

Notice: Use this form to request a **written response (on agency letterhead)** from the Department of Natural Resources (DNR) regarding technical assistance, a post-closure change to a site, a specialized agreement or liability clarification for Property with known or suspected environmental contamination. A fee will be required as is authorized by s. 292.55, Wis. Stats., and NR 749, Wis. Adm. Code., unless noted in the instructions below. Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records law [ss. 19.31 - 19.39, Wis. Stats.].

Definitions

"Property" refers to the subject Property that is perceived to have been or has been impacted by the discharge of hazardous substances.

"Liability Clarification" refers to a written determination by the Department provided in response to a request made on this form. The response clarifies whether a person is or may become liable for the environmental contamination of a Property, as provided in s. 292.55, Wis. Stats.

"Technical Assistance" refers to the Department's assistance or comments on the planning and implementation of an environmental investigation or environmental cleanup on a Property in response to a request made on this form as provided in s. 292.55, Wis. Stats.

"Post-closure modification" refers to changes to Property boundaries and/or continuing obligations for Properties or sites that received closure letters for which continuing obligations have been applied or where contamination remains. Many, but not all, of these sites are included on the GIS Registry layer of RR Sites Map to provide public notice of residual contamination and continuing obligations.

Select the Correct Form

This form should be used to request the following from the DNR:

- Technical Assistance
- Liability Clarification
- Post-Closure Modifications
- Specialized Agreements (tax cancellation, negotiated agreements, etc.)

Do **not** use this form if one of the following applies:

- Request for an **off-site liability exemption or clarification** for Property that has been or is perceived to be contaminated by one or more hazardous substances that originated on another Property containing the source of the contamination. Use DNR's Off-Site Liability Exemption and Liability Clarification Application Form 4400-201.
- Submittal of an Environmental Assessment for the **Lender Liability Exemption**, s 292.21, Wis. Stats., **if no response or review by DNR is requested**. Use the Lender Liability Exemption Environmental Assessment Tracking Form 4400-196.
- Request for an **exemption to develop on a historic fill site** or licensed landfill. Use DNR's Form 4400-226 or 4400-226A.
- **Request for closure** for Property where the investigation and cleanup actions are completed. Use DNR's Case Closure - GIS Registry Form 4400-202.

All forms, publications and additional information are available on the internet at: dnr.wi.gov/topic/Brownfields/Pubs.html.

Instructions

1. Complete sections 1, 2, 6 and 7 for all requests. Be sure to provide adequate and complete information.
2. Select the type of assistance requested: Section 3 for technical assistance or post-closure modifications, Section 4 for a written determination or clarification of environmental liabilities; or Section 5 for a specialized agreement.
3. Include the fee payment that is listed in Section 3, 4, or 5, unless you are a "Voluntary Party" enrolled in the Voluntary Party Liability Exemption Program **and** the questions in Section 2 direct otherwise. Information on to whom and where to send the fee is found in Section 8 of this form.
4. Send the completed request, supporting materials and the fee to the appropriate DNR regional office where the Property is located.

See the map on the last page of this form. A paper copy of the signed form and all reports and supporting materials shall be sent with an electronic copy of the form and supporting materials on a compact disk. For electronic document submittal requirements see: <http://dnr.wi.gov/files/PDF/pubs/rr/RR690.pdf>

The time required for DNR's determination varies depending on the complexity of the site, and the clarity and completeness of the request and supporting documentation.

Technical Assistance, Environmental Liability Clarification or Post-Closure Modification Request

Form 4400-237 (R 12/18)

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Section 1. Contact and Recipient Information

Requester Information

This is the person requesting technical assistance or a post-closure modification review, that his or her liability be clarified or a specialized agreement and is identified as the requester in Section 7. DNR will address its response letter to this person.

Last Name Nelson	First Denice	MI	Organization/ Business Name Tyco Fire Products LP
Mailing Address 2700 Industrial Parkway South			City Marinette
			State WI
			ZIP Code 54143
Phone # (include area code)	Fax # (include area code)	Email	

The requester listed above: (select all that apply)

- Is currently the owner
 Is considering selling the Property
 Is renting or leasing the Property
 Is considering acquiring the Property
 Is a lender with a mortgagee interest in the Property
 Other. Explain the status of the Property with respect to the applicant:

Contact Information (to be contacted with questions about this request)

Select if same as requester

Contact Last Name Milionis	First Peter	MI	Organization/ Business Name Arcadis
Mailing Address 126 N Jefferson Street, Suite 400			City Milwaukee
			State WI
			ZIP Code 53202
Phone # (include area code) (267) 285-1815	Fax # (include area code)	Email peter.milionis@arcadis.com	

Environmental Consultant (if applicable)

Contact Last Name Milionis	First Peter	MI	Organization/ Business Name Arcadis
Mailing Address 126 N Jefferson Street, Suite 400			City Milwaukee
			State WI
			ZIP Code 53202
Phone # (include area code) (267) 285-1815	Fax # (include area code)	Email peter.milionis@arcadis.com	

Section 2. Property Information

Property Name Tyco Fire Technology Center - PFCs	FID No. (if known) 438005590
BRRTS No. (if known) 0238580694	Parcel Identification Number
Street Address 2700 Industrial Parkway South	City Marinette
	State WI
	ZIP Code 54143
County Marinette	Municipality where the Property is located <input checked="" type="radio"/> City <input type="radio"/> Town <input type="radio"/> Village of Marinette
	Property is composed of: <input type="radio"/> Single tax parcel <input type="radio"/> Multiple tax parcels
	Property Size Acres 380

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1. Is a response needed by a specific date? (e.g., Property closing date) Note: Most requests are completed within 60 days. Please plan accordingly.

No Yes

Date requested by: _____

Reason: _____

2. Is the "Requester" enrolled as a Voluntary Party in the Voluntary Party Liability Exemption (VPLE) program?

No. **Include the fee that is required for your request in Section 3, 4 or 5.**

Yes. **Do not include a separate fee.** This request will be billed separately through the VPLE Program.

Fill out the information in Section 3, 4 or 5 which corresponds with the type of request:

Section 3. Technical Assistance or Post-Closure Modifications;

Section 4. Liability Clarification; or Section 5. Specialized Agreement.

Section 3. Request for Technical Assistance or Post-Closure Modification

Select the type of technical assistance requested: [Numbers in brackets are for WI DNR Use]

- No Further Action Letter (NFA) (Immediate Actions) - NR 708.09, [183] - **Include a fee of \$350.** Use for a written response to an immediate action after a discharge of a hazardous substance occurs. Generally, these are for a one-time spill event.
- Review of Site Investigation Work Plan - NR 716.09, [135] - **Include a fee of \$700.**
- Review of Site Investigation Report - NR 716.15, [137] - **Include a fee of \$1050.**
- Approval of a Site-Specific Soil Cleanup Standard - NR 720.10 or 12, [67] - **Include a fee of \$1050.**
- Review of a Remedial Action Options Report - NR 722.13, [143] - **Include a fee of \$1050.**
- Review of a Remedial Action Design Report - NR 724.09, [148] - **Include a fee of \$1050.**
- Review of a Remedial Action Documentation Report - NR 724.15, [152] - **Include a fee of \$350**
- Review of a Long-term Monitoring Plan - NR 724.17, [25] - **Include a fee of \$425.**
- Review of an Operation and Maintenance Plan - NR 724.13, [192] - **Include a fee of \$425.**

Other Technical Assistance - s. 292.55, Wis. Stats. [97] (For request to build on an abandoned landfill use Form 4400-226)

- Schedule a Technical Assistance Meeting - **Include a fee of \$700.**
- Hazardous Waste Determination - **Include a fee of \$700.**
- Other Technical Assistance - **Include a fee of \$700.** Explain your request in an attachment.

Post-Closure Modifications - NR 727, [181]

- Post-Closure Modifications: Modification to Property boundaries and/or continuing obligations of a closed site or Property; sites may be on the GIS Registry. This also includes removal of a site or Property from the GIS Registry. **Include a fee of \$1050, and:**
 - Include a fee of \$300 for sites with residual soil contamination; and
 - Include a fee of \$350 for sites with residual groundwater contamination, monitoring wells or for vapor intrusion continuing obligations.

Attach a description of the changes you are proposing, and documentation as to why the changes are needed (if the change to a Property, site or continuing obligation will result in revised maps, maintenance plans or photographs, those documents may be submitted later in the approval process, on a case-by-case basis).

Skip Sections 4 and 5 if the technical assistance you are requesting is listed above and complete Sections 6 and 7 of this form Section 6. Other Information Submitted

Identify all materials that are included with this request.

Send both a paper copy of the signed form and all reports and supporting materials, and an electronic copy of the form and all reports, including Environmental Site Assessment Reports, and supporting materials on a compact disk.

Include one copy of any document from any state agency files that you want the Department to review as part of this request. The person submitting this request is responsible for contacting other state agencies to obtain appropriate reports or information.

Phase I Environmental Site Assessment Report - Date: _____

Phase II Environmental Site Assessment Report - Date: _____

Technical Assistance, Environmental Liability Clarification or Post-Closure Modification Request

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Legal Description of Property (required for all liability requests and specialized agreements)

Map of the Property (required for all liability requests and specialized agreements)

Analytical results of the following sampled media: Select all that apply and include date of collection.

Groundwater Soil Sediment Other medium - Describe: _____

Date of Collection: _____

A copy of the closure letter and submittal materials

Draft tax cancellation agreement

Draft agreement for assignment of tax foreclosure judgment

Other report(s) or information - Describe: Deep Aquifer Bedrock Well Design and Long-Term Monitoring Work Plan

For Property with newly identified discharges of hazardous substances only: Has a notification of a discharge of a hazardous substance been sent to the DNR as required by s. NR 706.05(1)(b), Wis. Adm. Code?

Yes - Date (if known): _____

No

Note: The Notification for Hazardous Substance Discharge (non-emergency) form is available at:

dnr.wi.gov/files/PDF/forms/4400/4400-225.pdf.

Section 7. Certification by the Person who completed this form

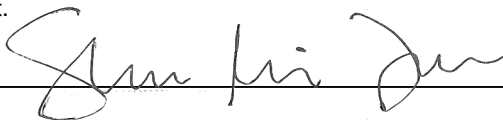
I am the person submitting this request (requester)

I prepared this request for: Denice Nelson

Requester Name

I certify that I am familiar with the information submitted on this request, and that the information on and included with this request is true, accurate and complete to the best of my knowledge. I also certify I have the legal authority and the applicant's permission to make this request.

Signature



Date Signed

9/27/2022

Senior Environmental Specialist

Title

(312) 575-3732
Telephone Number (include area code)

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Section 8. DNR Contacts and Addresses for Request Submittals

Send or deliver one paper copy and one electronic copy on a compact disk of the completed request, supporting materials, and fee to the region where the property is located to the address below. Contact a [DNR regional brownfields specialist](#) with any questions about this form or a specific situation involving a contaminated property. For electronic document submittal requirements see: <http://dnr.wi.gov/files/PDF/pubs/rr/RR690.pdf>.

DNR NORTHERN REGION

Attn: RR Program Assistant
Department of Natural Resources
223 E Steinfest Rd Antigo, WI 54409

DNR NORTHEAST REGION

Attn: RR Program Assistant
Department of Natural Resources
2984 Shawano Avenue
Green Bay WI 54313

DNR SOUTH CENTRAL REGION

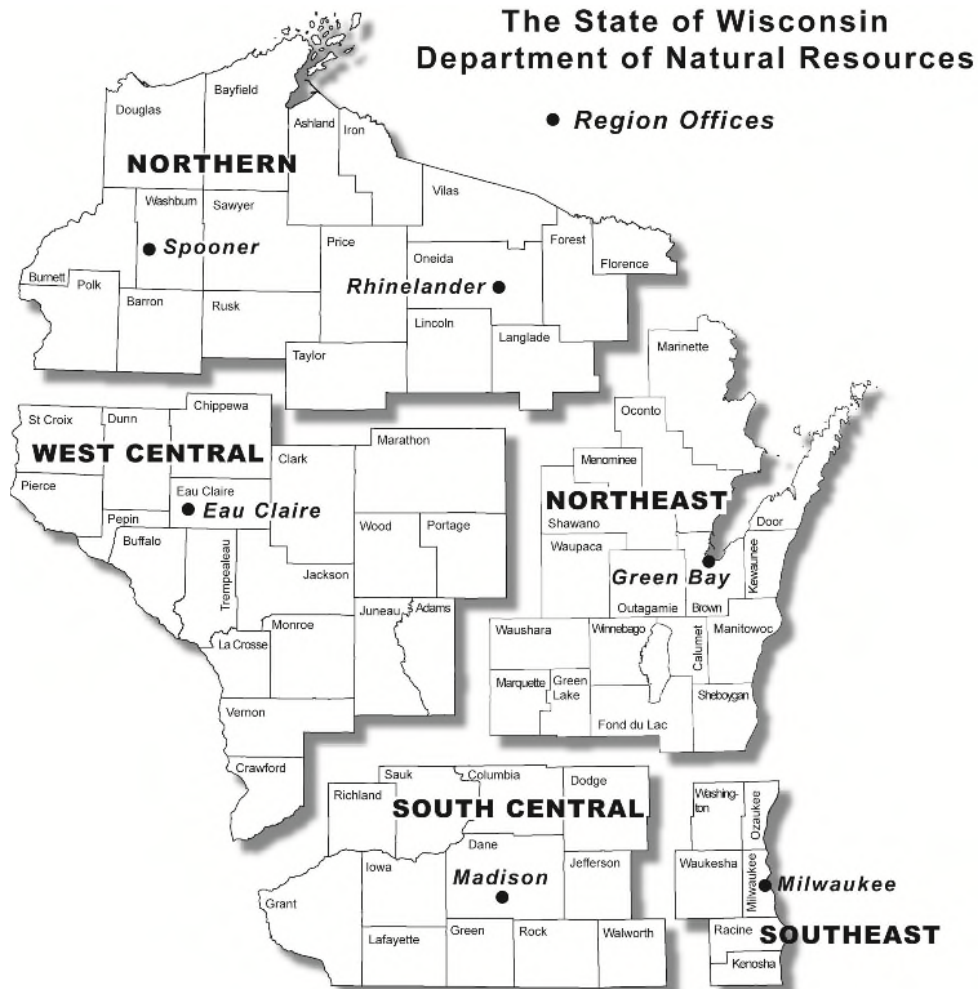
Attn: RR Program Assistant
Department of Natural Resources
3911 Fish Hatchery Road
Fitchburg WI 53711

DNR SOUTHEAST REGION

Attn: RR Program Assistant
Department of Natural Resources
2300 North Martin Luther King Drive
Milwaukee WI 53212

DNR WEST CENTRAL REGION

Attn: RR Program Assistant
Department of Natural Resources
1300 Clairemont Ave.
Eau Claire WI 54702



Note: These are the Remediation and Redevelopment Program's designated regions. Other DNR program regional boundaries may be different.

DNR Use Only			
Date Received	Date Assigned	BRRTS Activity Code	BRRTS No. (if used)
DNR Reviewer		Comments	
Fee Enclosed? <input type="radio"/> Yes <input type="radio"/> No	Fee Amount \$	Date Additional Information Requested	Date Requested for DNR Response Letter
Date Approved	Final Determination		

Tyco Fire Products LP

Deep Aquifer Bedrock Well Design and Long-Term Monitoring Work Plan

**Tyco Fire Technology Center
2700 Industrial Parkway South
Marinette, WI 54143
BRRTS# 02-38-580694**

September 27, 2022

**Deep Aquifer Bedrock Well Design and Long-Term Monitoring Work Plan
BRRTS# 02-38-580694**

September 27, 2022

Prepared By:

Arcadis U.S., Inc.
126 North Jefferson Street, Suite 400
Milwaukee
Wisconsin 53202
Phone: 414 276 7742
Fax: 414 276 7603

Prepared For:

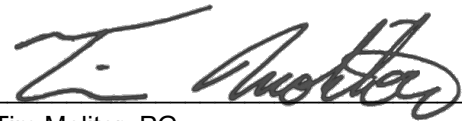
Tyco Fire Products LP
2700 Industrial Parkway South
Marinette, WI 54143

Our Ref:

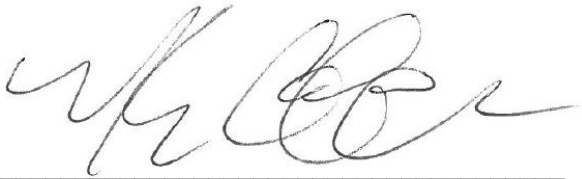
30135605



Christopher S. Peters, PG
Principal Geologist



Tim Molitor, PG
Project Geologist



Michael Cobb
Principal Scientist

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- Appendix A – Geophysical Logging Report

Acronyms and Abbreviations

AMSL	above mean sea level
Arcadis	Arcadis U.S., Inc.
bgs	below ground surface
FTC	Fire Technology Center
FOSA	perfluorooctanesulfonamide
gpm	gallons per minute
ng/L	nanograms per liter
PFAS	per- and poly-fluoroalkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
the Site	Fire Technology Center, 2700 Industrial, Parkway South in Marinette, Wisconsin
Tyco	Tyco Fire Products LP
WDNR	Wisconsin Department of Natural Resources
Wis. Adm. Code	Wisconsin Administrative Code

Executive Summary

Tyco Fire Products LP (Tyco) continues to investigate per- and poly-fluoroalkyl substances (PFAS) potentially related to the Tyco Fire Technology Center (FTC) located at 2700 Industrial Parkway South in Marinette, Wisconsin (the Site). To date, drinking water in an area southeast of the Site has been addressed on an interim basis by point-of-entry treatment systems and bottled water. Tyco is working with affected residents within the area to implement a long-term drinking water plan that will involve new deep drinking water wells and potential extension of the City of Marinette municipal water into part of the area.

This work plan proposes the design, location and monitoring approach for three sentinel monitoring wells that will be part of a long-term groundwater monitoring network.

The proposed sentinel wells are planned to extend to approximately 450 to 500 feet below ground surface (bgs) to monitor a deep bedrock aquifer that underlies the Marinette area. This water producing zone is below the vertical extent of the PFAS plume associated with the Site (Arcadis 2020), and is protected from future contamination by an aquitard in shallow bedrock. Long-term monitoring of the sentinel wells is planned to safeguard groundwater users against potential future changes in groundwater quality. The well design is based on the construction of private residential water supply wells with the addition of an extended surface casing to prevent cross-contamination from the shallow aquifer system. Specifications will meet or exceed Wisconsin Administrative Code (Wis Adm Code) NR 812 specifications for water supply wells. Monitoring of the sentinel wells will be performed following a purge-and-sample approach that will best represent groundwater quality as it would be encountered by a groundwater user.

The proposed sentinel wells will supplement a future groundwater monitoring network supporting site investigations relating to PFAS being conducted under NR 716. That network will comprise existing and future monitoring wells and piezometers in the overburden and shallow bedrock constructed consistent with NR 141 specifications. Delineation of the site-related PFAS plume will be completed vertically and laterally using NR 141-compliant wells. NR 141-compliant wells are not, however, appropriate to meet the objectives of the proposed sentinel wells. A variance from NR 141 is proposed for the deep bedrock sentinel monitoring wells based on the specifics of the local geology and groundwater for the distinct purpose of the wells as sentinels for deep bedrock aquifer users.

1. Introduction

On behalf of Tyco, Arcadis U.S., Inc. (Arcadis) prepared this Deep Aquifer Bedrock Well Design and Long-Term Monitoring Work Plan (work plan) as a component of ongoing investigations of per- and poly-fluoroalkyl substances (PFAS) potentially related to the Site (**Figure 1**). To date, PFAS-impacted drinking water has been addressed on an interim basis by point-of-entry treatment systems and bottled water. Tyco is working with the affected residents to implement a long-term drinking water plan that will involve new deep drinking water wells and potential extension of the City of Marinette municipal water into a portion of the Town of Peshtigo.

This work plan proposes the design, location and monitoring approach for sentinel monitoring wells that will be part of a long-term groundwater monitoring network. Proposed sentinel well locations are shown on **Figure 2**. The sentinel monitoring wells will be used to verify that site-related PFAS have not migrated downward into the deep bedrock aquifer system and that current and potential future users of groundwater from that aquifer remain protected against PFAS exposure.

Tyco is conducting site investigations relating to PFAS within the Wisconsin Department of Natural Resources (WDNR) Environmental Repair Program, pursuant to the requirements of Chapter Natural Resources (NR) 716 of the Wisconsin Administrative Code (Wis. Adm. Code). Project records have been tracked since January 2018 under the Bureau for Remediation and Redevelopment Tracking System (BRRTS) No. 02-38-580694. Earlier phases of site investigations were completed under BRRTS No. 03-38-001345.

As described in this work plan, the proposed sentinel well design will be based on the construction of private residential water supply wells as specified under NR 812, with extended surface casings to protect against cross-contamination from the shallow aquifer system, and open boreholes that will extend across a highly transmissive zone present at approximately 450 to 500 feet below ground surface (bgs). This design, with water samples collected using a multi-volume purge approach, are proposed as the most-effective way to monitor groundwater quality as it would be encountered by a groundwater user.

The proposed sentinel wells will supplement a future site-wide PFAS groundwater monitoring network, comprised of existing and future monitoring wells and piezometers in the overburden and shallow bedrock constructed consistent with NR 141 specifications. Delineation of the site-related PFAS plume will be completed vertically and laterally using NR 141-compliant wells to the degree feasible. As described in this work plan, the variances from NR 141 for the proposed deep bedrock sentinel monitoring wells are required based on the specifics of local geology and groundwater for the distinct purpose of the wells as sentinels for deep bedrock aquifer users.

2. Background

The Site is a fire suppressant training, testing, research and development facility, occupying approximately 380 acres in southern Marinette. Background information relevant to this work plan is summarized below. More comprehensive background information is available in prior reports, most recently the Additional Site Investigation Work Plan (Arcadis 2022a).

2.1. Previous Groundwater Investigation Findings

In 2017, Tyco completed site investigations that showed that PFAS had migrated in shallow groundwater off-site to the northeast, east and southeast of the Site into parts of the City of Marinette and the Town of Peshtigo. Tyco has since performed multiple phases of site-investigation to complete delineation, refine the conceptual site model, and install a network of monitoring wells and piezometers within the overburden and shallow bedrock aquifers.

This work has shown that the primary migration pathways for PFAS in groundwater are within the overburden aquifer system, which is mostly comprised of sand. To the north of the Site, PFAS has also been found at the bedrock surface, and in a zone of limited permeability that extends about 20 feet below the bedrock surface. PFAS has not been detected in shallow bedrock southeast of the Site within the area referred to as the Potable Well Sampling Area (PWSA). Below the surficial zone of bedrock, investigations have shown the bedrock is effectively impermeable to at least 200 feet below the bedrock surface. This shallow bedrock aquitard is interpreted to separate the shallow flow system (including overburden and surficial bedrock zone) from all water bearing zones below in the deep bedrock aquifer.

Section 3 provides a review of available information supporting the current understanding of bedrock groundwater. Work underway in the summer and fall of 2022 includes additional wells and test borings to refine the current understanding of the shallow bedrock zone, and the nature of the shallow bedrock aquitard. This ongoing work is being performed in accordance with the Additional Site Investigation Work Plan (Arcadis 2022a). The Additional Site Investigation Work Plan also includes a comprehensive review of PFAS investigations completed to-date.

2.2. Area Water-Use

Drinking water in the vicinity of the Site is provided through a combination of municipal water supply and private wells:

- Areas immediately surrounding the Site, and to the north and east within the City of Marinette are served by the City of Marinette public water system, which obtains water entirely from an intake in Green Bay. Water is treated at a central plant, and then distributed via buried lines to all connected properties in the service area.
- Municipalities southwest of the Site, including the cities of Peshtigo and Oconto, obtain water from production wells completed in the deep bedrock aquifer (consisting of sandstone and dolomite of Ordovician and Cambrian ages).

- In the Town of Peshtigo, south and southeast of the Site, all properties obtain water from private wells. Most private wells in this area are completed in the shallow unconsolidated aquifer system, with average depths of less than 75 feet. A small percentage of wells are completed to depths of 400 to 500 feet bgs, the approximate depth required to reach the deep bedrock aquifer system.

In 2017, groundwater investigations completed by Tyco identified a portion of the PFAS plume in the shallow overburden aquifer that had migrated southeast of the Site into portions of the Town of Peshtigo. Based on these data, Tyco initiated a potable well sampling program of approximately 140 private wells and offered bottled water and bottled water services to community members. As sample analyses were completed, Tyco offered point-of-entry treatment (POET) systems to those locations with a confirmed detection of perfluorooctanoic acid (PFOA) or perfluorooctanesulfonic acid (PFOS) above the laboratory reporting limits for these compounds.

To date, POET systems have been installed in 47 locations and Tyco has tested 173 private wells. Currently 46 POET systems remain in use, and 166 potable wells are sampled as outlined in the Revised Long-Term Potable Well Sampling Plan (Arcadis 2021) that was approved by WDNR. Residents will continue to receive bottled water service or POET system maintenance as requested while Tyco works with interested parties, including several municipalities, to define and implement permanent measures (Arcadis 2020).

Since the discovery that PFAS associated with the Site was present in groundwater used by private wells southeast of the Site, Tyco has worked with the affected residents and the WDNR to develop a long-term solution that would permanently eliminate the potential drinking water exposure pathway. Initial studies found that the most protective and implementable long-term approach was to connect the affected properties to municipal water from the City of Marinette (Arcadis 2019). After multiple years of dialog, and direct feedback from the residents, the current viable long-term water supply options for the affected area include (1) Annexation of a portion of the area to the City of Marinette to enable the provision of City of Marinette Municipal Water, and (2) Deep (Bedrock) Replacement Wells in the areas that will not be annexed.

Annexation to the City of Marinette is required for residents to receive City of Marinette municipal water.¹ Annexation requires at least 50% of electors in an area that is adjacent and contiguous to the City of Marinette to sign a petition for annexation. Tyco's outreach efforts have demonstrated that while there may be sufficient interest to achieve annexation of part of the affected area, there is not sufficient interest to annex the entire area. As a result, Tyco anticipates that in any area that is not annexed to the City of Marinette, Tyco will install deep bedrock replacement wells as a long-term solution. As discussed above, the purpose of this work plan is to propose a deep aquifer sentinel well network to monitor deep aquifer groundwater quality as it would be encountered by a groundwater user.

¹ ANNEXATION REQUIRED PRIOR TO NEW WATER CONNECTION No property outside of the corporate boundaries of the city may be connected as a new Marinette Municipal Water System customer unless that property has been annexed into the City of Marinette prior to the connection. In the event of inadvertent or mistaken connection of such a property without its annexation, upon the discovery of this fact, the Utility shall provide notice to the property owner that the owner has ninety (90) days within which to annex. If annexation does not occur within ninety (90) days of the notice, the service shall be immediately disconnected. City of Marinette Code of Ordinances 7.0129.

3. Summary of Related Studies and Information

3.1 Geology and Hydrostratigraphy

The geology in the Marinette and Peshtigo area comprises unconsolidated glacial deposits overlying at least 700 feet of sedimentary bedrock consisting of dolomite, shale and sandstone. The current understanding of the geology is based on multiple resources:

- Regional literature (e.g., Oakes and Hamilton 1973).
- Well-driller and lithologic descriptions available in State of Wisconsin databases including the WiscLith database maintained by the Wisconsin Geological and Natural History Survey.
- Drilling and geophysical logging completed by Tyco.

Based on these sources, the major components of the subsurface geology can be summarized as follows:

Summary of Geologic Units

Period	Lithology/Formation	Description and Approximate Thickness
Quaternary	Glacial Deposits	Mostly sand, with layers of silt and clay; till typically above bedrock surface. Highly permeable in sand zones. 30 to 125 feet thick.
Ordovician	Sinnipee Group (Galena, Decorah, and Platteville Formations)	Dolomite and shale. Unfractured to sparsely fractured with no significant permeability except at immediate bedrock surface. Up to 200-feet thick
	Ancell Group (Glenwood and St Peter Formations)	Sandstone with shale and dolomite. 25 to 50 feet thick
	Prairie du Chien Group	Mostly dolomite, with minor sandstone and shale. Vuggy and permeable near base of unit. 200 to 250 feet thick.
Cambrian	Trempealeau, Tunnel City and Elk Mound Groups	Mostly sandstone and dolomite, up to 500 feet thick. Portions highly permeable.
Precambrian	Crystalline rock	Igneous and metamorphic rocks. Negligible permeability.

As discussed in the sections below, site-specific and regional evidence show that the bedrock of the Sinnipee Group acts as a major aquitard that permits no significant vertical transmission of groundwater from the overburden to the deeper aquifer. Available data also show that the first zone of significant groundwater production in the deep aquifer system is a 50-foot-thick zone of pitted and vuggy dolomite, interpreted to belong either to the basal Prairie du Chien or Trempealeau Groups.

3.2 Bedrock Well Drilling and Logging Results

Investigations of bedrock groundwater are a component of the ongoing site-investigations associated with groundwater for both the Site and Tyco's Stanton Street Facility, located approximately 1.5 miles north of the Site. The investigations completed to-date have consistently supported two major observations relating to bedrock:

- A zone of shallow bedrock up to about 20 feet below the bedrock surface may contain fractures with limited permeability that are in communication with groundwater at and above the bedrock surface. PFAS impacts have been found in this zone at the Site and north of the Site. Data collected to date indicate that the portion of plume southeast of the Site is only present in the overburden aquifer and not in the shallow bedrock. These data are most recently reported in the Site Investigation Status Report for the Tyco Stanton Street Facility (Arcadis 2022b).
- Below the shallow zone of first encountered bedrock, the bedrock is effectively impermeable to at least 200 feet below the bedrock surface. This bedrock aquitard separates the shallow aquifer system (including overburden and surficial bedrock zone) from all deep bedrock water bearing zones below.

Three historical investigations, described below, provide data supporting the integrity of the shallow bedrock aquitard.

3.2.1 Bedrock Borings MW-100B, MW-101B, MW-102B

Three bedrock boreholes were completed in 2018 to evaluate the characteristics of bedrock and assess whether PFAS impacts had migrated into bedrock below the immediate rock surface (Arcadis, 2018a). The three boreholes (MW-100B, MW-101B and MW-102B) are shown on **Figure 3**. Each borehole was cased 10 feet below the bedrock surface to isolate it from potential surficial zone connections to the shallow aquifer system. Each borehole was then advanced to 205 feet bgs (between 118 and 145 feet below the bedrock surface).

While packer testing and well completion had been planned for each borehole, neither was possible due to the absence of groundwater yield, even after significant efforts surging and flushing the boreholes in an attempt to improve hydraulic communication with the formation. Geophysical logging completed at each borehole showed the rock to be a mixture of shale and dolomite with sparse evidence of fractures and no evidence of yield sufficient for sampling or well completion. Each borehole was abandoned with WDNR concurrence, after these findings were communicated in teleconferences on August 16 and 23, 2018.

3.2.2 Former Site Production Well Testing

In June 2018, Tyco conducted work to evaluate the condition of a former supply well located on the Site at the north end of the OTA (Arcadis, 2018a). The well (identified PW-1) is shown on **Figure 3**. Based on the 1964 construction log, the well had been drilled to 171 feet, with casing to the bedrock surface at 65 feet bgs.

Geophysical logging of the well showed that all measurable flow into the well under pumping conditions entered from either the base of the casing at 66 ft bgs or from a notable fracture just below the casing at 67 ft bgs. No measurable flow could be detected entering the well below 67 feet bgs. To verify the geophysical logging results, a single packer was deployed below the 67 feet fracture so that the yield of the zones above and below the packer could be tested separately via short pumping tests. The results showed that the zone above the packer

was the only significant water-bearing interval in the borehole (i.e., specific capacity of the shallow zone was found to be similar to that of the full well). The yield of the deeper zone was too low to measure.

These results supported the observations at MW-100B, MW-101B and MW-102B, namely that while the first encountered surficial bedrock zone may be transmissive, the rock directly below that zone has no recoverable groundwater and functions as an aquitard isolating the deep bedrock aquifer from the shallow aquifer system (including the overburden and surficial bedrock zone). The former production well was abandoned in June 2019, in accordance with WNDR guidelines.

3.2.3 Bedrock Investigations at the Stanton Street Site

Historical studies at the Tyco Stanton Street Site were performed to evaluate the nature of bedrock and assess the potential for downward migration of arsenic contamination from the shallow aquifer system (Dames & Moore 1976). The study involved three open-hole bedrock wells:

- The Dock Well, former supply well completed to approximately 625 feet bgs.
- The Research Well, another former supply well, completed to at least 480 feet bgs.
- A Test Well #1, completed to 115 feet bgs.

Well locations are shown on **Figure 3**. The studies included a combination of pumping tests, packer tests, borehole geophysics, and groundwater sampling. The Dock Well, was found to be impacted by site-related constituents; however, testing indicated that all or nearly all water entering the well was drawn from the surficial aquifer from leaks in the surface casing and not from bedrock. The well was subsequently abandoned in 1978. The Research Well, by comparison, was found to draw all or nearly all of its water from the deep aquifer and was not impacted by site-related constituents. Test Well #1, which was effectively cased off from the surficial zone but not drilled deep enough to reach the deep bedrock aquifer, was found to be essentially dry.

The report authors concluded that shallow bedrock to at least 114 feet had no appreciable permeability, and that the zone acts as a confining unit which effectively prevents water from migrating downward into the deep bedrock aquifer system from the surficial aquifer.

3.3 Irrigation Well Profiling

Starting in May 2022, Tyco completed geophysical logging and groundwater sampling at two irrigation wells located at the Marinette High School to assess the thickness of the shallow bedrock aquitard, and the depth and water quality of the deep bedrock aquifer. The locations of the wells, identified IRR-01 and IRR-02, are shown on **Figure 3**. Geophysical logs are included as **Appendix A**. The logging suite included tools to assess both the geology and hydraulic characteristics of the borehole. The major well details and logging findings are as follows:

Irrigation Well Profiling Details

	IRR-01	IRR-02
Well Use	Seasonal irrigation of baseball fields	Seasonal irrigation of football fields
Depth of surface casing	44 feet bgs	62 feet bgs

	IRR-01	IRR-02
Total Depth	415 feet bgs	584 feet bgs
Specific Capacity	5.5 gpm/foot of drawdown	8.5 gpm/foot of drawdown
Zone with no measurable groundwater inflow (shallow bedrock aquitard)	45 to 246 feet bgs	67 to 254 feet bgs
Zone of significant groundwater production (Transmissive Zone)	403 feet bgs to base of well	420 to 470 feet bgs

The hydrostratigraphy in both boreholes was nearly identical. No flowing fractures or porous zones were identified within the bedrock to a depth of approximately 250 feet bgs, a zone that comprises the Sinnipee and Ancel Groups. Minor fractures inflows were detected between about 250 and 400 feet within the Prairie du Chien. Below this, each well intersected a highly transmissive zone of pitted and vuggy dolomite, either at the base of the Prairie du Chien or within the Trempealeau Group. At IRR-01, this zone continued to the termination depth of the well (at 415 feet bgs). At IRR-02, this permeable zone continued to 470 feet bgs, below which little additional flow entered the well.

In both wells, the transmissive zone was found to produce significant quantities of water. IRR-02 is reportedly capable of sustaining 230 gpm when in use for irrigation. The high transmissivity of this zone is consistent with observations of similarly deep wells reported on well driller logs and based on performance of municipal wells completed in the zone in neighboring cities of Peshtigo and Oconto.

Samples to evaluate the potential presence of PFAS in the irrigation wells was performed in three phases:

- Dynamic vertical profiling samples were collected May 19 and 21, 2022 (**Table 1**). Samples were collected at multiple depths in each well while continuously pumping from the top of the water-column
- Total well samples were collected July 1, 2022 (**Table 2**). Samples were taken directly from the discharge of the permanent irrigation well pumps.
- Discrete-zone packer samples were collected (from IRR-02 only) on August 4 to 6, 2022 (**Table 3**)

Sample results from IRR-01 showed the PFAS is not present in the deeper aquifer. No PFAS were detected above laboratory reporting limits in any of the profiling samples, or in the total well sample except one compound, perfluorooctanesulfonamide (FOSA). FOSA was detected only in the total-well sample (using the permanent pump) at an estimated concentration of 1.5 nanograms per liter (ng/L). The compound is not associated with Tyco products, nor is it a significant constituent in shallow groundwater. The compound is present in a number of consumer and industrial products, and (as noted in Section 3.4) its frequent presence at low concentrations in residential well samples is likely the result of FOSA-containing components in the well pump or plumbing system.

Sample results from IRR-02 indicate that a minor leak in the surface casing or inflow from very shallow bedrock had allowed PFAS from the shallow aquifer system into the well. PFOA and other PFAS were detected in the first samples collected, and then at decreasing concentrations as pumping continued. These data show that concentrations of PFAS entering the well from the shallow aquifer system are rapidly diluted by PFAS-free water

entering the well from the transmissive zone in the deep bedrock aquifer. This interpretation was confirmed by the low PFOA concentrations of PFAS found in the total-well sample (**Table 2**) and by the packer test sampling (**Table 3**). The packer test results show that PFAS is present in the upper portion of the well (i.e., entering the well from the shallow aquifer system), but absent in deep bedrock groundwater. No PFAS were present above laboratory detection limits in the packer sample that isolated the borehole from 100 feet bgs to the base of the well.

Tyco is currently completing its analysis of the irrigation well testing results and will be providing a more-detailed report on these findings in a forthcoming deliverable. A temporary packer has been installed at IRR-02 to prevent flow from shallow to deep portions of the borehole until an appropriate repair to the well can be implemented.

3.4 Residential Well Water Quality

Groundwater monitoring data from the private wells located southeast of the Site shows that the deep bedrock aquifer is not impacted by PFAS. While most private wells southeast of the Site are completed in the overburden aquifer, 12 wells are reported to be constructed to depths between 400 and 622 feet bgs where they are likely to be drawing water from the deep bedrock aquifer. The surface casings for these existing wells were generally completed only to the bedrock surface, which provides less protection against potential leakage from the shallow aquifer than a casing installed deeper into bedrock. However, the results of sampling completed at these wells since 2017 has found no evidence to suggest that the overburden PFAS plume has either leaked into the wells or migrated downward into the deep bedrock.

Sampling of the 12 deep private wells is part of a residential well monitoring program undertaken by Tyco since 2017 under the oversight of the WDNR (Arcadis 2018b, Arcadis 2022c). As shown on **Figure 3**, the 12 wells are distributed over an area of about 1 square mile, as follows:

- One well (WS-006) is located just south of University Avenue and along County Road B.
- Three wells (WS-012, -028 and -056) are located near Oakwood Beach Road and Shore Drive.
- One well (WS-098) is on Shore Drive south of Wieggers Road.
- Four wells (WS-069A, -083, -130 and -156) are on or just south of Rader Road.
- One well (WS-103) is on Stanley Lane.
- Two wells (WS-002 and -004) are located at the former hospital at University and Shore Drives, in the City of Marinette. The wells were sampled in 2017 and 2018 but have since been abandoned.

Collectively, the 12 deep water wells have been sampled for PFAS 70 times between 2017 and 2022, an average of six times at each well. The analytical results for the PFAS analysis of the well water samples are summarized in **Table 4**. PFOA and PFOS were not detected above the laboratory reporting limits in any samples. Of the other PFAS analyzed, none were present above reporting limits except FOSA, which was detected in six of the ten wells, at levels between 1.1 and 6.1 nanograms per liter. As noted in Section 3.3., the compound is not associated with Tyco products, and its frequent presence at low concentrations in water supply well samples is likely the result of FOSA-containing components in the well pump or plumbing system.

4. Sentinel Well Design and Construction Approach

4.1 Well Siting

Three proposed sentinel well locations are shown on **Figure 2**. The locations are preliminary and subject to change based on obtaining property access or to avoid utilities. The locations were selected to fall between the Site and/or locations where PFAS is known to be present in surficial bedrock and areas to the southeast of the Site where deep residential water wells currently exist, and additional replacement wells are planned. The locations, to the extent possible, are on public or publicly accessible lands and avoid road easements so that wells may be completed with stick-up well casings. The selected locations also form a triangle and may be used to assess the hydraulic gradient in the deep aquifer system.

4.2 Design Objectives

Sentinel monitoring wells are proposed for the following purposes:

- Verify the current understanding of the hydrostratigraphy of deep bedrock, including thickness of the shallow bedrock aquitard and depth of the transmissive zone.
- Verify that PFAS associated with the Site is not present in deep groundwater
- Permit long-term monitoring in deep bedrock to safe-guard groundwater users against potential future changes in groundwater quality.

Note that the sentinel monitoring wells are not intended to serve as delineation points for the PFAS plume present in the shallow groundwater flow system. Tyco is in the process of demonstrating vertical delineation of the PFAS plume consistent with NR 716 requirements using conventional NR 141 compliant monitoring wells and piezometers along with related lines-of-evidence. Sentinel wells are planned as an additional layer of protection for deep groundwater users by providing monitoring locations where, in the unlikely scenario that PFAS impacts penetrate the aquitard, routine sampling would detect its presence in time to take corrective measures.

To serve this purpose most-effectively, the proposed sentinel monitoring wells require a non-standard design and sampling approach. The design objectives include the following:

- Be constructed with sufficient surface casing to eliminate potential for downward leakage from the shallow aquifer system into the well and deep aquifer.
- Encompass, to the degree feasible, minor water producing zones between the shallow bedrock aquitard and the transmissive zone where, if downward breakthrough were occurring, PFAS would be most likely detected first.
- Permit sampling of the well in a way that will mostly closely replicate how deep aquifer wells are used, and therefore provide the most representative data to assess potential drinking water exposure.

The most effective way to serve the sentinel wells' purpose and meet the design objectives is to construct them as open borehole wells, analogous to residential water wells (i.e., as specified under NR 812) with a deeper casing seated in the shallow bedrock aquitard. While this approach varies from the requirements for site-investigation related wells under NR 141, the proposed long-open borehole design and multi-volume purge sampling approach is better suited for sentinel monitoring. Alternative approaches such as short-screened

piezometer clusters or multi-level wells will unavoidably limit monitoring to fewer potential transport pathways, which are not representative of what would be encountered by a groundwater user.

4.3 Design and Construction

Sentinel monitoring wells will be drilled and installed by a Wisconsin-licensed driller. Design specifications are illustrated on **Figure 4**. The principal design and construction elements are as follows:

Design Element	Specifications
Upper borehole	10-inch diameter drilled by mud-rotary from the surface to approximately 75 feet below the bedrock surface.
Surface casing	6-inch diameter carbon steel from approximately 2 feet above grade to 75 feet below bedrock surface.
Surface casing seal	Neat cement grout injected from the base of the casing. Seal will be permitted a minimum of 48 hours to cure before drilling continues.
Lower borehole	6-inch diameter drilled by air rotary to approximately 500 feet bgs or at least 50 feet beyond the top of the transmissive zone, based on driller observations of water production.
Surface completion	Approximately 2-foot stick-up, vented well plug, and locking cover.

The casing depth of 75 feet below the bedrock surface was selected to extend a conservative distance into the shallow bedrock aquitard to create an effective seal between the overburden flow system and deeper bedrock. This casing depth significantly exceeds NR 812 requirements which specify a minimum casing depth of 40 feet below the ground surface for wells in limestone or dolomite aquifer. Based on the expected depth to bedrock of 70 to 80 feet at the sentinel well locations, surface casings will be completed to between 145 and 155 feet bgs.

Upon completion of drilling at each replacement well, development will occur until the water is practicably clear and free of silt and sand by any one of the following methods: mechanical surging, air-lifting, jetting, or by any combination of these methods per Wis. Adm. Code NR 141 and NR 812. Following development, a short-duration pumping test will be conducted to determine each well's stable yield and the water level drawdown.

After drilling and well development, geophysical logging will be performed to characterize the lithology and hydrostratigraphic characteristics of the bedrock at each well.

Completed wells will be surveyed by a Wisconsin-licensed surveyor. Ground surface and top of well casing elevations will be referenced to the North American Vertical Datum of 1988 (NAVD 88). Horizontal coordinates will be referenced to the State Plane North American Datum of 1983 (NAD 83) – Wisconsin Central (4802) Zone. Locations will be surveyed to the nearest 0.01 foot (horizontal and vertical).

Well completion logs will be finalized and submitted to the WDNR following well installation.

All wastes generated during well construction and development (i.e., drill cuttings, rock, and water) will be containerized and transported to the Site to be stored pending characterization and disposal. Waste will be segregated into two separate streams:

- Waste material generated during drilling and installation of the surface casing (i.e., overburden and upper bedrock zones) will be treated as potentially containing PFAS and characterized for appropriate disposal.
- Waste generated from drilling the lower borehole (i.e., below the surface casing) will be characterized and be treated as construction waste.

To the extent possible, wastewater will be containerized and treated at the Site via an appropriate on-site treatment system. Other containerized waste will be disposed either through an approved treatment facility or at an approved disposal facility.

5. Long-Term Monitoring

After installation, sentinel wells will be sampled for PFAS quarterly for 1 year, semiannually (twice per year) for 2 years, and annually thereafter until site closure or approval from WDNR to discontinue sampling on an annual basis.

Sampling will be completed by purging the well of approximately 5 well volumes (estimated to be about 3,600 gallons) with a submersible pump deployed in the cased portion of the well. This approach will simulate the water use of private wells completed in the deep bedrock aquifer. Samples will provide information on the quality of water entering across the length of the open borehole but be most representative of the primary water-producing zones (i.e., transmissivity-weighted). Samples collected in this way will best reflect the water quality as it is used by water-consumers.

Monitoring results will be communicated to property owners and tenants (as appropriate) within 10 days of final data being received by Arcadis from the laboratory. The results will include a letter describing the monitoring activities, a summary table of sampling results, and relevant pages from the laboratory report(s). A copy of the results package will be provided to WDNR within 10 days of final data being received by Arcadis.

6. References

- Arcadis. 2018b. Revised Long-Term Potable Well Sampling Plan. Tyco Fire Technology Center, 2700 Industrial Parkway, Marinette, Wisconsin 54143. BRRTS# 02-38-580694. April 20.
- Arcadis. 2018a. Site Investigation Report, Tyco Fire Technology Center Site, 2700 Industrial Parkway, Marinette, Wisconsin, BRRTS No. 02-38-580694. September 28.
- Arcadis. 2019. Remedial Action Options Report for Long-Term Drinking Water Supply, Town of Peshtigo, Wisconsin, Summary Report, Wisconsin Department of Natural Resources and Public Services Commission Submittal. September.
- Arcadis. 2020. Interim Site Investigation Report. Tyco Fire Technology Center, Marinette, Wisconsin, BRRTS No. 02-38-5806945. May 21.
- Arcadis. 2021. Revised Long-Term Potable Well Sampling Plan, Tyco Fire Technology Center Site, 2700 Industrial Parkway, Marinette, Wisconsin, BRRTS No. 02-38-580694. October 1.
- Arcadis. 2022a. Additional Site Investigation Work Plan, Tyco Stanton Street Facility, Marinette, Wisconsin, BRRTS No. 02-38-581955. February 22.
- Arcadis. 2022b. Site Investigation Status Report, Tyco Stanton Street Facility, Marinette, Wisconsin, BRRTS No. 02-38-581955. March 22.
- Arcadis. 2022c. Private Drinking Water Well Sampling Program Annual Summary Report – FTC Sampling Area, Tyco Fire Technology Center Site, 2700 Industrial Parkway, Marinette, Wisconsin 54143, BRRTS No. 02-38-580694. August.
- Dames & Moore. 1976. Investigation of Hydrology and Potential Ground-Water Contamination of Bedrock Aquifers at the Ansul Company Site, Marinette, Wisconsin. January 29.
- Oakes, E. L., & Hamilton, L. J. 1973. Water resources of Wisconsin: Menominee-Oconto-Peshtigo River basin (No. 470). US Geological Survey.

Tables

Table 1
Irrigation Well Summary PFAS Results
Deep Aquifer Bedrock Well Design and Long Term Monitoring Work Plan
Tyco Fire Products LP
Marinette, Wisconsin

Analyte	June 2019 DHS (Not Adopted by DNR Board) ⁽¹⁾	November 2020 DHS (Not Yet Proposed for Rulemaking by DNR) ⁽²⁾	Location Sample ID Sample Depth (ft bgs) Sample Time Purge Volume (gal) Sample Date Sample Type	IRR-01	IRR-01	IRR-01	IRR-01	IRR-02	IRR-02	IRR-02	IRR-02	IRR-02	IRR-02
				IRR-01-42 (20220519)	IRR-01-170 (20220519)	DUP-01 (20220519)	IRR-01-374 (20220519)	IRR-02-50 (20220521)	IRR-02-180 (20220521)	DUP-02 (20220521)	IRR-02-392 (20220521)	IRR-02-444 (20220521)	IRR-02-540 (20220521)
				42	170	170	374	50	180	180	14:45	444	540
				17:30	19:40	19:40	13:15	16:30	15:15	15:15	14:45	14:00	13:00
				2,600	10,600	10,600	8,900	8,700	7,400	7,400	6,400	5,300	4,400
				05/19/2022	05/19/2022	05/19/2022	05/19/2022	05/21/2022	05/21/2022	05/21/2022	05/21/2022	05/21/2022	05/21/2022
				N	N	FD	N	N	N	FD	N	N	N
			Unit										
PFBA	--	10,000	ng/l	< 4.4 U	< 4.7 U	< 4.8 U	< 4.5 U	< 4.8 U	< 5 U	< 4.8 U	14	16	23
PFPeA	--	--	ng/l	< 1.8 U	< 1.9 U	< 1.9 U	< 1.8 U	< 1.9 U	2.9	3.1	32	40	57
PFHxA	--	150,000	ng/l	< 1.8 U	< 1.9 U	< 1.9 U	< 1.8 U	< 1.9 U	3.7	4.8	50	60	78
PFHpA	--	--	ng/l	< 1.8 U	< 1.9 U	< 1.9 U	< 1.8 U	< 1.9 U	4.6	5.6	54	65	87
PFOA	20	--	ng/l	< 1.8 U	< 1.9 U	< 1.9 U	< 1.8 U	< 1.9 U	33	41	350	440 D	600 D
PFNA	--	30	ng/l	< 1.8 U	< 1.9 U	< 1.9 U	< 1.8 U	< 1.9 U	< 2 UB	< 1.9 UB	12	15	20
PFDA	--	300	ng/l	< 1.8 U	< 1.9 U	< 1.9 U	< 1.8 U	< 1.9 U	< 2 U	< 1.9 U	< 2 U	< 2 U	< 2 U
PFUnA	--	3,000	ng/l	< 1.8 U	< 1.9 U	< 1.9 U	< 1.8 U	< 1.9 U	< 2 U	< 1.9 U	< 2 U	< 2 U	< 2 U
PFDoA	--	500	ng/l	< 1.8 U	< 1.9 U	< 1.9 U	< 1.8 U	< 1.9 U	< 2 U	< 1.9 U	< 2 U	< 2 U	< 2 U
PFTriA	--	--	ng/l	< 1.8 U	< 1.9 U	< 1.9 U	< 1.8 U	< 1.9 U	< 2 U	< 1.9 U	< 2 U	< 2 U	< 2 U
PFTeA	--	10,000	ng/l	< 1.8 U	< 1.9 U	< 1.9 U	< 1.8 U	< 1.9 U	< 2 U	< 1.9 U	< 2 U	< 2 U	< 2 U
PFHxDA	--	--	ng/l	< 1.8 U	< 1.9 U	< 1.9 U	< 1.8 U	< 1.9 U	< 2 U	< 1.9 U	< 2 U	< 2 U	< 2 U
PFODA	--	400,000	ng/l	< 1.8 U	< 1.9 U	< 1.9 U	< 1.8 U	< 1.9 U	< 2 U	< 1.9 U	< 2 U	< 2 U	< 2 U
PFBS	--	450,000	ng/l	< 1.8 U	< 1.9 U	< 1.9 U	< 1.8 U	< 1.9 U	0.45 J	< 1.9 U	0.52 J	0.64 J	0.89 J
PFPeS	--	--	ng/l	< 1.8 U	< 1.9 U	< 1.9 U	< 1.8 U	< 1.9 U	< 2 U	< 1.9 U	0.51 J	0.62 J	0.76 J
PFHxS	--	40	ng/l	< 1.8 U	< 1.9 U	< 1.9 U	< 1.8 U	< 1.9 U	< 2 U	0.6 J	4	4.6	5.9
PFHpS	--	--	ng/l	< 1.8 U	< 1.9 U	< 1.9 U	< 1.8 U	< 1.9 U	< 2 U	< 1.9 U	< 2 U	< 2 U	< 2 U
PFOS	20	--	ng/l	< 1.8 U	< 1.9 U	< 1.9 U	< 1.8 U	< 1.9 U	< 2 U	< 1.9 U	< 2 U	< 2 UB	< 2 UB
PFNS	--	--	ng/l	< 1.8 U	< 1.9 U	< 1.9 U	< 1.8 U	< 1.9 U	< 2 U	< 1.9 U	< 2 U	< 2 U	< 2 U
PFDS	--	--	ng/l	< 1.8 U	< 1.9 U	< 1.9 U	< 1.8 U	< 1.9 U	< 2 U	< 1.9 U	< 2 U	< 2 U	< 2 U
PFDoS	--	--	ng/l	< 1.8 U	< 1.9 U	< 1.9 U	< 1.8 U	< 1.9 U	< 2 U	< 1.9 U	< 2 U	< 2 U	< 2 U
4:2 FTS	--	--	ng/l	< 1.8 U	< 1.9 U	< 1.9 U	< 1.8 U	< 1.9 U	0.36 J	0.55 J	4.1	4.6	6.8
6:2 FTS	--	--	ng/l	< 4.4 U	< 4.7 U	< 4.8 U	< 4.5 U	< 4.8 U	8.2	9.8	90	110	150
8:2 FTS	--	--	ng/l	< 1.8 U	< 1.9 U	< 1.9 U	< 1.8 U	< 1.9 U	< 2 U	< 1.9 U	0.91 J	1 J	1.6 J
10:2 FTS	--	--	ng/l	< 1.8 U	< 1.9 U	< 1.9 U	< 1.8 U	< 1.9 U	< 2 U	< 1.9 U	< 2 U	< 2 U	< 2 U
FOSA	--	20 ⁽²⁾	ng/l	< 1.8 U	< 1.9 U	< 1.9 U	< 1.8 U	< 1.9 U	< 2 U	< 1.9 U	< 2 U	< 2 U	< 2 U
NMeFOSA	--	--	ng/l	< 1.8 U	< 1.9 U	< 1.9 U	< 1.8 U	< 1.9 U	< 2 U	< 1.9 U	< 2 U	< 2 U	< 2 U
NEtFOSA	--	20 ⁽²⁾	ng/l	< 1.8 U	< 1.9 U	< 1.9 U	< 1.8 U	< 1.9 U	< 2 U	< 1.9 U	< 2 U	< 2 U	< 2 U
NMeFOSAA	--	--	ng/l	< 4.4 U	< 4.7 U	< 4.8 U	< 4.5 U	< 4.8 U	< 5 U	< 4.8 U	< 5 U	< 4.9 U	< 4.9 U
NEtFOSAA	--	20 ⁽²⁾	ng/l	< 4.4 U	< 4.7 U	< 4.8 U	< 4.5 U	< 4.8 U	< 5 U	< 4.8 U	< 5 U	< 4.9 U	< 4.9 U
NMeFOSE	--	--	ng/l	< 3.5 U	< 3.7 U	< 3.8 U	< 3.6 U	< 3.9 U	< 4 U	< 3.9 U	< 4 U	< 4 U	< 4 U
NEtFOSE	--	20 ⁽²⁾	ng/l	< 1.8 U	< 1.9 U	< 1.9 U	< 1.8 U	< 1.9 U	< 2 U	< 1.9 U	< 2 U	< 2 U	< 2 U
HFPO-DA	--	300	ng/l	< 3.5 U	< 3.7 U	< 3.8 U	< 3.6 U	< 3.9 U	< 4 U	< 3.9 U	< 4 U	< 4 U	< 4 U
DONA	--	3,000	ng/l	< 1.8 U	< 1.9 U	< 1.9 U	< 1.8 U	< 1.9 U	< 2 U	< 1.9 U	< 2 U	< 2 U	< 2 U
9Cl-PF3ONS	--	--	ng/l	< 1.8 U	< 1.9 U	< 1.9 U	< 1.8 U	< 1.9 U	< 2 U	< 1.9 U	< 2 U	< 2 U	< 2 U
11Cl-	--	--	ng/l	< 1.8 U	< 1.9 U	< 1.9 U	< 1.8 U	< 1.9 U	< 2 U	< 1.9 U	< 2 U	< 2 U	< 2 U

Notes on Page 2.

Table 1
Irrigation Well Summary PFAS Results
Deep Aquifer Bedrock Well Design and Long Term Monitoring Work Plan
Tyco Fire Products LP
Marinette, Wisconsin

Notes:

< = Compound not detected at reporting detection limit.

(1) = In June 2019 the Wisconsin Department of Health Services (DHS) recommended individual groundwater standards of 20 ng/L for PFOA and PFOS. The WDNR proposed those standards through the state rulemaking process. In February 2022, the Wisconsin Natural Resources Board did not approve the proposed rulemaking for groundwater. In August 2022, WDNR promulgated a drinking water standard of 70 ng/L for PFOA and PFOS, individually and combined, for public water systems. This standard does not apply to private drinking water wells.

(2) = In November 2020 the Wisconsin DHS recommended a combined groundwater standard of 20 ng/L for: FOSA, NEtFOSE, NEtFOSA, NEtFOSAA, PFOS and PFOA. DHS also recommended individual standards for FOSA, NEtFOSE, NEtFOSA, NEtFOSAA, PFBS, PFHxS, PFNA, PFDA, PFDoA, PFHxA, PFTeA, PFUnA, PFBA, PFODA, DONA, and GenX. In March 2021, The Wisconsin Natural Resources Board approved a Statement of Scope to initiate a rulemaking for this recommendation. The WDNR has not yet proposed rules to initiate the rulemaking process to implement this recommendation; the agency's authority to do so under the Statement of Scope will expire in September 2023.

-- = No standard

N = Normal sample

J = The analyte was positively identified; however the associated numerical value is an estimated concentration only

U = The analyte was analyzed for but the result was not detected above the method detection limit.

Chemical Abbreviations

PFBA = Perfluorobutanoic acid (C4)	PFNS = Perfluorononanesulfonic acid (C9)
PFPeA = Perfluoropentanoic acid (C5)	PFDS = Perfluorodecanesulfonic acid (C10)
PFHxA = Perfluorohexanoic acid (C6)	PFDoS = Perfluorododecanesulfonic acid (C12)
PFHpA = Perfluoroheptanoic acid (C7)	4:2 FTS = 4:2 fluorotelomer sulfonate (C6)
PFOA = Perfluorooctanoic acid (C8)	6:2 FTS = 6:2 fluorotelomer sulfonate (C8)
PFNA = Perfluorononanoic acid (C9)	8:2 FTS = 8:2 fluorotelomer sulfonate (C10)
PFDA = Perfluorodecanoic acid (C10)	10:2 FTS = 10:2 fluorotelomer sulfonate (C12)
PFUnA = Perfluoroundecanoic acid (C11)	FOSA = Perfluorooctanesulfonamide (C8)
PFDoA = Perfluorododecanoic acid (C12)	NMeFOSA = N-methylperfluorooctanesulfonamide (C9)
PFTriA = Perfluorotridecanoic acid (C13)	NEtFOSA = N-ethylperfluorooctanesulfonamide (C10)
PFTeA = Perfluorotetradecanoic acid (C14)	NMeFOSAA = N-methylperfluorooctanesulfonamidoacetic acid (C11)
PFHxDA = Perfluoro-n-hexadecanoic acid (C16)	NEtFOSAA = N-ethylperfluorooctanesulfonamidoacetic acid (C12)
PFODA = Perfluoro-n-octadecanoic acid (C18)	NMeFOSE = N-methylperfluorooctanesulfonamidoethanol (C11)
PFBS = Perfluorobutanesulfonic acid (C4)	NEtFOSE = N-ethylperfluorooctanesulfonamidoethanol (C12)
PFPeS = Perfluoropentanesulfonic acid (C5)	HFPO-DA = Hexafluoropropylene oxide dimer acid (C6)
PFHxS = Perfluorohexanesulfonic acid (C6)	DONA = 4,8-Dioxa-3H-perfluorononanoic acid (C7)
PFHpS = Perfluoroheptanesulfonic acid (C7)	F-53B Major = 9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (C8)
PFOS = Perfluorooctanesulfonic acid (C8)	F-53B Minor = 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (C10)

Table 2
Total Well Sample Confirmation Results
Deep Aquifer Bedrock Well Design and Long Term Monitoring Work Plan
Tyco Fire Products LP
Marinette, Wisconsin

Analyte	June 2019 DHS (Not Adopted by DNR Board) ⁽¹⁾	November 2020 DHS (Not Yet Proposed for Rulemaking by DNR) ⁽²⁾	Location Sample ID Depth Sample Date Sample Type	IRR-01 IRR-01 (070122) Composite Well 07/01/2022 N	IRR-02 IRR-02 (070122) Composite Well 07/01/2022 N
			Units		
PFBA	--	10,000	ng/l	< 5.3 U	< 5.1 U
PFPeA	--	--	ng/l	< 2.1 U	0.62 J
PFHxA	--	150,000	ng/l	< 2.1 U	1 J
PFHpA	--	--	ng/l	< 2.1 U	0.4 J
PFOA	20	--	ng/l	< 2.1 U	5.8
PFNA	--	30	ng/l	< 2.1 U	< 2 U
PFDA	--	300	ng/l	< 2.1 U	< 2 U
PFUnA	--	3,000	ng/l	< 2.1 U	< 2 U
PFDoA	--	500	ng/l	< 2.1 U	< 2 U
PFTriA	--	--	ng/l	< 2.1 U	< 2 U
PFTeA	--	10,000	ng/l	< 2.1 U	< 2 U
PFHxDA	--	--	ng/l	< 2.1 U	< 2 U
PFODA	--	400,000	ng/l	< 2.1 U	< 2 U
PFBS	--	450,000	ng/l	< 2.1 U	< 2 U
PFPeS	--	--	ng/l	< 2.1 U	< 2 U
PFHxS	--	40	ng/l	< 2.1 U	< 2 U
PFHpS	--	--	ng/l	< 2.1 U	< 2 U
PFOS	20	--	ng/l	< 2.1 U	< 2 U
PFNS	--	--	ng/l	< 2.1 U	< 2 U
PFDS	--	--	ng/l	< 2.1 U	< 2 U
PFDoS	--	--	ng/l	< 2.1 U	< 2 U
4:2 FTS	--	--	ng/l	< 2.1 U	< 2 U
6:2 FTS	--	--	ng/l	< 5.3 U	< 5.1 U
8:2 FTS	--	--	ng/l	< 2.1 U	< 2 U
10:2 FTS	--	--	ng/l	< 2.1 U	< 2 U
FOSA	--	20 ⁽²⁾	ng/l	1.5 J	2.7
NMeFOSA	--	--	ng/l	< 2.1 U	< 2 U
NEtFOSA	--	20 ⁽²⁾	ng/l	< 2.1 U	< 2 U
NMeFOSAA	--	--	ng/l	< 5.3 U	< 5.1 U
NEtFOSAA	--	20 ⁽²⁾	ng/l	< 5.3 U	< 5.1 U
NMeFOSE	--	--	ng/l	< 4.2 U	< 4.1 U
NEtFOSE	--	20 ⁽²⁾	ng/l	< 2.1 U	< 2 U
HFPO-DA	--	300	ng/l	< 4.2 U	< 4.1 U
DONA	--	3,000	ng/l	< 2.1 U	< 2 U
9Cl-PF3ONS	--	--	ng/l	< 2.1 U	< 2 U
11Cl-PF3OUdS	--	--	ng/l	< 2.1 U	< 2 U

Notes on Page 2.

Table 2
Total Well Sample Confirmation Results
Deep Aquifer Bedrock Well Design and Long Term Monitoring Work Plan
Tyco Fire Products LP
Marinette, Wisconsin

Notes:

< = Compound not detected at reporting detection limit.

(1) = In June 2019 the Wisconsin Department of Health Services (DHS) recommended individual groundwater standards of 20 ng/L for PFOA and PFOS. The WDNR proposed those standards through the state rulemaking process. In February 2022, the Wisconsin Natural Resources Board did not approve the proposed rulemaking for groundwater. In August 2022, WDNR promulgated a drinking water standard of 70 ng/L for PFOA and PFOS, individually and combined, for public water systems. This standard does not apply to private drinking water wells.

(2) = In November 2020 the Wisconsin DHS recommended a combined groundwater standard of 20 ng/L for: FOSA, NEtFOSE, NEtFOSA, NEtFOSAA, PFOS and PFOA. DHS also recommended individual standards for FOSA, NEtFOSE, NEtFOSA, NEtFOSAA, PFBS, PFHxS, PFNA, PFDA, PFDoA, PFHxA, PFTeA, PFUnA, PFBA, PFODA, DONA, and GenX. In March 2021, The Wisconsin Natural Resources Board approved a Statement of Scope to initiate a rulemaking for this recommendation. The WDNR has not yet proposed rules to initiate the rulemaking process to implement this recommendation; the agency's authority to do so under the Statement of Scope will expire in September 2023.

-- = No standard

N = Normal sample

ng/L = nanograms per liter

FD = Field duplicate sample

J = The analyte was positively identified; however the associated numerical value is an estimated concentration only

U = The analyte was analyzed for but the result was not detected above the method detection limit.

Chemical Abbreviations

PFBA = Perfluorobutanoic acid (C4)	PFNS = Perfluorononanesulfonic acid (C9)
PFPeA = Perfluoropentanoic acid (C5)	PFDS = Perfluorodecanesulfonic acid (C10)
PFHxA = Perfluorohexanoic acid (C6)	PFDoS = Perfluorododecanesulfonic acid (C12)
PFHpA = Perfluoroheptanoic acid (C7)	4:2 FTS = 4:2 fluorotelomer sulfonate (C6)
PFOA = Perfluorooctanoic acid (C8)	6:2 FTS = 6:2 fluorotelomer sulfonate (C8)
PFNA = Perfluorononanoic acid (C9)	8:2 FTS = 8:2 fluorotelomer sulfonate (C10)
PFDA = Perfluorodecanoic acid (C10)	10:2 FTS = 10:2 fluorotelomer sulfonate (C12)
PFUnA = Perfluoroundecanoic acid (C11)	FOSA = Perfluorooctanesulfonamide (C8)
PFDoA = Perfluorododecanoic acid (C12)	NMeFOSA = N-methylperfluorooctanesulfonamide (C9)
PFTriA = Perfluorotridecanoic acid (C13)	NEtFOSA = N-ethylperfluorooctanesulfonamide (C10)
PFTeA = Perfluorotetradecanoic acid (C14)	NMeFOSAA = N-methylperfluorooctanesulfonamidoacetic acid (C11)
PFHxDA = Perfluoro-n-hexadecanoic acid (C16)	NEtFOSAA = N-ethylperfluorooctanesulfonamidoacetic acid (C12)
PFODA = Perfluoro-n-octadecanoic acid (C18)	NMeFOSE = N-methylperfluorooctanesulfonamidoethanol (C11)
PFBS = Perfluorobutanesulfonic acid (C4)	NEtFOSE = N-ethylperfluorooctanesulfonamidoethanol (C12)
PFPeS = Perfluoropentanesulfonic acid (C5)	HFPO-DA = Hexafluoropropylene oxide dimer acid (C6)
PFHxS = Perfluorohexanesulfonic acid (C6)	DONA = 4,8-Dioxa-3H-perfluorononanoic acid (C7)
PFHpS = Perfluoroheptanesulfonic acid (C7)	F-53B Major = 9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (C8)
PFOS = Perfluorooctanesulfonic acid (C8)	F-53B Minor = 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (C10)

Table 3
Discrete-zone Packer Results
Deep Aquifer Bedrock Well Design and Long Term Monitoring Work Plan
Tyco Fire Products LP
Marinette, Wisconsin

Analyte	June 2019 DHS (Not Adopted by DNR Board) ⁽¹⁾	November 2020 DHS (Not Yet Proposed for Rulemaking by DNR) ⁽²⁾	Test Interval	Borehole above 100 ft bgs, after purging well dry		Borehole above 100 ft bgs, after recovery	Borehole below 150 feet, after 10x well volume purge		
				Location	IRR-02	IRR-02	IRR-02	IRR-02	IRR-02
				Sample ID	IRR-02_100 (20220804)	DUP-01 (20220804)	IRR-02_65 (20220805)	IRR-02_150 (20220806)	DUP-02 (20220806)
				Sample Date	08/04/2022	08/04/2022	08/05/2022	08/06/2022	08/06/2022
				Sample Type	N	FD	N	N	FD
Unit									
PFBA	--	10,000	ng/l	4.1 J	4.1 J	< 4.5 U	< 4.6 U	< 4.4 U	
PFPeA	--	--	ng/l	7.2	7	0.67 J	< 1.8 U	< 1.8 U	
PFHxA	--	150,000	ng/l	14	13	1.5 J	< 1.8 U	< 1.8 U	
PFHpA	--	--	ng/l	7.8	8	0.85 J	< 1.8 U	< 1.8 U	
PFOA	20	--	ng/l	94	93	11	< 1.8 U	< 1.8 U	
PFNA	--	30	ng/l	2	1.8	0.37 J	< 1.8 U	< 1.8 U	
PFDA	--	300	ng/l	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	
PFUnA	--	3,000	ng/l	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	
PFDoA	--	500	ng/l	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	
PFTriA	--	--	ng/l	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	
PFTeA	--	10,000	ng/l	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	
PFHxDA	--	--	ng/l	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	
PFODA	--	400,000	ng/l	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	
PFBS	--	450,000	ng/l	0.26 J	0.24 J	< 1.8 U	< 1.8 U	< 1.8 U	
PFPeS	--	--	ng/l	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	
PFHxS	--	40	ng/l	1.4 J	1.2 J	< 1.8 U	< 1.8 U	< 1.8 U	
PFHpS	--	--	ng/l	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	
PFOS	20	--	ng/l	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	
PFNS	--	--	ng/l	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	
PFDS	--	--	ng/l	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	
PFDoS	--	--	ng/l	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	
4:2 FTS	--	--	ng/l	0.9 J	0.95 J	< 1.8 U	< 1.8 U	< 1.8 U	
6:2 FTS	--	--	ng/l	27	28	3.2 J	< 4.6 U	< 4.4 U	
8:2 FTS	--	--	ng/l	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	
10:2 FTS	--	--	ng/l	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	
FOSA	--	20 ⁽²⁾	ng/l	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	
NMeFOSA	--	--	ng/l	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	
NEIFOSA	--	20 ⁽²⁾	ng/l	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	
NMeFOSAA	--	--	ng/l	< 4.5 U	< 4.5 U	< 4.5 U	< 4.6 U	< 4.4 U	
NEIFOSAA	--	20 ⁽²⁾	ng/l	< 4.5 U	< 4.5 U	< 4.5 U	< 4.6 U	< 4.4 U	
NMeFOSE	--	--	ng/l	< 3.6 U	< 3.6 U	< 3.6 U	< 3.7 U	< 3.6 U	
NEIFOSE	--	20 ⁽²⁾	ng/l	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	
HFPO-DA	--	300	ng/l	< 3.6 U	< 3.6 U	< 3.6 U	< 3.7 U	< 3.6 U	
DONA	--	3,000	ng/l	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	
9CI-PF3ONS	--	--	ng/l	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	
11CI-PF3OUdS	--	--	ng/l	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	

Notes:
< = Compound not detected at reporting detection limit.
(1) = In June 2019 the Wisconsin Department of Health Services (DHS) recommended individual groundwater standards of 20 ng/L for PFOA and PFOS. The WDNR proposed those standards through the state rulemaking process. In February 2022, the Wisconsin Natural Resources Board did not approve the proposed rulemaking for groundwater. In August 2022, WDNR promulgated a drinking water standard of 70 ng/L for PFOA and PFOS, individually and combined, for public water systems. This standard does not apply to private drinking water wells.
(2) = In November 2020 the Wisconsin DHS recommended a combined groundwater standard of 20 ng/L for: FOSA, NEIFOSE, NEIFOSAA, NEIFOSAA, PFOS and PFOA. DHS also recommended individual standards for FOSA, NEIFOSE, NEIFOSAA, NEIFOSAA, PFBS, PFHxS, PFNA, PFDA, PFDoA, PFHxA, PFTeA, PFUnA, PFBA, PFODA, DONA, and GenX. In March 2021, J = The analyte was positively identified; however the associated numerical value is an estimated concentration only
U = The analyte was analyzed for but the result was not detected above the method detection limit.

Chemical Abbreviations

- | | |
|--|--|
| PFBA = Perfluorobutanoic acid (C4) | PFNS = Perfluoronanesulfonic acid (C9) |
| PFPeA = Perfluoropentanoic acid (C5) | PFDS = Perfluorodecanesulfonic acid (C10) |
| PFHxA = Perfluorohexanoic acid (C6) | PFDoS = Perfluorododecanesulfonic acid (C12) |
| PFHpA = Perfluoroheptanoic acid (C7) | 4:2 FTS = 4:2 fluorotelomer sulfonate (C6) |
| PFOA = Perfluorooctanoic acid (C8) | 6:2 FTS = 6:2 fluorotelomer sulfonate (C8) |
| PFNA = Perfluorononanoic acid (C9) | 8:2 FTS = 8:2 fluorotelomer sulfonate (C10) |
| PFDA = Perfluorodecanoic acid (C10) | 10:2 FTS = 10:2 fluorotelomer sulfonate (C12) |
| PFUnA = Perfluoroundecanoic acid (C11) | FOSA = Perfluorooctanesulfonamide (C8) |
| PFDoA = Perfluorododecanoic acid (C12) | NMeFOSA = N-methylperfluorooctanesulfonamide (C9) |
| PFTriA = Perfluorotridecanoic acid (C13) | NEIFOSA = N-ethylperfluorooctanesulfonamide (C10) |
| PFTeA = Perfluorotetradecanoic acid (C14) | NMeFOSAA = N-methylperfluorooctanesulfonamidoacetic acid (C11) |
| PFHxDA = Perfluoro-n-hexadecanoic acid (C16) | NEIFOSAA = N-ethylperfluorooctanesulfonamidoacetic acid (C12) |
| PFODA = Perfluoro-n-octadecanoic acid (C18) | NMeFOSE = N-methylperfluorooctanesulfonamidoethanol (C11) |
| PFBS = Perfluorobutanesulfonic acid (C4) | NEIFOSE = N-ethylperfluorooctanesulfonamidoethanol (C12) |
| PFPeS = Perfluoropentanesulfonic acid (C5) | HFPO-DA = Hexafluoropropylene oxide dimer acid (C6) |
| PFHxS = Perfluorohexanesulfonic acid (C6) | DONA = 4,8-Dioxa-3H-perfluorononanoic acid (C7) |
| PFHpS = Perfluoroheptanesulfonic acid (C7) | F-53B Major = 9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (C8) |
| PFOS = Perfluorooctanesulfonic acid (C8) | F-53B Minor = 11-chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (C10) |

Table 4
Potable Well PFAS Analytical Results - December 2017 to June 2022
Deep Aquifer Bedrock Well Design and Long Term Monitoring Work Plan
Tyco Fire Products LP
Marinette, Wisconsin

	June 2019 WDHS (Not Adopted by WDNR Board) ⁽¹⁾	November 2020 WDHS (Not Yet Proposed for Rulemaking by WDNR) ⁽²⁾	Location	WS-002			WS-004	WS-006				
			Sample ID	WS-002 (041818)	DUP-064 (041818)	WS-002 (120717)	WS-004 (120717)	WS-006 (121217)	WS-006 (041818)	WS-006 (082918)	WS-006 (051221)	WS-006 (052322)
			Sample Date	4/18/2018	4/18/2018	12/7/2017	12/7/2017	12/12/2017	4/18/2018	8/29/2018	5/12/2021	5/23/2022
			Sample Type	N	FD	N	N	N	N	N	N	N
			General Depth	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep
			Well Depth	523	523	523	476	521	521	521	521	521
			Source	+,-	+,-	+,-	+	+,-	+,-	+,-	+,-	+,-
			WUWN	MT2112	MT2112	MT2112	UH526	UH515	UH515	UH515	UH515	UH515
PFAS	Unit											
PFBA	--	10,000	ng/L	NA	NA	NA	NA	NA	NA	NA	<4.7 U	NA
PFPeA	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	<1.9 U	NA
PFHxA	--	150,000	ng/L	NA	NA	NA	NA	NA	NA	<1.9 U	<1.9 U	NA
PFHpA	--	--	ng/L	<10 U	<10 U	<2.18 U	<2.02 U	<10 U	<9.7 U	<2.9 U	<1.9 U	NA
PFOA	20	--	ng/L	<21 U	<20 U	<2.18 U	<2.02 U	<20 U	<19 U	<5.8 U	<1.9 U	NA
PFNA	--	30	ng/L	<21 U	<20 U	<2.18 U	<2.02 U	<20 U	<19 U	<1.9 U	<1.9 U	NA
PFDA	--	300	ng/L	NA	NA	NA	NA	NA	NA	<1.9 U	<1.9 U	NA
PFUnA	--	3,000	ng/L	NA	NA	NA	NA	NA	NA	<1.9 U	<1.9 U	NA
PFDoA	--	500	ng/L	NA	NA	NA	NA	NA	NA	<1.9 U	<1.9 U	NA
PFTriA	--	--	ng/L	NA	NA	NA	NA	NA	NA	<1.9 U	<1.9 U	NA
PFTeA	--	10,000	ng/L	NA	NA	NA	NA	NA	NA	<1.9 U	<1.9 U	NA
PFHxDA	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	<1.9 U	NA
PFODA	--	400,000	ng/L	NA	NA	NA	NA	NA	NA	NA	<1.9 U	NA
PFBS	--	450,000	ng/L	<93 U	<92 U	<2.18 U	<2.02 U	<90 U	<87 U	<1.9 U	<1.9 U	NA
PFPeS	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	<1.9 U	NA
PFHxS	--	40	ng/L	<31 U	<31 U	<2.18 U	<2.02 U	<30 U	<29 U	<1.9 U	<1.9 U	NA
PFHpS	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	<1.9 U	NA
PFOS	20	--	ng/L	<41 U	<41 U	<2.18 U	<2.02 U	<40 U	<39 U	<1.9 U	<1.9 U	NA
PFNS	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	<1.9 U	NA
PFDS	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	<1.9 U	NA
PFDoS	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	<1.9 U	NA
4:2 FTS	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	<1.9 U	NA
6:2 FTS	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	<4.7 U	NA
8:2 FTS	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	<1.9 U	NA
10:2 FTS	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	<1.9 U	NA
FOSA	--	20 ⁽²⁾	ng/L	NA	NA	NA	NA	NA	NA	NA	4.4	NA
NMeFOSA	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	<1.9 U	NA
NEtFOSA	--	20 ⁽²⁾	ng/L	NA	NA	NA	NA	NA	NA	NA	<1.9 U	NA
NMeFOSAA	--	--	ng/L	NA	NA	NA	NA	NA	NA	<2.9 U	<4.7 U	NA
NEtFOSAA	--	20 ⁽²⁾	ng/L	NA	NA	NA	NA	NA	NA	<1.9 U	<4.7 U	NA
NMeFOSE	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	<3.8 U	NA
NEtFOSE	--	20 ⁽²⁾	ng/L	NA	NA	NA	NA	NA	NA	NA	<1.9 U	NA
HFPO-DA	--	300	ng/L	NA	NA	NA	NA	NA	NA	NA	<3.8 U	NA
DONA	--	3,000	ng/L	NA	NA	NA	NA	NA	NA	NA	<1.9 U	NA
9CI-PF3ONS	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	<1.9 U	NA
11CI-PF3OUdS	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	<1.9 U	NA

Notes on Page 12.

