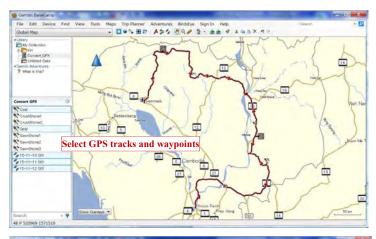




Database Operational Manual (GDMR)



JICA Project





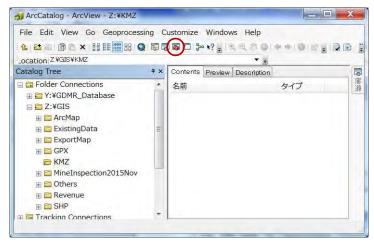
Database Operational Manual (GDMR)

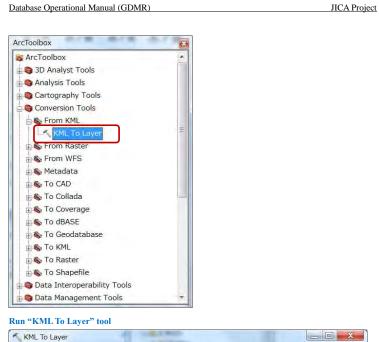
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JICA Project

Convert KML file to geodatabase by ArcToolbox

Start ArcCatalog, and open ArcToolbox







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Database Operational Manual (GDMR)

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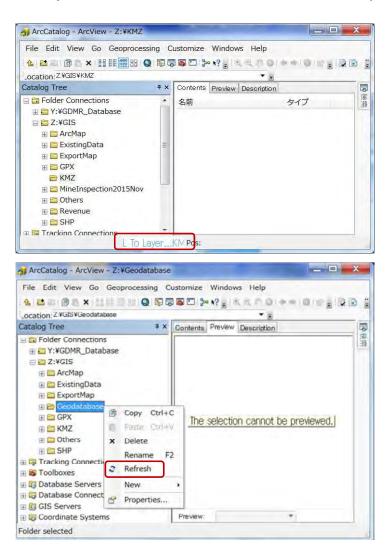
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JICA Project

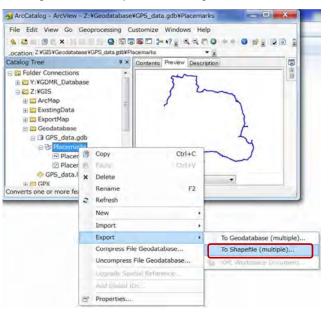
Database Operational Manual (GDMR)

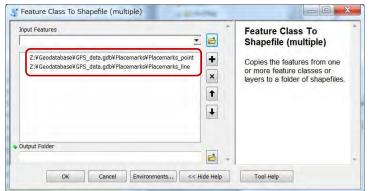
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Database Operational Manual (GDMR)

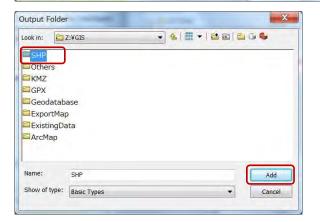
Convert geodatabase to shapefile in ArcCatalog





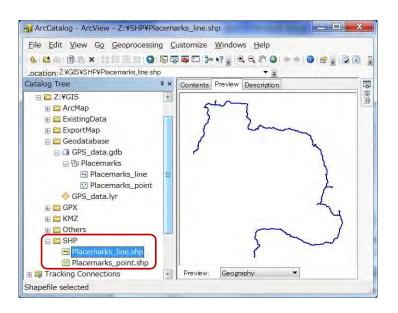
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4-2 Raster image data

Except GeoTIFF file, raster images have no coordinate system in most case. One example is scanned map. How to make GeoTIFF file of spatial information from raster images such as a scanned map

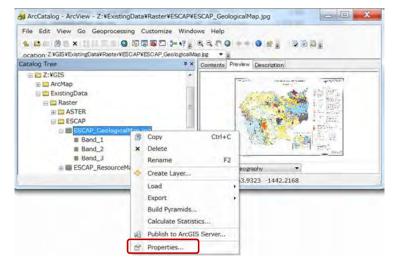
4-2-1 Check the coordinate system of raster data

ESCAP_GeologicalMap.jpg

Database Operational Manual (GDMR)







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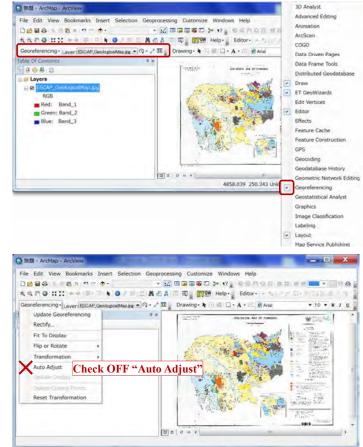
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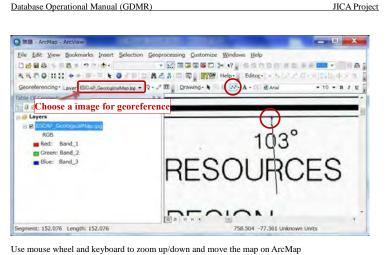
4-2-2 Georeference Setting Georeferencing Toolbar



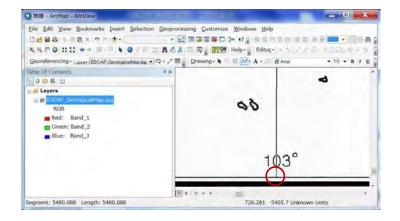
Georeference based on X,Y value Draw grid for control points If the map has no grid, it is better to draw temporary grid for accurate control points.

130

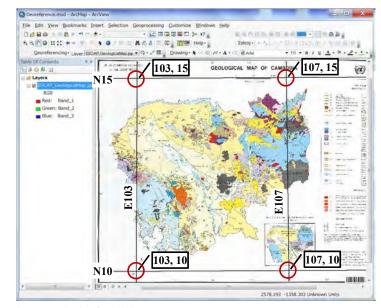
129







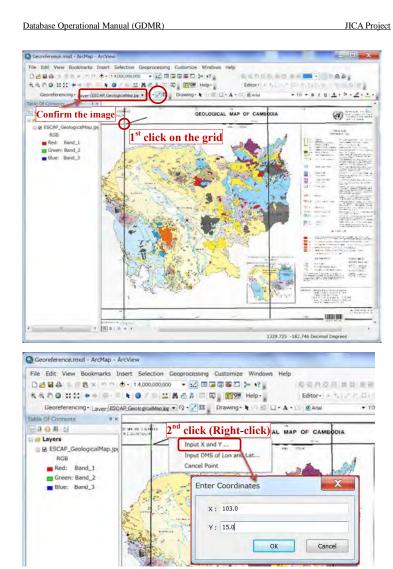
JICA Project



Input control points from X,Y

- 1st click : select control point

- 2nd click : input X,Y



Save as GeoTIFF file

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JICA Project

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JICA Project

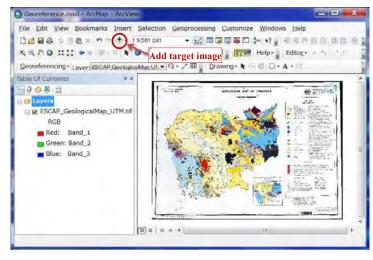
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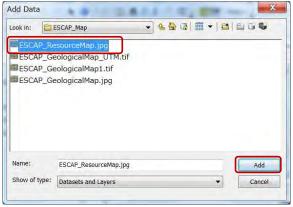
Database Operational Manual (GDMR)

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JICA Project

Georeference based on other layer objects

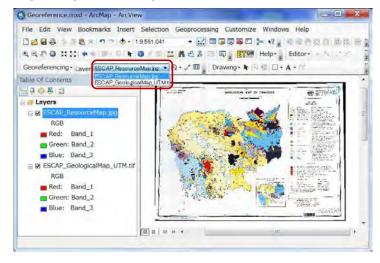


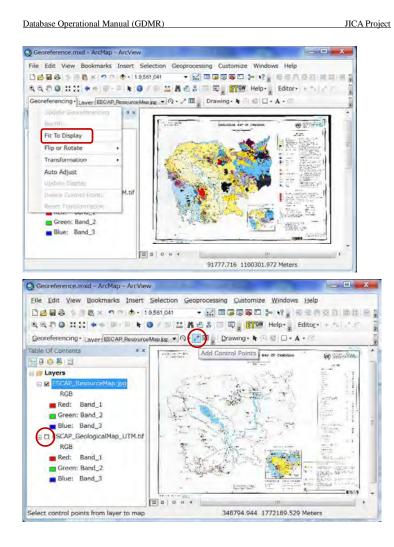


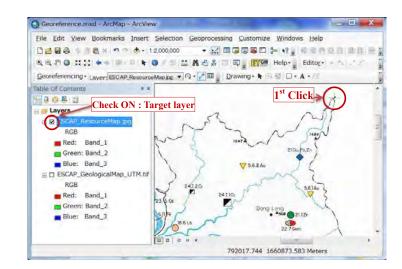
Database Operational Manual (GDMR)

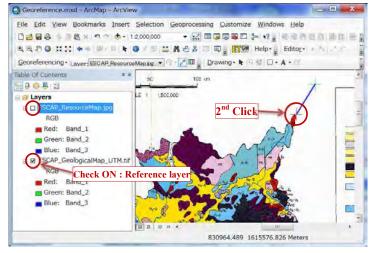
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Assign Control points from other object



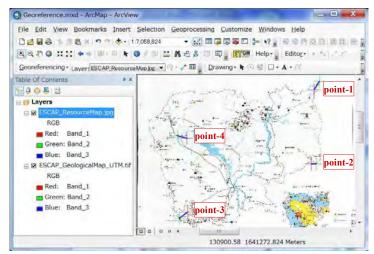






JICA Project

Continue to give at least 4 control points.



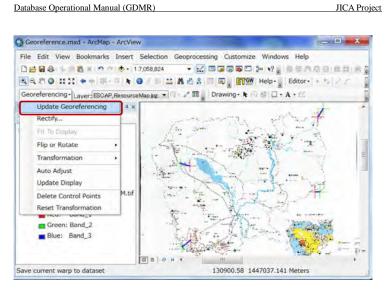
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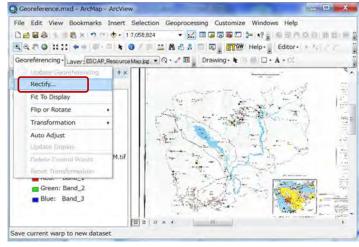
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JICA Project

Database Operational Manual (GDMR)



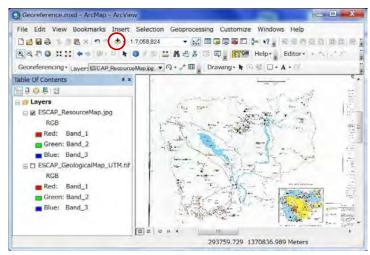
Save as GeoTIFF file



Database Operational Manual (GDMR)

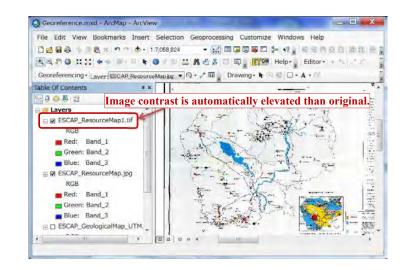
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Add created GeoTIFF file to ArcMap



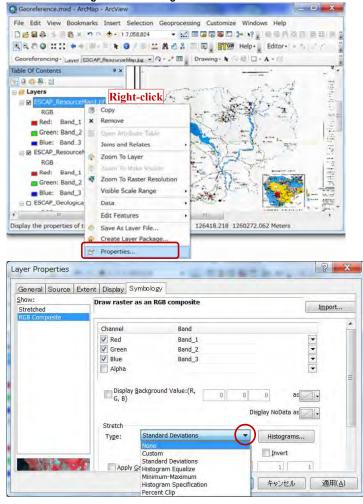
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Database Operational Manual (GDMR)

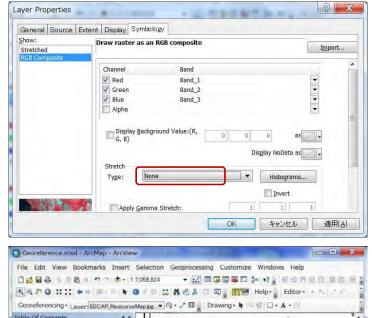


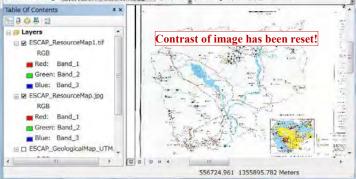
JICA Project

4-2-3 Reset of image contrast after georeference



Database Operational Manual (GDMR)

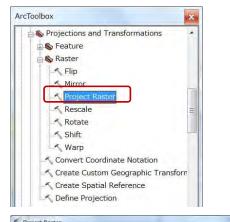




JICA Project

4-2-4 Convert coordinate system of raster data

Use "Project Raster" tools of ArcToolbox.

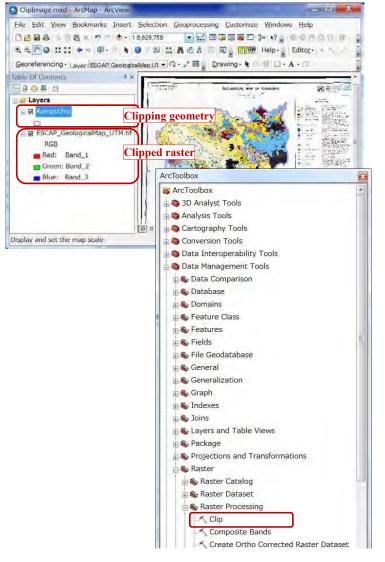


Input Raster	Resampling Techinque (optional)
ESCAP_GeologicalMap1.tif	
Input Coordinate System (optional)	The resampling algorithm to be used. The default is
IGC5_W05_1484	NEAREST.
Output Raster Dataset	
Z/VExistingDataVRasterVESCAPVESCAP_GeologicalMap_UTM.tif	 NEAREST—Nearest neighbor assignment.
Output Coordinate System	BILINEAR—Bilinear Interpolation
	CUBIC—Cubic convolution
Geographic Transformation (optional)	 MAJORITY—Majority resampling
	 categorical data, such as a land use classification. Th NEAREST option is the default ince it is the quickest and also because it will not change the cell values. Do not use NEAREST or MAJORITY for continuous data, such as elevation surfaces. The BILINEAR option and the CUBIC option are most appropriate for continuous data. It is not recommende that BILINEAR or CUBIC be used with categorical data because the cell values may be attered.
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Output Cell Size (optional)	
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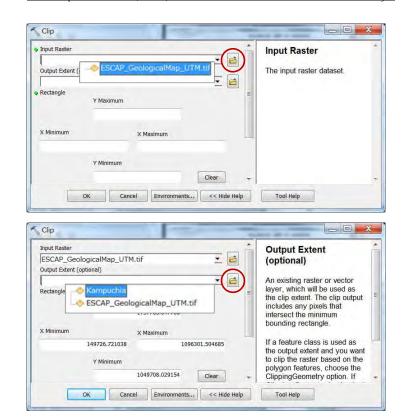
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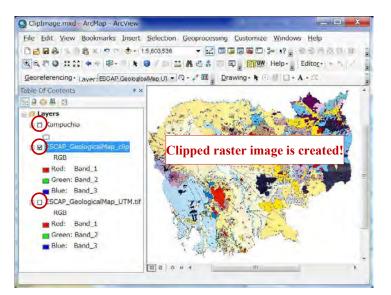
4-2-5 Clip the image by polygon



Database Operational Manual (GDMR)



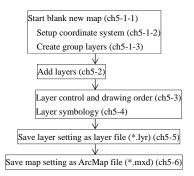
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5. Create a new map in ArcMap

Chapter 5 shows how to create a new map and design it. To start with defining the map coordinate system is recommended. The content is to add spatial data and table data to map layer, to design the layer appearance, and to save these settings as ArcMap file.



5-1 Setup a new map frame

A layer of different coordinate system shows sometimes wrong location, so not recommended.

5-1-1 Create new ArcMap file

If ArcMap has already been running, click "New map file" icon.



