

Seismic Data Management

SOFTWARE, WORKFLOWS AND SERVICES

Troika enables competitive advantage by helping to future-proof seismic libraries and deliver fast access to the right data. We provide a comprehensive suite of software and expert support services to recover data and condition datasets for computing and analytics.

www.troika-int.com

Troika is a major supplier of Seismic Data Management utilities to the upstream oil & gas industry

Data discovery, QC repair, meta-data extraction and imaging at very fast speed

WHO USES TROIKA

- Governments worldwide (NDRs, datarooms)
- Oil & gas companies (major, super major & NOCs)
- Speculative (multi-client) data suppliers
- Data transcription centres
- Service companies

WHY THEY USE TROIKA

- Maximising the value of their most important assets
- Improving the quality (reliability) of the data
- Decreasing the time to load, making the business more efficient
- Increasing knowledge of data in the business
- Reading and extracting metadata to populate the master database

MOU Signed between SEG and OSDU

THE SEG FORMATS REMAIN THE INTERNATIONAL EXCHANGE

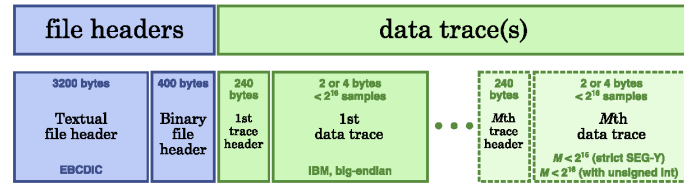
STANDARDS

SEG MDIO ZGY VDS



NOD (formerly NPD) Announcement

Rev
0
1975



KEY

mandatory

optional

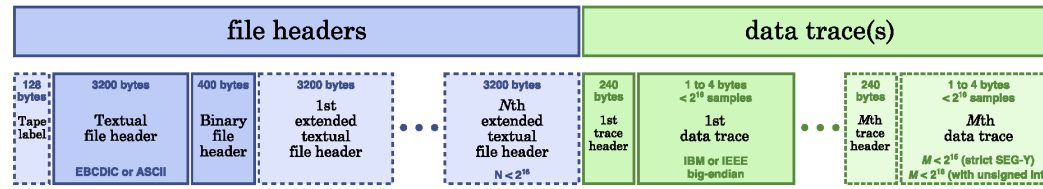
Changes from Rev 0 to Rev 1

- File may be written to any medium resolvable to a stream of variable length records.
- Data word formats expanded to include IEEE 32-bit float, and 8-bit integers.
- Some additional fields in the binary file header and trace headers, others clarified.
- Textual file header can be ASCII encoded.
- Extended textual file header introduced, using a stanza layout.
- Trace identification expanded, and engineering conversions introduced.
- Note that little-endian byte ordering is not compliant with Rev 0 or Rev 1.

What is SEG-Y?

- Widely adopted binary file standard for seismic data, especially industrial seismic reflection data.
- Maintained by the SEG Technical Standards Committee.
- Updated to accommodate high-capacity media and trends in seismic acquisition, such as 3D, time lapse, very high trace-densities, and microseismic monitoring.
- Files contain 2 or more file headers, one textual and one binary, followed by one or more data traces, each with one or more headers.
- Latest version, SEG-Y Rev 2, was ratified in April 2017.
- SEG-Y is not intended as a field recording format; see the SEG-D and SEG-2 formats.

