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Scientific Report for Cruise CK09-03 Expedition 905

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1 Introduction

The coring site at off Boso area locates at about 40 km south of Boso peninsula near from the Sagami Trough axis, Niijima, Boso and Awa canyon. The sedimentation rate of off Boso area is lower and dissolved oxygen concentration is higher than off Shimokita area. We expected that undegraded organic materials are well preserved in the sediments because high concentration of organic matters came from the neritic province. It is possible that the oldest fragmental DNAs can be retrieved from this area, and also unique microbial ecosystems and organic molecules exist in this area. This area is also close to volcanic island, and we can observe various sediment sequences. For this reason, we can collect sediment cores not only for science purposes, but also educational purposes.

The purposes of this expedition contain four proponents. The purposes are: 1) To describe vertical profiling patterns of detrital eukaryotic DNA fragments; 2) To describe vertical profiling patterns of organic molecules produced by microbes living in slope sediment sequence; 3) To describe vertical profiling patterns of pore-water chemistry; 4) To evaluate microbiological and biogeochemical core sample quality under several storage conditions. For micropaleontological use, we also need to collect sediment cores continuously and filled un-recovered layers in Expedition 904.

2 Site and holes

Site C9010 had been planned at the coordinate of 34 deg. 33.45 min. North, 139 deg. 53.40 min. East. The training region is south off Boso Peninsula and east from Ooshima and Niijima Islands. The site is at a gentle slope between Niijima and Miyake Canyons, which merge to large Boso and Awa Canyons, respectively (Fig. 2-1). During Expedition 904, Holes C9010A and C9010B were drilled at the position of the site and Holes C9010C and C9010D were drilled at the same position 30 m away toward 115 deg from Holes C9010A and C9010B. Holes C9010E and C9010G were every 30 m away toward 295 deg. from Holes C9010A and C9010B. Ship locations were handled as the hole locations (Table 2-1).

After taking the first core by Hydraulic Piston Coring System (HPCS) at each hole, the water depths were corrected by the mud line levels in the recovered cores (Table 2-1).

3 Core and section summaries

During Expedition 905, we cored three holes (E, F and G) at Site C9010. At each hole, we obtained 27, 29, and 20 cores, respectively using Hydraulic Piston Coring System (HPCS), Extended Punch Coring system (EPCS) and Extended Shoe Coring System (ESCS). Cores C9010E-16H, 28X, C9010F-18X, 21X, C9010G-13X, and 22X were empty. Recovered cores were cut into 170, 141, and 55 sections, including core catchers (Table 3-1). The total length of curated cores is 354.747 m.

4 Sampling plan and summary

We took seven types of samples during this expedition (Table 4-1 and Fig. 4-1): HS (headspace gas) for shipboard safety gas monitoring, SS (smear slide) for shipboard visual core description, 905HKD, 905NMA, 905NMB, 905NOOG and 905NOIW for personal post cruise research. In addition, 905NOIW samples were measured their pore water chemistry onboard.

- HS samples were taken from the top of most section 2 recovered between 100 and 120 m CSF (core depth below sea floor), and deeper than 160 m CSF.
- SS samples were taken from archive halves by toothpicks at all holes.
- 905HKD samples, 10 cm long whole round samples were taken from each section. Residues were returned as part of section after onboard sampling.
- 905NMA and 905NMB samples, both 10 cm long whole round samples were taken. 905NMA samples were from every section at the depth shallower than 10 m CSF, and one sample per a core deeper than 10 m CSF after X-ray CT scanning. A 905NMB sample was from Section C9010G-2H-2 before scanning.
- 905NOOG and 905NOIW samples, both 20 cm long whole round samples: three samples for each were taken per one core at the depth shallower than 9 m CSF; from deeper core than 9 m CSF, a sample was per one core. In addition, specific samples such as high organic content lithology (blackish layers) were taken for 905NOOG.