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5-1-2 Setup coordinate system of map



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5-1-3 Create Group layer

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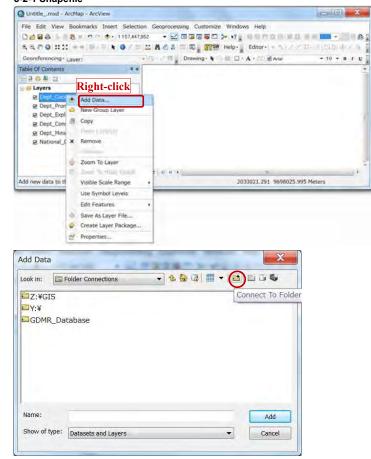


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Database Operational Manual (GDMR)

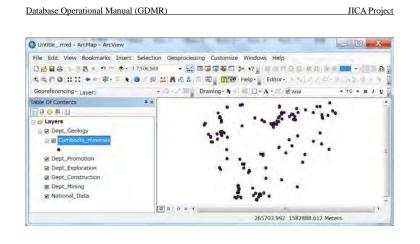
5-2 Add layers of spatial data 5-2-1 Shapefile



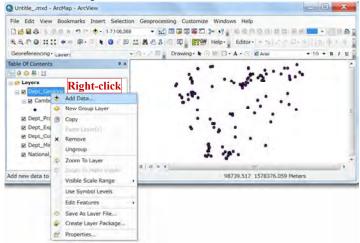
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5-2-2 GeoTIFF image file



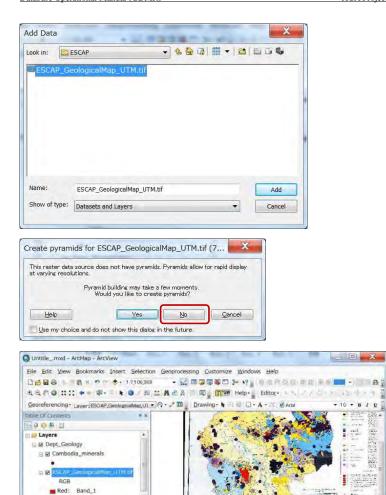
Database Operational Manual (GDMR)

Green: Band_2

Blue: Band_3

Dept_Promotion

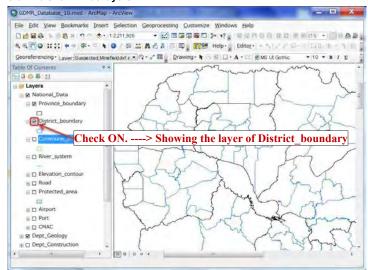
JICA Project



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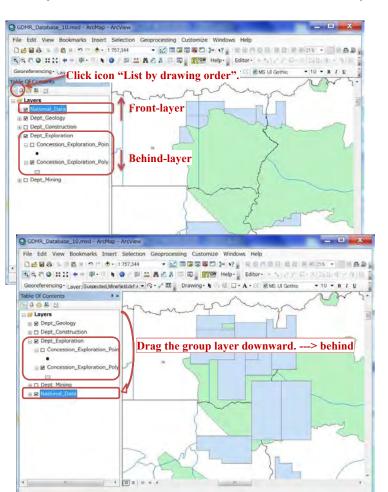
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5-3 Layer control 5-3-1 To show / hide layers



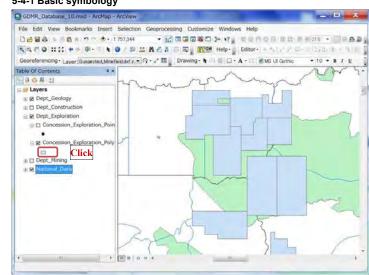
5-3-2 Drawing order

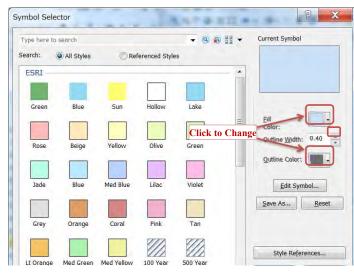
Click the icon of "List by drawing order", for arranging the layer order. Front layer is shown upper in the layer list. Behind layer is shown downward. Point layers are shown automatically at front side, while polygon layers at behind.



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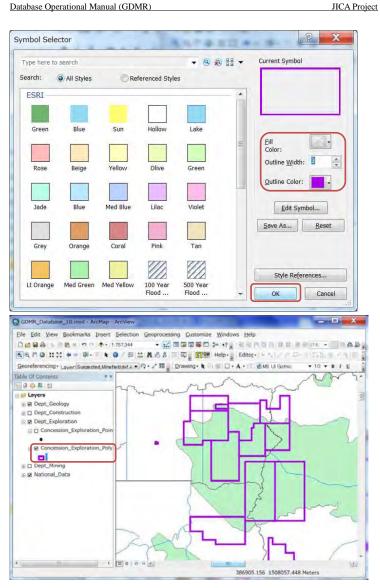
5-4 Symbology of layer 5-4-1 Basic symbology





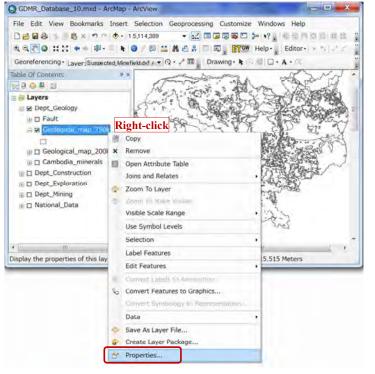


Database Operational Manual (GDMR)



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5-4-2 Advance symbology for geology



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Database Operational Manual (GDMR)

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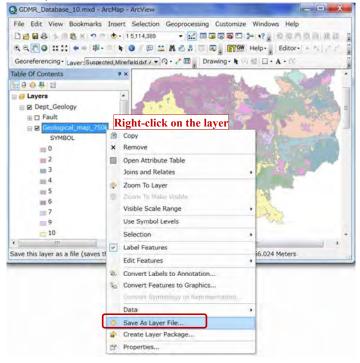
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Database O	perational Manual	(GDMR)	

5-5 Save as layer file (lyr file)

Save the layer setting as a layer file. The setting of either individual layer or a Group layer, can be saved in layer file



X Save Layer - & 🗁 🕼 🗰 - 🔛 🖴 🏜 🍇 Look in: Geological_map_750k Connect To Folder Name: Geological_map_750k.lyr Save Save as type: Layer files (*.lyr) Cancel Catalog × ◆ ▼ ♀ ≙ 🔐 通 ▼ 😫 🐄 Location: Rome - Documents¥GDMR_Database_v2 🖃 📾 Home – Documents¥GDMR_Database_ 🕀 🚍 Common Dept_Construction 🖃 🚞 Dept_Geology 🖃 🛅 Geological_map 🗄 🚞 ESCAP 🕀 🔚 Fault Geological_map_200k_14sheets 🖃 🛅 Geological_map_750k Geological_map_750k.lyr Geological_map_750k.shp 🗄 🚞 Resource_map 🗄 🛅 Dept_Mining

Trouble of missing the path of source file

Since a layer and a layer file stores only layer setting like symbology, NOT its source data. If missing the path of source file, a layer shows nothing. You have to recover to assign the path of source file as follows;

Database Operational Manual (GDMR)

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Database Operational Manual (GDMR)

5-6 Save as ArcMap file (mxd file)

ArcMap file can save the setting of all layers of map and layout setting. It covers the path of data file, but does not cover the data themselves.

5-6-1 Relative path

When saving ArcMap file, relative path is convenient. If moved to different folder location, relative path still keep a connection to the source files.

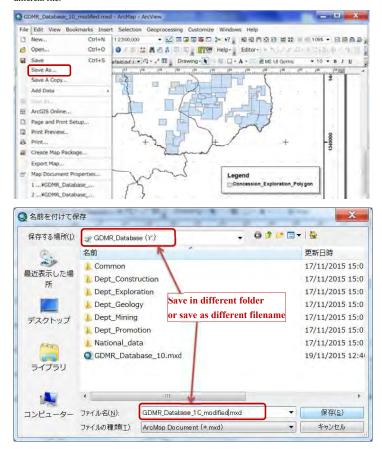
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5-6-2 Save

When choosing Save, the ArcMap file is overwritten.

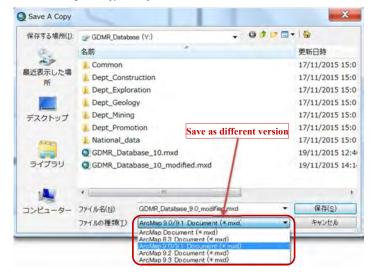
5-6-3 Save as (different filename or in other folder)

When choosing Save As..., the ArcMap file can be saved at different folder location, or saved as different file.



5-6-4 Save copy (as older version)

When choosing Save copy, ArcMap file can be saved as older version.

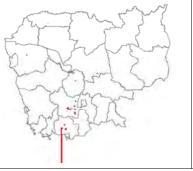


5-7 Troubleshooting

Typical troubles are shown below.

5-7-1 Wrong coordinates value in Excel sheet

Wrong coordinates data in "Concession.xls" lead to wrong polygon. Check the data range of Excel sheet. It may contain unnecessary rows and columns in case.

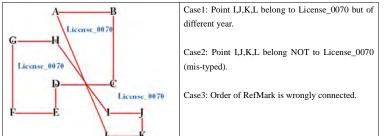


Case1: Wrong coordinates Case2: Blank data of coordinates (meaning zero value)

Case3: Wrong data-range of Concession.xls. Try to delete unnecessary columns and rows of Excel.

5-7-2 Wrong input (License number, order of RefMark)

Location of points is correct, but polygon shows wrong geometry. Check if three cases occur.



5-7-3 Adding layers of different coordinate system without transformation

Not always but some datum conversion requires transformation. In such a case without transformation, shows layers of different coordinate system at wrong location.

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ook in:	Concession_Exploration_Ind60 👻 😤 🖞	0 0 1 1 - 1 2 1	
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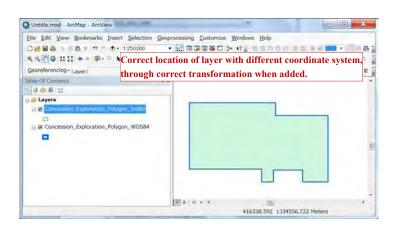
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How to add layers with different coordination

Although not recommended, layers with different coordination can be added, if correct transformations are given as follows.

The following data sources	use a geographic coord	inate system that is different
from the one used by the da		
Data Source	Geograpi	nic Coordinate System
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Alignment and accuracy pro between geographic coordin You can use this button to s transformation(s) used by ti	nate systems. pecify or modify the	there is a correct transformations
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GCS_WGS_1984		Cancel
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Indian_1960_To_WGS_198	4_2	• New

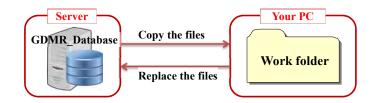
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Database Operational Manual (GDMR)

6. Update data

Chapter 6 shows which data should be updated, who and how to update. To record the log of history when and who updated should be attached.



6-1 Kind of data to be updated 6-1-1 License and concession data

License and concession data in three department (Exploration, Construction materials, Mining) should be updated at anytime to be issued. License stage is summarized below ;

License cycle	Case	Files to be updated
Start new license	New issue,	License_*.xls (Add new data)
	Relinquish concession	Concession_*.xls (Add new data)
		Mines_ Mining.xls
Continue operation	(Operation data)	Mines_Mining.xls
Temporary stop	Surrender	License_*.xls (Add the date and reason)
		Mines_ Mining.xls
End of license	Expire	License_*.xls (Add the date and reason)
	Revoke	Mines_ Mining.xls
	Return	

Issue new license

There are two cases of new license issued.

- New concession
- Relinquish existing consession

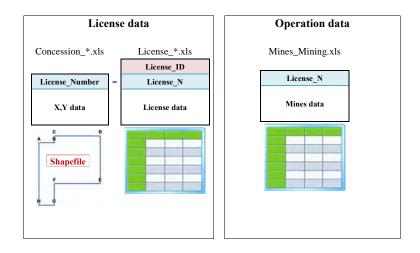
Based on license certificate, add new license number, issuer, date, and other conditions described in certificate (License.xls). It is also necessary to add coordinates data (Concession.xls and shapefiles from it).

Surrender license for a time

License may be surrendered, where operation is stopped temporarily. Input the date and reason in License_*.xls

Expired / Return / Revoke license

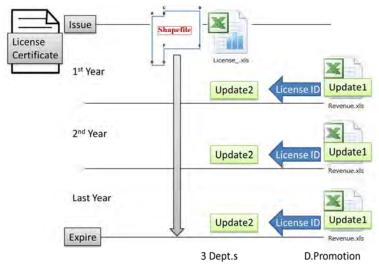
When license is expired according to license certificate, or returned, the payment should be checked by Department of Promotion. Keep these license at least until end of license-year in current database.



Database Operational Manual (GDMR)

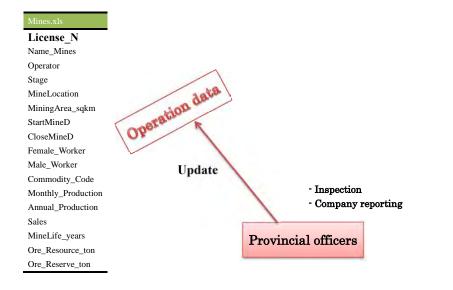
6-1-2 Revenue data

Department of Promotion manages revenue for all licenses of three departments. This data is controlled and updated by department of Promotion. The license number is not unique or different format between departments. So License ID is introduced and assigned by department of Promotion.



6-1-3 Mines data (Operation data)

Basic operation data shall be saved in the file of Mines.xls. These information is in many case provided by local provincial office, or sometimes by site-inspection. For sharing within GDMR, those data should be updated. Using License number, you can view from concession map.

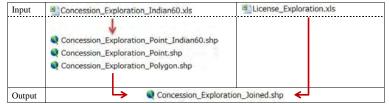


Database Operational Manual (GDMR)

6-2 File list and the responsibility to update 6-2-1 Files in "Dept_Exploration" folder

Officers of Department of Exploration have a responsibility to update under this folder and subfolders. Timing of update shall be decided by Department of Exploration.

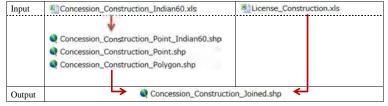
The list of required files to be updated is below.



6-2-2 Files in "Dept_Construction" folder

Officers of Department of Construction materials have a responsibility to update under this folder and subfolders. Timing of update shall be decided by Department of Construction materials.

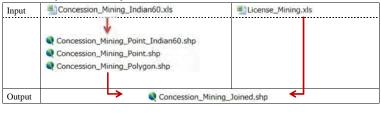
The list of required files to be updated is below.



6-2-3 Files in "Dept_Mining" folder

Officers of Department of Mining have a responsibility to update under this folder and subfolders. Timing of update shall be decided by Department of Mining.

The list of required files to be updated is below.



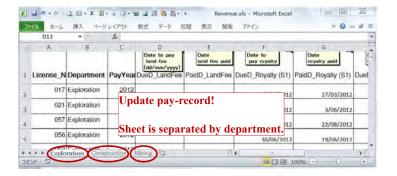
Input/Output Mines_Mining.xls

6-2-4 Files in "Dept_Promotion" folder

Officers of Department of Promotion have a responsibility to update under this folder and subfolders. Timing of update shall be decided by Department of Promotion.

The list of required files to be updated is below.

Input/Output "Exploration" sheet "Construction" sheet		U Revenue.xls
"Construction" sheet	I	"Exploration" sheet
	Input/Output	"Construction" sheet
"Mining" sheet		"Mining" sheet



6-2-5 Files in "Dept_Geology" folder

Officers of Department of geology have a responsibility to update under this folder and subfolders. There are two kinds of geological map in this database.

 Compiled geological map (S=1/750,000) based on ASEAN database including some GIS data from JICA(2010).

2) Local geological map (S=1/200,000), 14sheets.

Timing of update shall be decided by Department of geology. It depends on the progress by ASEAN database project on seamless geology.

6-3 Procedure to update the files

How to setup the file for updating work is shown here. Preparation of work folders in your PC, then start with updating data in Excel files.

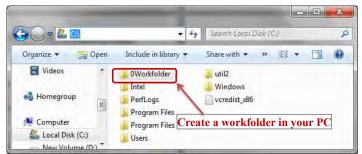


Make whole data kept and retained (Add new data besides existing data), in Excel files. Regarding to updating license data,

- See chapter 2 how to input into Excel file
- See chapter 3 how to create shapefile

6-3-1 Create a work-folder in your PC.

For example; C:¥0Workfolder



6-3-2 Copy the files from database to your PC Copy from Dept_Exploration folder Open the folder of "Dept_Exploration"

Database Operational Manual (GDMR) JICA Project -----_ - X - + De 整理 * » # • 🔲 📀 Company_report Concession_Exploration Concession_Exploration_Indian60 Copy these folders, to your PC. License_Exploration ***** _ O _ X 00 + 4 Conce... P 整理▼ ライブラリに追加・ 書き込む 新しいフォルダー # - 🗌 📀 Concession_Exploration_Indian60.xls Copy the Excel file, to your PC. Concession_Exploration_Indian60_Point_db Concession_Exploration_Indian60_Point.prj Remove shapefiles, Concession_Exploration_Indian60_Point.sbn because re-created from Excel file. Concession_Exploration_Indian60_Point.sbx Concession_Exploration_Indian60_Point.shp Concession_Exploration_Indian60_Pointshx 22222 2 Ge + ++ Licens... P 整理・ ライブラリに追加・ 書き込む 新しいフォルダー ** • 🚺 📀 License_Exploration.xls Copy the Excel file, to your PC.