Table 4
Potable Well PFAS Analytical Results - December 2017 to June 2022
Deep Aquifer Bedrock Well Design and Long Term Monitoring Work Plan
Tyco Fire Products LP
Marinette, Wisconsin

	June 2019 WDHS (Not Adopted by WDNR Board) ⁽¹⁾	November 2020 WDHS (Not Yet Proposed for Rulemaking by WDNR) ⁽²⁾	Location	WS-012						WS-028		
			Sample ID	WS-012 (121217)	WS-012 (041318)	WS-012 (092818)	WS-012 (112718)	WS-012 (051319)	WS-012 (102119)	WS-012 (020921)	WS-028 (121317)	WS-028 (041018)
			Sample Date	12/12/2017	4/13/2018	9/28/2018	11/27/2018	5/13/2019	10/21/2019	2/9/2021	12/13/2017	4/10/2018
			Sample Type	N	N	N	N	N	N	N	N	N
			General Depth	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep
			Well Depth	510	510	510	510	510	510	510	454	454
			Source	+,-	+,-	+,-	+,-	+,-	+,-	+,-	+,-	+,-
			WUWN	WS724	WS724	WS724	WS724	WS724	WS724	IC095	IC095	
PFAS			Unit									
PFBA	--	10,000	ng/L	NA	NA	NA	NA	NA	NA	<4.5 U	NA	NA
PFPeA	--	--	ng/L	NA	NA	NA	NA	NA	NA	<1.8 U	NA	NA
PFHxA	--	150,000	ng/L	NA	NA	<2.0 U	<1.8 U	<1.8 U	<1.8 U	<1.8 U	NA	NA
PFHpA	--	--	ng/L	<10 U	<10 U	<3.0 U	<1.8 U	<2.7 U	<1.8 U	<1.8 U	<11 U	<9.9 U
PFOA	20	--	ng/L	<20 U	<20 U	<6.0 U	<1.8 U	<5.5 U	<1.8 U	<1.8 U	<21 U	<20 U
PFNA	--	30	ng/L	<20 U	<20 U	<2.0 U	<1.8 U	<1.8 U	<1.8 U	<1.8 U	<21 U	<20 U
PFDA	--	300	ng/L	NA	NA	<2.0 U	<1.8 U	<1.8 U	<1.8 U	<1.8 U	NA	NA
PFUnA	--	3,000	ng/L	NA	NA	<2.0 U	<1.8 U	<1.8 U	<1.8 U	<1.8 U	NA	NA
PFDoA	--	500	ng/L	NA	NA	<2.0 U	<1.8 U	<1.8 U	<1.8 U	<1.8 U	NA	NA
PFTriA	--	--	ng/L	NA	NA	<2.0 U	<1.8 U	<1.8 U	<1.8 U	<1.8 U	NA	NA
PFTeA	--	10,000	ng/L	NA	NA	<2.0 U	<1.8 U	<1.8 U	<1.8 U	<1.8 U	NA	NA
PFHxDA	--	--	ng/L	NA	NA	NA	NA	NA	NA	<1.8 U	NA	NA
PFODA	--	400,000	ng/L	NA	NA	NA	NA	NA	NA	<1.8 U	NA	NA
PFBS	--	450,000	ng/L	<90 U	<92 U	<2.0 U	<1.8 U	<1.8 U	<1.8 U	<1.8 U	<96 U	<89 U
PFPeS	--	--	ng/L	NA	NA	NA	NA	NA	NA	<1.8 U	NA	NA
PFHxS	--	40	ng/L	<30 U	<31 U	<2.0 U	<1.8 U	<1.8 U	<1.8 U	<1.8 U	<32 U	<30 U
PFHpS	--	--	ng/L	NA	NA	NA	NA	NA	NA	<1.8 U	NA	NA
PFOS	20	--	ng/L	<40 U	<41 U	<2.0 U	<1.8 U	<1.8 U	<1.8 U	<1.8 U	<43 U	<39 U
PFNS	--	--	ng/L	NA	NA	NA	NA	NA	NA	<1.8 U	NA	NA
PFDS	--	--	ng/L	NA	NA	NA	NA	NA	NA	<1.8 U	NA	NA
PFDoS	--	--	ng/L	NA	NA	NA	NA	NA	NA	<1.8 U	NA	NA
4:2 FTS	--	--	ng/L	NA	NA	NA	NA	NA	NA	<1.8 U	NA	NA
6:2 FTS	--	--	ng/L	NA	NA	NA	NA	NA	NA	<4.5 U	NA	NA
8:2 FTS	--	--	ng/L	NA	NA	NA	NA	NA	NA	<1.8 U	NA	NA
10:2 FTS	--	--	ng/L	NA	NA	NA	NA	NA	NA	<1.8 U	NA	NA
FOSA	--	20 ⁽²⁾	ng/L	NA	NA	NA	NA	NA	NA	<1.8 U	NA	NA
NMeFOSA	--	--	ng/L	NA	NA	NA	NA	NA	NA	<1.8 U	NA	NA
NEtFOSA	--	20 ⁽²⁾	ng/L	NA	NA	NA	NA	NA	NA	<1.8 U	NA	NA
NMeFOSAA	--	--	ng/L	NA	NA	<3.0 U	<1.8 U	<2.7 U	<1.8 U	<4.5 U	NA	NA
NEtFOSAA	--	20 ⁽²⁾	ng/L	NA	NA	<2.0 U	<1.8 U	<1.8 U	<1.8 U	<4.5 U	NA	NA
NMeFOSE	--	--	ng/L	NA	NA	NA	NA	NA	NA	<3.6 U	NA	NA
NEtFOSE	--	20 ⁽²⁾	ng/L	NA	NA	NA	NA	NA	NA	<1.8 U	NA	NA
HFPO-DA	--	300	ng/L	NA	NA	NA	NA	NA	NA	<3.6 U	NA	NA
DONA	--	3,000	ng/L	NA	NA	NA	NA	NA	NA	<1.8 U	NA	NA
9Cl-PF3ONS	--	--	ng/L	NA	NA	NA	NA	NA	NA	<1.8 U	NA	NA
11Cl-PF3OUdS	--	--	ng/L	NA	NA	NA	NA	NA	NA	<1.8 U	NA	NA

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Table 4
Potable Well PFAS Analytical Results - December 2017 to June 2022
Deep Aquifer Bedrock Well Design and Long Term Monitoring Work Plan
Tyco Fire Products LP
Marinette, Wisconsin

	June 2019 WDHS (Not Adopted by WDNR Board) ⁽¹⁾	November 2020 WDHS (Not Yet Proposed for Rulemaking by WDNR) ⁽²⁾	Location	WS-028 (continued)					WS-056			
			Sample ID	WS-028 (090518)	WS-028 (120618)	DUP-205 (120618)	WS-028 (031622)	DUP-461 (031622)	WS-056 (122717)	DUP-08 (122717)	WS-056 (050118)	WS-056 (091818)
			Sample Date	9/5/2018	12/6/2018	12/6/2018	3/16/2022	3/16/2022	12/27/2017	12/27/2017	5/1/2018	9/18/2018
			Sample Type	N	N	FD	N	FD	N	FD	N	N
			General Depth	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep
			Well Depth	454	454	454	454	454	495	495	495	495
			Source	+,-	+,-	+,-	+,-	+,-	+,-	+,-	+,-	+,-
			WUWN	IC095	IC095	IC095	IC095	IC095	WS712	WS712	WS712	WS712
PFAS			Unit									
PFBA	--	10,000	ng/L	NA	NA	NA	<4.7 U	<4.6 U	NA	NA	NA	NA
PFPeA	--	--	ng/L	NA	NA	NA	<1.9 U	<1.8 U	NA	NA	NA	NA
PFHxA	--	150,000	ng/L	<1.9 U	<1.8 U	<1.8 U	<1.9 U	<1.8 U	NA	NA	NA	<2.1 U
PFHpA	--	--	ng/L	<2.9 U	<1.8 U	<1.8 U	<1.9 U	<1.8 U	<10 U	<10 U	<9.6 U	<3.2 U
PFOA	20	--	ng/L	<5.7 U	<1.8 U	<1.8 U	<1.9 U	<1.8 U	<20 U	<21 U	<19 U	<6.4 U
PFNA	--	30	ng/L	<1.9 U	<1.8 U	<1.8 U	<1.9 U	<1.8 U	<20 U	<21 U	<19 U	<2.1 U
PFDA	--	300	ng/L	<1.9 U	<1.8 U	<1.8 U	<1.9 U	<1.8 U	NA	NA	NA	<2.1 U
PFUnA	--	3,000	ng/L	<1.9 U	<1.8 U	<1.8 U	<1.9 U	<1.8 U	NA	NA	NA	<2.1 U
PFDaA	--	500	ng/L	<1.9 U	<1.8 U	<1.8 U	<1.9 U	<1.8 U	NA	NA	NA	<2.1 U
PFTriA	--	--	ng/L	<1.9 U	<1.8 U	<1.8 U	<1.9 U	<1.8 U	NA	NA	NA	<2.1 U
PFTeA	--	10,000	ng/L	<1.9 U	<1.8 U	<1.8 U	<1.9 U	<1.8 U	NA	NA	NA	<2.1 U
PFHxDA	--	--	ng/L	NA	NA	NA	<1.9 U	<1.8 U	NA	NA	NA	NA
PFODA	--	400,000	ng/L	NA	NA	NA	<1.9 U	<1.8 U	NA	NA	NA	NA
PFBS	--	450,000	ng/L	<1.9 U	<1.8 UB	<1.8 UB	<1.9 U	<1.8 U	<90 U	<93 U	<87 U	<2.1 U
PFPeS	--	--	ng/L	NA	NA	NA	<1.9 U	<1.8 U	NA	NA	NA	NA
PFHxS	--	40	ng/L	<1.9 U	<1.8 U	<1.8 U	<1.9 U	<1.8 U	<30 U	<31 U	<29 U	<2.1 U
PFHpS	--	--	ng/L	NA	NA	NA	<1.9 U	<1.8 U	NA	NA	NA	NA
PFOS	20	--	ng/L	<1.9 U	<1.8 U	<1.8 U	<1.9 U	<1.8 U	<40 U	<41 U	<38 U	<2.1 U
PFNS	--	--	ng/L	NA	NA	NA	<1.9 U	<1.8 U	NA	NA	NA	NA
PFDS	--	--	ng/L	NA	NA	NA	<1.9 U	<1.8 U	NA	NA	NA	NA
PFDoS	--	--	ng/L	NA	NA	NA	<1.9 U	<1.8 U	NA	NA	NA	NA
4:2 FTS	--	--	ng/L	NA	NA	NA	<1.9 U	<1.8 U	NA	NA	NA	NA
6:2 FTS	--	--	ng/L	NA	NA	NA	<4.7 U	<4.6 U	NA	NA	NA	NA
8:2 FTS	--	--	ng/L	NA	NA	NA	<1.9 U	<1.8 U	NA	NA	NA	NA
10:2 FTS	--	--	ng/L	NA	NA	NA	<1.9 U	<1.8 U	NA	NA	NA	NA
FOSA	--	20 ⁽²⁾	ng/L	NA	NA	NA	2.4	2.3	NA	NA	NA	NA
NMeFOSA	--	--	ng/L	NA	NA	NA	<1.9 U	<1.8 U	NA	NA	NA	NA
NEtFOSA	--	20 ⁽²⁾	ng/L	NA	NA	NA	<1.9 U	<1.8 U	NA	NA	NA	NA
NMeFOSAA	--	--	ng/L	<2.9 U	<1.8 U	<1.8 U	<4.7 U	<4.6 U	NA	NA	NA	<3.2 U
NEtFOSAA	--	20 ⁽²⁾	ng/L	<1.9 U	<1.8 U	<1.8 U	<4.7 U	<4.6 U	NA	NA	NA	<2.1 U
NMeFOSE	--	--	ng/L	NA	NA	NA	<3.8 U	<3.6 U	NA	NA	NA	NA
NEtFOSE	--	20 ⁽²⁾	ng/L	NA	NA	NA	<1.9 U	<1.8 U	NA	NA	NA	NA
HFPO-DA	--	300	ng/L	NA	NA	NA	<3.8 U	<3.6 U	NA	NA	NA	NA
DONA	--	3,000	ng/L	NA	NA	NA	<1.9 U	<1.8 U	NA	NA	NA	NA
9Cl-PF3ONS	--	--	ng/L	NA	NA	NA	<1.9 U	<1.8 U	NA	NA	NA	NA
11Cl-PF3OUdS	--	--	ng/L	NA	NA	NA	<1.9 U	<1.8 U	NA	NA	NA	NA

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Table 4
Potable Well PFAS Analytical Results - December 2017 to June 2022
Deep Aquifer Bedrock Well Design and Long Term Monitoring Work Plan
Tyco Fire Products LP
Marinette, Wisconsin

	June 2019 WDHS (Not Adopted by WDNR Board) ⁽¹⁾	November 2020 WDHS (Not Yet Proposed for Rulemaking by WDNR) ⁽²⁾	Location	WS-056 (continued)				WS-069A				
			Sample ID	WS-056 (062019)	DUP-283 (062019)	WS-056 (062921)	DUP-422 (06292021)	WS-069A (010918)	WS-069A (042318)	DUP-068 (042318)	WS-069A (090418)	WS-069A (102518)
			Sample Date	6/20/2019	6/20/2019	6/29/2021	6/29/2021	1/9/2018	4/23/2018	4/23/2018	9/4/2018	10/25/2018
			Sample Type	N	FD	N	FD	N	N	FD	N	N
			General Depth	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep
			Well Depth	495	495	495	495	520	520	520	520	520
			Source	+,-	+,-	+,-	+,-	+,-	+,-	+,-	+,-	+,-
			WUWN	WS712	WS712	WS712	WS712	LK952	LK952	LK952	LK952	LK952
PFAS			Unit									
PFBA	--	10,000	ng/L	NA	NA	<4.7 U	<4.5 U	NA	NA	NA	NA	NA
PFPeA	--	--	ng/L	NA	NA	<1.9 U	<1.8 U	NA	NA	NA	NA	NA
PFHxA	--	150,000	ng/L	<1.8 U	<2.0 UJ-	<1.9 U	<1.8 U	NA	NA	NA	<1.8 U	<1.7 U
PFHpA	--	--	ng/L	<2.8 U	<2.9 UJ-	<1.9 U	<1.8 U	<8.8 U	<9.7 U	<10 U	<2.6 U	<2.6 U
PFOA	20	--	ng/L	<5.5 U	<5.9 UJ-	<1.9 U	<1.8 U	<18 U	<19 U	<20 U	<5.3 U	<5.1 U
PFNA	--	30	ng/L	<1.8 U	<2.0 UJ-	<1.9 U	<1.8 U	<18 U	<19 U	<20 U	<1.8 U	<1.7 U
PFDA	--	300	ng/L	<1.8 U	<2.0 UJ-	0.29 J	0.32 J	NA	NA	NA	<1.8 U	<1.7 U
PFUnA	--	3,000	ng/L	<1.8 U	<2.0 UJ-	<1.9 U	<1.8 U	NA	NA	NA	<1.8 U	<1.7 U
PFDoA	--	500	ng/L	<1.8 U	<2.0 UJ-	<1.9 U	<1.8 U	NA	NA	NA	<1.8 U	<1.7 U
PFTriA	--	--	ng/L	<1.8 U	<2.0 UJ-	<1.9 U	<1.8 U	NA	NA	NA	<1.8 U	<1.7 U
PFTeA	--	10,000	ng/L	<1.8 U	<2.0 UJ-	<1.9 U	<1.8 U	NA	NA	NA	<1.8 U	<1.7 U
PFHxDA	--	--	ng/L	NA	NA	<1.9 U	<1.8 U	NA	NA	NA	NA	NA
PFODA	--	400,000	ng/L	NA	NA	<1.9 U	<1.8 U	NA	NA	NA	NA	NA
PFBS	--	450,000	ng/L	<1.8 U	<2.0 UJ-	<1.9 U	<1.8 U	<79 U	<87 U	<90 U	<1.8 U	<1.7 U
PFPeS	--	--	ng/L	NA	NA	<1.9 U	<1.8 U	NA	NA	NA	NA	NA
PFHxS	--	40	ng/L	<1.8 U	<2.0 UJ-	<1.9 U	<1.8 U	<26 U	<29 U	<30 U	<1.8 U	<1.7 U
PFHpS	--	--	ng/L	NA	NA	<1.9 U	<1.8 U	NA	NA	NA	NA	NA
PFOS	20	--	ng/L	<1.8 U	<2.0 UJ-	<1.9 U	<1.8 U	<35 U	<39 U	<40 U	<1.8 U	<1.7 U
PFNS	--	--	ng/L	NA	NA	<1.9 U	<1.8 U	NA	NA	NA	NA	NA
PFDS	--	--	ng/L	NA	NA	<1.9 U	<1.8 U	NA	NA	NA	NA	NA
PFDoS	--	--	ng/L	NA	NA	<1.9 U	<1.8 U	NA	NA	NA	NA	NA
4:2 FTS	--	--	ng/L	NA	NA	<1.9 U	<1.8 U	NA	NA	NA	NA	NA
6:2 FTS	--	--	ng/L	NA	NA	<4.7 U	<4.5 U	NA	NA	NA	NA	NA
8:2 FTS	--	--	ng/L	NA	NA	<1.9 U	<1.8 U	NA	NA	NA	NA	NA
10:2 FTS	--	--	ng/L	NA	NA	<1.9 U	<1.8 U	NA	NA	NA	NA	NA
FOSA	--	20 ⁽²⁾	ng/L	NA	NA	<1.9 U	<1.8 U	NA	NA	NA	NA	NA
NMeFOSA	--	--	ng/L	NA	NA	<1.9 U	<1.8 U	NA	NA	NA	NA	NA
NEtFOSA	--	20 ⁽²⁾	ng/L	NA	NA	<1.9 U	<1.8 U	NA	NA	NA	NA	NA
NMeFOSAA	--	--	ng/L	<2.8 U	<2.9 UJ-	<4.7 U	<4.5 U	NA	NA	NA	<2.6 U	<2.6 U
NEtFOSAA	--	20 ⁽²⁾	ng/L	<1.8 U	<2.0 UJ-	<4.7 U	<4.5 U	NA	NA	NA	<1.8 U	<1.7 U
NMeFOSE	--	--	ng/L	NA	NA	<3.7 U	<3.6 U	NA	NA	NA	NA	NA
NEtFOSE	--	20 ⁽²⁾	ng/L	NA	NA	<1.9 U	<1.8 U	NA	NA	NA	NA	NA
HFPO-DA	--	300	ng/L	NA	NA	<3.7 U	<3.6 U	NA	NA	NA	NA	NA
DONA	--	3,000	ng/L	NA	NA	<1.9 U	<1.8 U	NA	NA	NA	NA	NA
9Cl-PF3ONS	--	--	ng/L	NA	NA	<1.9 U	<1.8 U	NA	NA	NA	NA	NA
11Cl-PF3OUdS	--	--	ng/L	NA	NA	<1.9 U	<1.8 U	NA	NA	NA	NA	NA

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Table 4
Potable Well PFAS Analytical Results - December 2017 to June 2022
Deep Aquifer Bedrock Well Design and Long Term Monitoring Work Plan
Tyco Fire Products LP
Marinette, Wisconsin

	June 2019 WDHS (Not Adopted by WDNR Board) ⁽¹⁾	November 2020 WDHS (Not Yet Proposed for Rulemaking by WDNR) ⁽²⁾	Location	WS-069A (continued)							WS-083		
			Sample ID	DUP-179 (102518)	WS-069A (051519)	WS-069A (082819)	WS-069A (100219)	DUP-325 (100219)	WS-069A (033021)	WS-069A (062922)	WS-083 (011118)	WS-083 (042418)	
			Sample Date	10/25/2018	5/15/2019	8/28/2019	10/2/2019	10/2/2019	3/30/2021	6/29/2022	1/11/2018	4/24/2018	
			Sample Type	FD	N	N	N	FD	N	N	N	N	
			General Depth	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	
			Well Depth	520	520	520	520	520	520	520	400	400	
			Source	+,-	+,-	+,-	+,-	+,-	+,-	+,-	-	-	
			WUWN	LK952	LK952	LK952	LK952	LK952	LK952	LK952	N/A	N/A	
PFAS			Unit										
PFBA	--	10,000	ng/L	NA	NA	NA	NA	NA	<4.6 U	<5.1 U	NA	NA	
PFPeA	--	--	ng/L	NA	NA	NA	NA	NA	<1.8 U	<2.0 U	NA	NA	
PFHxA	--	150,000	ng/L	<1.7 U	<1.8 U	<1.9 U	<1.9 U	<1.9 U	<1.8 U	<2.0 U	NA	NA	
PFHpA	--	--	ng/L	<2.6 U	<2.7 U	<1.9 U	<1.9 U	<1.9 U	<1.8 U	<2.0 U	<10 U	<10 U	
PFOA	20	--	ng/L	<5.2 U	<5.4 U	0.59 J	<1.9 U	<1.9 U	<1.8 U	<2.0 U	<21 U	<20 U	
PFNA	--	30	ng/L	<1.7 U	<1.8 U	<1.9 U	<1.9 U	<1.9 U	<1.8 U	<2.0 U	<21 U	<20 U	
PFDA	--	300	ng/L	<1.7 U	<1.8 U	<1.9 U	<1.9 U	<1.9 U	0.32 J	<2.0 U	NA	NA	
PFUnA	--	3,000	ng/L	<1.7 U	<1.8 U	<1.9 U	<1.9 U	<1.9 U	<1.8 U	<2.0 U	NA	NA	
PFDoA	--	500	ng/L	<1.7 U	<1.8 U	<1.9 U	<1.9 U	<1.9 U	<1.8 U	<2.0 U	NA	NA	
PFTriA	--	--	ng/L	<1.7 U	<1.8 U	<1.9 U	<1.9 U	<1.9 U	<1.8 U	<2.0 U	NA	NA	
PFTeA	--	10,000	ng/L	<1.7 U	<1.8 U	<1.9 U	<1.9 U	<1.9 U	<1.8 U	<2.0 U	NA	NA	
PFHxDA	--	--	ng/L	NA	NA	NA	NA	NA	<1.8 U	<2.0 U	NA	NA	
PFODA	--	400,000	ng/L	NA	NA	NA	NA	NA	<1.8 U	<2.0 U	NA	NA	
PFBS	--	450,000	ng/L	<1.7 U	<1.8 U	<1.9 U	<1.9 U	<1.9 U	<1.8 U	<2.0 U	<93 U	<90 U	
PFPeS	--	--	ng/L	NA	NA	NA	NA	NA	<1.8 U	<2.0 U	NA	NA	
PFHxS	--	40	ng/L	<1.7 U	<1.8 U	<1.9 U	<1.9 U	<1.9 U	<1.8 U	<2.0 U	<31 U	<30 U	
PFHpS	--	--	ng/L	NA	NA	NA	NA	NA	<1.8 U	<2.0 U	NA	NA	
PFOS	20	--	ng/L	<1.7 U	<1.8 U	<1.9 U	<1.9 U	<1.9 U	<1.8 U	<2.0 U	<41 U	<40 U	
PFNS	--	--	ng/L	NA	NA	NA	NA	NA	<1.8 U	<2.0 U	NA	NA	
PFDS	--	--	ng/L	NA	NA	NA	NA	NA	<1.8 U	<2.0 U	NA	NA	
PFDoS	--	--	ng/L	NA	NA	NA	NA	NA	<1.8 U	<2.0 U	NA	NA	
4:2 FTS	--	--	ng/L	NA	NA	NA	NA	NA	<1.8 U	<2.0 U	NA	NA	
6:2 FTS	--	--	ng/L	NA	NA	NA	NA	NA	<4.6 U	<5.1 U	NA	NA	
8:2 FTS	--	--	ng/L	NA	NA	NA	NA	NA	<1.8 U	<2.0 U	NA	NA	
10:2 FTS	--	--	ng/L	NA	NA	NA	NA	NA	<1.8 U	<2.0 U	NA	NA	
FOSA	--	20 ⁽²⁾	ng/L	NA	NA	NA	NA	NA	6.1	<2.0 U	NA	NA	
NMeFOSA	--	--	ng/L	NA	NA	NA	NA	NA	<1.8 U	<2.0 U	NA	NA	
NEtFOSA	--	20 ⁽²⁾	ng/L	NA	NA	NA	NA	NA	<1.8 U	<2.0 U	NA	NA	
NMeFOSAA	--	--	ng/L	<2.6 U	<2.7 U	<1.9 U	<1.9 U	<1.9 U	<4.6 U	<5.1 U	NA	NA	
NEtFOSAA	--	20 ⁽²⁾	ng/L	<1.7 U	<1.8 U	<1.9 U	<1.9 U	<1.9 U	<4.6 U	<5.1 U	NA	NA	
NMeFOSE	--	--	ng/L	NA	NA	NA	NA	NA	<3.7 U	<4.1 U	NA	NA	
NEtFOSE	--	20 ⁽²⁾	ng/L	NA	NA	NA	NA	NA	<1.8 U	<2.0 U	NA	NA	
HFPO-DA	--	300	ng/L	NA	NA	NA	NA	NA	<3.7 U	<4.1 U	NA	NA	
DONA	--	3,000	ng/L	NA	NA	NA	NA	NA	<1.8 U	<2.0 U	NA	NA	
9Cl-PF3ONS	--	--	ng/L	NA	NA	NA	NA	NA	<1.8 U	<2.0 U	NA	NA	
11Cl-PF3OUdS	--	--	ng/L	NA	NA	NA	NA	NA	<1.8 U	<2.0 U	NA	NA	

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Table 4
Potable Well PFAS Analytical Results - December 2017 to June 2022
Deep Aquifer Bedrock Well Design and Long Term Monitoring Work Plan
Tyco Fire Products LP
Marinette, Wisconsin

	June 2019 WDHS (Not Adopted by WDNR Board) ⁽¹⁾	November 2020 WDHS (Not Yet Proposed for Rulemaking by WDNR) ⁽²⁾	Location	WS-083 (continued)						WS-098		
			Sample ID	WS-083 (112918)	WS-083 (031819)	WS-083 (051319)	DUP-262 (051319)	WS-083 (030220)	WS-083 (032321)	WS-098 (012718)	WS-098 (053018)	WS-098 (092818)
			Sample Date	11/29/2018	3/18/2019	5/13/2019	5/13/2019	3/2/2020	3/23/2021	1/27/2018	5/30/2018	9/28/2018
			Sample Type	N	N	N	FD	N	N	N	N	N
			General Depth	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep
			Well Depth	400	400	400	400	400	400	488	488	488
			Source	-	-	-	-	-	-	+	+	+
WUWN	N/A	N/A	N/A	N/A	N/A	N/A	N/A	MT272	MT272	MT272		
PFAS			Unit									
PFBA	--	10,000	ng/L	NA	NA	NA	NA	NA	<4.1 U	NA	NA	NA
PFPeA	--	--	ng/L	NA	NA	NA	NA	NA	<1.7 U	NA	NA	NA
PFHxA	--	150,000	ng/L	<1.8 U	<1.7 U	<1.9 U	<1.8 U	<1.8 U	<1.7 U	NA	NA	<2.1 U
PFHpA	--	--	ng/L	<1.8 U	<2.6 U	<2.8 U	<2.7 U	<1.8 U	<1.7 U	<10 U	<10 U	<3.1 U
PFOA	20	--	ng/L	<1.8 U	<5.2 U	<5.6 U	<5.4 U	<1.8 U	<1.7 U	<20 U	<20 U	<6.2 U
PFNA	--	30	ng/L	<1.8 U	<1.7 U	<1.9 U	<1.8 U	<1.8 U	<1.7 U	<20 U	<20 U	<2.1 U
PFDA	--	300	ng/L	<1.8 U	<1.7 U	<1.9 U	<1.8 U	<1.8 U	0.27 J	NA	NA	<2.1 U
PFUnA	--	3,000	ng/L	<1.8 U	<1.7 U	<1.9 U	<1.8 U	<1.8 U	<1.7 U	NA	NA	<2.1 U
PFDaA	--	500	ng/L	<1.8 U	<1.7 U	<1.9 U	<1.8 U	<1.8 U	<1.7 U	NA	NA	<2.1 U
PFTriA	--	--	ng/L	<1.8 U	<1.7 U	<1.9 U	<1.8 U	<1.8 U	<1.7 U	NA	NA	<2.1 U
PFTeA	--	10,000	ng/L	<1.8 U	<1.7 U	<1.9 U	<1.8 U	<1.8 U	<1.7 U	NA	NA	<2.1 U
PFHxDA	--	--	ng/L	NA	NA	NA	NA	NA	<1.7 U	NA	NA	NA
PFODA	--	400,000	ng/L	NA	NA	NA	NA	NA	<1.7 U	NA	NA	NA
PFBS	--	450,000	ng/L	<1.8 U	<1.7 U	<1.9 U	<1.8 U	<1.8 U	<1.7 U	<92 U	<90 U	<2.1 U
PFPeS	--	--	ng/L	NA	NA	NA	NA	NA	<1.7 U	NA	NA	NA
PFHxS	--	40	ng/L	<1.8 U	<1.7 U	<1.9 U	<1.8 U	<1.8 U	<1.7 U	<31 U	<30 U	<2.1 U
PFHpS	--	--	ng/L	NA	NA	NA	NA	NA	<1.7 U	NA	NA	NA
PFOS	20	--	ng/L	<1.8 U	<1.7 U	<1.9 U	<1.8 U	<1.8 U	<1.7 U	<41 U	<40 U	<2.1 U
PFNS	--	--	ng/L	NA	NA	NA	NA	NA	<1.7 U	NA	NA	NA
PFDS	--	--	ng/L	NA	NA	NA	NA	NA	<1.7 U	NA	NA	NA
PFDoS	--	--	ng/L	NA	NA	NA	NA	NA	<1.7 U	NA	NA	NA
4:2 FTS	--	--	ng/L	NA	NA	NA	NA	NA	<1.7 U	NA	NA	NA
6:2 FTS	--	--	ng/L	NA	NA	NA	NA	NA	<4.1 U	NA	NA	NA
8:2 FTS	--	--	ng/L	NA	NA	NA	NA	NA	<1.7 U	NA	NA	NA
10:2 FTS	--	--	ng/L	NA	NA	NA	NA	NA	<1.7 U	NA	NA	NA
FOSA	--	20 ⁽²⁾	ng/L	NA	NA	NA	NA	NA	<1.7 U	NA	NA	NA
NMeFOSA	--	--	ng/L	NA	NA	NA	NA	NA	<1.7 U	NA	NA	NA
NEtFOSA	--	20 ⁽²⁾	ng/L	NA	NA	NA	NA	NA	<1.7 U	NA	NA	NA
NMeFOSAA	--	--	ng/L	<1.8 U	<2.6 U	<2.8 U	<2.7 U	<1.8 U	<4.1 U	NA	NA	<3.1 U
NEtFOSAA	--	20 ⁽²⁾	ng/L	<1.8 U	<1.7 U	<1.9 U	<1.8 U	<1.8 U	<4.1 U	NA	NA	<2.1 U
NMeFOSE	--	--	ng/L	NA	NA	NA	NA	NA	<3.3 U	NA	NA	NA
NEtFOSE	--	20 ⁽²⁾	ng/L	NA	NA	NA	NA	NA	<1.7 U	NA	NA	NA
HFPO-DA	--	300	ng/L	NA	NA	NA	NA	NA	<3.3 U	NA	NA	NA
DONA	--	3,000	ng/L	NA	NA	NA	NA	NA	<1.7 U	NA	NA	NA
9Cl-PF3ONS	--	--	ng/L	NA	NA	NA	NA	NA	<1.7 U	NA	NA	NA
11Cl-PF3OUdS	--	--	ng/L	NA	NA	NA	NA	NA	<1.7 U	NA	NA	NA

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Potable Well PFAS Analytical Results - December 2017 to June 2022
Deep Aquifer Bedrock Well Design and Long Term Monitoring Work Plan
Tyco Fire Products LP
Marinette, Wisconsin

	June 2019 WDHS (Not Adopted by WDNR Board) ⁽¹⁾	November 2020 WDHS (Not Yet Proposed for Rulemaking by WDNR) ⁽²⁾	Location	WS-098 (continued)						WS-103		
			Sample ID	DUP-158 (092818)	WS-098 (102718)	DUP-181 (102718)	WS-098 (051719)	WS-098 (041321)	DUP-409 (041321)	WS-103 (020218)	WS-103 (040518)	DUP-049 (040518)
			Sample Date	9/28/2018	10/27/2018	10/27/2018	5/17/2019	4/13/2021	4/13/2021	2/2/2018	4/5/2018	4/5/2018
			Sample Type	FD	N	FD	N	N	FD	N	N	FD
			General Depth	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep
			Well Depth	488	488	488	488	488	488	622	622	622
			Source	+	+	+	+	+	+	+	+	+
WUWN	MT272	MT272	MT272	MT272	MT272	MT272	MT272	TL121, WR076	TL121, WR076	TL121, WR076		
PFAS	Unit											
PFBA	--	10,000	ng/L	NA	NA	NA	NA	<4.7 U	<4.5 U	NA	NA	NA
PFPeA	--	--	ng/L	NA	NA	NA	NA	<1.9 U	<1.8 U	NA	NA	NA
PFHxA	--	150,000	ng/L	<2.0 U	<1.9 U	<1.9 U	<1.9 U	<1.9 U	<1.8 U	NA	NA	NA
PFHpA	--	--	ng/L	<3.0 U	<2.8 U	<2.8 U	<2.9 U	<1.9 U	<1.8 U	<10 U	<10 U	<9.9 U
PFOA	20	--	ng/L	<6.0 U	<5.6 U	<5.6 U	<5.8 U	<1.9 U	<1.8 U	<21 U	<20 U	<20 U
PFNA	--	30	ng/L	<2.0 U	<1.9 U	<1.9 U	<1.9 U	<1.9 U	<1.8 U	<21 U	<20 U	<20 U
PFDA	--	300	ng/L	<2.0 U	<1.9 U	<1.9 U	<1.9 U	<1.9 U	<1.8 U	NA	NA	NA
PFUnA	--	3,000	ng/L	<2.0 U	<1.9 U	<1.9 U	<1.9 U	<1.9 U	<1.8 U	NA	NA	NA
PFDaA	--	500	ng/L	<2.0 U	<1.9 U	<1.9 U	<1.9 U	<1.9 U	<1.8 U	NA	NA	NA
PFTriA	--	--	ng/L	<2.0 U	<1.9 U	<1.9 U	<1.9 U	<1.9 U	<1.8 U	NA	NA	NA
PFTeA	--	10,000	ng/L	<2.0 U	<1.9 U	<1.9 U	<1.9 U	<1.9 U	<1.8 U	NA	NA	NA
PFHxDA	--	--	ng/L	NA	NA	NA	NA	<1.9 U	<1.8 U	NA	NA	NA
PFODA	--	400,000	ng/L	NA	NA	NA	NA	<1.9 U	<1.8 U	NA	NA	NA
PFBS	--	450,000	ng/L	<2.0 U	<1.9 U	<1.9 U	<1.9 U	<1.9 U	<1.8 U	<93 U	<90 U	<89 U
PFPeS	--	--	ng/L	NA	NA	NA	NA	<1.9 U	<1.8 U	NA	NA	NA
PFHxS	--	40	ng/L	<2.0 U	<1.9 U	<1.9 U	<1.9 U	<1.9 U	<1.8 U	<31 U	<30 U	<30 U
PFHpS	--	--	ng/L	NA	NA	NA	NA	<1.9 U	<1.8 U	NA	NA	NA
PFOS	20	--	ng/L	<2.0 U	<1.9 U	<1.9 U	<1.9 U	<1.9 U	<1.8 U	<41 U	<40 U	<40 U
PFNS	--	--	ng/L	NA	NA	NA	NA	<1.9 U	<1.8 U	NA	NA	NA
PFDS	--	--	ng/L	NA	NA	NA	NA	<1.9 U	<1.8 U	NA	NA	NA
PFDoS	--	--	ng/L	NA	NA	NA	NA	<1.9 U	<1.8 U	NA	NA	NA
4:2 FTS	--	--	ng/L	NA	NA	NA	NA	<1.9 U	<1.8 U	NA	NA	NA
6:2 FTS	--	--	ng/L	NA	NA	NA	NA	<4.7 U	<4.5 U	NA	NA	NA
8:2 FTS	--	--	ng/L	NA	NA	NA	NA	<1.9 U	<1.8 U	NA	NA	NA
10:2 FTS	--	--	ng/L	NA	NA	NA	NA	<1.9 U	<1.8 U	NA	NA	NA
FOSA	--	20 ⁽²⁾	ng/L	NA	NA	NA	NA	3.9	5.1	NA	NA	NA
NMeFOSA	--	--	ng/L	NA	NA	NA	NA	<1.9 U	<1.8 U	NA	NA	NA
NEtFOSA	--	20 ⁽²⁾	ng/L	NA	NA	NA	NA	<1.9 U	<1.8 U	NA	NA	NA
NMeFOSAA	--	--	ng/L	<3.0 U	<2.8 U	<2.8 U	<2.9 U	<4.7 U	<4.5 U	NA	NA	NA
NEtFOSAA	--	20 ⁽²⁾	ng/L	<2.0 U	<1.9 U	<1.9 U	<1.9 U	<4.7 U	<4.5 U	NA	NA	NA
NMeFOSE	--	--	ng/L	NA	NA	NA	NA	<3.8 U	<3.6 U	NA	NA	NA
NEtFOSE	--	20 ⁽²⁾	ng/L	NA	NA	NA	NA	<1.9 U	<1.8 U	NA	NA	NA
HFPO-DA	--	300	ng/L	NA	NA	NA	NA	<3.8 U	<3.6 U	NA	NA	NA
DONA	--	3,000	ng/L	NA	NA	NA	NA	<1.9 U	<1.8 U	NA	NA	NA
9Cl-PF3ONS	--	--	ng/L	NA	NA	NA	NA	<1.9 U	<1.8 U	NA	NA	NA
11Cl-PF3OUdS	--	--	ng/L	NA	NA	NA	NA	<1.9 U	<1.8 U	NA	NA	NA

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Deep Aquifer Bedrock Well Design and Long Term Monitoring Work Plan
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	June 2019 WDHS (Not Adopted by WDNR Board) ⁽¹⁾	November 2020 WDHS (Not Yet Proposed for Rulemaking by WDNR) ⁽²⁾	Location	WS-103 (continued)						WS-130		
			Sample ID	WS-103 (090518)	DUP-138 (090518)	WS-103 (103018)	DUP-183 (103018)	WS-103 (041619)	DUP-249 (041619)	WS-103 (030921)	WS-130 (022718)	WS-130 (040618)
			Sample Date	9/5/2018	9/5/2018	10/30/2018	10/30/2018	4/16/2019	4/16/2019	3/9/2021	2/27/2018	4/6/2018
			Sample Type	N	FD	N	FD	N	FD	N	N	N
			General Depth	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep
			Well Depth	622	622	622	622	622	622	622	506	506
			Source	+	+	+	+	+	+	+	+,-	+,-
			WUWN	TL121, WR076	TL121, WR076	TL121, WR076	TL121, WR076	TL121, WR076	TL121, WR076	TL121, WR076	TL121, WR076	XC094
PFAS	Unit											
PFBA	--	10,000	ng/L	NA	NA	NA	NA	NA	NA	<4.7 U	NA	NA
PFPeA	--	--	ng/L	NA	NA	NA	NA	NA	NA	<1.9 U	NA	NA
PFHxA	--	150,000	ng/L	<1.8 U	<1.7 U	<1.9 U	<1.8 U	<1.7 U	<1.8 U	<1.9 U	NA	NA
PFHpA	--	--	ng/L	<2.7 U	<2.6 U	<2.8 U	<2.7 U	<2.6 U	<2.6 U	<1.9 U	<9.3 U	<10 UJ
PFOA	20	--	ng/L	<5.3 U	<5.2 U	<5.6 U	<5.3 U	<5.2 U	<5.3 U	<1.9 U	<19 U	<20 UJ
PFNA	--	30	ng/L	<1.8 U	<1.7 U	<1.9 U	<1.8 U	<1.7 U	<1.8 U	<1.9 U	<19 U	<20 UJ
PFDA	--	300	ng/L	<1.8 U	<1.7 U	<1.9 U	<1.8 U	<1.7 U	<1.8 U	<1.9 U	NA	NA
PFUnA	--	3,000	ng/L	<1.8 U	<1.7 U	<1.9 U	<1.8 U	<1.7 U	<1.8 U	<1.9 U	NA	NA
PFDoA	--	500	ng/L	<1.8 U	<1.7 U	<1.9 U	<1.8 U	<1.7 U	<1.8 U	<1.9 U	NA	NA
PFTriA	--	--	ng/L	<1.8 U	<1.7 U	<1.9 U	<1.8 U	<1.7 U	<1.8 U	<1.9 U	NA	NA
PFTeA	--	10,000	ng/L	<1.8 U	<1.7 U	<1.9 U	<1.8 U	<1.7 U	<1.8 U	<1.9 U	NA	NA
PFHxDA	--	--	ng/L	NA	NA	NA	NA	NA	NA	<1.9 U	NA	NA
PFODA	--	400,000	ng/L	NA	NA	NA	NA	NA	NA	<1.9 U	NA	NA
PFBS	--	450,000	ng/L	<1.8 U	<1.7 U	<1.9 U	<1.8 U	<1.7 U	<1.8 U	<1.9 U	<84 U	<90 UJ
PFPeS	--	--	ng/L	NA	NA	NA	NA	NA	NA	<1.9 U	NA	NA
PFHxS	--	40	ng/L	<1.8 U	<1.7 U	<1.9 U	<1.8 U	<1.7 U	<1.8 U	<1.9 U	<28 U	<30 UJ
PFHpS	--	--	ng/L	NA	NA	NA	NA	NA	NA	<1.9 U	NA	NA
PFOS	20	--	ng/L	<1.8 U	<1.7 U	<1.9 U	<1.8 U	<1.7 U	<1.8 U	<1.9 U	<37 U	<40 UJ
PFNS	--	--	ng/L	NA	NA	NA	NA	NA	NA	<1.9 U	NA	NA
PFDS	--	--	ng/L	NA	NA	NA	NA	NA	NA	<1.9 U	NA	NA
PFDoS	--	--	ng/L	NA	NA	NA	NA	NA	NA	<1.9 U	NA	NA
4:2 FTS	--	--	ng/L	NA	NA	NA	NA	NA	NA	<1.9 U	NA	NA
6:2 FTS	--	--	ng/L	NA	NA	NA	NA	NA	NA	<4.7 U	NA	NA
8:2 FTS	--	--	ng/L	NA	NA	NA	NA	NA	NA	0.90 J	NA	NA
10:2 FTS	--	--	ng/L	NA	NA	NA	NA	NA	NA	<1.9 U	NA	NA
FOSA	--	20 ⁽²⁾	ng/L	NA	NA	NA	NA	NA	NA	2.0	NA	NA
NMeFOSA	--	--	ng/L	NA	NA	NA	NA	NA	NA	<1.9 U	NA	NA
NEtFOSA	--	20 ⁽²⁾	ng/L	NA	NA	NA	NA	NA	NA	<1.9 U	NA	NA
NMeFOSAA	--	--	ng/L	<2.7 U	<2.6 U	<2.8 U	<2.7 U	<2.6 U	<2.6 U	<4.7 U	NA	NA
NEtFOSAA	--	20 ⁽²⁾	ng/L	<1.8 U	<1.7 U	<1.9 U	<1.8 U	<1.7 U	<1.8 U	<4.7 U	NA	NA
NMeFOSE	--	--	ng/L	NA	NA	NA	NA	NA	NA	<3.8 U	NA	NA
NEtFOSE	--	20 ⁽²⁾	ng/L	NA	NA	NA	NA	NA	NA	<1.9 U	NA	NA
HFPO-DA	--	300	ng/L	NA	NA	NA	NA	NA	NA	<3.8 U	NA	NA
DONA	--	3,000	ng/L	NA	NA	NA	NA	NA	NA	<1.9 U	NA	NA
9Cl-PF3ONS	--	--	ng/L	NA	NA	NA	NA	NA	NA	<1.9 U	NA	NA
11Cl-PF3OUdS	--	--	ng/L	NA	NA	NA	NA	NA	NA	<1.9 U	NA	NA

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Potable Well PFAS Analytical Results - December 2017 to June 2022
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	June 2019 WDHS (Not Adopted by WDNR Board) ⁽¹⁾	November 2020 WDHS (Not Yet Proposed for Rulemaking by WDNR) ⁽²⁾	Location	WS-130 (continued)										
			Sample ID	WS-130 (091118)	WS-130 (112718)	DUP-199 (112718)	WS-130 (031319)	DUP-233 (031319)	WS-130 (051719)	DUP-266 (051719)	WS-130 (082719)	DUP-309 (082719)		
			Sample Date	9/11/2018	11/27/2018	11/27/2018	3/13/2019	3/13/2019	5/17/2019	5/17/2019	8/27/2019	8/27/2019		
			Sample Type	N	N	FD	N	FD	N	FD	N	FD		
			General Depth	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep		
			Well Depth	506	506	506	506	506	506	506	506	506		
			Source	+,-	+,-	+,-	+,-	+,-	+,-	+,-	+,-	+,-		
			WUWN	XC094	XC094	XC094	XC094	XC094	XC094	XC094	XC094	XC094		
PFAS			Unit											
PFBA	--	10,000	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFPeA	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFHxA	--	150,000	ng/L	<2.0 U	<1.8 U	<1.7 U	<1.9 U	<1.9 U	<2.0 U	<2.1 U	<1.9 U	<1.8 U	<1.8 U	<1.8 U
PFHpA	--	--	ng/L	<2.9 U	<1.8 U	<1.7 U	<2.8 U	<2.8 U	<3.0 U	<3.1 U	<1.9 U	<1.8 U	<1.8 U	<1.8 U
PFOA	20	--	ng/L	<5.9 U	<1.8 U	<1.7 U	<5.6 U	<5.7 U	<5.9 U	<6.3 U	<1.9 U	<1.8 U	<1.8 U	<1.8 U
PFNA	--	30	ng/L	<2.0 U	<1.8 U	<1.7 U	<1.9 U	<1.9 U	<2.0 U	<2.1 U	<1.9 U	<1.8 U	<1.8 U	<1.8 U
PFDA	--	300	ng/L	<2.0 U	<1.8 U	<1.7 U	<1.9 U	<1.9 U	<2.0 U	<2.1 U	<1.9 U	<1.8 U	<1.8 U	<1.8 U
PFUnA	--	3,000	ng/L	<2.0 U	<1.8 U	<1.7 U	<1.9 U	<1.9 U	<2.0 U	<2.1 U	<1.9 U	<1.8 U	<1.8 U	<1.8 U
PFDoA	--	500	ng/L	<2.0 U	<1.8 U	<1.7 U	<1.9 U	<1.9 U	<2.0 U	<2.1 U	<1.9 U	<1.8 U	<1.8 U	<1.8 U
PFTriA	--	--	ng/L	<2.0 U	<1.8 U	<1.7 U	<1.9 U	<1.9 U	<2.0 U	<2.1 U	<1.9 U	<1.8 U	<1.8 U	<1.8 U
PFTeA	--	10,000	ng/L	<2.0 U	<1.8 U	<1.7 U	<1.9 U	<1.9 U	<2.0 U	<2.1 U	<1.9 U	<1.8 U	<1.8 U	<1.8 U
PFHxDA	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFODA	--	400,000	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFBS	--	450,000	ng/L	<2.0 U	<1.8 U	<1.7 U	<1.9 U	<1.9 U	<2.0 U	<2.1 U	<1.9 U	<1.8 U	<1.8 U	<1.8 U
PFPeS	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFHxS	--	40	ng/L	<2.0 U	<1.8 U	<1.7 U	<1.9 U	<1.9 U	<2.0 U	<2.1 U	<1.9 U	<1.8 U	<1.8 U	<1.8 U
PFHpS	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFOS	20	--	ng/L	<2.0 U	<1.8 U	<1.7 U	<1.9 U	<1.9 U	<2.0 U	<2.1 U	<1.9 U	<1.8 U	<1.8 U	<1.8 U
PFNS	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFDS	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PFDoS	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4:2 FTS	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6:2 FTS	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
8:2 FTS	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10:2 FTS	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FOSA	--	20 ⁽²⁾	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NMeFOSA	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NEtFOSA	--	20 ⁽²⁾	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NMeFOSAA	--	--	ng/L	<2.9 U	<1.8 U	<1.7 U	<2.8 U	<2.8 U	<3.0 U	<3.1 U	<1.9 U	<1.8 U	<1.8 U	<1.8 U
NEtFOSAA	--	20 ⁽²⁾	ng/L	<2.0 U	<1.8 U	<1.7 U	<1.9 U	0.55 J	<2.0 U	<2.1 U	<1.9 U	<1.8 U	<1.8 U	<1.8 U
NMeFOSE	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NEtFOSE	--	20 ⁽²⁾	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HFPO-DA	--	300	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DONA	--	3,000	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
9Cl-PF3ONS	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
11Cl-PF3OUdS	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes on Page 12.

Table 4
Potable Well PFAS Analytical Results - December 2017 to June 2022
Deep Aquifer Bedrock Well Design and Long Term Monitoring Work Plan
Tyco Fire Products LP
Marinette, Wisconsin

	June 2019 WDHS (Not Adopted by WDNR Board) ⁽¹⁾	November 2020 WDHS (Not Yet Proposed for Rulemaking by WDNR) ⁽²⁾	Location	WS-130 (continued)					WS-156			
			Sample ID	WS-130 (110719)	WS-130 (030920)	DUP-368 (030920)	WS-130 (031021)	WS-130 (060722)	WS-156 (101018)	WS-156 (022619)	WS-156 (052219)	WS-156 (081419)
			Sample Date	11/7/2019	3/9/2020	3/9/2020	3/10/2021	6/7/2022	10/10/2018	2/26/2019	5/22/2019	8/14/2019
			Sample Type	N	N	FD	N	N	N	N	N	N
			General Depth	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep	Deep
			Well Depth	506	506	506	506	506	550	550	550	550
			Source	+,-	+,-	+,-	+,-	+,-	+,-	+,-	+,-	+,-
	WUWN	XC094	XC094	XC094	XC094	XC094	MT2117	MT2117	MT2117	MT2117		
PFAS			Unit									
PFBA	--	10,000	ng/L	NA	NA	NA	<4.7 U	<4.7 U	NA	NA	NA	NA
PFPeA	--	--	ng/L	NA	NA	NA	<1.9 U	<1.9 U	NA	NA	NA	NA
PFHxA	--	150,000	ng/L	<2.0 UJ-	<1.9 U	<2.0 U	<1.9 U	<1.9 U	<1.9 U	<1.9 U	<2.0 U	<1.9 U
PFHpA	--	--	ng/L	<2.0 UJ-	<1.9 U	<2.0 U	<1.9 U	<1.9 U	<2.8 U	<2.9 U	<3.0 U	<1.9 U
PFOA	20	--	ng/L	<2.0 UJ-	<1.9 U	<2.0 U	<1.9 U	<1.9 U	<5.6 U	<5.8 U	<6.0 U	<1.9 U
PFNA	--	30	ng/L	<2.0 UJ-	<1.9 U	<2.0 U	<1.9 U	<1.9 U	<1.9 U	<1.9 U	<2.0 U	<1.9 U
PFDA	--	300	ng/L	<2.0 UJ-	<1.9 U	<2.0 U	<1.9 U	<1.9 U	<1.9 U	<1.9 U	<2.0 U	<1.9 U
PFUnA	--	3,000	ng/L	<2.0 UJ-	<1.9 U	<2.0 U	<1.9 U	<1.9 U	<1.9 U	<1.9 U	<2.0 U	<1.9 U
PFDaA	--	500	ng/L	<2.0 UJ-	<1.9 U	<2.0 U	<1.9 U	<1.9 U	<1.9 U	<1.9 U	<2.0 U	<1.9 U
PFTriA	--	--	ng/L	<2.0 UJ-	<1.9 U	<2.0 U	<1.9 U	<1.9 U	<1.9 U	<1.9 U	<2.0 U	<1.9 U
PFTeA	--	10,000	ng/L	<2.0 UJ-	<1.9 U	<2.0 U	<1.9 U	<1.9 U	<1.9 U	<1.9 U	<2.0 U	<1.9 U
PFHxDA	--	--	ng/L	NA	NA	NA	<1.9 U	<1.9 U	NA	NA	NA	NA
PFODA	--	400,000	ng/L	NA	NA	NA	<1.9 U	<1.9 U	NA	NA	NA	NA
PFBS	--	450,000	ng/L	<2.0 UJ-	<1.9 U	<2.0 U	<1.9 U	<1.9 U	<1.9 U	<1.9 U	<2.0 U	<1.9 U
PFPeS	--	--	ng/L	NA	NA	NA	<1.9 U	<1.9 U	NA	NA	NA	NA
PFHxS	--	40	ng/L	<2.0 UJ-	<1.9 U	<2.0 U	<1.9 U	<1.9 U	<1.9 U	<1.9 U	<2.0 U	<1.9 U
PFHpS	--	--	ng/L	NA	NA	NA	<1.9 U	<1.9 U	NA	NA	NA	NA
PFOS	20	--	ng/L	<2.0 UJ-	<1.9 U	<2.0 U	<1.9 U	<1.9 U	<1.9 U	<1.9 U	<2.0 U	<1.9 U
PFNS	--	--	ng/L	NA	NA	NA	<1.9 U	<1.9 U	NA	NA	NA	NA
PFDS	--	--	ng/L	NA	NA	NA	<1.9 U	<1.9 U	NA	NA	NA	NA
PFDoS	--	--	ng/L	NA	NA	NA	<1.9 U	<1.9 U	NA	NA	NA	NA
4:2 FTS	--	--	ng/L	NA	NA	NA	<1.9 U	<1.9 U	NA	NA	NA	NA
6:2 FTS	--	--	ng/L	NA	NA	NA	<4.7 U	<4.7 U	NA	NA	NA	NA
8:2 FTS	--	--	ng/L	NA	NA	NA	<1.9 U	<1.9 U	NA	NA	NA	NA
10:2 FTS	--	--	ng/L	NA	NA	NA	<1.9 U	<1.9 U	NA	NA	NA	NA
FOSA	--	20 ⁽²⁾	ng/L	NA	NA	NA	1.1 J	1.7 J	NA	NA	NA	NA
NMeFOSA	--	--	ng/L	NA	NA	NA	<1.9 U	<1.9 U	NA	NA	NA	NA
NEtFOSA	--	20 ⁽²⁾	ng/L	NA	NA	NA	<1.9 U	<1.9 U	NA	NA	NA	NA
NMeFOSAA	--	--	ng/L	<2.0 UJ-	<1.9 U	<2.0 U	<4.7 U	<4.7 U	<2.8 U	<2.9 U	<3.0 U	<1.9 U
NEtFOSAA	--	20 ⁽²⁾	ng/L	<2.0 UJ-	<1.9 U	<2.0 U	<4.7 U	<4.7 U	<1.9 U	<1.9 U	<2.0 U	<1.9 U
NMeFOSE	--	--	ng/L	NA	NA	NA	<3.8 U	<3.7 U	NA	NA	NA	NA
NEtFOSE	--	20 ⁽²⁾	ng/L	NA	NA	NA	<1.9 U	<1.9 U	NA	NA	NA	NA
HFPO-DA	--	300	ng/L	NA	NA	NA	<3.8 U	<3.7 U	NA	NA	NA	NA
DONA	--	3,000	ng/L	NA	NA	NA	<1.9 U	<1.9 U	NA	NA	NA	NA
9Cl-PF3ONS	--	--	ng/L	NA	NA	NA	<1.9 U	<1.9 U	NA	NA	NA	NA
11Cl-PF3OUdS	--	--	ng/L	NA	NA	NA	<1.9 U	<1.9 U	NA	NA	NA	NA

Notes on Page 12.

Table 4
Potable Well PFAS Analytical Results - December 2017 to June 2022
Deep Aquifer Bedrock Well Design and Long Term Monitoring Work Plan
Tyco Fire Products LP
Marinette, Wisconsin

	June 2019 WDHS (Not Adopted by WDNR Board) ⁽¹⁾	November 2020 WDHS (Not Yet Proposed for Rulemaking by WDNR) ⁽²⁾	Location	WS-156 (continued)			
			Sample ID	WS-156 (102919)	DUP-337 (102919)	WS-156 (022420)	WS-156 (031621)
			Sample Date	10/29/2019	10/29/2019	2/24/2020	3/16/2021
			Sample Type	N	FD	N	N
			General Depth	Deep	Deep	Deep	Deep
			Well Depth	550	550	550	550
			Source	+,-	+,-	+,-	+,-
			WUWN	MT2117	MT2117	MT2117	MT2117
PFAS			Unit				
PFBA	--	10,000	ng/L	NA	NA	NA	<4.5 U
PFPeA	--	--	ng/L	NA	NA	NA	<1.8 U
PFHxA	--	150,000	ng/L	<1.9 U	<2.0 U	<1.8 U	<1.8 U
PFHpA	--	--	ng/L	<1.9 U	<2.0 U	<1.8 U	<1.8 U
PFOA	20	--	ng/L	<1.9 U	<2.0 U	<1.8 U	<1.8 U
PFNA	--	30	ng/L	<1.9 U	<2.0 U	<1.8 U	<1.8 U
PFDA	--	300	ng/L	<1.9 U	<2.0 U	<1.8 U	<1.8 U
PFUnA	--	3,000	ng/L	<1.9 U	<2.0 U	<1.8 U	<1.8 U
PFDoA	--	500	ng/L	<1.9 U	<2.0 U	<1.8 U	<1.8 U
PFTriA	--	--	ng/L	<1.9 U	<2.0 U	<1.8 U	<1.8 U
PFTeA	--	10,000	ng/L	<1.9 U	<2.0 U	<1.8 U	<1.8 U
PFHxDA	--	--	ng/L	NA	NA	NA	<1.8 U
PFODA	--	400,000	ng/L	NA	NA	NA	<1.8 U
PFBS	--	450,000	ng/L	<1.9 U	<2.0 U	<1.8 U	<1.8 U
PFPeS	--	--	ng/L	NA	NA	NA	<1.8 U
PFHxS	--	40	ng/L	<1.9 U	<2.0 U	<1.8 U	<1.8 U
PFHpS	--	--	ng/L	NA	NA	NA	<1.8 U
PFOS	20	--	ng/L	<1.9 U	<2.0 U	<1.8 U	<1.8 U
PFNS	--	--	ng/L	NA	NA	NA	<1.8 U
PFDS	--	--	ng/L	NA	NA	NA	<1.8 U
PFDoS	--	--	ng/L	NA	NA	NA	<1.8 U
4:2 FTS	--	--	ng/L	NA	NA	NA	<1.8 U
6:2 FTS	--	--	ng/L	NA	NA	NA	<4.5 U
8:2 FTS	--	--	ng/L	NA	NA	NA	<1.8 U
10:2 FTS	--	--	ng/L	NA	NA	NA	<1.8 U
FOSA	--	20 ⁽²⁾	ng/L	NA	NA	NA	<1.8 U
NMeFOSA	--	--	ng/L	NA	NA	NA	<1.8 U
NEtFOSA	--	20 ⁽²⁾	ng/L	NA	NA	NA	<1.8 U
NMeFOSAA	--	--	ng/L	<1.9 U	<2.0 U	<1.8 U	<4.5 U
NEtFOSAA	--	20 ⁽²⁾	ng/L	<1.9 U	<2.0 U	<1.8 U	<4.5 U
NMeFOSE	--	--	ng/L	NA	NA	NA	<3.6 U
NEtFOSE	--	20 ⁽²⁾	ng/L	NA	NA	NA	<1.8 U
HFPO-DA	--	300	ng/L	NA	NA	NA	<3.6 U
DONA	--	3,000	ng/L	NA	NA	NA	<1.8 U
9Cl-PF3ONS	--	--	ng/L	NA	NA	NA	<1.8 U
11Cl-PF3OUdS	--	--	ng/L	NA	NA	NA	<1.8 U

Notes on Page 12.

Table 4
Potable Well PFAS Analytical Results - December 2017 to June 2022
Deep Aquifer Bedrock Well Design and Long Term Monitoring Work Plan
Tyco Fire Products LP
Marinette, Wisconsin

Notes:

< = Compound not detected at method detection limit

⁽¹⁾ = In June 2019 the Wisconsin Department of Health Services (DHS) recommended individual groundwater standards of 20 ng/L for PFOA and PFOS. The WDNR proposed those standards through the state rulemaking process. In February 2022, the Wisconsin Natural Resources Board did not approve the proposed rulemaking for groundwater. In August 2022, WDNR promulgated a drinking water standard of 70 ng/L for PFOA and PFOS, individually and combined, for public water systems. This standard does not apply to private drinking water wells.

⁽²⁾ = In November 2020 the Wisconsin DHS recommended a combined groundwater standard of 20 ng/L for: FOSA, NEtFOSE, NEtFOSA, NEtFOSAA, PFOS and PFOA. DHS also recommended individual standards for FOSA, NEtFOSE, NEtFOSA, NEtFOSAA, PFBS, PFHxS, PFNA, PFDA, PFDoA, PFHxA, PFTeA, PFUnA, PFBA, PFODA, DONA, and GenX. In March 2021, The Wisconsin Natural Resources Board approved a Statement of Scope to initiate a rulemaking for this recommendation. The WDNR has not yet proposed rules to initiate the rulemaking process to implement this recommendation; the agency's authority to do so under the Statement of Scope will expire in September 2023.

- = Information gathered from sampling log according to homeowners

+ = Information gathered from well construction form

+, - = Information gathered from well construction form, but information also available from sampling log

Well depth in feet

-- = No standard

NA = Not analyzed

N = Normal sample

FD = Field Duplicate

ng/L = nanograms per liter

J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

J- = The result is an estimated quantity. The associated numerical value is expected to have a negative or low bias.

U = The analyte was analyzed for but the result was not detected above the method detection limit

UB = Compound considered non-detect at the listed value due to associated blank contamination

UJ = The compound was not detected above the reported sample method detection limit. However, the reported limit is approximate and may or may not represent the actual method detection limit.

UJ- = The compound was not detected above the reported sample method detection limit. However, the reported limit is expected to be biased low and may or may not represent the actual method detection limit.

USEPA = United States Environmental Protection Agency

WDNR = Wisconsin Department of Natural Resources

WUWN = Wisconsin Unique Well Number

Chemical Abbreviations:

PFOA = Perfluorooctanoic acid (C8)

PFOS = Perfluorooctanesulfonic acid (C8)

PFBS = Perfluorobutanesulfonic acid (C4)

PFHpA = Perfluoroheptanoic acid (C7)

PFHxS = Perfluorohexanesulfonic acid (C6)

PFNA = Perfluorononanoic acid (C9)

PFDA = Perfluorodecanoic acid (C10)

PFDoA = Perfluorododecanoic acid (C12)

PFHxA = Perfluorohexanoic acid (C6)

PFTeA = Perfluorotetradecanoic acid (C14)

PFTriA = Perfluorotridecanoic acid (C13)

PFUnA = Perfluoroundecanoic acid (C11)

NEtFOSAA = N-ethylperfluorooctanesulfonamidoacetic acid (C12)

NMeFOSAA = N-methylperfluorooctanesulfonamidoacetic acid (C11)

PFBA = Perfluorobutanoic acid (C4)

PFPeA = Perfluoropentanoic acid (C5)

PFHxDA = Perfluoro-n-hexadecanoic acid (C16)

PFODA = Perfluoro-n-octadecanoic acid (C18)

PFPeS = Perfluoropentanesulfonic acid (C5)

PFHpS = Perfluoroheptanesulfonic acid (C7)

PFNS = Perfluorononanesulfonic acid (C9)

PFDS = Perfluorodecanesulfonic acid (C10)

PFDoS = Perfluorododecanesulfonic acid (C12)

FOSA = Perfluorooctanesulfonamide (C8)

NEtFOSA = N-ethylperfluorooctanesulfonamide (C10)

NMeFOSA = N-methylperfluorooctanesulfonamide (C9)

NMeFOSE = N-methylperfluorooctanesulfonamidoethanol (C11)

NEtFOSE = N-ethylperfluorooctanesulfonamidoethanol (C12)

4:2 FTS = 4:2 fluorotelomer sulfonate (C6)

6:2 FTS = 6:2 fluorotelomer sulfonate (C8)

8:2 FTS = 8:2 fluorotelomer sulfonate (C10)

10:2 FTS = 10:2 fluorotelomer sulfonate (C12)

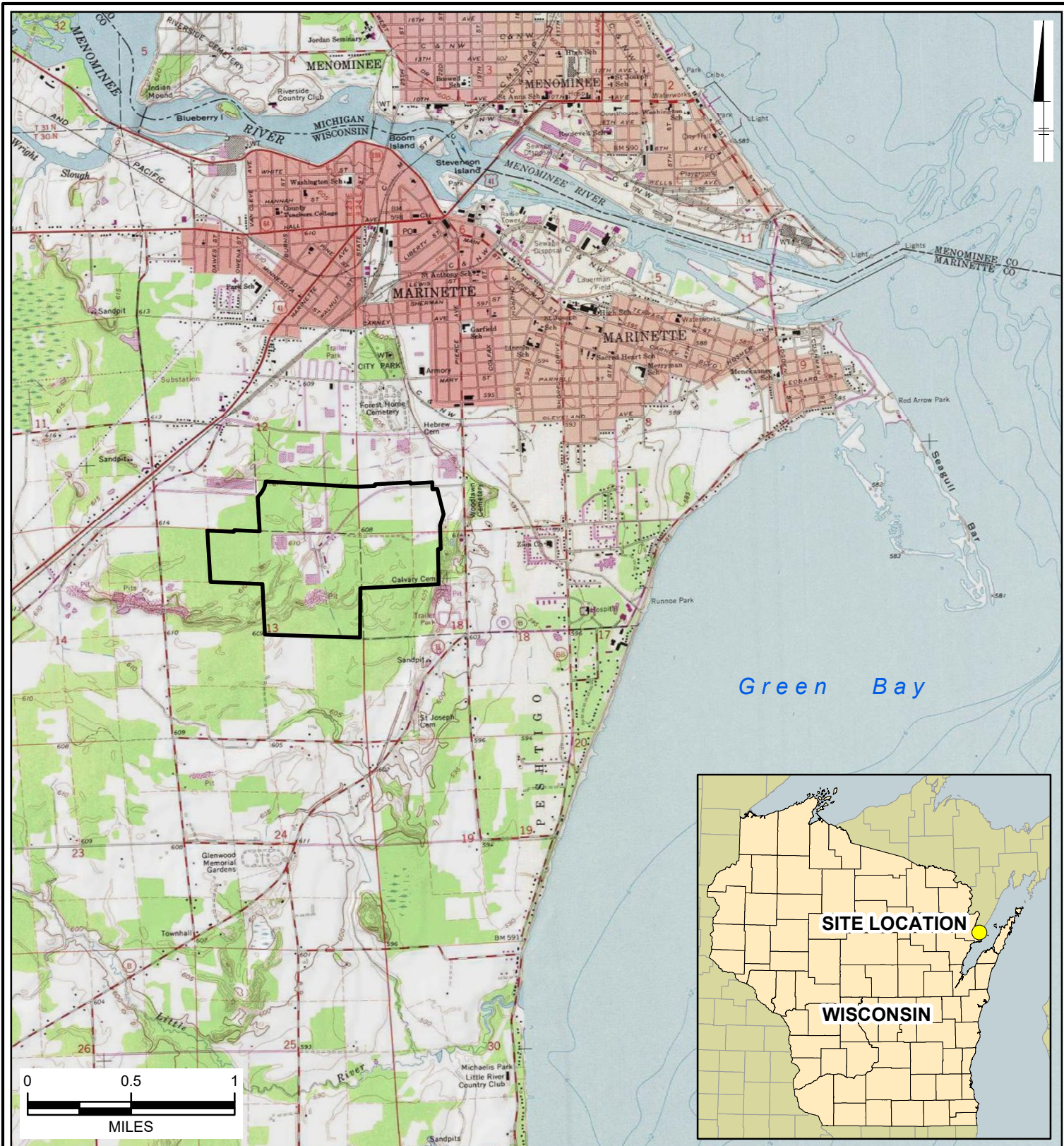
ADONA = 4,8-Dioxa-3H-perfluorononanoic acid (C7)

HFPO-DA (GenX) = Hexafluoropropylene oxide dimer acid (C6)

F-53B Major = 9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (C8)

F-53B Minor = 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (C10)

Figures



LEGEND:

 APPROXIMATE SITE PROPERTY BOUNDARY

NOTES:

1. TOPOGRAPHIC MAP SOURCE: COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED, ACCESSED SEPTEMBER 2022.

TYCO FIRE PRODUCTS LP
MARINETTE, WISCONSIN

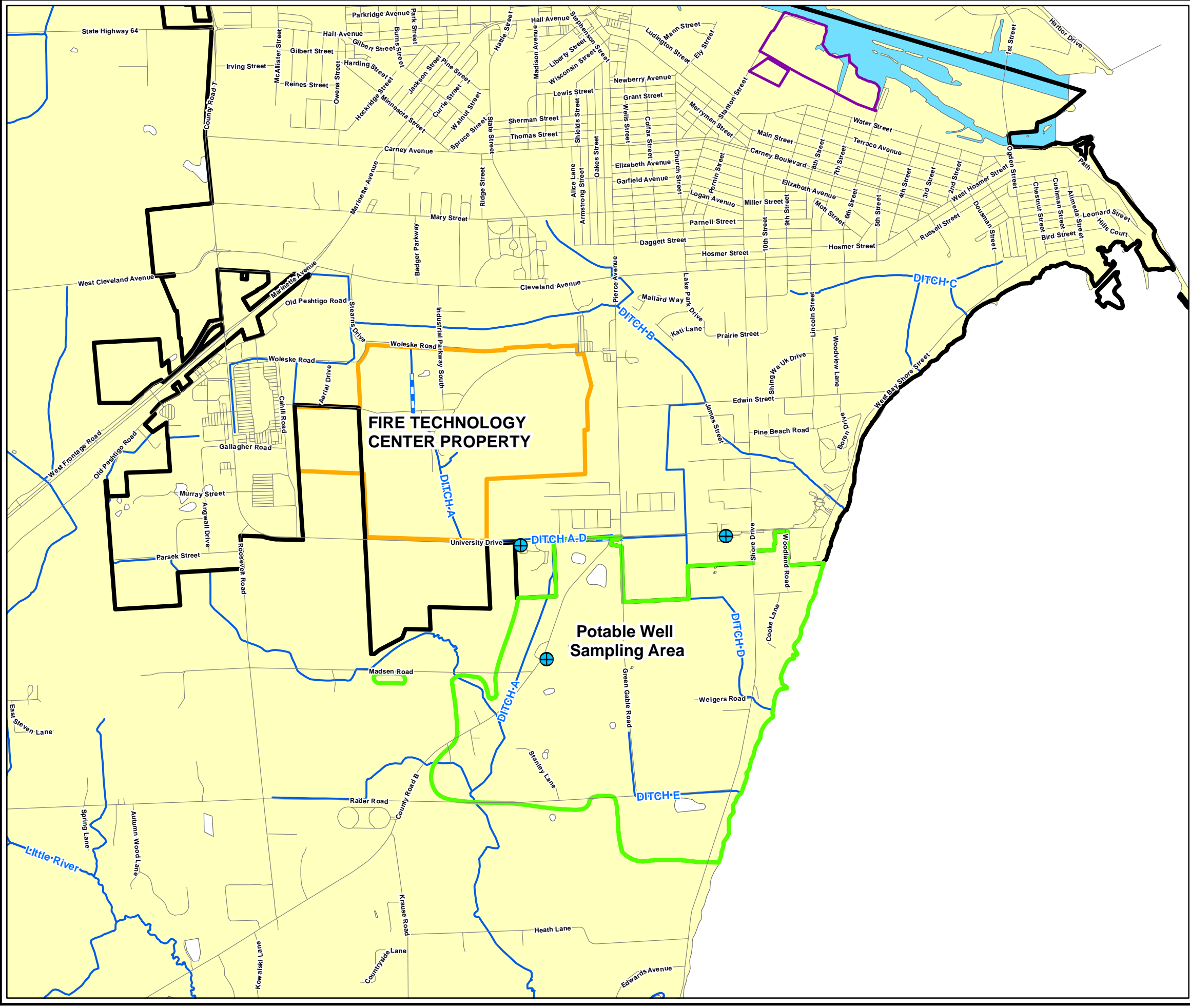
SITE LOCATION



**FIGURE
1**

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T:_ENV\TYCO\MXD\FTCPotable_Well\Figure2_Proposed_Sentinel_Well_Locs.mxd 9/13/2022 1:24:06 PM



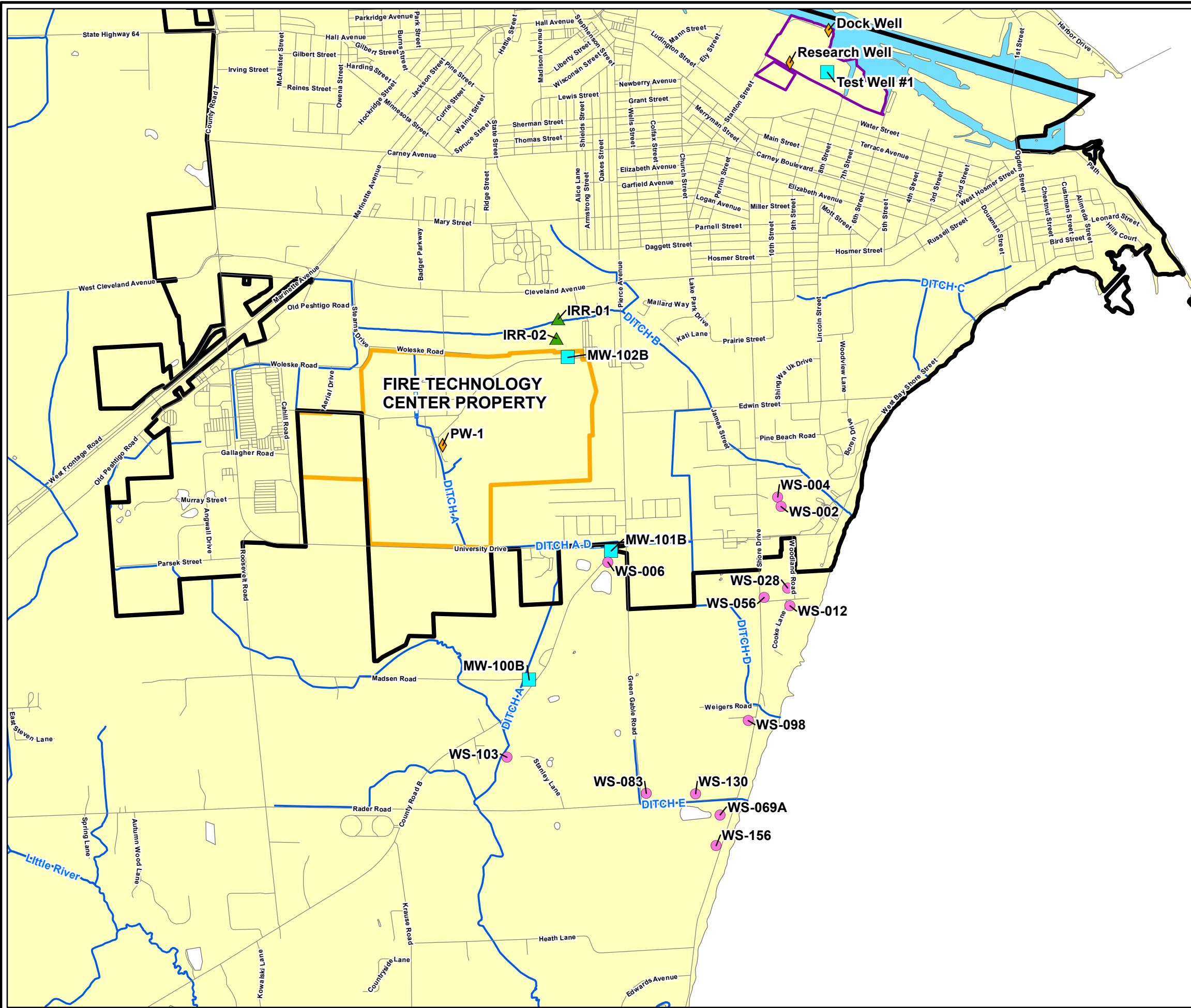
- LEGEND:**
- PROPOSED SENTINEL WELL LOCATION
 - POTABLE WELL SAMPLING AREA
 - STANTON STREET FACILITY BOUNDARY
 - APPROXIMATE SITE PROPERTY BOUNDARY
 - APPROXIMATE MARINETTE CITY BOUNDARY
 - WATERBODY
 - DITCH OR STREAM
 - ROAD

TYCO FIRE PRODUCTS LP
MARINETTE, WISCONSIN

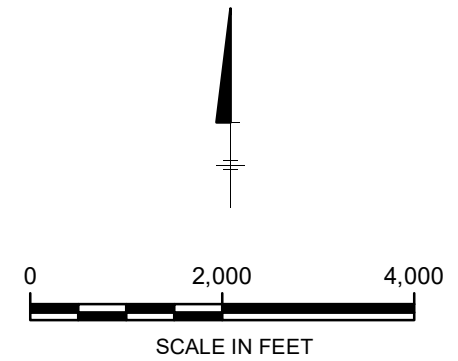
PROPOSED SENTINEL WELL LOCATIONS

ARCADIS | **FIGURE 2**

TYCO\FIRE\TYCO\FTC\RemedialActionDesign\Report\Fig_2_Bedrock_Logging_Locations.mxd 9/1/2022 5:56:38 PM



- LEGEND:**
- FORMER BEDROCK BOREHOLE
 - ◆ FORMER BEDROCK PRODUCTION WELL
 - ▲ IRRIGATION WELL
 - RESIDENTIAL WELL
 - STANTON STREET FACILITY BOUNDARY
 - APPROXIMATE SITE PROPERTY BOUNDARY
 - APPROXIMATE MARINETTE CITY BOUNDARY
 - WATERBODY
 - DITCH OR STREAM
 - ROAD

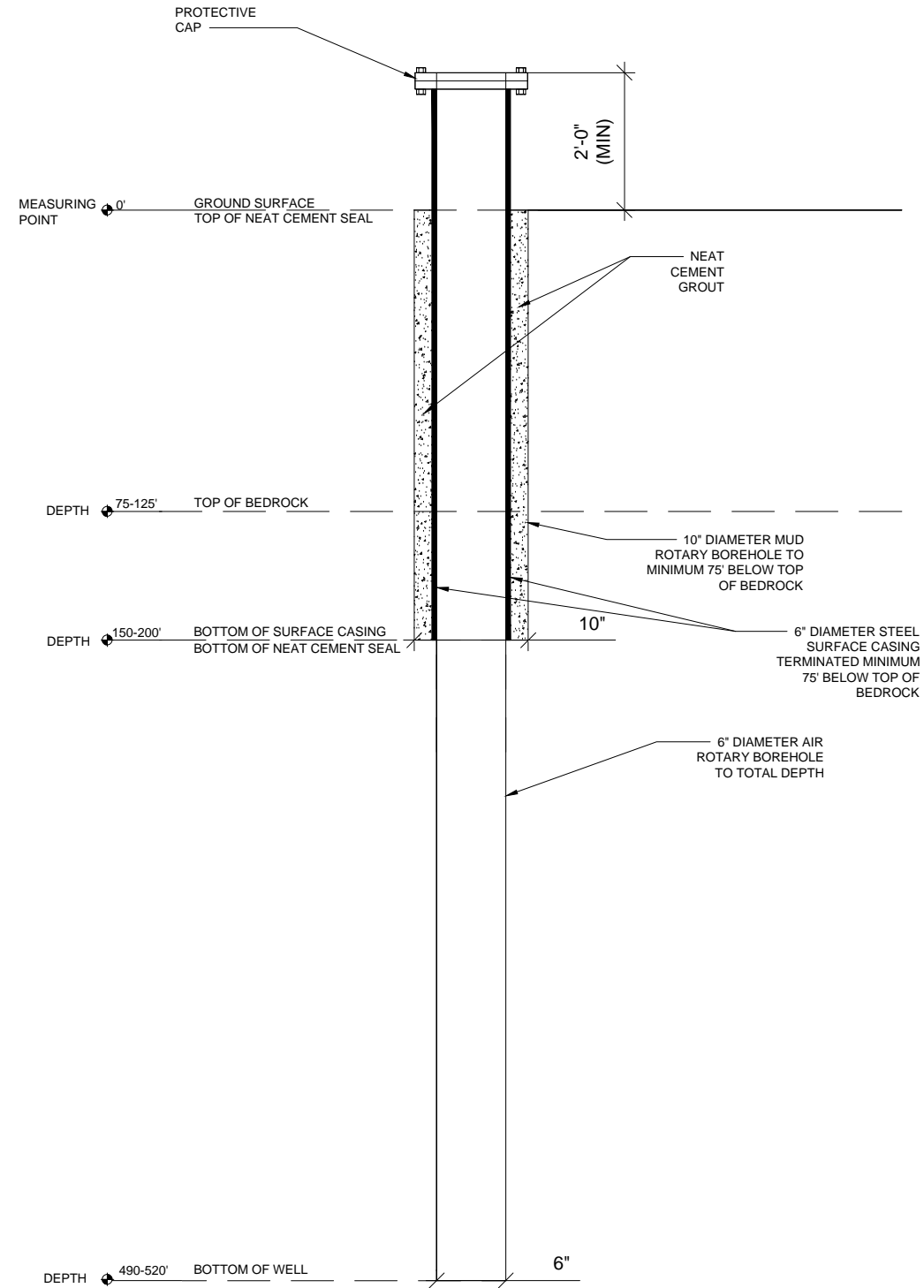


TYCO FIRE PRODUCTS LP
MARINETTE, WISCONSIN

**EXISTING AND FORMER BEDROCK
EXPLORATORY WELLS AND SAMPLING
LOCATIONS**

ARCADIS | **FIGURE 3**

CITY: SYR-NY DIV/GROUP: IMDV DB: S.HILL, K.SARTORI PIC: B.STONE PM: J.BERRIGAN TM: B.ZELER LYNON--OFF--REF-
 \arcadis-us.com\office\data\Milwaukee-WI\Aproj\01\001605\cadd\Deep Well Investigation\M-Mechanical\Mairmette Private Well.dwg LAYOUT: M-16-01
 ACADVER: 23.05 (LMS TECH) PAGES: 1-1 PLOT: 8/30/2022 1:41 PM
 PLOTTED: 8/30/2022 1:44 PM BY: DOYLE, BRIGID



A SENTINEL BEDROCK WELL DETAIL
 NTS

No.	Date	Revisions	By	Ckd

Professional Engineer's Name		
Professional Engineer's No.		
State	Date Signed	Project Mgr.
Designed by	Drawn by	Checked by

--	--	--



TYCO FIRE PRODUCTS LP MARINETTE, WI 54143-2542

SENTINEL BEDROCK WELL DETAIL

ARCADIS Project No.
 30135605.00006

Date
 AUGUST 2022

ARCADIS NA
 126 NORTH JEFFERSON STREET
 SUITE 400
 MILWAUKEE, WISCONSIN 53202
 TEL. 414.276.7742

FIGURE 4

THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.

Appendix A

Geophysical Logging Report



borehole geophysics / hydrophysics

Geophysical Summary Plot

COMPANY: Arcadis

PROJECT: Marinette

DATE LOGGED: 18 May 2022

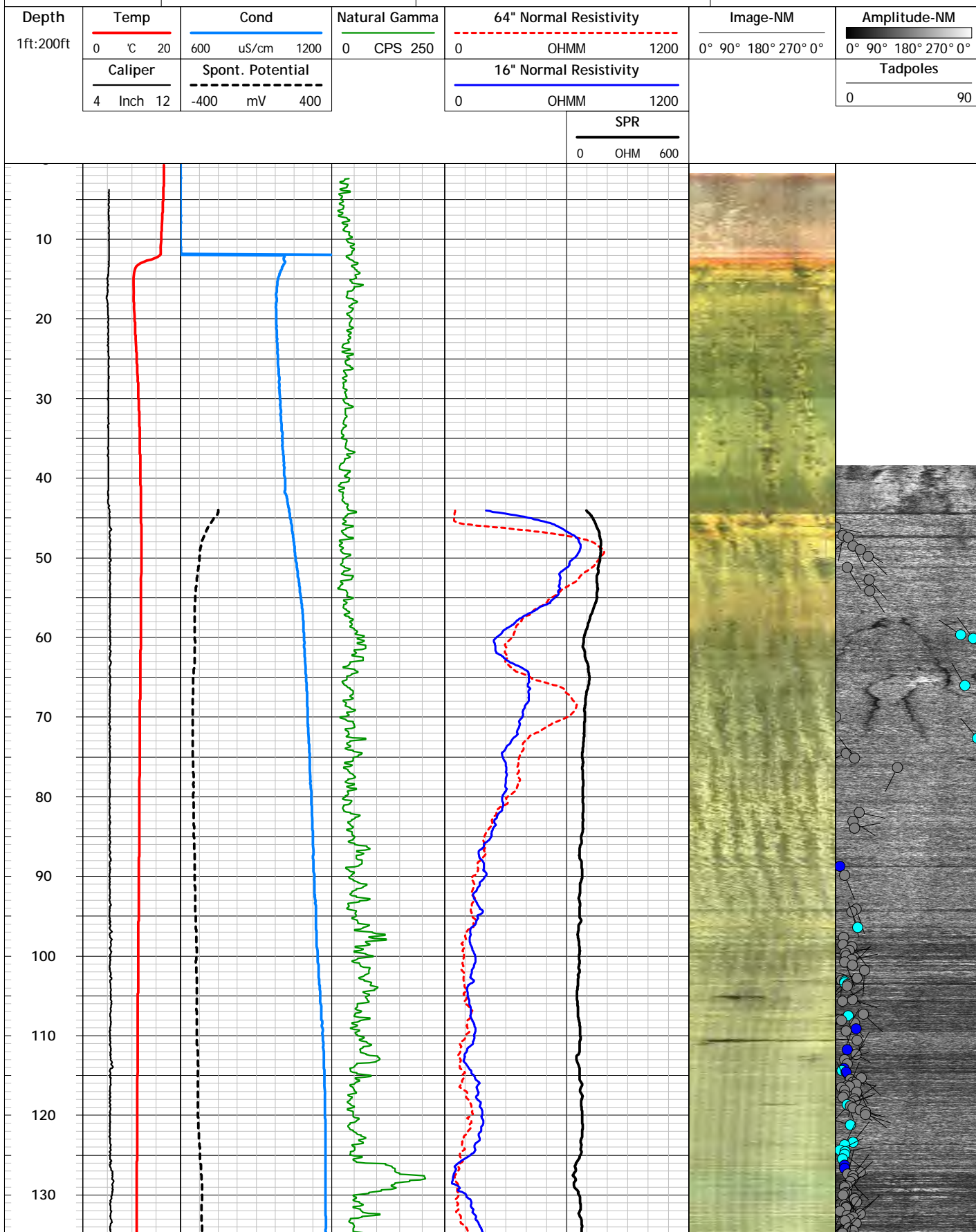
WELL: IRR-01

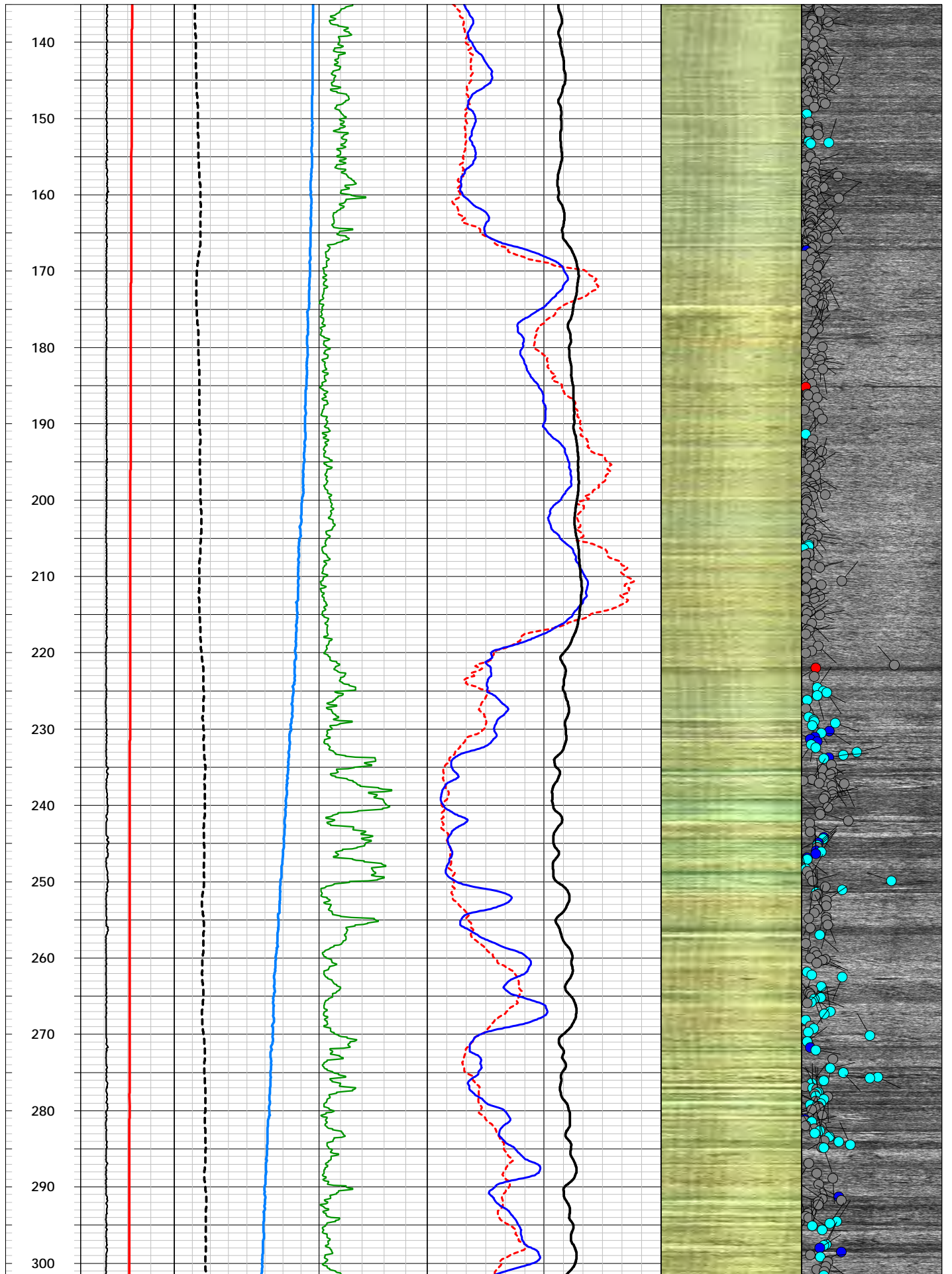
Colog, Inc.