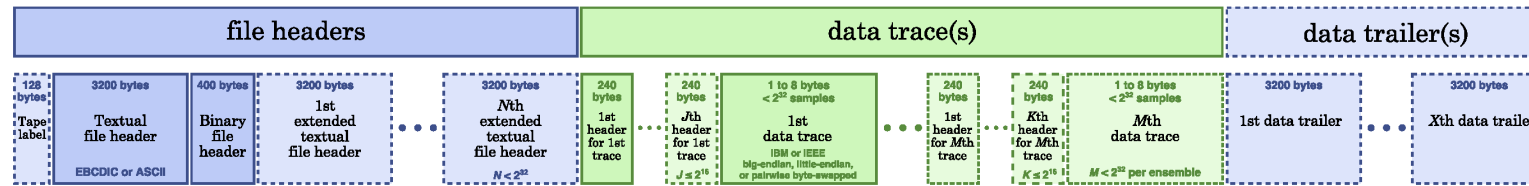
Rev
1
2002



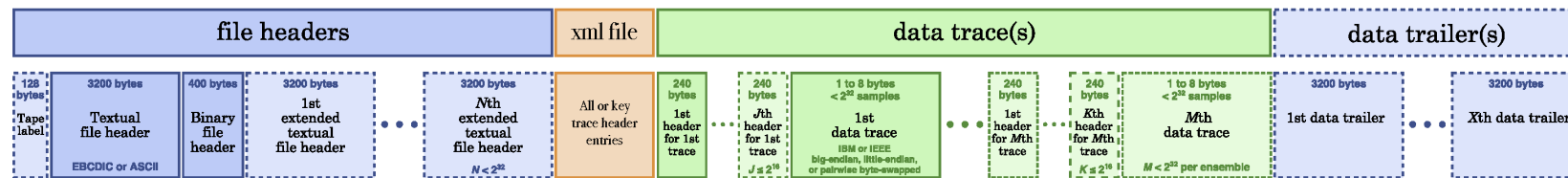
Changes from Rev 1 to Rev 2

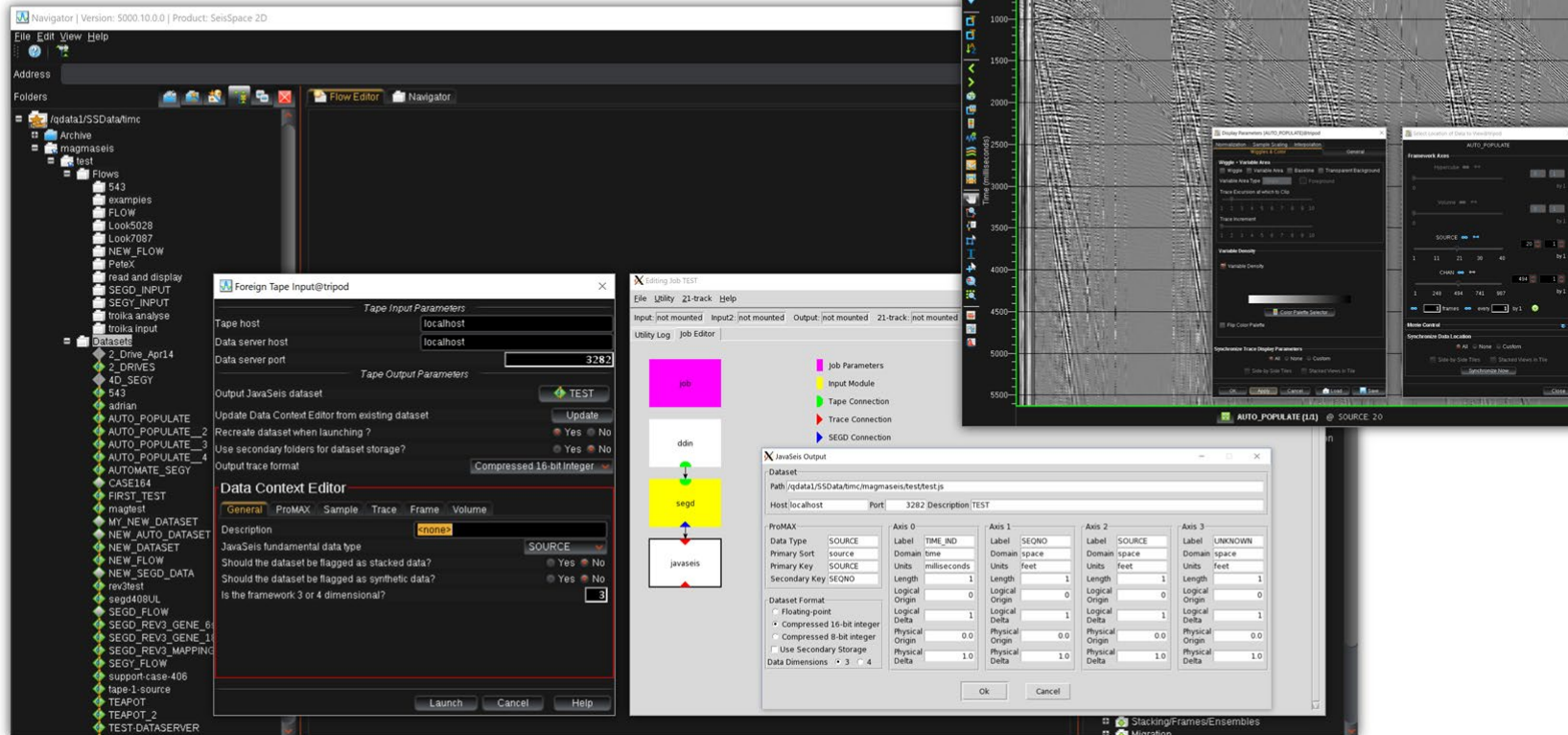
- Support for little-endian byte ordering, and pairwise byte-swapping.
- Provision for up to 65 535 additional trace headers; bytes 233-240 for names.
- Up to $2^{16} - 1$ samples/traces and trace/record, and $2^{16} - 1$ traces/line or traces/file.
- Arbitrarily large or small sample intervals.
- Additional sample formats, including IEEE 64-bit floats.
- Microsecond precision in time and date stamps.
- Additional precision on coordinates, depths, elevations, and more CBS support.
- Extended textual file header stanzas must start at 3200-byte boundaries.
- Stanzas may appear after the last data trace in a data trailer.
- Flexible trace header mapping via extended textual file header definition.
- XML allowed in extended textual file header and data trailer.