Database Operational Manual (GDMR)

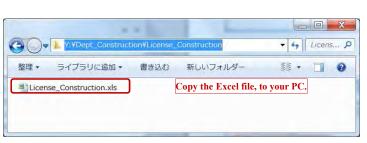
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Copy from Dept_Construction folder



Copy the folders into your PC. Only Excel files are necessary. Shapefile is NOT necessary, because created again from updated Excel files.

Image: With the second secon	Conce P
 整理・ ライブラリに追加・ 書き込む 新しいフォルダー 継 Concession_Construction_Indian60.xlsx Concession_Construction_Point_Indian60.cPG Concession_Construction_Point_Indian60.sbn Concession_Construction_Point_Indian60.sbn Concession_Construction_Point_Indian60.sbn Concession_Construction_Point_Indian60.sbn Concession_Construction_Point_Indian60.sbn Concession_Construction_Point_Indian60.sbn Concession_Construction_Point_Indian60.sbn Concession_Construction_Point_Indian60.sbn Concession_Construction_Point_Indian60.sbn Concession_Construction_Polygon_Indian60.cPG Concession_Construction_Polygon_Indian60.dbf Concession_Construction_Polygon_Indian60.prj Concession_Construction_Polygon_Indian60.shp 	your PC.

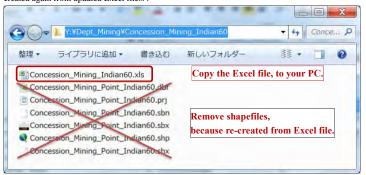


JICA Project

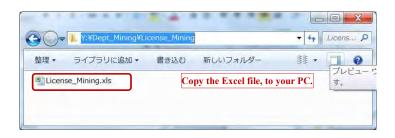
Copy from Dept_Mining folder

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Concession_Mining_Indian60			Copy these folders,	to your PC

Copy the folders into your PC. Only Excel files are necessary. Shapefile is NOT necessary, because created again from updated Excel files.



Database Operational Manual (GDMR)



Copy from Dept_Promotion folder

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Revenue.	xls	Co	py the Excel file, to y	our PC.	

6-3-3 Update the files and save in your work-folder (Step1) Update the Excel files

Edit data. Add new data, besides existing data .

Do not remove the license data, until annual update and decision by Department or Promotion.



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ng Northin	Easting	Mark	Number	1
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73 13155	494073	в	License_2	1
12152	494090	C	Liconeo 2	2
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data				
78 13151	494078	F	License_2	5
	494078 494082	F		5 6
078 13151 082 13150	494078 494082	F G	License_2 License_2	5 6
078 13151 082 13150 703 13150	494078 494082 493703	F G H	License_2 License_2 License_2	567
078 13151 082 13150 703 13150	494078 494082	F G H	License_2 License_2 License_2	5 6 7 8
078 13151 082 13150 703 13150	494078 494082 493703	F G H	License_2 License_2 License_2	5 6 7 8

(Step2) Create shapefiles from X,Y data of concession.xls

(See chapter 3-1, to create shapefiles of concession).

6-3-4 Replace the files in the database.

Note for update in database folders

If someone using the ArcMap file on database, you cannot update the files referenced by the ArcMap file. So it is necessary to stop use by other users.

(Step 1) Stop sharing the database.

(Step 2) Replace the files in the database. Copy the updated files from your work-folder. Paste (replace) to the assigned folder in database (Step 3) Start sharing the database.

6-3-5 Record of updating history

When updating, record the date and person in the text file, which is put in the same folder as updated file. The filename for the log is like "UpdateMemo_***.txt (*** is original filename), to identify the file.

License_Construction.xlsx UpdateMemo_License_Construction.txt UpdateMemo_License_Construction.txt - メモ帳 ファイル(E) 編集(E) 書式(Q) 表示(Y) ヘルプ(H) Updated on 21st Jun 2015, by Mr.__ of Dept.Construction. Updated on 28th Oct 2015, by Mr.__ of Dept.Construction. Updated on 20th Nov 2015, by Mr.__ of Dept.Construction.

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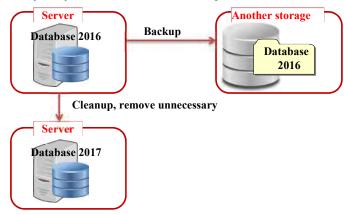
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6-4 Annual updates of whole part of database (Task for Database Administrators)

When new license-year starts, renew the database.

Backup whole part of current database into another storage/media.



Clean up unnecessary file. Recover or reset the ArcMap file. Choice of license data to transfer, which depends on both the license status and the payment, shall be

decided by Department of Promotion.

Choice of license data to transfer to next year database (annual update)

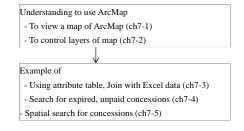
Status Payment	Valid licenses (including Surrender)	Expire /Return / Revoke
Paid completely	Select *	Remove**
Un-paid license	Select *	Select *

*Select: Transfer data to next year database

**Remove: Remove from next year database (Stored in past database)

7. View a map on ArcMap

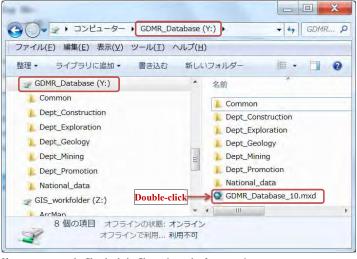
Chapter 7 shows how to view the map for all users. After opening the ArcMap file "GDMR_Database.mxd", basic guide is navigated how to view or zoom the map, how to handle the layers of map. As advance step, the case of how to view license data related to concession map is instructed.



7-1 View a map

7-1-1 Open ArcMap file

Connect to "GDMR_Database", then double-click on ArcMap file "GDMR_Database_10.mxd".



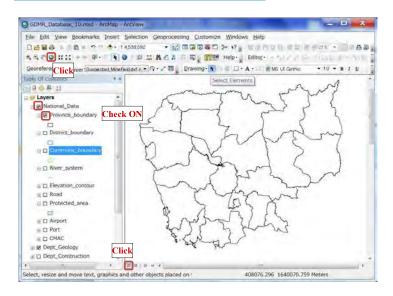
198

ArcMap File version Available Software version

If you cannot open the file, check the file version and software version.

JICA Project

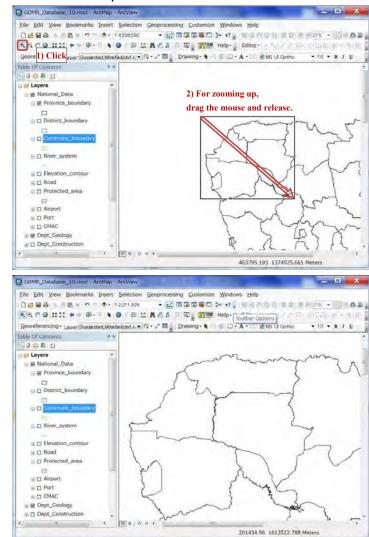
Version 9 (mxd file)	ArcGIS 9
	ArcGIS 10.0
	ArcGIS 10.1
	ArcGIS 10.2
	ArcGIS 10.3
Version 10.0 (mxd file)	ArcGIS 10.0
	ArcGIS 10.1
	ArcGIS 10.2
	ArcGIS 10.3
Version 10.1 (mxd file)	ArcGIS 10.1
	ArcGIS 10.2
	ArcGIS 10.3
Version 10.2 (mxd file)	ArcGIS 10.2
	ArcGIS 10.3
Version 10.3 (mxd file)	ArcGIS 10.3



Database Operational Manual (GDMR)

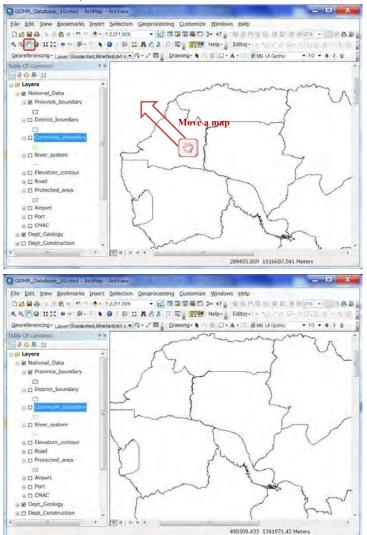
JICA Project

7-1-2 Zoom in/out map

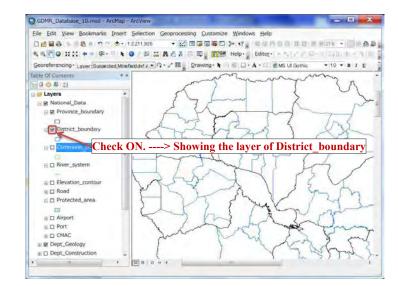


200

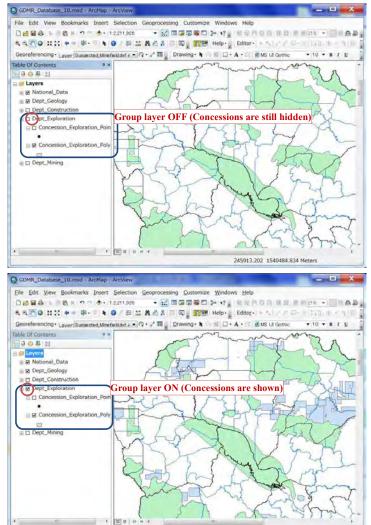
7-1-3 Move a map



7-2 Layer control 7-2-1 To show / hide layers

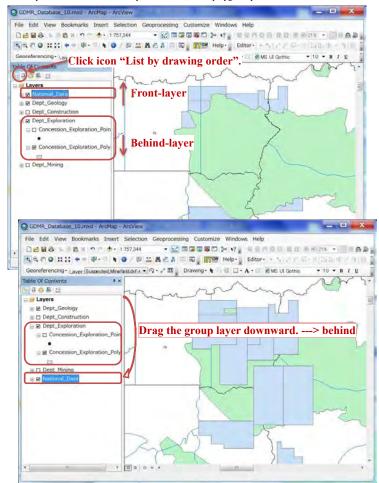


7-2-2 Group layer



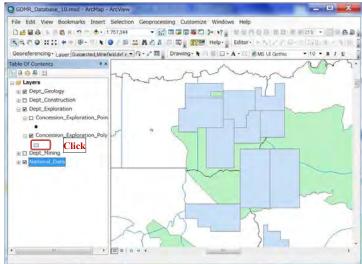
7-2-3 Drawing order

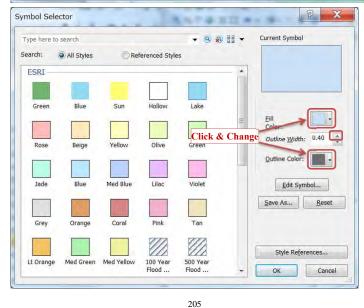
Click the icon of "List by drawing order", for arranging the layer order. Front layer is shown upper in the layer list. Behind layer is shown downward. Point layers are shown automatically at front side, while polygon layers at behind.



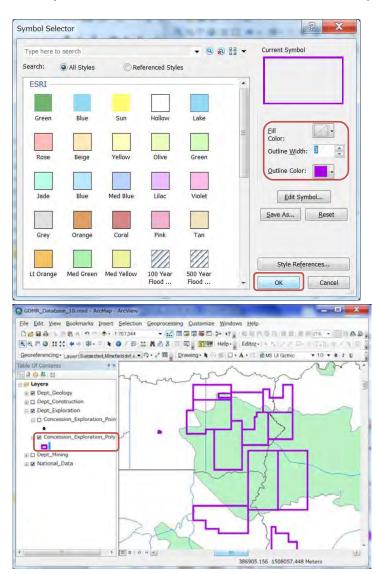
Database O	perational	Manual ((GDMR))

7-2-4 Symbology of layer





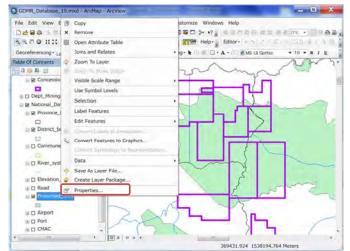
Database Operational Manual (GDMR)



7-2-5 Advance layer control

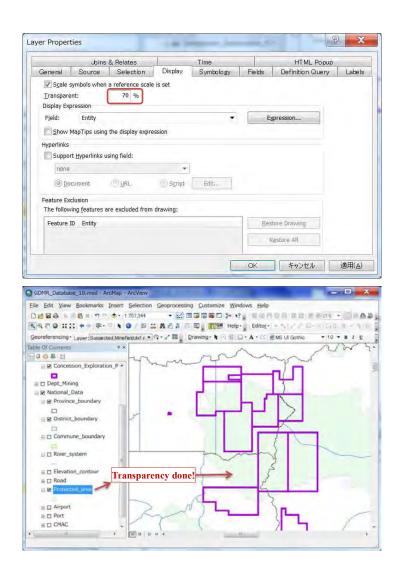
From "Layer properties", various settings of layer appearance are available.

transparency of layer

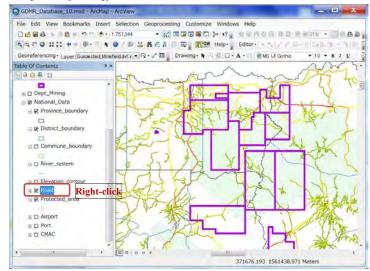


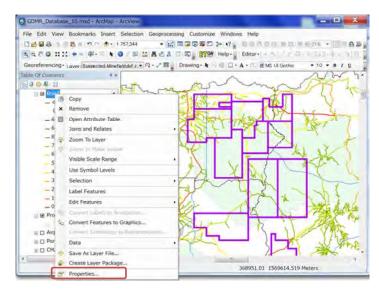
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Database Operational Manual (GDMR)



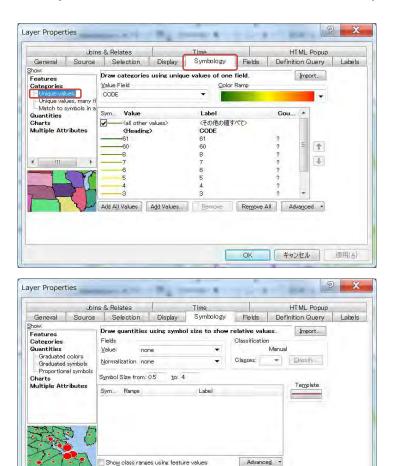
Categorized symbology





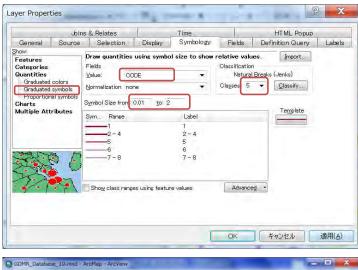
Database Operational Manual (GDMR)

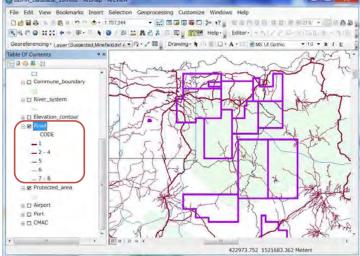
JICA Project



OK キャンセル 適用(A)

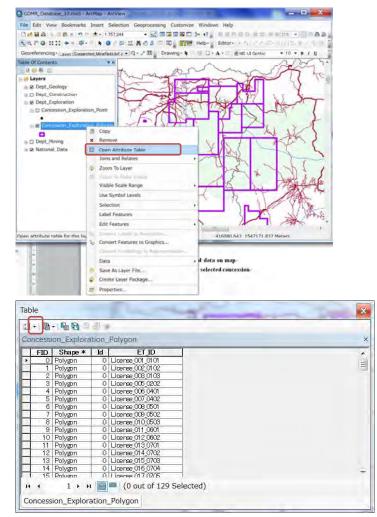
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7-3 Attribute table of shapefile

7-3-1 Calculate the concession area



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Database Operational Manual (GDMR)

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Cancel

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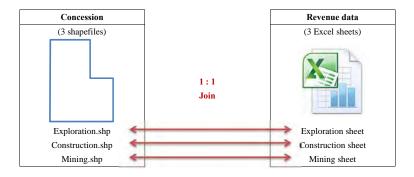
Help

JICA Project

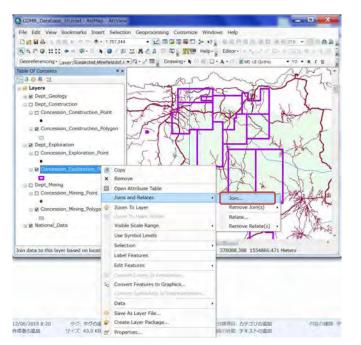
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4	Polygon	0	License_006_0401	205.81 0264	
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7-3-2 Join revenue data to concession

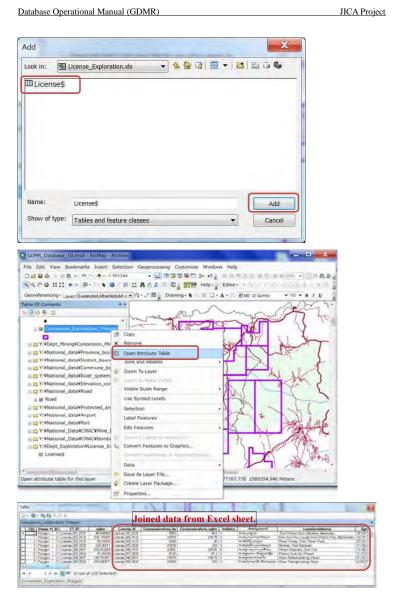
Revenue data are stored in a Excel file, having three sheets, of Exploration, Construction, Mining. Concession of Exploration shall be joined with revenue data of Exploration, by License_ID.