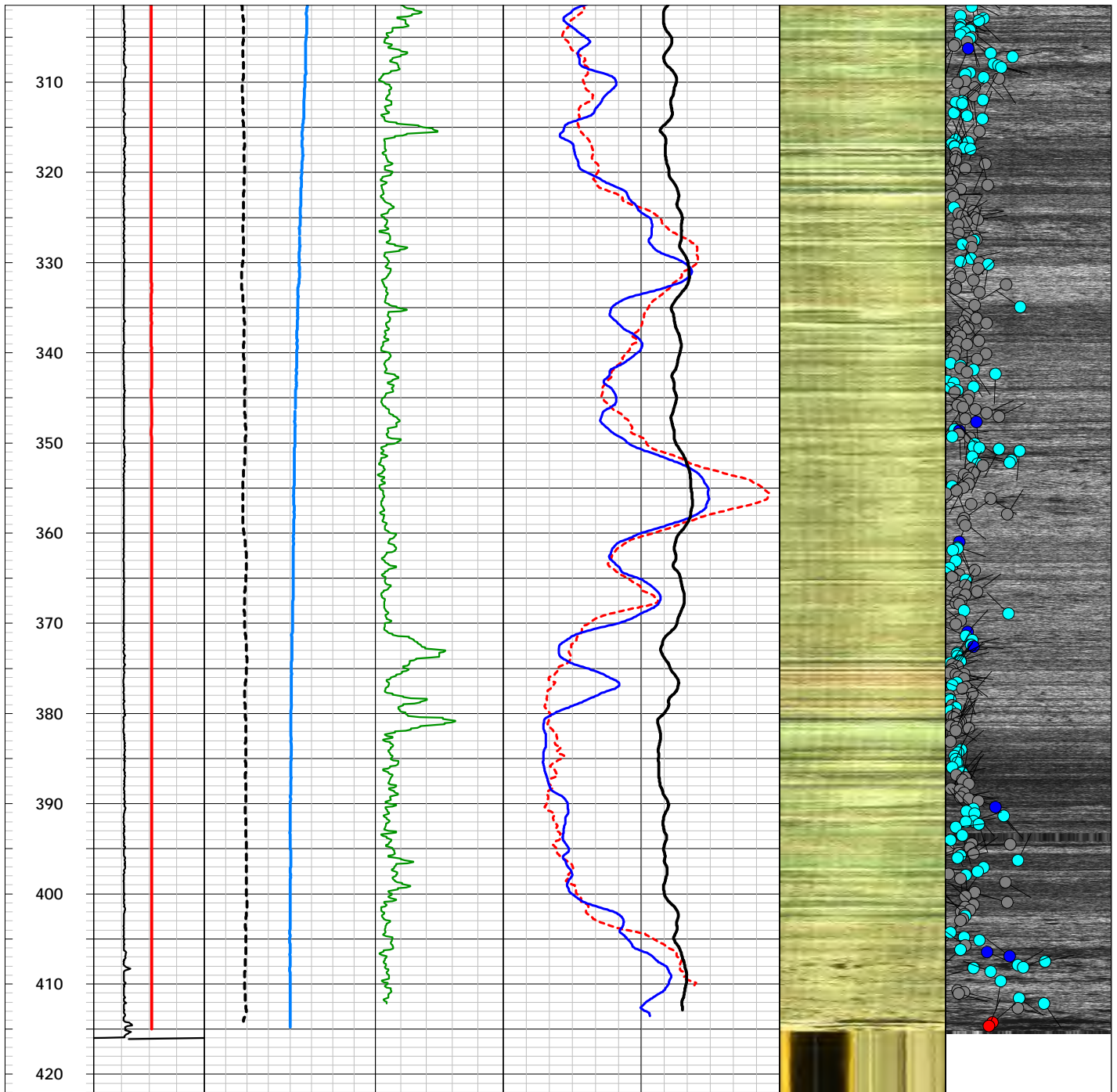
810 Quail St., Suite E, Lakewood, CO 80215

Phone: (303) 279-0171, Fax: (303) 278-0135

www.colog.com







0 OHM 600
SPR

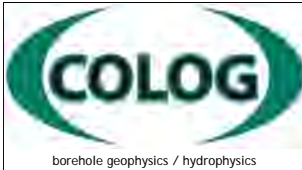
4 Inch 12	-400 mV 400
Caliper	Spont. Potential
0 °C 20	600 uS/cm 1200
Temp	Cond

0 OHMM 1200	0 OHMM 1200
16" Normal Resistivity	64" Normal Resistivity

0° 90° 180° 270° 0°
Image-NM

0 90
Tadpoles
0° 90° 180° 270° 0°
Amplitude-NM

1ft:200ft
Depth



Optical & Acoustic Televiewer

Colog, Inc.

810 Quail St, Unit E, Lakewood, CO 80215

Office: (303) 279-0171

www.colog.com

COMPANY: Arcadis

PROJECT: Marinette

DATE LOGGED: 18 May 2022

WELL: IRR-01

LOCATION: Marinette, WI

LOG MEASURED FROM: Ground Surface

FIELD ENGINEER(S): M. Cullum

TOP & BOTTOM OF CASING: 0 ft - 44 ft

WITNESSED BY: NA

BOREHOLE DIAMETER: 6 in.

DEPTH DRILLER: NA

FLUID LEVEL DEPTH: 12.5 ft

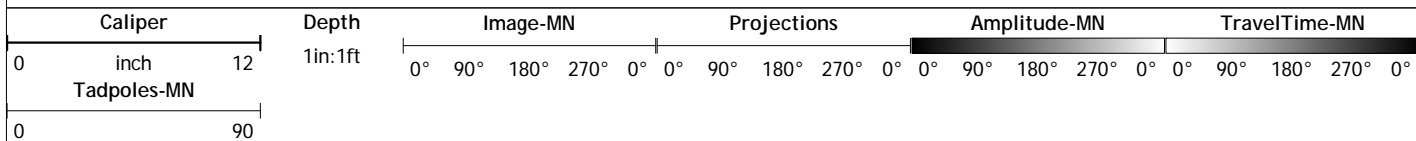
DEPTH LOGGER: 415.5 ft

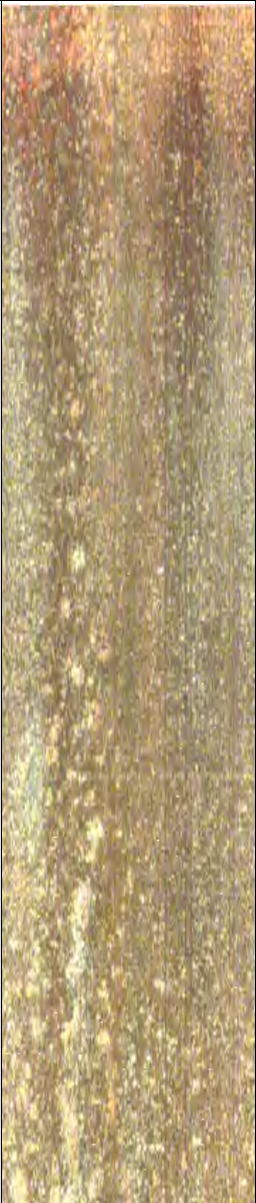
ORIENTATION REFERENCE: Magnetic North

COMMENTS:


STRUCTURE LEGEND:


- 0 - Healed Fracture/Bedding Plane
- 1 - Partial Fracture
- 2 - Complete Fracture
- 3 - Open Fracture

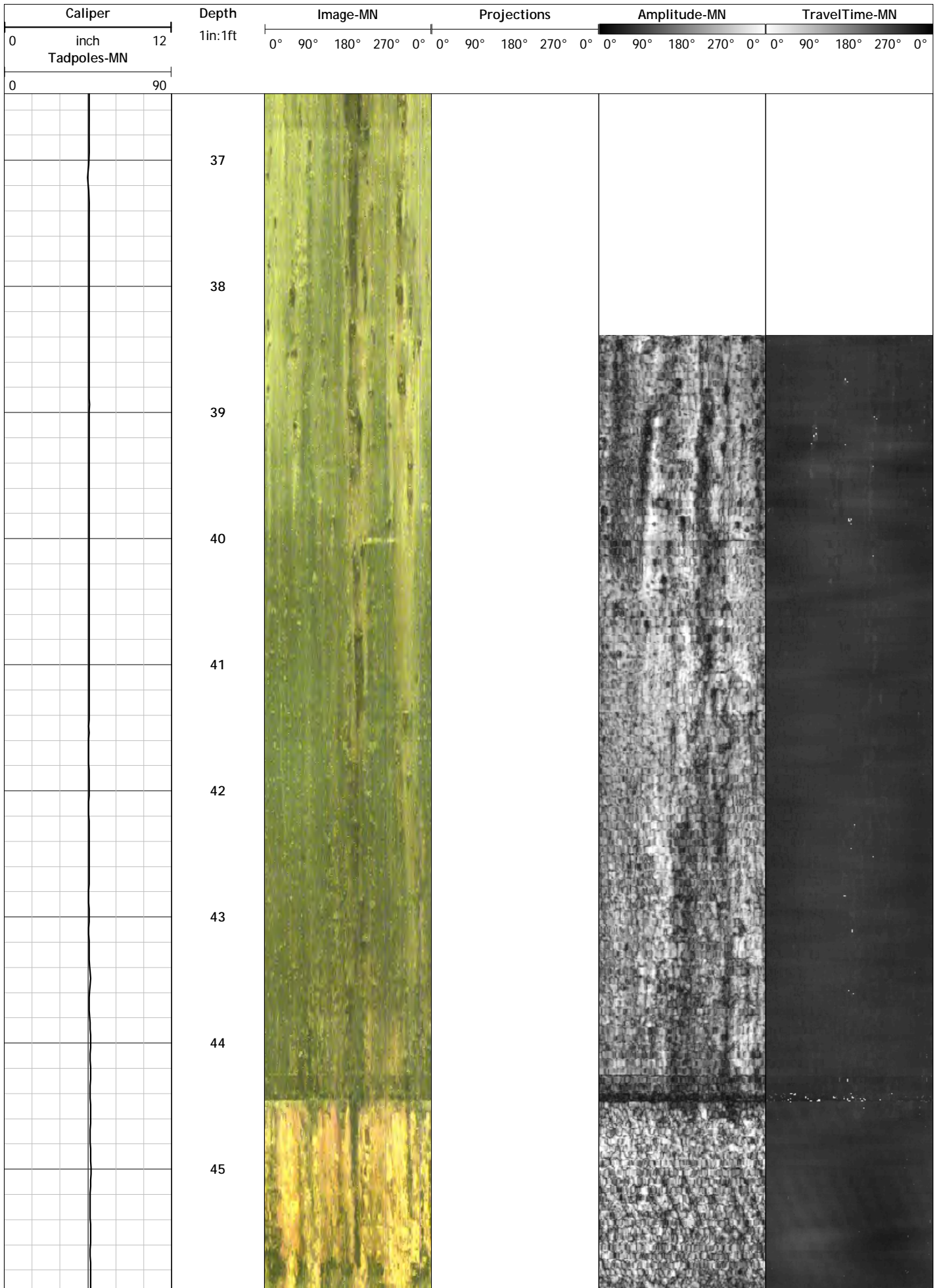


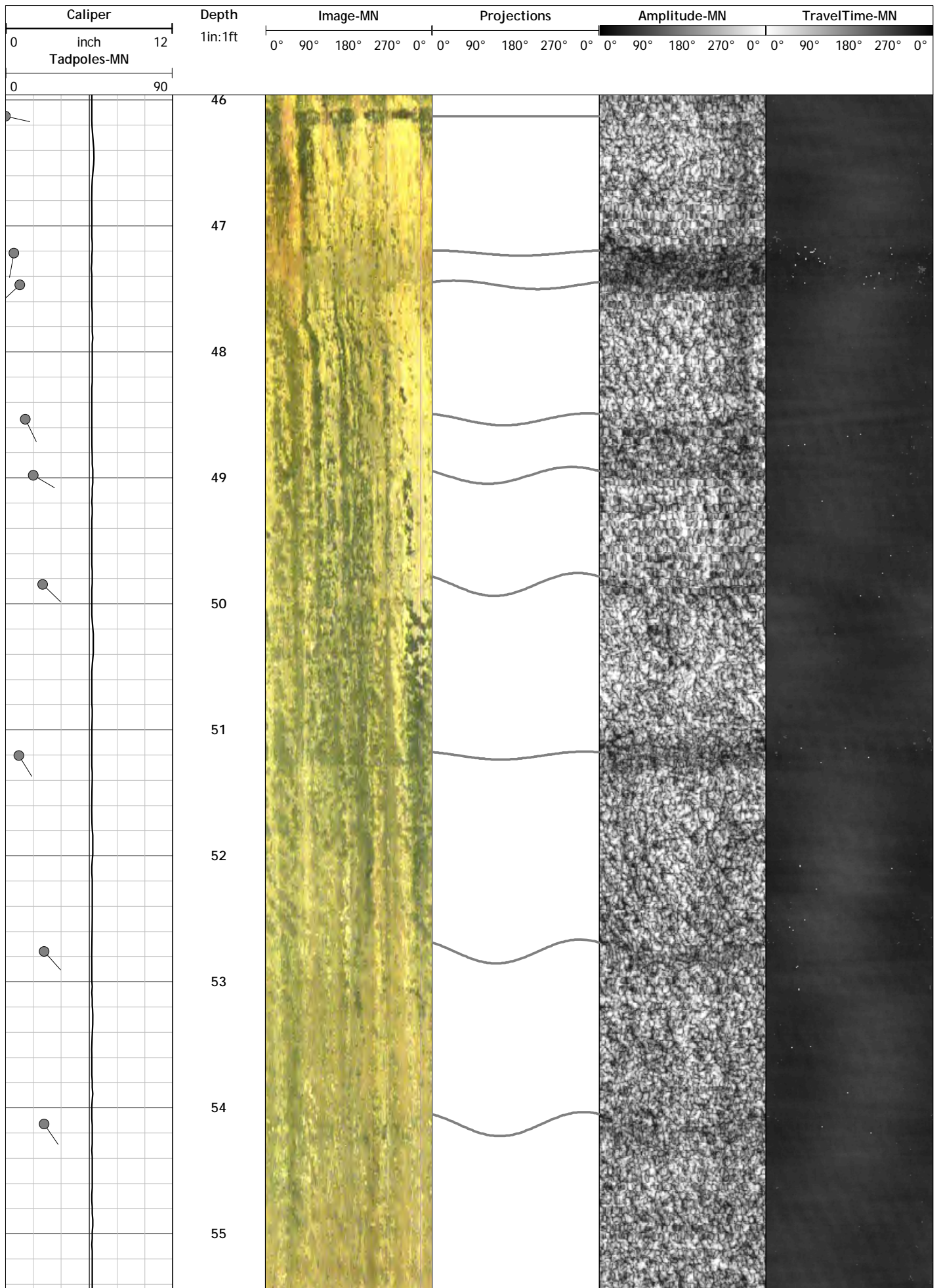
Caliper	Depth	Image-MN	Projections	Amplitude-MN	TravelTime-MN
	2				
	3				
	4				
	5				
	6				
	7				
	8				
	9				

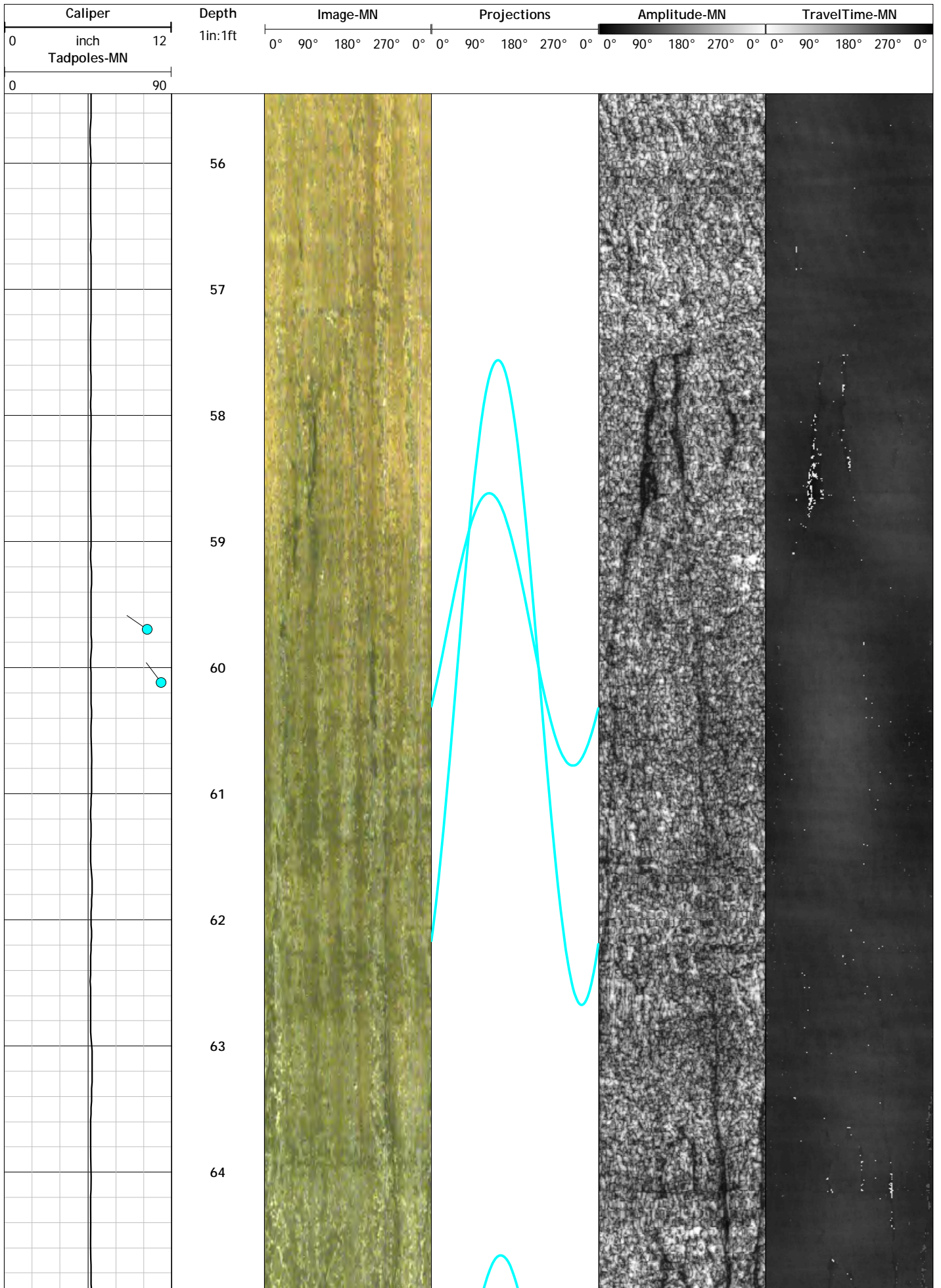
Caliper		Depth 1in:1ft	Image-MN				Projections				Amplitude-MN				TravelTime-MN						
0	12 inch Tadpoles-MN		0°	90°	180°	270°	0°	0°	90°	180°	270°	0°	0°	90°	180°	270°	0°	0°	90°	180°	270°
0	90	0																			
		9																			
		10																			
		11																			
		12																			
		13																			
		14																			
		15																			
		16																			
		17																			

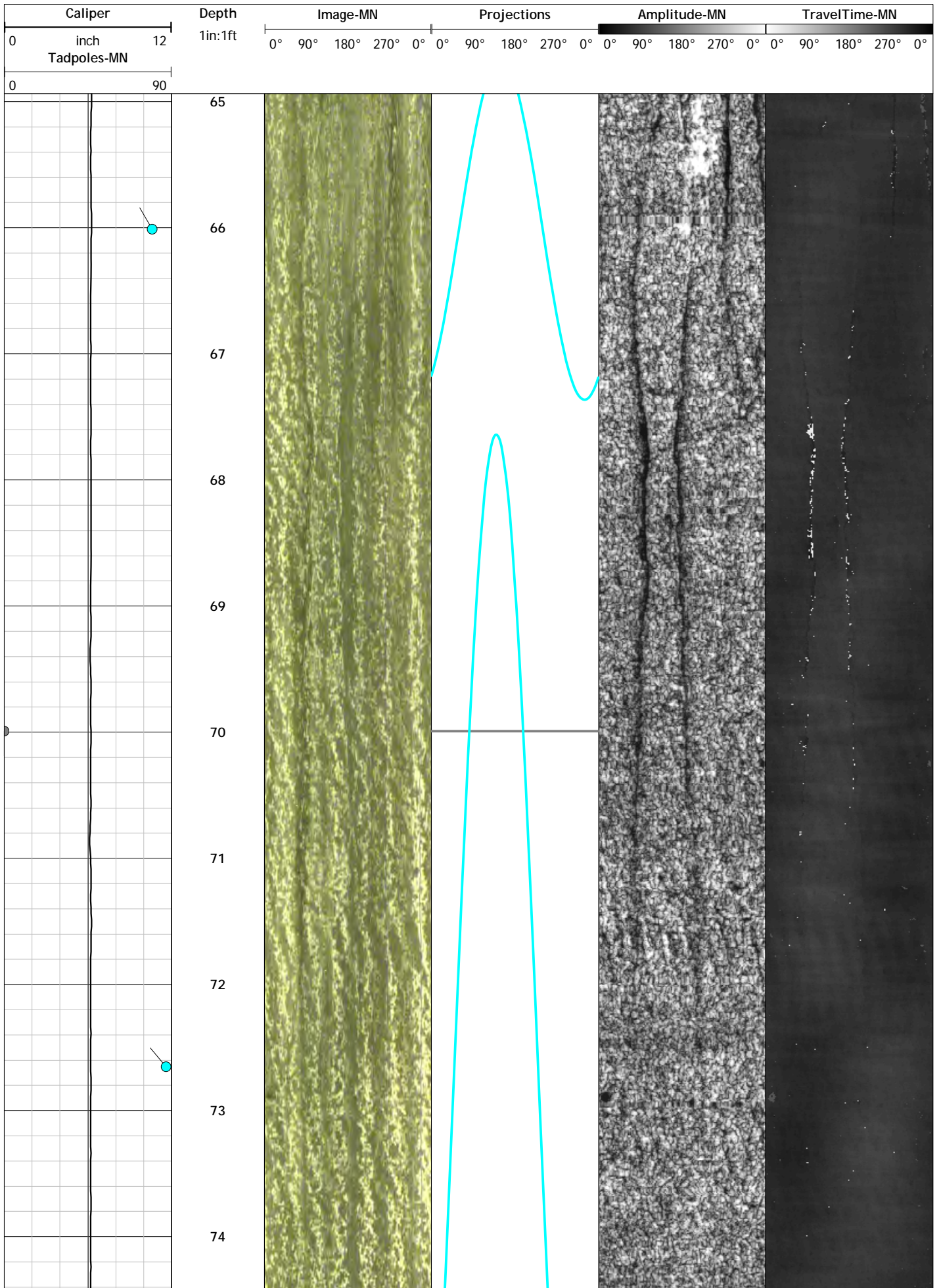
Caliper		Depth 1in:1ft	Image-MN				Projections				Amplitude-MN				TravelTime-MN							
0	12 inch Tadpoles-MN		0°	90°	180°	270°	0°	0°	90°	180°	270°	0°	0°	90°	180°	270°	0°	0°	90°	180°	270°	0°
0		90																				
		18																				
		19																				
		20																				
		21																				
		22																				
		23																				
		24																				
		25																				
		26																				
		27																				

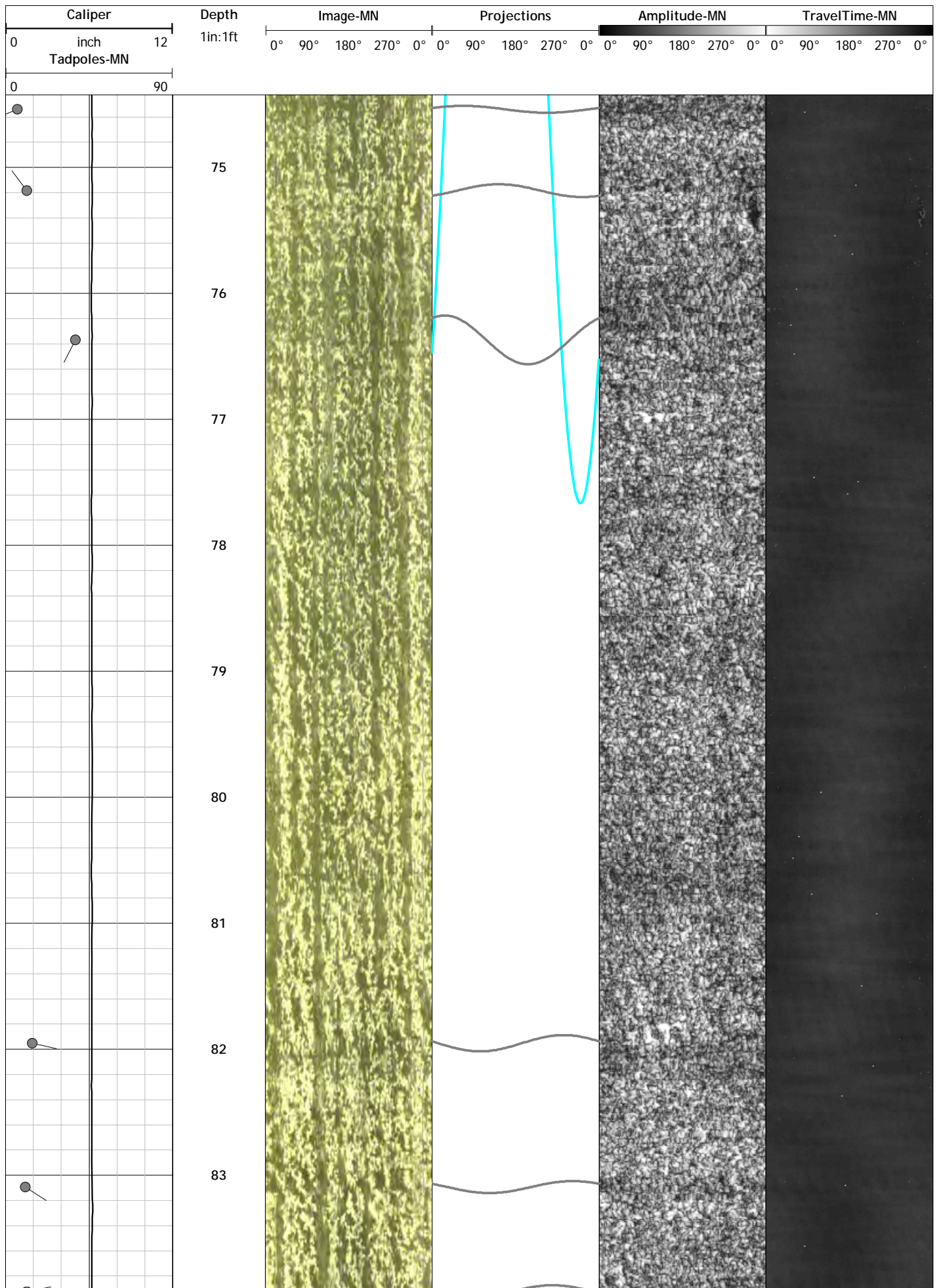
Caliper		Depth 1in:1ft	Image-MN				Projections				Amplitude-MN				TravelTime-MN						
0	12 inch Tadpoles-MN		0°	90°	180°	270°	0°	0°	90°	180°	270°	0°	0°	90°	180°	270°	0°	0°	90°	180°	270°
0	90	27																			
		28																			
		29																			
		30																			
		31																			
		32																			
		33																			
		34																			
		35																			
		36																			