Rev
2
2017



Rev
2.1
2023





Troika's Magma software was selected to handle all Foreign Tape Input into the Halliburton Landmark SeisSpace® Seismic Processing System



An intelligent disk trawler for identifying seismic file information and extracting basic metadata. The software launches Midi and Minima software as and when required for data transcription and/or QC.

- Efficiently identifies your seismic data
- Search by file or line name, encapsulation, format
- Report on possible duplicates
- A GUI to build and run Midi jobs
- Run prebuilt Midi workflows
- Build and run custom Midi jobs
- Launch Minima for interactive QC

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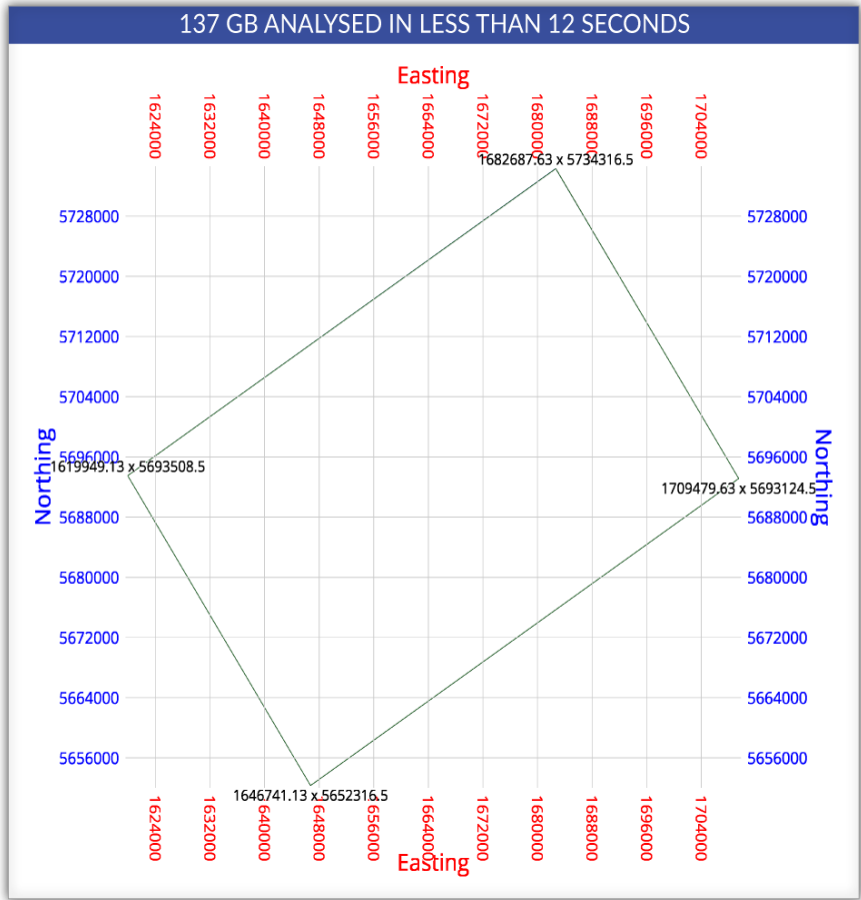
9 14:50:21 Text Header : 1 (EBCDIC)
10 14:50:21 C01 AREA : Taranaki_Basin - PARIHAKA-3D PSTM/PEGI
11 14:50:21 C02 DESCRIPTION: 3D SEISMIC COVERAGE
12 14:50:21 C03 SURVEY: PARIHAKA-3D
13 14:50:21 C04 INLINE: 1667 - 5599 CROSSLINE: 2050 - 14026 CDP: 166702050 - 559914026
14 14:50:21 C05 SAMPLE RATE: 4000 RECORD LENGTH: 6004 CLASS: 3D SEISMIC
15 14:50:21 C06=====
16 14:50:21 C07 THIS DATASET HAS BEEN COMPILED FROM A RANGE OF OPEN FILE SEISMIC DATA,
17 14:50:21 C08 COORDINATES CONVERTED TO A STANDARD PROJECTION AND WRITTEN IN SEGY FORMAT.
18 14:50:21 C09=====
19 14:50:21 C10 THIS DATASET WAS PREPARED AND COMPILED BY NEW ZEALAND PETROLEUM AND
20 14:50:21 C11 MINERALS (NZPM), 15 STOUT ST, WELLINGTON, 6140, NEW ZEALAND.
21 14:50:21 C12
22 14:50:21 C13 THIS DATA IS PROVIDED ON A "AS IS" BASIS AND ALTHOUGH DATA HAS BEEN
23 14:50:21 C14 MODIFIED BY NZPM, NO WARRANTY, EXPRESSED OR IMPLIED, IS MADE BY
24 14:50:21 C15 NZPM AS TO THE ACCURACY OF THE DATA OR RELATED MATERIALS, ITS
25 14:50:21 C16 COMPLETENESS OR FITNESS FOR PURPOSE. IN NO EVENT WILL NZPM, ITS
26 14:50:21 C17 EMPLOYEES, AGENTS OR CONTRACTORS BE LIABLE FOR ANY LOSS COSTS OR DAMAGE
27 14:50:21 C18 ARISING FROM ANY PARTIES USE OR RELIANCE ON THE DATASET INCLUDING ANY
28 14:50:21 C19 CONSEQUENTIAL, SPECIAL, INDIRECT, INCIDENTAL, PUNITIVE OR EXEMPLARY