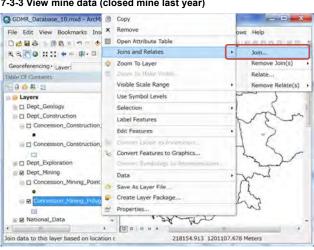
Database Operational Manual (GDMR)



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on Data				
Join lets you append additional data to this for example, symbolize the layer's features		you can,		
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	3			
Show the attribute tables of layer	s in this list			
3. Choose the field in the table to base	the join on:			
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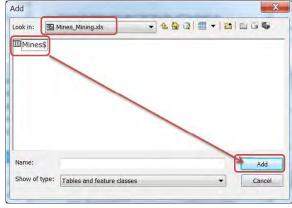
Join Data



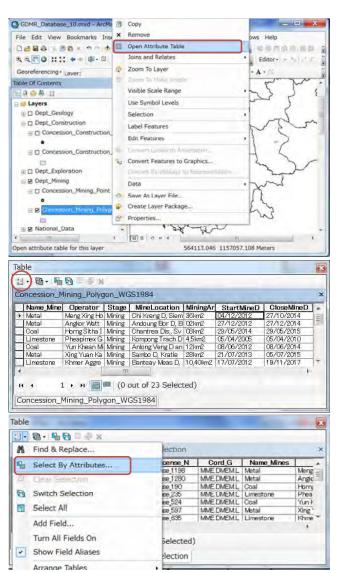
7-3-3 View mine data (closed mine last year)

Join lets you append additional data to this layer's attribute table so you can, for example, symbolize the layer's features using this data. What do you want to join to this layer? Join attributes from a table -1. Choose the field in this layer that the join will be based on: ET_ID -2. Choose the table to join to this layer, or load the table from - (12) Mines\$ Show the attribute tables of layers in this list 3. Choose the field in the table to base the join on: License_N -Join Options () Keep all records All records in the target table are shown in the resulting table. Unmatched records will contain null values for all fields being appended into the target table from the join table. C Keep only matching records If a record in the target table doesn't have a match in the join table, that record is removed from the resulting target table. Validate Join About Joining Data OK Cancel

2 X



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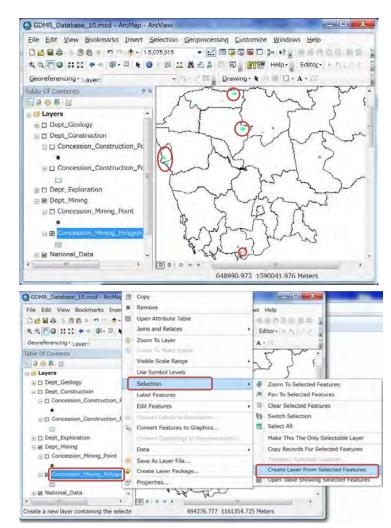
Database Operational Manual (GDMR)

Select by Attributes Enter a WHERE clause to select records in the table window. Method : Create a new selection • "Concession_Mining_Polygon_WGS1984.FID" à "Concession_Mining_Polygon_WGS1984.Id" = "Concession_Mining_Polygon_WGS1984.ET_D" "Mines\$.License_N" "Mines\$.Cord_G" = (<> | Like > >= And < <= Or _ % () Not Is Get Unique <u>V</u>alues <u>G</u>o To: SELECT * FROM Concession_Mining_Polycon_WGS1984_Mines\$ WHERE: Clean Wenity Help Load... Saya Apply Close Select by Attributes Enter a WHERE clause to select records in the table window. Method : Create a new selection -"Mines&StartMineD" . Mines\$.CloseMineD" Mines&Lemale Worker "Mines\$.Male_Worker" -"Mines\$.Commodity_Code" = <> Like > >= Apd < <= Or _ % () Not Get Unique Values Go To: Is SELECT * FROM Concession Mining Polygon WGS1984 Mines\$ WHERE: "Mines® CloseMineD" Clear Verify Help Load... Saye... Apply Glose

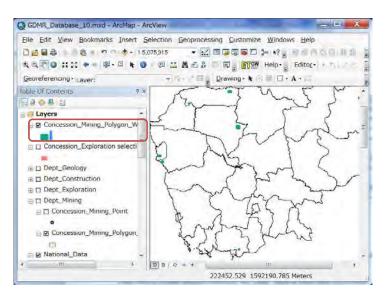
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Database Operational Manual (GDMR)





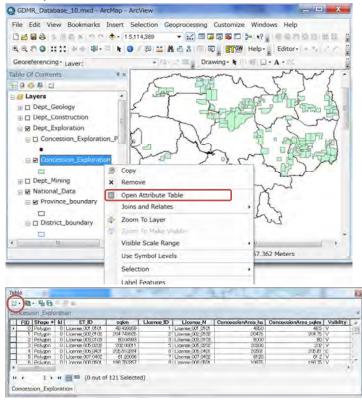


7-4 Attribute search for the concession

For practice, let's search the expired concessions with no payment record. At first, search (create a selection of) expired concessions, and save as a new layer. Secondly, join the new layer with revenue data.

Then search (create another selection of) "Null" data in Date field of revenue.

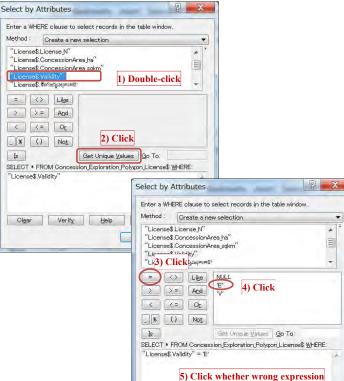
7-4-1 Expired concession



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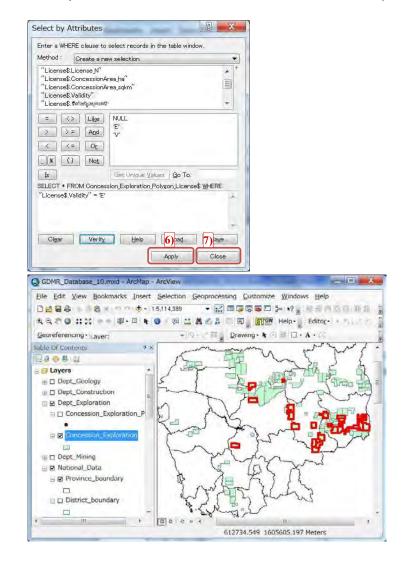
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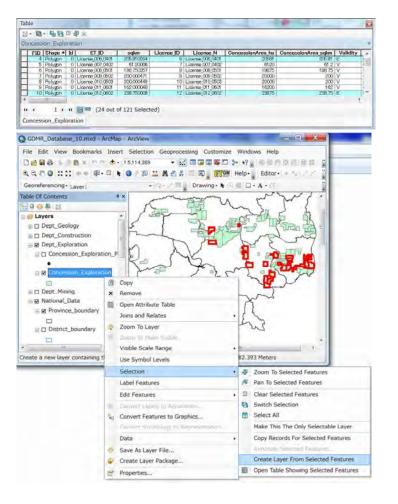


Database Operational Manual (GDMR)

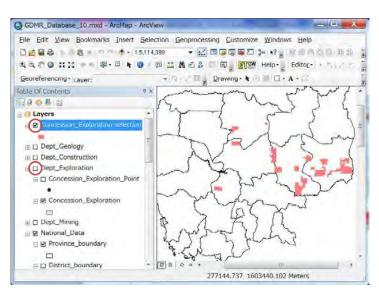
JICA Project





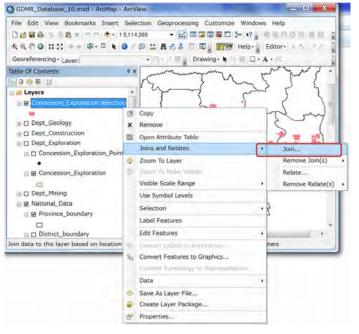


Database Operational Manual (GDMR)



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7-4-2 Unpaid concession



Database Operational Manual (GDMR)

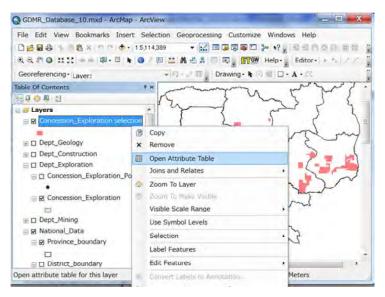
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Database Operational Manual (GDMR)

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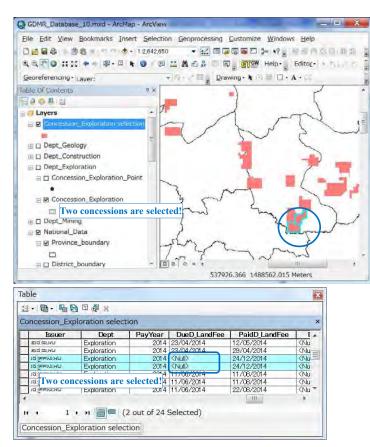


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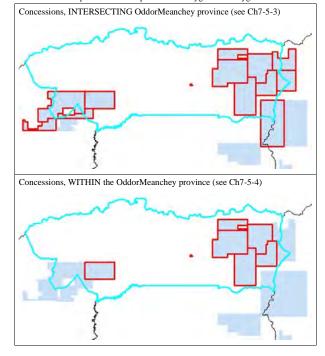
Database Operational Manual (GDMR)

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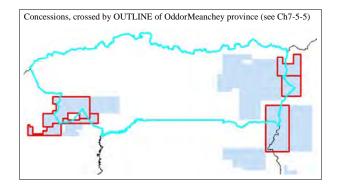




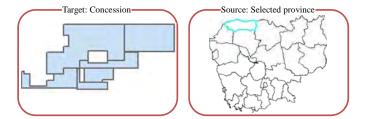
For example, let's search for the concessions in OddarMeanchey province. Concession layer is of polygon object. Province layer is of polygon object. There are some spatial relationships between Polygon and Polygon.



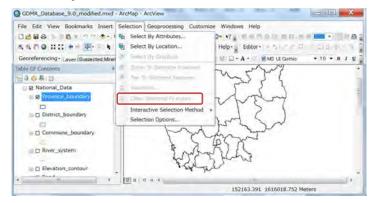


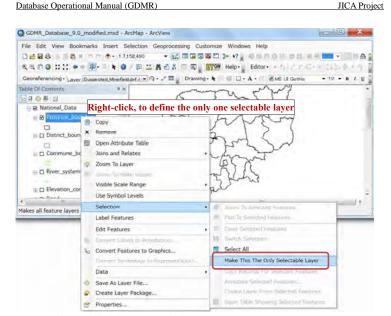


7-5-1 Select a province as search source



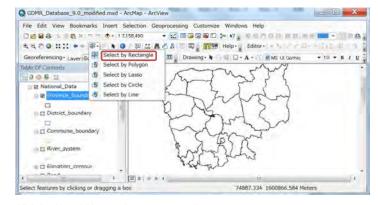
Reset the existing selection (Clear selected features).



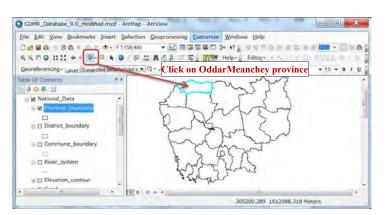


From Menu icons, click "Select By Rectangle"

Database Operational Manual (GDMR)



Click the object (OddarMeanchey) you want to select



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Show the target layer (concession layer) by checkbox ON.



Database Operational Manual (GDMR)

7-5-2 Select by location



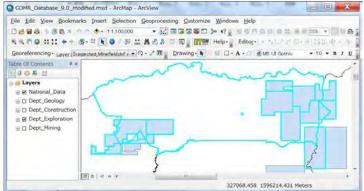
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7-5-3 Search intersecting concessions

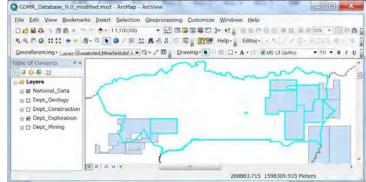
elect reatures from of elation to the features	ne or more target layers bas in the source layer.	sed on their location in
election method:		
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arget layer(s):		
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<u>■</u> ● Dept_Mining <u>Only</u> show selectable	Exploration_Polygon	
王 🔷 Dept_Mining	e layers in this list	
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Database Operational Manual (GDMR)

7-5-4 Search within-located concessions

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Oept_Construction	
🖃 🧼 Dept_Exploration	
Concession Explora	
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en de la de Contrario	
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ource layer: Province_boundary	in this list (1 features selected)
ource layer: Province_boundary Vuse selected features	
Source layer: ◆ Province_boundary ✓ Use selected features Spatial selection method:	(1 features selected)
ource layer: Province_boundary Use selected features Spatial selection method: Target layer(s) features are	(1 features selected)
Source layer: ◆ Province_boundary ✓ Use selected features Spatial selection method:	(1 features selected)
Source layer: Province_boundary Juse selected features Spatial selection method: Target layer(s) features are Apply a search gistance	(1 features selected)



E S National_Data E Dept_Geology IE Dept_Construction E Dept_Exploration B Dept_Mining

.......

JICA Project

315892.436 1598077.102 Meters

7-5-5 Search boundary-located concessions

elect features from one or more target layers based on their location in elation to the features in the source layer.	
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[arget layer(s):	
Only show selectable layers in this list	<u>.</u>
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Use selected features (1 features selected)	-
<u>V</u> <u>U</u> se selected features (1 features selected) spatial selection method:	•
✓ Use selected features (1 features selected) igatial selection method: Target layer(s) features are crossed by the outline of the Source layer fe	•
Use selected features (1 features selected) igatial selection method: Target layer(s) features are crossed by the outline of the Source layer fe Apply a search distance	
Z Use selected features (1 features selected) igatial selection method: Image: Selected features are crossed by the outline of the Source layer features are crossed by the outline of the Source layer features Apply a search gistance Image: Selected features Image: Image: Image: Image: Selected features Image: Selected features Help OK Apply Image: Selected features Image: Selected features	
Z Use selected features (1 features selected) igatial selection method: Image: Selected features are crossed by the outline of the Source layer features Apply a search gistance Image: Selected features Image: Image: Image: Image: Image: Selected features Image: Selected features Help OK Apply CDMR_Database_9.0_modified.mxd - ArcMap - ArcView	
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Database Operational Manual (GDMR)

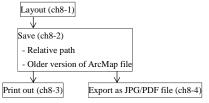
7-5-6 Create overlap objects between two polygon layers

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🖃 🚳 Toolboxes	
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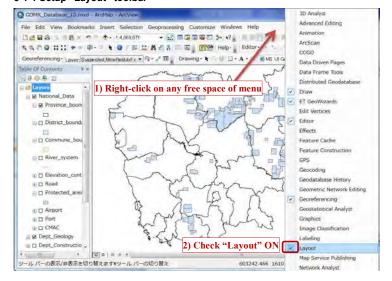
Database O	perational	Manual ((GDMR)	

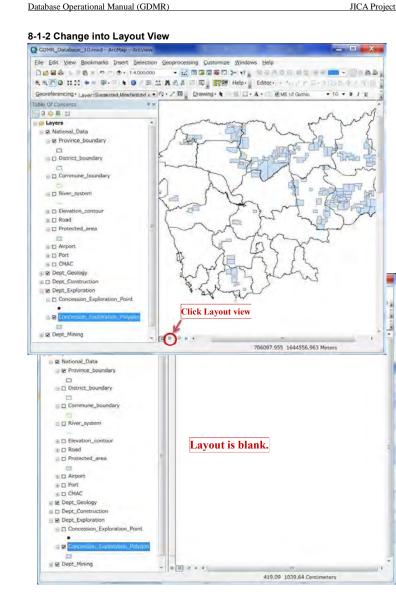
8. Printing map

Chapter 8 shows how to print out the map of ArcMap. At first you need to decide the paper size of map in layout window, then print out. The layout shall be saved in a "mxd" file. You can export the map as a digital file like JPG or PDF file.