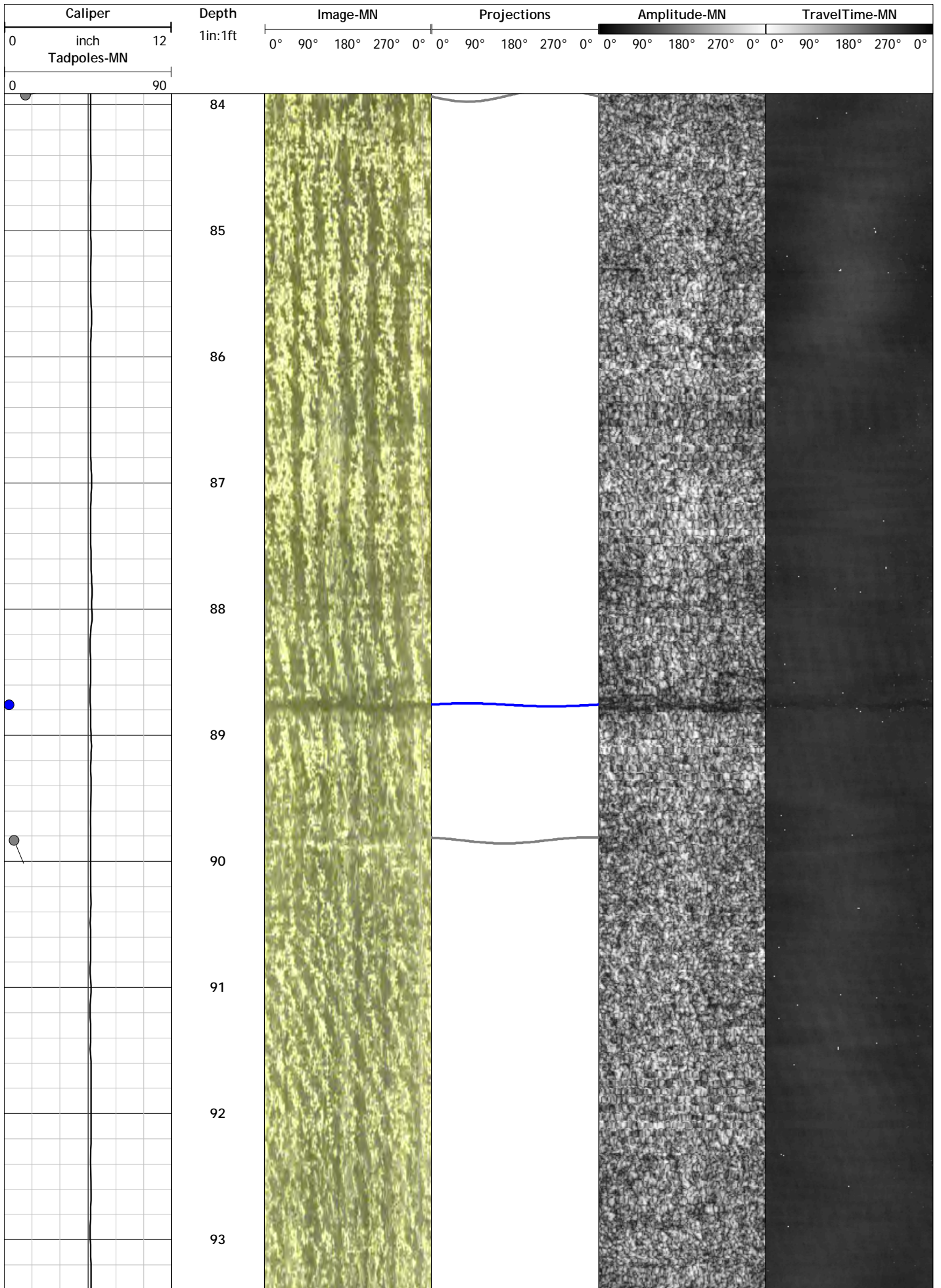


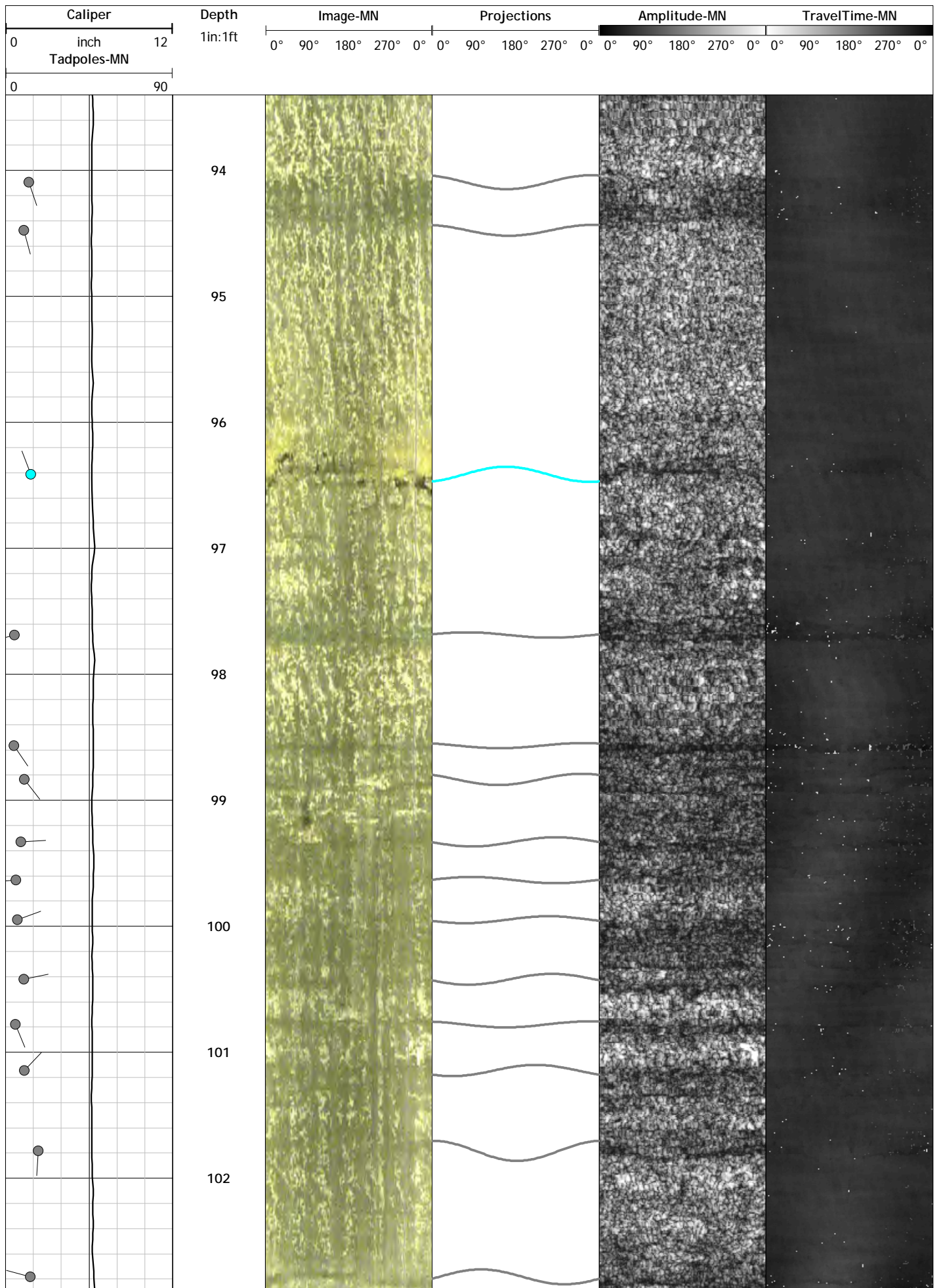


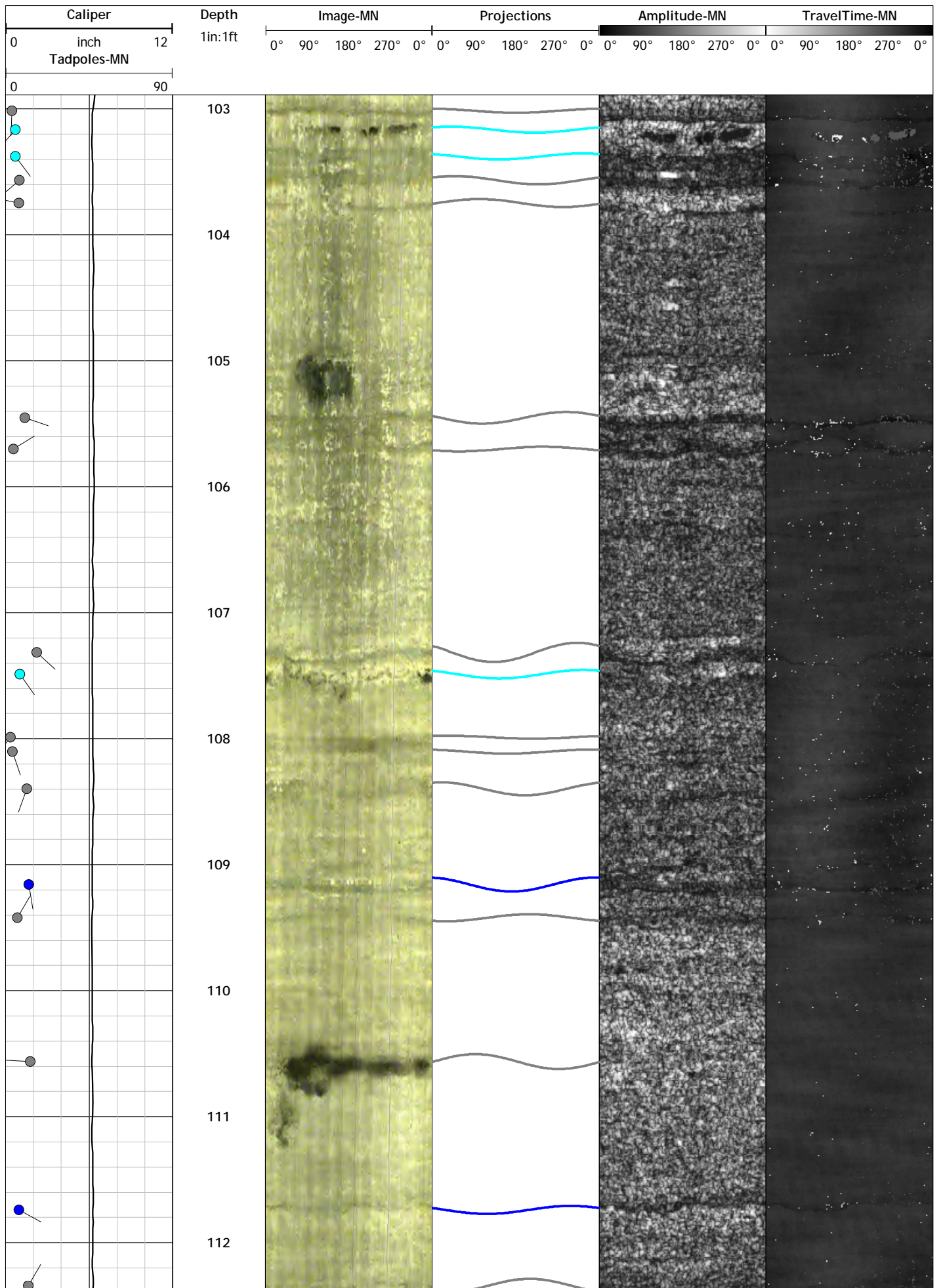


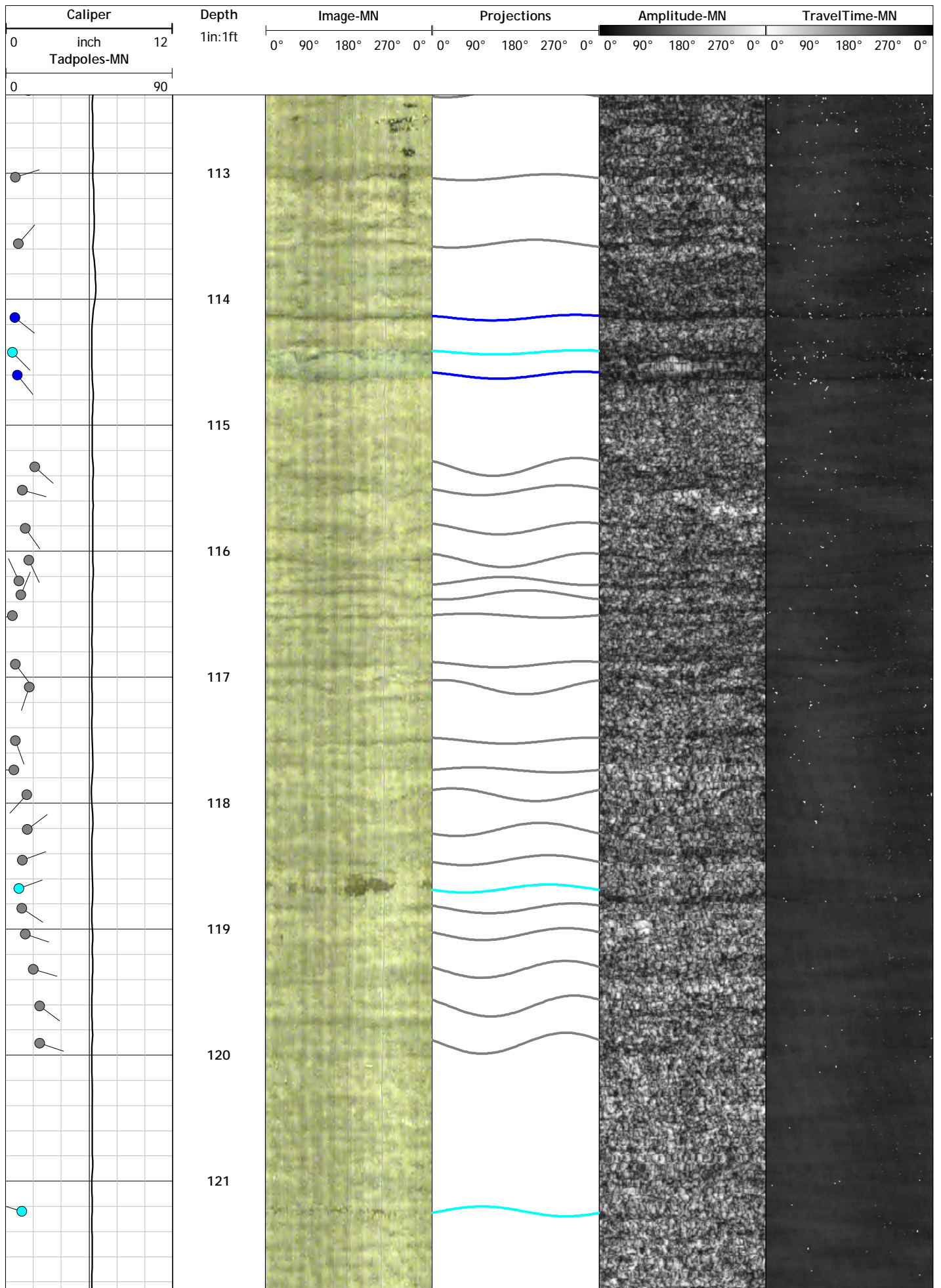


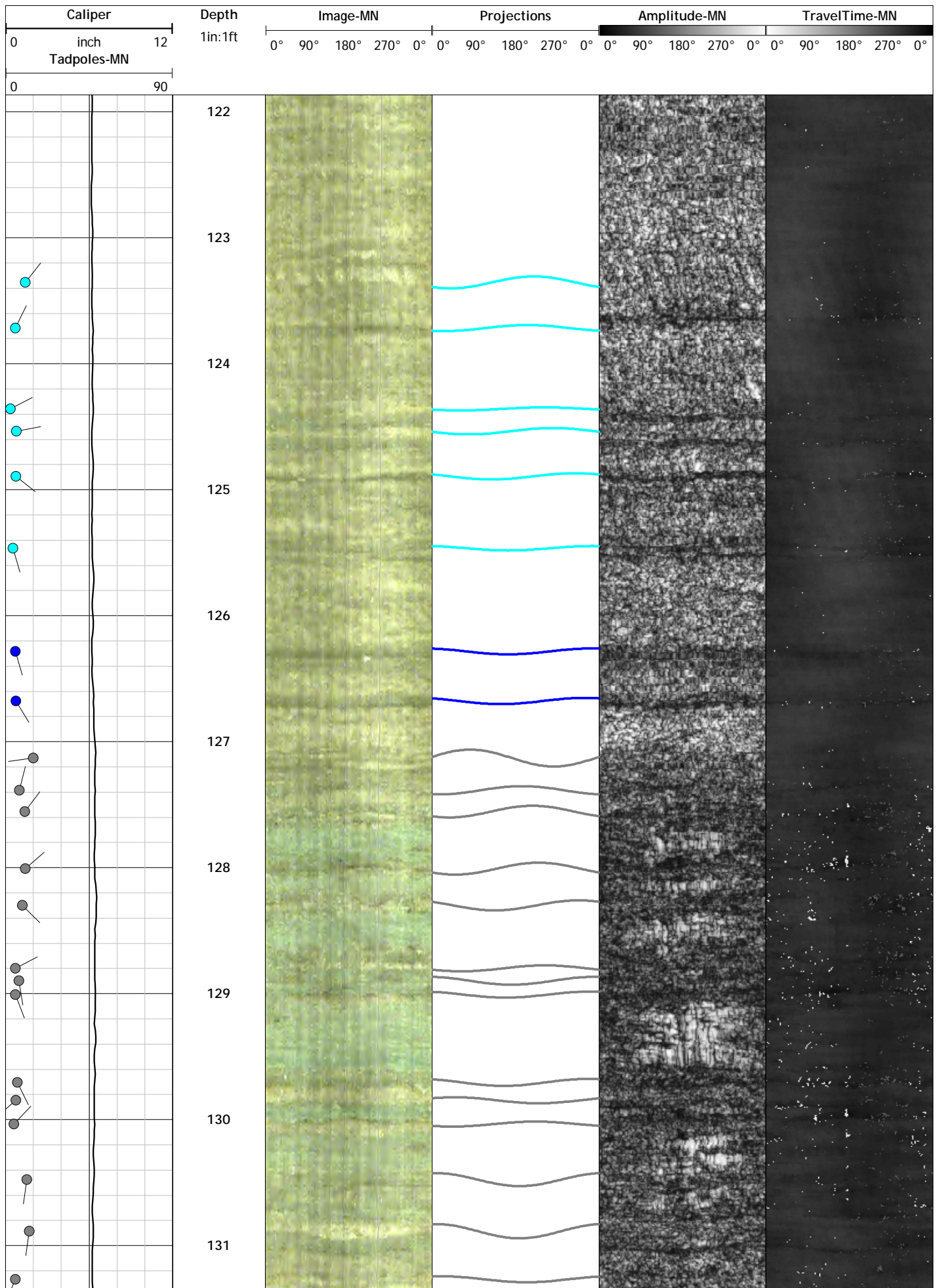


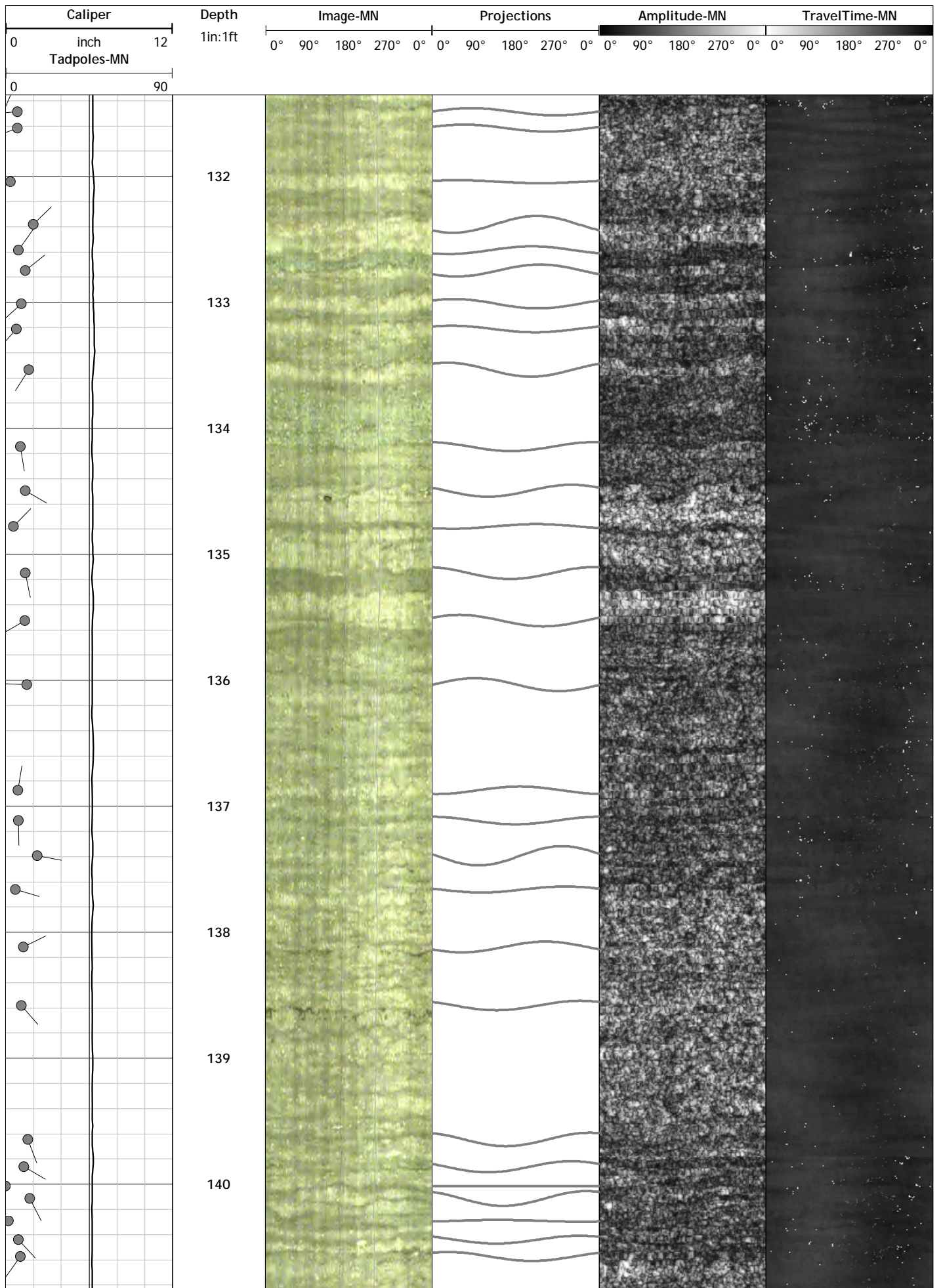


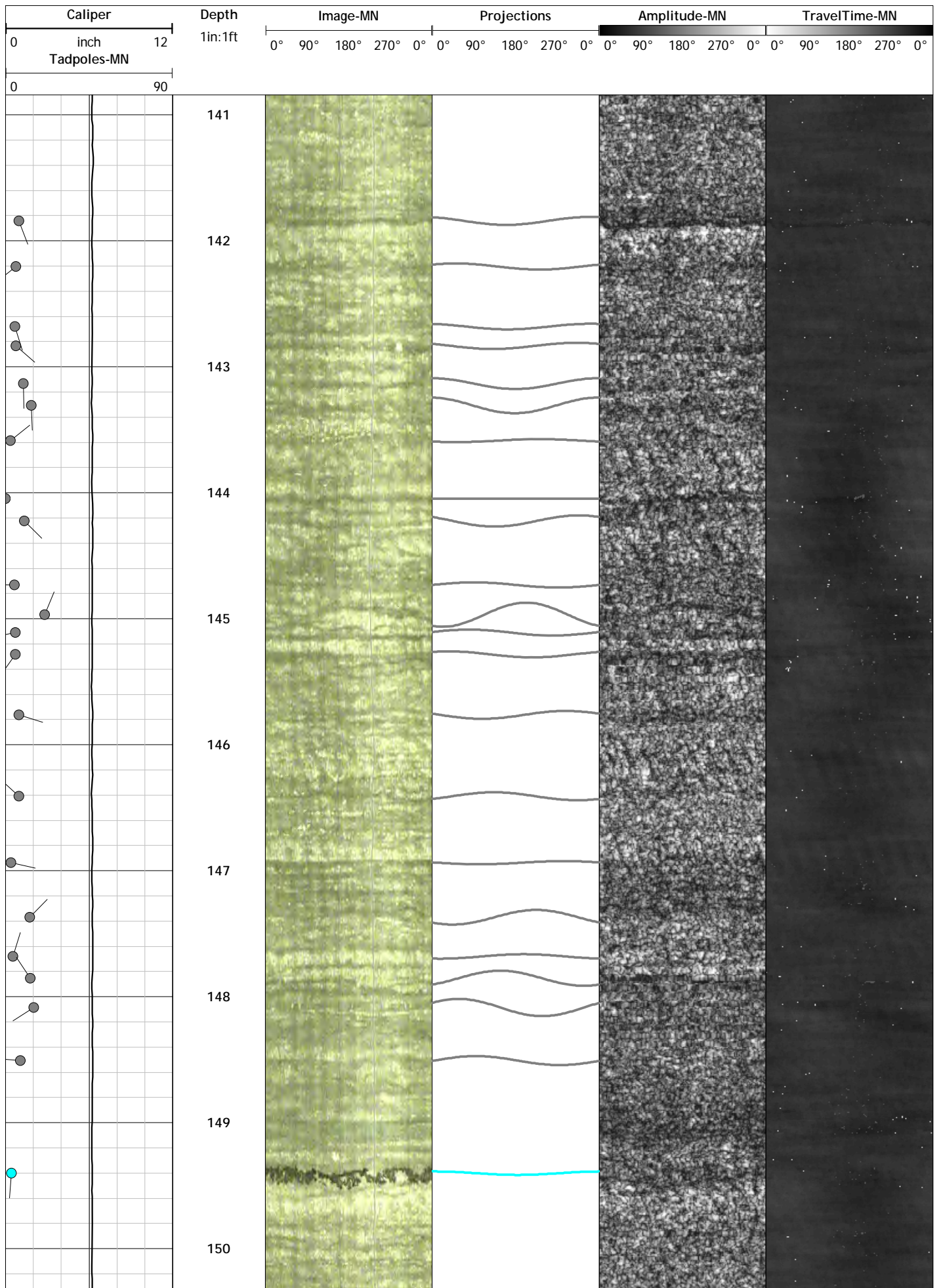


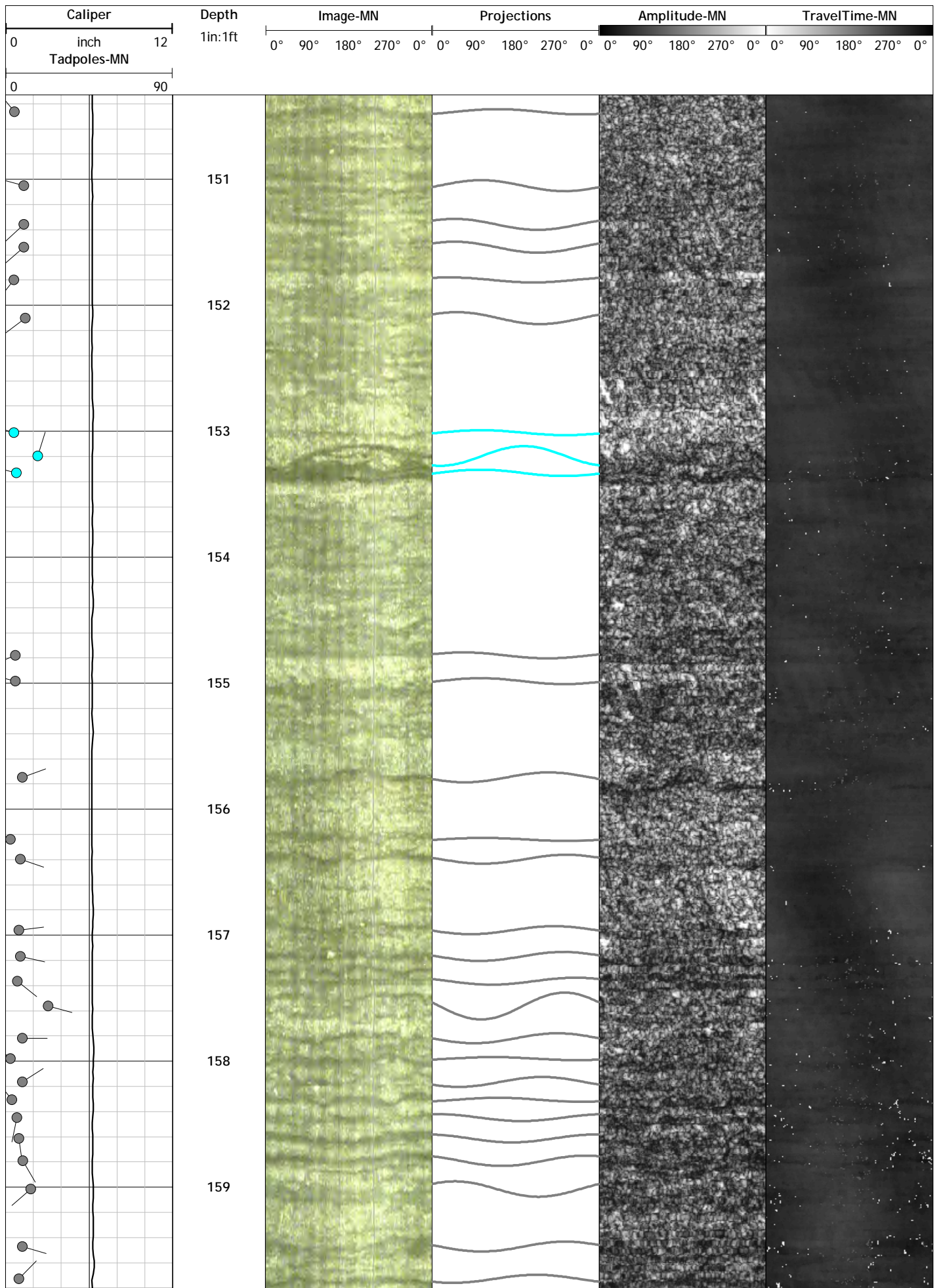


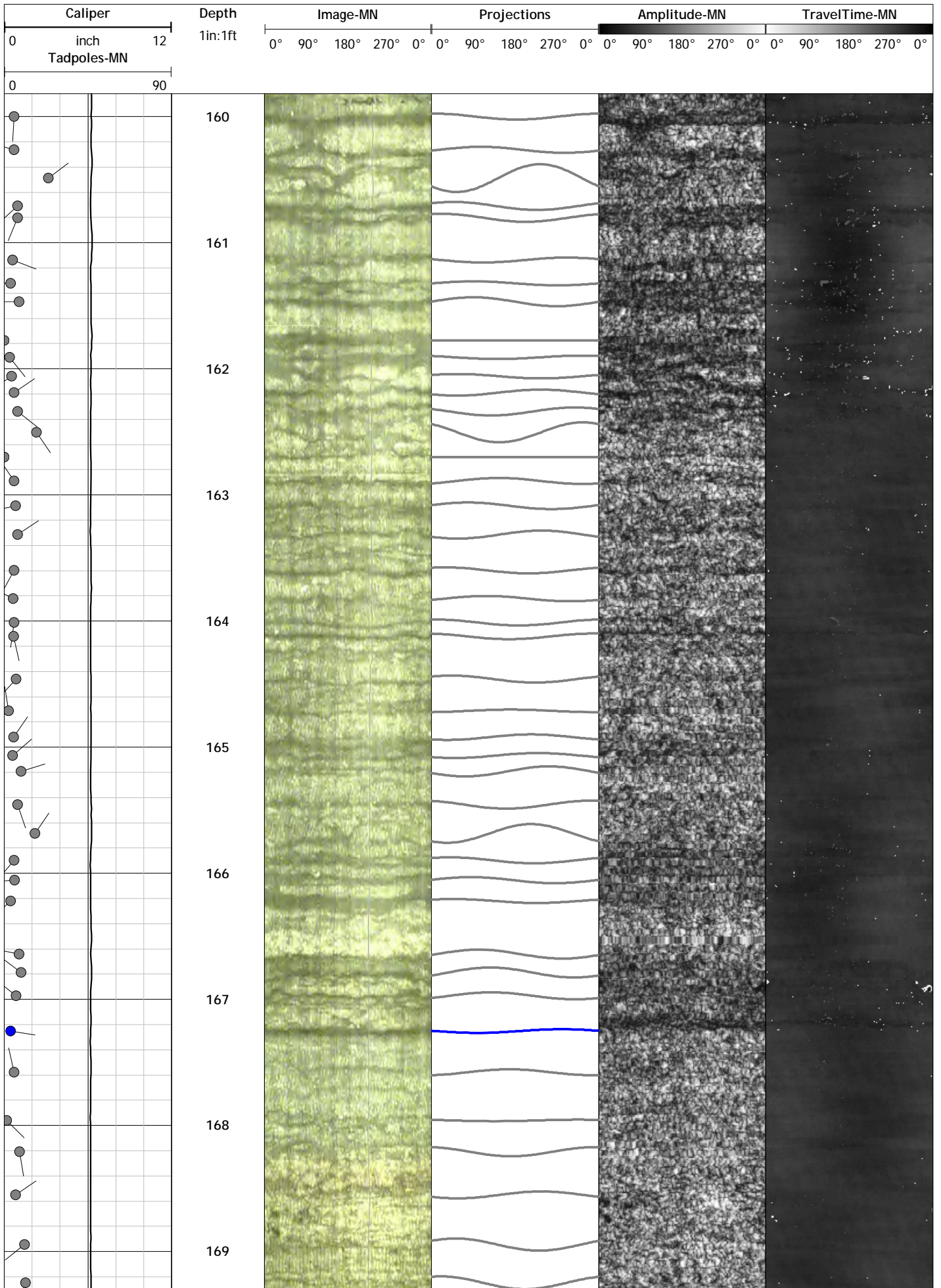


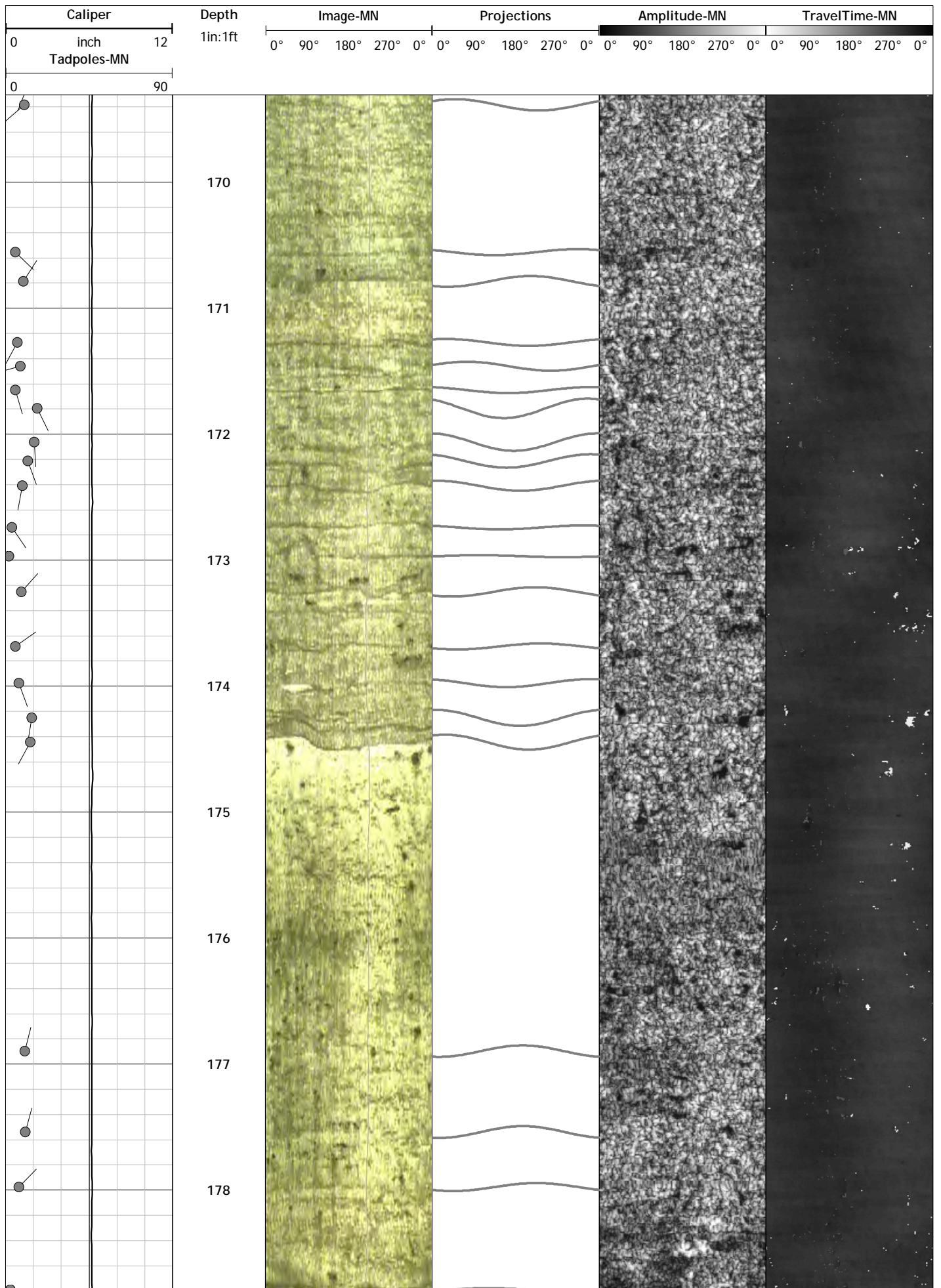


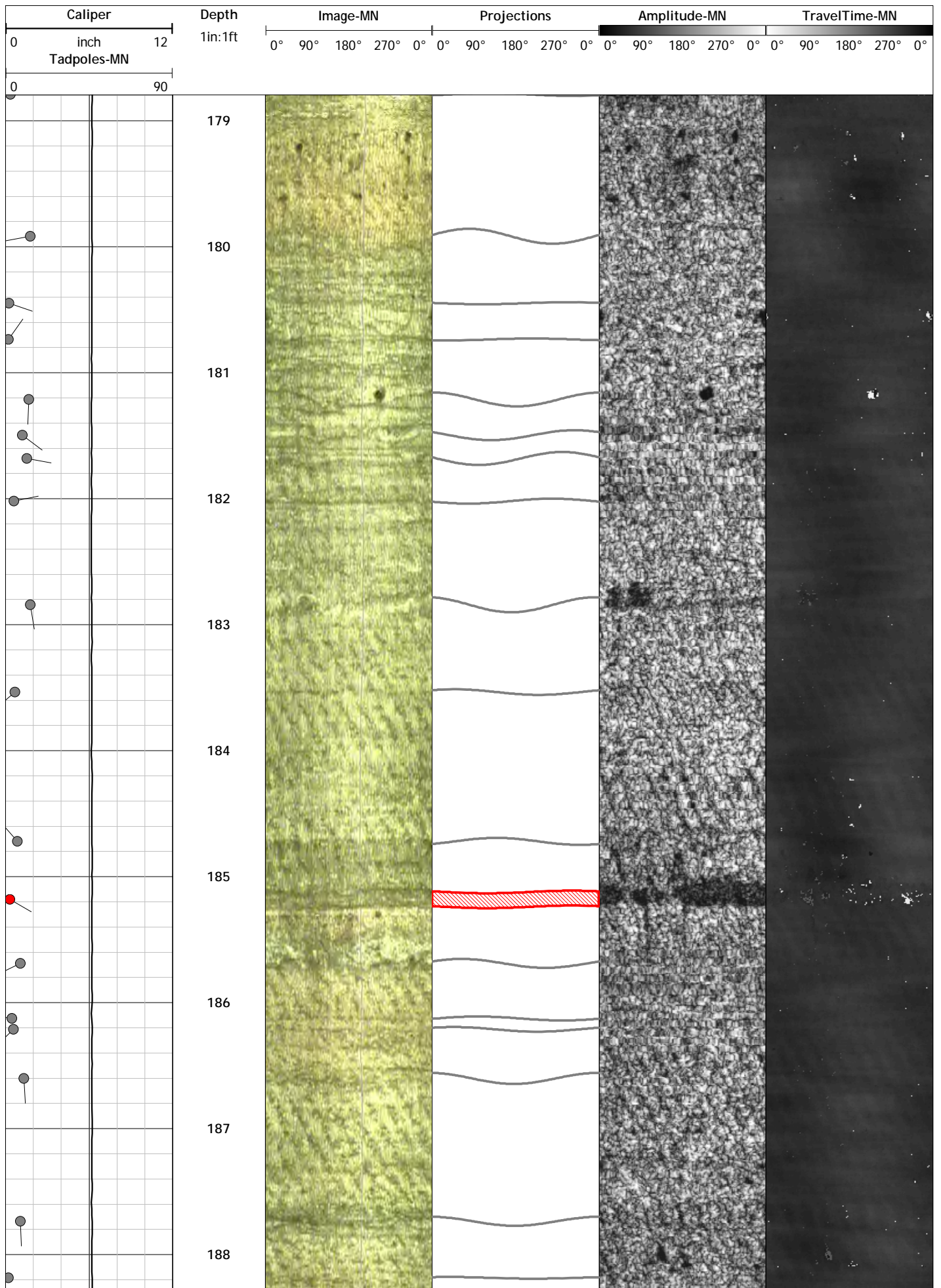


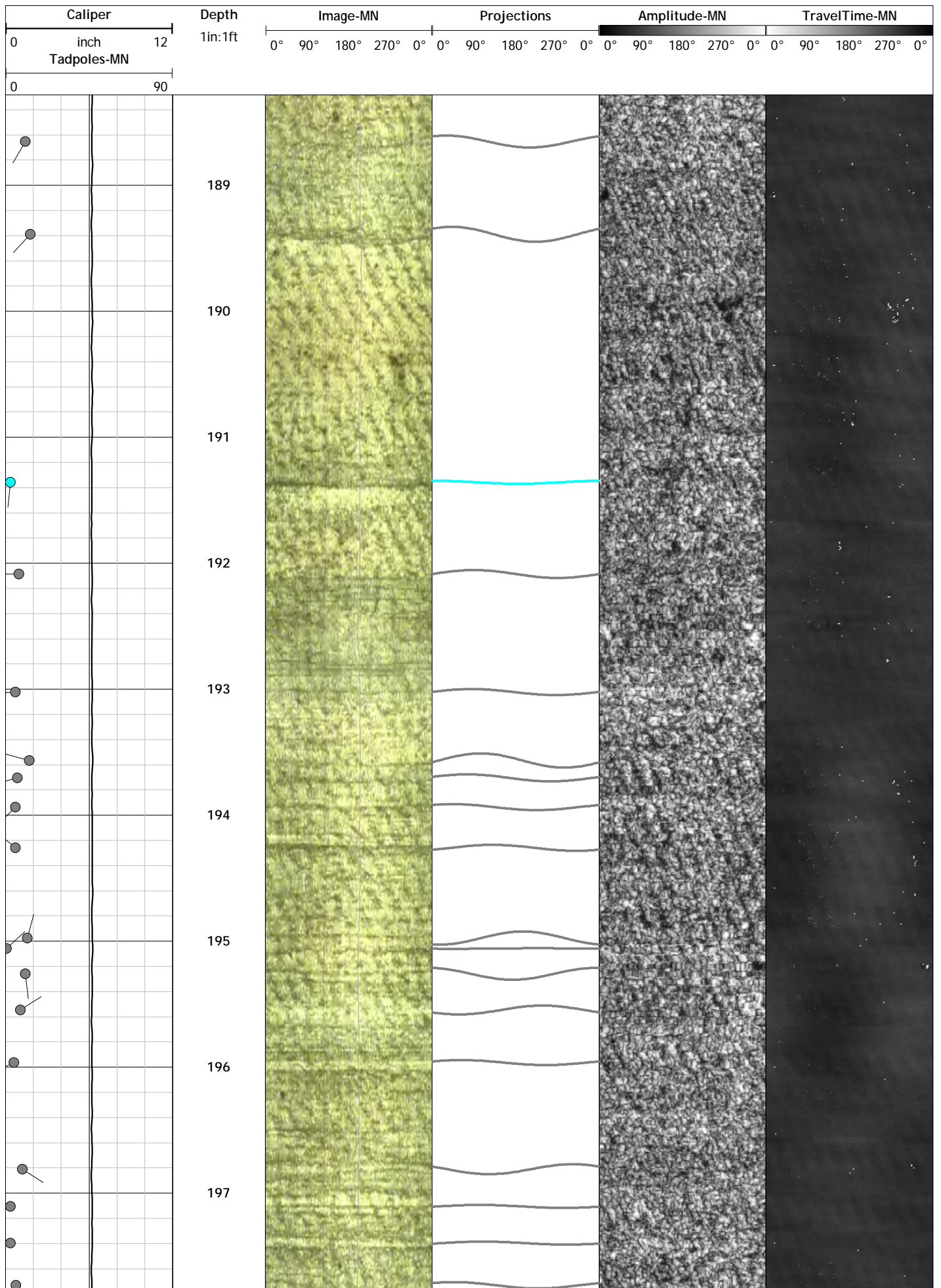


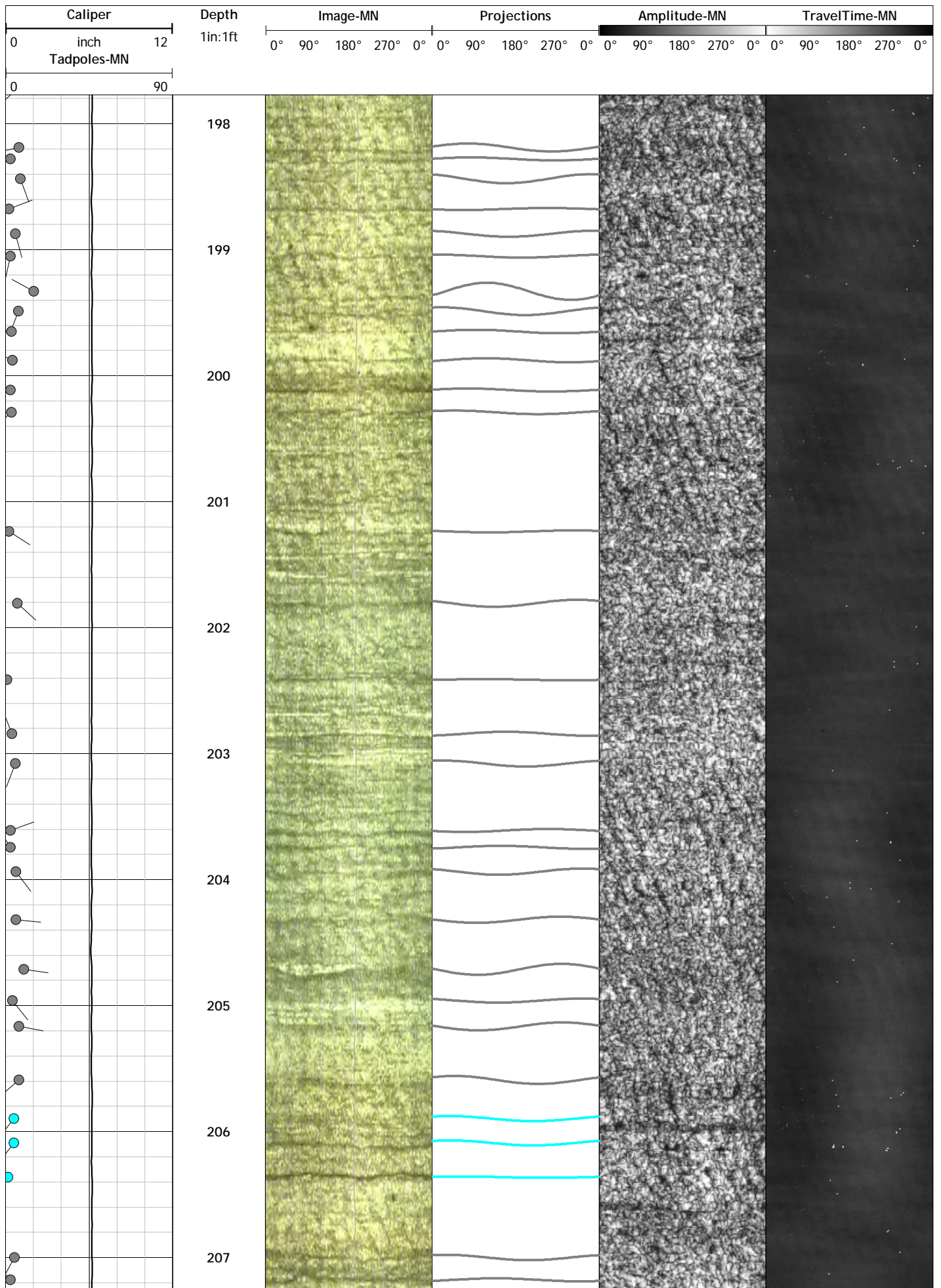


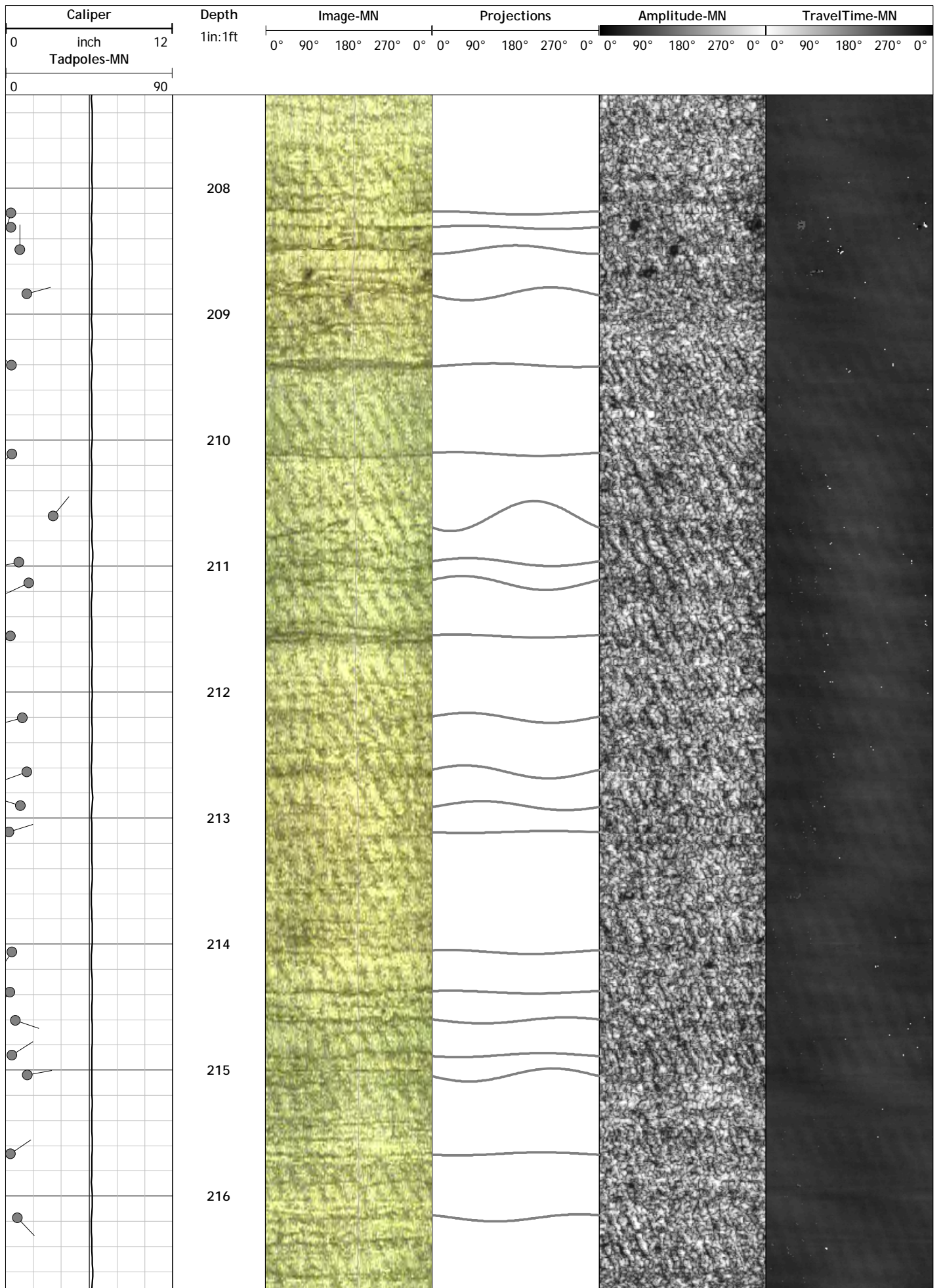


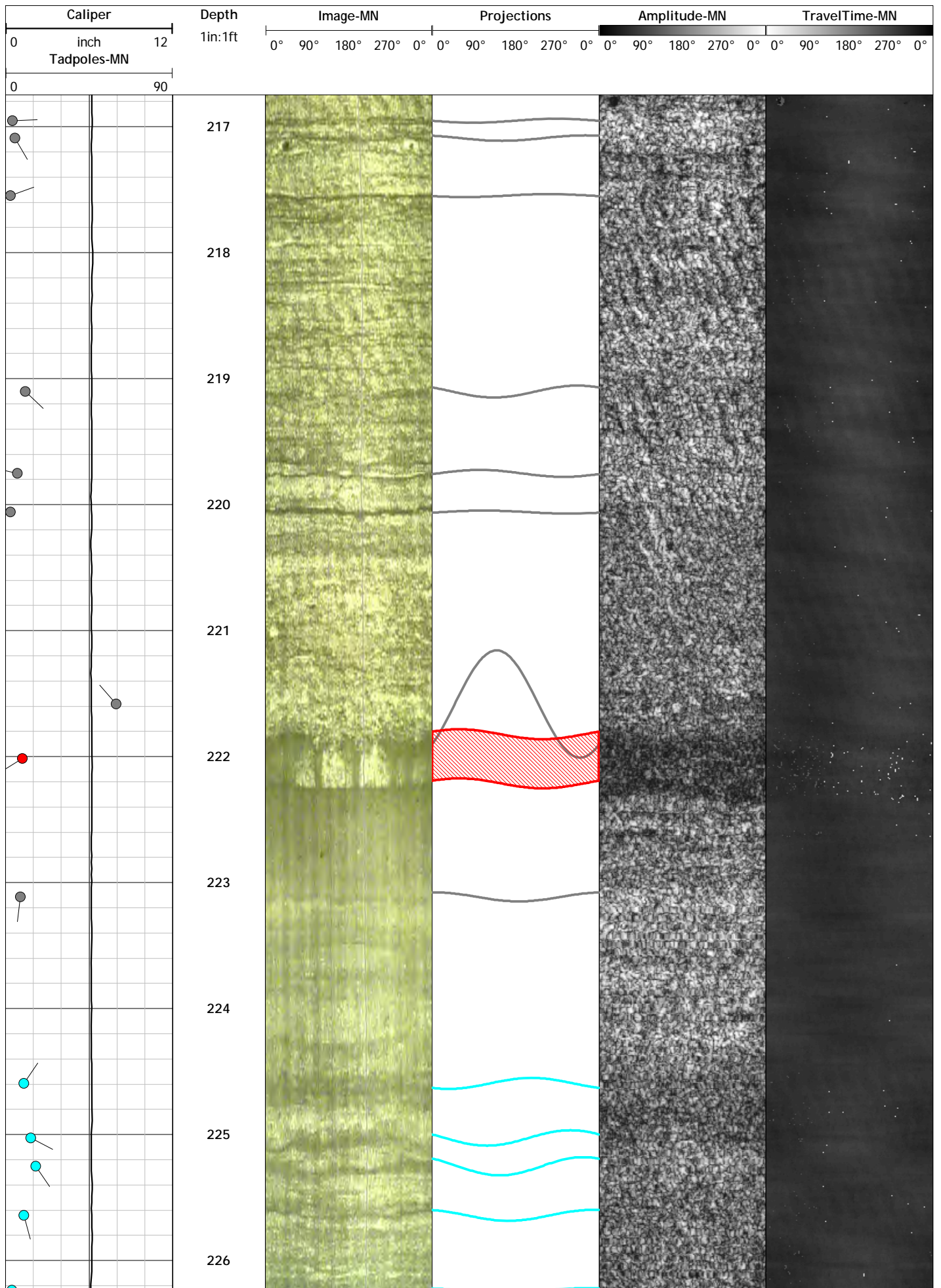


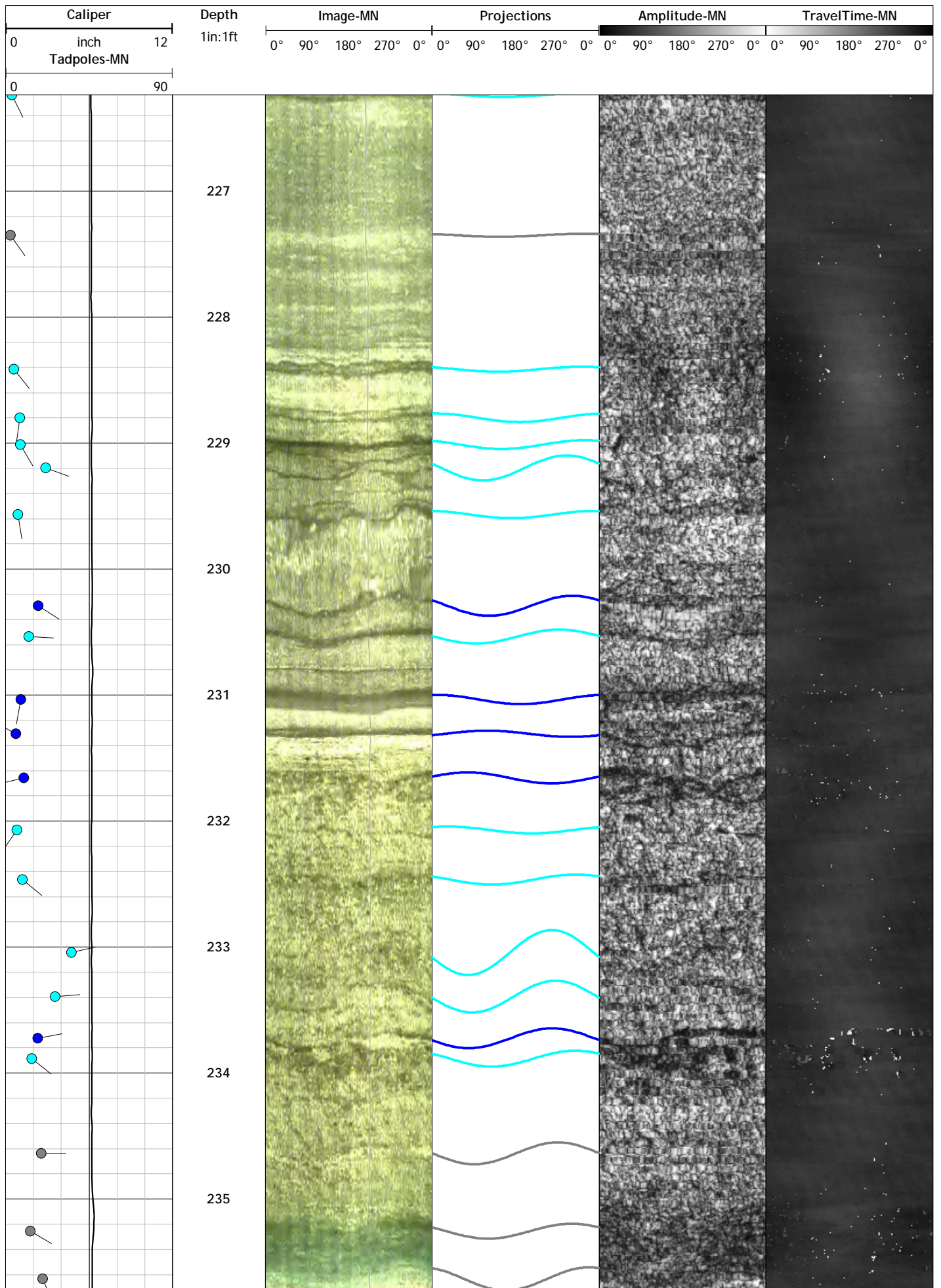


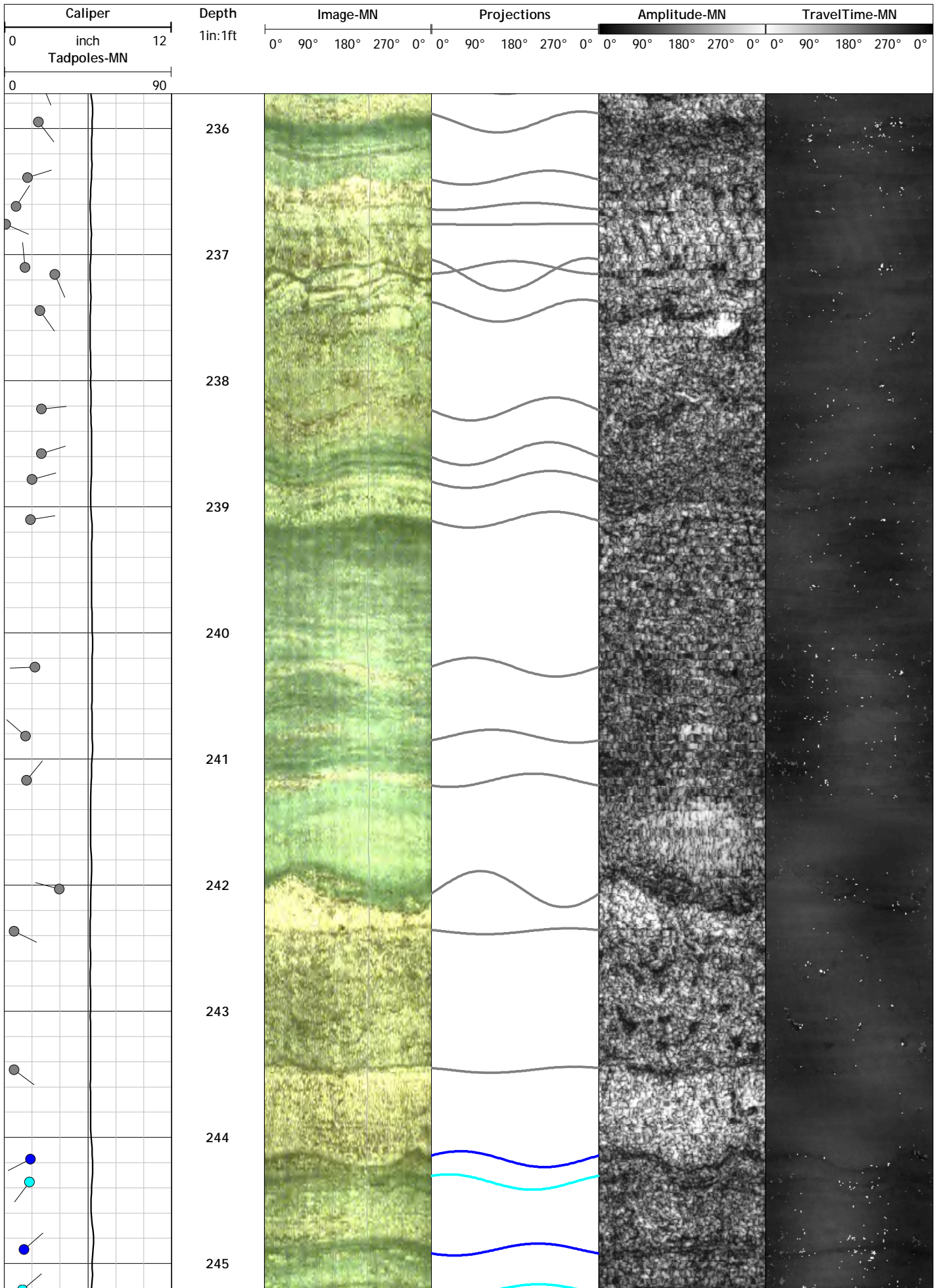


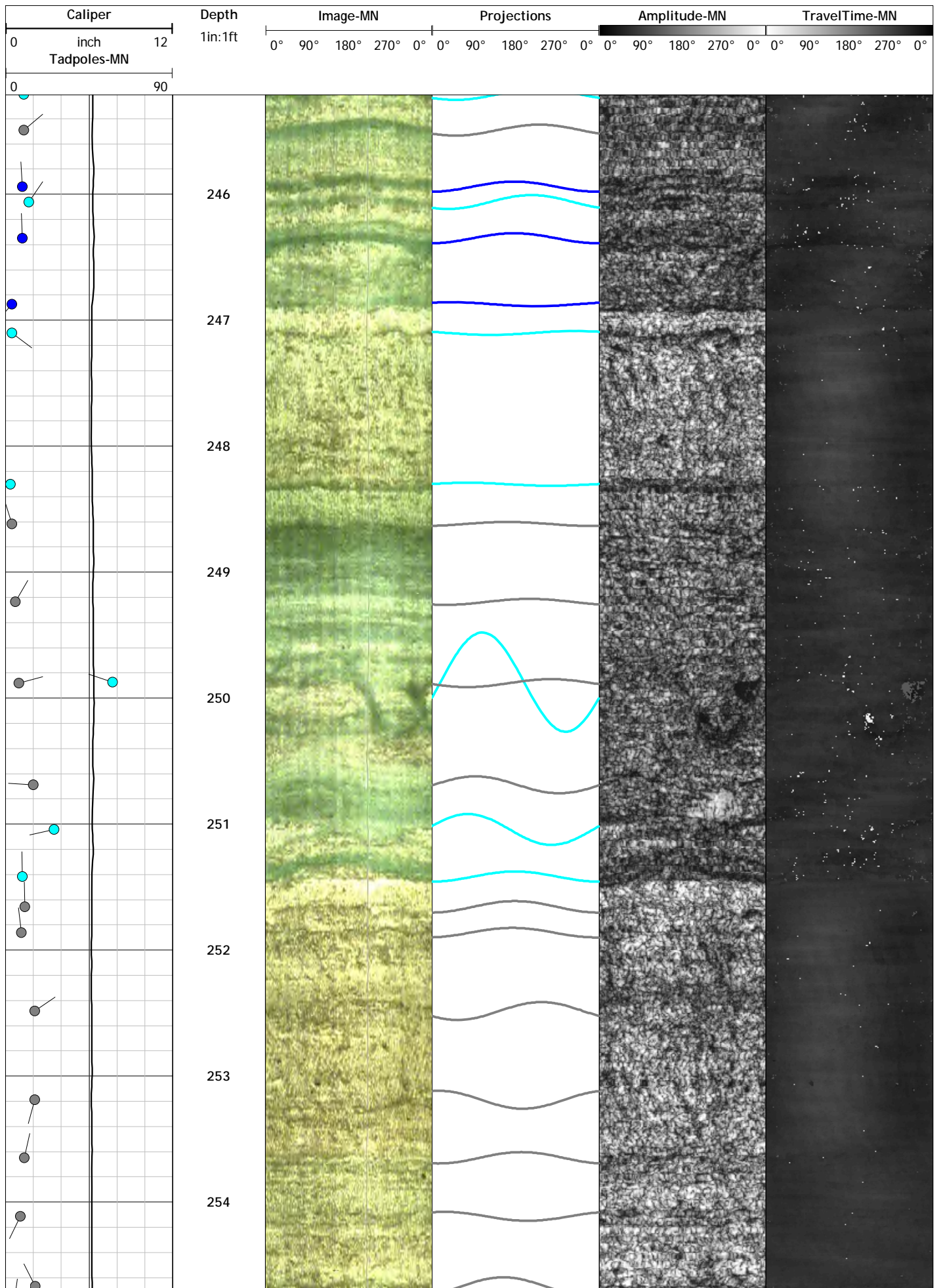


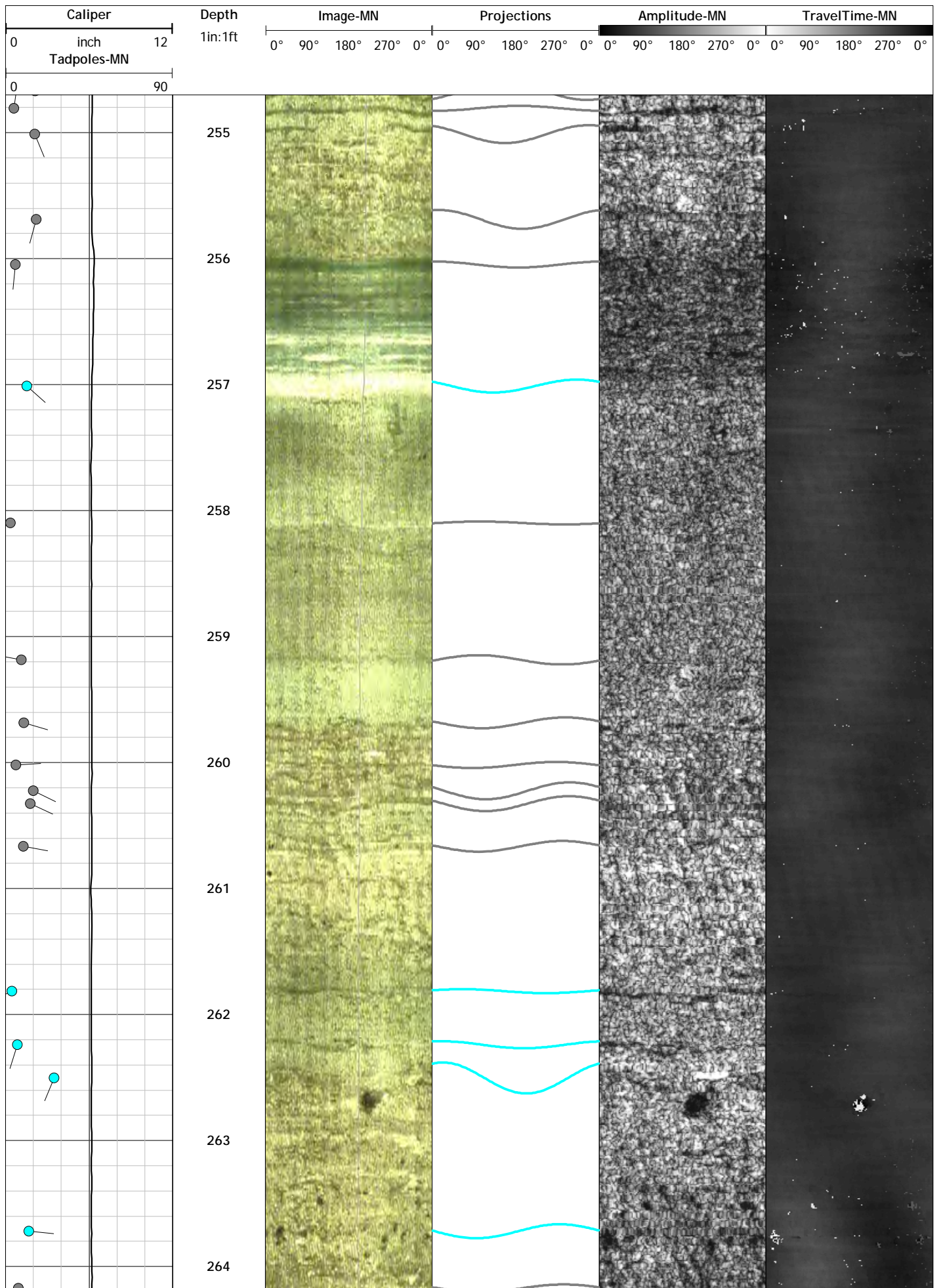


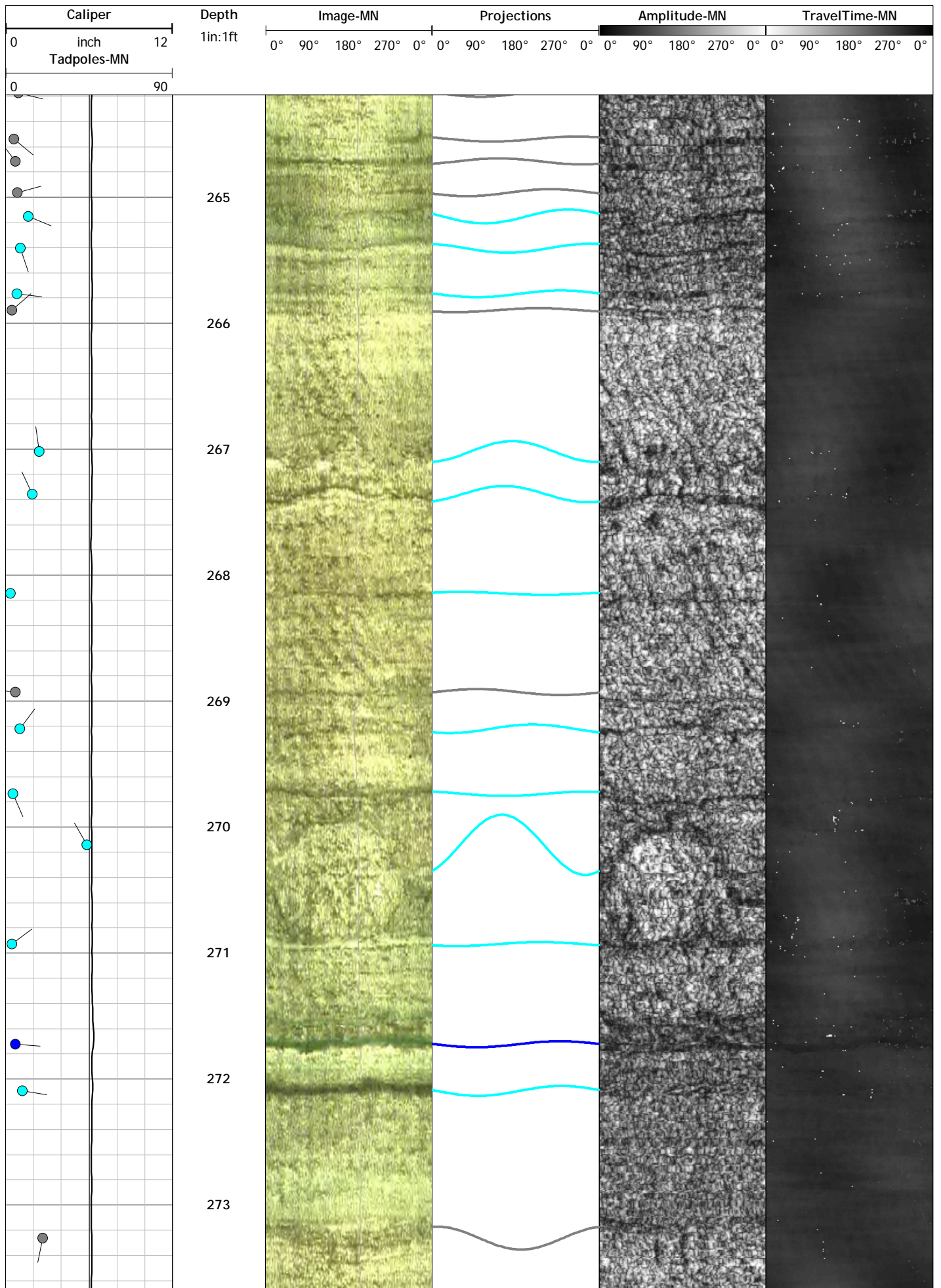


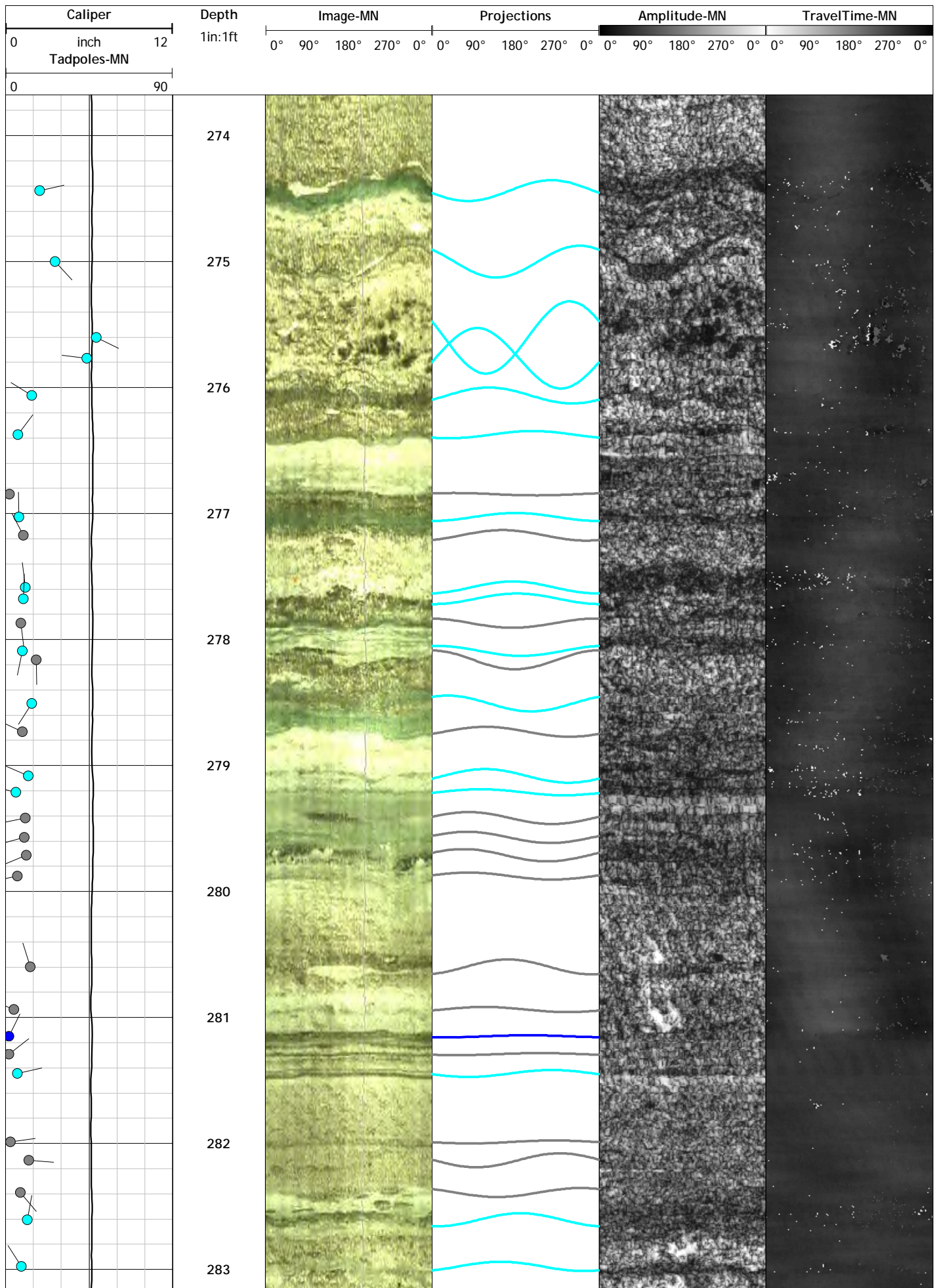


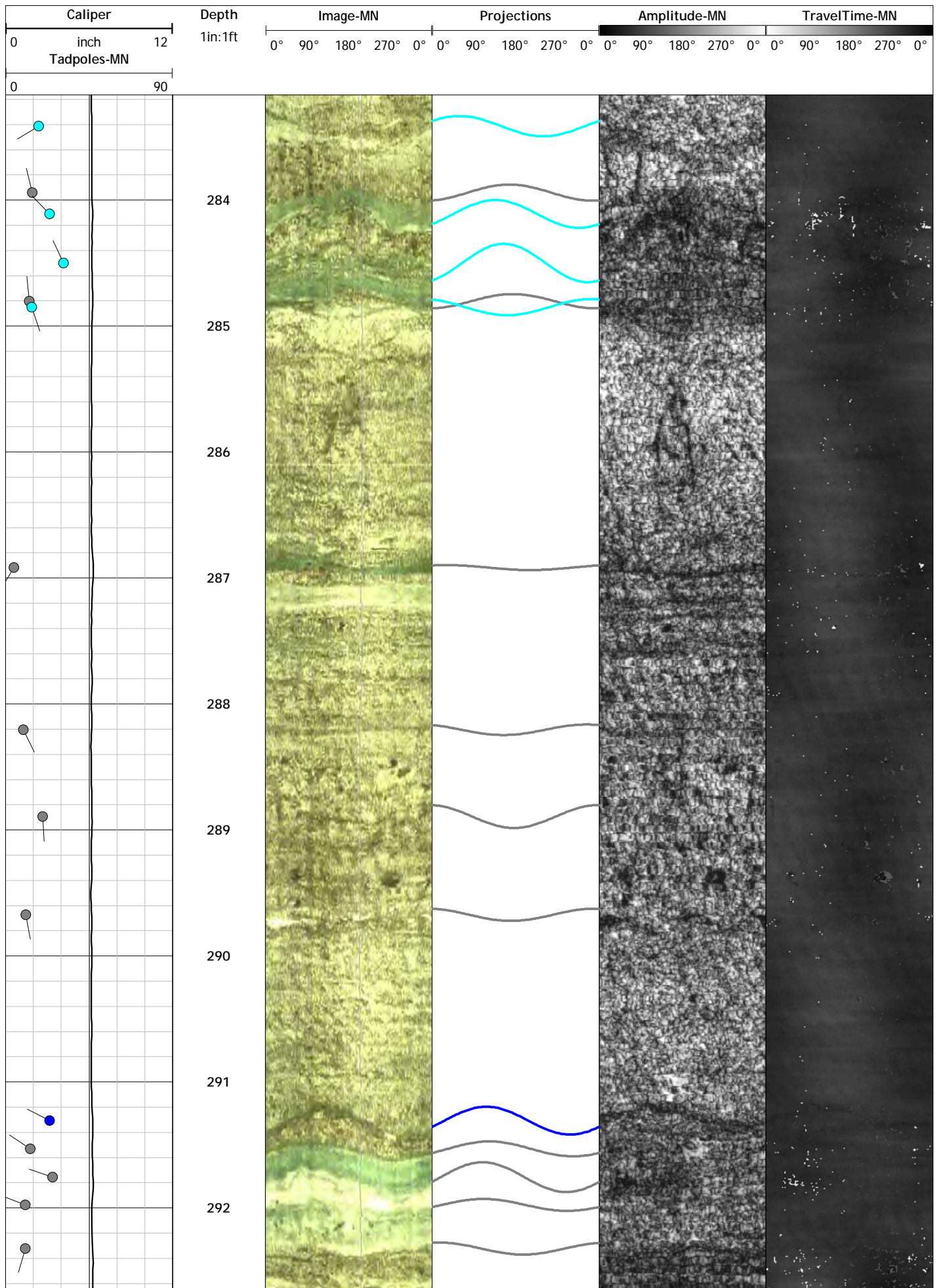


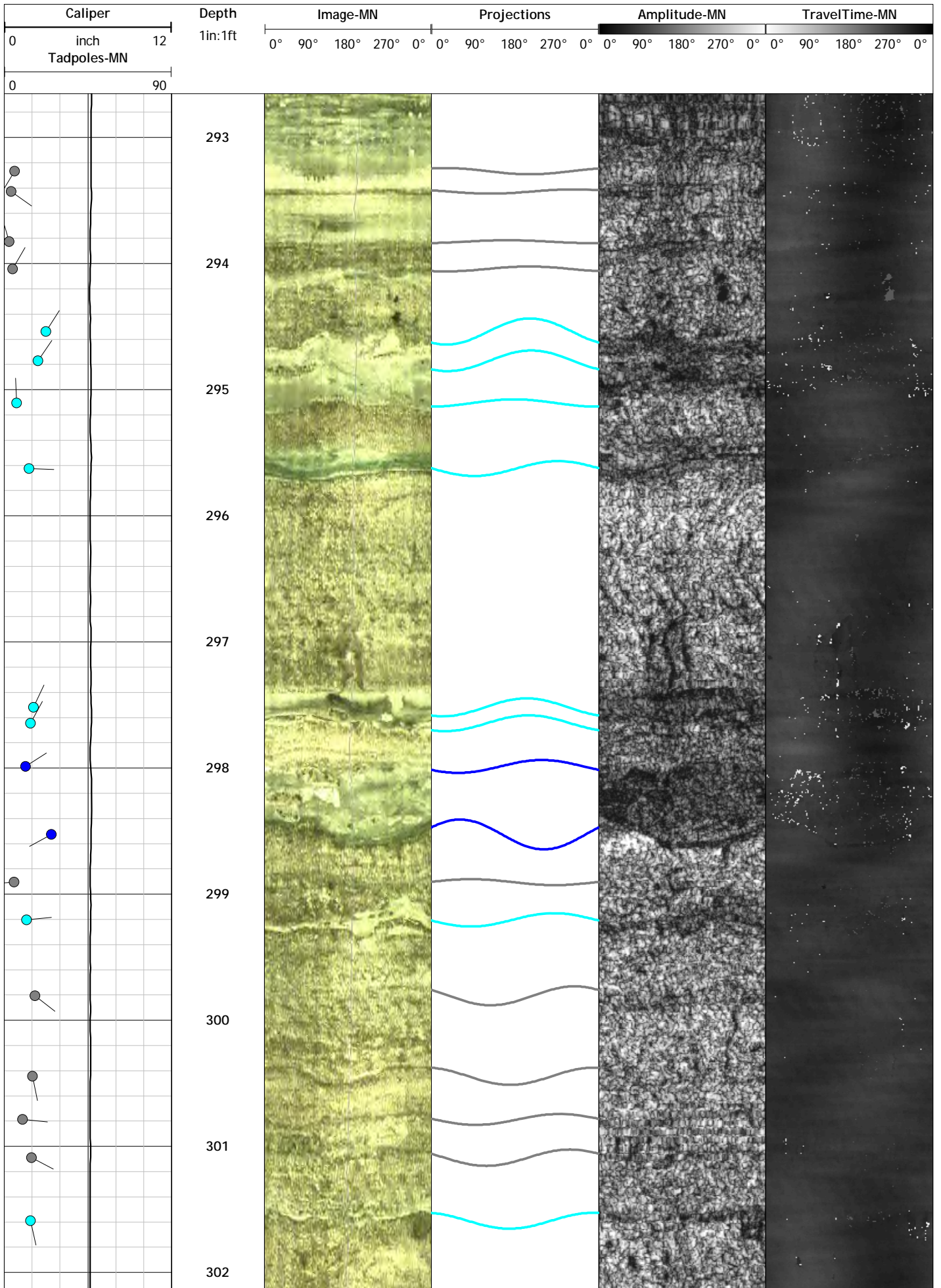


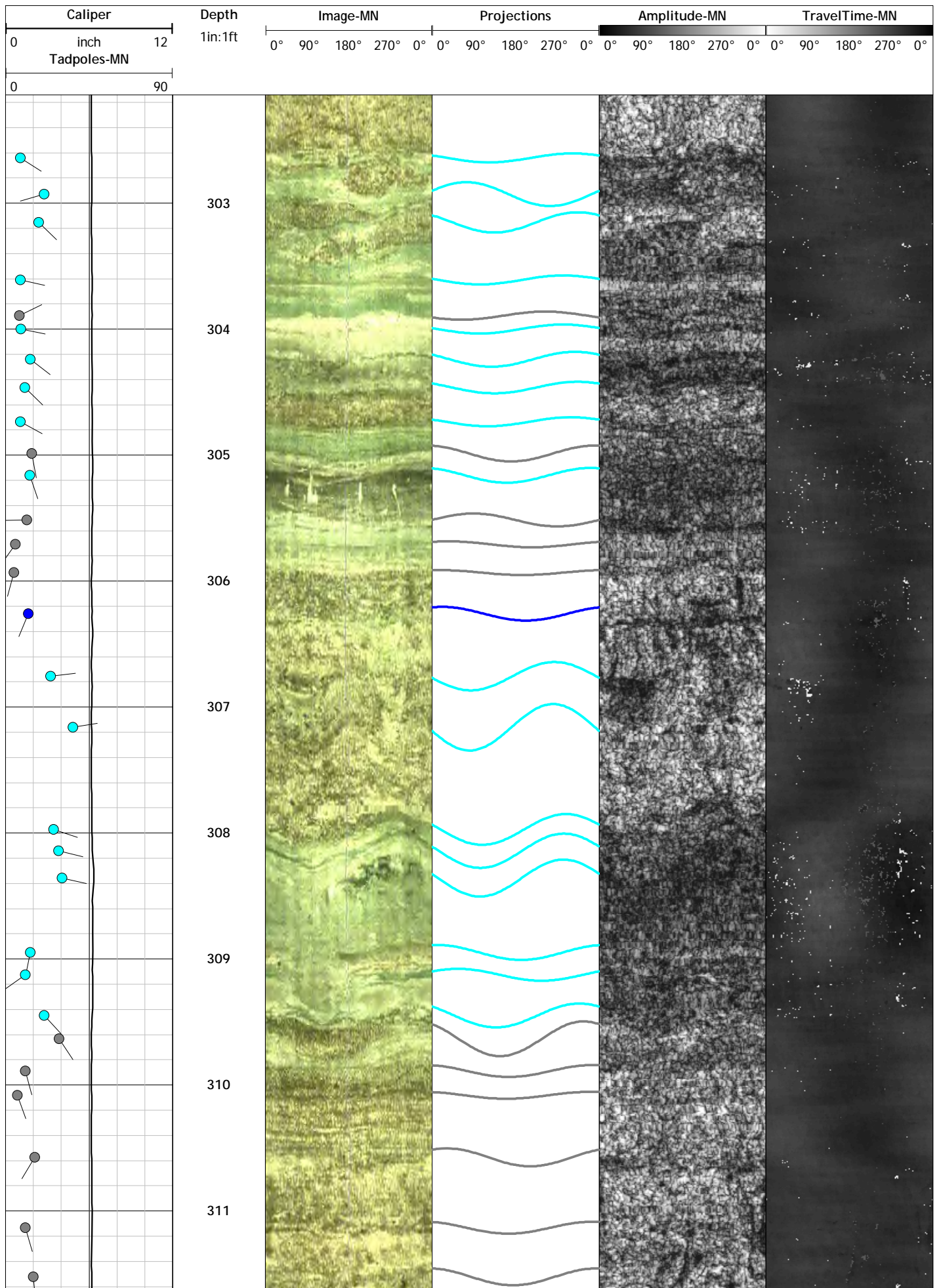


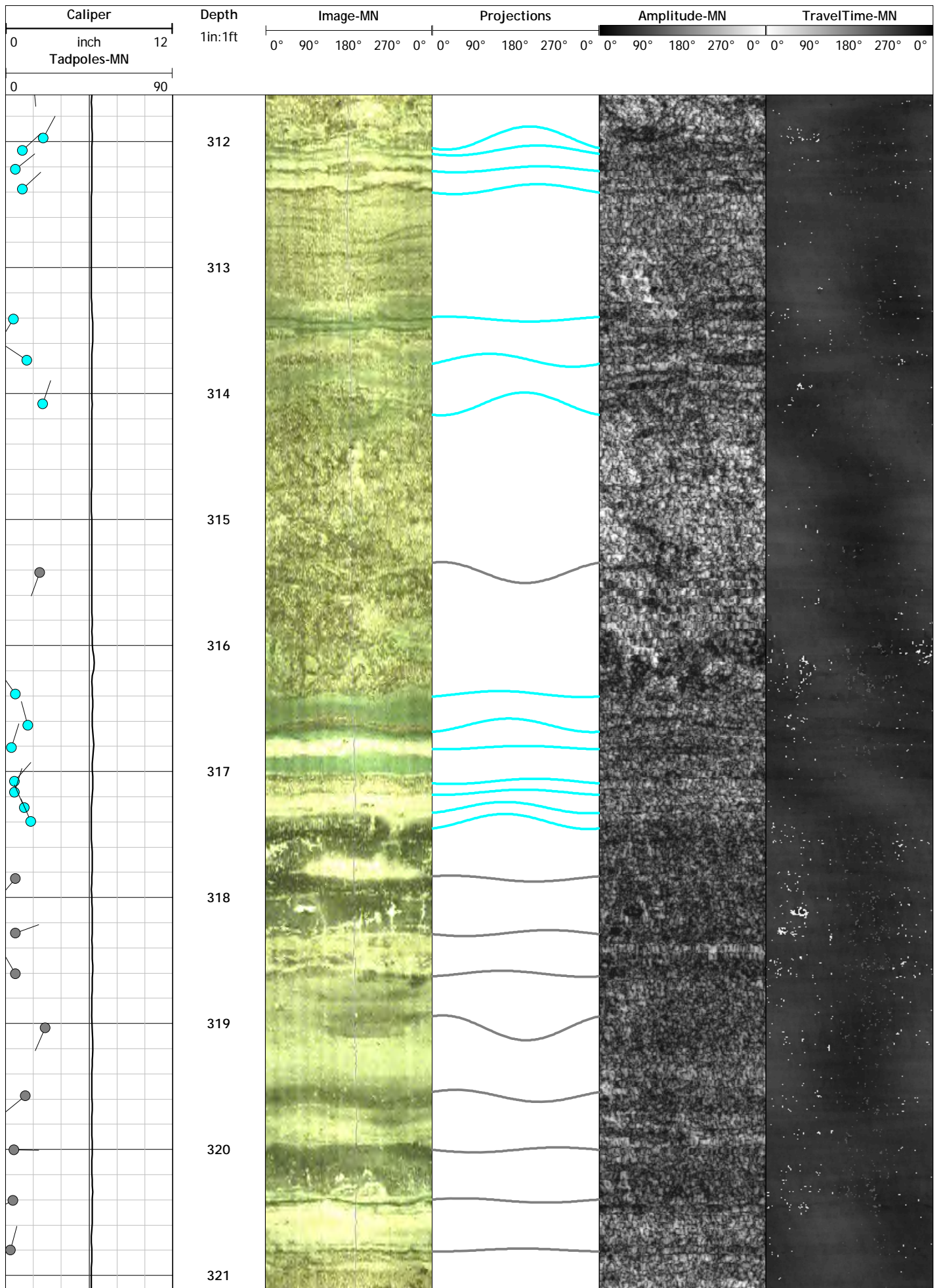


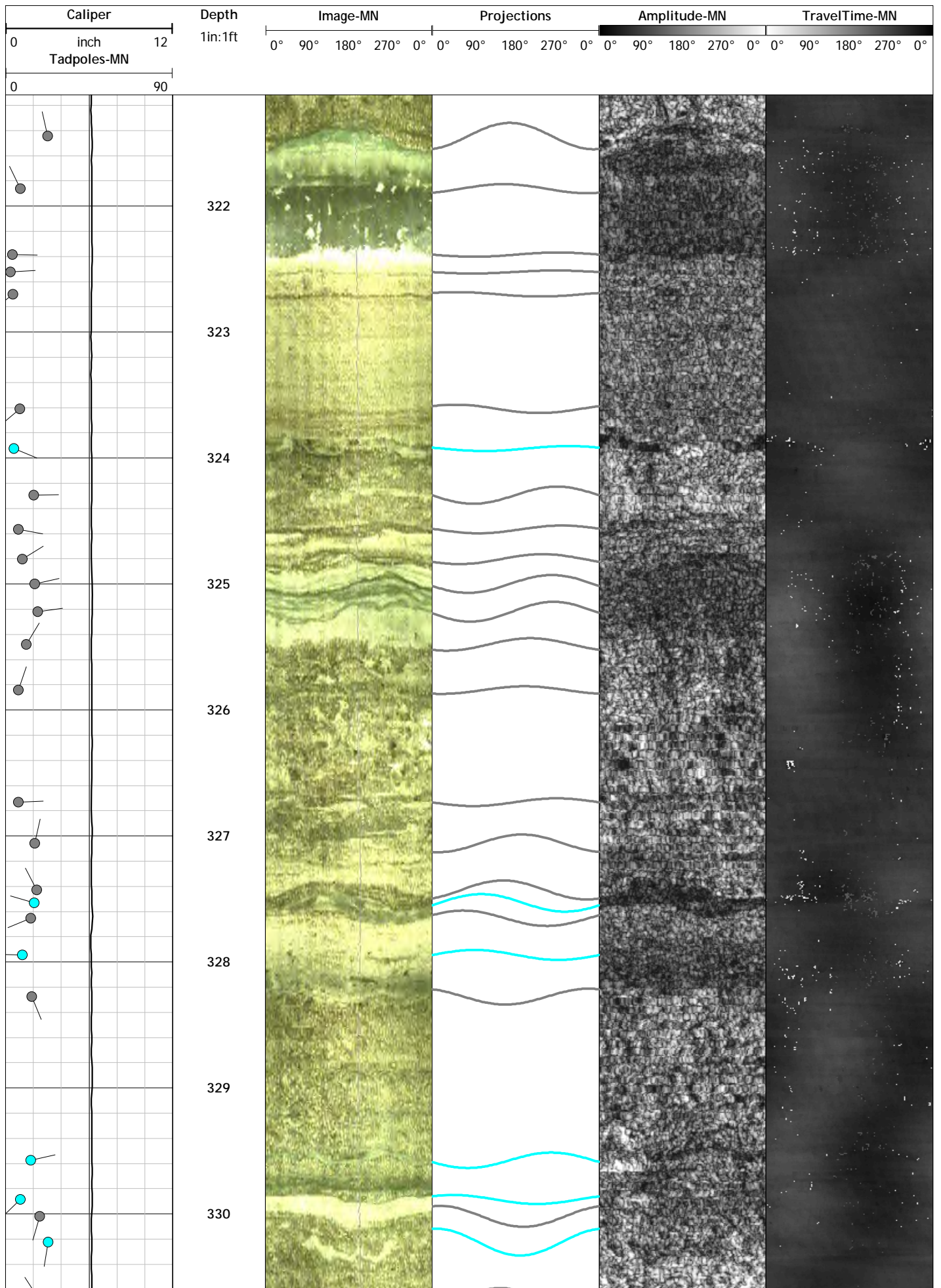


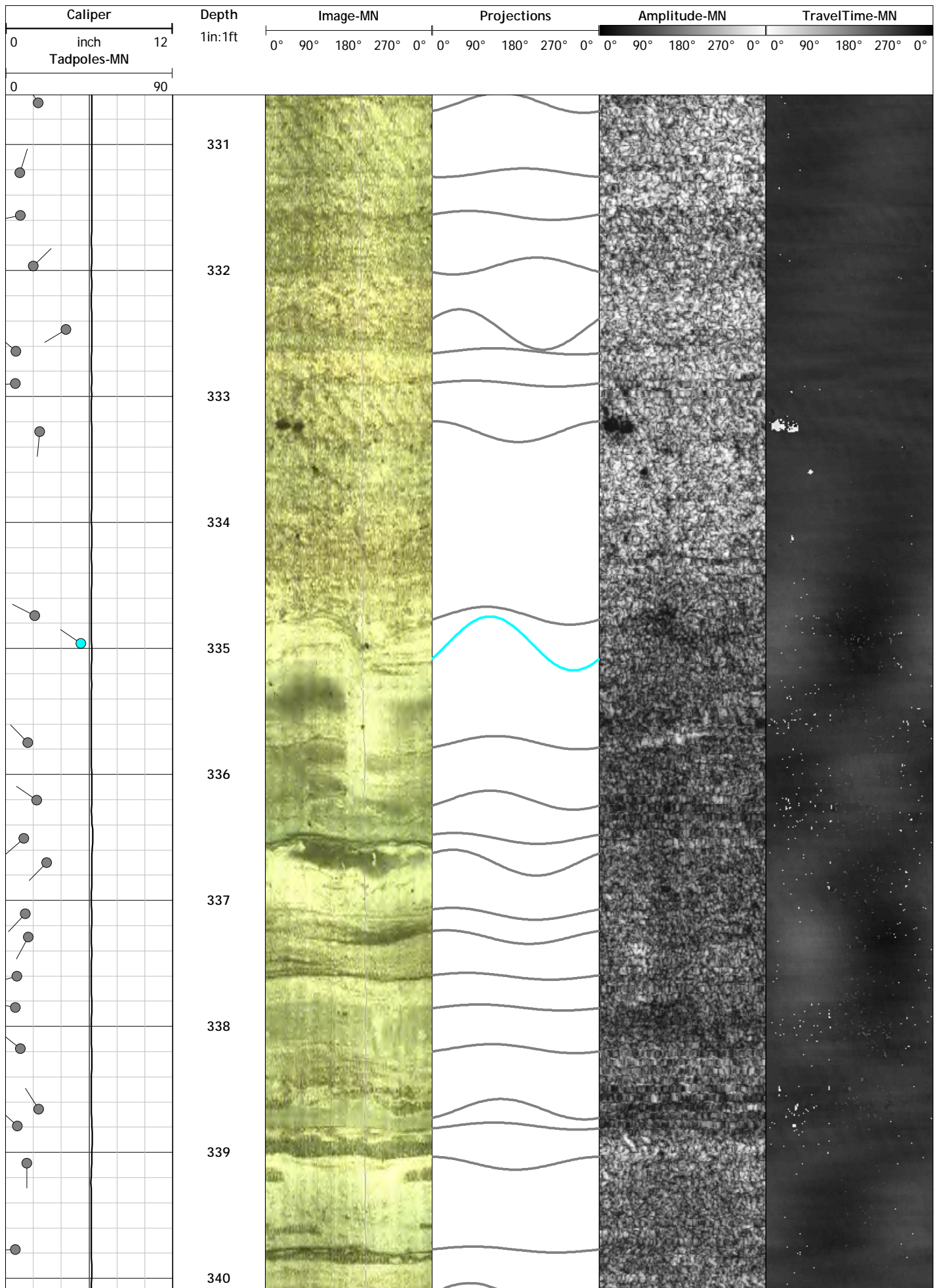


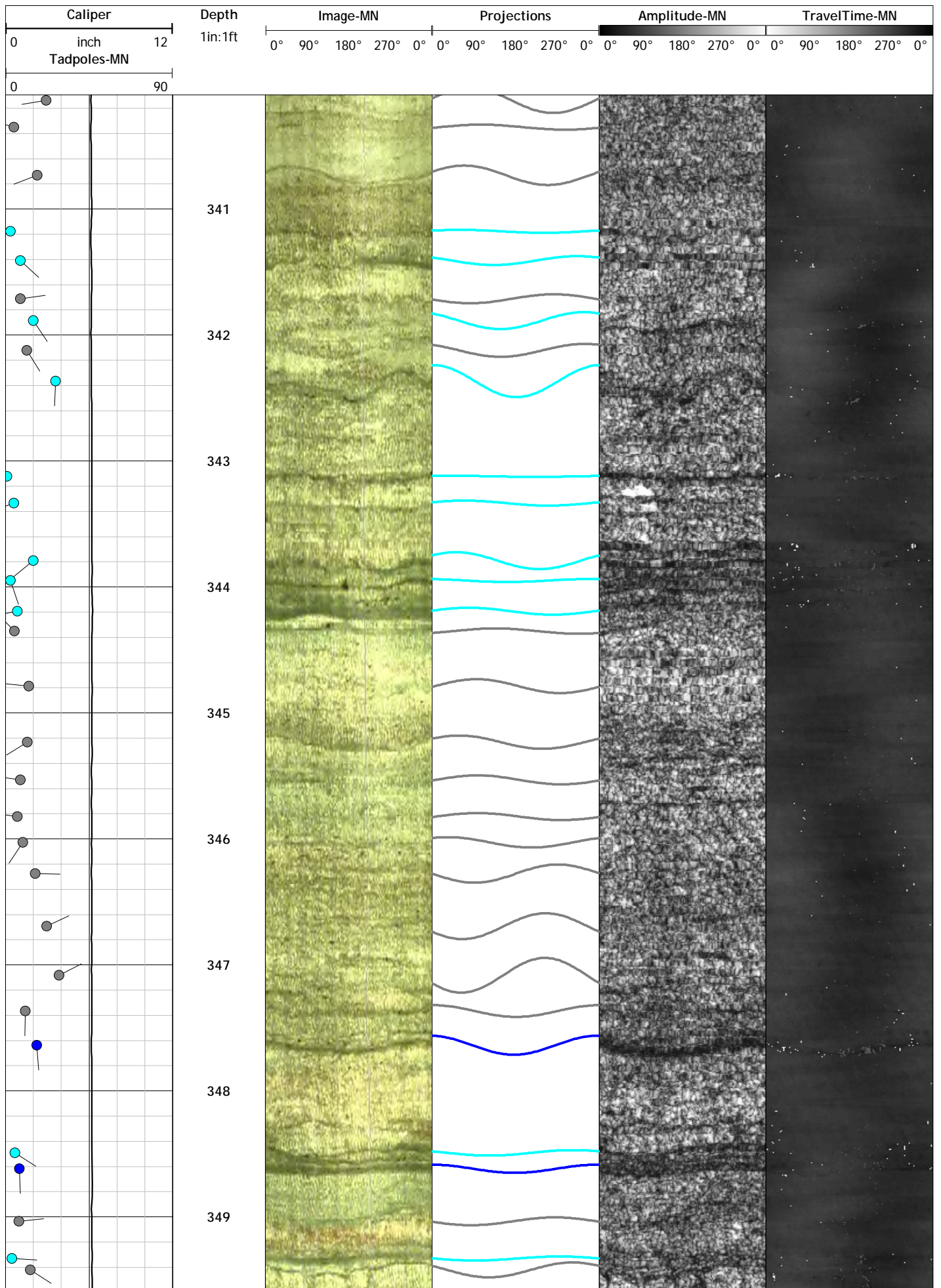


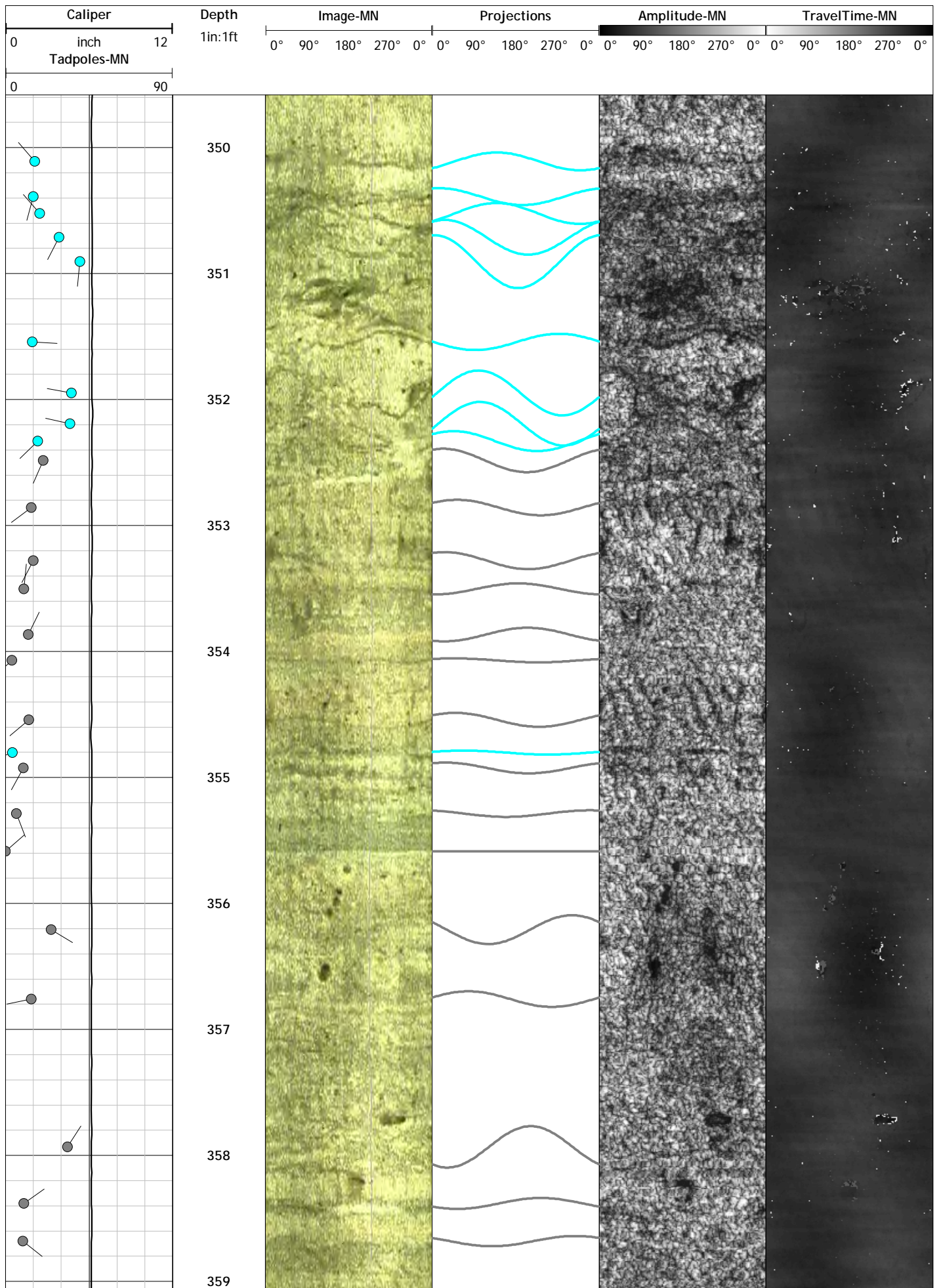


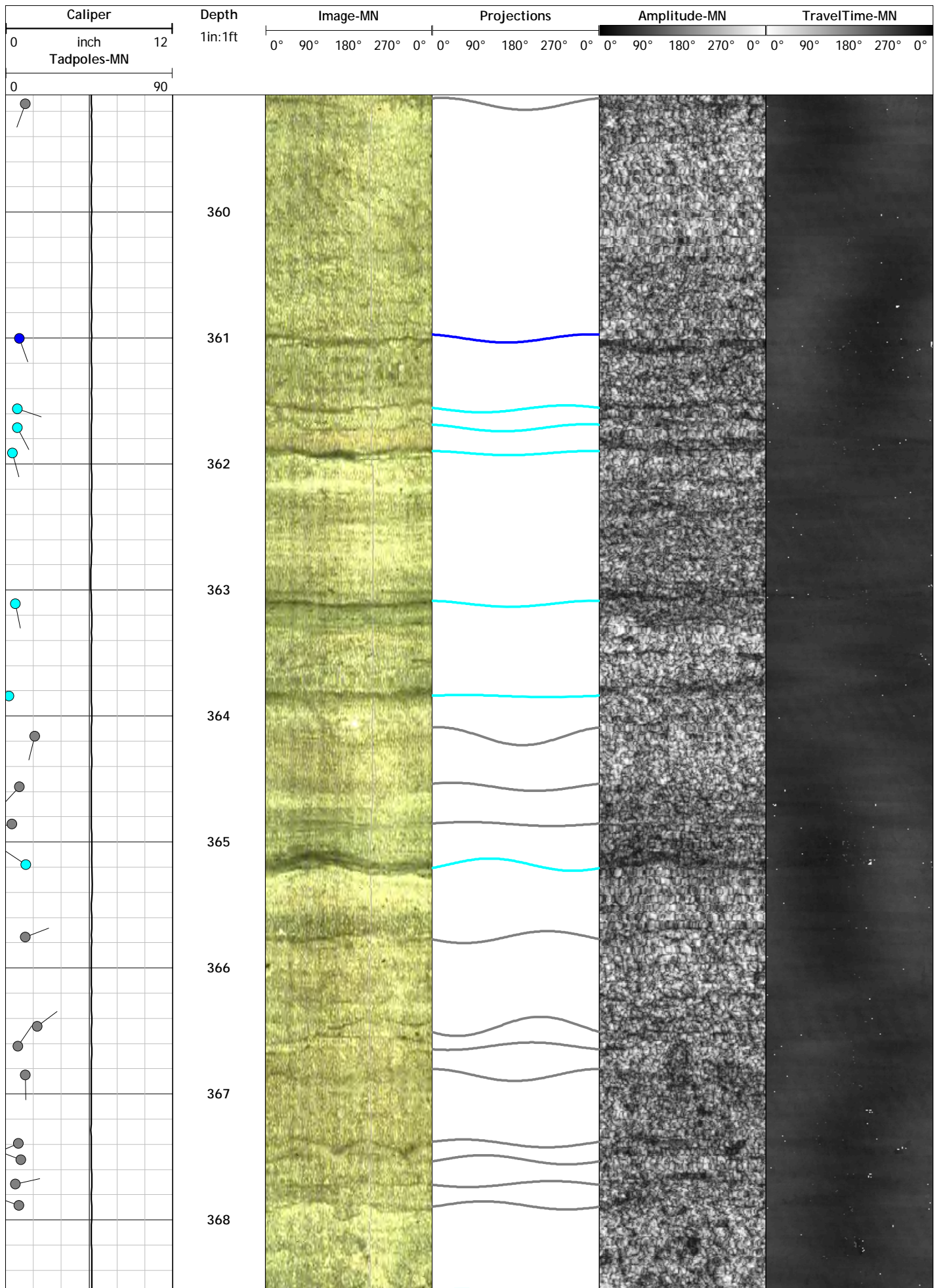


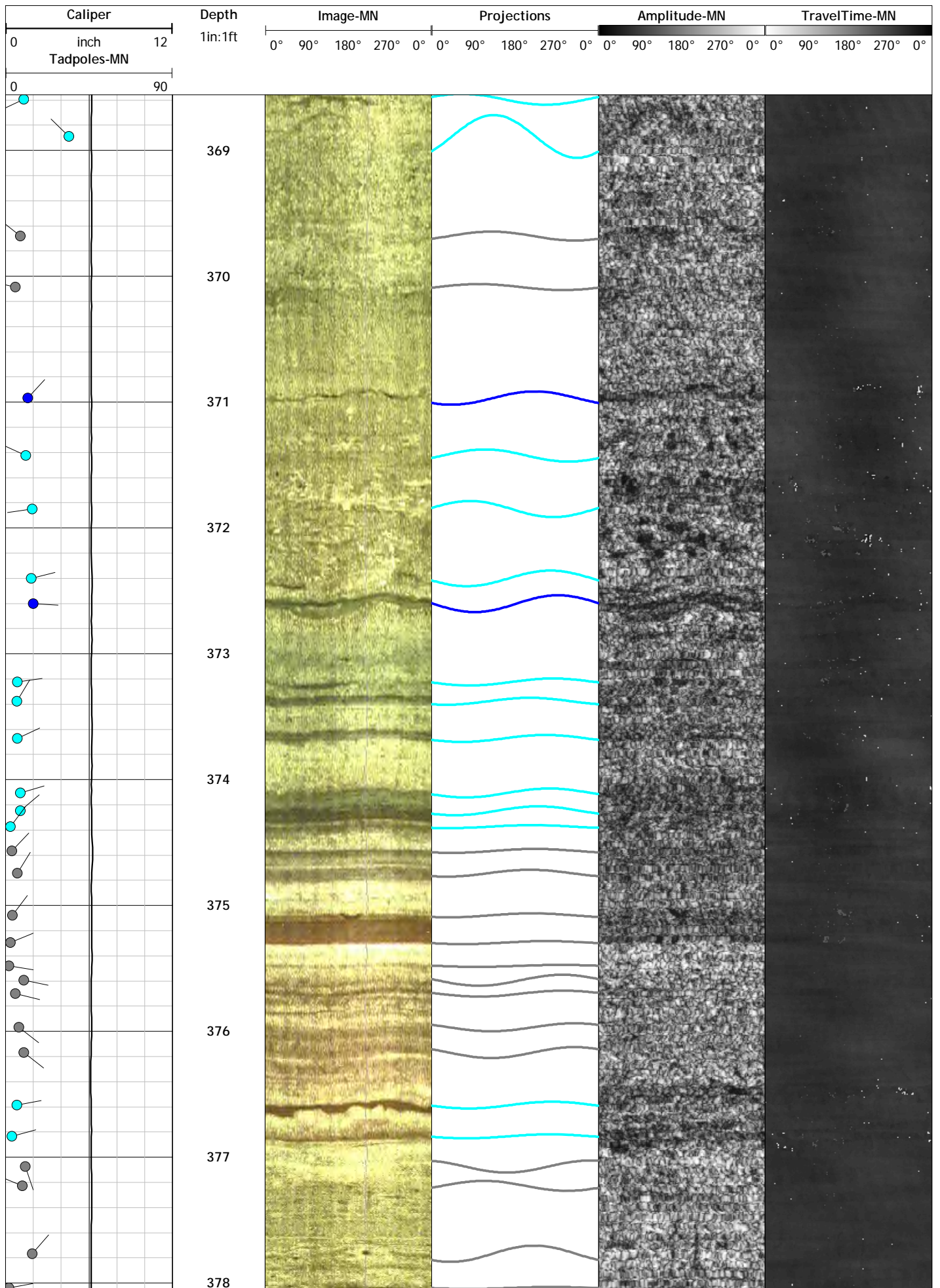


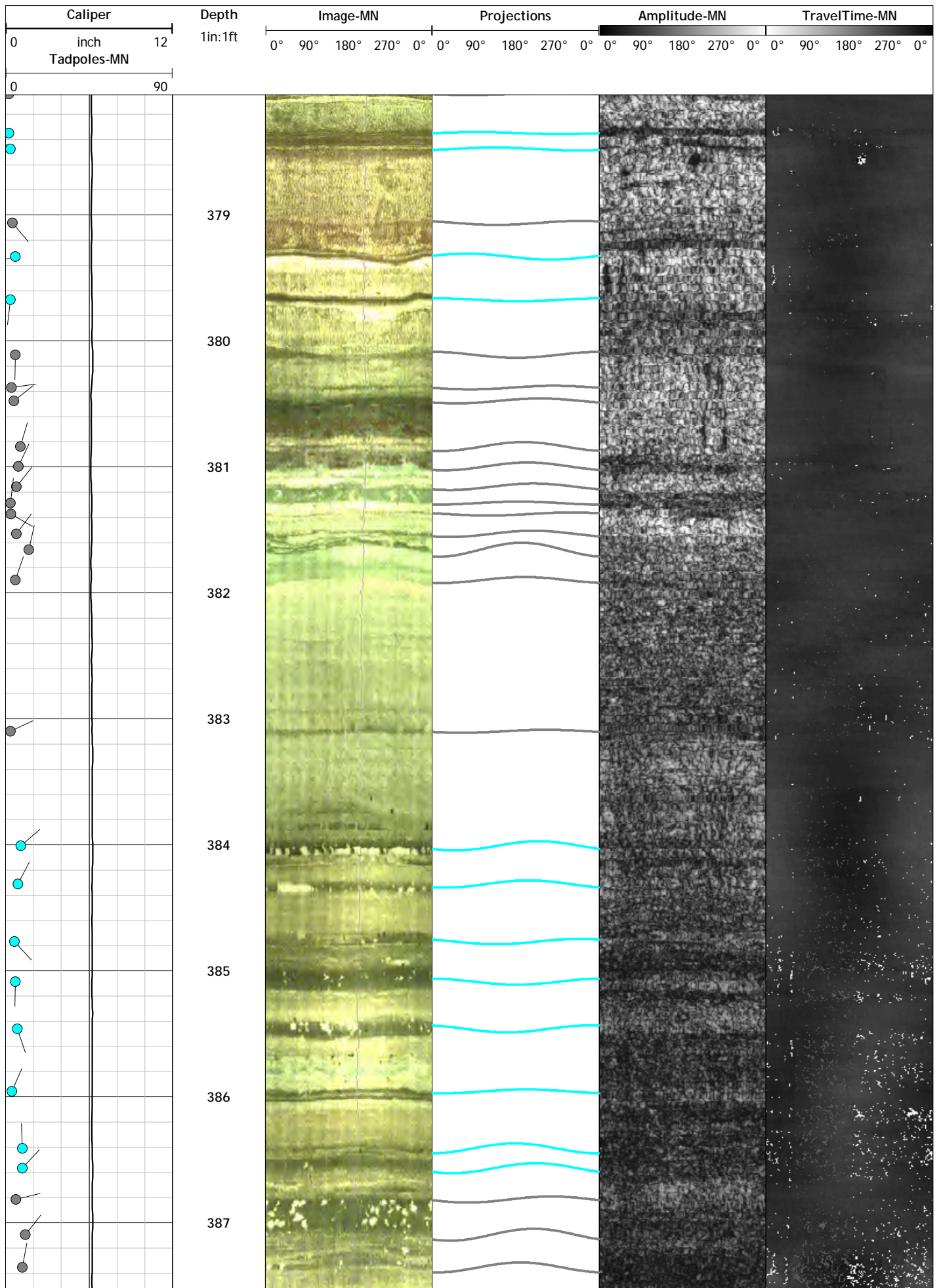


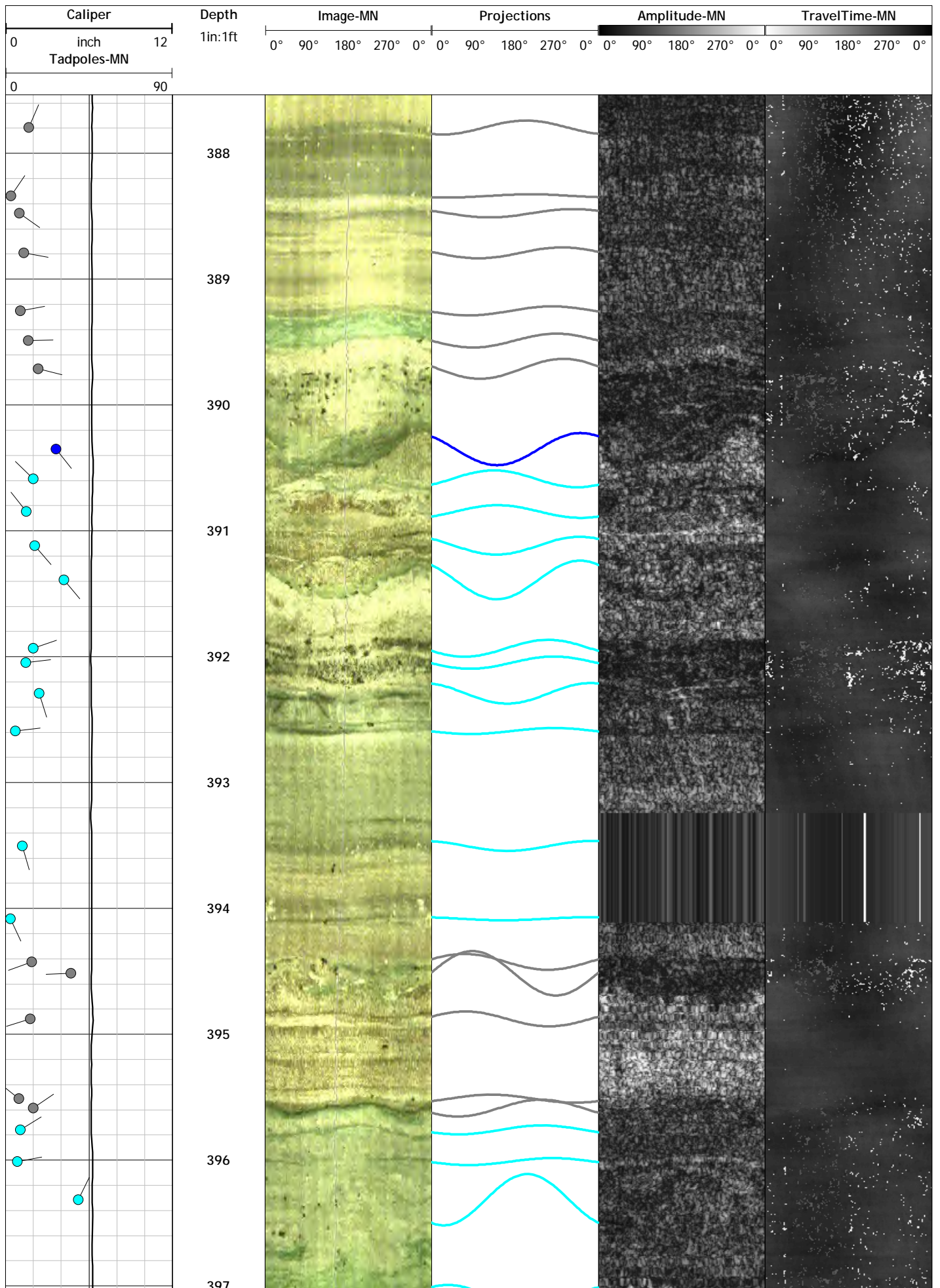


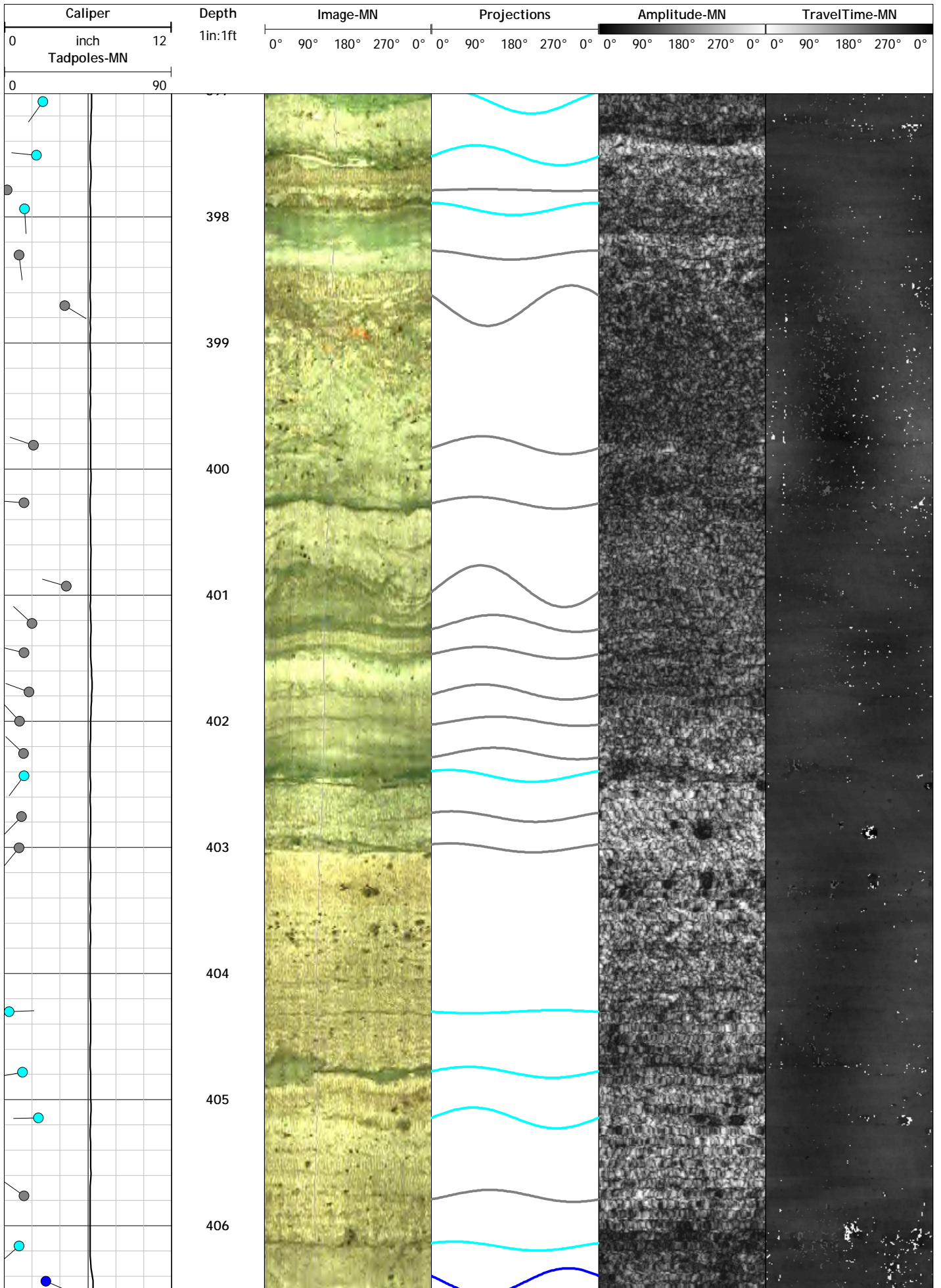


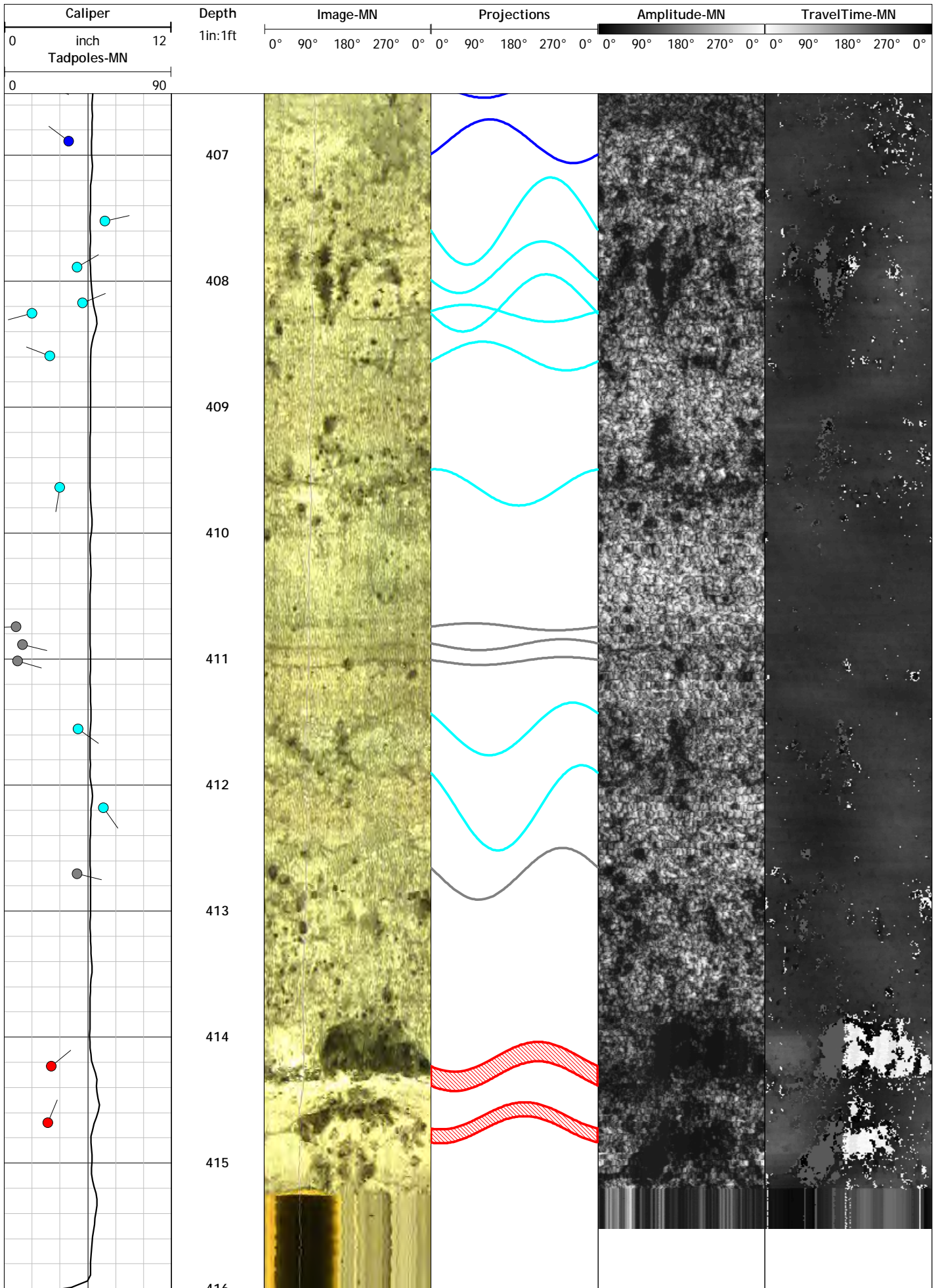






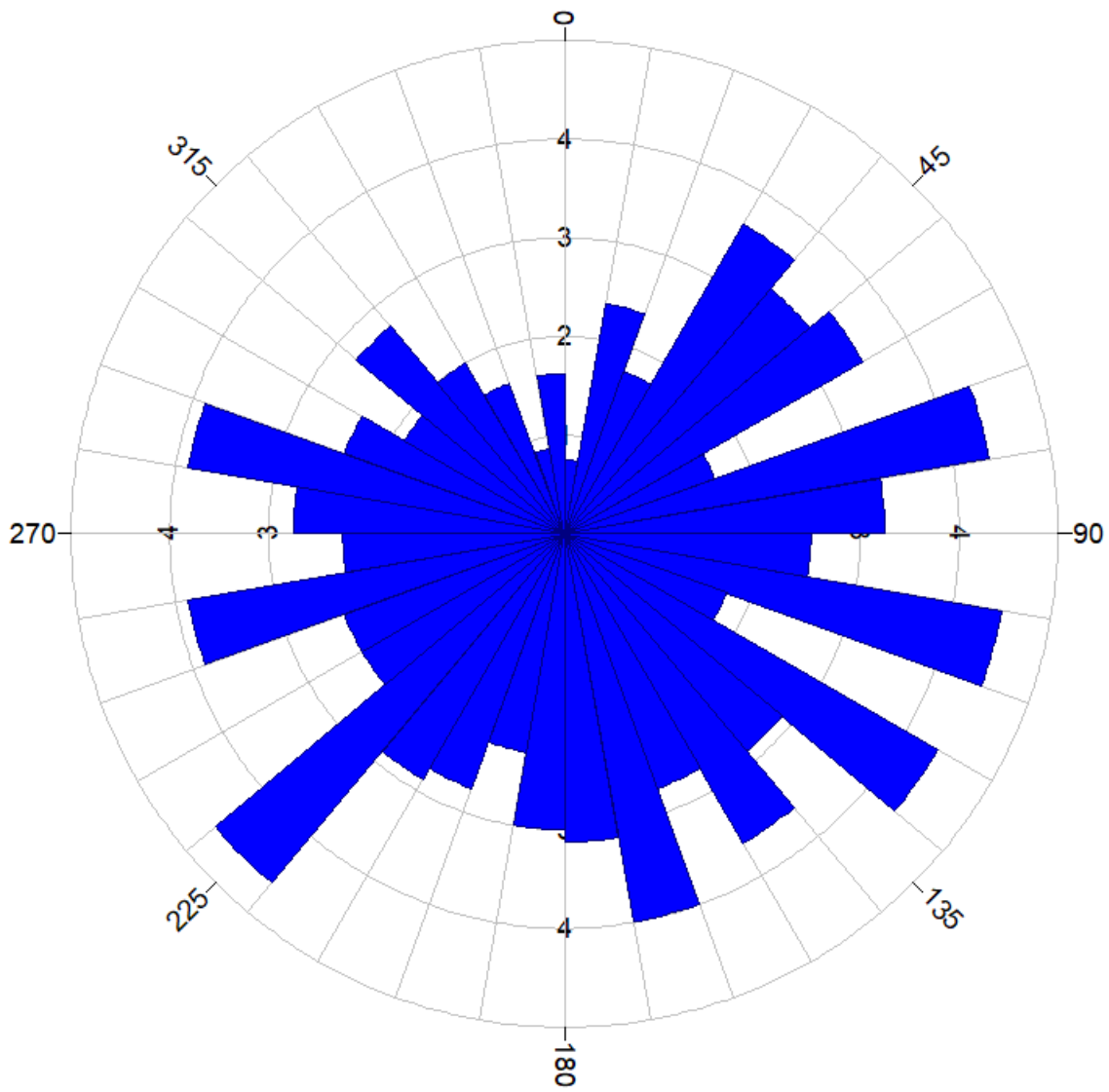






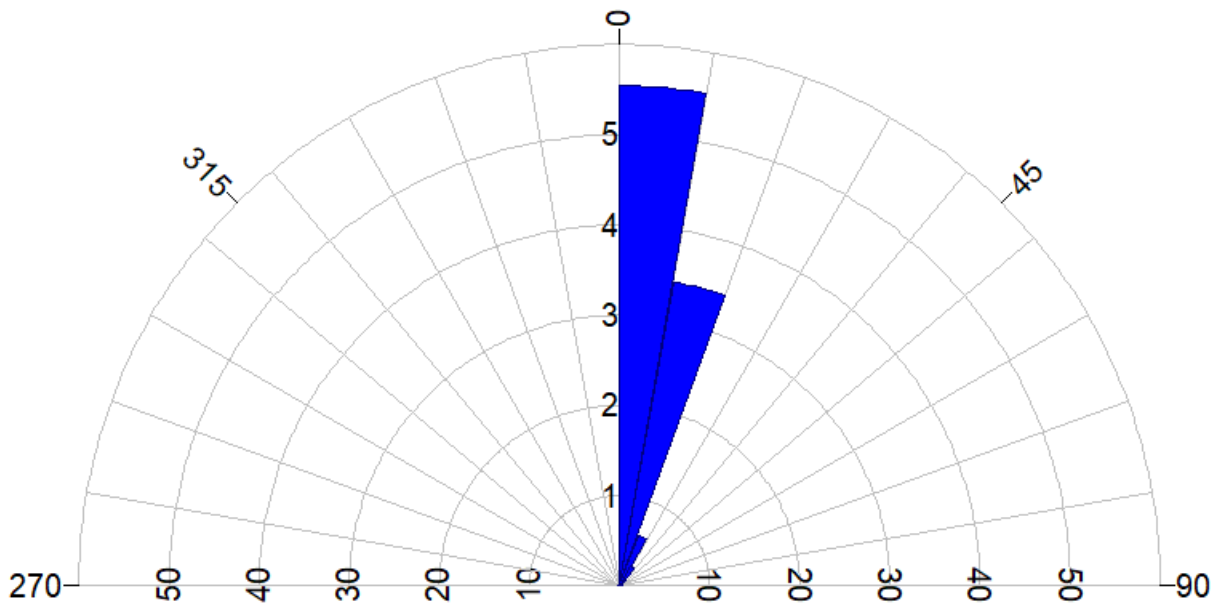
Caliper		Depth 1in:1ft	Image-MN				Projections				Amplitude-MN				TravelTime-MN			
0	12 inch Tadpoles-MN		0°	90°	180°	270°	0°	0°	90°	180°	270°	0°	0°	90°	180°	270°	0°	
0	90	416																
		417																
		418																
		419																
		420																
		421																
		422																
		423																

Figure IRR-01:1 Rose Diagram - Dip Directions
Televiewer Image Features
Arcadis
Marinette
IRR-01
18 May 2022



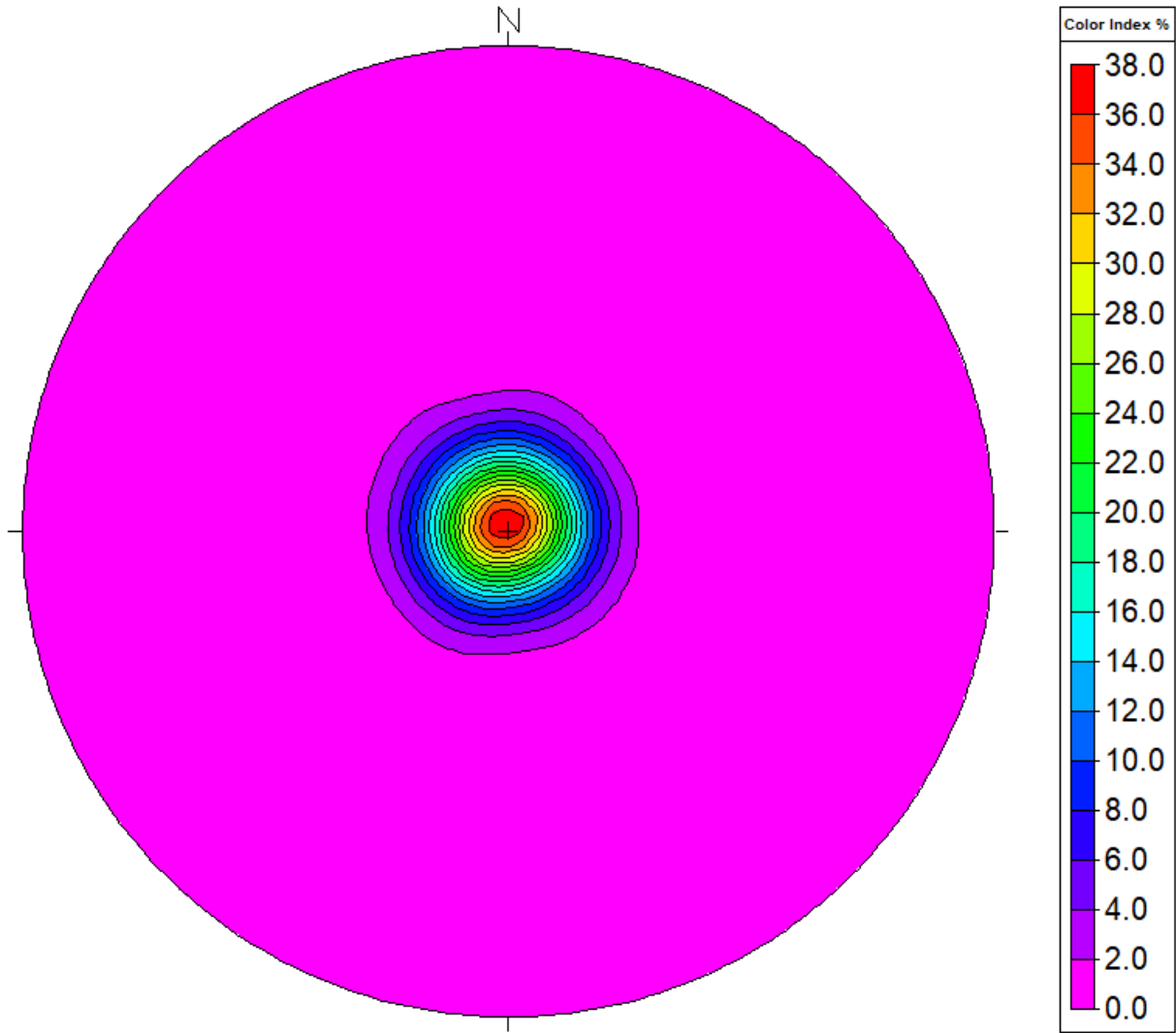
All directions are with respect to Magnetic North.