29 14:50:21 C20 DAMAGES, COSTS, EXPENSES OR LOSSES. NZPM WILL NOT ACCEPT ANY
30 14:50:21 C21 LIABILITY FOR THE CONSEQUENCES OF ANY PARTY ACTING ON THIS INFORMATION.
31 14:50:21 C22=====
32 14:50:21 C23 THE 3D DATA HAS BEEN DATUM AND PHASE SHIFTED.
33 14:50:21 C24 CROSSLINE INCREMENT OF 2
34 14:50:21 C25
35 14:50:21 C26
36 14:50:21 C27 POINTS USED FOR ^ INLINE 1667 XLINE 2050 1646743E 5652325M
37 14:50:21 C28 SURVEY DEFINITION^ INLINE 1667 XLINE 14026 1709471E 5693126M
38 14:50:21 C29 ^ INLINE 5599 XLINE 14026 1682668E 5734313N
39 14:50:21 C30=====
40 14:50:21 C31 TRACE HEADER BYTE LOCATIONS:

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101 14:50:21 Edge Scan started :
102 14:50:21 Edge Scan completed
104
105 14:50:21 Calculating Geometry :
106 14:50:27 Geometry completed
107
108 14:50:27 Geom Edge Scan Results :
109 14:50:27 Primary Sort : Inline
110 14:50:27 Bin Height : 12.5
111 14:50:27 Bin Width : 12.5
112 14:50:27 Min X : 1619958.00
113 14:50:27 Min Y : 5652325.00
114 14:50:27 Max X : 1709471.00
115 14:50:27 Max Y : 5734313.00
116 14:50:27 Min Inline : 1667
117 14:50:27 Min Crossline : 2050
118 14:50:27 Max Inline : 5599
119 14:50:27 Max Crossline : 14026
120 14:50:27 Inline Inc. : 1
121 14:50:27 Crossline Inc. : 2
122 14:50:27 Inlines run : East -> East at 56.9583 Degrees
123 14:50:27 Bin Centers at four corners :
124 14:50:27 A : 1667 , 2050 1646743.00 , 5652325.00
125 14:50:27 B : 5599 , 2050 1619958.00 , 5693506.00
126 14:50:27 C : 5599 , 14026 1682668.00 , 5734313.00
127 14:50:27 D : 1667 , 14026 1709471.00 , 5693126.00
128
129 14:50:27 Creating output images :
130 14:50:27 GIS :: D:\Testing\Demo\BO_Parihaka3D-GIS_image.png
131 14:50:28 BOX :: D:\Testing\Demo\BO_Parihaka3D-BOX_image.png
132 14:50:32 Completion: Normal
133

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GEOM

Fast 3D Dataset Geographical Analysis

Within a few seconds this utility reports key parameters including spacing and extents of inlines, crosslines and x,y coordinates for a 3D dataset as a geometrical quality control check prior to lengthy data loading operations.