8-1 Create layout in ArcMap 8-1-1 Setup "Layout" toolbar





GDMR_Database_10.mxd - ArcMap - ArcView

Ctrl+N

Ctrl+S

4 C:VUse...Vuntilize.r Page and Print Setup

Printer Setup

Name:

Status:

Type:

Where:

Comments:

Paper

Size:

Source:

Orientation

Map Page Size

Page

Width:

Height:

Orientation

Data Driven Pages...

Use Printer Paper Settings

A FX DocuCentre S1810

A4 (210 x 297mm)

Page Size that will be used is equal to Printer Paper Size

21

29.7

Portrait

OPortrait

Follow Printer Settings

Landscape

Centimeters 💌

Centimeters 🔻

Show Printer Margins on Layout 📃 Scale Map Elements proportionally to changes in Page Size

(@) Landscape

FX DocuCentre S1810

Ready

USB000

File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help

10.1

Click

8-1-3 Page setup Setup paper size of map.

D New ...

B Open...

Save

Save As.

Add Data

E ArcGIS Online.

Print Preview.

Export Map ...

A Print...

Page and Print Setup...

Create Map Package...

Map Document Properties...

1 ... VGDMR_Database_...

2 C:VUsers...VUntitle.mxd

3 C #Geoneference.

5 ... VGDMR_Databas

6 VGDMR_Databat

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Exit

88

B Dept_Mining

Save A Copy ...

JICA Project

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PX

▼ Propertjes...

Printer Paper

Printer Margins

Sample Map Elements

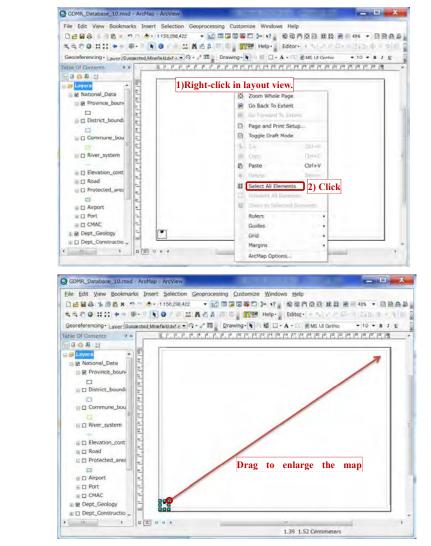
OK

Cancel

Map Page (Page Layout)

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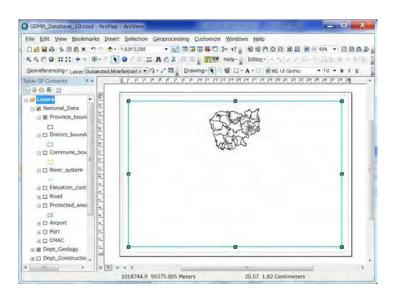
8-1-4 Data Frame



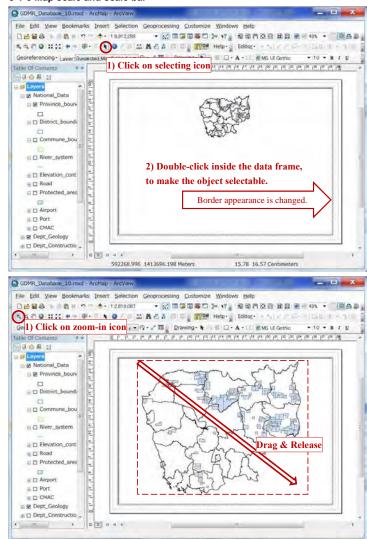
249

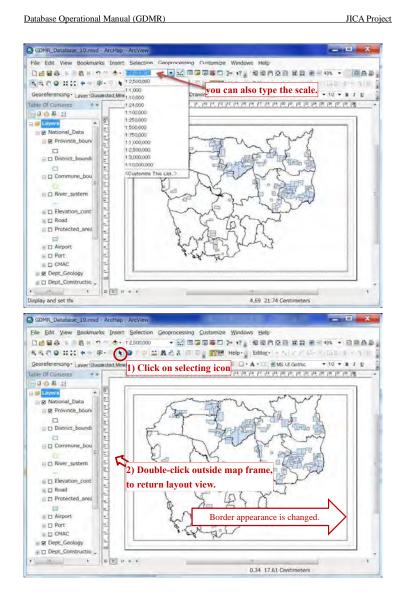
250

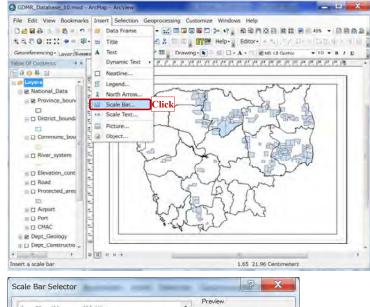


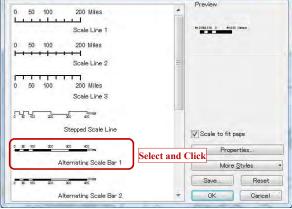


8-1-5 Map scale and scale bar

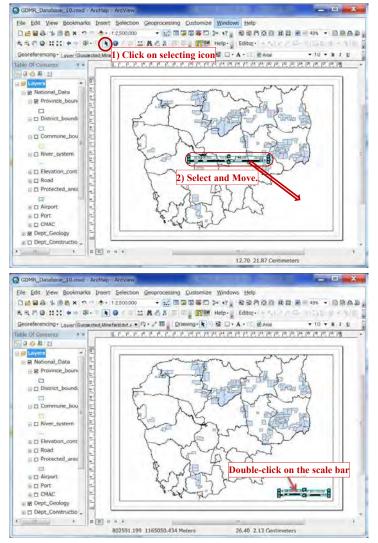






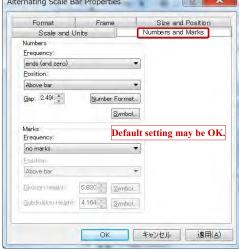


Adjust the location of Scale bar in layout.



Database Operational Manual (GDMR)

2 X Alternating Scale Bar Properties . Size and Position Format Frame Scale and Units Numbers and Marks Scale 100 km Division value: Auto Number of divisions: Number of subdivisions: 2 🔺 Design the scale bar Show one division before zero When resizing ... Adjust divisions and division value 💌 Units Division Units: Kilometers Label Position: after bar OK キャンセル 適用(A) Alternating Scale Bar Properties ? X -



256

JICA Project

Scale and Units	Numbers and Marks
	Frame Size and Position
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Database Operational Manual (GDMR)

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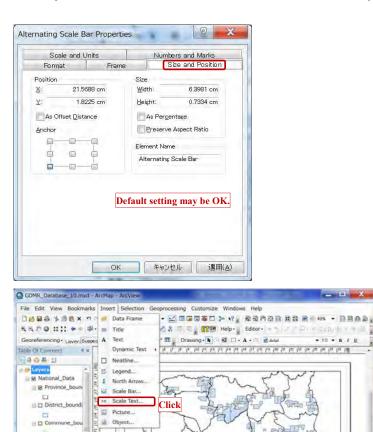
I DI CMAC E & Dept_Geology E Dept_Constructio JICA Project

_ - X

• 10 • B / U

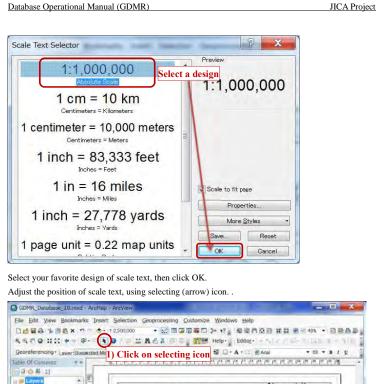
- Cintern B

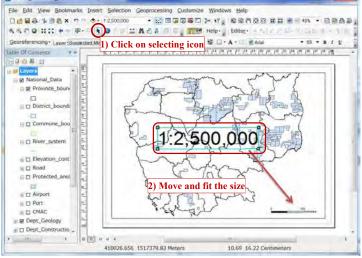
6.61 15.96 Centimeters

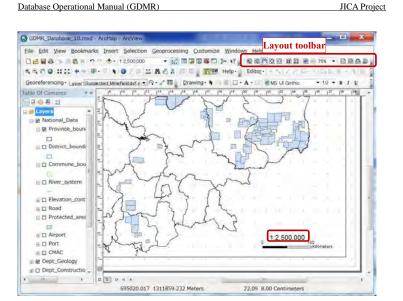


258

307807.634 1510855.212 Meters



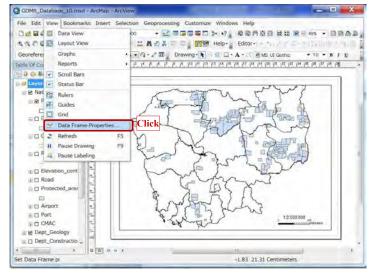




You can zoom or move the layout, by layout toolbar.

8-1-6 Coordinate grid

Add coordinate grid to map layout



Database Operational Manual (GDMR)

JICA Project

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	Properties
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Database Operational Manual (GDMR) JICA Project

29730 631988	Which do you want to create?
	Graticule: divides map by meridians and parallels
	Measured Grid: divides map into a grid of map units
31464	Reference Grid: divides map into a grid for indexing
	Grid name: Measured Grid 1
	< 戻ぶ(B) 次へ(N) > キャンセル

Select the type of grid units.

34000 mg 44000 mg 44000	□ Labels only Style: □ ick marks and labels □ □ Grid and labels □ ○ Grid and labels □ ○ Grid and labels □ ✓ Same as data frame> • Transverse Mercator • Fase_ Easting: S00000,000000 • Intervals • ✓ Axis: 100000 ✓ Meters
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2 X Axes and labels Axes 500000 110000 Line style: Major division ticks Line style: Minor division ticks * Number of ticks per major 0 Labeling AaBbCc... Text < 戻る(B) 次へ(N)> キャンセル 2 X Create a measured grid Measured Grid Border 000 500000 110000 00000 Place a border between grid and axis labels Neatline Place a border outside the grid Grid Properties Store as a static graphic that can be edited Store as a fixed grid that updates with changes to the data frame く 戻る(日) Finish キャンセル Select the grid on the list, then click Properties button

JICA Project

Database Operational Manual (GDMR)

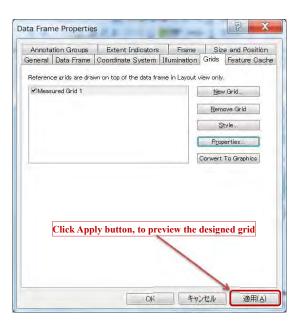
Database O	perational	Manual	(GDMR))

2 × Data Frame Properties Annotation Groups Extent Indicators Frame Size and Position General Data Frame Coordinate System Illumination Grids Feature Cache Reference grids are drawn on top of the data frame in Layout view only. Measured Grid 1 New Grid... Remove Grid Style... Properties... Convert To Graphics OK キャンセル 適用(A) Reference System Properties Axes Labels Lines System Intervals Label Axes Тор ▼ Left ✓ Bottom ✓ Right Label Style Format: Mixed Font Font: O Arial . Size: 7.8 BIU -Label Offset: 6 pts Color: + Additional Properties... Label Orientation Vertical Labels: Тор V Left Bottom V Right OK キャンセル 適用(A)

Database Operational Manual (GDMR)

JICA Project

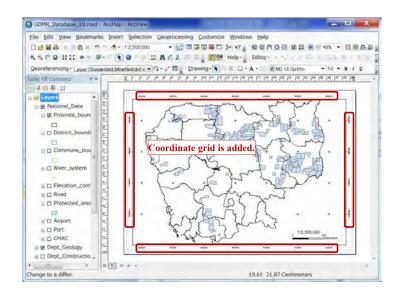
2 X Grid Label Properties Mixed Font Label Group by decimal point Specify the number of digits in a group 3 -Secondary Font Name: 🙆 Arial -Size: 4.8 🔻 BIU -Color: Number Format... OK キャンセル 適用(A) X Number Format Properties Numeric Rounding Wumber of decimal places Number of significant digits Alignment Left Right 12 : characters Show <u>t</u>housands separators Pad with zeros Show plus sign OK キャンセル 適用(A)



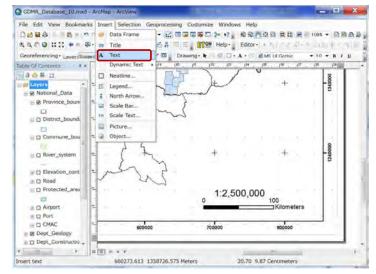
JICA Project

Database Operational Manual (GDMR)

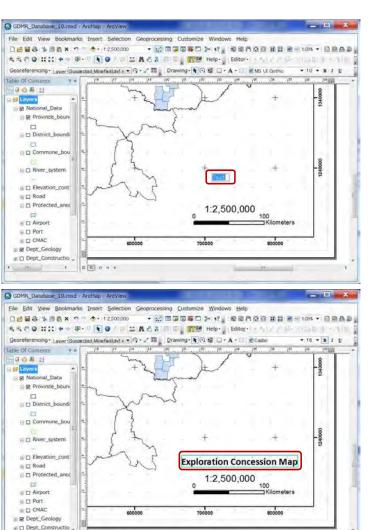
JICA Project



8-1-7 Insert Text



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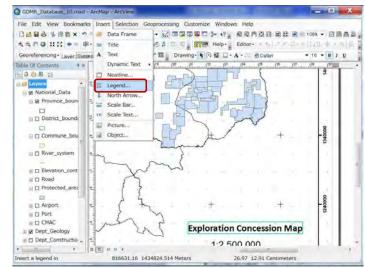


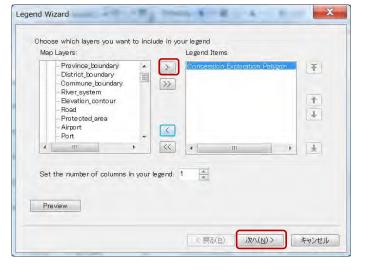
JICA Project

Database Operational Manual (GDMR)

JICA Project

8-1-7 Legend





25.38 9.66 Centimeters

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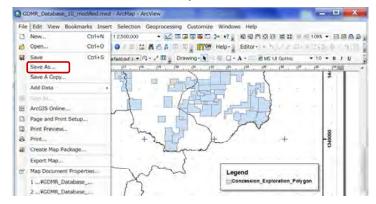
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and polygon features in you	ur legend.	
Select one or more legend	items whose patches you want to change.	
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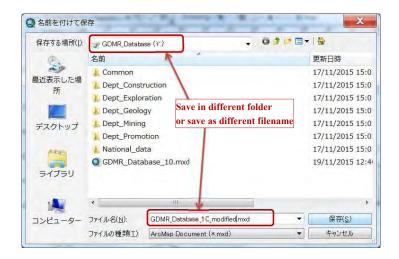
8-2 Save ArcMap file 8-2-1 Relative path

Save Ctrl+	0	Δ -
Save As Save A Copy	Map Document Properties	
Add Data Sign In Page and Print Setup Print Preview Print Preview Print Preview Create Map Package Export Map Map Document Properties 1 VGDMR_Database 2 VGDMR_Database	General Ele: Y:¥GDMR_Database.mxd Ittle:	
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	Thumbnail Delete Thumbrail	

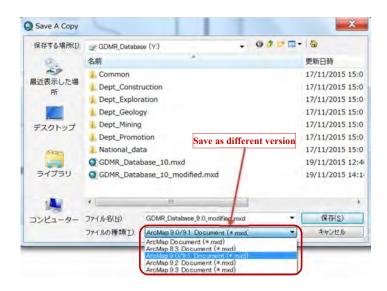
Database Operational Manual (GDMR)

8-2-2 Save as different filename or filepath

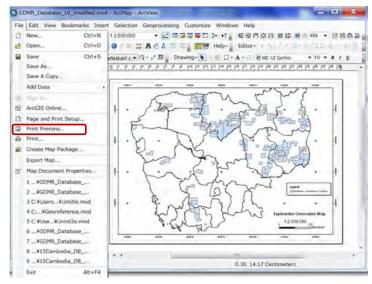


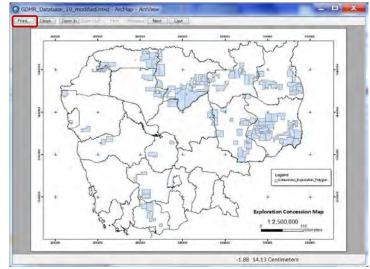


8-2-3 Save copy as older version



8-3 Print out





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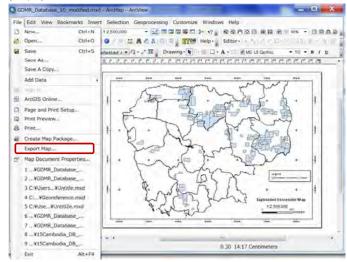
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JICA Project

Database Operational Manual (GDMR)

8-4 Export as digital map

Available output files of a map is either raster map (JPG, TIFF, Bitmap, PNG, GIF) or vector map (PDF, AI).