Figure IRR-01:2 Rose Diagram - Dip Angles
Televiewer Image Features
Arcadis
Marinette
IRR-01
18 May 2022



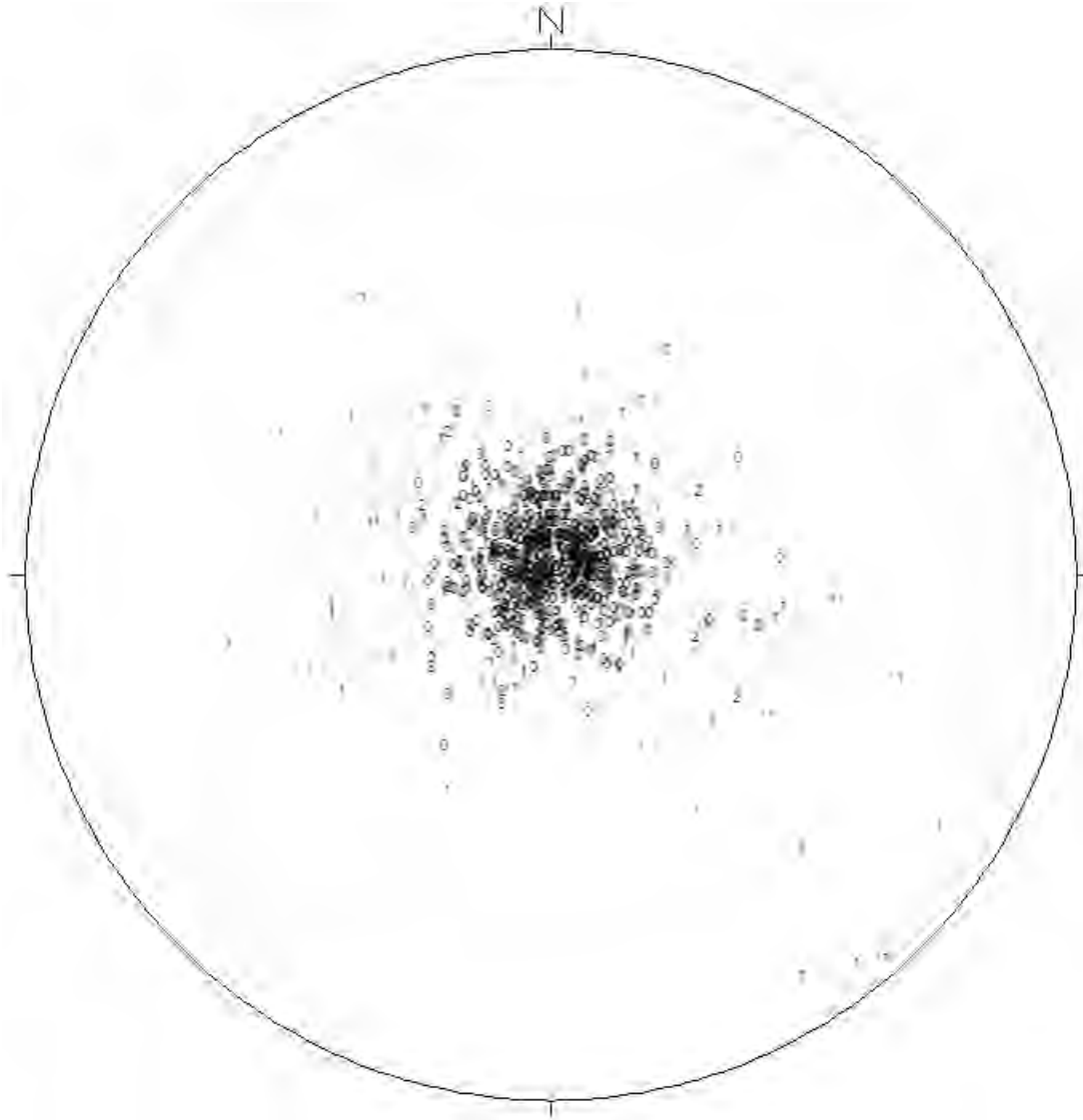
All directions are with respect to Magnetic North.

Figure IRR-01:3 Stereonet Diagram - Schmidt Projection
Televiewer Image Features
Arcadis
Marinette
IRR-01
18 May 2022



All directions are with respect to Magnetic North.

Figure IRR-01:4 Stereonet Diagram - Schmidt Projection
Televiewer Image Features
Arcadis
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All directions are with respect to Magnetic North.



Table IRR-01:1 Orientation Summary Table
TelevIEWER Image Features
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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
1	14.06	46.1	103	0	0	0
2	14.39	47.2	190	5	0	0
3	14.47	47.5	227	8	0	0
4	14.79	48.5	154	11	0	0
5	14.93	49.0	120	15	0	0
6	15.19	49.9	134	20	0	0
7	15.61	51.2	148	7	0	0
8	16.08	52.8	138	21	0	0
9	16.50	54.1	146	21	0	0
10	18.20	59.7	304	77	0	1
11	18.32	60.1	323	84	0	1
12	20.12	66.0	329	80	0	1
13	21.33	70.0	180	0	0	0
14	22.14	72.7	320	87	0	1
15	22.72	74.5	247	6	0	0
16	22.92	75.2	324	11	0	0
17	23.28	76.4	207	38	0	0
18	24.98	82.0	103	14	0	0
19	25.33	83.1	123	11	0	0
20	25.58	83.9	79	12	0	0
21	27.05	88.8	258	3	0	2
22	27.38	89.8	157	5	0	0
23	28.68	94.1	161	12	0	0
24	28.80	94.5	165	10	0	0
25	29.39	96.4	339	14	0	1
26	29.78	97.7	255	5	0	0
27	30.04	98.6	146	5	0	0
28	30.12	98.8	142	10	0	0
29	30.28	99.3	86	8	0	0
30	30.37	99.6	266	6	0	0
31	30.46	100.0	71	6	0	0
32	30.61	100.4	78	10	0	0
33	30.72	100.8	157	5	0	0
34	30.83	101.1	43	10	0	0
35	31.02	101.8	183	18	0	0
36	31.33	102.8	285	13	0	0
37	31.40	103.0	182	4	0	0

All directions are with respect to Magnetic North.



Table IRR-01:1 Orientation Summary Table
TelevIEWER Image Features
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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
38	31.45	103.2	221	5	0	1
39	31.51	103.4	144	5	0	1
40	31.57	103.6	229	7	0	0
41	31.62	103.8	281	7	0	0
42	32.14	105.5	109	10	0	0
43	32.22	105.7	58	4	0	0
44	32.71	107.3	133	17	0	0
45	32.76	107.5	145	8	0	1
46	32.92	108.0	216	3	0	0
47	32.95	108.1	162	4	0	0
48	33.04	108.4	200	12	0	0
49	33.27	109.2	171	12	0	2
50	33.35	109.4	30	6	0	0
51	33.70	110.6	273	13	0	0
52	34.06	111.7	118	7	0	2
53	34.24	112.3	30	12	0	0
54	34.45	113.0	73	5	0	0
55	34.61	113.6	41	7	0	0
56	34.79	114.1	128	5	0	2
57	34.88	114.4	136	4	0	1
58	34.93	114.6	142	6	0	2
59	35.15	115.3	132	16	0	0
60	35.21	115.5	105	9	0	0
61	35.30	115.8	144	11	0	0
62	35.38	116.1	155	12	0	0
63	35.43	116.2	335	7	0	0
64	35.46	116.3	22	8	0	0
65	35.51	116.5	258	4	0	0
66	35.63	116.9	143	5	0	0
67	35.69	117.1	199	13	0	0
68	35.81	117.5	160	5	0	0
69	35.89	117.7	270	5	0	0
70	35.95	117.9	223	11	0	0
71	36.03	118.2	53	12	0	0
72	36.10	118.5	70	9	0	0
73	36.17	118.7	71	7	0	1
74	36.22	118.8	123	9	0	0

All directions are with respect to Magnetic North.



Table IRR-01:1 Orientation Summary Table
TelevIEWer Image Features
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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
75	36.28	119.0	109	11	0	0
76	36.37	119.3	107	15	0	0
77	36.46	119.6	127	18	0	0
78	36.55	119.9	108	18	0	0
79	36.95	121.2	287	9	0	1
80	37.60	123.4	39	11	0	1
81	37.71	123.7	26	5	0	1
82	37.90	124.4	62	3	0	1
83	37.96	124.5	80	6	0	1
84	38.07	124.9	128	6	0	1
85	38.24	125.5	164	4	0	1
86	38.49	126.3	163	5	0	2
87	38.61	126.7	148	6	0	2
88	38.75	127.1	262	15	0	0
89	38.83	127.4	14	8	0	0
90	38.88	127.6	37	10	0	0
91	39.02	128.0	49	11	0	0
92	39.11	128.3	135	9	0	0
93	39.26	128.8	63	5	0	0
94	39.29	128.9	171	7	0	0
95	39.32	129.0	159	5	0	0
96	39.53	129.7	154	6	0	0
97	39.58	129.8	229	6	0	0
98	39.64	130.0	43	5	0	0
99	39.77	130.5	188	12	0	0
100	39.89	130.9	188	13	0	0
101	40.01	131.3	203	5	0	0
102	40.08	131.5	265	7	0	0
103	40.12	131.6	249	6	0	0
104	40.25	132.0	234	3	0	0
105	40.35	132.4	45	15	0	0
106	40.41	132.6	35	7	0	0
107	40.46	132.8	52	11	0	0
108	40.54	133.0	228	8	0	0
109	40.60	133.2	222	6	0	0
110	40.70	133.5	213	12	0	0
111	40.89	134.1	170	8	0	0

All directions are with respect to Magnetic North.



Table IRR-01:1 Orientation Summary Table
TelevIEWER Image Features
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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
112	41.00	134.5	120	11	0	0
113	41.08	134.8	44	4	0	0
114	41.19	135.2	169	11	0	0
115	41.31	135.5	239	10	0	0
116	41.46	136.0	273	12	0	0
117	41.72	136.9	9	7	0	0
118	41.79	137.1	179	7	0	0
119	41.88	137.4	100	17	0	0
120	41.96	137.7	107	5	0	0
121	42.10	138.1	64	10	0	0
122	42.24	138.6	139	9	0	0
123	42.56	139.6	159	12	0	0
124	42.63	139.9	120	10	0	0
125	42.68	140.0	279	0	0	0
126	42.71	140.1	153	13	0	0
127	42.76	140.3	322	2	0	0
128	42.81	140.4	138	7	0	0
129	42.85	140.6	215	8	0	0
130	43.23	141.8	159	7	0	0
131	43.34	142.2	231	6	0	0
132	43.49	142.7	163	5	0	0
133	43.53	142.8	131	6	0	0
134	43.63	143.1	179	10	0	0
135	43.68	143.3	177	14	0	0
136	43.77	143.6	51	3	0	0
137	43.91	144.1	213	0	0	0
138	43.96	144.2	135	10	0	0
139	44.11	144.7	271	5	0	0
140	44.19	145.0	23	21	0	0
141	44.23	145.1	259	5	0	0
142	44.28	145.3	216	5	0	0
143	44.43	145.8	108	7	0	0
144	44.63	146.4	313	7	0	0
145	44.79	146.9	102	3	0	0
146	44.92	147.4	44	13	0	0
147	45.01	147.7	17	4	0	0
148	45.06	147.9	327	13	0	0

All directions are with respect to Magnetic North.



Table IRR-01:1 Orientation Summary Table
TelevIEWer Image Features
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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
149	45.14	148.1	237	15	0	0
150	45.27	148.5	274	8	0	0
151	45.54	149.4	185	3	0	1
152	45.86	150.5	321	5	0	0
153	46.04	151.1	285	10	0	0
154	46.13	151.4	227	10	0	0
155	46.19	151.5	229	10	0	0
156	46.27	151.8	218	5	0	0
157	46.36	152.1	233	11	0	0
158	46.64	153.0	286	5	0	1
159	46.70	153.2	17	17	0	1
160	46.73	153.3	284	6	0	1
161	47.18	154.8	248	5	0	0
162	47.24	155.0	284	5	0	0
163	47.47	155.8	71	9	0	0
164	47.62	156.2	289	3	0	0
165	47.67	156.4	109	8	0	0
166	47.84	157.0	83	7	0	0
167	47.91	157.2	102	8	0	0
168	47.97	157.4	128	6	0	0
169	48.02	157.6	105	23	0	0
170	48.10	157.8	90	9	0	0
171	48.15	158.0	311	3	0	0
172	48.21	158.2	57	9	0	0
173	48.25	158.3	321	4	0	0
174	48.30	158.5	192	6	0	0
175	48.34	158.6	172	7	0	0
176	48.40	158.8	150	9	0	0
177	48.47	159.0	229	14	0	0
178	48.61	159.5	107	9	0	0
179	48.69	159.7	45	7	0	0
180	48.77	160.0	184	5	0	0
181	48.85	160.3	286	5	0	0
182	48.92	160.5	54	24	0	0
183	48.98	160.7	227	7	0	0
184	49.01	160.8	203	7	0	0
185	49.12	161.1	111	5	0	0

All directions are with respect to Magnetic North.



Table IRR-01:1 Orientation Summary Table
TelevIEWER Image Features
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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
186	49.17	161.3	271	4	0	0
187	49.22	161.5	270	8	0	0
188	49.31	161.8	271	0	0	0
189	49.35	161.9	142	3	0	0
190	49.40	162.1	236	4	0	0
191	49.44	162.2	56	5	0	0
192	49.48	162.3	128	7	0	0
193	49.53	162.5	146	17	0	0
194	49.59	162.7	312	0	0	0
195	49.65	162.9	325	5	0	0
196	49.71	163.1	258	6	0	0
197	49.78	163.3	56	7	0	0
198	49.87	163.6	209	5	0	0
199	49.93	163.8	298	5	0	0
200	49.99	164.0	188	5	0	0
201	50.02	164.1	167	5	0	0
202	50.13	164.5	223	6	0	0
203	50.20	164.7	350	2	0	0
204	50.27	164.9	35	5	0	0
205	50.31	165.1	49	5	0	0
206	50.35	165.2	73	9	0	0
207	50.43	165.5	161	7	0	0
208	50.50	165.7	34	16	0	0
209	50.57	165.9	220	5	0	0
210	50.61	166.1	265	6	0	0
211	50.66	166.2	227	4	0	0
212	50.79	166.6	282	8	0	0
213	50.84	166.8	307	9	0	0
214	50.89	167.0	309	6	0	0
215	50.98	167.3	99	3	0	2
216	51.08	167.6	348	5	0	0
217	51.19	168.0	135	1	0	0
218	51.27	168.2	171	8	0	0
219	51.37	168.6	56	6	0	0
220	51.49	168.9	232	11	0	0
221	51.59	169.3	201	11	0	0
222	51.63	169.4	229	10	0	0

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Table IRR-01:1 Orientation Summary Table
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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
223	51.98	170.6	134	5	0	0
224	52.06	170.8	32	10	0	0
225	52.20	171.3	209	6	0	0
226	52.26	171.5	255	8	0	0
227	52.32	171.7	164	5	0	0
228	52.36	171.8	154	17	0	0
229	52.44	172.1	176	15	0	0
230	52.49	172.2	160	12	0	0
231	52.55	172.4	190	9	0	0
232	52.65	172.7	146	4	0	0
233	52.72	173.0	282	2	0	0
234	52.81	173.3	42	8	0	0
235	52.94	173.7	54	5	0	0
236	53.03	174.0	160	7	0	0
237	53.11	174.3	189	14	0	0
238	53.17	174.4	209	13	0	0
239	53.92	176.9	14	10	0	0
240	54.11	177.5	15	11	0	0
241	54.25	178.0	45	7	0	0
242	54.50	178.8	302	3	0	0
243	54.84	179.9	260	13	0	0
244	55.00	180.5	109	2	0	0
245	55.09	180.7	35	2	0	0
246	55.23	181.2	183	12	0	0
247	55.32	181.5	127	9	0	0
248	55.38	181.7	100	12	0	0
249	55.48	182.0	79	5	0	0
250	55.73	182.8	171	13	0	0
251	55.94	183.5	229	5	0	0
252	56.30	184.7	319	6	0	0
253	56.44	185.2	120	2	36	3
254	56.60	185.7	244	8	0	0
255	56.73	186.1	279	4	0	0
256	56.76	186.2	226	4	0	0
257	56.88	186.6	176	10	0	0
258	57.22	187.7	178	8	0	0
259	57.36	188.2	219	2	0	0

All directions are with respect to Magnetic North.



Table IRR-01:1 Orientation Summary Table
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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
260	57.50	188.7	210	11	0	0
261	57.73	189.4	223	13	0	0
262	58.33	191.4	186	3	0	1
263	58.55	192.1	271	7	0	0
264	58.83	193.0	266	5	0	0
265	59.00	193.6	285	13	0	0
266	59.04	193.7	255	6	0	0
267	59.11	193.9	225	5	0	0
268	59.21	194.3	310	5	0	0
269	59.43	195.0	15	12	0	0
270	59.45	195.1	47	1	0	0
271	59.52	195.3	173	11	0	0
272	59.60	195.6	58	8	0	0
273	59.73	196.0	244	5	0	0
274	59.99	196.8	123	9	0	0
275	60.08	197.1	283	3	0	0
276	60.17	197.4	289	3	0	0
277	60.27	197.7	228	6	0	0
278	60.41	198.2	258	7	0	0
279	60.44	198.3	264	3	0	0
280	60.48	198.4	160	8	0	0
281	60.56	198.7	69	2	0	0
282	60.62	198.9	165	5	0	0
283	60.67	199.1	193	3	0	0
284	60.76	199.3	298	15	0	0
285	60.80	199.5	201	7	0	0
286	60.85	199.7	274	3	0	0
287	60.92	199.9	296	4	0	0
288	60.99	200.1	258	3	0	0
289	61.05	200.3	228	3	0	0
290	61.33	201.2	123	2	0	0
291	61.51	201.8	133	6	0	0
292	61.69	202.4	294	1	0	0
293	61.83	202.8	338	4	0	0
294	61.90	203.1	201	5	0	0
295	62.06	203.6	70	3	0	0
296	62.10	203.7	328	3	0	0

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Table IRR-01:1 Orientation Summary Table
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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
297	62.16	203.9	144	6	0	0
298	62.28	204.3	96	6	0	0
299	62.40	204.7	98	10	0	0
300	62.47	205.0	142	4	0	0
301	62.54	205.2	100	7	0	0
302	62.66	205.6	229	7	0	0
303	62.76	205.9	218	5	0	1
304	62.82	206.1	218	5	0	1
305	62.90	206.4	242	1	0	1
306	63.09	207.0	209	5	0	0
307	63.15	207.2	317	3	0	0
308	63.46	208.2	198	3	0	0
309	63.49	208.3	261	3	0	0
310	63.55	208.5	0	8	0	0
311	63.65	208.8	75	12	0	0
312	63.83	209.4	311	3	0	0
313	64.04	210.1	228	3	0	0
314	64.19	210.6	40	26	0	0
315	64.30	211.0	258	7	0	0
316	64.35	211.1	245	12	0	0
317	64.48	211.6	231	3	0	0
318	64.68	212.2	255	9	0	0
319	64.81	212.6	250	12	0	0
320	64.89	212.9	287	8	0	0
321	64.96	213.1	73	2	0	0
322	65.25	214.1	214	4	0	0
323	65.34	214.4	220	2	0	0
324	65.41	214.6	109	5	0	0
325	65.50	214.9	58	4	0	0
326	65.54	215.0	79	12	0	0
327	65.74	215.7	56	3	0	0
328	65.89	216.2	137	6	0	0
329	66.13	217.0	88	4	0	0
330	66.17	217.1	150	5	0	0
331	66.31	217.6	71	3	0	0
332	66.78	219.1	133	11	0	0
333	66.98	219.8	283	6	0	0

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Table IRR-01:1 Orientation Summary Table
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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
334	67.07	220.1	293	3	0	0
335	67.54	221.6	319	60	0	0
336	67.67	222.0	238	9	118	3
337	68.00	223.1	187	8	0	0
338	68.46	224.6	35	10	0	1
339	68.59	225.0	118	14	0	1
340	68.66	225.3	146	16	0	1
341	68.78	225.6	164	10	0	1
342	68.96	226.2	154	4	0	1
343	69.30	227.4	145	3	0	0
344	69.62	228.4	141	5	0	1
345	69.74	228.8	188	8	0	1
346	69.80	229.0	149	8	0	1
347	69.86	229.2	110	22	0	1
348	69.97	229.6	171	7	0	1
349	70.19	230.3	123	18	0	2
350	70.27	230.5	94	12	0	1
351	70.42	231.0	191	8	0	2
352	70.50	231.3	299	6	0	2
353	70.61	231.7	256	10	0	2
354	70.73	232.1	214	6	0	1
355	70.85	232.5	129	9	0	1
356	71.03	233.0	78	36	0	1
357	71.14	233.4	86	27	0	1
358	71.24	233.7	79	17	0	2
359	71.29	233.9	128	14	0	1
360	71.52	234.6	91	19	0	0
361	71.71	235.3	120	13	0	0
362	71.82	235.6	158	20	0	0
363	71.92	236.0	142	18	0	0
364	72.05	236.4	73	12	0	0
365	72.12	236.6	33	6	0	0
366	72.16	236.8	114	1	0	0
367	72.27	237.1	354	11	0	0
368	72.29	237.2	157	27	0	0
369	72.37	237.4	145	19	0	0
370	72.61	238.2	84	20	0	0

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Table IRR-01:1 Orientation Summary Table
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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
371	72.72	238.6	73	20	0	0
372	72.78	238.8	75	15	0	0
373	72.88	239.1	81	14	0	0
374	73.23	240.3	268	17	0	0
375	73.40	240.8	311	12	0	0
376	73.51	241.2	40	12	0	0
377	73.77	242.0	285	30	0	0
378	73.87	242.4	116	5	0	0
379	74.21	243.5	127	5	0	0
380	74.42	244.2	243	14	0	2
381	74.48	244.4	217	14	0	1
382	74.64	244.9	49	11	0	2
383	74.74	245.2	50	10	0	1
384	74.83	245.5	50	10	0	0
385	74.96	245.9	357	9	0	2
386	75.00	246.1	34	12	0	1
387	75.09	246.4	357	9	0	2
388	75.25	246.9	221	4	0	2
389	75.32	247.1	126	4	0	1
390	75.68	248.3	256	3	0	1
391	75.78	248.6	343	4	0	0
392	75.97	249.2	30	5	0	0
393	76.16	249.9	288	58	0	1
394	76.16	249.9	75	7	0	0
395	76.41	250.7	274	15	0	0
396	76.52	251.0	257	26	0	1
397	76.63	251.4	359	9	0	1
398	76.71	251.7	358	10	0	0
399	76.77	251.9	353	9	0	0
400	76.96	252.5	55	16	0	0
401	77.17	253.2	195	16	0	0
402	77.31	253.7	13	10	0	0
403	77.45	254.1	206	8	0	0
404	77.62	254.7	333	16	0	0
405	77.67	254.8	8	5	0	0
406	77.73	255.0	157	16	0	0
407	77.93	255.7	195	17	0	0

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Table IRR-01:1 Orientation Summary Table
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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
408	78.04	256.1	186	5	0	0
409	78.34	257.0	132	12	0	1
410	78.67	258.1	284	3	0	0
411	79.00	259.2	280	8	0	0
412	79.15	259.7	106	10	0	0
413	79.25	260.0	87	5	0	0
414	79.32	260.2	116	15	0	0
415	79.35	260.3	115	13	0	0
416	79.45	260.7	101	10	0	0
417	79.80	261.8	245	4	0	1
418	79.93	262.2	197	6	0	1
419	80.01	262.5	203	26	0	1
420	80.38	263.7	95	12	0	1
421	80.52	264.2	104	7	0	0
422	80.63	264.5	129	5	0	0
423	80.69	264.7	323	5	0	0
424	80.76	265.0	75	6	0	0
425	80.82	265.2	113	12	0	1
426	80.90	265.4	162	8	0	1
427	81.01	265.8	97	6	0	1
428	81.05	265.9	49	4	0	0
429	81.39	267.0	352	18	0	1
430	81.49	267.4	335	14	0	1
431	81.73	268.1	242	3	0	1
432	81.97	268.9	277	5	0	0
433	82.06	269.2	37	8	0	1
434	82.21	269.7	156	4	0	1
435	82.34	270.1	330	44	0	1
436	82.58	270.9	54	4	0	1
437	82.82	271.7	95	5	0	2
438	82.93	272.1	99	9	0	1
439	83.29	273.3	192	20	0	0
440	83.65	274.4	77	18	0	1
441	83.82	275.0	138	27	0	1
442	84.00	275.6	116	49	0	1
443	84.05	275.8	277	44	0	1
444	84.14	276.1	302	14	0	1

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Table IRR-01:1 Orientation Summary Table
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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
445	84.24	276.4	36	7	0	1
446	84.38	276.8	225	2	0	0
447	84.44	277.0	359	7	0	1
448	84.48	277.2	332	9	0	0
449	84.61	277.6	353	11	0	1
450	84.64	277.7	3	10	0	1
451	84.69	277.9	173	8	0	0
452	84.76	278.1	192	9	0	1
453	84.78	278.2	179	17	0	0
454	84.89	278.5	213	14	0	1
455	84.96	278.7	295	9	0	0
456	85.06	279.1	294	12	0	1
457	85.10	279.2	284	5	0	1
458	85.17	279.4	258	11	0	0
459	85.21	279.6	255	10	0	0
460	85.26	279.7	248	11	0	0
461	85.31	279.9	258	6	0	0
462	85.53	280.6	343	13	0	0
463	85.63	280.9	292	5	0	0
464	85.69	281.2	26	2	0	2
465	85.74	281.3	52	2	0	0
466	85.78	281.4	78	6	0	1
467	85.95	282.0	82	3	0	0
468	85.99	282.1	95	12	0	0
469	86.07	282.4	140	8	0	0
470	86.14	282.6	10	12	0	1
471	86.25	283.0	327	8	0	1
472	86.38	283.4	239	18	0	1
473	86.54	283.9	347	14	0	0
474	86.60	284.1	316	24	0	1
475	86.72	284.5	335	31	0	1
476	86.81	284.8	354	13	0	0
477	86.82	284.9	162	14	0	1
478	87.45	286.9	211	5	0	0
479	87.84	288.2	153	9	0	0
480	88.05	288.9	176	20	0	0
481	88.29	289.7	170	11	0	0

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Table IRR-01:1 Orientation Summary Table
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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
482	88.79	291.3	297	24	0	2
483	88.86	291.5	303	13	0	0
484	88.93	291.8	289	25	0	0
485	89.00	292.0	291	11	0	0
486	89.10	292.3	196	11	0	0
487	89.39	293.3	211	6	0	0
488	89.44	293.4	126	4	0	0
489	89.56	293.8	344	3	0	0
490	89.62	294.0	30	5	0	0
491	89.78	294.5	32	22	0	1
492	89.85	294.8	35	18	0	1
493	89.95	295.1	358	7	0	1
494	90.11	295.6	92	13	0	1
495	90.68	297.5	25	16	0	1
496	90.72	297.7	29	14	0	1
497	90.83	298.0	58	11	0	2
498	90.99	298.5	242	25	0	2
499	91.11	298.9	265	5	0	0
500	91.20	299.2	84	12	0	1
501	91.38	299.8	128	17	0	0
502	91.57	300.4	169	15	0	0
503	91.68	300.8	96	10	0	0
504	91.77	301.1	118	15	0	0
505	91.92	301.6	168	14	0	1
506	92.24	302.6	123	8	0	1
507	92.33	302.9	254	21	0	1
508	92.40	303.2	134	18	0	1
509	92.54	303.6	103	8	0	1
510	92.63	303.9	64	7	0	0
511	92.66	304.0	102	8	0	1
512	92.73	304.2	128	13	0	1
513	92.80	304.5	134	10	0	1
514	92.88	304.7	119	8	0	1
515	92.96	305.0	170	14	0	0
516	93.01	305.2	161	13	0	1
517	93.12	305.5	269	12	0	0
518	93.18	305.7	215	5	0	0

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Table IRR-01:1 Orientation Summary Table
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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
519	93.25	305.9	195	5	0	0
520	93.35	306.3	202	12	0	2
521	93.50	306.8	83	24	0	1
522	93.62	307.2	81	36	0	1
523	93.87	308.0	108	26	0	1
524	93.92	308.1	104	29	0	1
525	93.99	308.4	103	30	0	1
526	94.17	309.0	192	13	0	1
527	94.22	309.1	235	11	0	1
528	94.32	309.5	137	21	0	1
529	94.38	309.6	147	29	0	0
530	94.45	309.9	165	11	0	0
531	94.51	310.1	160	6	0	0
532	94.66	310.6	211	16	0	0
533	94.83	311.1	164	11	0	0
534	94.95	311.5	174	15	0	0
535	95.09	312.0	29	20	0	1
536	95.12	312.1	47	9	0	1
537	95.16	312.2	52	5	0	1
538	95.21	312.4	47	9	0	1
539	95.53	313.4	211	4	0	1
540	95.63	313.7	303	12	0	1
541	95.73	314.1	19	20	0	1
542	96.14	315.4	200	18	0	0
543	96.44	316.4	325	5	0	1
544	96.51	316.6	345	12	0	1
545	96.56	316.8	17	3	0	1
546	96.65	317.1	41	5	0	1
547	96.67	317.2	18	5	0	1
548	96.71	317.3	337	10	0	1
549	96.74	317.4	337	14	0	1
550	96.88	317.9	220	5	0	0
551	97.01	318.3	70	5	0	0
552	97.11	318.6	330	5	0	0
553	97.24	319.0	203	21	0	0
554	97.40	319.6	231	11	0	0
555	97.54	320.0	91	5	0	0

All directions are with respect to Magnetic North.



Table IRR-01:1 Orientation Summary Table
TelevIEWER Image Features
Arcadis
Marinette
IRR-01
18 May 2022

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
556	97.66	320.4	243	4	0	0
557	97.78	320.8	15	3	0	0
558	97.98	321.5	348	23	0	0
559	98.10	321.9	334	8	0	0
560	98.26	322.4	91	4	0	0
561	98.30	322.5	86	3	0	0
562	98.36	322.7	232	4	0	0
563	98.64	323.6	230	8	0	0
564	98.73	323.9	113	5	0	1
565	98.84	324.3	89	15	0	0
566	98.93	324.6	100	7	0	0
567	99.00	324.8	58	9	0	0
568	99.06	325.0	78	16	0	0
569	99.13	325.2	82	17	0	0
570	99.21	325.5	31	11	0	0
571	99.32	325.8	19	7	0	0
572	99.59	326.7	88	7	0	0
573	99.69	327.1	13	16	0	0
574	99.80	327.4	333	17	0	0
575	99.83	327.5	286	16	0	1
576	99.87	327.7	247	14	0	0
577	99.96	327.9	271	9	0	1
578	100.06	328.3	158	14	0	0
579	100.45	329.6	77	14	0	1
580	100.55	329.9	226	8	0	1
581	100.59	330.0	197	18	0	0
582	100.65	330.2	189	23	0	1
583	100.79	330.7	327	18	0	0
584	100.96	331.2	17	8	0	0
585	101.06	331.6	258	8	0	0
586	101.18	332.0	46	15	0	0
587	101.34	332.5	239	33	0	0
588	101.39	332.6	311	6	0	0
589	101.47	332.9	265	5	0	0
590	101.58	333.3	186	18	0	0
591	102.03	334.7	297	16	0	0
592	102.10	335.0	305	41	0	1

All directions are with respect to Magnetic North.



Table IRR-01:1 Orientation Summary Table
TelevIEWER Image Features
Arcadis
Marinette
IRR-01
18 May 2022

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
593	102.34	335.8	316	12	0	0
594	102.47	336.2	305	17	0	0
595	102.57	336.5	229	10	0	0
596	102.63	336.7	224	22	0	0
597	102.75	337.1	223	11	0	0
598	102.81	337.3	209	12	0	0
599	102.90	337.6	255	6	0	0
600	102.98	337.9	282	5	0	0
601	103.08	338.2	308	8	0	0
602	103.22	338.7	328	18	0	0
603	103.26	338.8	313	6	0	0
604	103.35	339.1	180	11	0	0
605	103.56	339.8	268	5	0	0
606	103.67	340.1	261	22	0	0
607	103.74	340.4	286	5	0	0
608	103.85	340.7	249	17	0	0
609	103.99	341.2	240	3	0	1
610	104.06	341.4	133	8	0	1
611	104.15	341.7	82	8	0	0
612	104.21	341.9	147	15	0	1
613	104.28	342.1	148	12	0	0
614	104.35	342.4	182	27	0	1
615	104.58	343.1	221	1	0	1
616	104.65	343.3	250	5	0	1
617	104.79	343.8	231	15	0	1
618	104.84	344.0	162	3	0	1
619	104.91	344.2	259	6	0	1
620	104.96	344.4	316	5	0	0
621	105.09	344.8	276	12	0	0
622	105.23	345.2	238	12	0	0
623	105.32	345.5	278	8	0	0
624	105.41	345.8	278	6	0	0
625	105.47	346.0	214	9	0	0
626	105.55	346.3	91	16	0	0
627	105.67	346.7	65	22	0	0
628	105.79	347.1	63	29	0	0
629	105.88	347.4	181	11	0	0

All directions are with respect to Magnetic North.



Table IRR-01:1 Orientation Summary Table
TelevIEWER Image Features
Arcadis
Marinette
IRR-01
18 May 2022

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
630	105.96	347.6	176	17	0	2
631	106.22	348.5	123	5	0	1
632	106.26	348.6	178	7	0	2
633	106.38	349.0	84	7	0	0
634	106.48	349.3	93	4	0	1
635	106.50	349.4	123	13	0	0
636	106.71	350.1	319	16	0	1
637	106.80	350.4	194	15	0	1
638	106.84	350.5	319	18	0	1
639	106.90	350.7	207	29	0	1
640	106.95	350.9	185	40	0	1
641	107.15	351.5	93	15	0	1
642	107.27	352.0	280	36	0	1
643	107.35	352.2	283	35	0	1
644	107.39	352.3	226	17	0	1
645	107.44	352.5	204	20	0	0
646	107.55	352.9	234	14	0	0
647	107.68	353.3	207	15	0	0
648	107.75	353.5	5	10	0	0
649	107.86	353.9	26	12	0	0
650	107.92	354.1	228	4	0	0
651	108.06	354.5	230	12	0	0
652	108.14	354.8	250	4	0	1
653	108.18	354.9	208	10	0	0
654	108.29	355.3	159	6	0	0
655	108.38	355.6	49	0	0	0
656	108.57	356.2	121	25	0	0
657	108.74	356.8	258	14	0	0
658	109.10	357.9	32	33	0	0
659	109.23	358.4	54	10	0	0
660	109.33	358.7	128	9	0	0
661	109.47	359.1	200	11	0	0
662	110.03	361.0	160	7	0	2
663	110.20	361.6	108	6	0	1
664	110.25	361.7	153	6	0	1
665	110.31	361.9	165	4	0	1
666	110.68	363.1	168	5	0	1

All directions are with respect to Magnetic North.



Table IRR-01:1 Orientation Summary Table
TelevIEWER Image Features
Arcadis
Marinette
IRR-01
18 May 2022

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
667	110.90	363.8	248	2	0	1
668	111.00	364.2	194	16	0	0
669	111.12	364.6	222	7	0	0
670	111.21	364.9	257	4	0	0
671	111.31	365.2	304	11	0	1
672	111.48	365.8	69	11	0	0
673	111.70	366.5	53	17	0	0
674	111.75	366.6	34	7	0	0
675	111.82	366.9	179	11	0	0
676	111.98	367.4	247	7	0	0
677	112.02	367.5	291	8	0	0
678	112.08	367.7	77	5	0	0
679	112.13	367.9	290	7	0	0
680	112.35	368.6	245	10	0	1
681	112.44	368.9	314	34	0	1
682	112.68	369.7	308	8	0	0
683	112.80	370.1	282	5	0	0
684	113.07	371.0	42	12	0	2
685	113.21	371.4	294	11	0	1
686	113.34	371.9	262	14	0	1
687	113.51	372.4	76	14	0	1
688	113.57	372.6	93	15	0	2
689	113.76	373.2	82	6	0	1
690	113.81	373.4	31	6	0	1
691	113.89	373.7	65	6	0	1
692	114.03	374.1	73	8	0	1
693	114.07	374.3	50	8	0	1
694	114.11	374.4	36	3	0	1
695	114.17	374.6	44	4	0	0
696	114.22	374.7	32	6	0	0
697	114.32	375.1	36	4	0	0
698	114.39	375.3	68	3	0	0
699	114.45	375.5	99	2	0	0
700	114.48	375.6	102	10	0	0
701	114.51	375.7	104	5	0	0
702	114.60	376.0	128	7	0	0
703	114.66	376.2	128	10	0	0

All directions are with respect to Magnetic North.



Table IRR-01:1 Orientation Summary Table
TelevIEWER Image Features
Arcadis
Marinette
IRR-01
18 May 2022

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
704	114.78	376.6	79	6	0	1
705	114.86	376.8	75	4	0	1
706	114.93	377.1	161	11	0	0
707	114.98	377.2	293	9	0	0
708	115.14	377.8	41	15	0	0
709	115.23	378.0	79	2	0	0
710	115.32	378.4	277	2	0	1
711	115.36	378.5	315	3	0	1
712	115.54	379.1	140	4	0	0
713	115.62	379.3	255	5	0	1
714	115.72	379.7	187	3	0	1
715	115.86	380.1	181	5	0	0
716	115.94	380.4	82	3	0	0
717	115.97	380.5	52	5	0	0
718	116.08	380.8	17	8	0	0
719	116.13	381.0	25	7	0	0
720	116.18	381.2	38	6	0	0
721	116.22	381.3	7	3	0	0
722	116.24	381.4	120	3	0	0
723	116.29	381.5	37	6	0	0
724	116.33	381.7	13	13	0	0
725	116.40	381.9	19	5	0	0
726	116.77	383.1	65	3	0	0
727	117.05	384.0	49	8	0	1
728	117.14	384.3	27	7	0	1
729	117.28	384.8	138	5	0	1
730	117.38	385.1	181	5	0	1
731	117.49	385.5	162	6	0	1
732	117.64	386.0	23	3	0	1
733	117.78	386.4	358	9	0	1
734	117.83	386.6	43	9	0	1
735	117.90	386.8	76	6	0	0
736	117.99	387.1	38	11	0	0
737	118.06	387.4	10	9	0	0
738	118.20	387.8	23	12	0	0
739	118.37	388.3	34	3	0	0
740	118.41	388.5	125	8	0	0

All directions are with respect to Magnetic North.



Table IRR-01:1 Orientation Summary Table
TelevIEWER Image Features
Arcadis
Marinette
IRR-01
18 May 2022

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
741	118.50	388.8	101	10	0	0
742	118.64	389.3	80	8	0	0
743	118.72	389.5	89	12	0	0
744	118.78	389.7	104	18	0	0
745	118.98	390.4	141	27	0	2
746	119.05	390.6	314	15	0	1
747	119.13	390.8	322	11	0	1
748	119.21	391.1	139	16	0	1
749	119.30	391.4	140	32	0	1
750	119.46	391.9	71	15	0	1
751	119.50	392.1	84	11	0	1
752	119.57	392.3	162	18	0	1
753	119.66	392.6	83	5	0	1
754	119.94	393.5	163	9	0	1
755	120.12	394.1	155	3	0	1
756	120.22	394.4	250	14	0	0
757	120.25	394.5	268	35	0	0
758	120.36	394.9	253	13	0	0
759	120.55	395.5	308	7	0	0
760	120.58	395.6	56	15	0	0
761	120.63	395.8	58	8	0	1
762	120.70	396.0	80	6	0	1
763	120.80	396.3	26	39	0	1
764	121.03	397.1	216	21	0	1
765	121.16	397.5	276	17	0	1
766	121.25	397.8	291	2	0	0
767	121.29	397.9	177	11	0	1
768	121.40	398.3	173	8	0	0
769	121.53	398.7	121	33	0	0
770	121.86	399.8	289	16	0	0
771	122.00	400.3	275	11	0	0
772	122.20	400.9	286	33	0	0
773	122.29	401.2	313	15	0	0
774	122.37	401.5	284	11	0	0
775	122.46	401.8	290	13	0	0
776	122.53	402.0	318	8	0	0
777	122.61	402.3	313	10	0	0

All directions are with respect to Magnetic North.



Table IRR-01:1 Orientation Summary Table
Televiewer Image Features
Arcadis
Marinette
IRR-01
18 May 2022

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
778	122.66	402.4	217	11	0	1
779	122.76	402.8	224	9	0	0
780	122.83	403.0	219	8	0	0
781	123.23	404.3	88	3	0	1
782	123.38	404.8	259	10	0	1
783	123.49	405.2	269	18	0	1
784	123.68	405.8	306	11	0	0
785	123.80	406.2	229	8	0	1
786	123.88	406.4	114	23	0	2
787	124.02	406.9	306	35	0	2
788	124.21	407.5	77	54	0	1
789	124.32	407.9	60	39	0	1
790	124.41	408.2	68	42	0	1
791	124.44	408.3	255	15	0	1
792	124.54	408.6	291	25	0	1
793	124.86	409.6	189	30	0	1
794	125.19	410.7	268	6	0	0
795	125.24	410.9	104	10	0	0
796	125.28	411.0	106	7	0	0
797	125.44	411.6	126	40	0	1
798	125.63	412.2	144	53	0	1
799	125.79	412.7	103	39	0	0
800	126.26	414.2	51	25	42	3
801	126.39	414.7	22	23	31	3

All directions are with respect to Magnetic North.

Table IRR-01:2. Summary of Corehole Dynamic Flowmeter Test-Station Results; Arcadis; Marinette, WI; Wellbore: IRR-01

IRR-01					
Depth (feet)	Flow in Borehole During Ambient Testing (GPM)	Ambient Flow Direction in Borehole	Flow in Borehole During Pumping as Measured by CDFM (GPM)	Flow in Borehole During Pumping Normalized to Pumping Rate Max (GPM)	Comments
45.0	0.05	↑	22.30	21.7	Test station just outside casing. 0.05 gpm of ambient upflow is observed, indicating this ambient flow exits the borehole between 45.0 - 44.4 feet (bottom of casing). No change in flow is observed in the pumping data, suggesting the outflow zone was reversed to a "no-flow" zone, however, a small amount of inflow would be difficult to discern with so much background flow (~21.7 gpm) already present.
52.0	0.05	↑	21.50	21.7	No observed change in flow under ambient or pumping conditions between 52.0 - 82.0 feet, based on normalized values during pumping.
82.0	0.05	↑	21.60	21.7	No observed change in flow under ambient or pumping conditions between 82.0 - 120.0 feet, based on normalized values during pumping.
120.0	0.05	↑	22.90	21.7	No observed change in flow under ambient or pumping conditions between 120.0 - 150.0 feet, based on normalized values during pumping.
150.0	0.05	↑	22.20	21.7	No observed change in flow under ambient or pumping conditions between 150.0 - 168.0 feet, based on normalized values during pumping.
168.0	0.05	↑	22.15	21.7	No observed change in flow under ambient or pumping conditions between 168.0 - 202.0 feet, based on normalized values during pumping.
202.0	0.05	↑	23.20	21.7	No observed change in flow under ambient or pumping conditions between 202.0 - 246.5 feet, based on normalized values during pumping.
246.5	0.05	↑	23.00	21.7	0.01 gpm exits the borehole under ambient conditions likely between 246.5 - 267.5 feet, likely through solution openings in the host rock. During pumping, 0.9 gpm enters the borehole.
267.5	x	↑	21.80	20.8	No observed change in flow under ambient or pumping conditions between 267.5 - 289.5 feet, based on normalized values during pumping.
289.5	x	↑	22.60	20.8	No observed change in flow under ambient or pumping conditions between 289.5 - 299.0 feet, based on normalized values during pumping.
299.0	0.06	↑	22.10	20.8	No observed change in flow under ambient or pumping conditions between 299.0 - 330.0 feet, based on normalized values during pumping.
330.0	0.06	↑	22.55	20.8	No observed change in flow under ambient or pumping conditions between 330.0 - 365.0 feet, based on normalized values during pumping.

Table IRR-01:2. Summary of Corehole Dynamic Flowmeter Test-Station Results; Arcadis; Marinette, WI; Wellbore: IRR-01

365.0	0.06	↑	22.21	20.8	No observed change in flow under ambient conditions between 365.0 - 379.5 feet. During pumping, 2.1 gpm enters the borehole at this interval, based on normalized values.
379.5	0.06	↑	20.00	18.7	0.02 gpm exits the borehole under ambient conditions between 379.5 - 409.5 feet, likely through solution openings in the host rock. During pumping, 3.5 gpm enters the borehole.
409.5	0.08	↑	16.26	15.2	0.08 gpm enters the borehole under ambient conditions between 409.5 - 415.5 feet (TD) and migrates upward. During pumping, 15.2 gpm enters the borehole and migrates upward toward the pump inside casing. This represents the dominant inflow zone in the borehole.

Ambient WL (ftbgs) 11.40
 Bottom of casing (ftbgs) 44.4
 Total Depth (TD) (ftbgs) 415.5
 Avg. Extraction Rate (gpm) 21.7
 Observed Drawdown (ft) 3.93
 Specific Capacity (gpm/ft-dd) 5.52

Note: Negative flow is downflow in the borehole. Positive flow is upflow in the borehole.

Additional note: Pumping was conducted at a relatively constant, time-averaged rate of 21.7 gpm. The CDFM flowmeter registered a maximum flow rate of 23.0 gpm. The observed values reported by the CDFM have been normalized to 21.7 gpm maximum registered flow.



borehole geophysics / hydrophysics

Geophysical Summary Plot

COMPANY: Arcadis

PROJECT: Marinette

DATE LOGGED: 20 May 2022

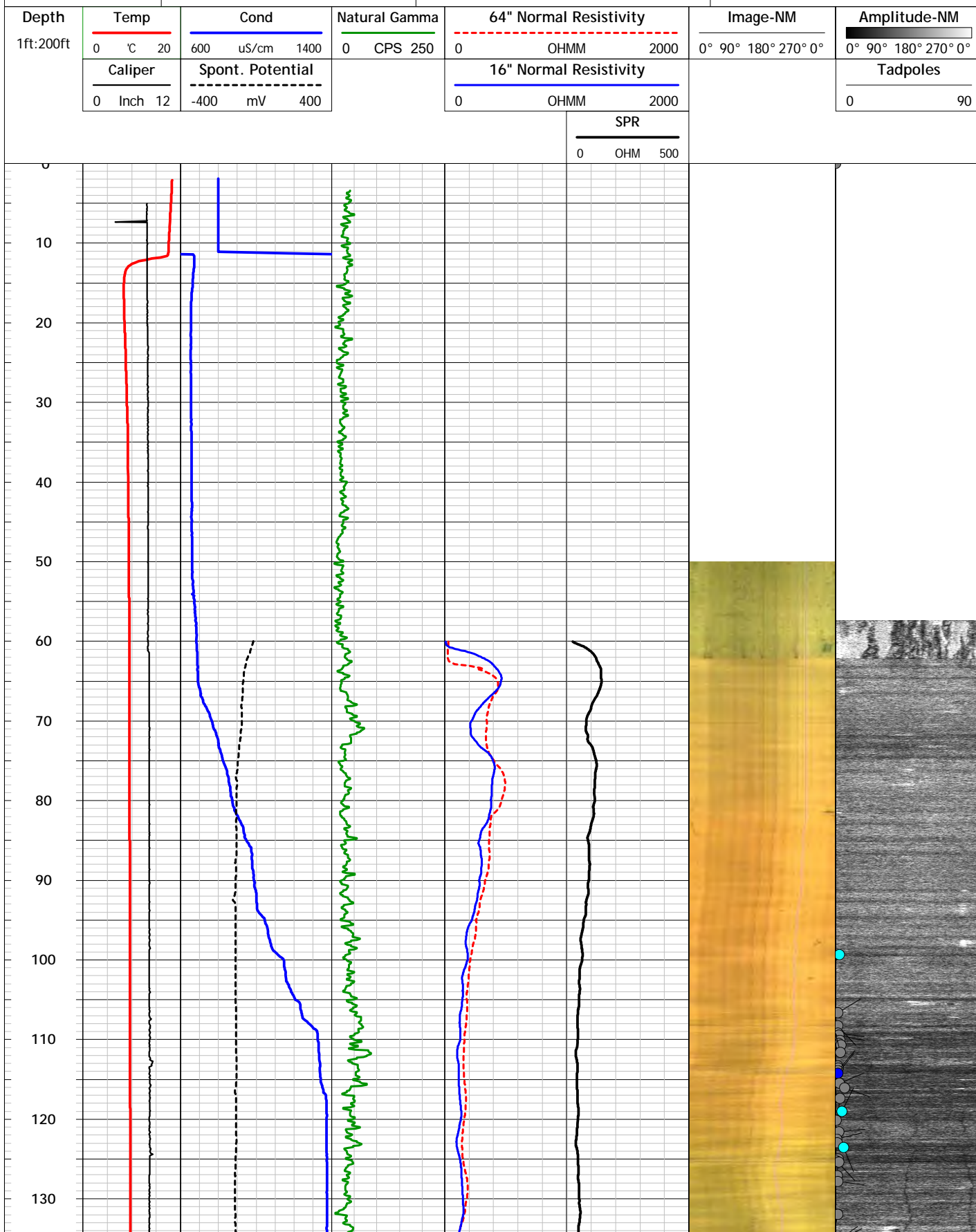
WELL: IRR-02

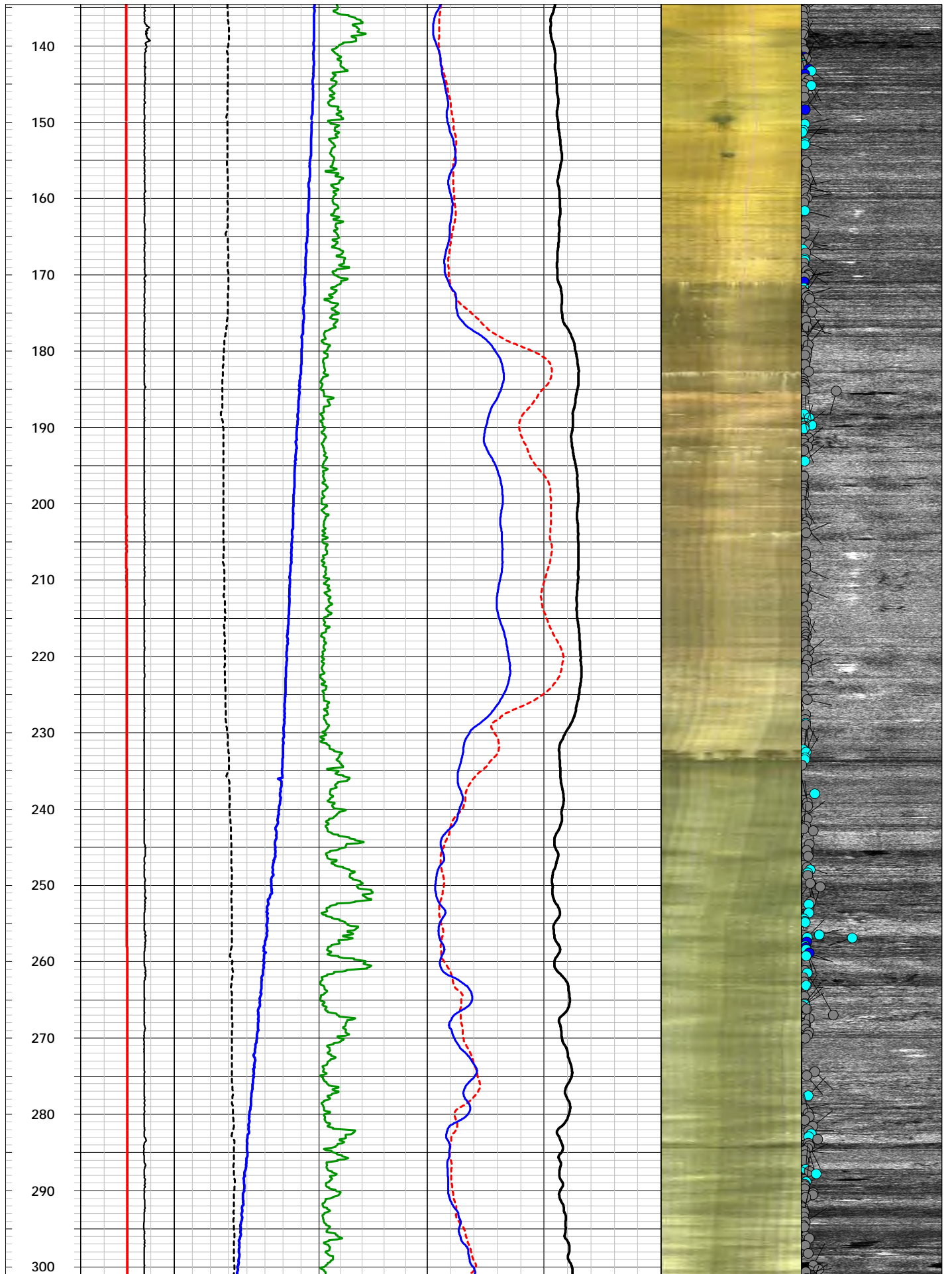
Colog, Inc.

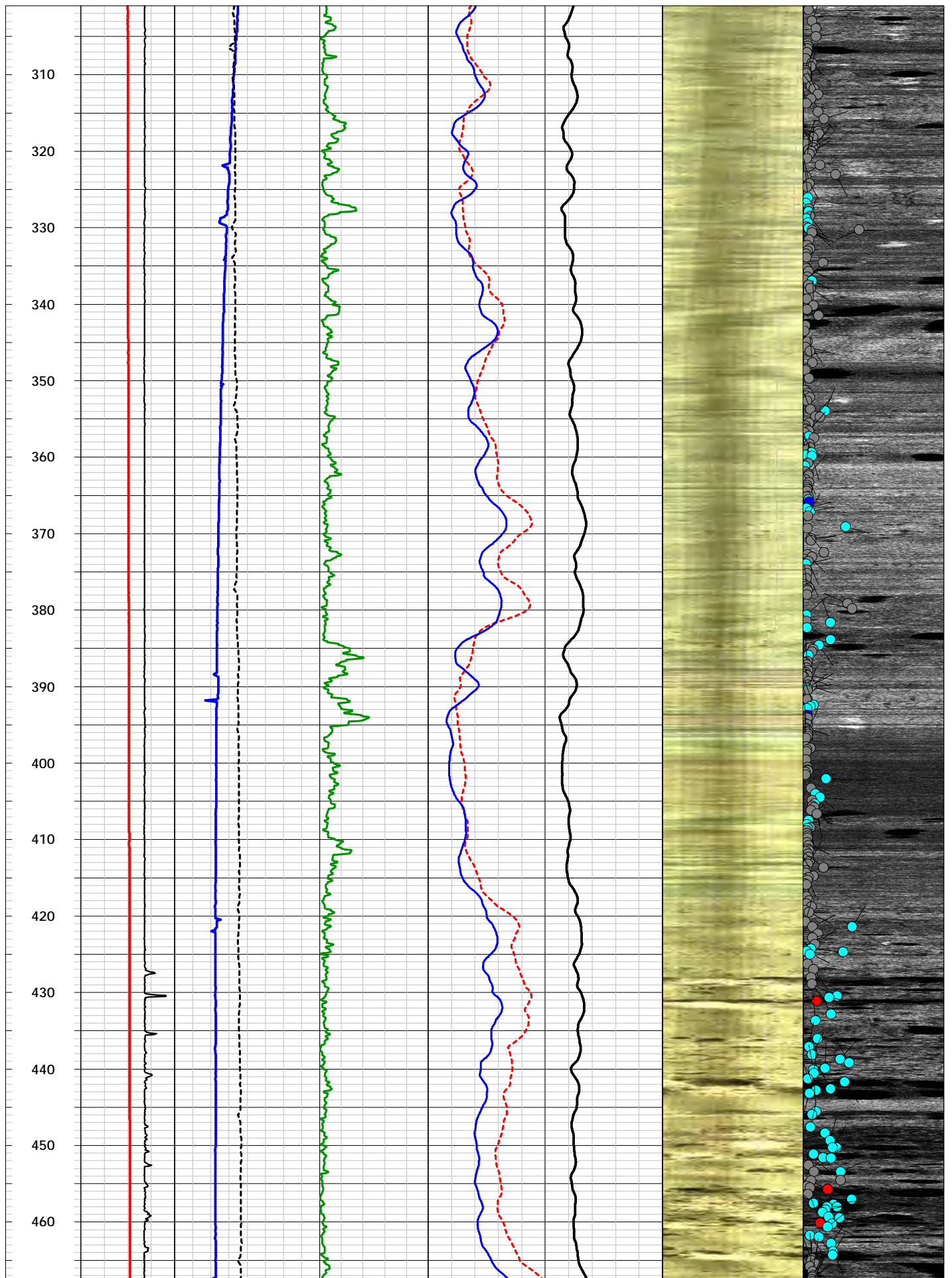
810 Quail St., Suite E, Lakewood, CO 80215

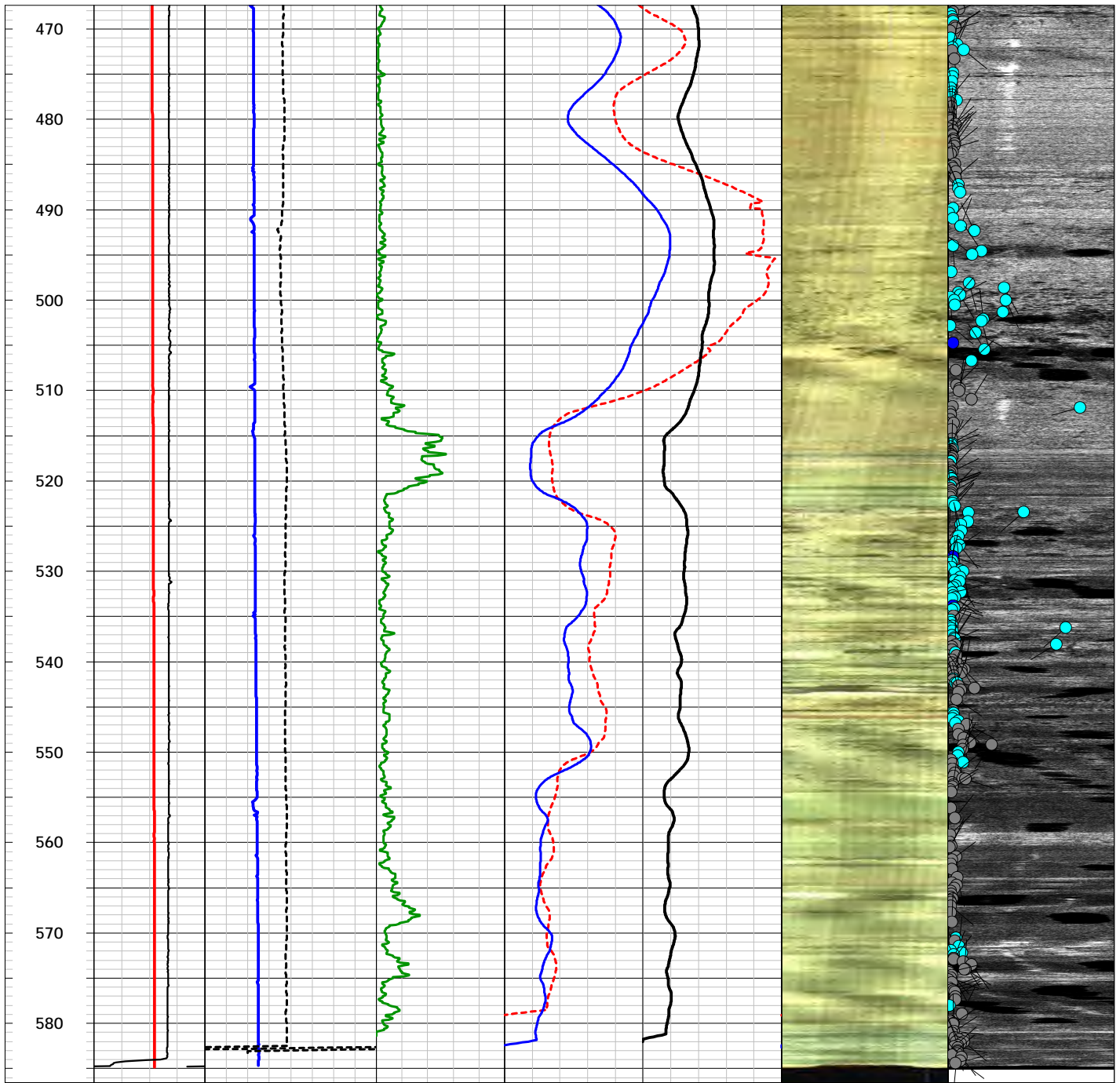
Phone: (303) 279-0171, Fax: (303) 278-0135

www.colog.com

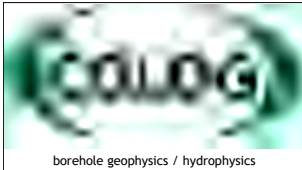








1ft:200ft Depth	0 Inch 12	-400 mV 400	0 OHMM 2000	0 90° 180° 270° 0°
	Caliper	Spont. Potential	16" Normal Resistivity	Tadpoles
	0 °C 20	600 uS/cm 1400	0 OHMM 2000	0° 90° 180° 270° 0°
	Temp	Cond	64" Normal Resistivity	Image-NM
		0 CPS 250		Amplitude-NM
		Natural Gamma		



Geophysical Summary Plot

Colog, Inc.
 810 Quail St., Unit E, Lakewood, CO 80215
 Office: (303) 279-0171
 www.colog.com

COMPANY: Arcadis

PROJECT: Marinette

DATE LOGGED: 20 May 2022

WELL: IRR-02

LOCATION: Marinette, WI

LOG MEASURED FROM: Ground Surface

FIELD ENGINEER(S): M. Cullum

TOP & BOTTOM OF CASING: 0 ft - 62 ft

WITNESSED BY: NA

BOREHOLE DIAMETER: 8 in.

DEPTH DRILLER: NA

FLUID LEVEL DEPTH: 12 ft

DEPTH LOGGER: 584.3 ft

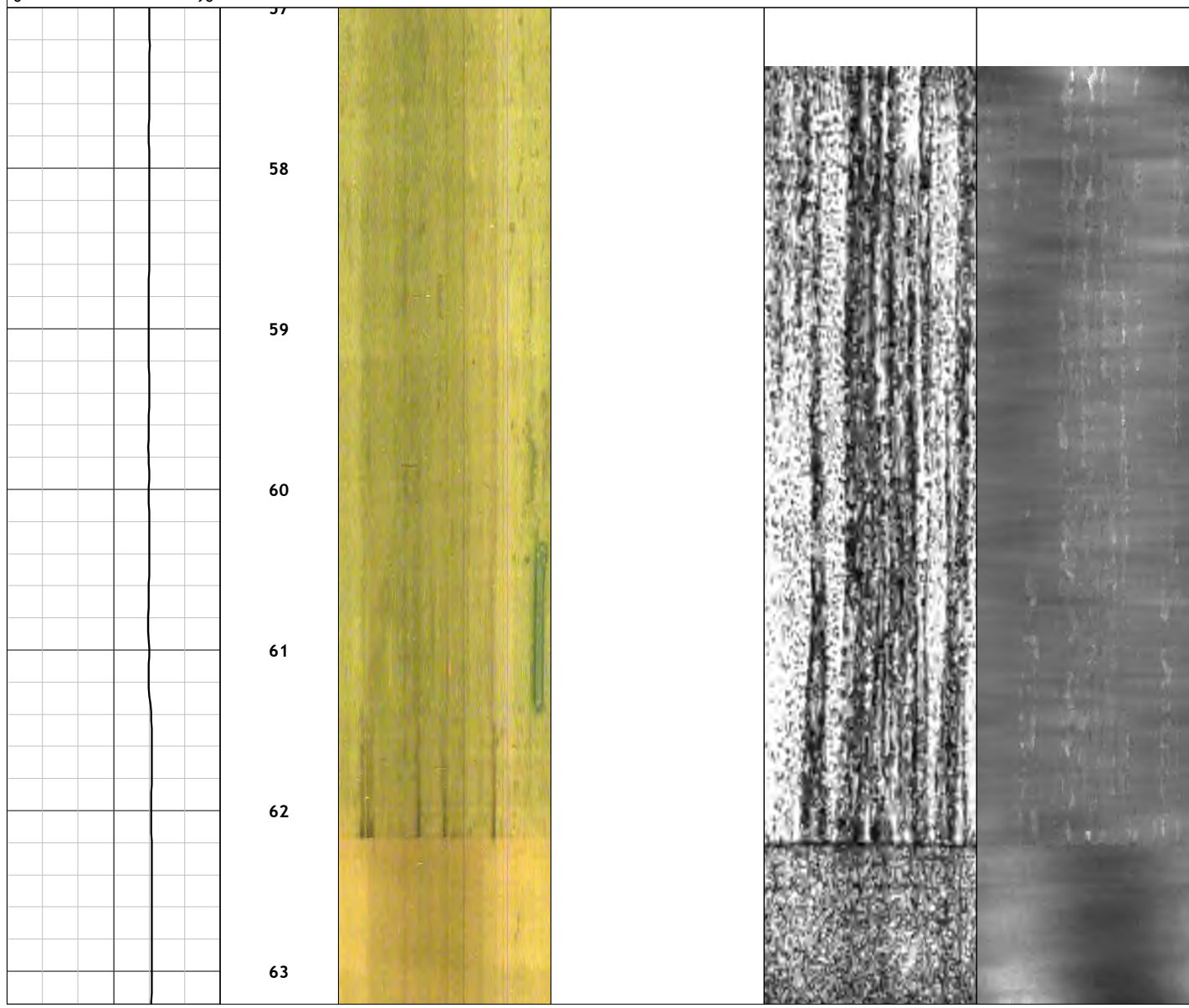
ORIENTATION REFERENCE: Magnetic North

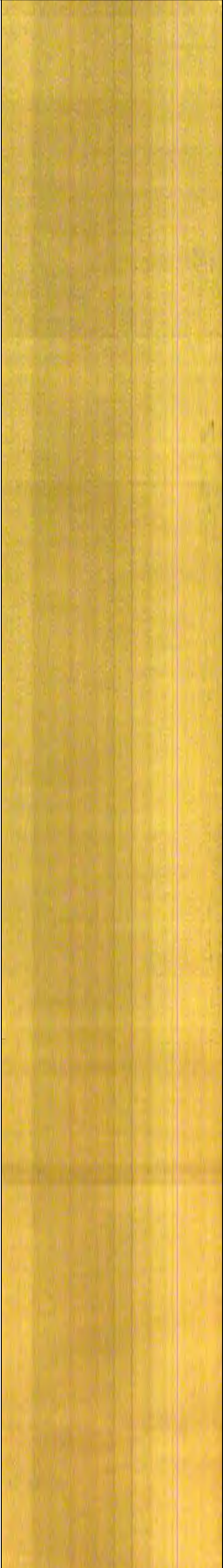


COMMENTS:

STRUCTURE LEGEND:

- 0 - Heated Fracture/Bedding Plane
- 1 - Partial Fracture
- 2 - Complete Fracture
- 3 - Open Fracture

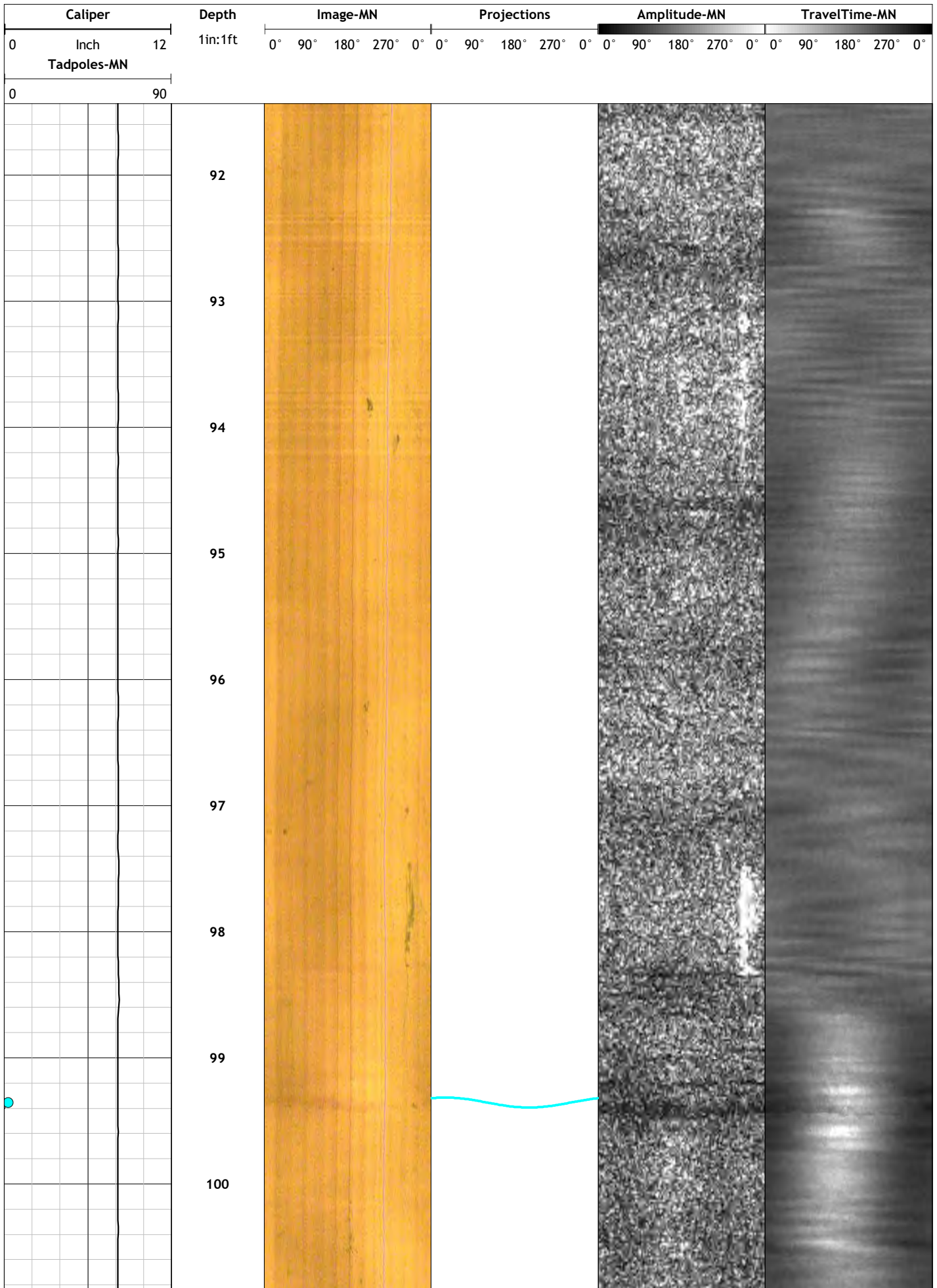
Caliper	Depth	Image-MN	Projections	Amplitude-MN	TravelTime-MN
0 Inch 12	1in:1ft	0° 90° 180° 270° 0° 0°	0° 90° 180° 270° 0° 0°	0° 90° 180° 270° 0° 0°	0° 90° 180° 270° 0°
0 Tadpoles-MN 90					

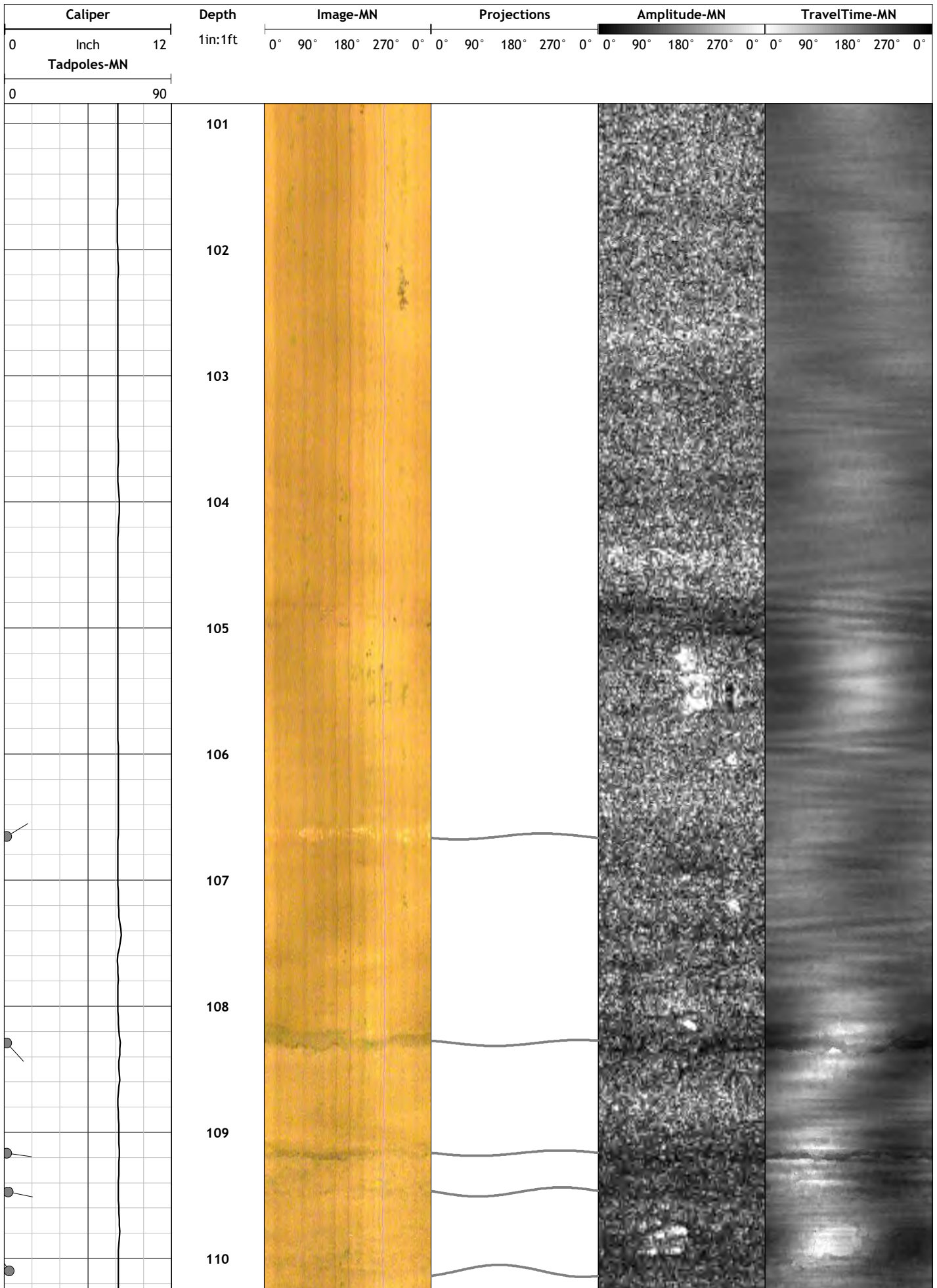


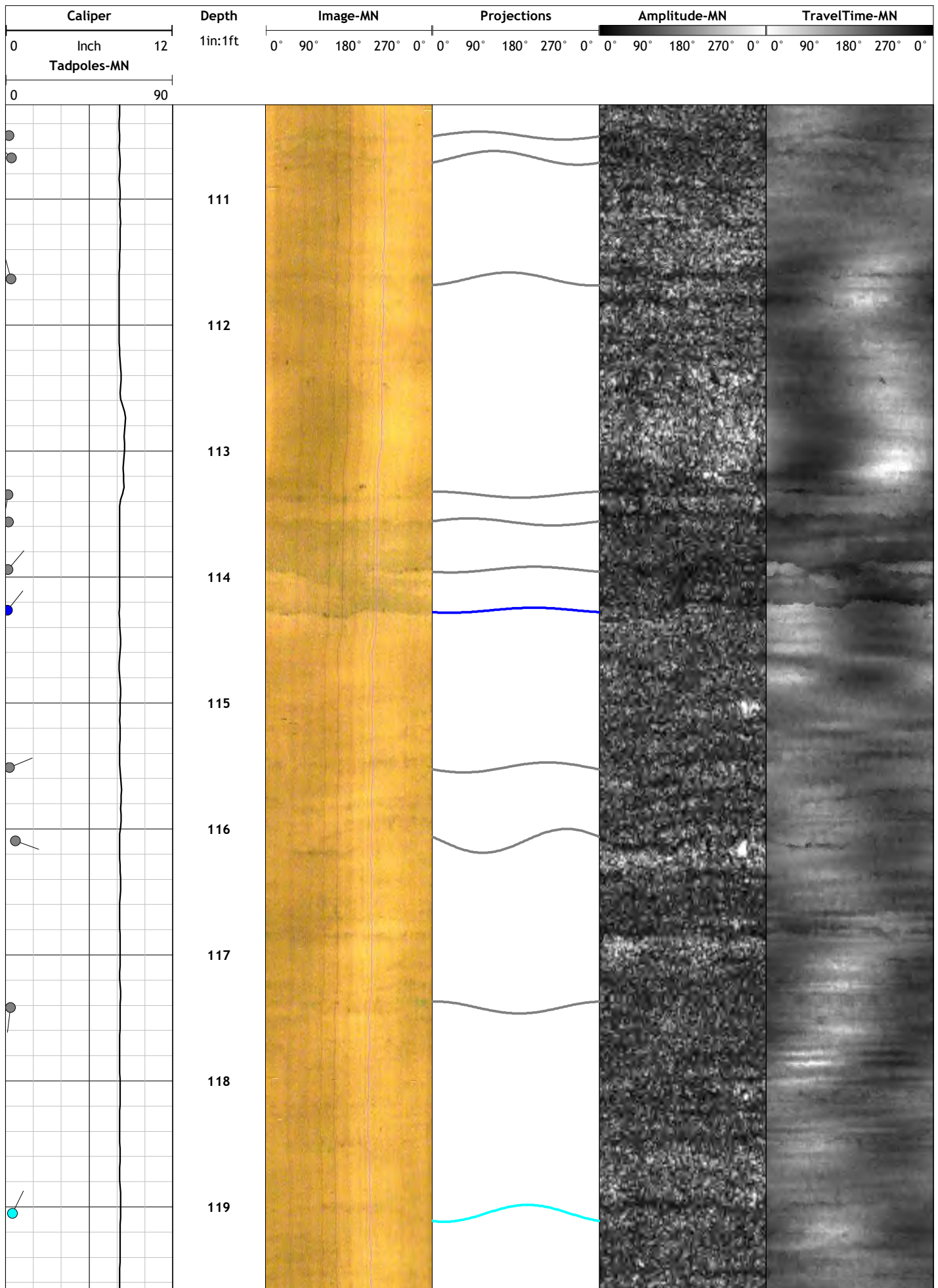
Caliper		Depth 1in:1ft	Image-MN				Projections				Amplitude-MN				TravelTime-MN						
0	Inch 12		0°	90°	180°	270°	0°	0°	90°	180°	270°	0°	0°	90°	180°	270°	0°	0°	90°	180°	270°
Tadpoles-MN																					
0	90																				
		64																			
		65																			
		66																			
		67																			
		68																			
		69																			
		70																			
		71																			
		72																			