Geom will calculate and output Inline/Crossline corner points, survey azimuth, bin dimensions, tracecount, etc. and optionally an outline surface type image. Geom can be used to validate and gain assurance that your data meets your basic requirements. Geom is a high speed Post-stack SEG Y 3D Data Geographical Analysis tool which allows the user to collect fast information on:

- Textual Headers
- Trace Headers Bin Spacing
- Inlines/Crossline and X/Y Coordinates
- Geometrical Corner Points
- Shapefiles
- Logfile including all of above, including the ability to export Header Definitions for integration into Macros or other text files



MINIMA

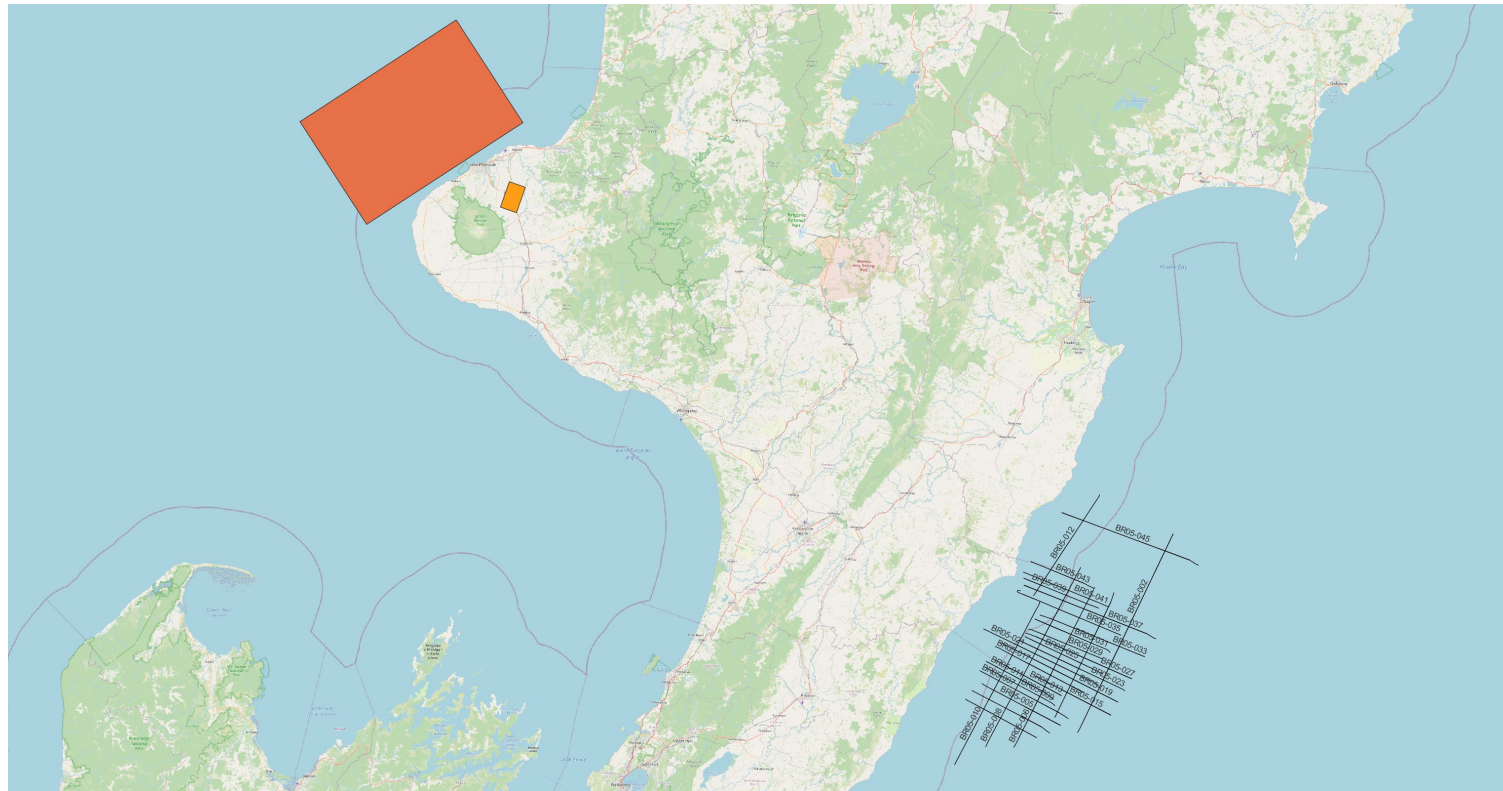
QC and Rationalise SEG-Y and Navigation Data