8-4-1 Export as raster file (JPG)

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leight:	1190 p	a⊩ (*.gr)		
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8-4-2 Export as vector file (PDF)

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9. Other usage of GIS data

Chapter 9 shows ;

- how to convert to/from GoogleEarth data
- how to export to/import from GPS

9-1 GoogleEarth

9-1-1 File type and Coordinate system in GoogleEarth

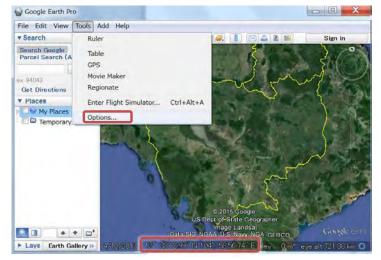
Google Earth uses KML file or KMZ file, which is compressed file of KML. ArcToolbox can convert between KMZ file and shapefile, as following section.

Google Earth coordinate system is based on the WGS84 datum, a global datum. You have to use WGS1984 in datum of coordinate system. Otherwise leading to wrong geolocation.

F	file type	C	oordination system applied
-	KML	-	WGS1984 GCS (Geographic Coordinate System)
-	KMZ	-	WGS1984 UTM (Universal Transverse Mercator)

Choose available coordinate in GoogleEarth from options of Tools menu.

- decimal degrees
- DMS (degree minutes seconds)
- degrees decimal minutes,
- UTM (Universal Transverse Mercator).



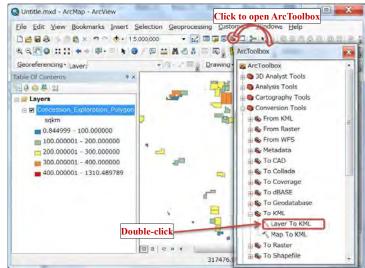
Database Operational Manual (GDMR) JICA Project X Google Earth Options 3D View Cache Touring Navigation General Graphics Mode Texture Colors Anisotropic Filtering Labels/Icon Size High Color (16 bit) OpenGL O Off Small True Color (32 bit) O DirectX Medium Medium) High Compress Large 📃 Use safe mode Show Lat/Long Units of Measurement Fonts Decimal Degrees Svstem default Degrees, Minutes, Seconds C Feet, Miles Degrees, Decimal Minutes Ohoose 3D Font Universal Transverse Mercator Meters, Kilometers Military Grid Reference System Terrain Elevation Exaggeration (also scales 3D buildings and trees): 1 (0.01 - 3)Use high quality terrain (disable for quicker resolution and faster rendering) ☑ Use 3D Imagery (disable to use legacy 3D buildings) Atmosphere Use photorealistic atmosphere rendering (EXPERIMENTAL) Overview Map Map Size: Small Large 1 infinity Zoom Relation: infinity 1.1 Restore Defaults OK Cancel Apply - 0 X Google Earth Pro Eile Edit View Tools Add Help 🗖 😽 🖉 🍼 🌒 🔔 🗶 📘 🖂 🛓 📾 **v** Search Sign in Search Google Parcel Search (APN) Search × 94043 Get Directions History v Places My Places Temporary Places + + 🖬' ► Lave Earth Gallery »

Database Operational Manual (GDMR)

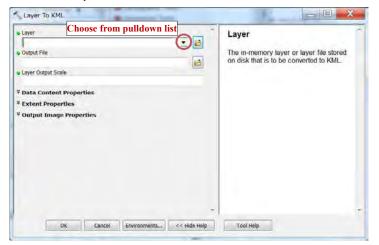
JICA Project

9-1-2 Convert a shapefile to a kmz file

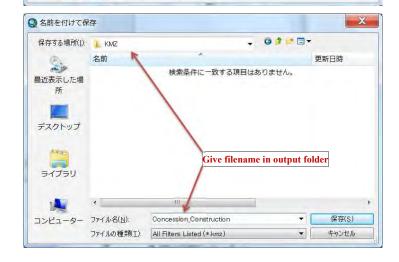
Open ArcMap file, then open ArcToolbox.



Double-click on "Layer To KML".



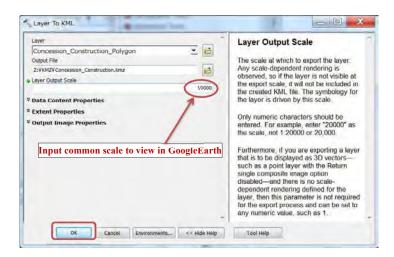
Database Operational Manual (GDMR) JICA Project Layer To KML - 0 × Laver **Output File** Concession_Construction_Polygon 2 8 The KML file to write. This file is Output File compressed and has a .kmz extension. It can be read by any KML client including B Layer Output Scale Click then give filename in output folder Explorer, ArcGlobe, and Google [♥] Data Content Properties ⁸ Extent Properties * Output Image Properties



OK Cancel Environments... << Hide Help Tool Help

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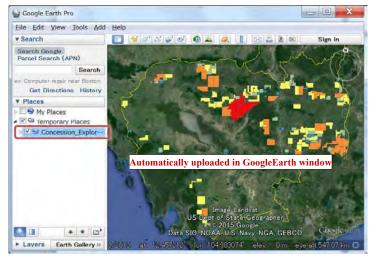
9-1-3 View in GoogleEarth

Start GoogleEarth (or GoogleEarth Pro) program. Drag a kmz file into GoogleEarth window.

Database Operational Manual (GDMR)

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Database Operational Manual (GDMR)
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9-2 GPS

Most of Garmin GPS can exchange data with PC.

9-2-1 File type and required software

Garmin GPS uses GPX file type. Data exchange with PC requires a free software of "Garmin BaseCamp", and a USB connection. See chapter 1-3-4 for installation of "Garmin BaseCamp"

9-2-2 Export a shapefile to GPS

Step1: Convert a shapefile to a kmz file (see Ch9-1-2)

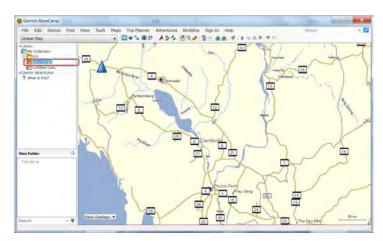
Step2: Upload KMZ files to BaseCamp window

Setup new list in BaseCamp for uploading KMZ files



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Click KMZ files in windows folder

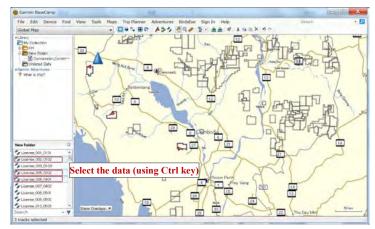


Database Operational Manual (GDMR)

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Select the objects from the list



Step3: Send to GPS

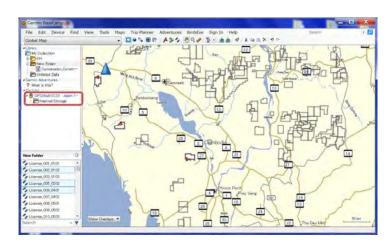
Connect GPS via USB cable.

Turn ON the GPS power.

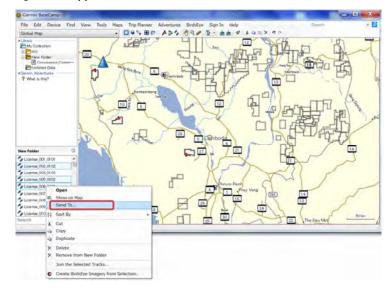
GPS device is automatically detected and shown in BaseCamp window.

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Right-click on any part of selected lists.



Database Operational	Manual	(GDMR))



The selected data is copied to GPS in a short time. Close Garmin BaseCamp software. Turn OFF power of GPS

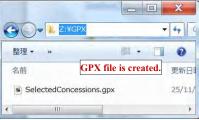
Step4: Save as GPX file



Database Operational Manual (GDMR)	Database O	perational Manual	(GDMR)
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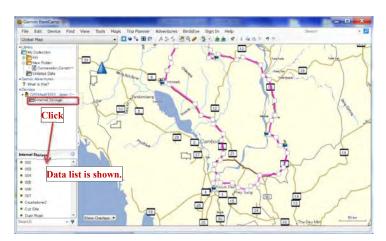






9-2-3 Import vector data from GPS Step1: From GPS to KML file Open BaseCamp software Connect GPS via USB cable. Turn ON the GPS power. GPS device is automatically detected and shown in BaseCamp window.



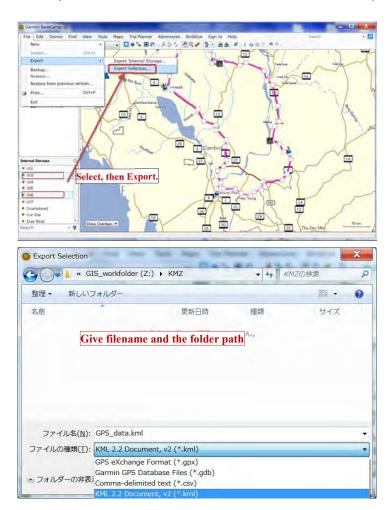


Select the data list, by using Ctrl key if more than 1 selected.



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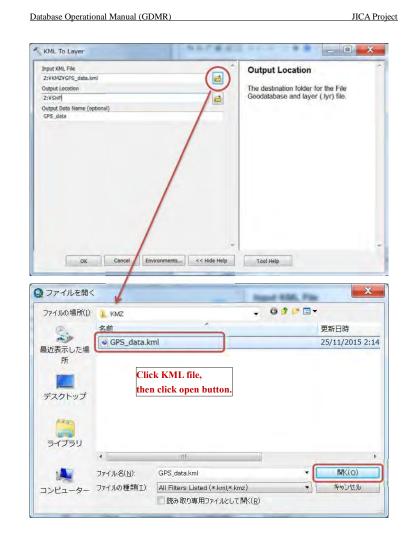
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ファイル4	検索 S <u>(N):</u> GPS_data.kml	¢	Click save bu		

Close Garmin BaseCamp software. Turn OFF the GPS power.

Step2: From KML file to shapefile

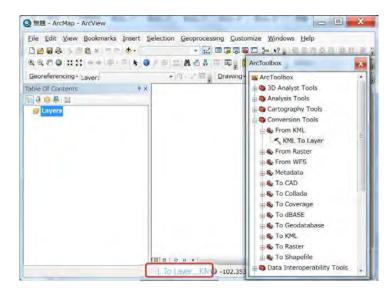
Open ArcMap software.

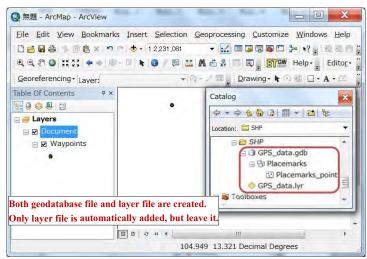
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Database Operational Manual (GDMR)

JICA Project



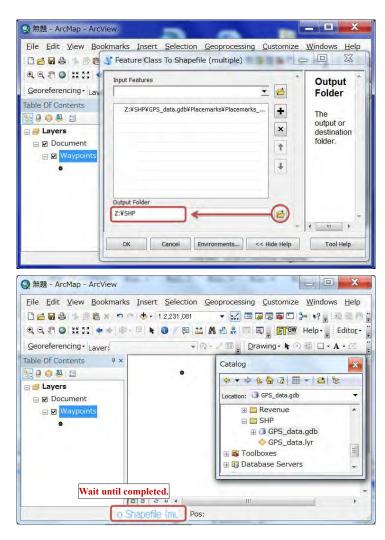


Database Operational Manual (GDMR)

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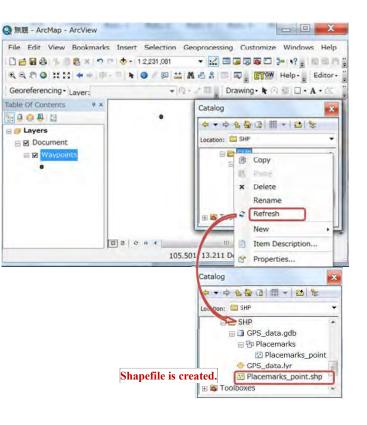
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Database Operational Manual (GDMR)



Database Operational Manual (GDMR)

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General XY Coordina Name: CCC Details: Angular Unit: Degre Prime Meridian: Gre Datum: D_WGS_191 Spheroid: WGS_11 Semiminor Axis: Seriminor Axis: Inverse Flattenin GPS data i with WGS	WG5_1984 e (0.017453292519943295) enwich (0.0000000000000000000 4 84 84 6355752.31424517930000000 1: 298.257223563000030000 s converted 1984 Geographic Coordinate system port a coordinate system and X/Y, m an existing geodataset (e.g., fei ss, raster).	am Fields Indexes dinate system m. Z and M domains ature dataset, feature	

1. General about GDMR Database

Database Management Manual (GDMR)

This manual is described for administrators about maintenance of the GDMR Database. The concept and design of the database is described in chapter 1. For maintenance of the database, database administrator is needed. The task is listed up in chapter 2. When data are updated, database administrators need to support and work together, as the procedures shown in chapter 3.

1-1 Concept of GDMR Database

This database works on ArcGIS Desktop Version 10.0 Basic model (ArcView).



Checklist	Volume	Application
Users	Limited numbers (within GDMR)	Excel
Update frequency	Less (weekly/monthly)	Excel
Type of data resource	Spacial data (shapefile, GeoTIFF,)	ArcGIS
	Table data (Excel file)	
Number of records	Less (up to Thousands)	Excel

Current version is designed based on ArcGIS Desktop Version 10.0 ArcView (Basic model).

1-2 Responsibility to the data

Database administrators have a responsibility to secure the whole data and performance of database. He is required to understand ArcGIS and to recover the ArcMap file with connecting paths of source files. The folders of each department may be updated sometimes occasionally. So the data of each department is taken care by each department's responsibility.

"National data" folder includes huge size of remote sensing data, which are not so often updated. "Common" folder includes the manual and law and regulation related to mining activity.

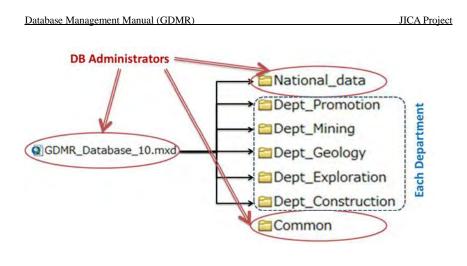
Database Management Manual

THE PROJECT ON CAPACITY DEVELOPMENT FOR MINING ADMINISTRATION IN THE KINGDOM OF CAMBODIA

Date of Issue: 14th December 2015 Japan International Cooperation Agency (JICA)

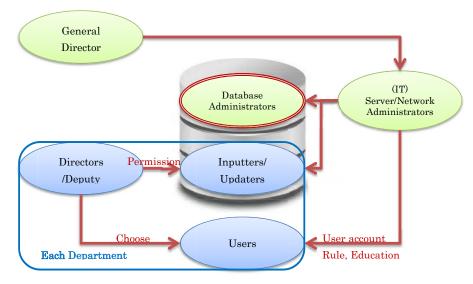
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3. PROCEDURES ON UPDATE WORK	4
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2. Roles and tasks for management and maintenance

To maintain the database, administrators to do it are needed. One is database administrators, and the other is server/network administrators. The two roles can be played by same person, who has the skill of both tasks.



Database Management Manual (GDMR)

2-1 Database Administrators

Tasks of database administrators are :

- Monitoring data-folder size
- Installation / version-up / patch of GIS software (ArcGIS)
- Backup GDMR Database
- Recovery (Re-build) GDMR Database (source file connection to the ArcMap file)
- Check performance of database, Clean up unnecessary files
- Trouble-shooting for database user
- Monitor the data/folder size and report to Server Administrators

The roles of Database administrators and Server administrators

Database	IT (Network/server)	
Administrators	Administrators	
DATABASE maintenance	Server maintenance	
Application update (ArcGIS)	Network maintenance	
• Backup	• Security setting (Antivirus, firewall)	
 Whole backup 	User account update	
- Differential backup (Updated	• User (Network) security rule	
datafolder only)	Education to Users	
Monitor data size	Support database update-work	
 Cleanup unnecessary files 	 Stop network service 	
Recover the ArcMap file	Monitor Disk space of server	
 Layer source-file path 	Backup and Recover data	

Current data-size is shown below.