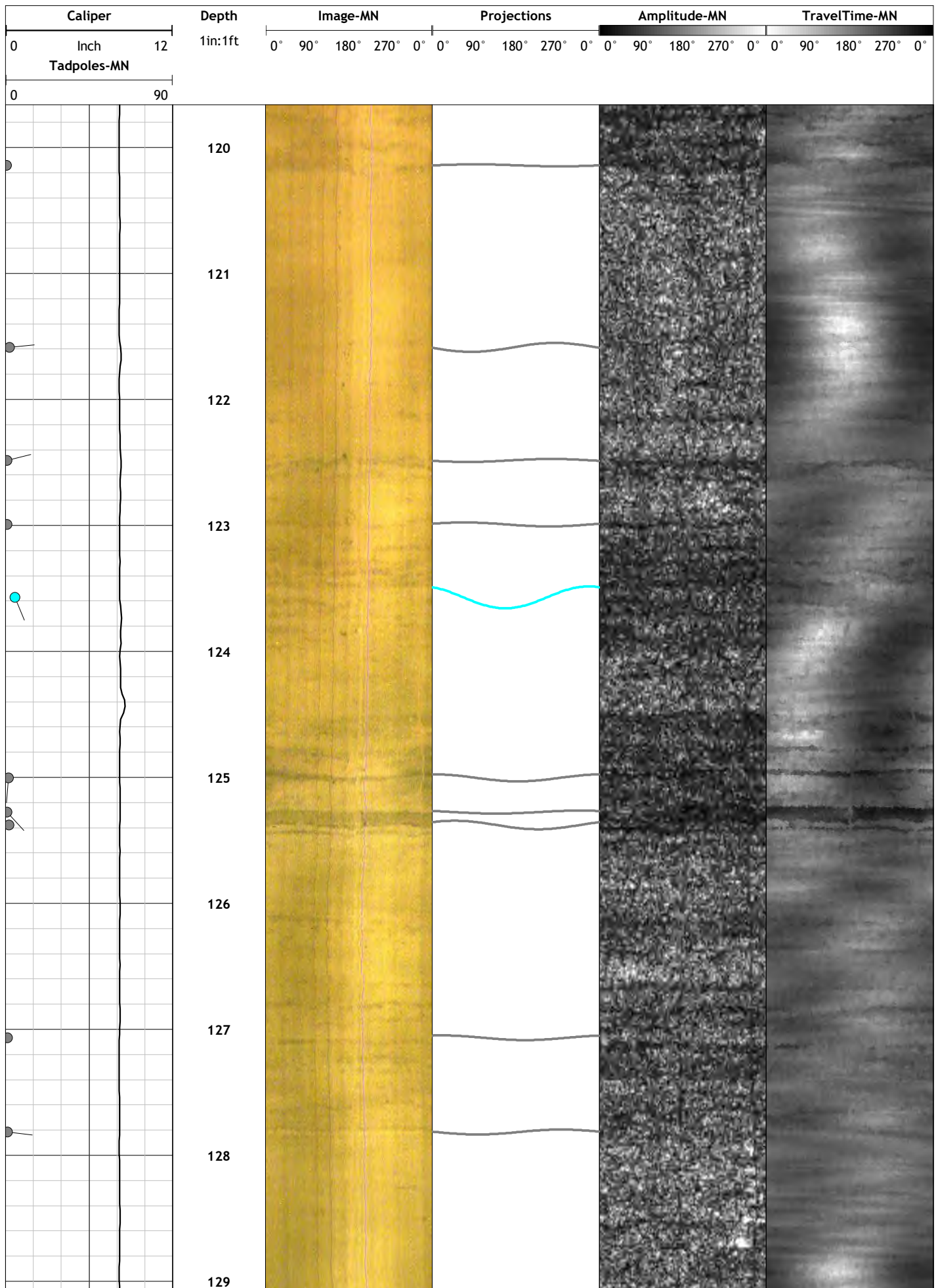
Caliper		Depth 1in:1ft	Image-MN				Projections				Amplitude-MN				TravelTime-MN			
0	Inch 12		0°	90°	180°	270°	0°	0°	90°	180°	270°	0°	0°	90°	180°	270°	0°	
Tadpoles-MN																		
0	90																	
		73																
		74																
		75																
		76																
		77																
		78																
		79																
		80																
		81																
		82																

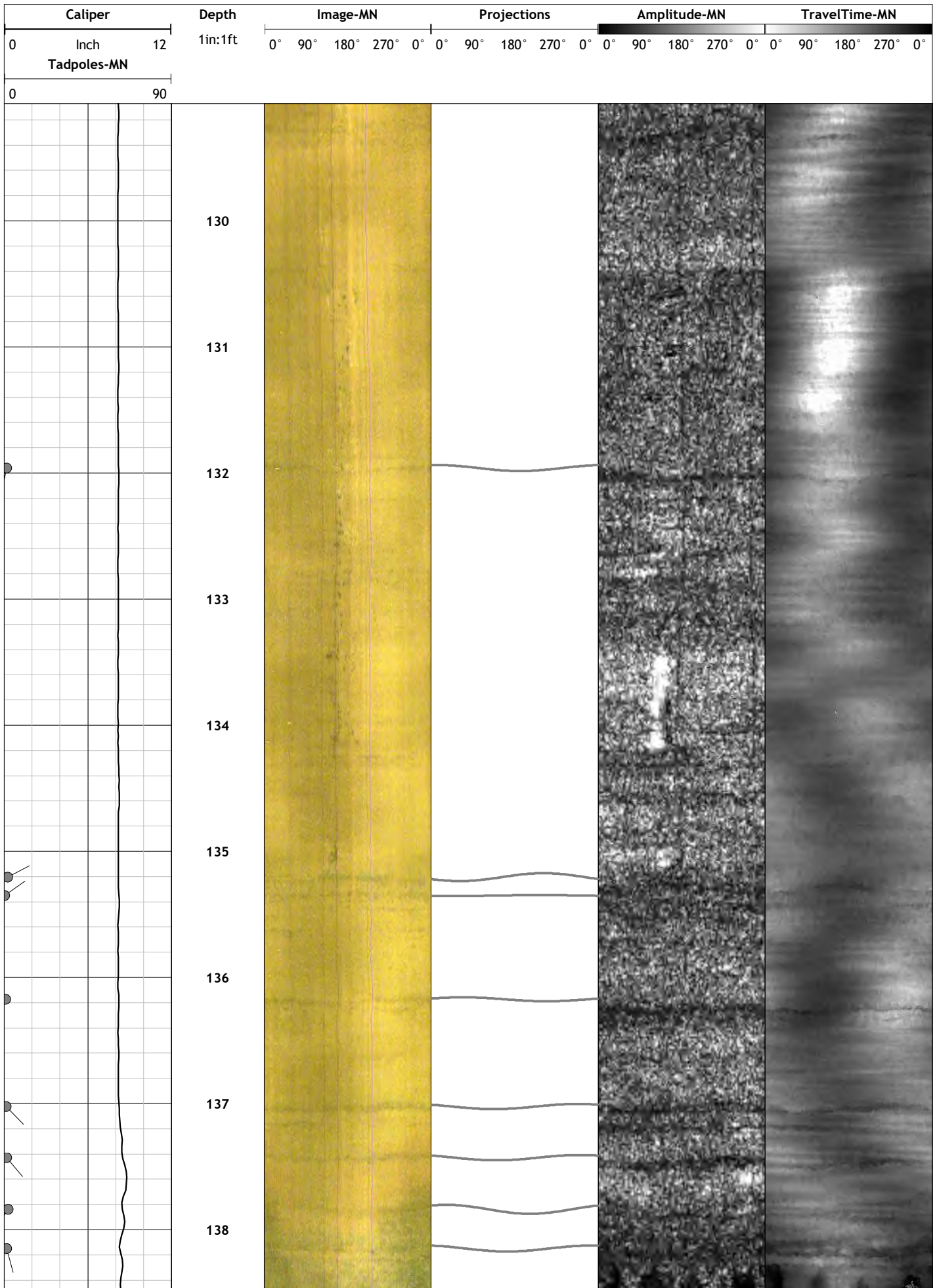
Caliper		Depth 1in:1ft	Image-MN				Projections				Amplitude-MN				TravelTime-MN						
0	Inch 12		0°	90°	180°	270°	0°	0°	90°	180°	270°	0°	0°	90°	180°	270°	0°	0°	90°	180°	270°
Tadpoles-MN																					
0	90																				
		83																			
		84																			
		85																			
		86																			
		87																			
		88																			
		89																			
		90																			
		91																			