Line number	Value	Value description	
1 - 4	Job number	8119	
5 - 8	Line number	101	
9 - 12	Reel number	25493505	
13 - 14	Data traces / ensemble	1	
15 - 16	Auxiliary traces / ensemble	0	
17 - 18	Sample Interval	4000	
21 - 22	Samples / trace	1516	
25 - 26	Sample format code	1	4-byte IBM floating-point
27 - 28	Ensemble fold	1	
29 - 30	Trace sort code	4	Horizontally stacked
31 - 32	Vertical sum code	1	No sum
51 - 52	Gain recovered flag	1	Yes
53 - 54	Amplitude recovery method	4	Other (not Spherical divergence or AGC)
55 - 56	Measurement system code	1	Meters
57 - 58	Impulse signal polarity	1	Pressure increase / upward movement gives negative value
97 - 100	Byte order flag	0	
301 - 301	Major format revision number	0	Major revision 0
302 - 302	Minor format revision number	0	Minor revision 0
303 - 304	Fixed trace length flag	0	Trace lengths may vary
305 - 306	Extended textual headers	0	

Rationalizes 2D and 3D SEG-Y data on disk and provides the opportunity to repair datasets to prepare them for problem-free uploading to workstations for processing, analysis, interpretation and other applications.

- An interactive view on your data, display sections and slices
- View and compare locations from 2D seismic and navigation files
- Report and highlight data inconsistencies
- Produce 2D and 3D shapefiles
- Condition the data
- Commit changes to original files or write new volumes
- Create navigation files from seismic headers