GDMR_Database (Y:)	
L Common	400MB
📗 Database	$200 \mathrm{MB}$
17	100 MB
Law	100MB
Dept_Construction	<u>20MB</u>
L Dept_Exploration	<u>10MB</u>
L Dept_Geology	<u>150MB</u>
L Dept_Mining	<u>10MB</u>
Dept_Promotion	<u>10MB</u>

📙 National_data	<u>81GB</u>
📙 Airport	0.1MB
D L CMAC	300MB
L Commune_boundary	6 MB
L District_boundary	3MB
Elevation_contour	$280 \mathrm{MB}$
📙 Port	0.1MB
Protected_area	1MB
Province_boundary	2MB
Remote_sensing	80GB
River_system	39MB
🗼 Road	14MB

The procedures on updating revenue data is in the same way as shown below.

2-2 Updaters of each department

Director chooses the inputter/updaters from his department. When updating, updaters get the permission from (his Director). The time to update is decided by individual department.

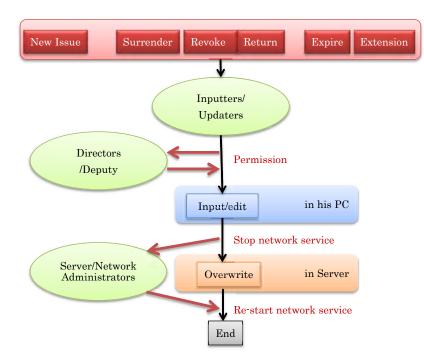
3. Procedures on update work

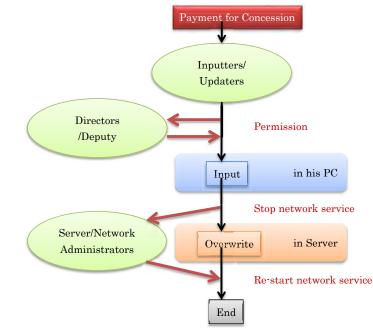
3-1 Anytime update

The procedures on updating license data is shown below.

The event on license issue is like new issue, surrender, revoke, return, expire, or extension.

When the event on license occurs, inputters/updaters get permission from (his director) before updating. The work of editing data is done in his PC. During overwriting the files on the database, network should be stopped to make no other person using the database.

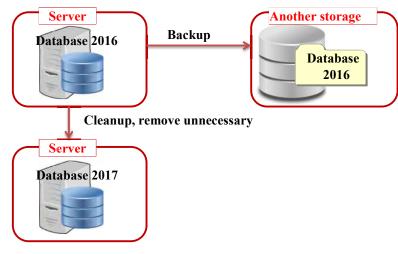




3-2 Annual updates

When new license-year starts, renew the database.

Backup whole part of current database into another storage/media.



Clean up unnecessary file. Recover or reset the ArcMap file.

Choice of license data to transfer, which depends on both the license status and the payment, shall be decided by Department of Promotion.

Choice of license data to transfer to next year database (annual update)

Status	Valid licenses (including Surrender)	Expire /Return / Revoke
Paid completely	Select *	Remove**
Un-paid license	Select *	Select *

*Select: Transfer data to next year database

**Remove: Remove from next year database (Stored in past database)

Quick Manual - Topics on GDMR's Interest -

THE PROJECT ON CAPACITY DEVELOPMENT FOR MINING ADMINISTRATION IN THE KINGDOM OF CAMBODIA

Issue: March 2017

Japan International Cooperation Agency (JICA)

This is a quick manual for database utilization, covering

Inspection data;	Hyperlink access
□ Irregular shape Concessions;	Combine into a single shapefile
□ Topic on interest;	Methods for Counting concessions

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1) Save Inspection Reports in below folder.	1
2) Add Points of Inspection site in "Inspection_P" layer (shapefile)	1
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3.3 New Layer for Valid concession by Year	22
3.4 COUNT CONCESSIONS, USING CATEGORIZING SYMBOLOGY	26

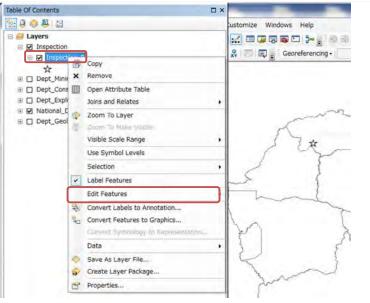
Display Inspection report through map (Hyperlink) Save Inspection Reports in below folder.

C:\GDMR_Database\Inspection\InspectionReport

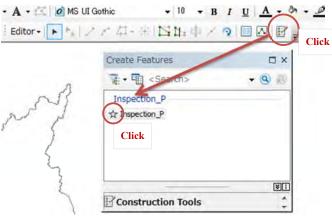
2) Add Points of Inspection site in "Inspection_P" layer (shapefile)

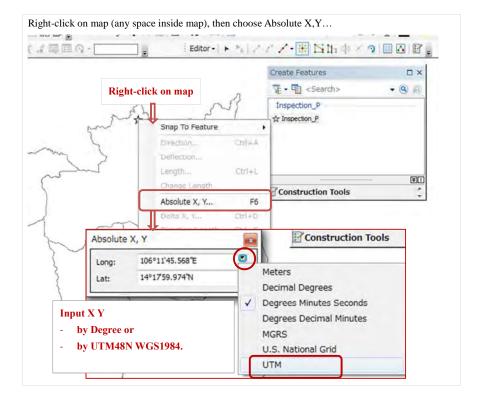
Open (double-click) "GDMR_Database.mxd".

On Arcmap, Right-click on "Inspection_P" layer, choose "Edit Features" and Start Editing.

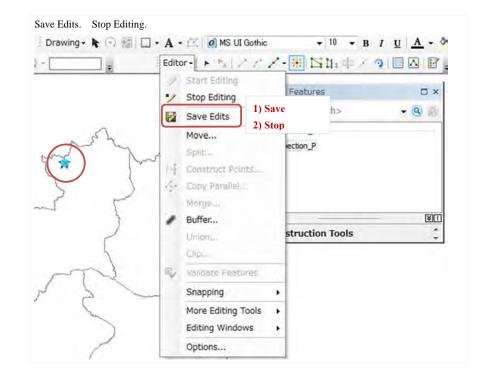


On Editor tool bar, click the icon "Create Features".





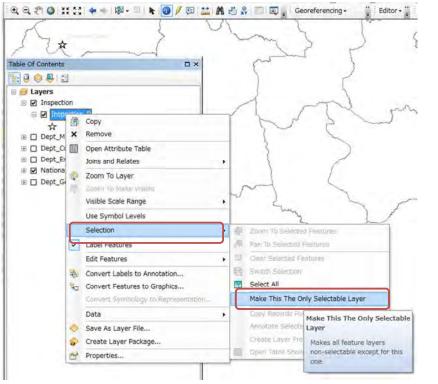
Database Management Manual (GDMR)



3) Setup Hyperlinks

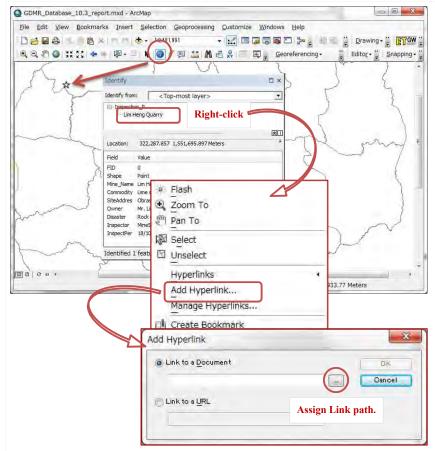
Before work, let's Make this The only selectable layer.

Right-click on the target layer, choose Selection.

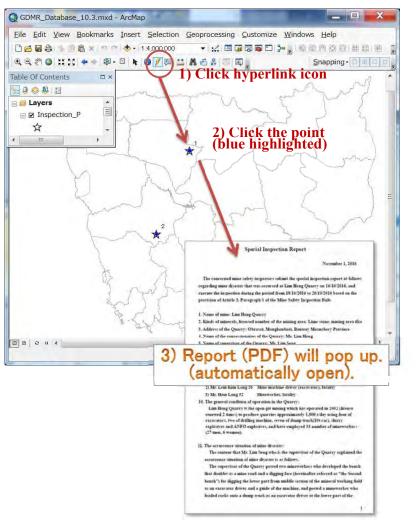


Database Management Manual (GDMR)

Click "i" icon on toolbar. Click the inspection point. Soon Ientity windows appears. Right-click on the point name on Identify window, then choose "Add hyperlink".



4) Pop up view of Inspection Report



2. To combine multiple shapefiles 2.1 Various types of Concessions

Type1) Multiple-zone Concessions

There are licenses with multiple zones in a single license.

	Licens	0009		License	_025 Zone10		
	Licens	2 Unes					
License_025 Zor	168						
Code_N	Zone ,	RefMark_	RefMark	Easting	Northing	License_025Z	Cone11
License_025	License_025 Zone8	- 1	A 👝	500441	1266148		\backslash
License_025	License_025 Zone8	2	B D	501231	1266171	· · · ·	$\left(\right)$
License_025	License_025 Zone8	3	C I	501636	1266248		11
License_025	License_025 Zone8	4	D	501653	1266170		
License_025	License_025 Zone8	0 5	E D	501252	1266078		
License_025	License_025 Zone8		F to	500911	1266076	E	
License_025	License_025 Zone8	E 7	G 🕡	500441	1266095		
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License_025	License_025 Zone9	13	M	503108	1266576		N
icense_025	License_025 Zone9	14	N	503114	1266525		
_icense_025	License_025 Zone9	15	0	502583	1266445		Licen
License_025	License_025 Zone9	16	P	502444	1266409		
License_025	License_025 Zone9	17	Q	502243	1266348		
License_025	License_025 Zone9	18	R	502031	1266274		
License_025	License_025 Zone9	19	S	501663	1266186		
License_025	License_025 Zone10	20	Т	503112	1266597		
License_025	License_025 Zone10	21	U	503678	1266626		
_icense_025	License_025 Zone10	22	V	504084	1266580		
_icense_025	License_025 Zone10	23	W	504402	1266444		
License_025	License_025 Zone10	24	Х	504359	1266367		
License_025	License_025 Zone10	25	Y	504097	1266462		
License_025	License_025 Zone10	26	Z	503464	1266523		
License_025	License_025 Zone10	27	A1	503126	1266/02		
License_025	License_025 Zone11	28	A2	This cas	se gives a	lphabetical order	as;
License_025	License_025 Zone11	29	A3	A A1 A	2 A3 A4	- 4,,B,C,D,E,Z	

For creating separate polygons (zones),

1) Input Zone in "Template_Concession.xls".

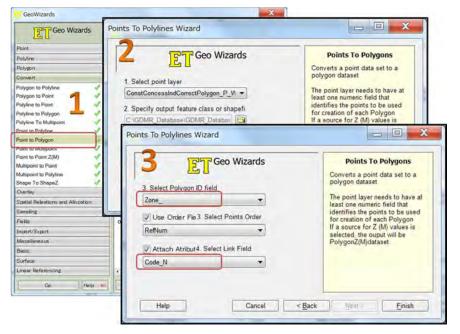
2) Input RefMark, by either of 2 ways ;

- Option1: By Input Number in Integer number field (1,2,3,4,5,6,7,8,9,10,11,...)
- Option2: By Input Alphabet in Character field (AA,AB,AC,AD,....AZ, BA,BB,BC,...)

3) Save & Close this Excel file.

4) Start ArcMap. Create point shapefile from XY. (See Operational Manual for procedure.) Add layer of this (may done automatically).

From toolbar, run ETGeoWizard, as below figures.



Type2) Line Concessions

For River sand concessions, linear concessions are issued along river. Three steps to create polygon concessions/shapefiles, as follows;

1) Create Polyline as first shapefile.

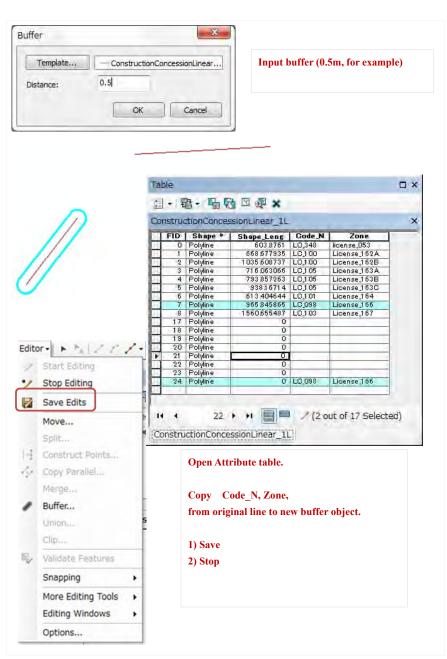
2) Modify from polyline to polygon; 3 ways ;

2)-1: Hand-tracing the width of river of satellite photo, using editor

Database Manag	gement Manual ((GDMR))

2)-2: Buffer to lines (individually), using editor

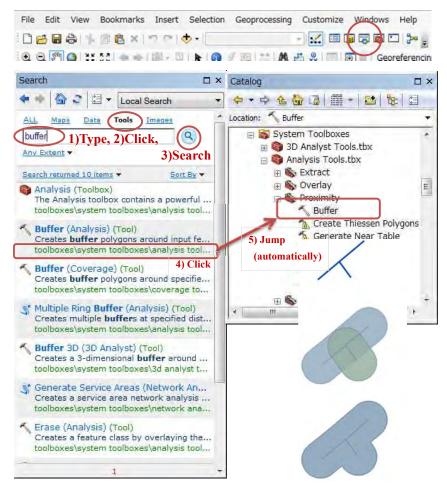
Insert Selection Geoprocessing	Customize Windows Help			
• • • 1:26,775 •		100000	3 11 11 11 13	100x - 0 0 0
10 k 🛛 / 🗊 🔛 🕅 📇	👷 🗊 🗊 🖕 🕴 Editor -	A 4	中国国	
		Edit Tool		
		Contraction of the second	edit features in n. This tool sele	
			electable layer nes you are no	
		editing. If t	there is more to ble feature wh	han
		you click, y	ou can refine t y clicking the	
		selection ic	on that appear	son
		the map.		
/	Editor		1 + 11.	
		tart Editing		
		top Editing		
	🙀 S	Save Edits		-
	N	love		
Choose Buffer.	9	split		
	14 0	Construct Po	ints	
	4 0	Copy Parallel		
	N	lerge	_	
	e e	Buffer		
	L	Union	Buffer	
	L			new feature at a
		Union	Create a buffered	distance from
		Jnion	Create a buffered	distance from point, line, or polygon
		Jnion Clip /alidate Feat	Create a buffered selected features.	distance from point, line, or polygon



Database Management Manual (GDMR)

2)-3: Give Buffer to lines (of all lines in a shapefile), using Arctool, as below.

Click "Search" icon.

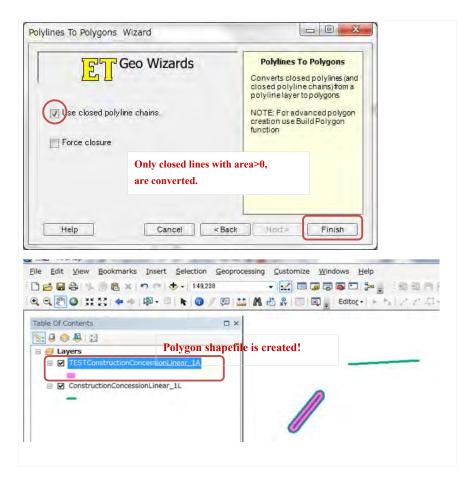


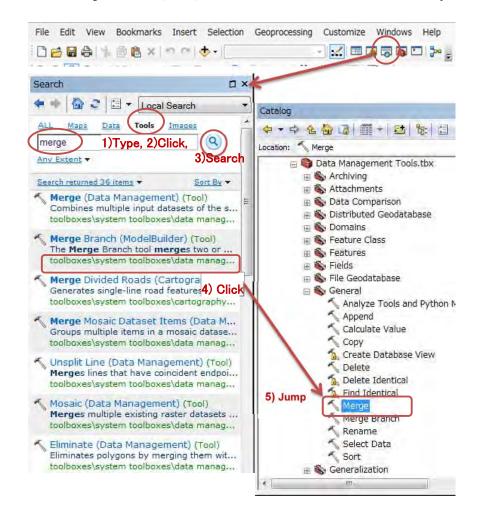
3) Convert Polyline to Polygon.