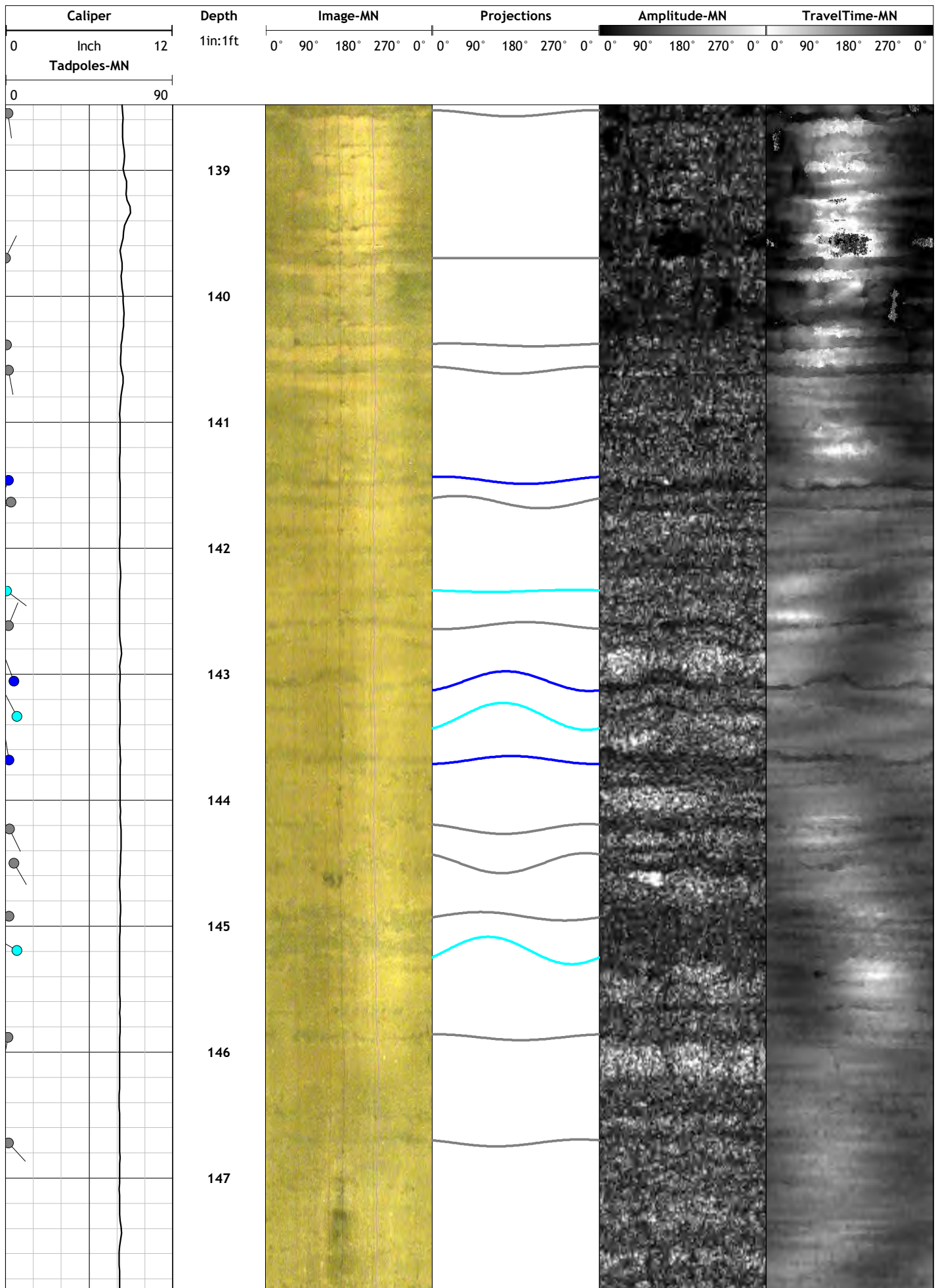


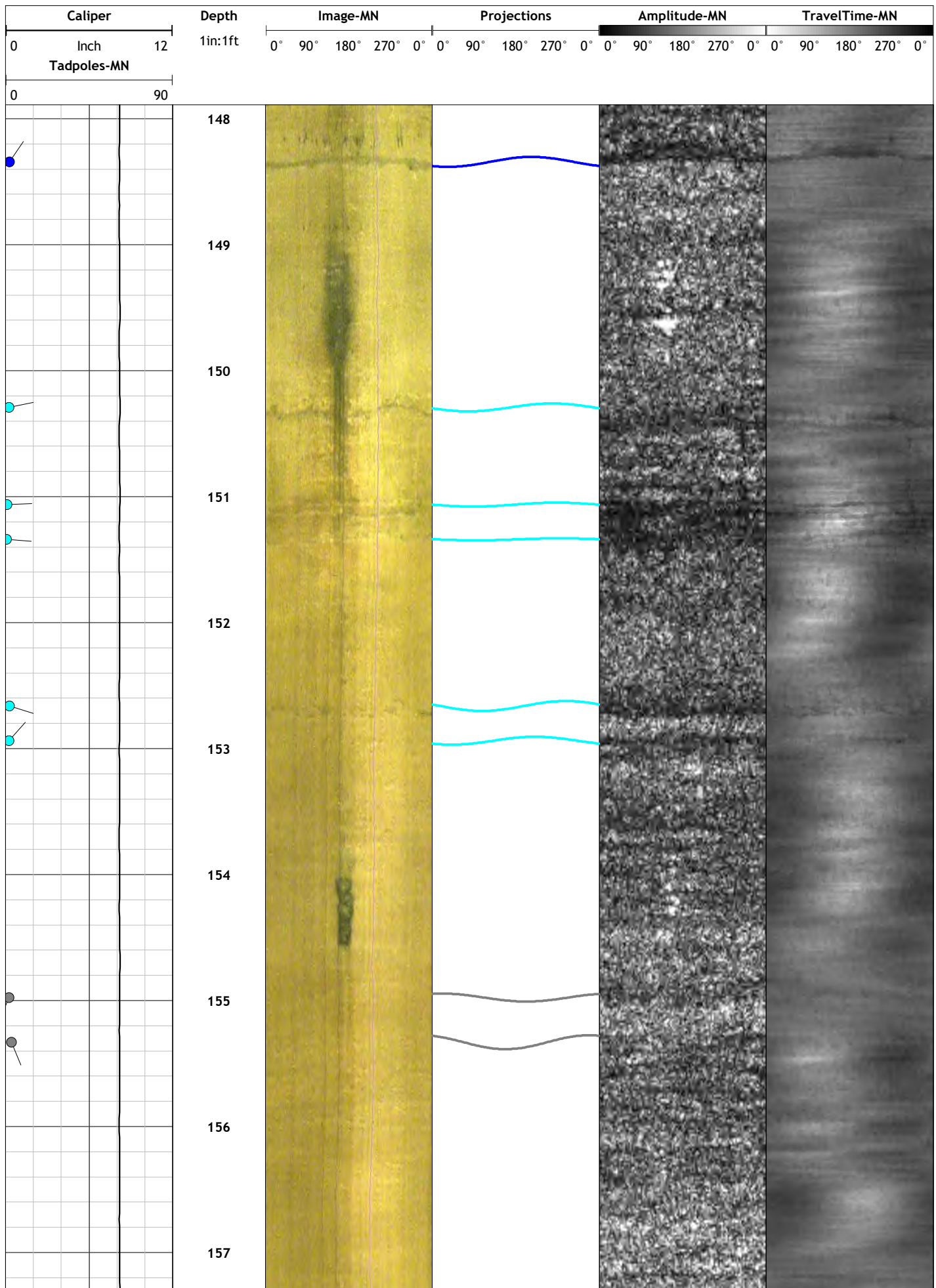


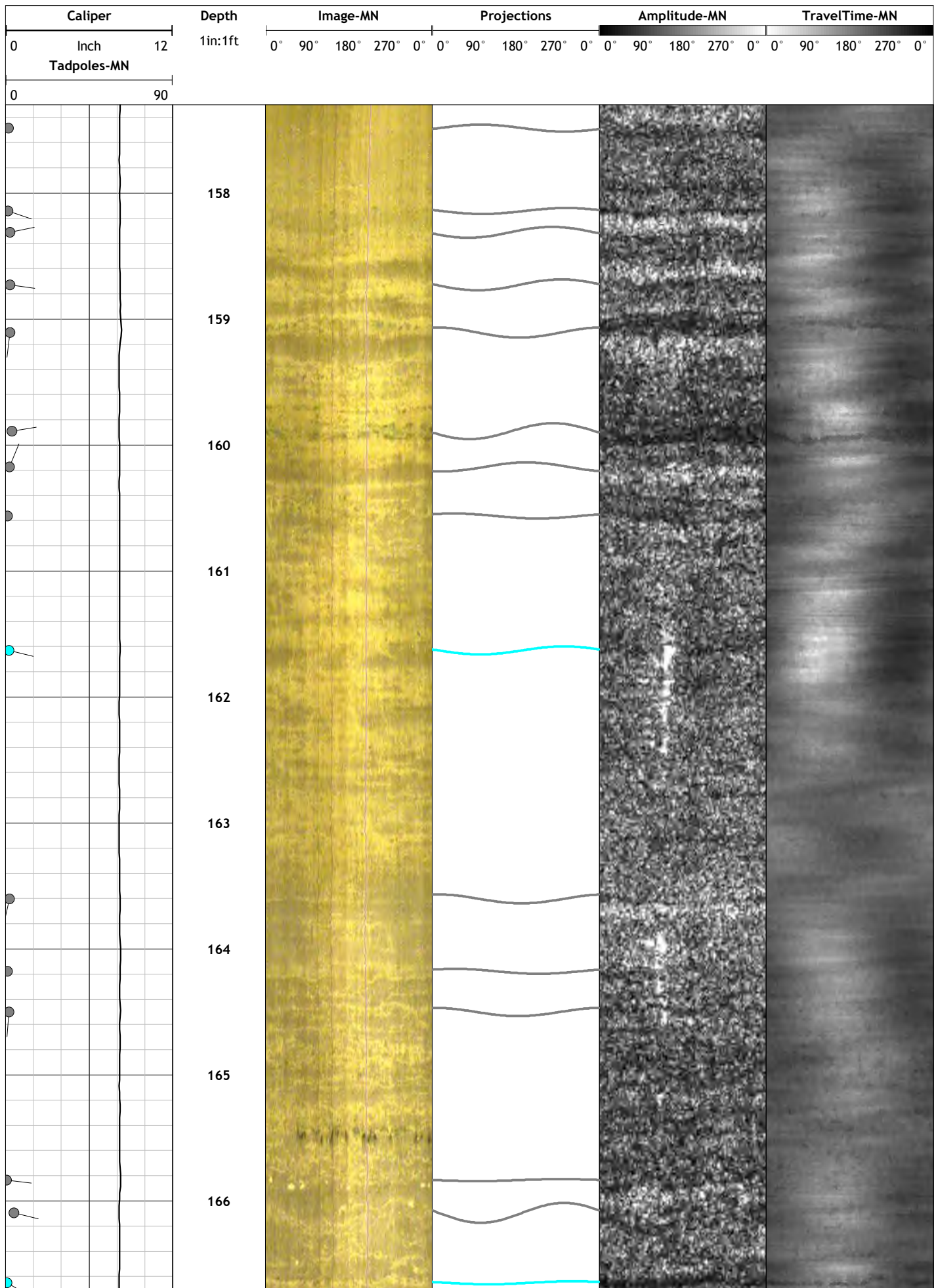


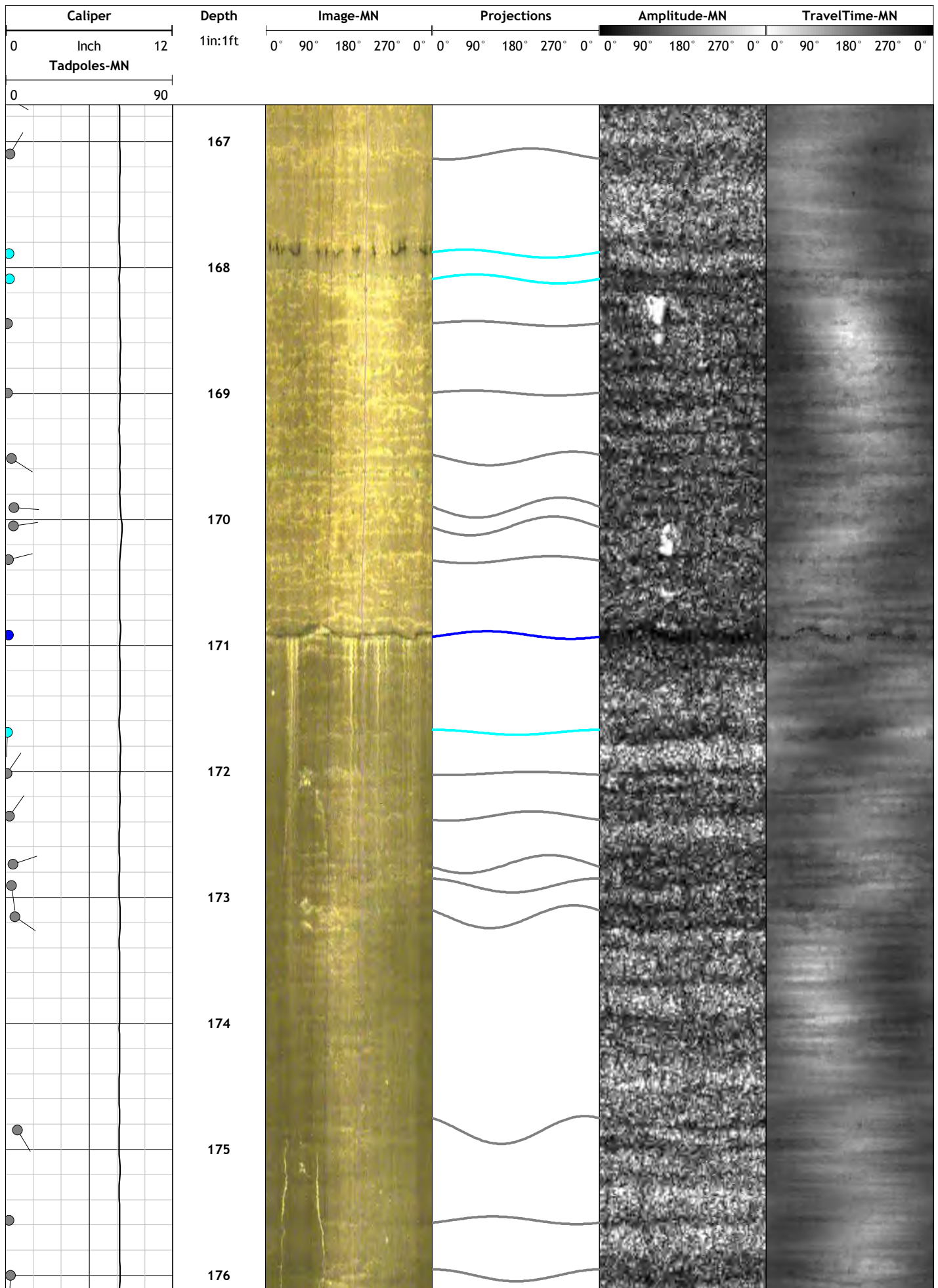


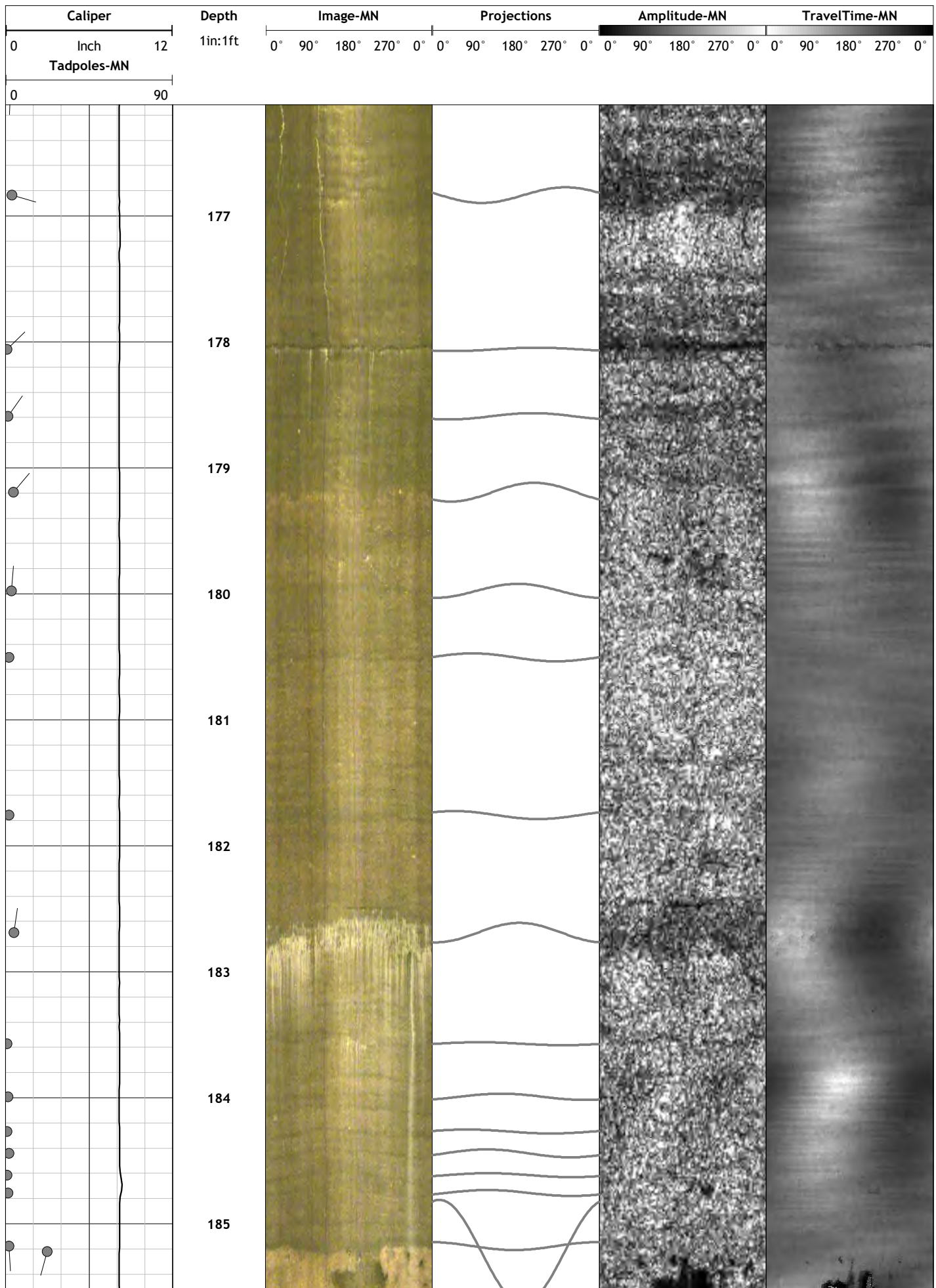


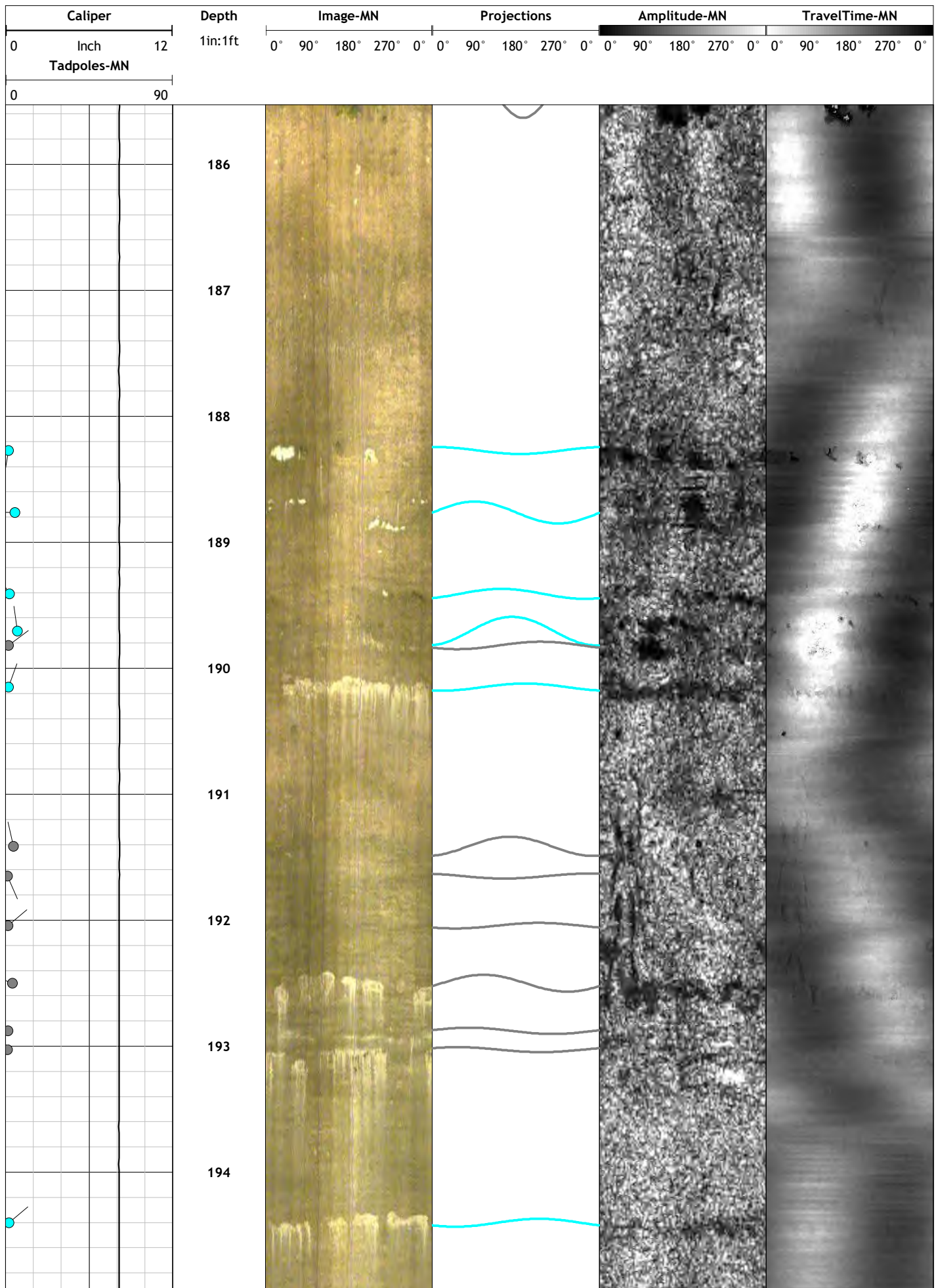


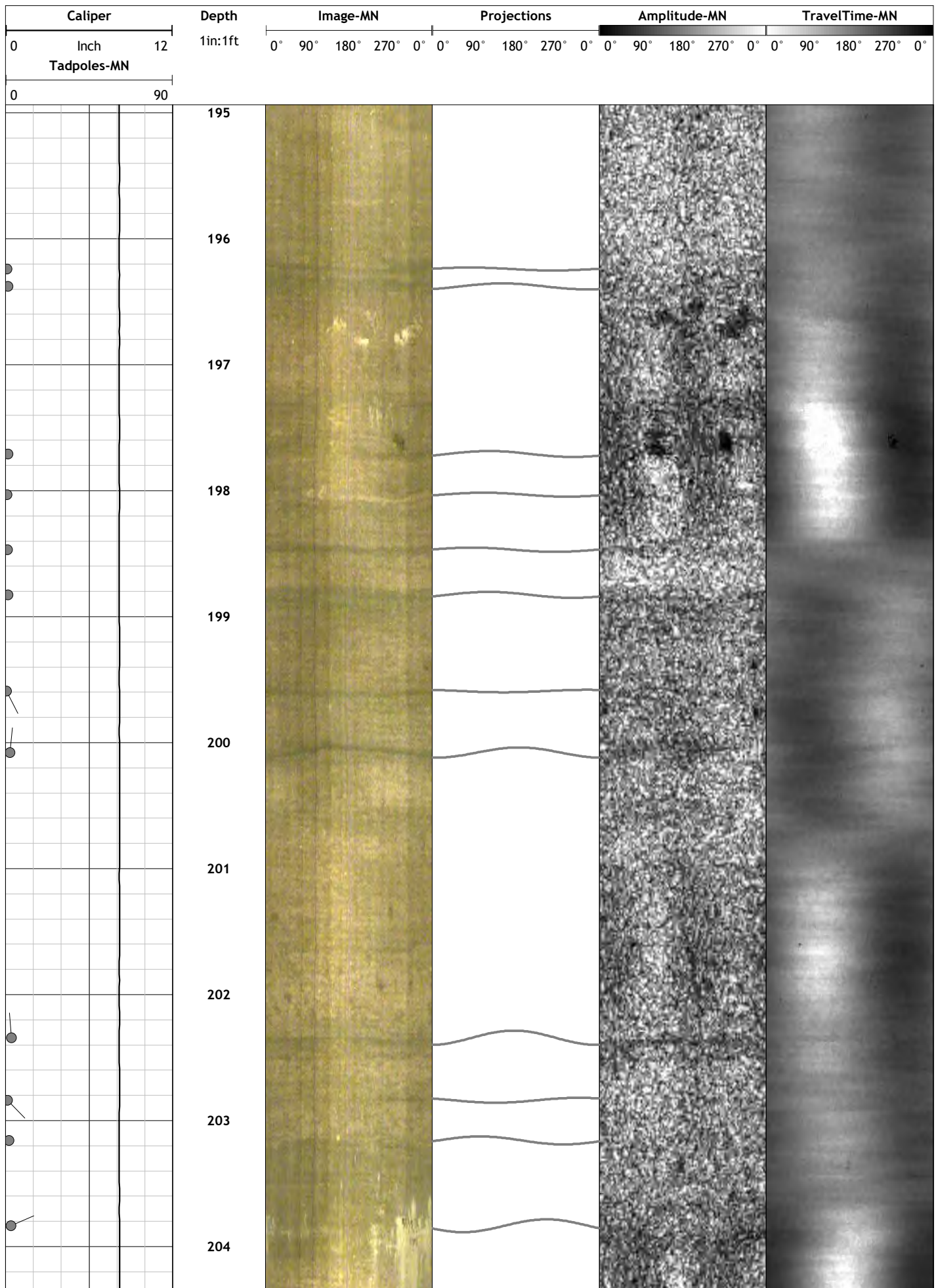


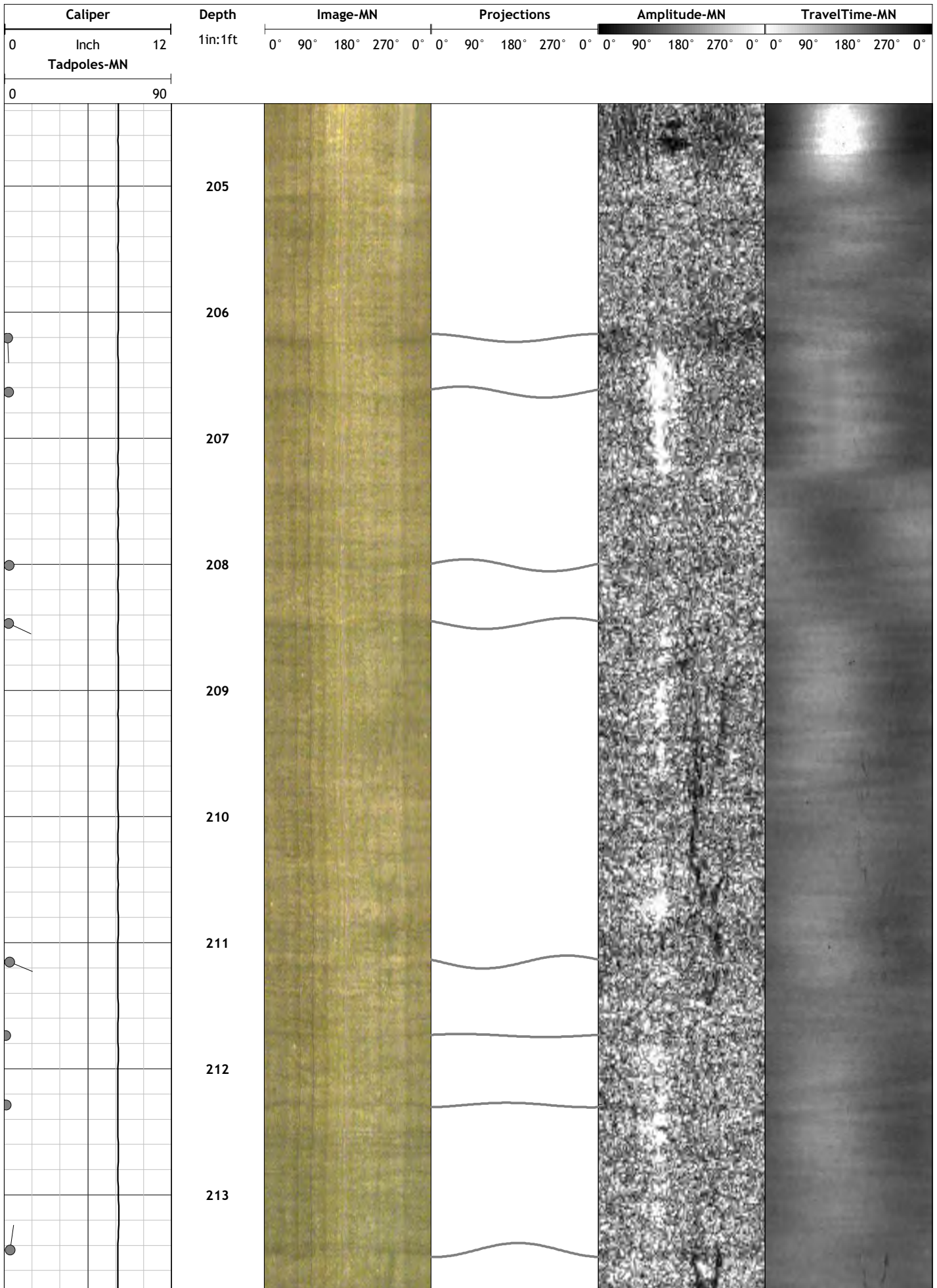


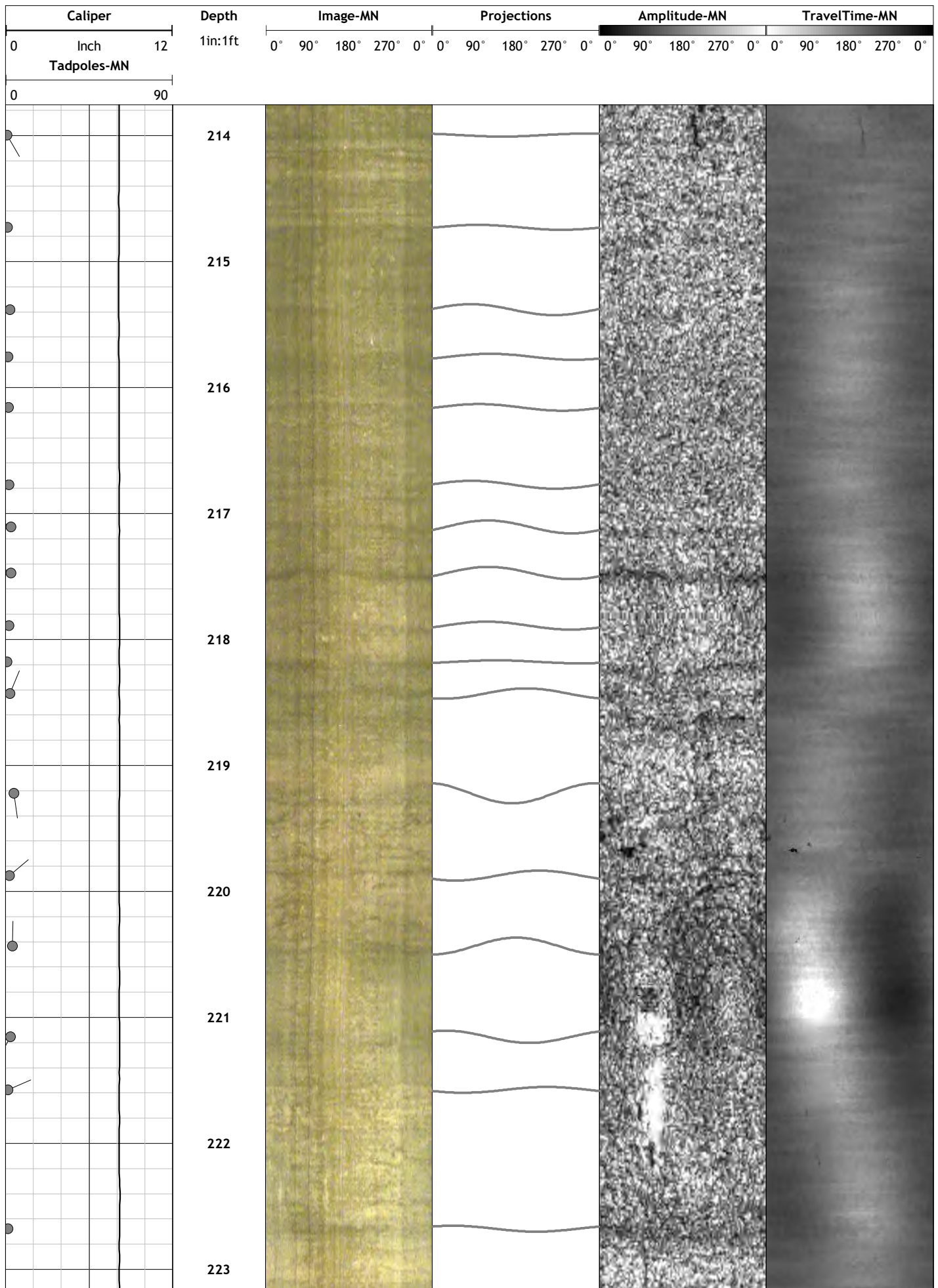


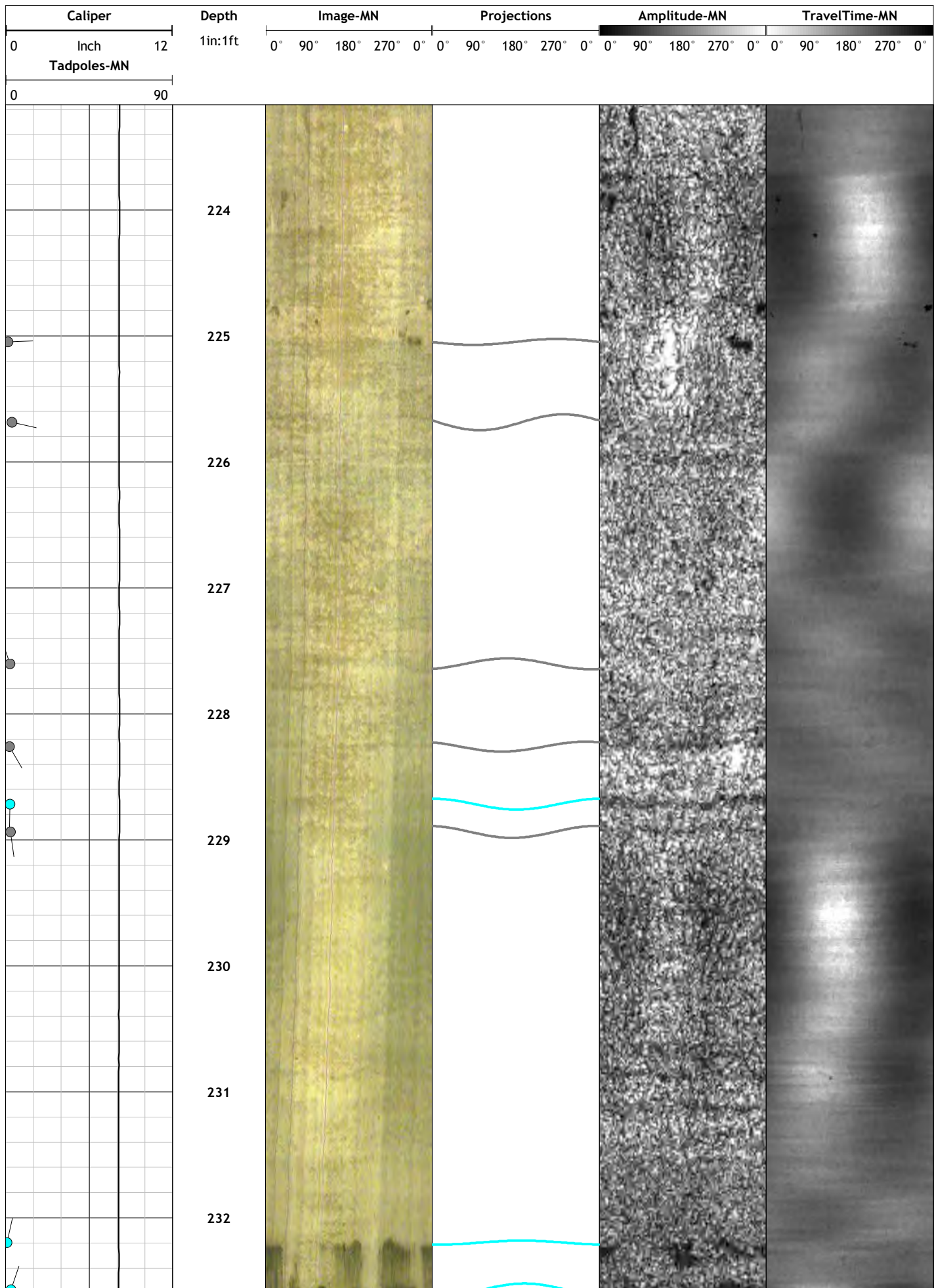


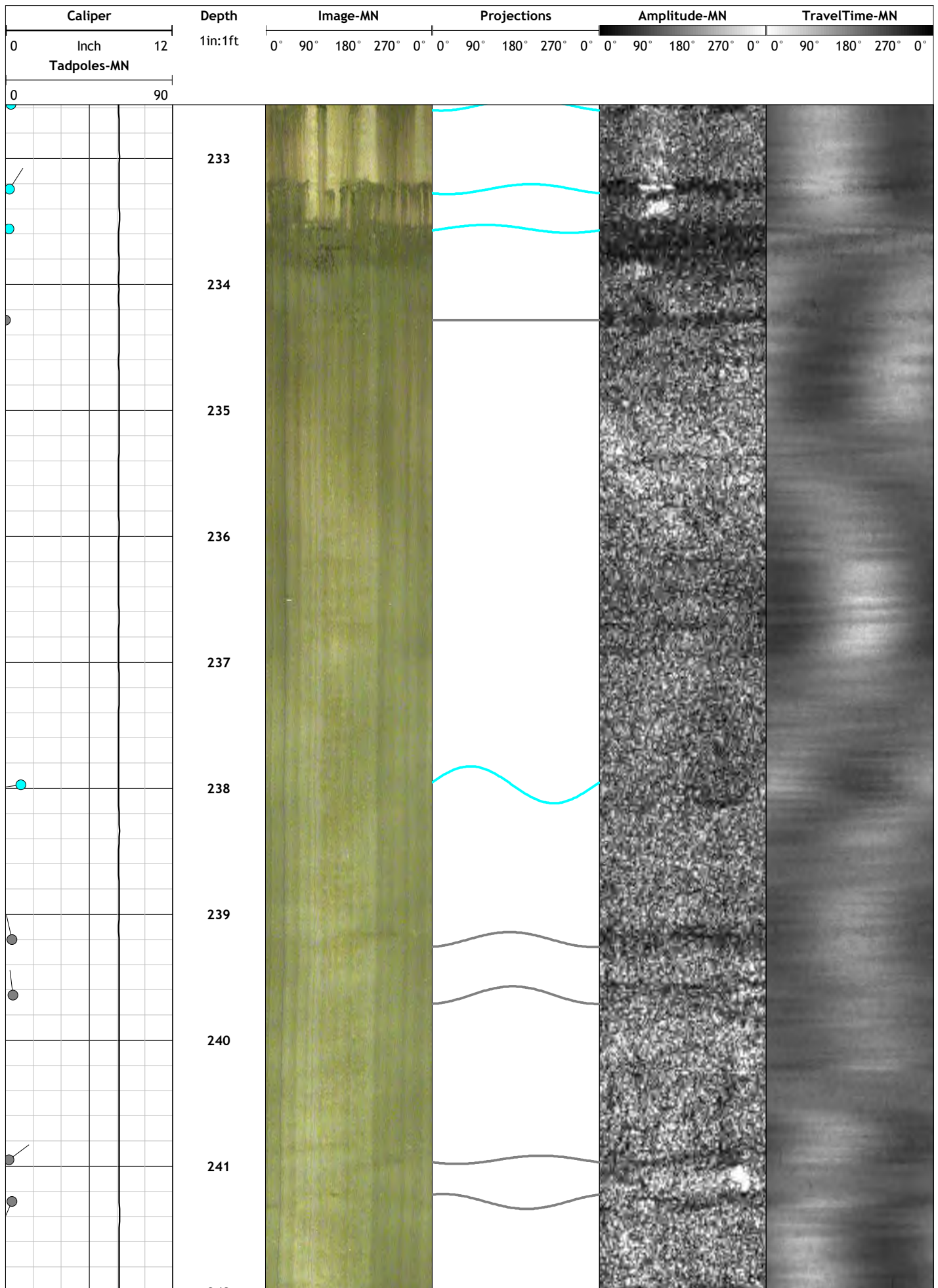


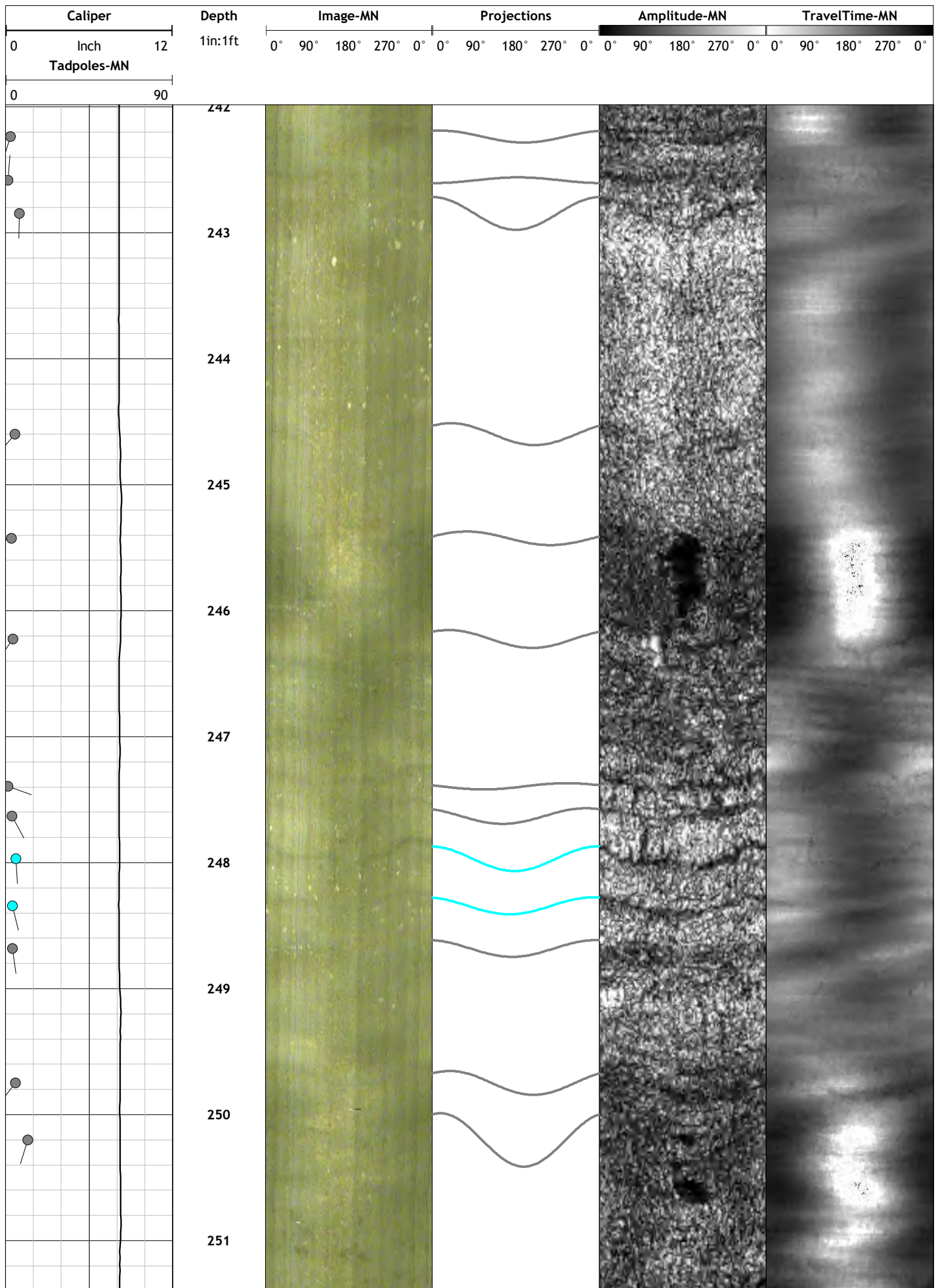


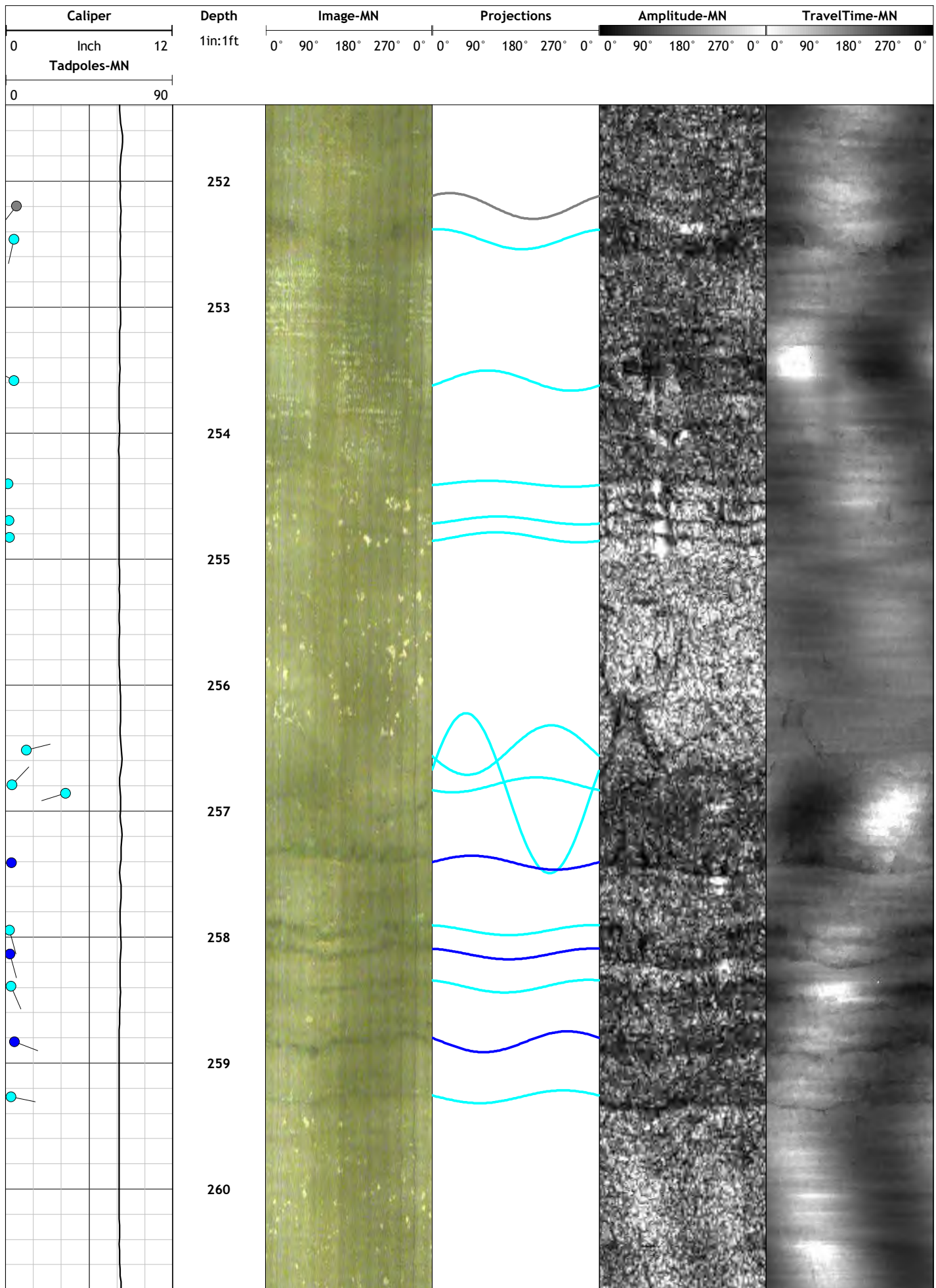


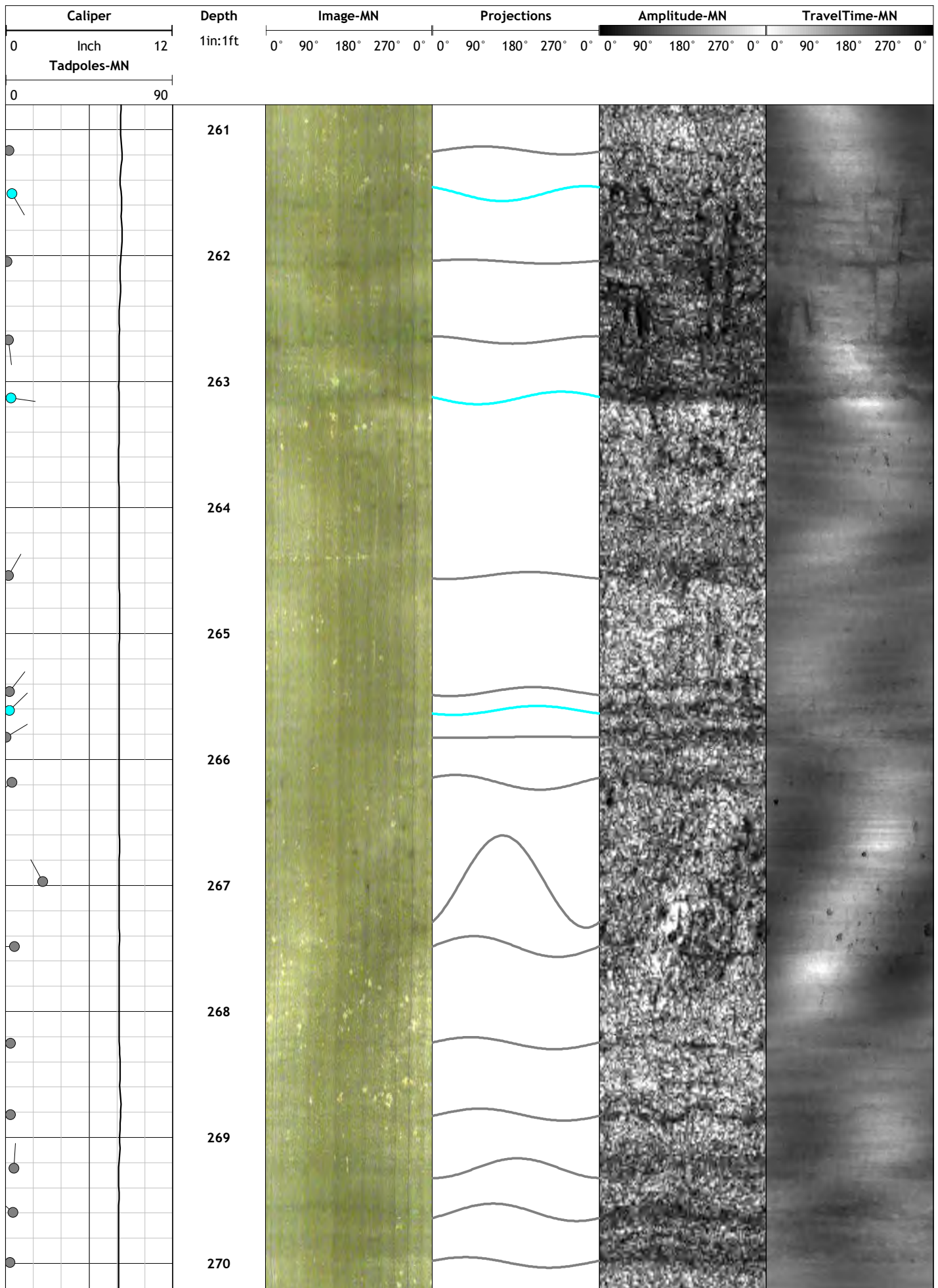


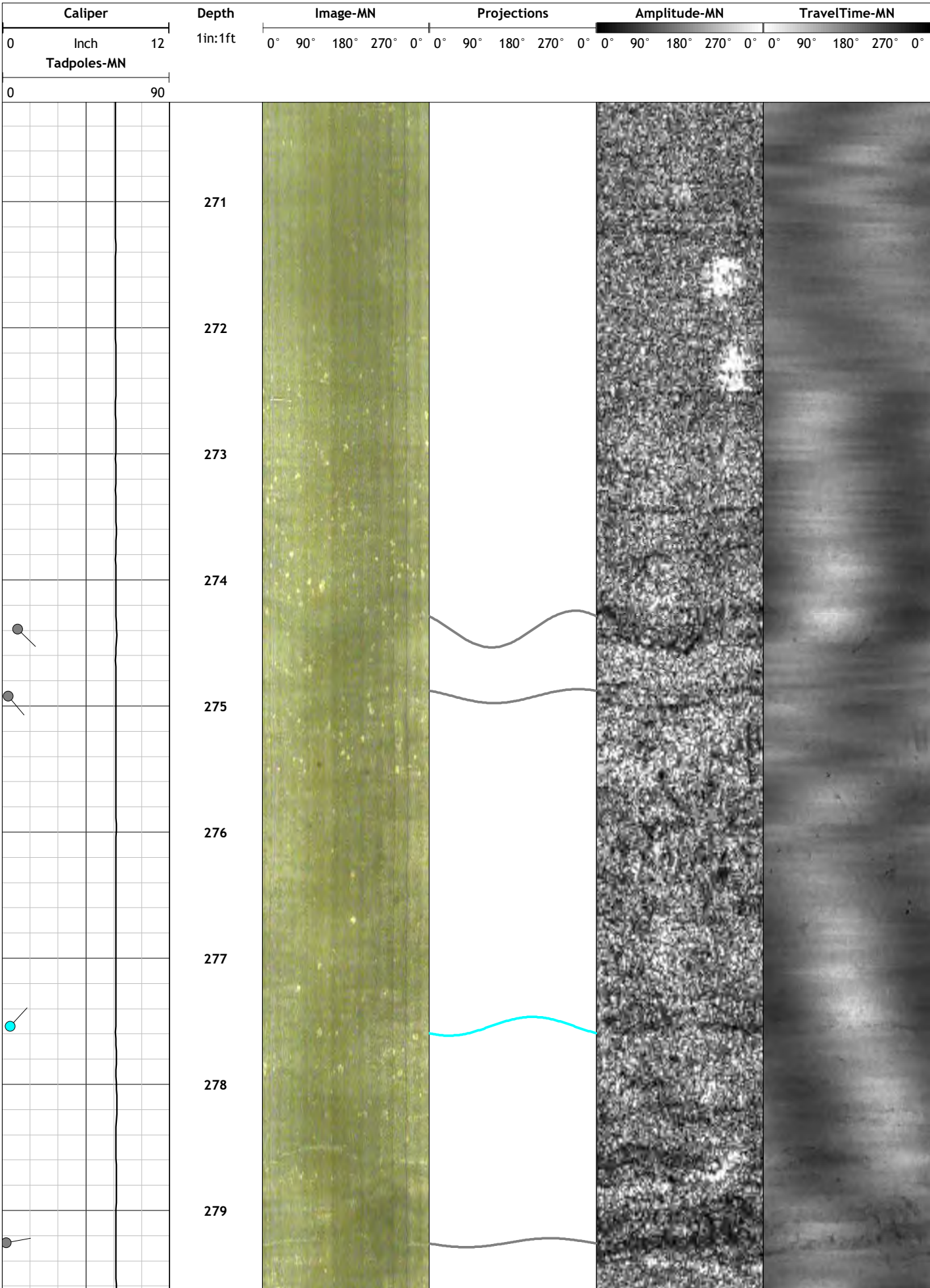


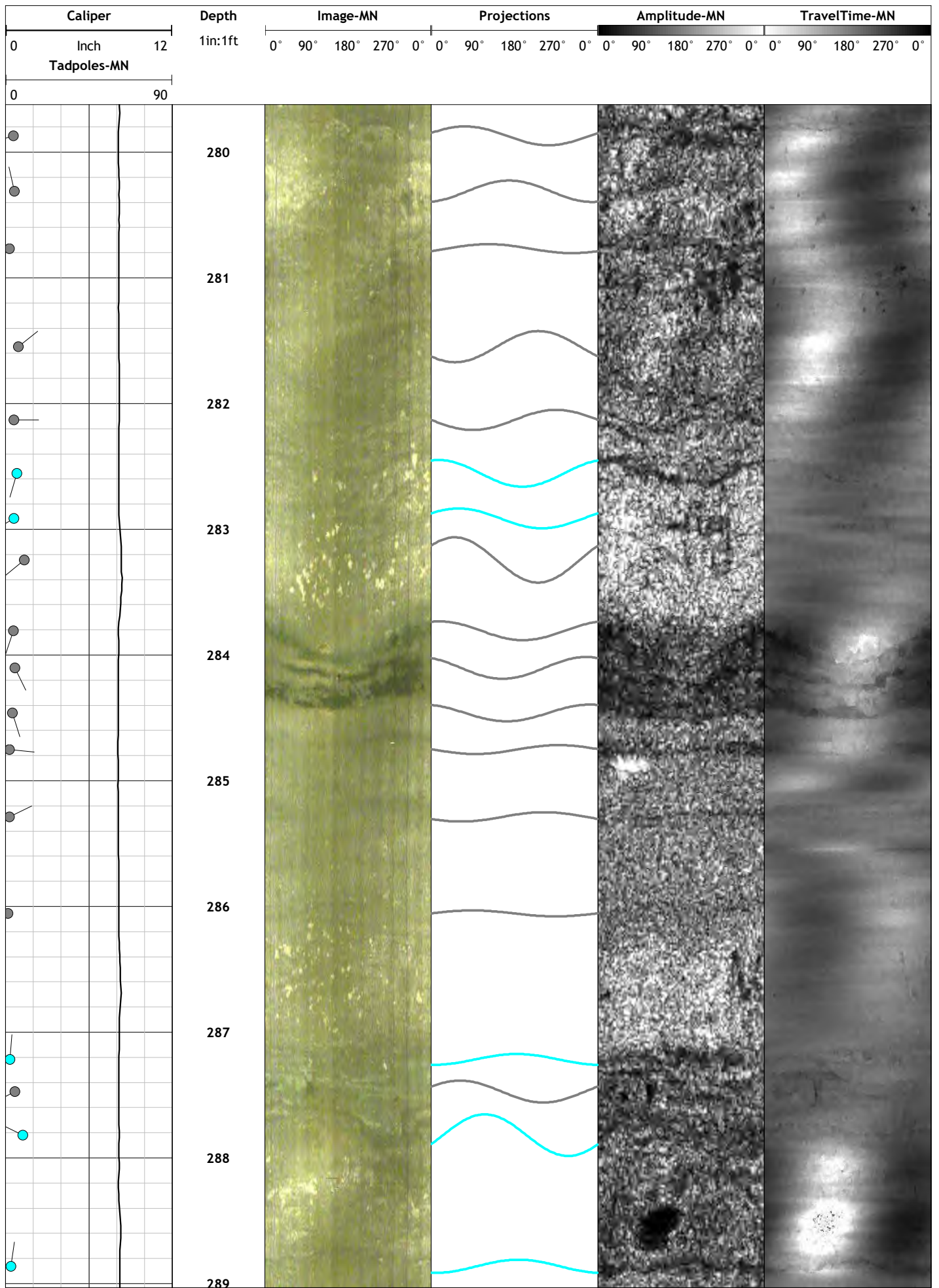


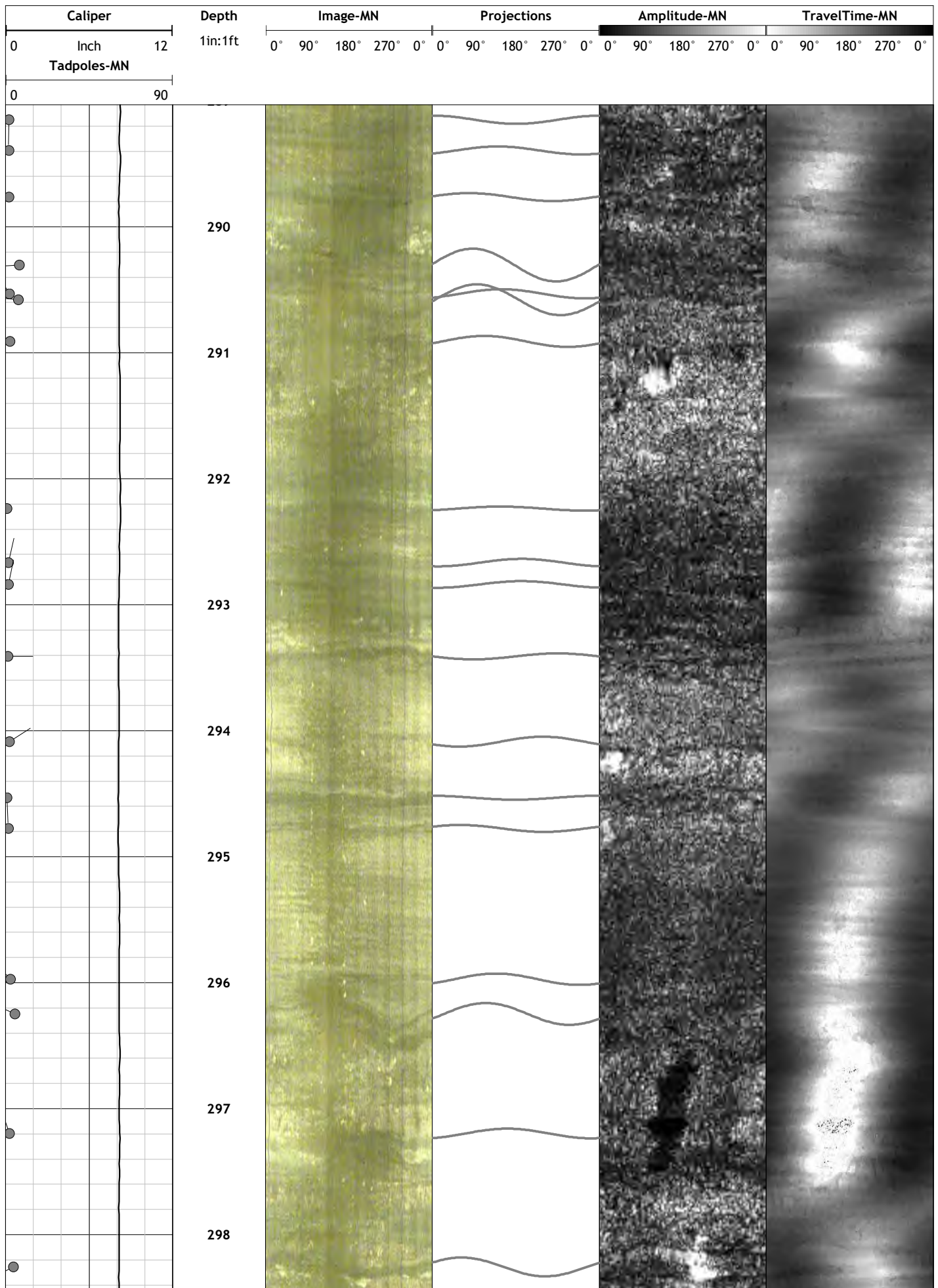


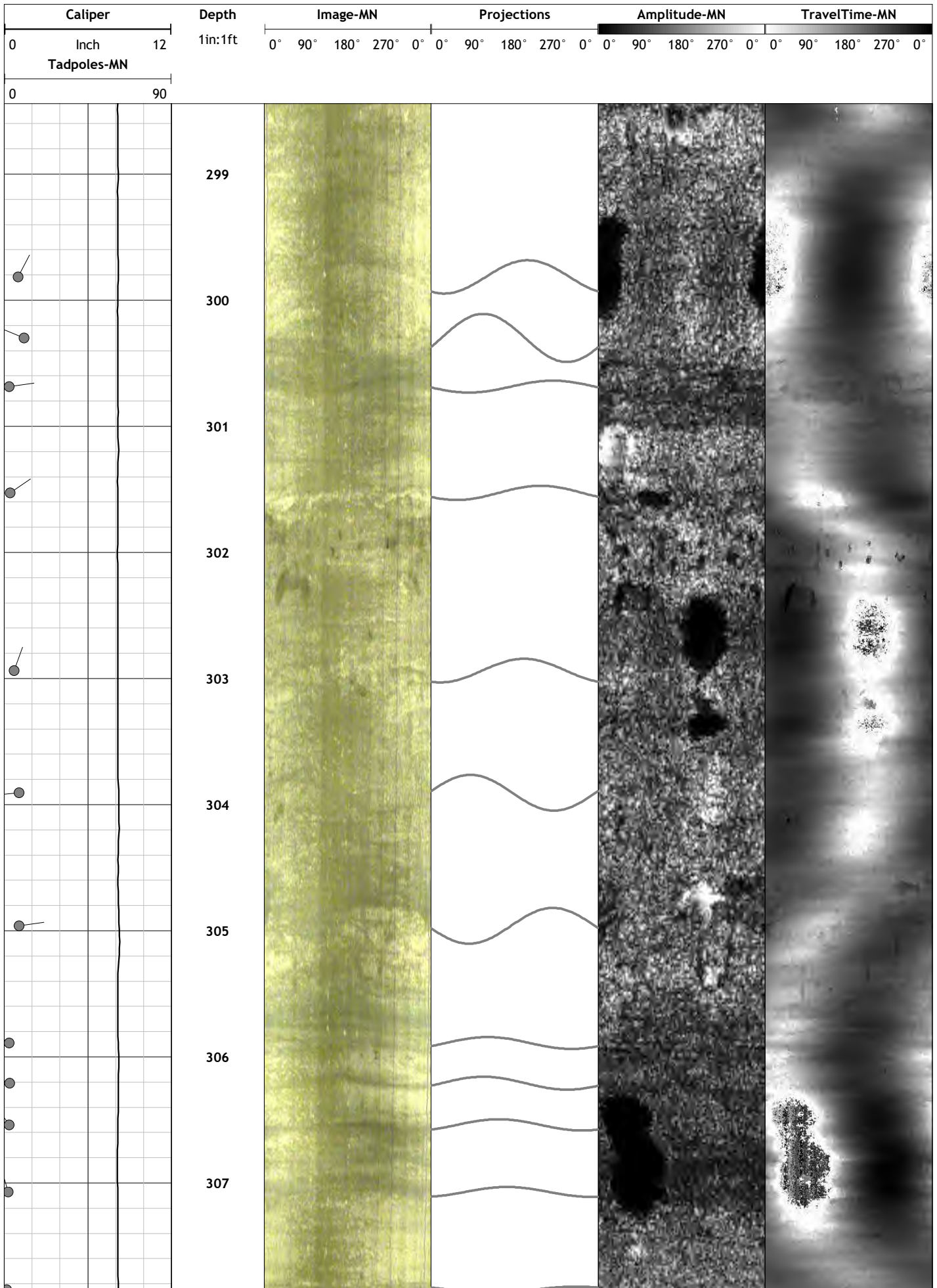


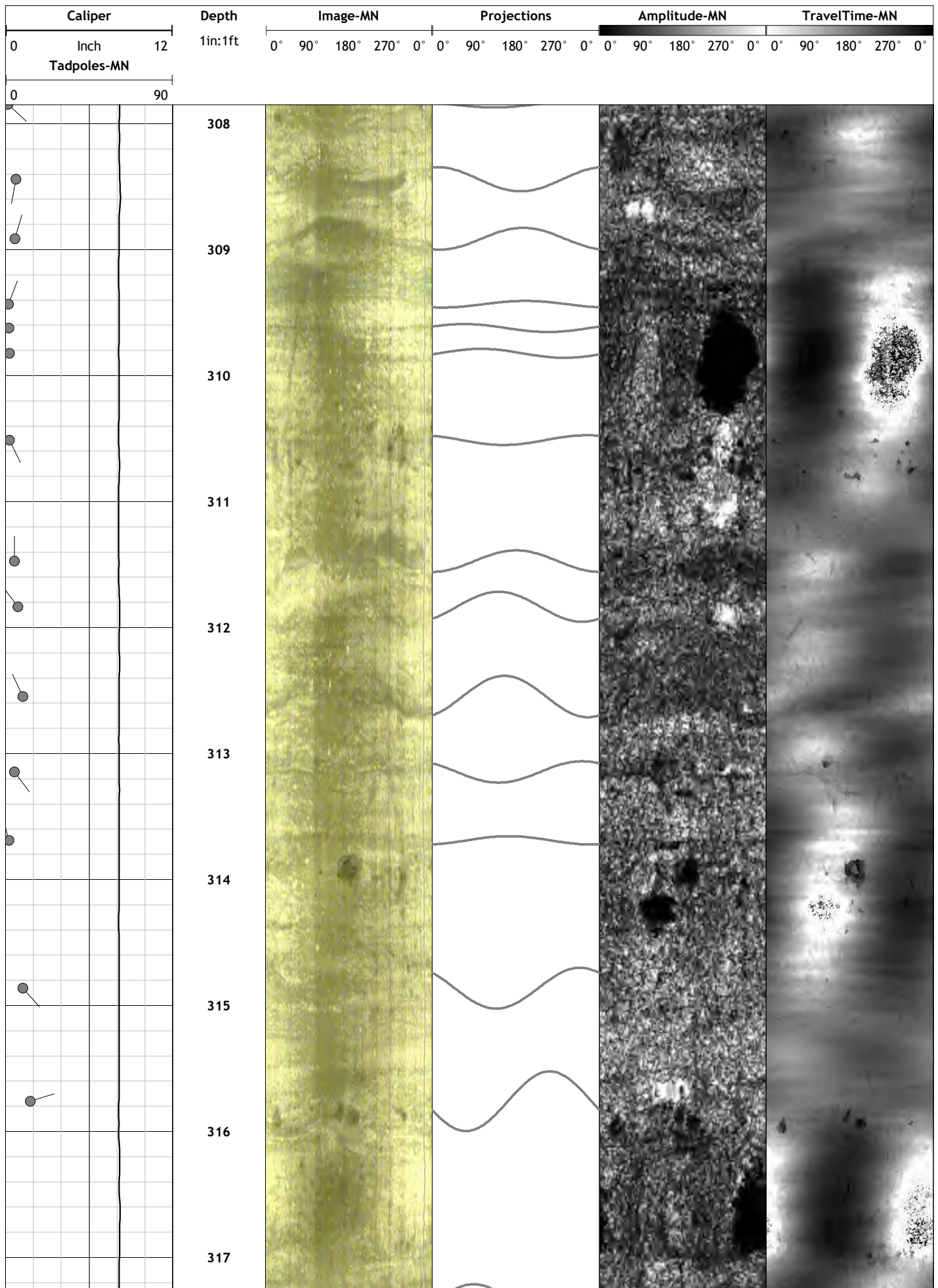


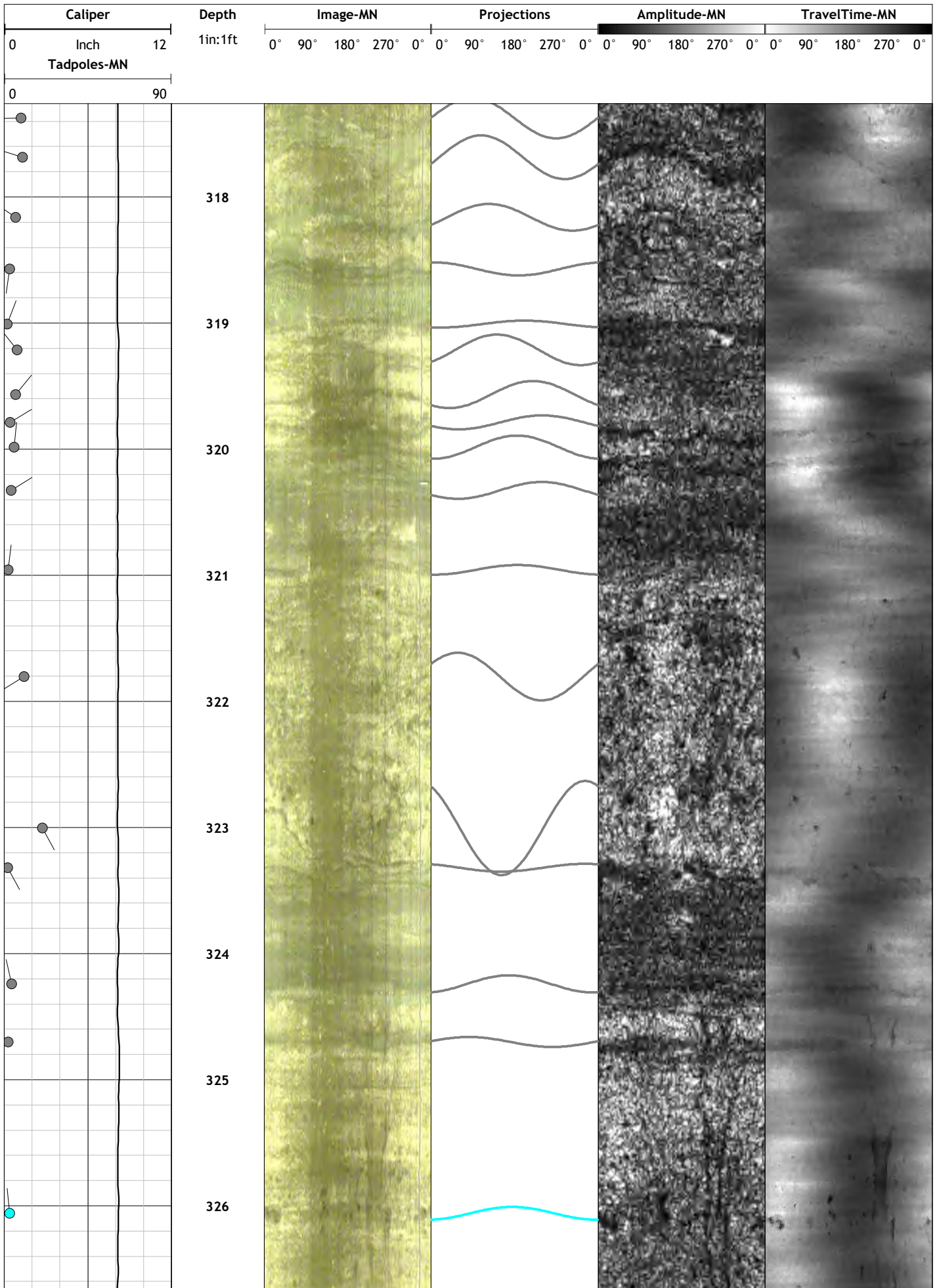


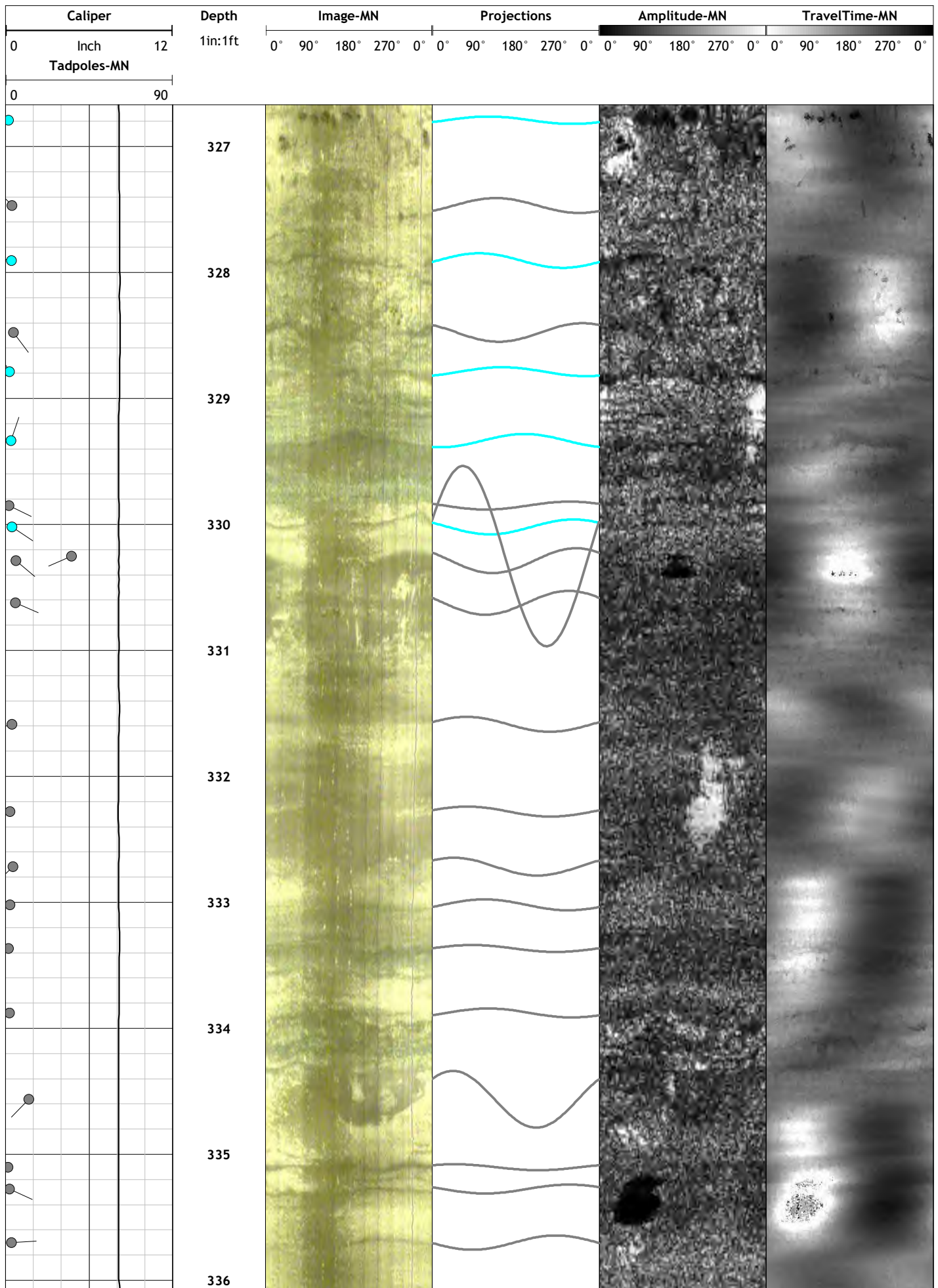


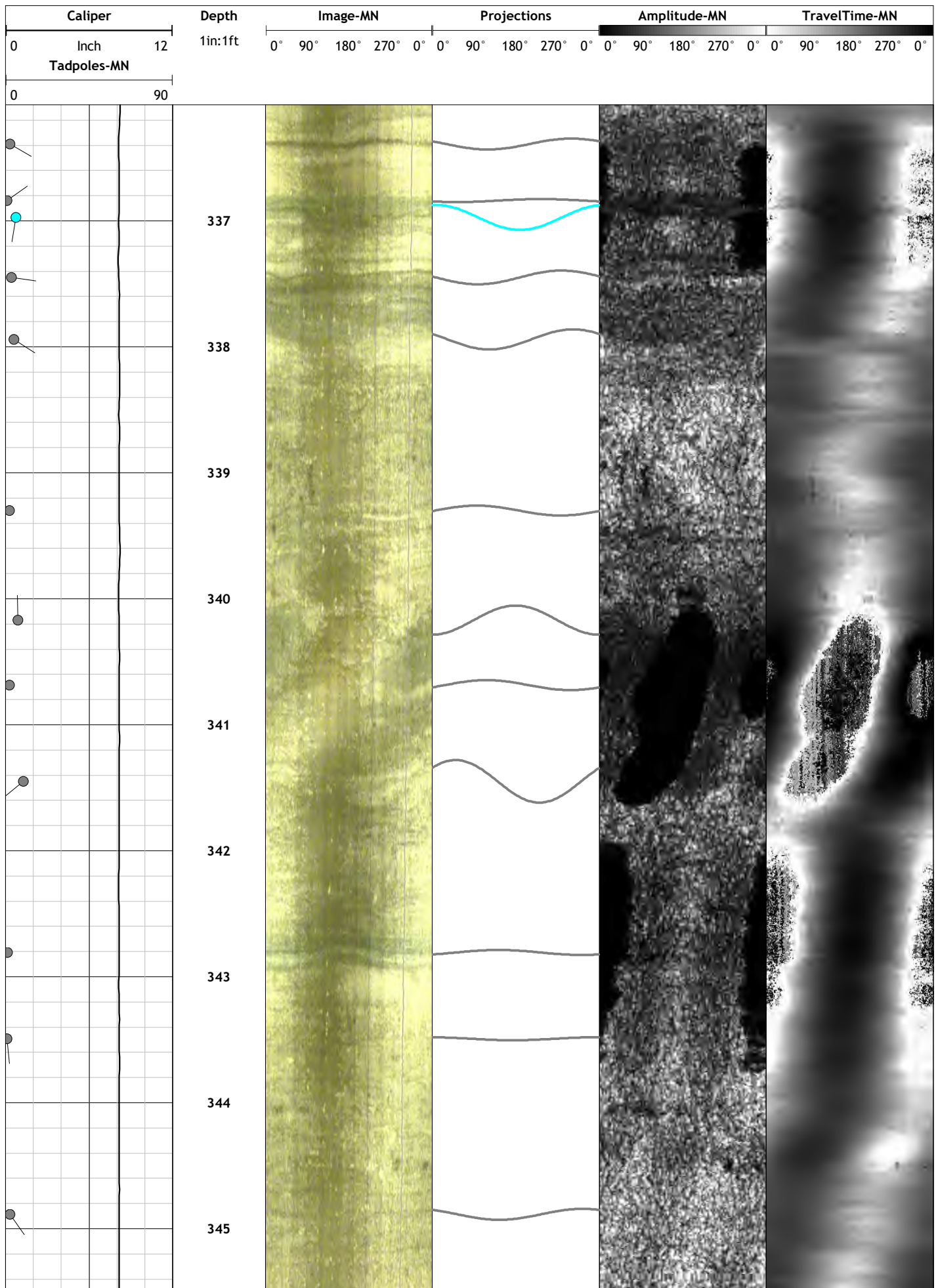


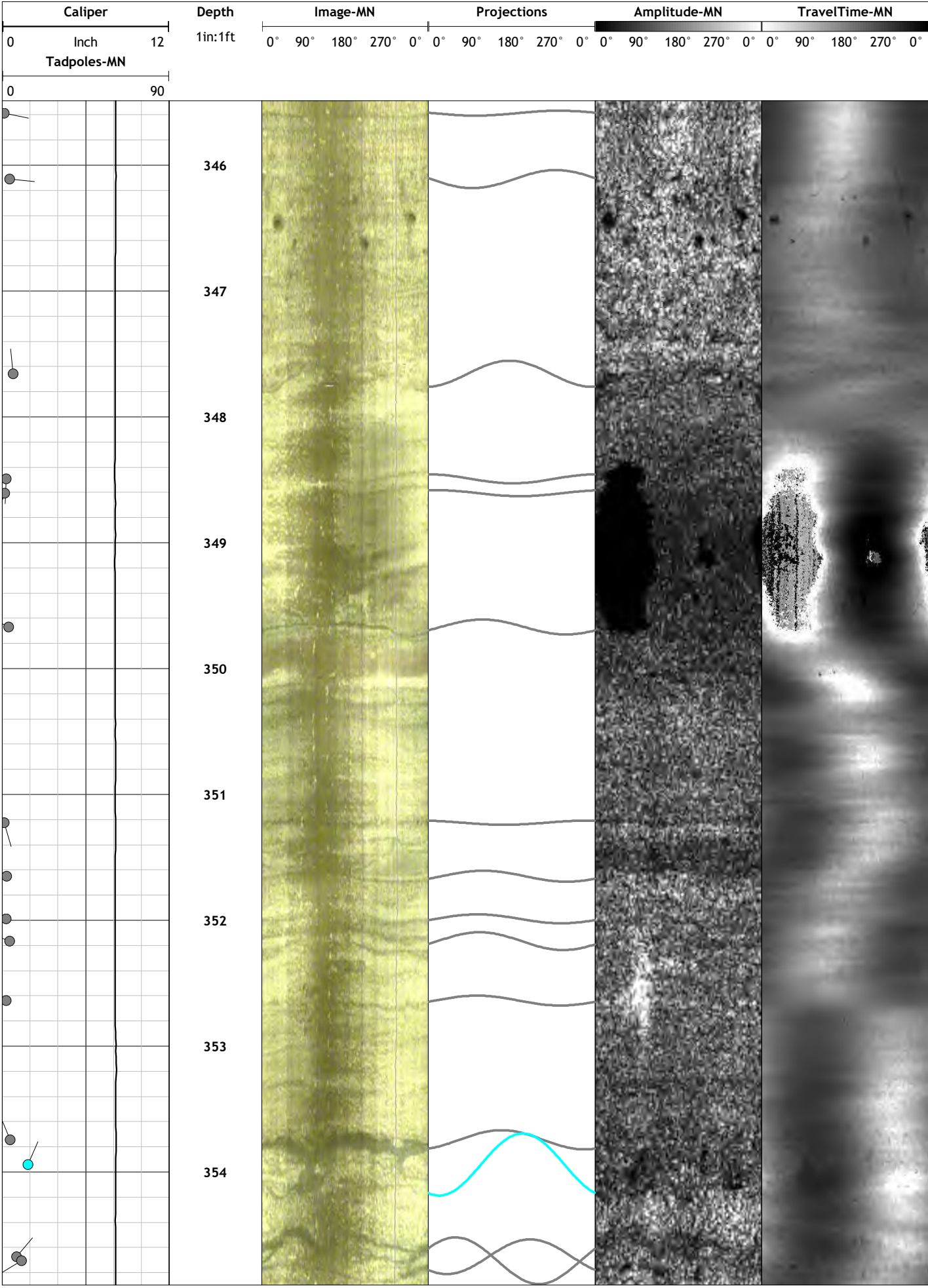


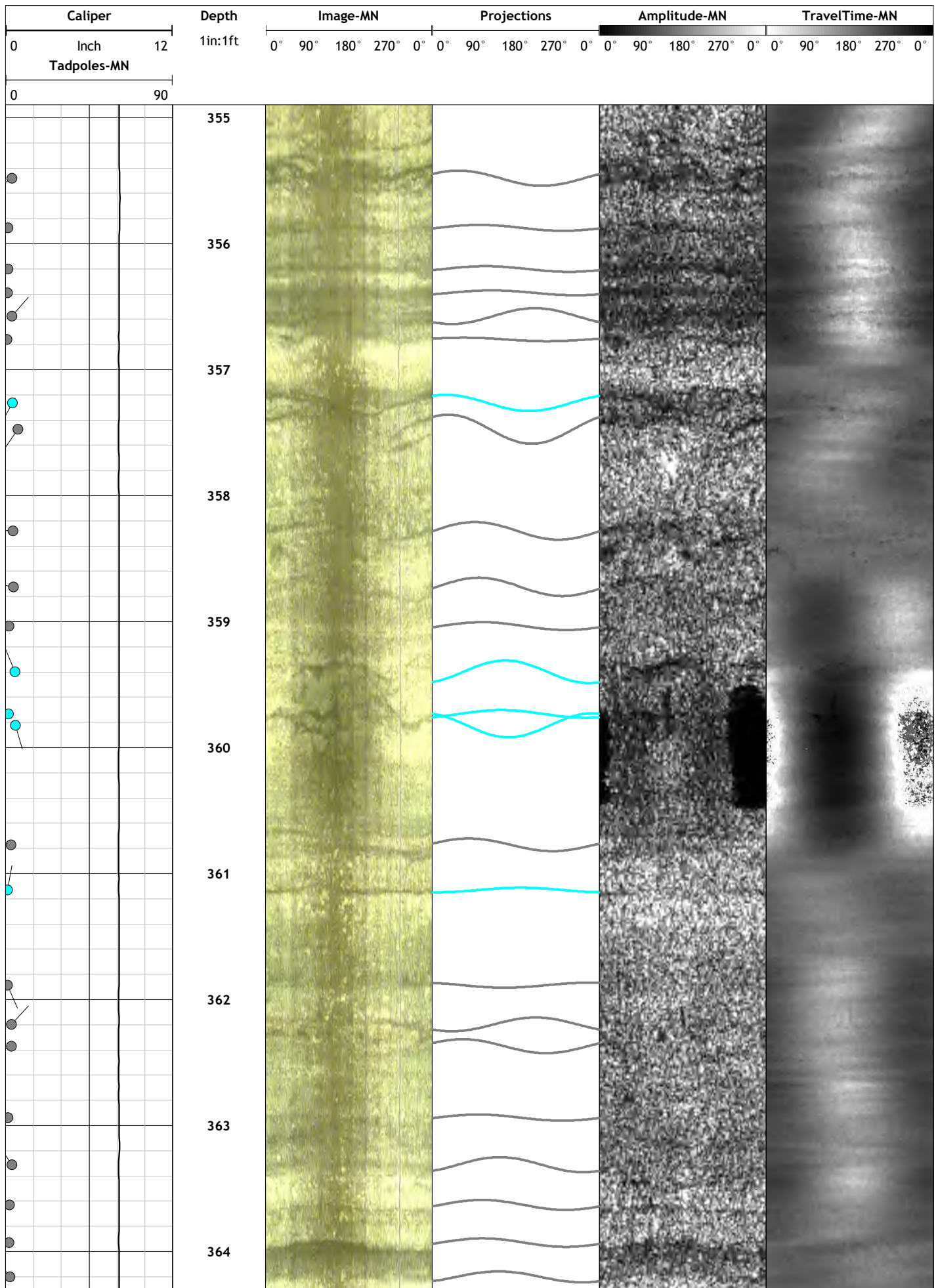


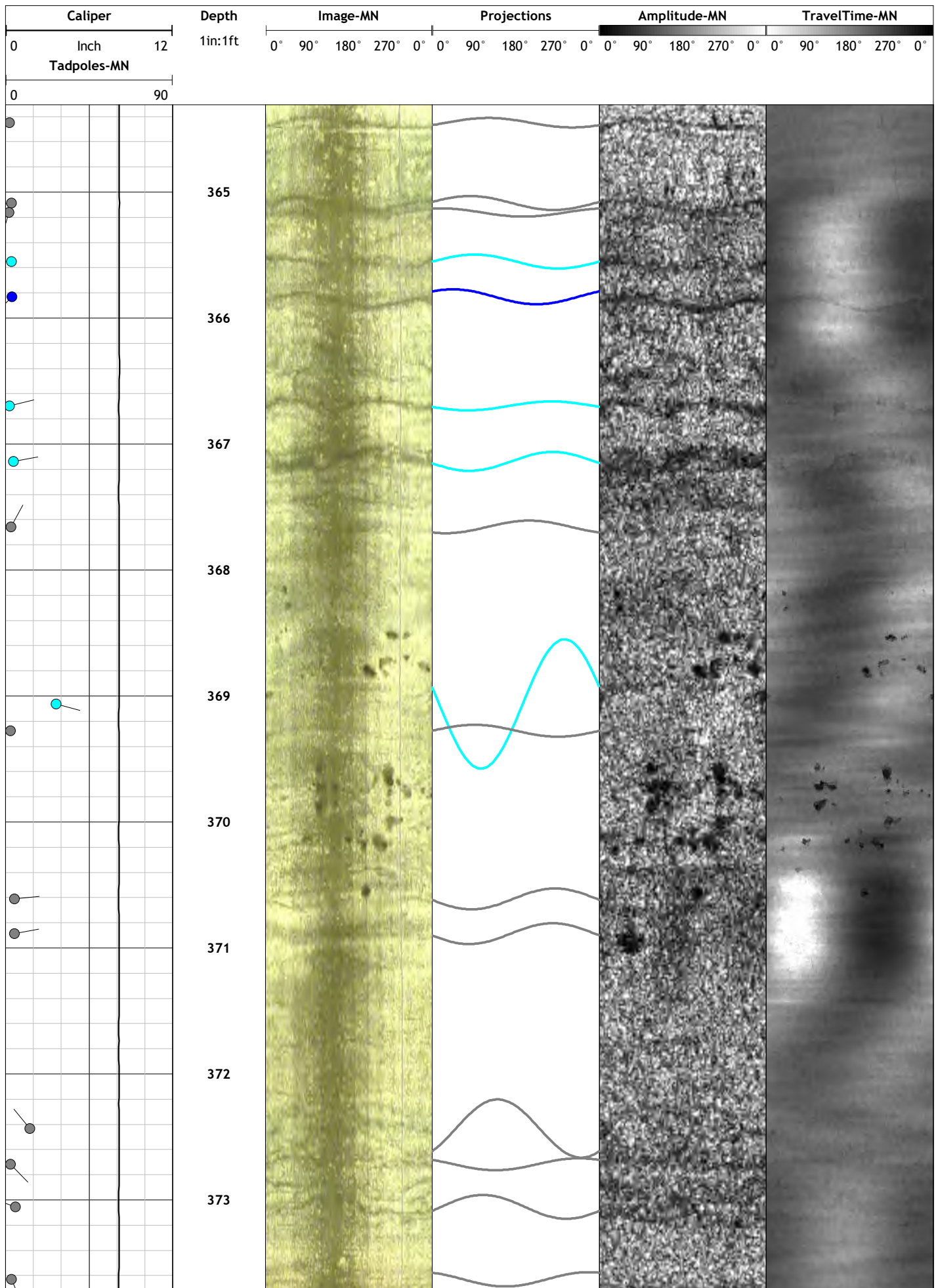


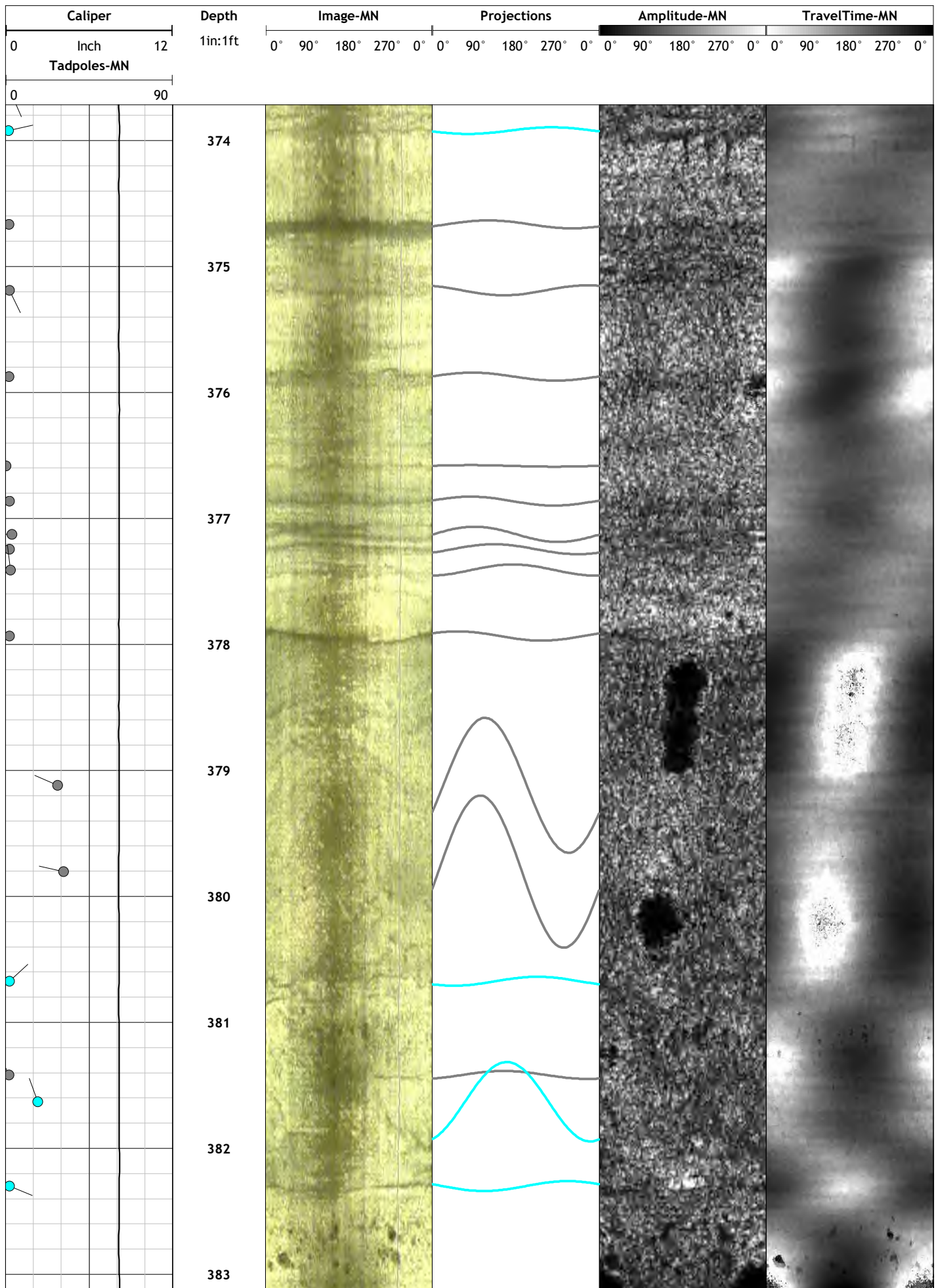


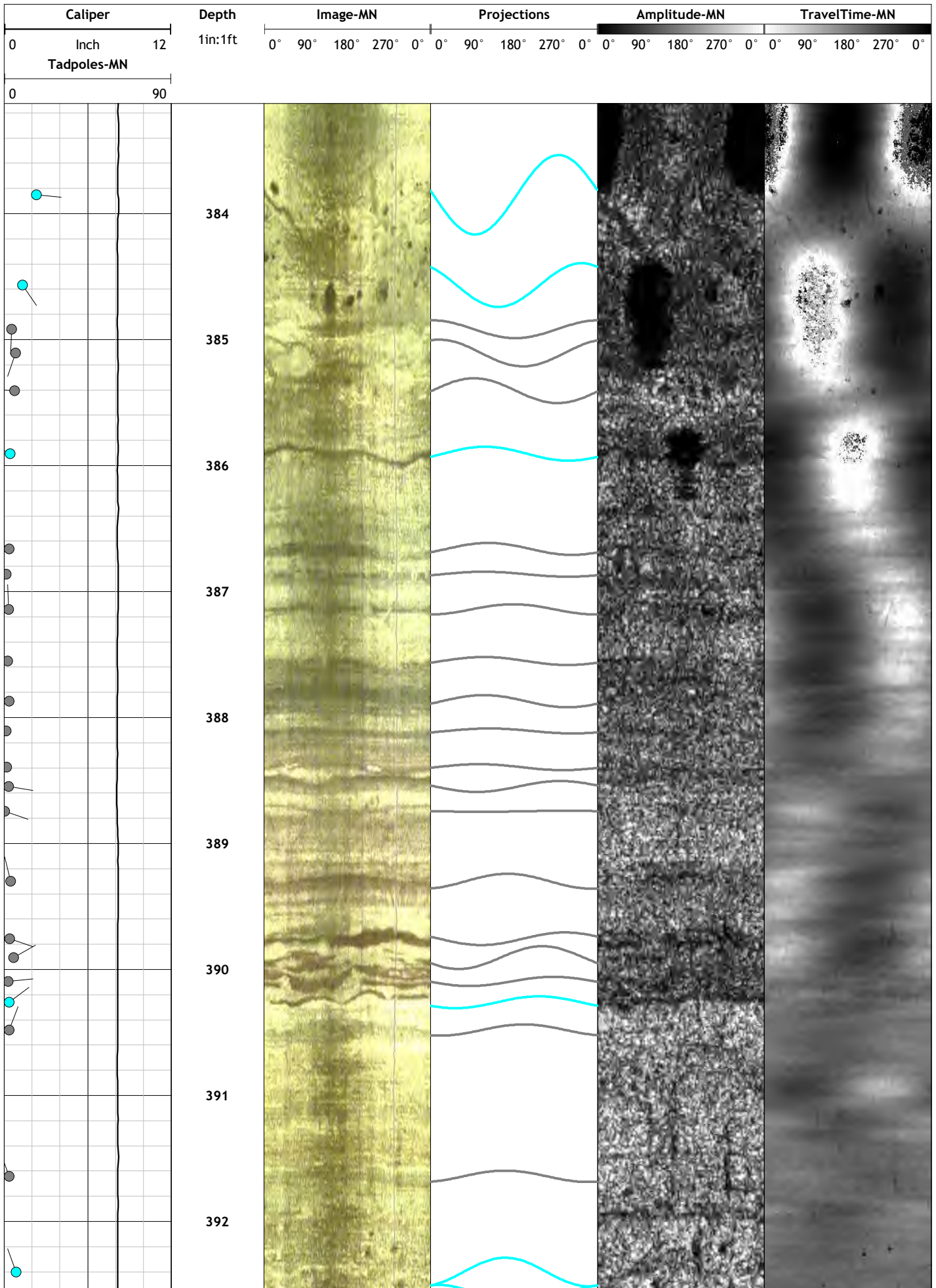


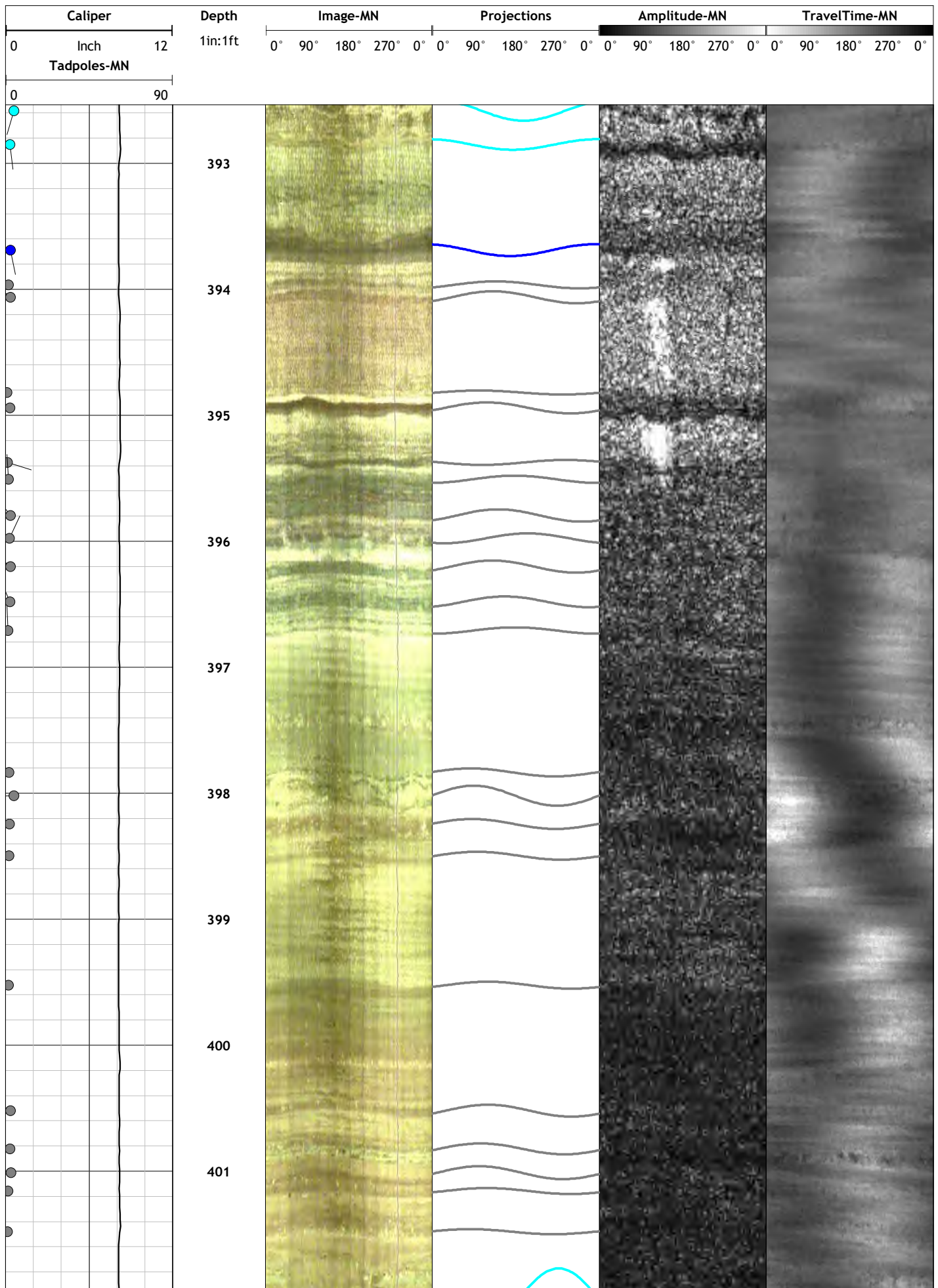


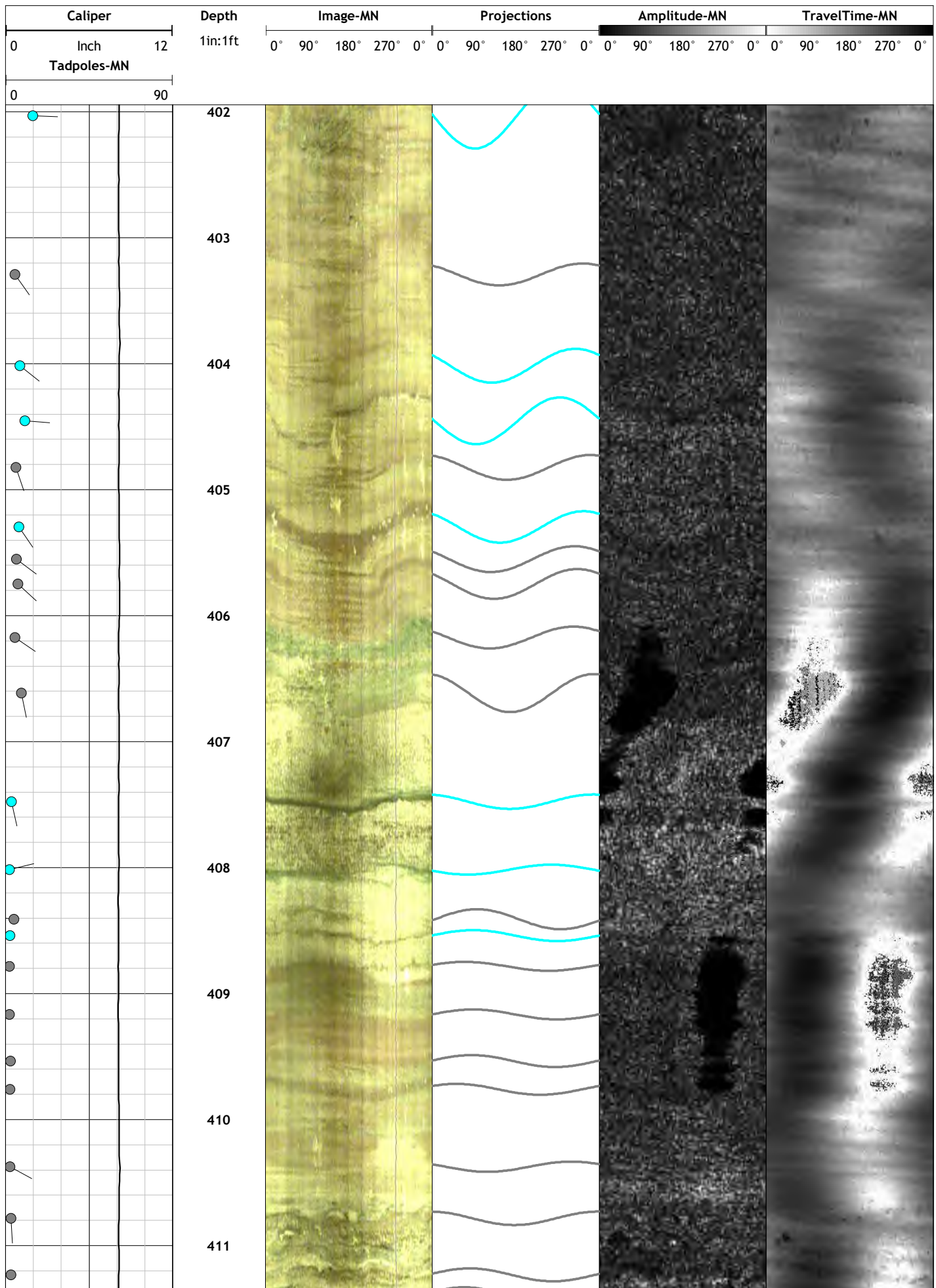


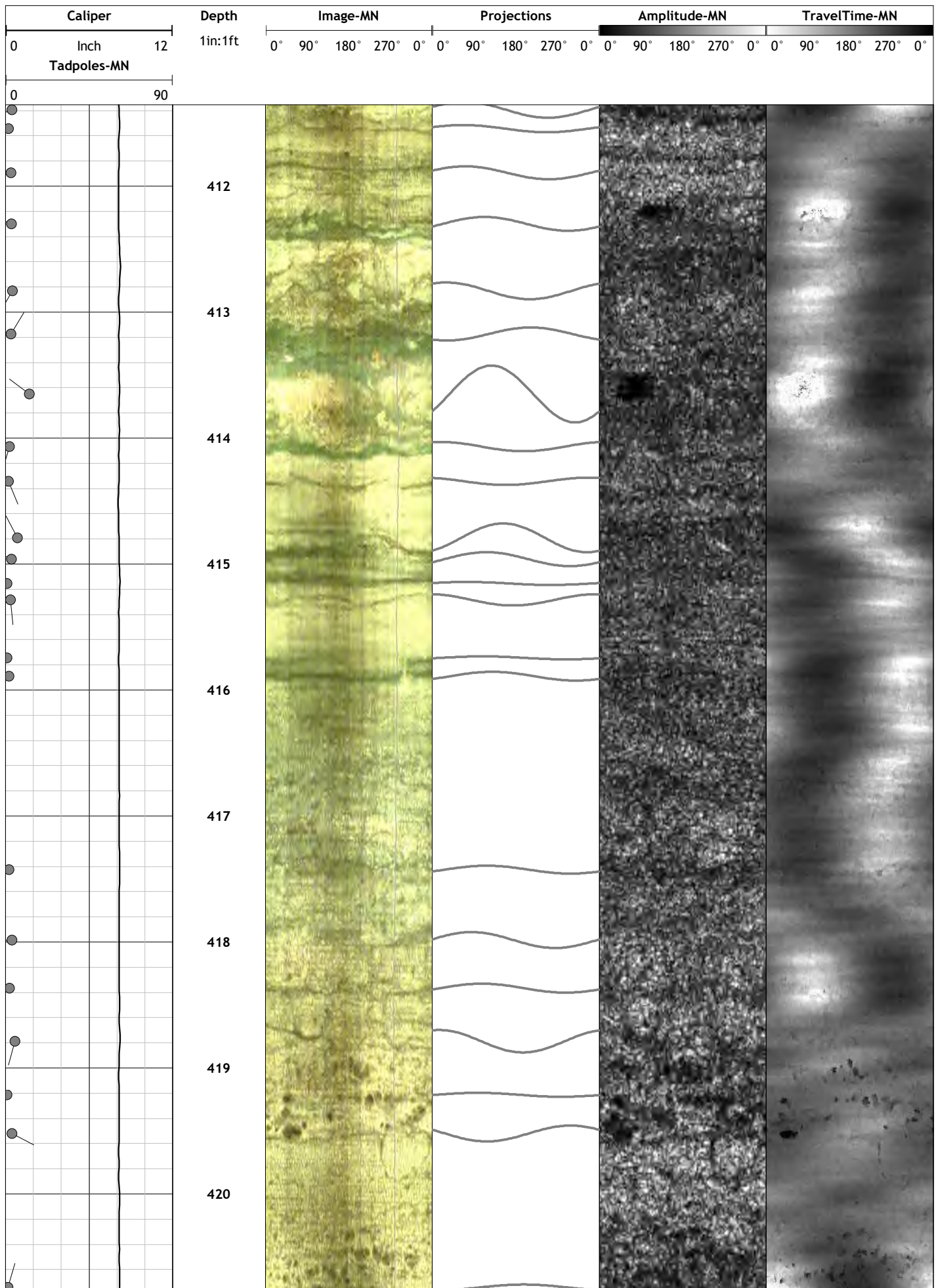


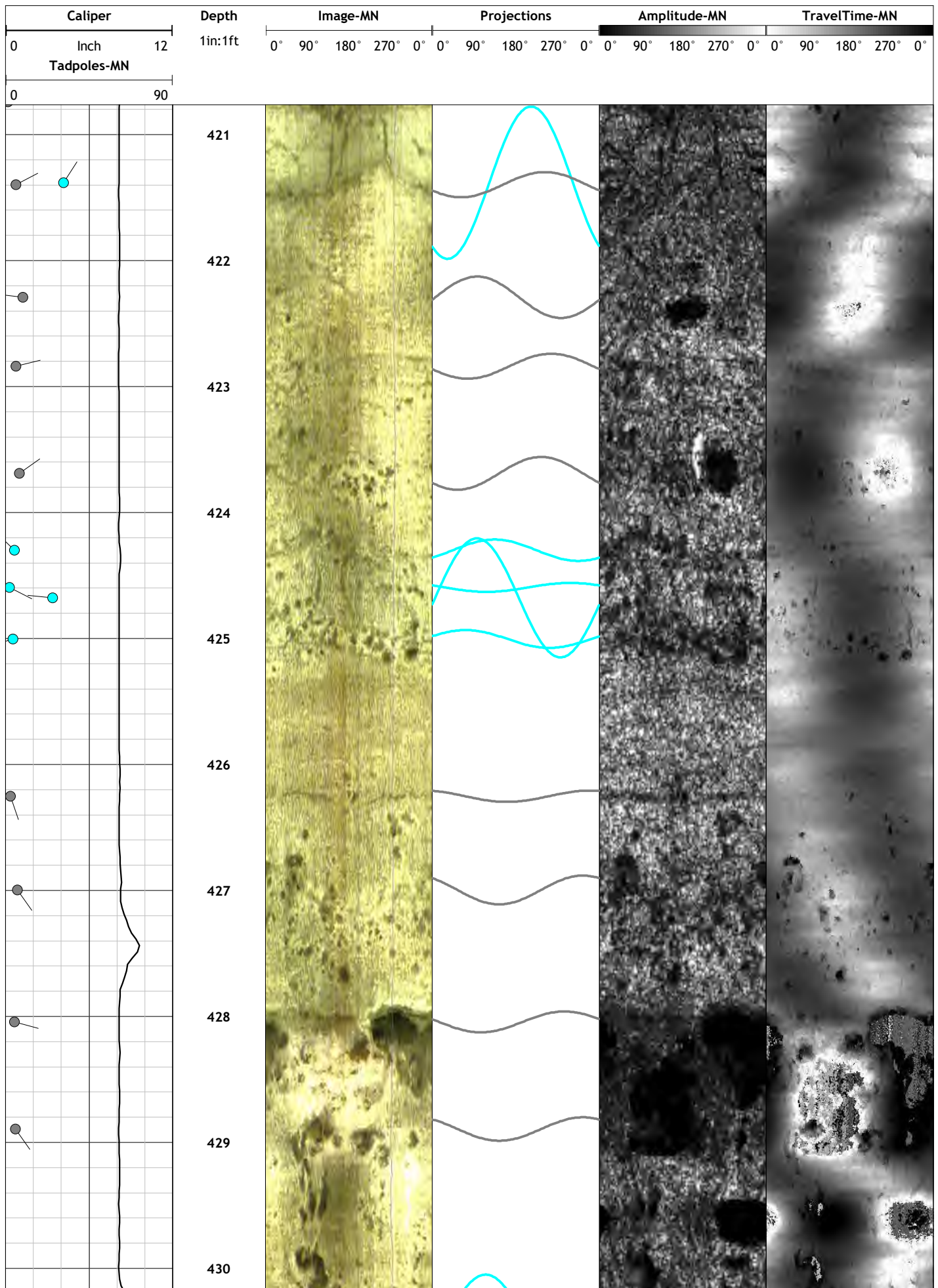


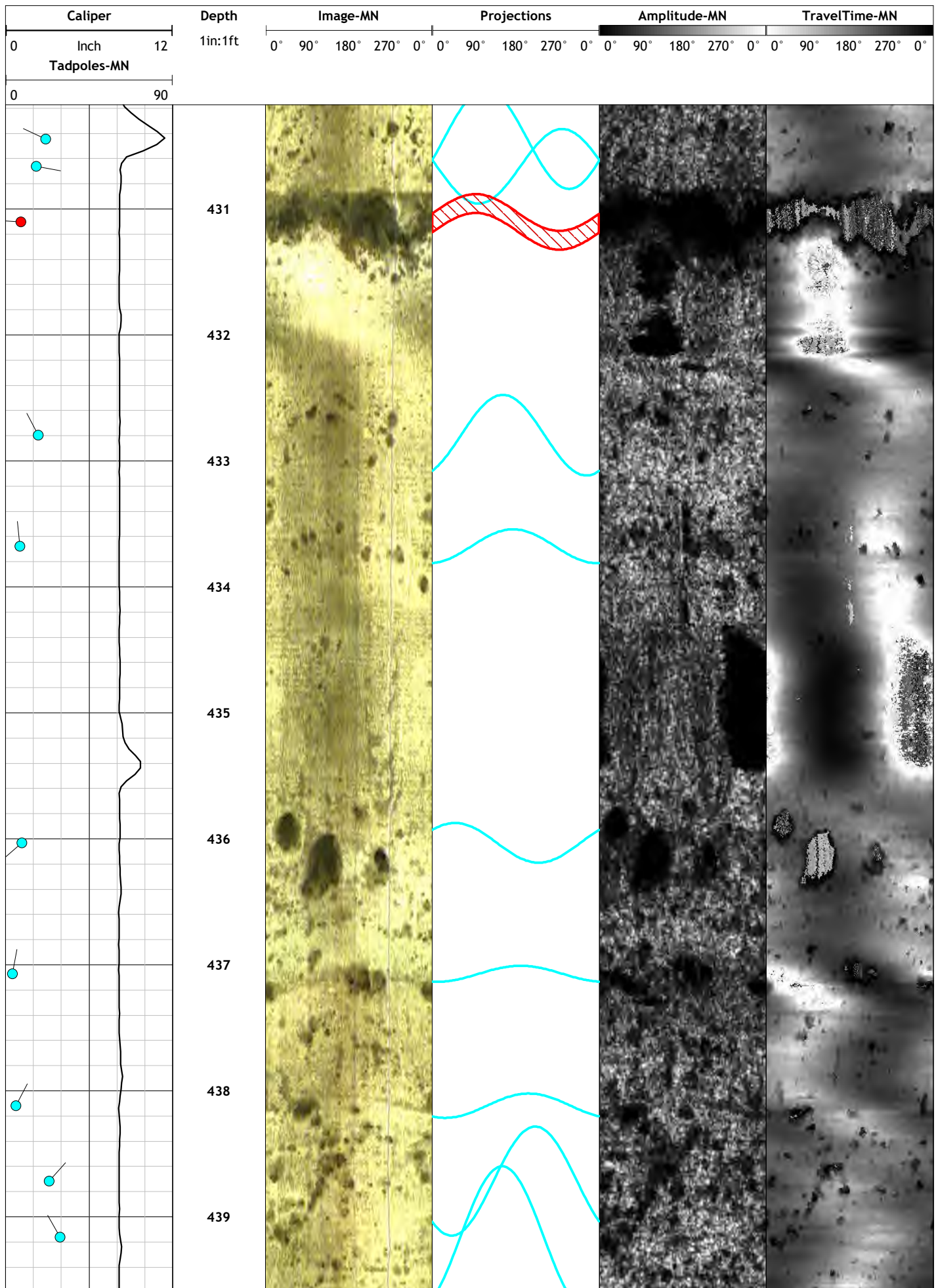


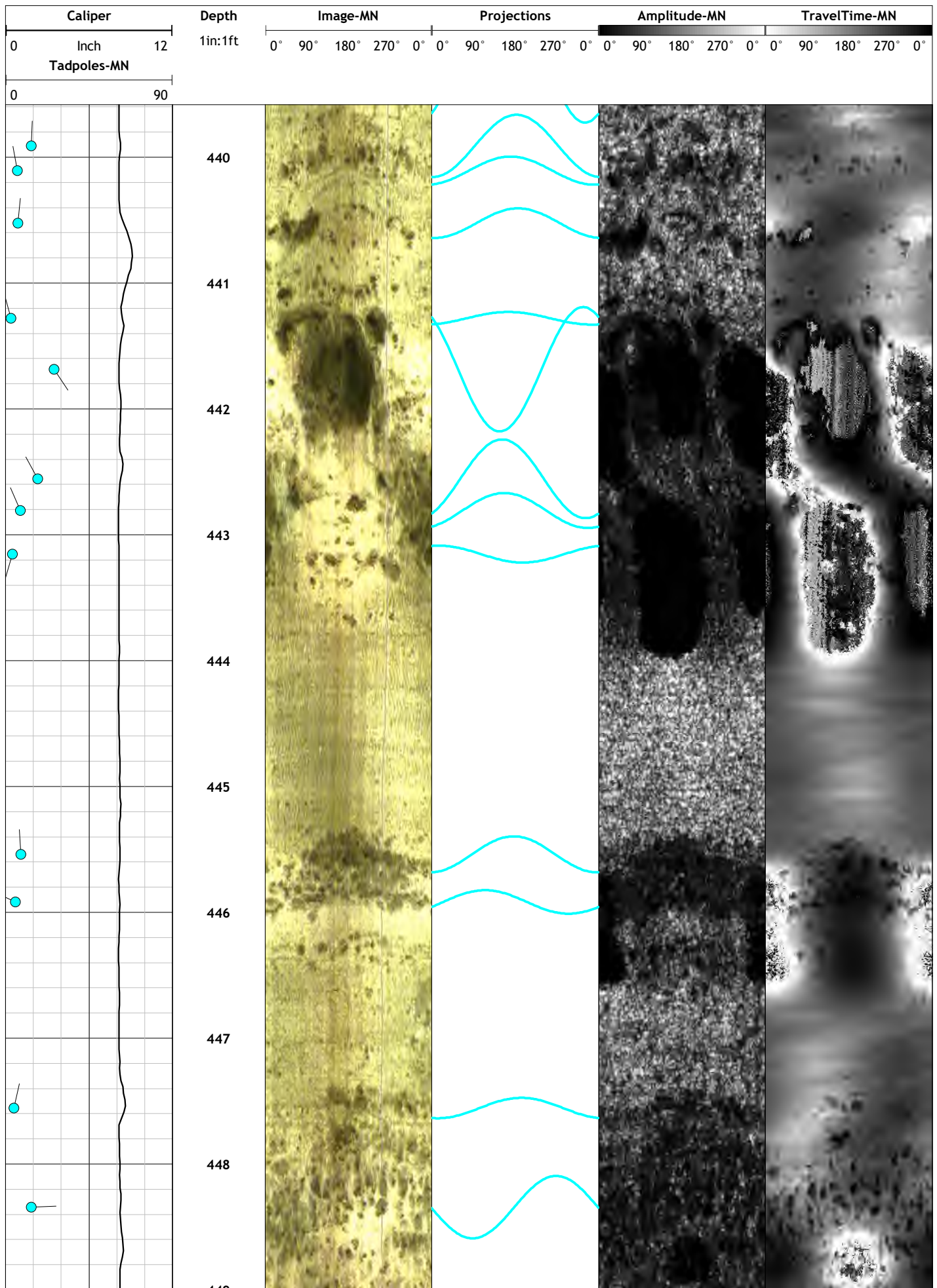


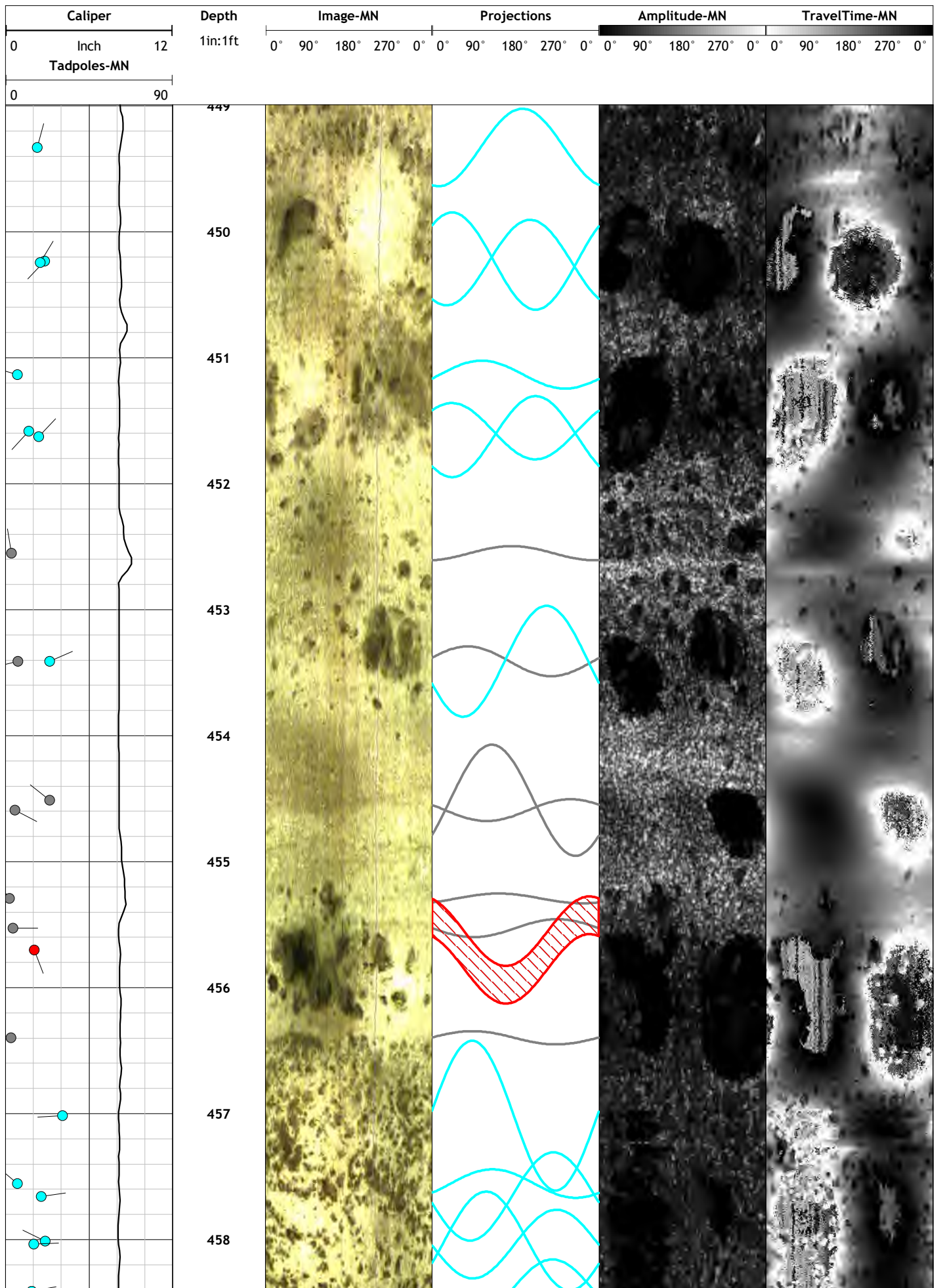


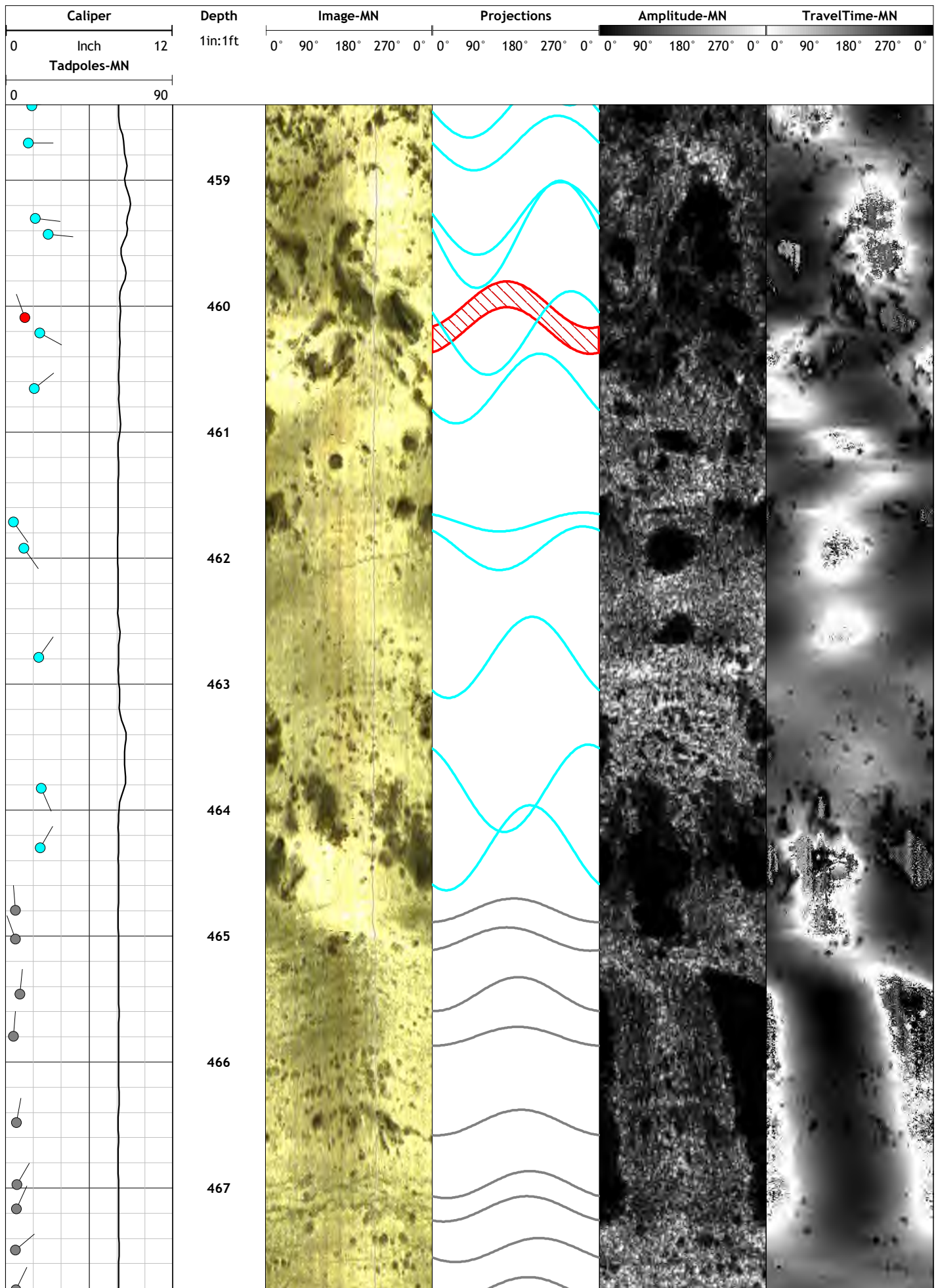


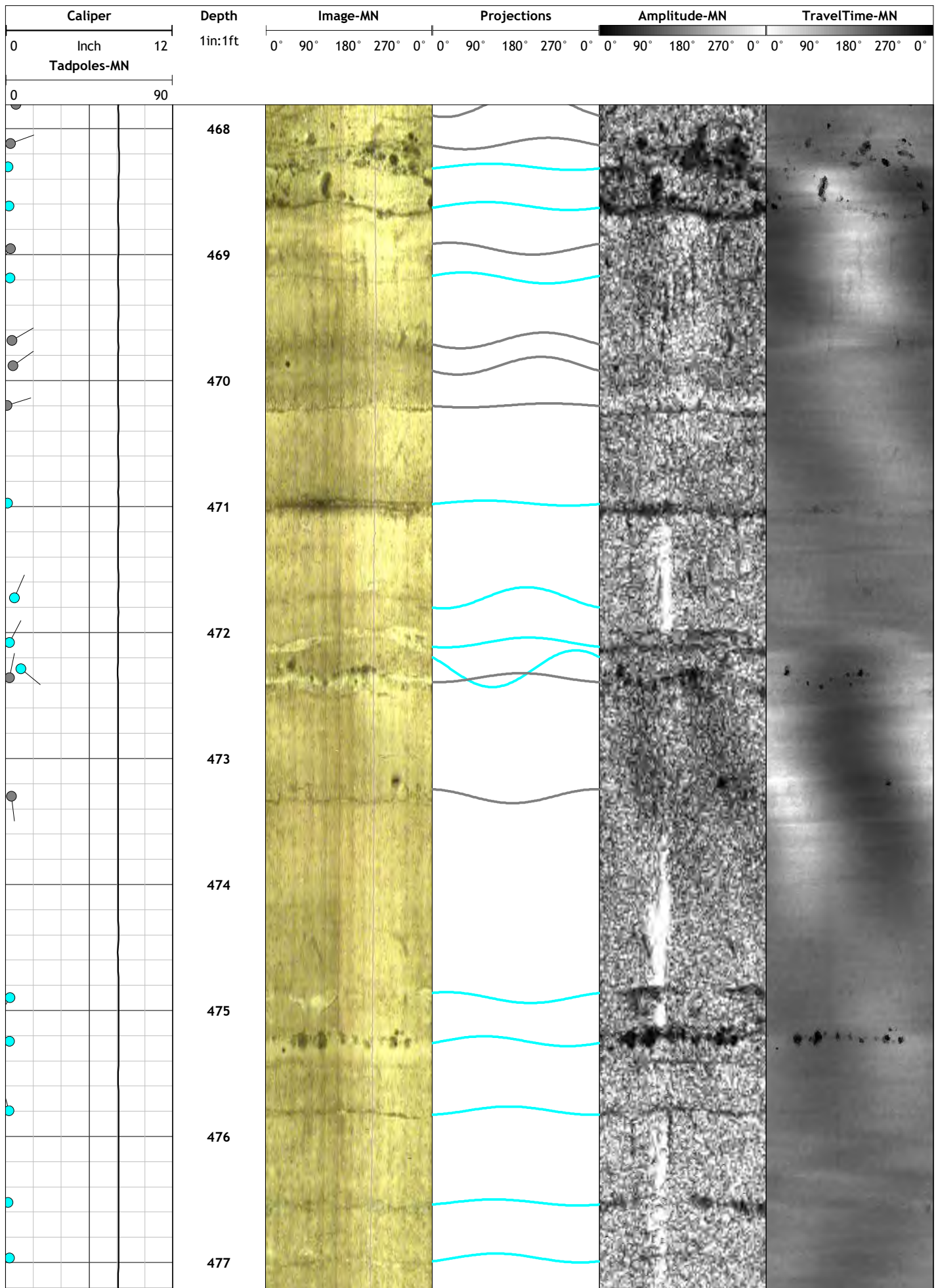


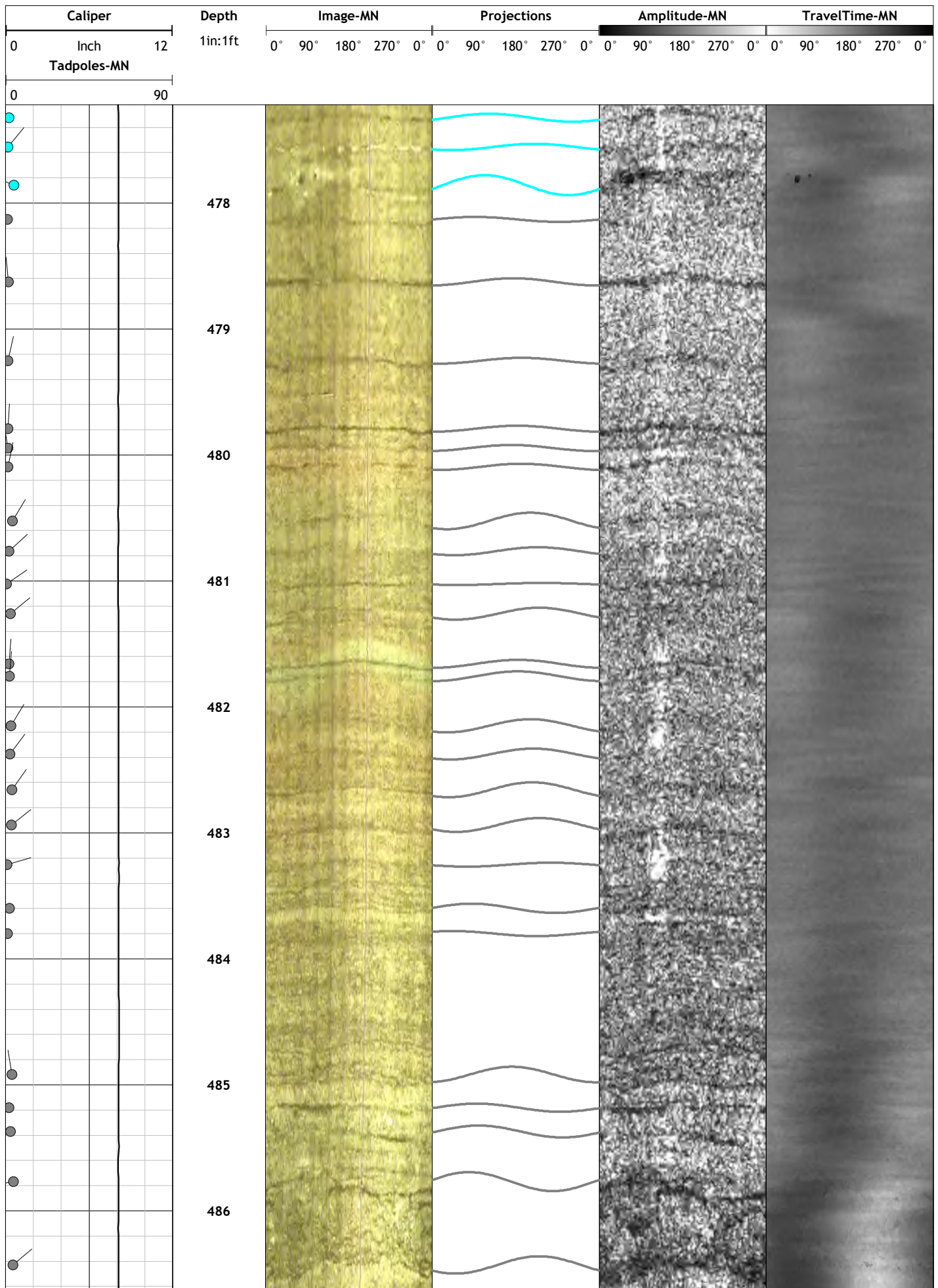


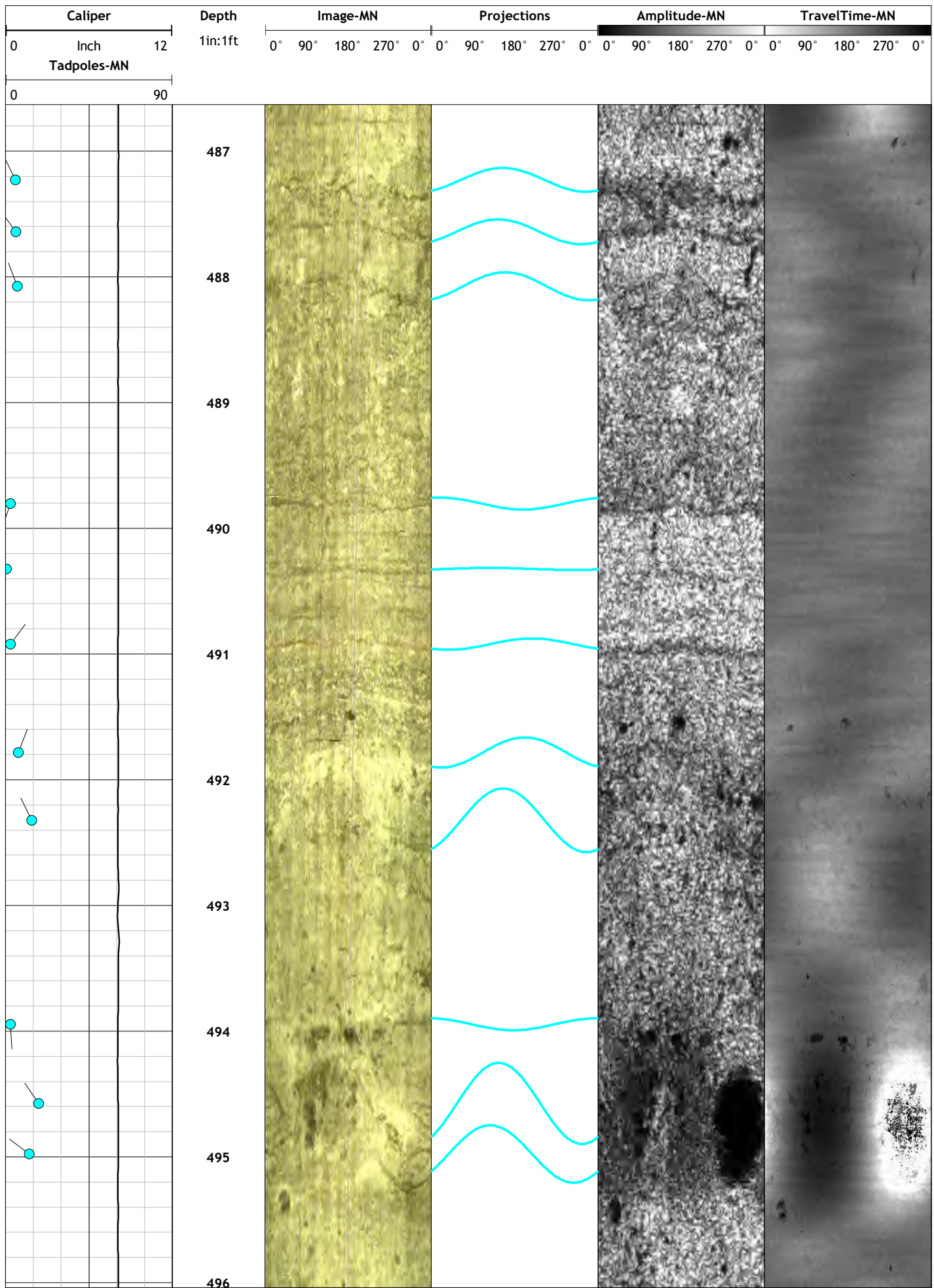


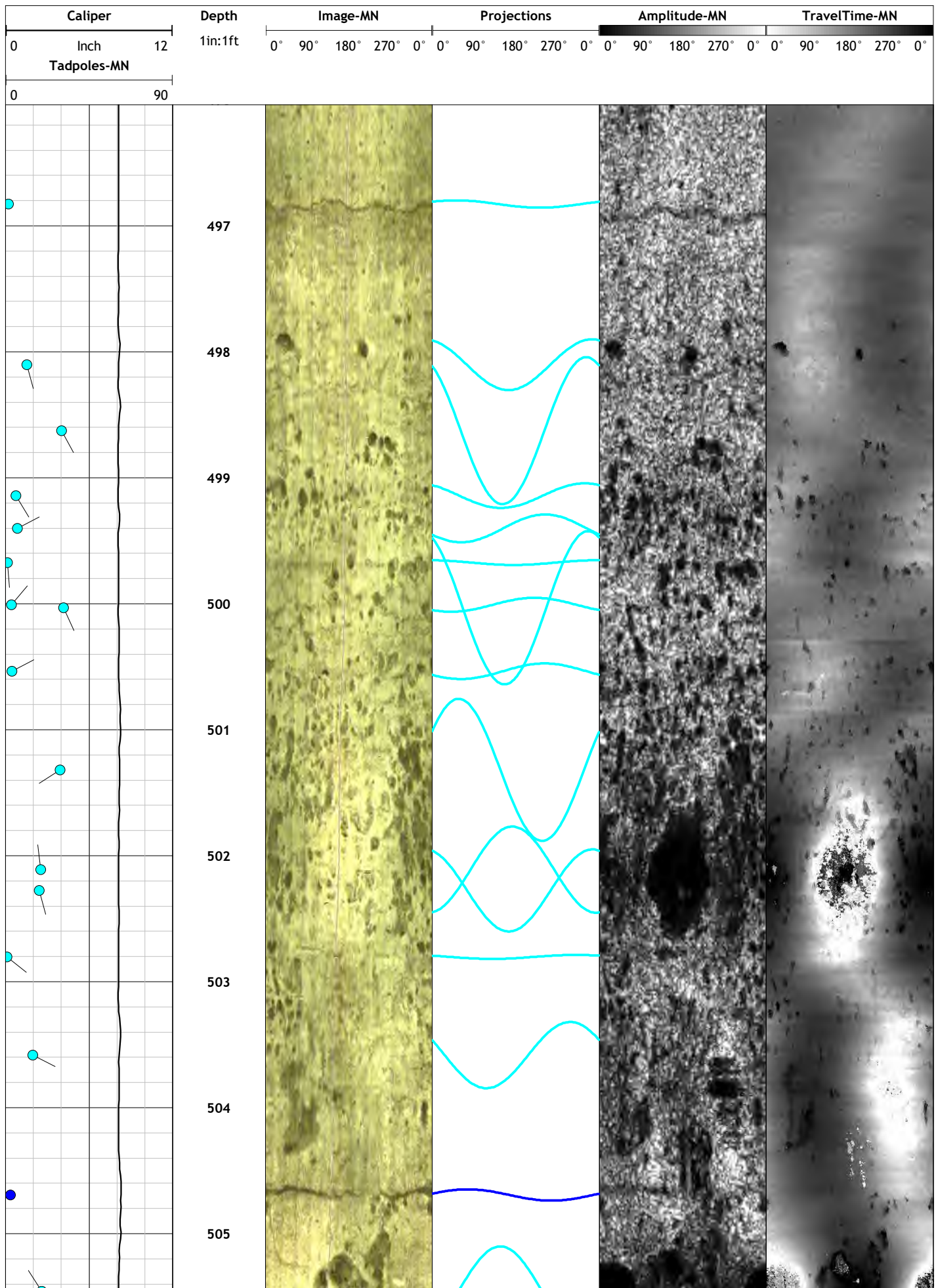


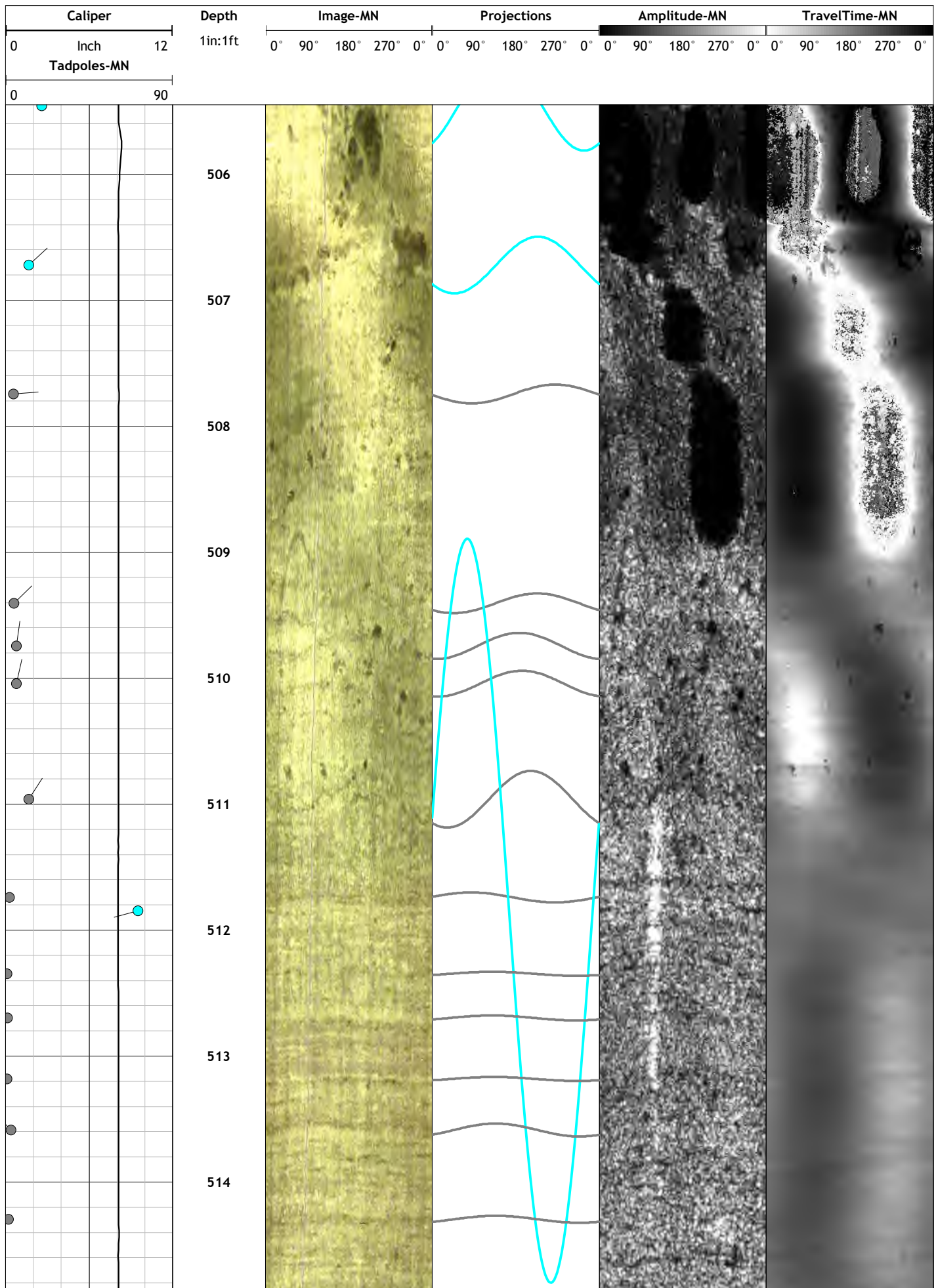


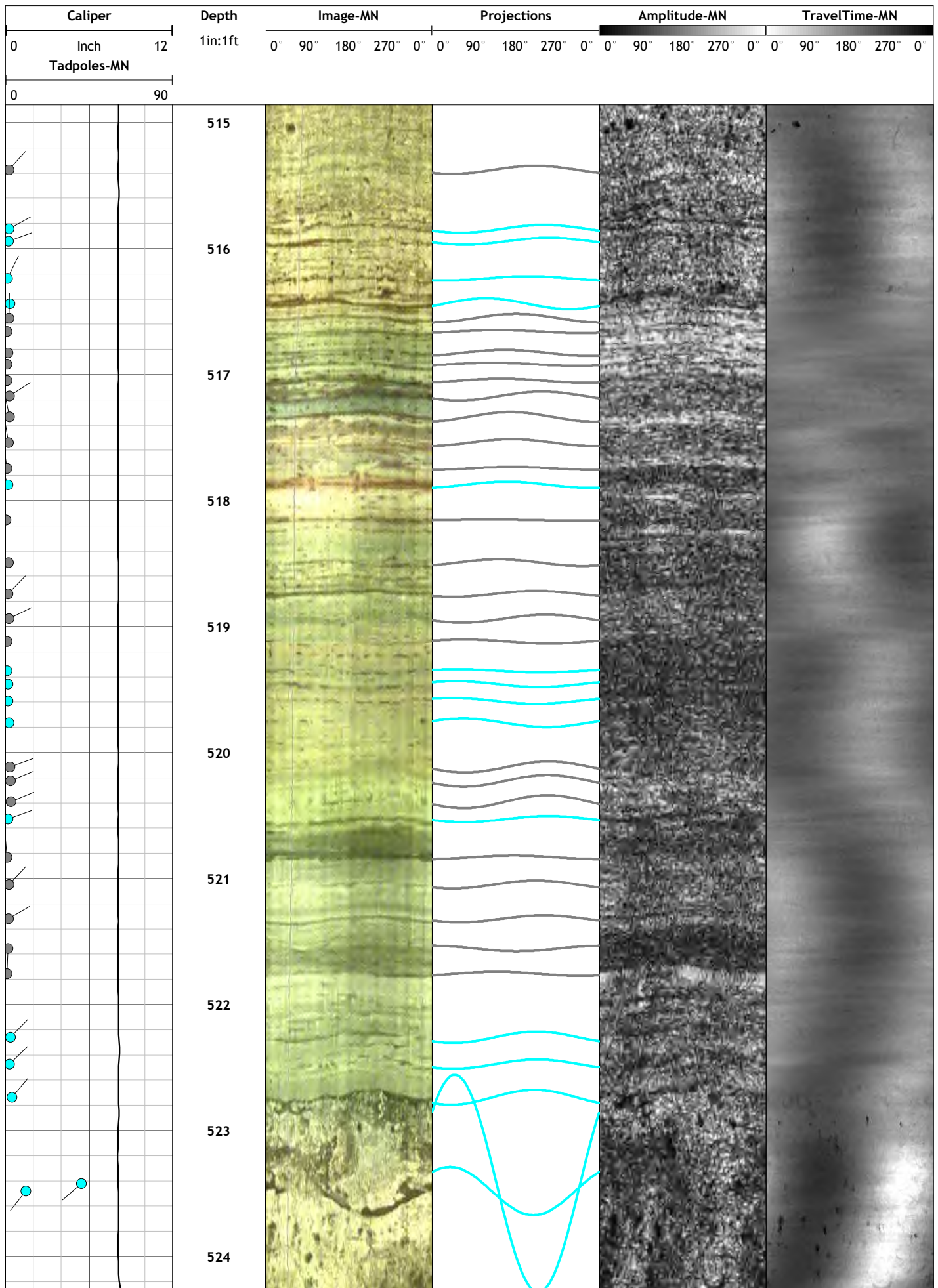


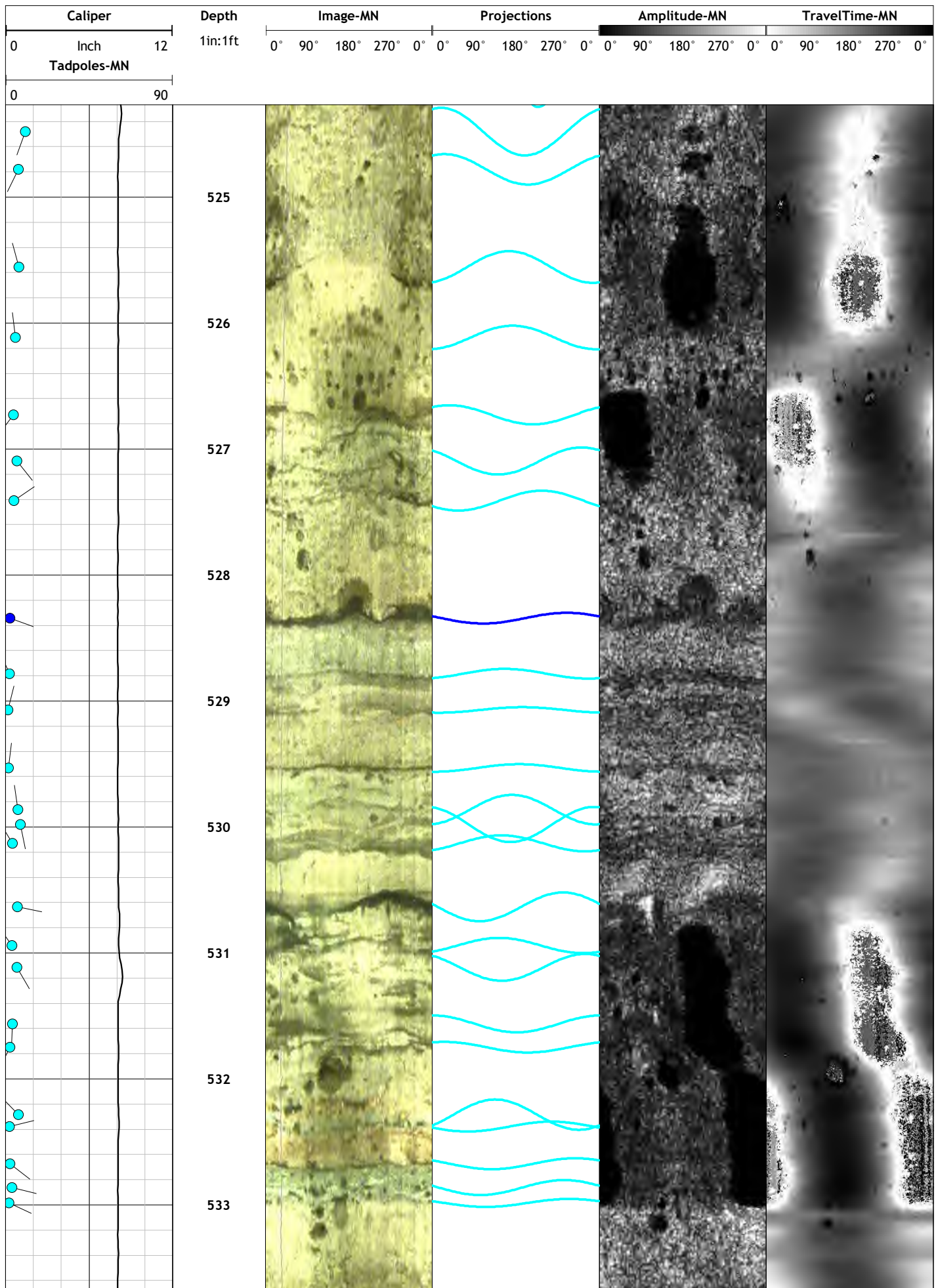


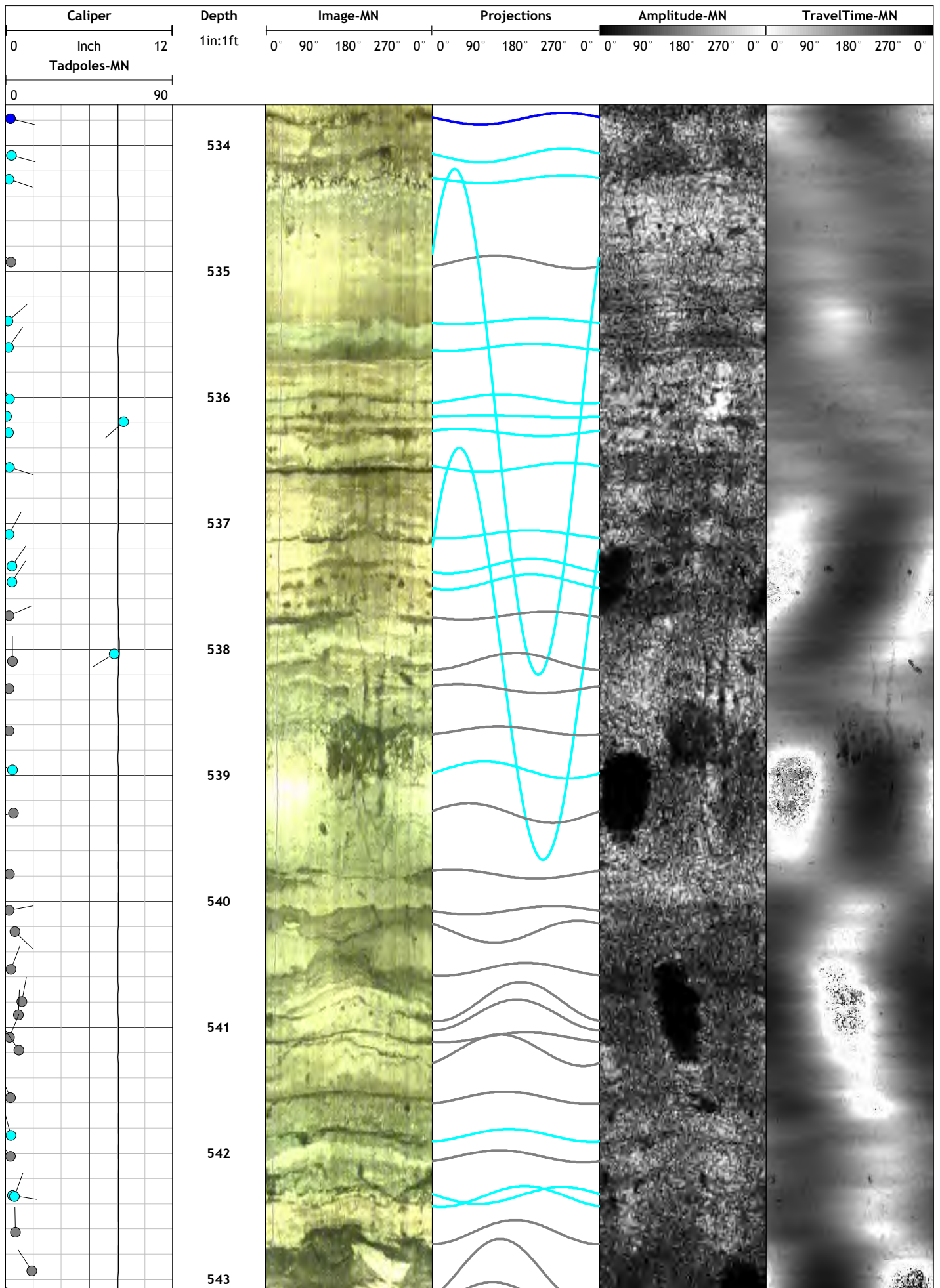


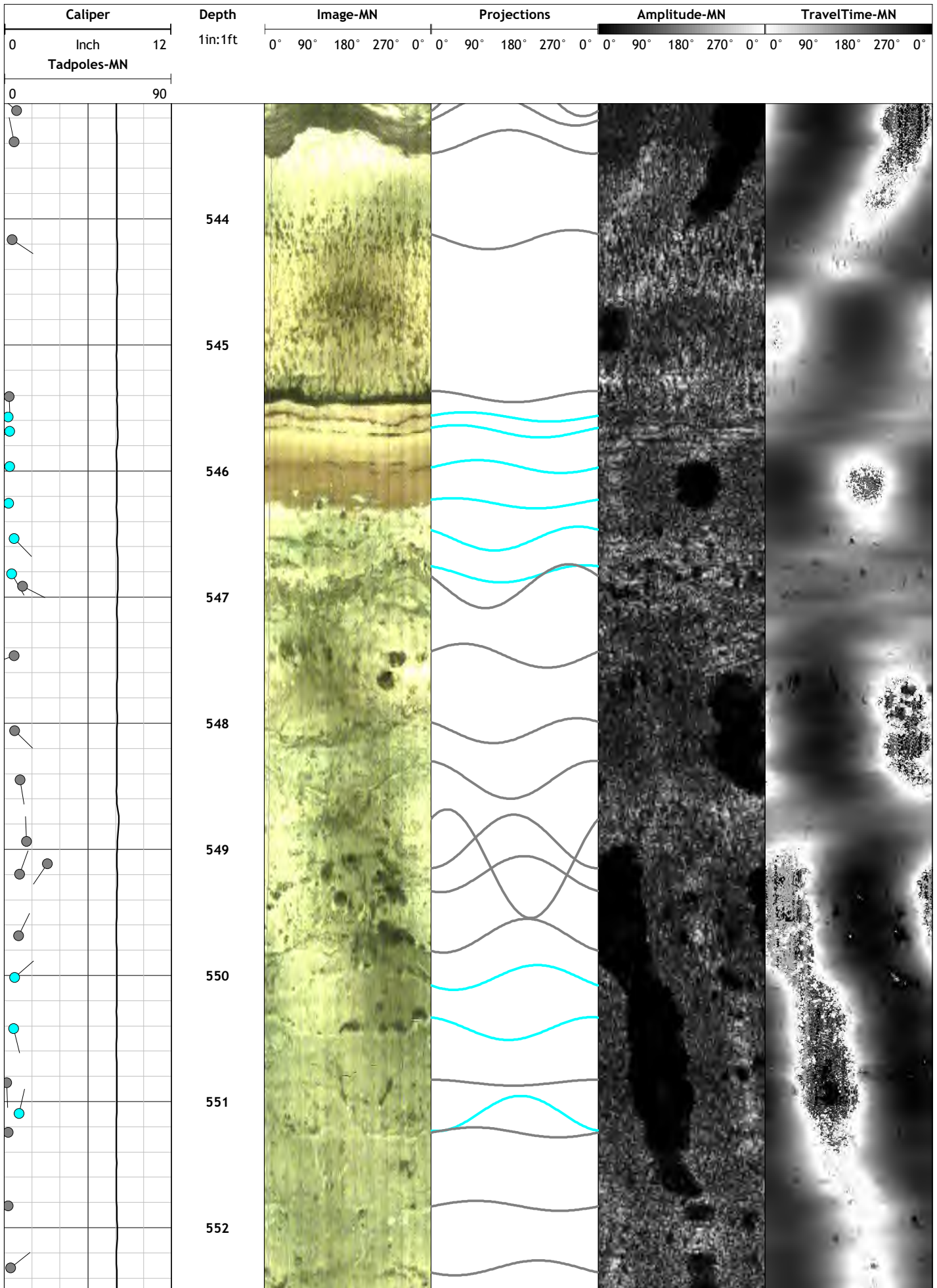


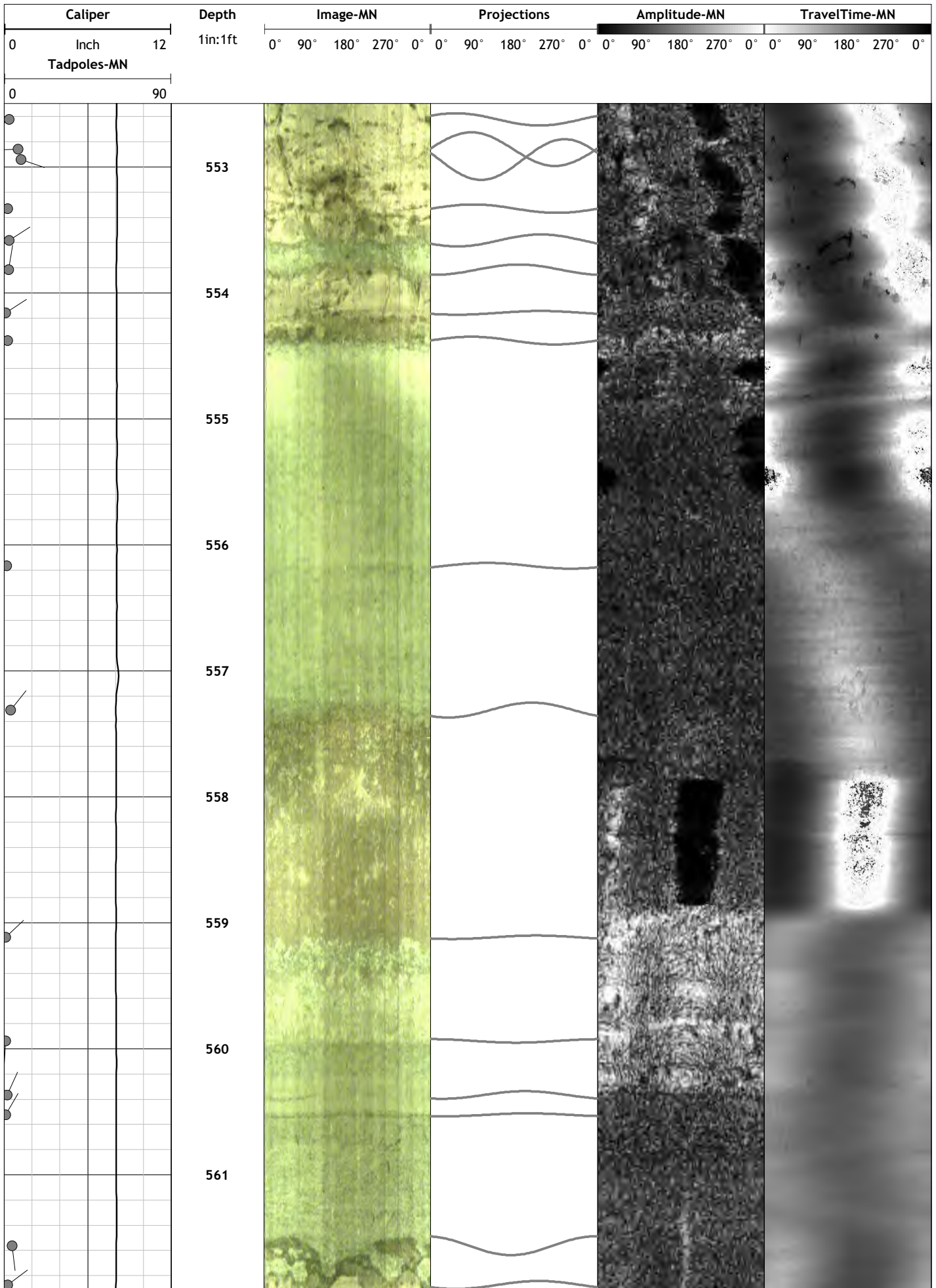


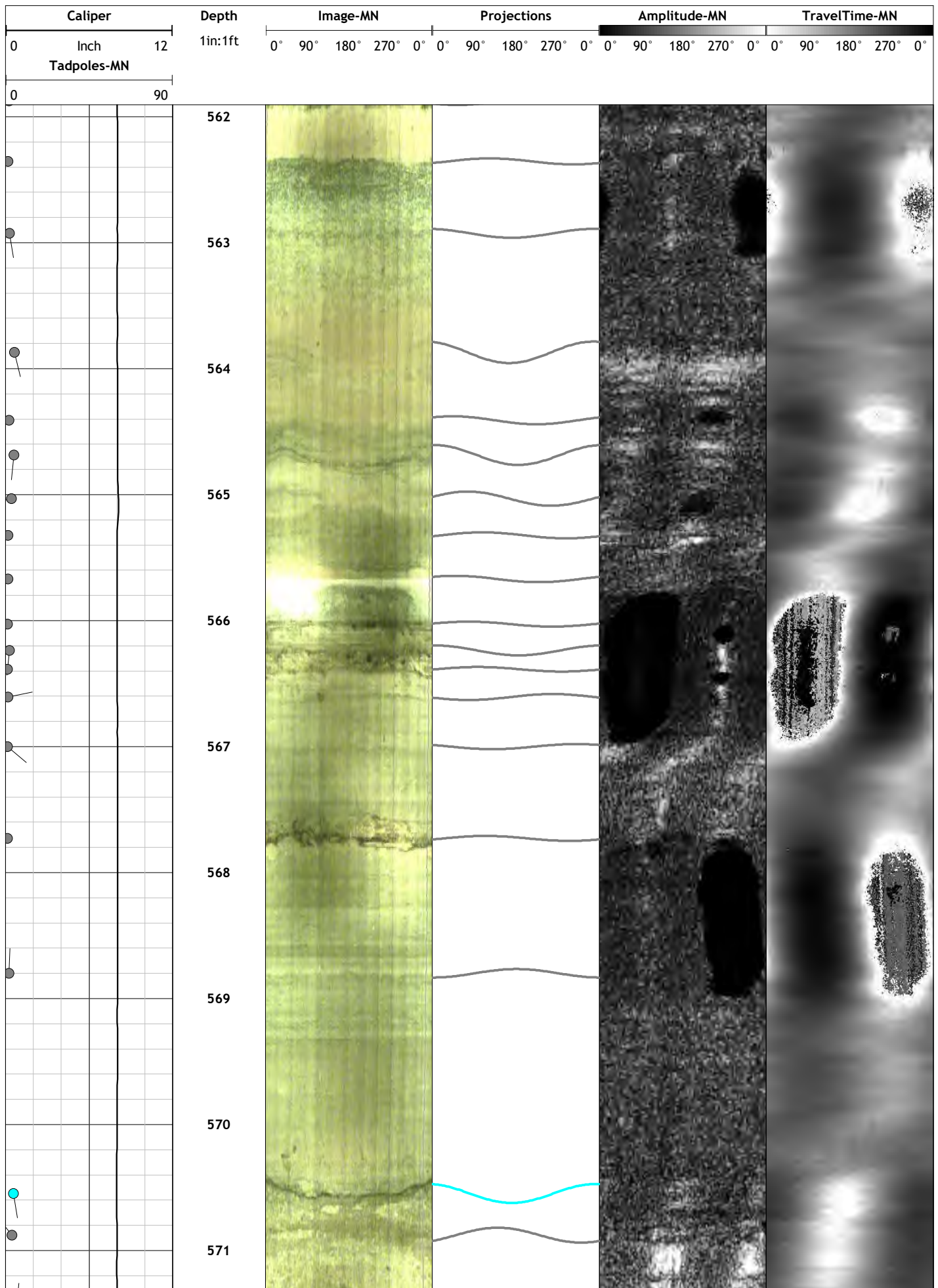


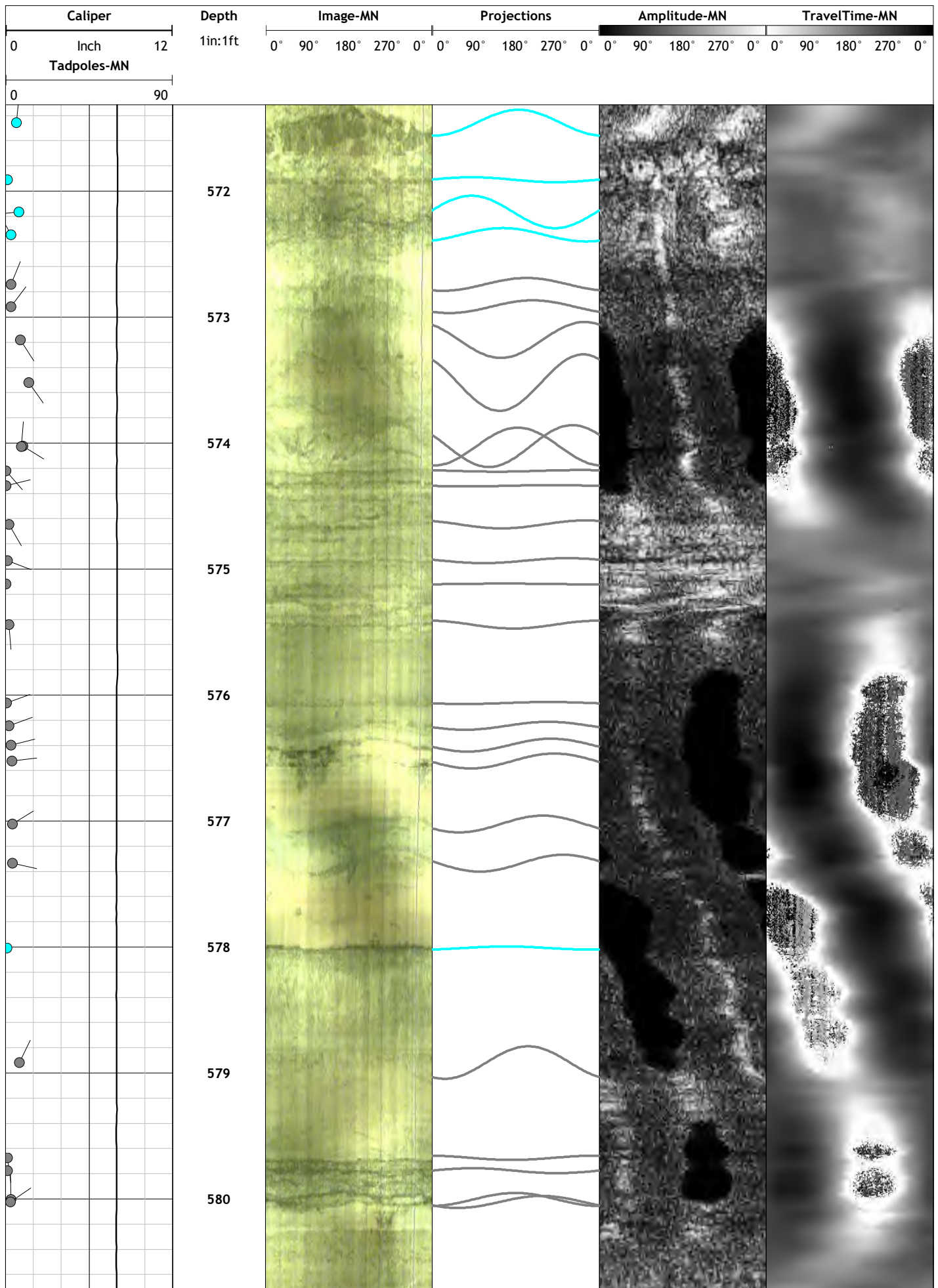












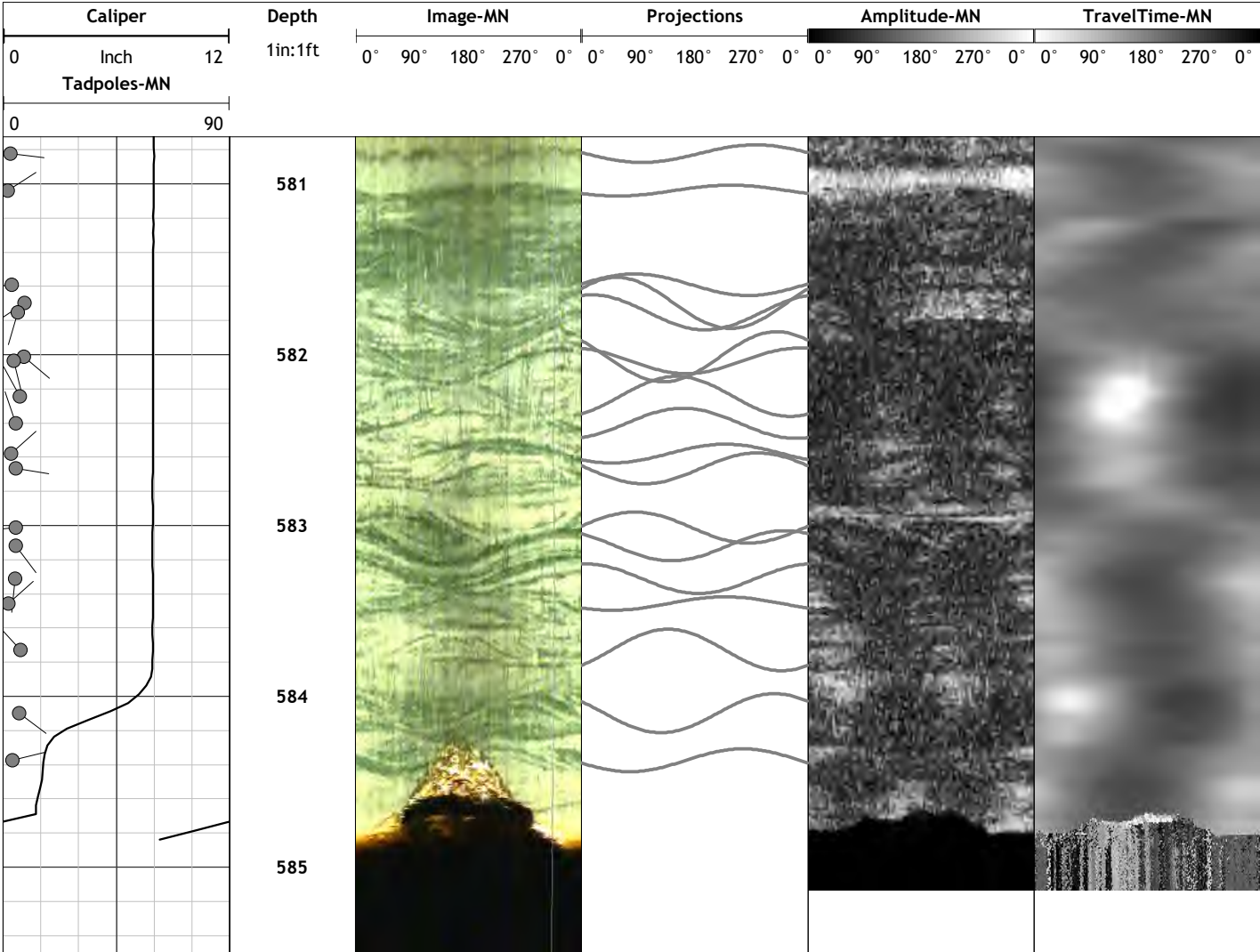
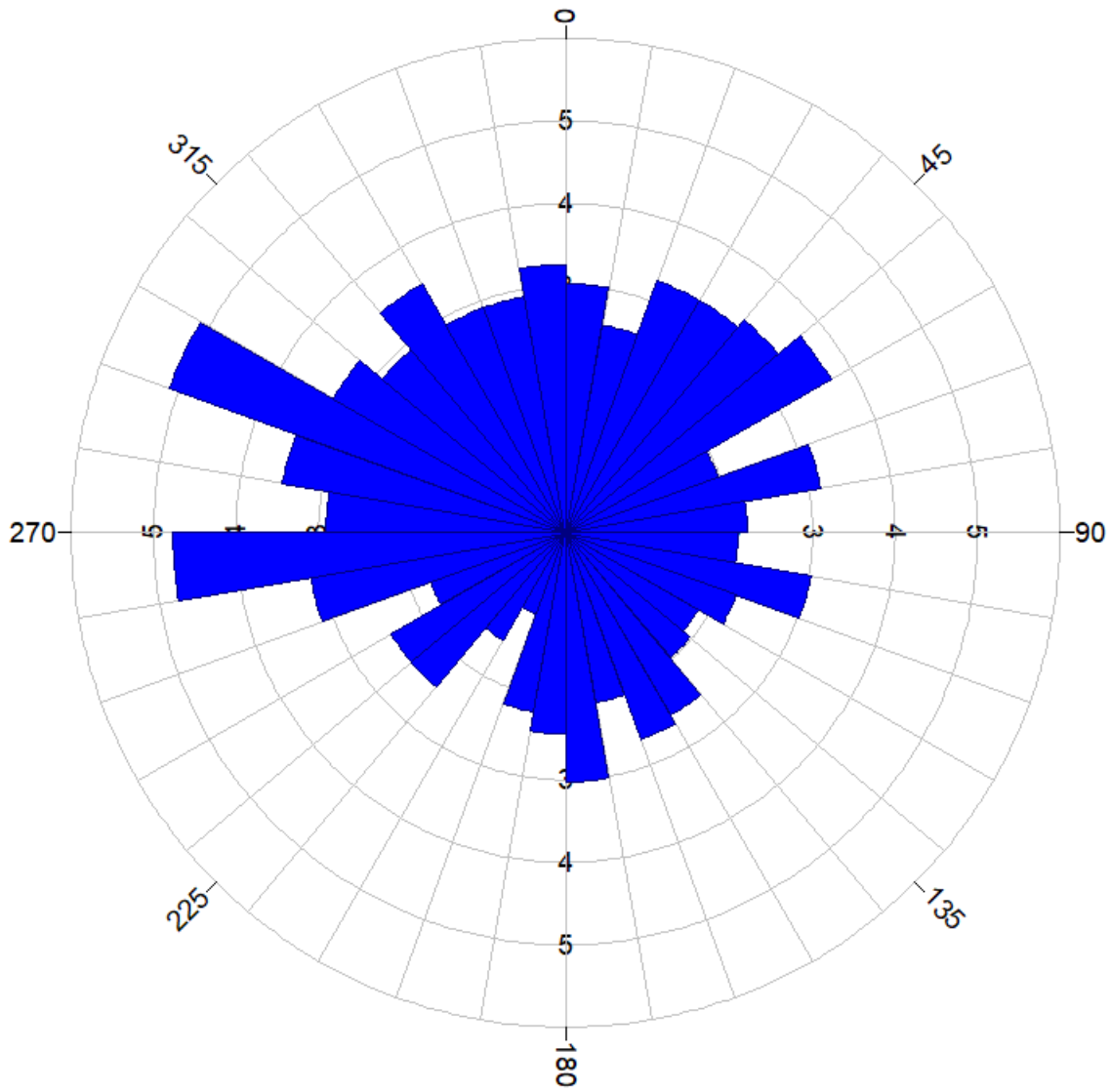


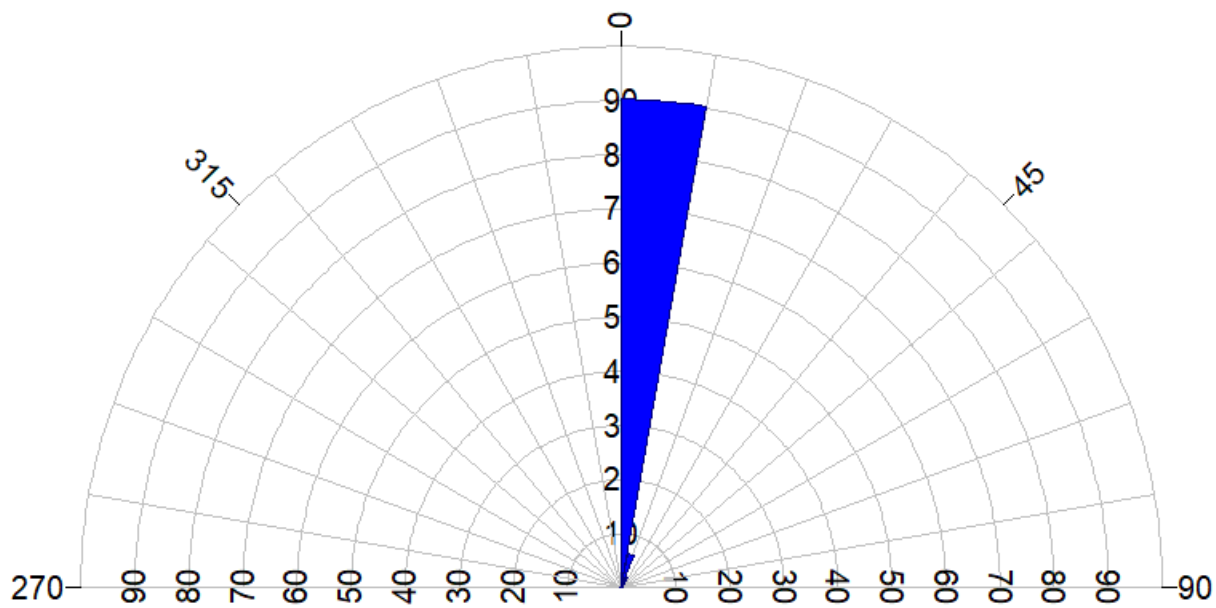
Figure IRR-02:1. Rose Diagram - Dip Directions
Televiewer Image Features
Arcadis
Marinette
IRR-02
20 May 2022



All directions are with respect to Magnetic North.

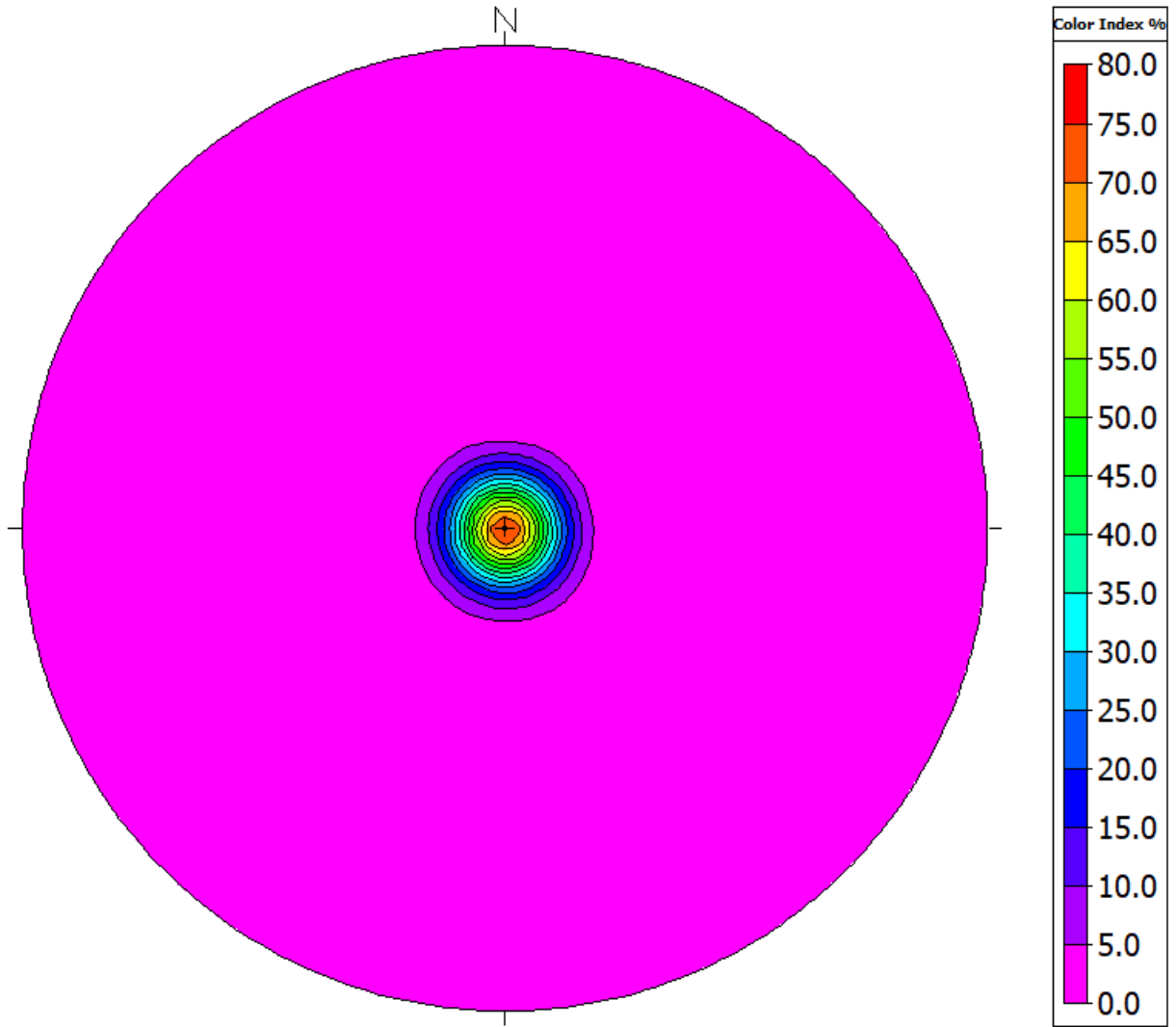


Figure IRR-02:2. Rose Diagram - Dip Angles
Televiewer Image Features
Arcadis
Marinette
IRR-02
20 May 2022



All directions are with respect to Magnetic North.

Figure IRR-02:3. Stereonet Diagram - Schmidt Projection
Televiewer Image Features
Arcadis
Marinette
IRR-02
20 May 2022



All directions are with respect to Magnetic North.

Figure IRR-02:4. Stereonet Diagram - Schmidt Projection
Televiewer Image Features
Arcadis
Marinette
IRR-02
20 May 2022

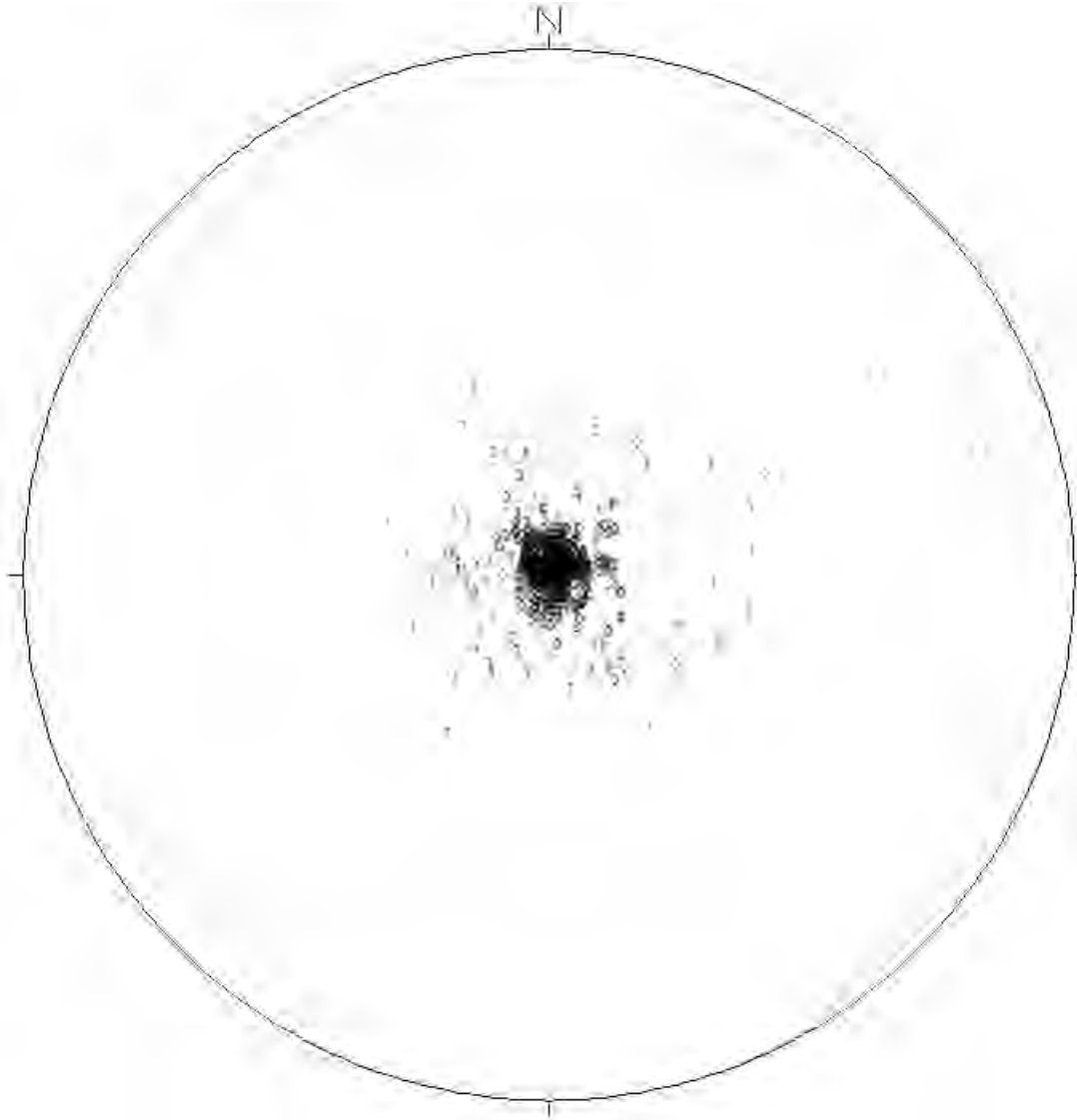




Table IRR-02:1. Orientation Summary Table
TelevIEWer Image Features
Arcadis
Marinette
IRR-02
20 May 2022

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
1	30.28	99.4	211	2	0	1
2	32.51	106.7	59	1	0	0
3	33.01	108.3	138	1	0	0
4	33.28	109.2	98	1	0	0
5	33.37	109.5	102	2	0	0
6	33.56	110.1	327	3	0	0
7	33.68	110.5	281	2	0	0
8	33.73	110.7	314	3	0	0
9	34.02	111.6	345	3	0	0
10	34.55	113.4	189	1	0	0
11	34.61	113.6	259	2	0	0
12	34.73	113.9	40	1	0	0
13	34.83	114.3	38	1	0	2
14	35.21	115.5	68	2	0	0
15	35.38	116.1	110	5	0	0
16	35.79	117.4	187	3	0	0
17	36.29	119.1	26	4	0	1
18	36.62	120.1	273	0	0	0
19	37.06	121.6	84	2	0	0
20	37.33	122.5	76	1	0	0
21	37.49	123.0	250	1	0	0
22	37.66	123.6	157	5	0	1
23	38.10	125.0	185	2	0	0
24	38.18	125.3	138	1	0	0
25	38.22	125.4	228	2	0	0
26	38.73	127.1	200	1	0	0
27	38.96	127.8	97	1	0	0
28	40.22	132.0	192	1	0	0
29	41.21	135.2	62	2	0	0
30	41.25	135.4	54	0	0	0
31	41.50	136.2	248	1	0	0
32	41.76	137.0	135	1	0	0
33	41.89	137.4	140	1	0	0
34	42.01	137.8	213	2	0	0
35	42.11	138.2	164	1	0	0
36	42.23	138.6	172	1	0	0
37	42.58	139.7	26	0	0	0

All directions are with respect to Magnetic North.



Table IRR-02:1. Orientation Summary Table
TelevIEWER Image Features
Arcadis
Marinette
IRR-02
20 May 2022

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
38	42.79	140.4	218	1	0	0
39	42.85	140.6	170	2	0	0
40	43.12	141.5	201	2	0	2
41	43.17	141.6	233	3	0	0
42	43.39	142.3	126	0	0	1
43	43.47	142.6	22	2	0	0
44	43.60	143.1	338	4	0	2
45	43.69	143.3	332	6	0	1
46	43.79	143.7	351	2	0	2
47	43.96	144.2	154	2	0	0
48	44.04	144.5	149	5	0	0
49	44.17	144.9	285	2	0	0
50	44.25	145.2	300	6	0	1
51	44.46	145.9	191	1	0	0
52	44.72	146.7	138	2	0	0
53	45.21	148.3	34	2	0	2
54	45.81	150.3	78	2	0	1
55	46.04	151.1	87	1	0	1
56	46.13	151.3	95	0	0	1
57	46.53	152.7	107	2	0	1
58	46.62	152.9	42	2	0	1
59	47.24	155.0	202	2	0	0
60	47.34	155.3	158	3	0	0
61	48.00	157.5	285	2	0	0
62	48.20	158.1	108	1	0	0
63	48.25	158.3	78	2	0	0
64	48.38	158.7	98	2	0	0
65	48.50	159.1	187	2	0	0
66	48.73	159.9	80	4	0	0
67	48.82	160.2	23	2	0	0
68	48.94	160.6	227	1	0	0
69	49.26	161.6	104	2	0	1
70	49.87	163.6	192	2	0	0
71	50.04	164.2	228	1	0	0
72	50.14	164.5	185	2	0	0
73	50.54	165.8	97	0	0	0
74	50.62	166.1	104	5	0	0

All directions are with respect to Magnetic North.



Table IRR-02:1. Orientation Summary Table
TelevIEWer Image Features
Arcadis
Marinette
IRR-02
20 May 2022

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
75	50.79	166.7	120	1	0	1
76	50.93	167.1	32	2	0	0
77	51.17	167.9	250	2	0	1
78	51.23	168.1	271	2	0	1
79	51.34	168.4	267	1	0	0
80	51.51	169.0	265	1	0	0
81	51.67	169.5	123	3	0	0
82	51.79	169.9	95	5	0	0
83	51.83	170.1	82	4	0	0
84	51.91	170.3	76	2	0	0
85	52.10	170.9	298	2	0	2
86	52.33	171.7	183	1	0	1
87	52.43	172.0	34	1	0	0
88	52.53	172.4	35	2	0	0
89	52.65	172.7	72	4	0	0
90	52.70	172.9	172	3	0	0
91	52.78	173.2	124	5	0	0
92	53.29	174.8	148	6	0	0
93	53.51	175.6	310	2	0	0
94	53.64	176.0	182	3	0	0
95	53.90	176.8	107	4	0	0
96	54.27	178.1	46	1	0	0
97	54.43	178.6	36	1	0	0
98	54.62	179.2	40	4	0	0
99	54.86	180.0	5	3	0	0
100	55.02	180.5	267	2	0	0
101	55.40	181.8	228	2	0	0
102	55.68	182.7	8	4	0	0
103	55.95	183.6	281	1	0	0
104	56.08	184.0	328	1	0	0
105	56.17	184.3	256	1	0	0
106	56.22	184.4	297	2	0	0
107	56.27	184.6	301	1	0	0
108	56.31	184.8	299	1	0	0
109	56.44	185.2	177	2	0	0
110	56.46	185.2	196	22	0	0
111	57.38	188.3	189	2	0	1

All directions are with respect to Magnetic North.



Table IRR-02:1. Orientation Summary Table
TelevIEWer Image Features
Arcadis
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IRR-02
20 May 2022

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
112	57.53	188.8	271	5	0	1
113	57.73	189.4	329	2	0	1
114	57.82	189.7	352	6	0	1
115	57.86	189.8	53	2	0	0
116	57.96	190.2	19	2	0	1
117	58.34	191.4	347	4	0	0
118	58.41	191.7	156	1	0	0
119	58.53	192.0	50	1	0	0
120	58.67	192.5	291	4	0	0
121	58.79	192.9	259	1	0	0
122	58.84	193.0	234	1	0	0
123	59.25	194.4	50	2	0	1
124	59.81	196.2	260	1	0	0
125	59.86	196.4	332	1	0	0
126	60.26	197.7	303	1	0	0
127	60.36	198.0	291	1	0	0
128	60.49	198.5	265	1	0	0
129	60.60	198.8	302	1	0	0
130	60.84	199.6	153	1	0	0
131	60.98	200.1	6	2	0	0
132	61.67	202.3	356	3	0	0
133	61.83	202.8	136	1	0	0
134	61.92	203.2	283	2	0	0
135	62.13	203.8	66	3	0	0
136	62.85	206.2	178	2	0	0
137	62.98	206.6	243	2	0	0
138	63.40	208.0	255	3	0	0
139	63.54	208.5	115	2	0	0
140	64.36	211.2	112	3	0	0
141	64.54	211.7	245	1	0	0
142	64.71	212.3	343	1	0	0
143	65.06	213.4	8	3	0	0
144	65.23	214.0	150	1	0	0
145	65.45	214.7	278	1	0	0
146	65.65	215.4	263	2	0	0
147	65.76	215.8	305	1	0	0
148	65.89	216.2	280	2	0	0

All directions are with respect to Magnetic North.



Table IRR-02:1. Orientation Summary Table
TelevIEWer Image Features
Arcadis
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IRR-02
20 May 2022

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
149	66.07	216.8	265	2	0	0
150	66.18	217.1	299	3	0	0
151	66.28	217.5	301	3	0	0
152	66.41	217.9	297	2	0	0
153	66.50	218.2	317	1	0	0
154	66.58	218.4	23	2	0	0
155	66.82	219.2	172	5	0	0
156	67.02	219.9	50	2	0	0
157	67.19	220.4	1	4	0	0
158	67.41	221.2	209	3	0	0
159	67.54	221.6	67	1	0	0
160	67.87	222.7	224	1	0	0
161	68.60	225.1	88	1	0	0
162	68.79	225.7	102	4	0	0
163	69.37	227.6	341	2	0	0
164	69.57	228.3	150	2	0	0
165	69.71	228.7	182	2	0	1
166	69.78	228.9	172	3	0	0
167	70.77	232.2	13	1	0	1
168	70.89	232.6	19	3	0	1
169	71.09	233.2	33	2	0	1
170	71.19	233.6	294	2	0	1
171	71.41	234.3	313	0	0	0
172	72.53	238.0	262	8	0	1
173	72.91	239.2	347	3	0	0
174	73.04	239.6	353	4	0	0
175	73.44	241.0	53	2	0	0
176	73.54	241.3	203	3	0	0
177	73.83	242.2	197	3	0	0
178	73.94	242.6	5	1	0	0
179	74.02	242.9	181	7	0	0
180	74.55	244.6	220	5	0	0
181	74.80	245.4	254	3	0	0
182	75.05	246.2	215	4	0	0
183	75.41	247.4	110	1	0	0
184	75.48	247.6	151	4	0	0
185	75.58	248.0	177	6	0	1

All directions are with respect to Magnetic North.



Table IRR-02:1. Orientation Summary Table
TelevIEWer Image Features
Arcadis
Marinette
IRR-02
20 May 2022

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
186	75.69	248.3	166	4	0	1
187	75.80	248.7	172	4	0	0
188	76.12	249.8	218	5	0	0
189	76.26	250.2	197	12	0	0
190	76.87	252.2	218	6	0	0
191	76.95	252.5	193	5	0	1
192	77.29	253.6	299	5	0	1
193	77.54	254.4	298	1	0	1
194	77.63	254.7	322	2	0	1
195	77.67	254.8	316	2	0	1
196	78.19	256.5	76	11	0	1
197	78.27	256.8	43	3	0	1
198	78.29	256.9	253	32	0	1
199	78.46	257.4	265	3	0	2
200	78.62	257.9	165	2	0	1
201	78.68	258.1	165	2	0	2
202	78.76	258.4	156	3	0	1
203	78.89	258.8	111	5	0	2
204	79.03	259.3	101	3	0	1
205	79.60	261.2	288	2	0	0
206	79.71	261.5	150	3	0	1
207	79.87	262.1	249	1	0	0
208	80.06	262.7	173	2	0	0
209	80.20	263.1	98	3	0	1
210	80.63	264.5	30	2	0	0
211	80.91	265.5	38	2	0	0
212	80.96	265.6	46	2	0	1
213	81.02	265.8	59	0	0	0
214	81.13	266.2	231	3	0	0
215	81.37	267.0	332	20	0	0
216	81.53	267.5	270	5	0	0
217	81.76	268.3	263	3	0	0
218	81.94	268.8	283	3	0	0
219	82.06	269.2	4	4	0	0
220	82.17	269.6	311	4	0	0
221	82.29	270.0	252	2	0	0
222	83.63	274.4	134	8	0	0

All directions are with respect to Magnetic North.



Table IRR-02:1. Orientation Summary Table
TelevIEWER Image Features
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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
223	83.80	274.9	140	3	0	0
224	84.59	277.5	42	4	0	1
225	85.12	279.3	80	2	0	0
226	85.30	279.9	253	4	0	0
227	85.44	280.3	348	5	0	0
228	85.58	280.8	304	2	0	0
229	85.82	281.6	52	7	0	0
230	85.99	282.1	90	5	0	0
231	86.12	282.6	197	6	0	1
232	86.23	282.9	239	5	0	1
233	86.33	283.2	231	10	0	0
234	86.51	283.8	198	4	0	0
235	86.59	284.1	154	5	0	0
236	86.70	284.5	163	4	0	0
237	86.79	284.8	95	2	0	0
238	86.96	285.3	64	2	0	0
239	87.19	286.1	269	1	0	0
240	87.54	287.2	5	2	0	1
241	87.62	287.5	242	5	0	0
242	87.73	287.8	296	9	0	1
243	88.04	288.9	8	3	0	1
244	88.13	289.2	181	2	0	0
245	88.21	289.4	321	2	0	0
246	88.32	289.8	259	2	0	0
247	88.48	290.3	267	7	0	0
248	88.55	290.5	328	2	0	0
249	88.57	290.6	276	7	0	0
250	88.67	290.9	291	2	0	0
251	89.07	292.2	327	1	0	0
252	89.21	292.7	13	2	0	0
253	89.26	292.8	12	2	0	0
254	89.43	293.4	89	1	0	0
255	89.64	294.1	58	2	0	0
256	89.77	294.5	178	1	0	0
257	89.85	294.8	240	2	0	0
258	90.21	296.0	317	3	0	0
259	90.30	296.3	295	5	0	0

All directions are with respect to Magnetic North.



Table IRR-02:1. Orientation Summary Table
Televiever Image Features
Arcadis
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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
260	90.59	297.2	342	2	0	0
261	90.91	298.3	243	4	0	0
262	91.38	299.8	28	8	0	0
263	91.53	300.3	292	11	0	0
264	91.65	300.7	82	3	0	0
265	91.91	301.5	56	3	0	0
266	92.34	302.9	20	5	0	0
267	92.63	303.9	265	8	0	0
268	92.95	305.0	82	8	0	0
269	93.24	305.9	302	3	0	0
270	93.33	306.2	293	3	0	0
271	93.43	306.5	326	3	0	0
272	93.59	307.1	343	2	0	0
273	93.83	307.9	132	1	0	0
274	94.01	308.4	190	5	0	0
275	94.16	308.9	16	5	0	0
276	94.31	309.4	21	2	0	0
277	94.37	309.6	249	2	0	0
278	94.43	309.8	285	2	0	0
279	94.64	310.5	154	2	0	0
280	94.94	311.5	1	5	0	0
281	95.05	311.8	323	7	0	0
282	95.27	312.6	335	9	0	0
283	95.45	313.2	143	5	0	0
284	95.61	313.7	345	2	0	0
285	95.97	314.9	138	9	0	0
286	96.24	315.8	73	13	0	0
287	96.73	317.4	269	9	0	0
288	96.83	317.7	288	10	0	0
289	96.98	318.2	305	6	0	0
290	97.10	318.6	188	3	0	0
291	97.23	319.0	21	2	0	0
292	97.30	319.2	322	7	0	0
293	97.40	319.6	39	6	0	0
294	97.47	319.8	59	3	0	0
295	97.53	320.0	5	5	0	0
296	97.64	320.3	58	4	0	0

All directions are with respect to Magnetic North.



Table IRR-02:1. Orientation Summary Table
TelevIEWer Image Features
Arcadis
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20 May 2022

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
297	97.83	321.0	7	2	0	0
298	98.08	321.8	238	11	0	0
299	98.45	323.0	152	20	0	0
300	98.55	323.3	151	2	0	0
301	98.83	324.2	348	4	0	0
302	98.97	324.7	261	2	0	0
303	99.38	326.1	355	3	0	1
304	99.61	326.8	301	2	0	1
305	99.81	327.5	317	3	0	0
306	99.95	327.9	281	3	0	1
307	100.12	328.5	143	4	0	0
308	100.22	328.8	331	2	0	1
309	100.38	329.3	19	3	0	1
310	100.54	329.9	116	2	0	0
311	100.59	330.0	124	3	0	1
312	100.66	330.3	246	36	0	0
313	100.67	330.3	130	6	0	0
314	100.77	330.6	114	5	0	0
315	101.07	331.6	253	3	0	0
316	101.28	332.3	255	2	0	0
317	101.41	332.7	226	4	0	0
318	101.50	333.0	293	2	0	0
319	101.61	333.4	266	2	0	0
320	101.77	333.9	301	2	0	0
321	101.97	334.6	224	13	0	0
322	102.14	335.1	228	1	0	0
323	102.19	335.3	114	2	0	0
324	102.32	335.7	87	3	0	0
325	102.53	336.4	120	2	0	0
326	102.67	336.8	54	1	0	0
327	102.71	337.0	189	6	0	1
328	102.85	337.5	98	3	0	0
329	103.00	337.9	123	5	0	0
330	103.42	339.3	276	2	0	0
331	103.68	340.2	359	7	0	0
332	103.84	340.7	297	2	0	0
333	104.07	341.5	231	10	0	0

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Table IRR-02:1. Orientation Summary Table
TelevIEWer Image Features
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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
334	104.49	342.8	322	1	0	0
335	104.70	343.5	174	1	0	0
336	105.12	344.9	144	2	0	0
337	105.34	345.6	102	1	0	0
338	105.49	346.1	95	4	0	0
339	105.97	347.7	355	6	0	0
340	106.22	348.5	182	2	0	0
341	106.26	348.6	198	1	0	0
342	106.58	349.7	297	3	0	0
343	107.05	351.2	164	1	0	0
344	107.18	351.7	299	2	0	0
345	107.29	352.0	286	2	0	0
346	107.34	352.2	291	4	0	0
347	107.48	352.6	285	2	0	0
348	107.82	353.7	338	4	0	0
349	107.88	353.9	24	14	0	1
350	108.10	354.7	40	8	0	0
351	108.11	354.7	239	10	0	0
352	108.35	355.5	237	3	0	0
353	108.47	355.9	281	1	0	0
354	108.57	356.2	295	1	0	0
355	108.63	356.4	309	1	0	0
356	108.68	356.6	41	4	0	0
357	108.74	356.8	247	1	0	0
358	108.90	357.3	209	4	0	1
359	108.96	357.5	214	7	0	0
360	109.20	358.3	272	4	0	0
361	109.34	358.7	280	4	0	0
362	109.44	359.0	288	2	0	0
363	109.55	359.4	338	5	0	1
364	109.65	359.7	329	2	0	1
365	109.67	359.8	164	5	0	1
366	109.96	360.8	259	3	0	0
367	110.07	361.1	10	1	0	1
368	110.30	361.9	156	1	0	0
369	110.40	362.2	43	3	0	0
370	110.45	362.4	245	3	0	0

All directions are with respect to Magnetic North.



Table IRR-02:1. Orientation Summary Table
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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
371	110.62	362.9	280	1	0	0
372	110.74	363.3	325	3	0	0
373	110.83	363.6	287	2	0	0
374	110.93	363.9	288	2	0	0
375	111.01	364.2	322	2	0	0
376	111.08	364.5	301	2	0	0
377	111.28	365.1	261	3	0	0
378	111.30	365.2	197	2	0	0
379	111.42	365.6	271	3	0	1
380	111.50	365.8	224	3	0	2
381	111.77	366.7	76	2	0	1
382	111.90	367.1	79	4	0	1
383	112.06	367.7	29	3	0	0
384	112.49	369.1	105	27	0	1
385	112.56	369.3	271	3	0	0
386	112.96	370.6	84	5	0	0
387	113.05	370.9	79	5	0	0
388	113.52	372.4	321	13	0	0
389	113.61	372.7	136	3	0	0
390	113.71	373.1	289	5	0	0
391	113.88	373.6	156	3	0	0
392	113.97	373.9	77	2	0	1
393	114.20	374.7	301	2	0	0
394	114.36	375.2	154	2	0	0
395	114.57	375.9	266	2	0	0
396	114.78	376.6	262	0	0	0
397	114.87	376.9	263	2	0	0
398	114.95	377.1	271	3	0	0
399	114.98	377.2	313	2	0	0
400	115.03	377.4	354	3	0	0
401	115.19	377.9	235	2	0	0
402	115.56	379.1	294	28	0	0
403	115.76	379.8	283	31	0	0
404	116.03	380.7	47	2	0	1
405	116.26	381.4	335	2	0	0
406	116.32	381.6	341	17	0	1
407	116.53	382.3	112	2	0	1

All directions are with respect to Magnetic North.



Table IRR-02:1. Orientation Summary Table
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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
408	117.00	383.9	96	17	0	1
409	117.22	384.6	146	10	0	1
410	117.32	384.9	183	4	0	0
411	117.38	385.1	199	6	0	0
412	117.47	385.4	273	6	0	0
413	117.63	385.9	297	3	0	1
414	117.85	386.7	304	3	0	0
415	117.91	386.9	295	1	0	0
416	118.00	387.1	358	2	0	0
417	118.13	387.6	295	2	0	0
418	118.22	387.9	295	3	0	0
419	118.30	388.1	307	1	0	0
420	118.38	388.4	284	1	0	0
421	118.43	388.6	100	2	0	0
422	118.49	388.7	108	0	0	0
423	118.66	389.3	346	3	0	0
424	118.80	389.8	109	3	0	0
425	118.84	389.9	61	5	0	0
426	118.90	390.1	84	2	0	0
427	118.95	390.3	54	3	0	1
428	119.02	390.5	21	3	0	0
429	119.37	391.6	341	3	0	0
430	119.60	392.4	341	6	0	1
431	119.66	392.6	196	5	0	1
432	119.74	392.9	174	2	0	1
433	120.00	393.7	168	3	0	2
434	120.08	394.0	317	2	0	0
435	120.11	394.1	311	3	0	0
436	120.34	394.8	281	1	0	0
437	120.38	394.9	297	2	0	0
438	120.51	395.4	107	1	0	0
439	120.55	395.5	357	2	0	0
440	120.64	395.8	322	3	0	0
441	120.69	396.0	25	2	0	0
442	120.76	396.2	310	3	0	0
443	120.85	396.5	336	2	0	0
444	120.92	396.7	358	1	0	0

All directions are with respect to Magnetic North.



Table IRR-02:1. Orientation Summary Table
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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
445	121.26	397.8	263	2	0	0
446	121.32	398.0	269	5	0	0
447	121.38	398.2	266	2	0	0
448	121.46	398.5	277	2	0	0
449	121.77	399.5	299	2	0	0
450	122.08	400.5	299	3	0	0
451	122.17	400.8	284	2	0	0
452	122.23	401.0	281	3	0	0
453	122.27	401.2	297	1	0	0
454	122.37	401.5	261	1	0	0
455	122.54	402.0	92	15	0	1
456	122.92	403.3	144	5	0	0
457	123.15	404.0	128	8	0	1
458	123.28	404.5	95	10	0	1
459	123.39	404.8	161	6	0	0
460	123.54	405.3	146	7	0	1
461	123.61	405.6	126	6	0	0
462	123.67	405.8	133	7	0	0
463	123.80	406.2	124	5	0	0