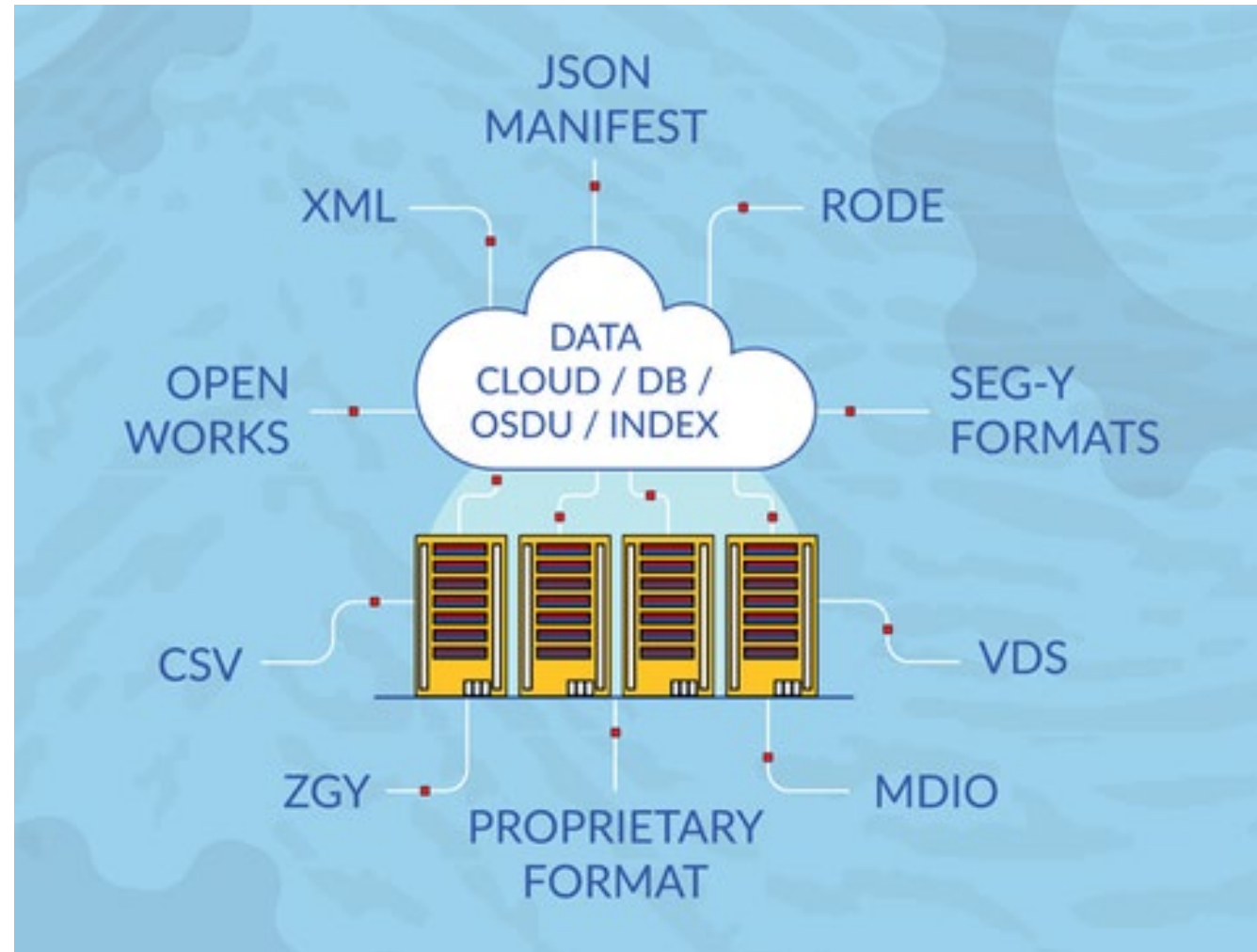
Data Posted To GIS



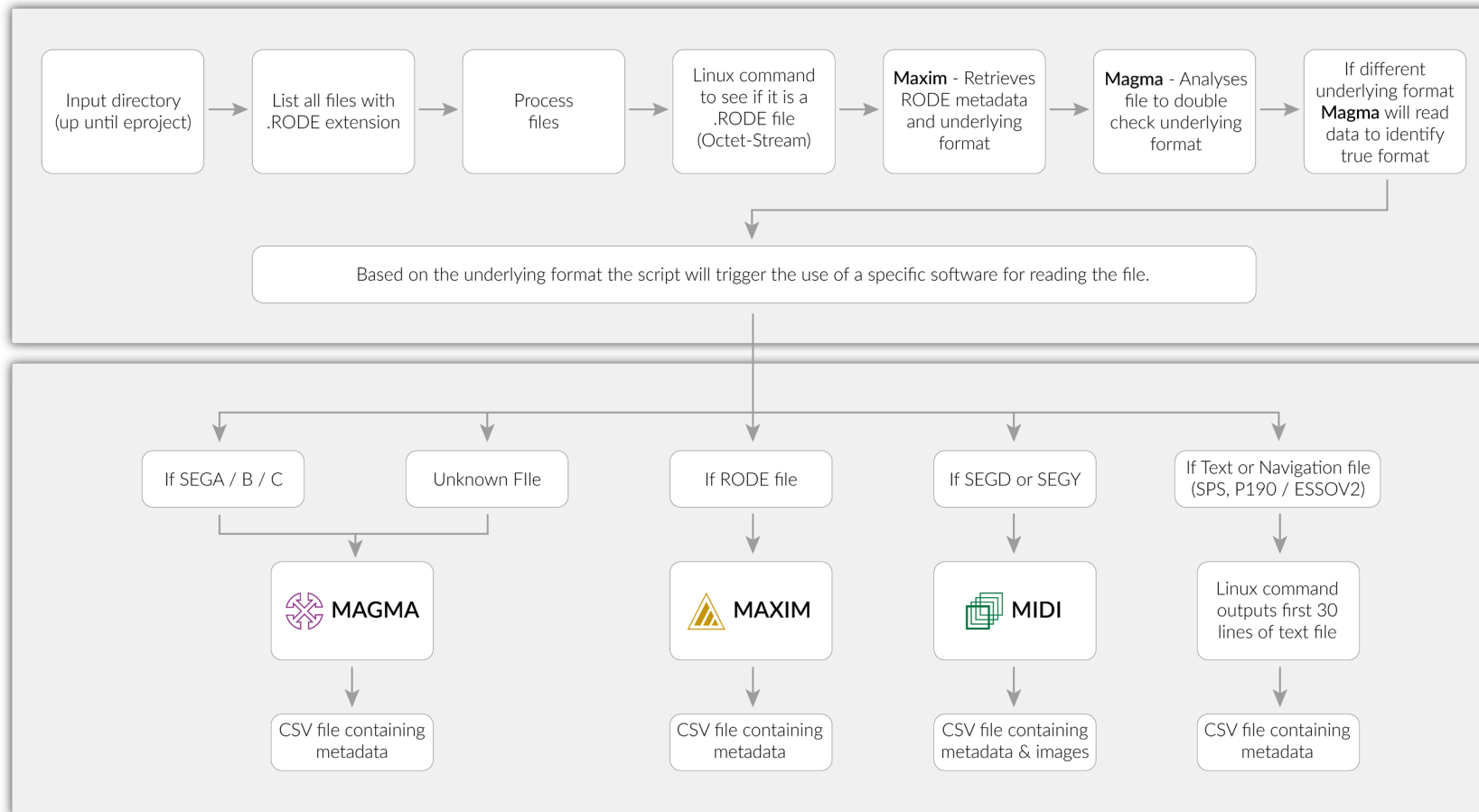
Select CRS

Apply and Output Shape
File

Post To GIS system



Data Scanning – An automated solution for Shell

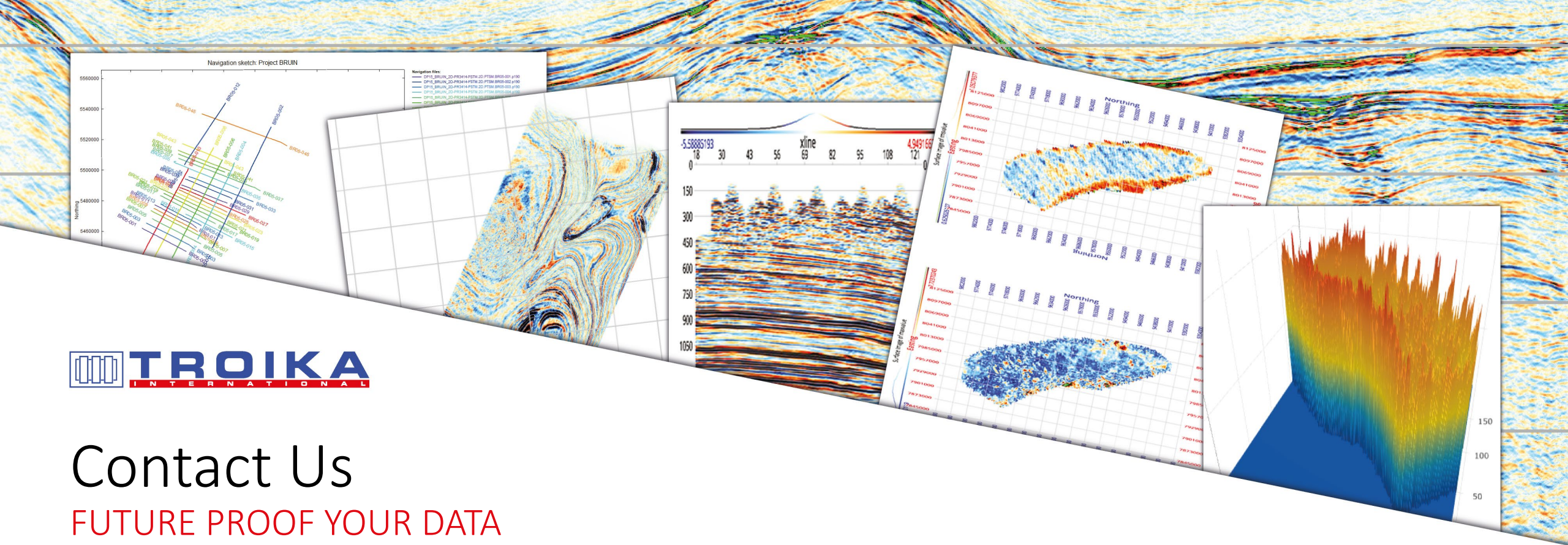


The scope of work

- Master database had become out of sync with the data
- Re index required
- Roughly 800,000 files in Rode encapsulation all of which were an unknown format

Troika's solution

- Troika supplied an automated solution to extract metadata & make sure the data was in sequence
- The client then had all the information needed to identify the data and decide which process should be used in the next phase
- Shell had allocated 14 months for the project and Troika delivered it in 4 weeks



Contact Us

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