Run ETGeoWizard from Toolbar

Geo Wizards	Polygon To Polyline	, T				
Point	Go to ToolBox Implementation	Go to				
Polyline		a management of the second				
Polygon	Converts a polygon data set to a po	olyline feature class				
Convert	Inputs:					
Polygon to Polyline 🛛 🖓 🔺						
Polygon to Point	A polygon feature layer					
Polyline to Point						
Polyline to Polygon	Outputs:					
Polyline To Maltipoint	New polyline feature class					
Point to Polyline						
Point to Polygon	Notes :					
Point to Multipoint	and and an internet with	Contraction of the Association o				
Point to Point Z(M)	 Each ring of a polygon will be represented by a single polyline. The common boundaries between the 					
Multipoint to Point 🥥 🔫	polygons will be represente					
Overlay	The Clean Polylines Wizard					
Spatial Releations and Allocation		 intersections and remove duplicate lines. The attributes of the original polygons are transferred to 				
e contraction of the contraction						
Sampling	the resulting polylines.	I polygons are transferred to				
Sampling Fields	the resulting polylines.If the input is of PolygonZ(M) type, the output will be of				
Fields Import/Export	the resulting polylines.) type, the output will be of				
Fields Import/Export Miscellaneous	the resulting polylines. If the input is of PolygonZ(M PolylineZ(M) type. The Z(M)) type, the output will be of				
Fields Import/Export Miscellaneous Basic	the resulting polylines.If the input is of PolygonZ(M) type, the output will be of values will be preserved.				
Fields Import/Export Miscellaneous Basic Surface Polylines To Polyg	the resulting polylines. If the input is of PolygonZ(M PolylineZ(M) type. The Z(M) ToolBox implementation (Go to TOP)) type, the output will be of				
Fields Import/Export Miscellaneous Basic Surface Polylines To Polyg Linear Referen	the resulting polylines. If the input is of PolygonZ(M PolylineZ(M) type. The Z(M) ToolBox implementation (Go to TOP)) type, the output will be of values will be preserved.				
Fields Import/Export Miscellaneous Basic Surface Polylines To Polyg Linear Referen	the resulting polylines. If the input is of PolygonZ(M PolylineZ(M) type. The Z(M) ToolBox implementation (Go to TOP) ons Wizard) type, the output will be of values will be preserved.				
Fields Import/Export Miscellaneous Basic Surface Polylines To Polyg Linear Referen	the resulting polylines. If the input is of PolygonZ(M PolylineZ(M) type. The Z(M) ToolBox implementation (Go to TOP)) type, the output will be of values will be preserved.				
Fields Import/Export Miscellaneous Basic Surface Polylines To Polyg Linear Referen	the resulting polylines. If the input is of PolygonZ(M PolylineZ(M) type. The Z(M) ToolBox implementation (Go to TOP) ons Wizard) type, the output will be of values will be preserved.				
Fields Import/Export Miscellaneous Basic Surface Polylines To Polyg Linear Referen	the resulting polylines. If the input is of PolygonZ(M PolylineZ(M) type. The Z(M) ToolBox implementation (Go to TOP) ons Wizard Geo Wizards) type, the output will be of values will be preserved.				
Fields Import/Export Miscellaneous Basic Surface Polylines To Polyg Linear Referen Go	the resulting polylines. If the input is of PolygonZ(M PolylineZ(M) type. The Z(M) ToolBox implementation (Go to TOP) ons Wizard Geo Wizards) type, the output will be of values will be preserved.				
Fields Import/Export Miscellaneous Basic Surface Polylines To Polyg Linear Referen Go 1. Select polylin	the resulting polylines. If the input is of PolygonZ(M PolylineZ(M) type. The Z(M) ToolBox implementation (Go to TOP) ons Wizard Geo Wizards) type, the output will be of values will be preserved.				
Fields Import/Export Miscellaneous Basic Surface Polylines To Polyg Linear Referen Go 1. Select polylin	the resulting polylines. If the input is of PolygonZ(M PolylineZ(M) type. The Z(M) ToolBox implementation (Go to TOP) ons Wizard Geo Wizards ne layer) type, the output will be of values will be preserved.				
Fields Import/Export Miscellaneous Basic Surface Polylines To Polyg Linear Referen Go 1. Select polylin ConstructionCo	the resulting polylines. If the input is of PolygonZ(M PolylineZ(M) type. The Z(M) ToolBox implementation (Go to TOP) ons Wizard Geo Wizards ne layer) type, the output will be of values will be preserved.				
Fields Import/Export Miscellaneous Basic Surface Polylines To Polyg Linear Referen Go 1. Select polylin ConstructionCo	the resulting polylines. If the input is of PolygonZ(M PolylineZ(M) type. The Z(M) ToolBox implementation (Go to TOP) toons Wizard Geo Wizards ne layer mcessionLinear_1L) type, the output will be of values will be preserved.				

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2.2 Merge Multiple shapefiles into a single file

By department, multiple shapefiles must be merged into 1 shapefile. This will make it easy to Search/Count concession on interest.

- Multiple zones of a license
 Input Zone to separate polygon
- Different datum
 - Seperately to create Feature from XY
- LINE (Linear) concession
 - Create Polyline by ETGeoWizard
 - Buffer of ArcToolbox

"Merge" Tool

Polygon shapefile-1

Polygon

Polygon

shapefile-3

shapefile-2

Merge

loput Detasets

Output Dateset

Shies Delete

54

Field Map (optional)

E Licenseli (Text)

ConstConcessind SourceDatu (Text)

Rename

Merge Rule

Properties.

- 0 ×

JICA Project

3. Topics on Interest

Data

1)Type,

Summary: not available.

Table To Excel (Conversion) (Tool)

1

Search

ALL

excel

Any Extent *

Maps

Search returned 5 items *

S Excel (Toolset)

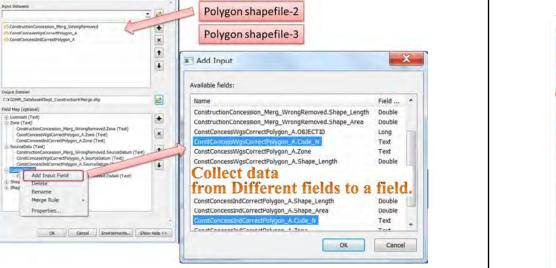
3.1 Export to Excel file / Using Pivot table

Images

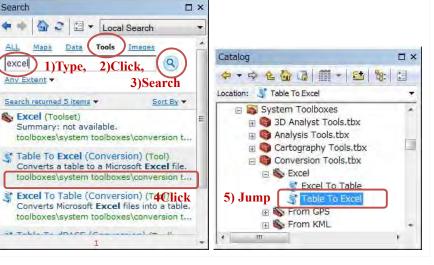
2 🗄 🔻 Local Search

Tools

2)Click

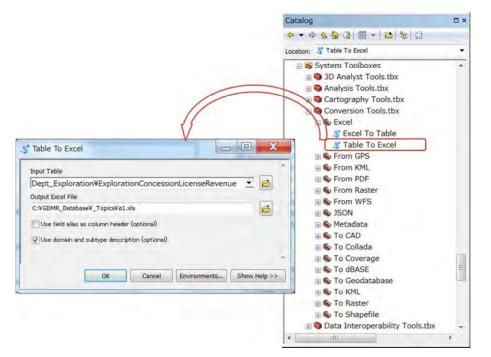


Polygon shapefile-1



Input Table		
Dept_Construction¥Construct	ionConcessionLicenseRevenue	
Output Excel File		\sim
C:¥Users¥Public¥Documents¥Const	ructionConcessionLicenseRevenue.xls	(🖻)
👿 Use field alias as column header (a	optional)	\bigcirc
Use domain and subtype description	on (optional)	

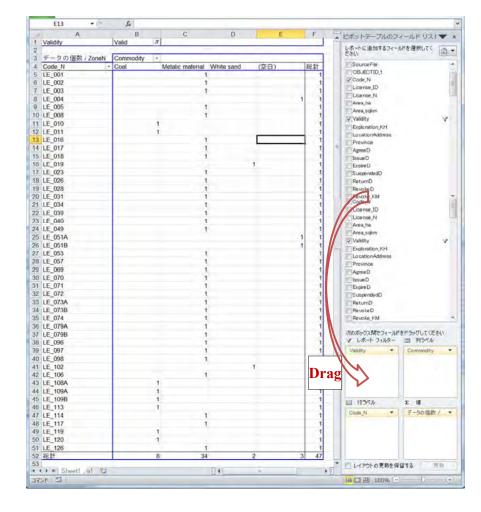
Using tool "Table To Excel", Khmer characters data never destroyed.



Start Microsoft Excel, Open tye Excel file. Insert PivotTable.



Database Management Manual (GDMR)



See from below website, more about Pivot table. .

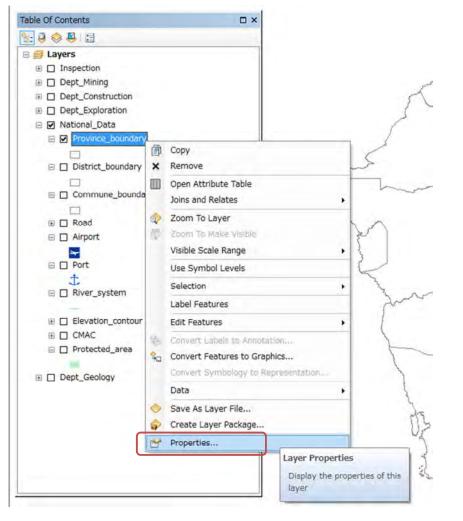
https://support.office.com/en-us/article/Create-a-PivotTable-to-analyze-worksheet-data-a9a84538-bfe 9-40a9-a8e9-f99134456576?ui=en-US&rs=en-US&ad=US

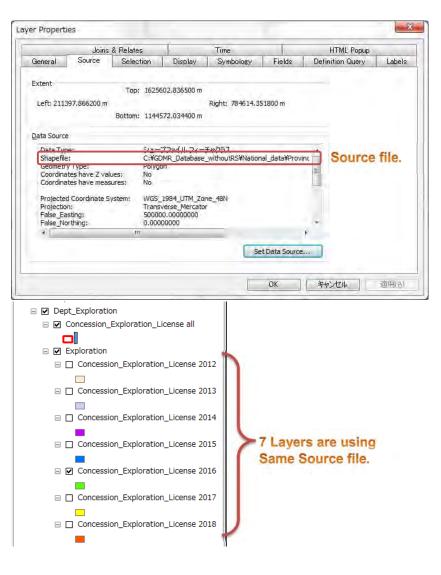
http://www.siumed.edu/lib/classes/excel/Excel2010-PivotTables.pdf

3.2 Understanding Layer/Layerfile

- Layer is useful because it keep your selecting data/objects.
- Layer can be saved as Layerfile (.lyr).
- You can create a lot of layers with your queries, from a same shapefile.
- Layer has no data and needs a source file of shapefile instead.
- Layer has information of linking path to the source file, query script and symbology.

Let's check the source file of a layer

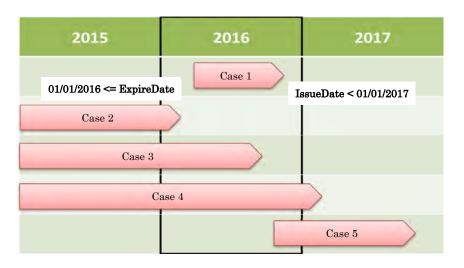


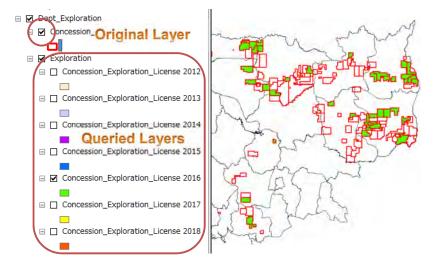


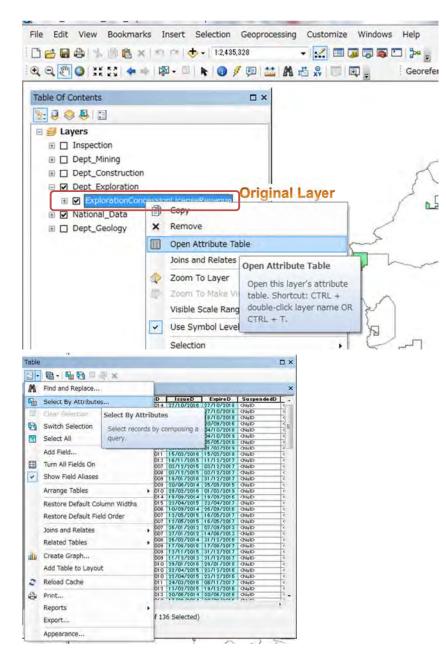
3.3 New Layer for Valid concession by Year

Licenses are valid only during the period from Issue date to Expire date, unless canceled/ surrenderred/ Relinquished.

GDMR database stores both licenses of valid and invalid over years. If you want to show only valid licenses of 2016, you must select using script which covers all cases as below.

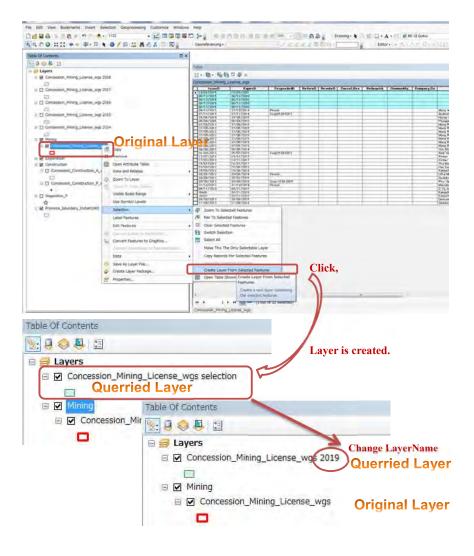






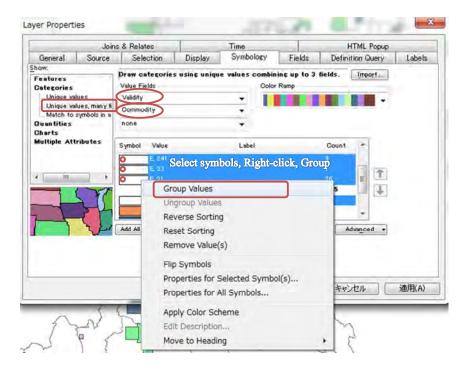
inter a WH	ERE clause to select records in the table window.	
fethod :	Oreate a new selection	*
"Location "Province "AgreeD" "IssueD" "ExpireD"		-
>	Like date '2011-08-17 00:00:00' date '2011-08-25 00:00:00' date '2011-12-23 00:00:00' date '2012-01-25 00:00:00'	
	O Not date '201 2-01 -27 00:00:00' date '201 2-02-24 00:00:00' date '201 2-02-24 00:00:00'	2016-valid
ls	In Null Bat Unique Values Go To:	
ELECT * P	FROM ExplorationConsessionLicense WHERE:	
	IssueD AND	<pre>date '2017-01-01 00:00:00'</pre>
Slear	AND	D >= date '2016-01-01 00:00:00'
SELEO	AND Expire Verify Help Load,. Som Apply Close	D >= date '2016-01-01 00:00:00'
SELEC	Verify Help Loady. Save	D >= date '2016-01-01 00:00:00'

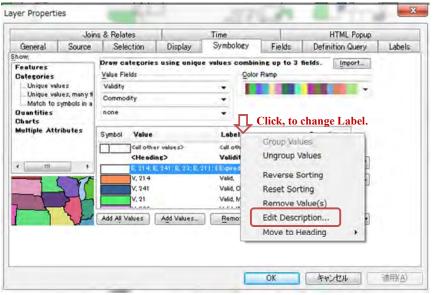
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Apply

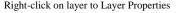
Close

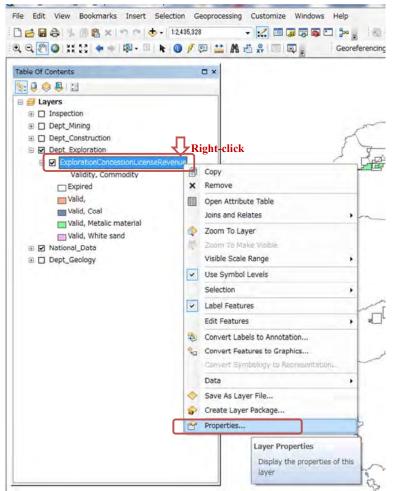




3.4 Count Concessions, using Categorizing Symbology

We can count each category of concessions, using symbology.





For counting categorized concessions, go to Symbology then assign Categories, as below.

	Joins & Relates		Time	-		HTML Popup	
General Sour	rce Selection	Display	Symbology	Fields	Defin	ition Query	Labels
Bow: Features Categories Unique values Unique values, mai Math to symbols Quantities Charts Multiple Attributes	Value Fields Validity Dommodity none Sambol Value Call ott	s ner values> lin 5 > E, 241 ; E, 23 ; E,	Label Call other values Validity, Do 21.1; E Expired Valid, Coal Valid, Metalic	Ramp Cli Jes> mmodity	ck, Boun 1 135 89 2 8 34		counting

The END