464	123.93	406.6	168	9	0	0
465	124.20	407.5	167	3	0	1
466	124.36	408.0	76	2	0	1
467	124.48	408.4	276	5	0	0
468	124.52	408.5	268	2	0	1
469	124.60	408.8	250	2	0	0
470	124.72	409.2	268	2	0	0
471	124.83	409.5	265	3	0	0
472	124.89	409.8	232	2	0	0
473	125.08	410.4	119	2	0	0
474	125.21	410.8	176	3	0	0
475	125.34	411.2	260	3	0	0
476	125.39	411.4	249	4	0	0
477	125.44	411.5	247	2	0	0
478	125.54	411.9	251	3	0	0
479	125.67	412.3	293	3	0	0
480	125.83	412.8	210	4	0	0
481	125.93	413.2	32	3	0	0

All directions are with respect to Magnetic North.



Table IRR-02:1. Orientation Summary Table
TelevIEWer Image Features
Arcadis
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IRR-02
20 May 2022

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
482	126.08	413.7	307	13	0	0
483	126.21	414.1	196	2	0	0
484	126.29	414.3	158	2	0	0
485	126.43	414.8	333	7	0	0
486	126.48	415.0	297	3	0	0
487	126.54	415.2	255	1	0	0
488	126.58	415.3	174	3	0	0
489	126.72	415.7	289	1	0	0
490	126.76	415.9	309	2	0	0
491	127.23	417.4	297	2	0	0
492	127.40	418.0	265	4	0	0
493	127.52	418.4	287	2	0	0
494	127.65	418.8	195	5	0	0
495	127.78	419.2	278	1	0	0
496	127.87	419.5	118	4	0	0
497	128.24	420.7	17	1	0	0
498	128.44	421.4	33	31	0	1
499	128.44	421.4	62	6	0	0
500	128.71	422.3	277	9	0	0
501	128.88	422.8	76	6	0	0
502	129.14	423.7	54	7	0	0
503	129.33	424.3	314	5	0	1
504	129.42	424.6	117	2	0	1
505	129.44	424.7	276	25	0	1
506	129.54	425.0	252	4	0	1
507	129.92	426.3	161	3	0	0
508	130.15	427.0	144	7	0	0
509	130.47	428.0	105	5	0	0
510	130.73	428.9	145	5	0	0
511	131.20	430.4	295	22	0	1
512	131.27	430.7	100	16	0	1
513	131.40	431.1	273	8	45	3
514	131.91	432.8	332	18	0	1
515	132.19	433.7	354	8	0	1
516	132.90	436.0	229	9	0	1
517	133.22	437.1	11	4	0	1
518	133.54	438.1	28	6	0	1

All directions are with respect to Magnetic North.



Table IRR-02:1. Orientation Summary Table
Televiever Image Features
Arcadis
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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
519	133.72	438.7	42	23	0	1
520	133.86	439.2	330	29	0	1
521	134.08	439.9	3	14	0	1
522	134.15	440.1	350	6	0	1
523	134.27	440.5	6	7	0	1
524	134.50	441.3	345	3	0	1
525	134.63	441.7	147	26	0	1
526	134.89	442.6	332	17	0	1
527	134.97	442.8	336	8	0	1
528	135.07	443.2	196	4	0	1
529	135.80	445.5	357	8	0	1
530	135.92	445.9	295	5	0	1
531	136.41	447.6	13	5	0	1
532	136.65	448.3	88	14	0	1
533	136.96	449.3	15	17	0	1
534	137.23	450.2	223	21	0	1
535	137.23	450.2	31	19	0	1
536	137.50	451.1	287	6	0	1
537	137.64	451.6	222	13	0	1
538	137.66	451.6	43	18	0	1
539	137.94	452.6	351	3	0	0
540	138.20	453.4	257	7	0	0
541	138.20	453.4	66	24	0	1
542	138.53	454.5	309	24	0	0
543	138.56	454.6	118	5	0	0
544	138.77	455.3	323	2	0	0
545	138.85	455.5	89	4	0	0
546	138.90	455.7	159	15	88	3
547	139.11	456.4	267	3	0	0
548	139.30	457.0	266	31	0	1
549	139.46	457.6	310	6	0	1
550	139.49	457.7	82	19	0	1
551	139.60	458.0	296	21	0	1
552	139.61	458.0	88	15	0	1
553	139.72	458.4	79	14	0	1
554	139.81	458.7	90	12	0	1
555	139.99	459.3	97	16	0	1

All directions are with respect to Magnetic North.



Table IRR-02:1. Orientation Summary Table
TelevIEWer Image Features
Arcadis
Marinette
IRR-02
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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
556	140.03	459.4	95	23	0	1
557	140.24	460.1	341	10	61	3
558	140.27	460.2	119	18	0	1
559	140.41	460.7	51	15	0	1
560	140.73	461.7	144	4	0	1
561	140.79	461.9	144	10	0	1
562	141.06	462.8	35	18	0	1
563	141.38	463.8	156	19	0	1
564	141.52	464.3	31	19	0	1
565	141.67	464.8	356	5	0	0
566	141.74	465.0	341	5	0	0
567	141.87	465.5	6	8	0	0
568	141.97	465.8	4	4	0	0
569	142.18	466.5	11	6	0	0
570	142.33	467.0	30	6	0	0
571	142.39	467.2	24	6	0	0
572	142.49	467.5	50	5	0	0
573	142.59	467.8	27	6	0	0
574	142.68	468.1	70	3	0	0
575	142.74	468.3	303	1	0	1
576	142.83	468.6	295	2	0	1
577	142.94	469.0	217	3	0	0
578	143.01	469.2	247	2	0	1
579	143.16	469.7	60	4	0	0
580	143.22	469.9	54	4	0	0
581	143.32	470.2	73	1	0	0
582	143.55	471.0	293	1	0	1
583	143.78	471.7	23	5	0	1
584	143.89	472.1	27	2	0	1
585	143.95	472.3	129	8	0	1
586	143.98	472.4	12	2	0	0
587	144.26	473.3	173	3	0	0
588	144.75	474.9	212	2	0	1
589	144.85	475.2	291	2	0	1
590	145.02	475.8	345	2	0	1
591	145.24	476.5	313	1	0	1
592	145.38	477.0	317	2	0	1

All directions are with respect to Magnetic North.



Table IRR-02:1. Orientation Summary Table
TelevIEWer Image Features
Arcadis
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IRR-02
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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
593	145.49	477.3	302	2	0	1
594	145.56	477.6	40	1	0	1
595	145.65	477.9	292	5	0	1
596	145.73	478.1	273	1	0	0
597	145.89	478.6	355	2	0	0
598	146.08	479.3	13	1	0	0
599	146.24	479.8	3	1	0	0
600	146.29	479.9	350	1	0	0
601	146.33	480.1	12	1	0	0
602	146.46	480.5	32	4	0	0
603	146.54	480.8	47	2	0	0
604	146.61	481.0	56	0	0	0
605	146.69	481.3	51	3	0	0
606	146.81	481.7	5	2	0	0
607	146.84	481.8	4	2	0	0
608	146.96	482.2	32	3	0	0
609	147.03	482.4	38	2	0	0
610	147.11	482.7	35	3	0	0
611	147.20	482.9	51	3	0	0
612	147.29	483.3	74	1	0	0
613	147.40	483.6	265	2	0	0
614	147.46	483.8	224	1	0	0
615	147.80	484.9	351	4	0	0
616	147.88	485.2	276	2	0	0
617	147.94	485.4	280	3	0	0
618	148.06	485.8	260	4	0	0
619	148.26	486.4	50	4	0	0
620	148.51	487.2	334	5	0	1
621	148.63	487.6	324	6	0	1
622	148.76	488.1	339	6	0	1
623	149.29	489.8	198	3	0	1
624	149.45	490.3	305	0	0	1
625	149.63	490.9	37	3	0	1
626	149.89	491.8	21	7	0	1
627	150.06	492.3	334	14	0	1
628	150.55	493.9	177	3	0	1
629	150.74	494.6	325	18	0	1

All directions are with respect to Magnetic North.



Table IRR-02:1. Orientation Summary Table
Televiever Image Features
Arcadis
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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
630	150.87	495.0	307	13	0	1
631	151.43	496.8	231	2	0	1
632	151.82	498.1	164	11	0	1
633	151.98	498.6	152	30	0	1
634	152.14	499.1	148	6	0	1
635	152.22	499.4	63	6	0	1
636	152.30	499.7	175	1	0	1
637	152.40	500.0	40	3	0	1
638	152.41	500.0	156	31	0	1
639	152.56	500.5	62	4	0	1
640	152.80	501.3	237	29	0	1
641	153.04	502.1	353	19	0	1
642	153.09	502.3	165	18	0	1
643	153.25	502.8	129	1	0	1
644	153.49	503.6	117	15	0	1
645	153.83	504.7	257	3	0	2
646	154.06	505.5	327	20	0	1
647	154.45	506.7	48	13	0	1
648	154.76	507.7	85	4	0	0
649	155.27	509.4	46	4	0	0
650	155.37	509.7	8	6	0	0
651	155.46	510.0	13	6	0	0
652	155.74	511.0	32	13	0	0
653	155.98	511.7	264	2	0	0
654	156.01	511.8	255	71	0	1
655	156.16	512.4	309	1	0	0
656	156.27	512.7	309	1	0	0
657	156.42	513.2	312	1	0	0
658	156.54	513.6	317	3	0	0
659	156.76	514.3	317	2	0	0
660	157.09	515.4	42	2	0	0
661	157.23	515.8	61	2	0	1
662	157.26	515.9	71	2	0	1
663	157.35	516.2	27	1	0	1
664	157.41	516.4	295	2	0	1
665	157.44	516.6	1	2	0	0
666	157.48	516.7	321	1	0	0

All directions are with respect to Magnetic North.



Table IRR-02:1. Orientation Summary Table
TelevIEWer Image Features
Arcadis
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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
667	157.53	516.8	335	1	0	0
668	157.56	516.9	310	1	0	0
669	157.60	517.1	330	1	0	0
670	157.63	517.2	57	2	0	0
671	157.68	517.3	348	2	0	0
672	157.75	517.5	351	2	0	0
673	157.81	517.7	352	1	0	0
674	157.85	517.9	341	1	0	1
675	157.93	518.2	303	0	0	0
676	158.04	518.5	323	2	0	0
677	158.11	518.7	44	1	0	0
678	158.17	518.9	64	2	0	0
679	158.23	519.1	250	1	0	0
680	158.30	519.4	234	1	0	1
681	158.33	519.5	230	1	0	1
682	158.37	519.6	224	1	0	1
683	158.43	519.8	246	2	0	1
684	158.53	520.1	71	2	0	0
685	158.56	520.2	68	3	0	0
686	158.61	520.4	68	3	0	0
687	158.66	520.5	70	1	0	1
688	158.75	520.8	355	1	0	0
689	158.82	521.1	43	2	0	0
690	158.90	521.3	60	2	0	0
691	158.97	521.6	183	1	0	0
692	159.03	521.8	318	1	0	0
693	159.18	522.3	45	3	0	1
694	159.25	522.5	46	2	0	1
695	159.33	522.7	40	3	0	1
696	159.54	523.4	229	41	0	1
697	159.56	523.5	218	11	0	1
698	159.86	524.5	200	11	0	1
699	159.95	524.8	206	7	0	1
700	160.19	525.6	345	7	0	1
701	160.36	526.1	353	5	0	1
702	160.55	526.7	217	4	0	1
703	160.66	527.1	142	6	0	1

All directions are with respect to Magnetic North.



Table IRR-02:1. Orientation Summary Table
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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
704	160.75	527.4	56	5	0	1
705	161.04	528.3	110	2	0	2
706	161.17	528.8	336	2	0	1
707	161.26	529.1	14	1	0	1
708	161.40	529.5	7	2	0	1
709	161.50	529.9	352	7	0	1
710	161.54	530.0	169	8	0	1
711	161.58	530.1	329	4	0	1
712	161.74	530.6	102	7	0	1
713	161.83	530.9	324	3	0	1
714	161.88	531.1	149	6	0	1
715	162.02	531.6	182	4	0	1
716	162.08	531.8	206	2	0	1
717	162.24	532.3	316	7	0	1
718	162.27	532.4	76	2	0	1
719	162.36	532.7	128	2	0	1
720	162.42	532.9	104	3	0	1
721	162.45	533.0	115	2	0	1
722	162.70	533.8	103	3	0	2
723	162.79	534.1	105	3	0	1
724	162.85	534.3	108	2	0	1
725	163.05	534.9	315	3	0	0
726	163.19	535.4	49	1	0	1
727	163.25	535.6	35	2	0	1
728	163.38	536.0	328	2	0	1
729	163.42	536.2	295	0	0	1
730	163.43	536.2	228	64	0	1
731	163.46	536.3	237	2	0	1
732	163.54	536.6	107	2	0	1
733	163.71	537.1	29	2	0	1
734	163.78	537.3	34	3	0	1
735	163.82	537.5	33	3	0	1
736	163.90	537.7	66	2	0	0
737	163.99	538.0	239	59	0	1
738	164.01	538.1	360	4	0	0
739	164.08	538.3	236	2	0	0
740	164.18	538.7	323	2	0	0

All directions are with respect to Magnetic North.



Table IRR-02:1. Orientation Summary Table
TelevIEWer Image Features
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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
741	164.28	539.0	293	4	0	1
742	164.38	539.3	259	4	0	0
743	164.52	539.8	222	2	0	0
744	164.61	540.1	80	2	0	0
745	164.67	540.2	134	5	0	0
746	164.76	540.5	21	3	0	0
747	164.83	540.8	11	9	0	0
748	164.87	540.9	2	7	0	0
749	164.92	541.1	23	2	0	0
750	164.95	541.2	326	7	0	0
751	165.07	541.6	337	3	0	0
752	165.16	541.9	345	3	0	1
753	165.21	542.0	325	3	0	0
754	165.30	542.3	100	4	0	1
755	165.31	542.3	19	5	0	1
756	165.39	542.6	358	5	0	0
757	165.49	542.9	327	14	0	0
758	165.55	543.1	310	7	0	0
759	165.63	543.4	349	5	0	0
760	165.86	544.2	124	4	0	0
761	166.24	545.4	178	3	0	0
762	166.29	545.6	254	2	0	1
763	166.32	545.7	235	3	0	1
764	166.41	546.0	279	3	0	1
765	166.50	546.3	226	2	0	1
766	166.59	546.5	136	5	0	1
767	166.67	546.8	150	4	0	1
768	166.70	546.9	117	10	0	0
769	166.87	547.5	250	5	0	0
770	167.05	548.1	134	6	0	0
771	167.17	548.5	170	9	0	0
772	167.32	548.9	358	12	0	0
773	167.37	549.1	214	23	0	0
774	167.40	549.2	20	8	0	0
775	167.55	549.7	26	8	0	0
776	167.65	550.0	49	6	0	1
777	167.77	550.4	167	5	0	1

All directions are with respect to Magnetic North.



Table IRR-02:1. Orientation Summary Table
Televiever Image Features
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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
778	167.90	550.9	178	1	0	0
779	167.97	551.1	13	8	0	1
780	168.02	551.2	273	2	0	0
781	168.20	551.8	277	2	0	0
782	168.35	552.3	51	3	0	0
783	168.44	552.6	234	3	0	0
784	168.51	552.9	268	8	0	0
785	168.54	552.9	109	9	0	0
786	168.65	553.3	272	2	0	0
787	168.73	553.6	58	3	0	0
788	168.80	553.8	10	2	0	0
789	168.91	554.2	57	1	0	0
790	168.98	554.4	267	2	0	0
791	169.52	556.2	302	1	0	0
792	169.87	557.3	38	3	0	0
793	170.42	559.1	47	1	0	0
794	170.67	559.9	184	1	0	0
795	170.80	560.4	24	2	0	0
796	170.85	560.5	30	1	0	0
797	171.16	561.6	173	4	0	0
798	171.26	561.9	53	2	0	0
799	171.40	562.4	304	1	0	0
800	171.58	562.9	170	2	0	0
801	171.87	563.9	166	5	0	0
802	172.03	564.4	224	2	0	0
803	172.12	564.7	185	5	0	0
804	172.22	565.0	256	3	0	0
805	172.31	565.3	288	1	0	0
806	172.42	565.7	229	1	0	0
807	172.53	566.0	258	1	0	0
808	172.59	566.2	186	2	0	0
809	172.64	566.4	279	1	0	0
810	172.70	566.6	79	1	0	0
811	172.82	567.0	130	1	0	0
812	173.04	567.7	295	1	0	0
813	173.37	568.8	2	2	0	0
814	173.90	570.6	171	4	0	1

All directions are with respect to Magnetic North.



Table IRR-02:1. Orientation Summary Table
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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
815	174.00	570.9	321	3	0	0
816	174.18	571.5	6	6	0	1
817	174.32	571.9	265	1	0	1
818	174.40	572.2	264	7	0	1
819	174.45	572.3	331	3	0	1
820	174.57	572.7	23	3	0	0
821	174.63	572.9	37	3	0	0
822	174.71	573.2	148	8	0	0
823	174.81	573.5	145	13	0	0
824	174.96	574.0	122	9	0	0
825	174.96	574.0	4	9	0	0
826	175.02	574.2	139	0	0	0
827	175.06	574.3	76	0	0	0
828	175.15	574.7	149	2	0	0
829	175.24	574.9	111	1	0	0
830	175.30	575.1	335	0	0	0
831	175.39	575.4	175	2	0	0
832	175.58	576.1	70	0	0	0
833	175.64	576.2	70	2	0	0
834	175.69	576.4	76	3	0	0
835	175.72	576.5	83	3	0	0
836	175.88	577.0	58	4	0	0
837	175.97	577.3	102	4	0	0
838	176.18	578.0	340	1	0	1
839	176.45	578.9	26	7	0	0
840	176.68	579.7	172	1	0	0
841	176.72	579.8	268	1	0	0
842	176.78	580.0	358	3	0	0
843	176.79	580.0	55	3	0	0
844	177.03	580.8	96	3	0	0
845	177.10	581.0	57	2	0	0
846	177.27	581.6	265	4	0	0
847	177.30	581.7	236	8	0	0
848	177.32	581.8	196	6	0	0
849	177.40	582.0	130	8	0	0
850	177.41	582.0	167	4	0	0
851	177.47	582.3	331	7	0	0

All directions are with respect to Magnetic North.



Table IRR-02:1. Orientation Summary Table
Televiewer Image Features
Arcadis
Marinette
IRR-02
20 May 2022

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
852	177.52	582.4	341	5	0	0
853	177.57	582.6	49	3	0	0
854	177.60	582.7	100	5	0	0
855	177.70	583.0	265	5	0	0
856	177.73	583.1	143	5	0	0
857	177.79	583.3	186	5	0	0
858	177.84	583.5	48	2	0	0
859	177.92	583.7	318	7	0	0
860	178.03	584.1	126	7	0	0
861	178.12	584.4	76	4	0	0

All directions are with respect to Magnetic North.

Table IRR-02:2. Summary of Corehole Dynamic Flowmeter Test-Station Results; Arcadis; Marinette, WI; Wellbore: IRR-02

IRR-02					
Depth (feet)	Flow in Borehole During Ambient Testing (GPM)	Ambient Flow Direction in Borehole	Flow in Borehole During Pumping as Measured by CDFM (GPM)	Flow in Borehole During Pumping Normalized to Pumping Rate Max (GPM)	Comments
67.0	0.05	↑	10.60	21.7	Test station just outside casing. 0.05 gpm of ambient upflow is observed, indicating no change in ambient flow between 67.0 - 101.0 feet. This ambient upflow of 0.05 gpm exits the borehole between 62.2 feet (bottom of casing) and 67.0 feet. During pumping, 0.10 gpm enters the borehole between 67.0 - 101.0 feet. Based on the pumping rate of 23.7 gpm and a test station inside casing at 55 feet that registered ~20 gpm (difficult seal inside casing), it is our assumption that approximately 13.1 gpm enters the borehole near the base of casing, suggesting a poor cement seal behind casing.
101.0	0.05	↑	10.50	21.7	No observed change in flow under ambient or pumping conditions between 101.0 - 120.5 feet.
120.5	0.05	↑	10.50	21.7	No observed change in flow under ambient or pumping conditions between 120.5 - 132.0 feet.
132.0	0.05	↑	10.50	21.7	No observed change in flow under ambient or pumping conditions between 132.0 - 156.0 feet.
156.0	0.05	↑	10.50	21.7	No observed change in flow under ambient or pumping conditions between 156.0 - 183.0 feet.
183.0	0.05	↑	10.50	21.7	No observed change in flow under ambient or pumping conditions between 183.0 - 194.0 feet.
194.0	0.05	↑	10.50	21.7	No observable change in flow under ambient conditions between 194.0 - 254.5 feet. During pumping, 0.80 gpm enters the borehole at this same interval.
254.5	0.05	↑	9.70	21.7	No observable change in flow under ambient conditions between 254.5 - 284.5 feet. During pumping, 1.00 gpm enters the borehole at this same interval.
284.5	0.05	↑	8.70	20.8	No observable change in flow under ambient conditions between 284.5 - 314.5 feet. During pumping, 0.41 gpm enters the borehole at this same interval.
314.5	0.05	↑	8.31	20.8	No observed change in flow under ambient or pumping conditions between 314.5 - 357.0 feet.
357.0	0.05	↑	8.31	20.8	No observed change in flow under ambient or pumping conditions between 357.0 - 393.5 feet.

Table IRR-02:2. Summary of Corehole Dynamic Flowmeter Test-Station Results; Arcadis; Marinette, WI; Wellbore: IRR-02

393.5	0.05	↑	8.31	20.8	0.01 gpm enters the borehole under ambient conditions between 393.5 - 443.7 feet. During pumping, 1.46 gpm enters the borehole, likely through solution openings.
443.7	0.04	↑	6.85	20.8	0.05 gpm enters the borehole under ambient conditions between 443.7 - 473.0 feet: 0.04 gpm migrates up the borehole while 0.01 gpm migrates down the borehole. During pumping, 6.43 gpm enters the borehole.
473.0	-0.01	↓	0.42	18.7	No observable change in flow under ambient conditions between 473.0 - 495.5 feet. During pumping, 0.04 gpm enters the borehole at this same interval.
495.5	-0.01	↓	0.38	15.2	No observed change in flow under ambient or pumping conditions between 495.5 - 513.0 feet.
513.0	-0.01	↓	0.38		0.02 gpm exits the borehole under ambient conditions between 513.0 - 534.0 feet. During pumping, 0.01 gpm exits the borehole.
534.0	-0.03	↓	0.39	15.2	0.05 gpm exits the borehole under ambient conditions between 534.0 - 558.5 feet. 0.03 gpm came from above 534.0 feet while 0.02 gpm came from below 558.5 feet. During pumping, 0.24 gpm enters the borehole.
558.5	0.02	↑	0.15		0.01 gpm exits the borehole under ambient conditions between 558.5 - 571.0 feet, likely through fractures along bedding planes, with aperture. During pumping, 0.03 gpm enters the borehole.
571.0	0.03	↑	0.12	15.2	No observable change in flow under ambient conditions between 571.0 - 580.0 feet. During pumping, 0.07 gpm enters the borehole at this same interval.
580.0	0.03	↑	0.05	15.2	0.03 gpm enters the borehole under ambient conditions between 580.0 - 584.5 feet (TD) and migrates upward. During pumping, 0.05 gpm enters the borehole and migrates upward toward the pump inside casing.

Ambient WL (ftbgs) 11.33
 Bottom of casing (ftbgs) 62.2
 Total Depth (TD) (ftbgs) 584.5
 Avg. Extraction Rate (gpm) 23.7
 Observed Drawdown (ft) 2.79
 Specific Capacity (gpm/ft-dd) 8.49

Note: Negative flow is downflow in the borehole. Positive flow is upflow in the borehole.

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