As shown in Table 4-2, 344 samples are taken in total, including 109 ship samples (HS and SS) and 235 personal samples. 11 HS residues and 98 smear slides of SS samples will be shipped to Kochi Core Center.

5 Operation summary

The science party and the crews embarked at Tateyama port area at 9:50 on December 2nd, 2009. Chikyu left from anchor ground at 14:10 toward the coring site C9010E (34°33.4569' N, 139°53.3822'E, Seabed Depth: 2055.55 m DRF; drilling depth below rig floor), and then arrived the site at 21:50. After DPS checking, the 11-7/8" HPCS/ESCS coring assembly was started lowering to the seafloor at 00:00 on December 3rd. The assembly was placed 3 m above the estimated seafloor depth to recover the mud line completely. The underwater TV system was not used during Exp. 905.

HPCS coring was conducted at Hole C9010E at 8:12. The first core C9010E-1H was recovered the surface sediment column of 7.95 m. Because the advance of HPCS had set to 9.5m, the actual position of the coring assembly was estimated to be located at 1.55m above the seafloor. Nearly complete recovery of Core C9010E-1H to 11H (102.95 m DSF; drilling depth below seafloor) was archived although the core liner was stuck in the core barrel in Core C9010E-10H. After Core C9010E-11H was taken, the HPCS advance was frequently incomplete (i.e., partial penetration) because of the presence of abundant volcaniclastic sand/gravel layers in the formation. To skip such layers, intervals of Core C9010E-14H to 15H (111.11--113.11 m DSF) and Core C9010E-16H to 17H (113.83--123.83 m DSF), drill without coring was conducted for 2 m and 10 m, respectively.

After retrieval of Core C9010E-23H (165.43 m DSF) at 10:16 on December 5th, the coring system was switched over to the Extended Punching Coring System

(EPCS). The six EPCS cores C9010E-24X to 29X were taken with about half stroke penetrations (5.82 m for 24X, and 4.70 m for 25X through 29X) to improve recovery for alternate layers (i.e., silty clay/scoriaceous sand). Unfortunately, their recoveries were 0 to 87.8%, generally lower than those by HPCS. After retrieval of Core C9010E-29X at 00:11 on December 6th, the hole was swept out, spotted kill mud solution and then the coring assembly was pulled out of the hole above 50m from the seafloor for ready to move the next Hole C9010F.

Hole F had a sandy start, similar to Hole E, and suggests the presence of a mound or ridge at the drill site. The first 6 cores came up with good recovery, if a tendency for expanded sections. After 6H, the switch to EPCS coring resulted in much reduced recovery rates, ranging between 8.7 an 70.4%. After 11X we switched back to HPCS on request from the scientists, resulting in recovery back to 100%. When reaching the interval that caused trouble in Hole E core 10H, the core jammed in the barrel again. Switched to EPCS after 14H resulting in reduced recovery from scoriaceous sands and gravel, then to ESCS after 17X with little recovery from the gravelly sediment. A brief switch to HPCS for core 20H was followed by a return to ESCS coring by core 21X. The recovery rate did not improve, however, until pump rate was reduced to 0-10 spm by core 26X. After 31X, we pulled out of hole from December 7th, 07:30, and set course for Tateyama and crew change. When retrieving BHA we found the bit seal to be damaged, probably caused by excess mudflow when cutting core with both EPCS and ESCS.

After crew change in Tateyama on December 9th, Chikyu headed to the C9010G location to begin coring on December 10, 02:33. The first HPCS core advanced 6.76 m with 100% recovery. This was followed by drilling to 80 m DSF and cutting of core C9010G-2H. Besides poor recovery in a gravelly interval in section 3H, recovery was good down to and including section 5H. After drilling ahead to 169.76 m DSF, we switched to EPCS, followed by ESCS. Recovery dropped accordingly, varying between essentially no recovery and about 70 %. By 21:00 on December 11, weather conditions deteriorated enough for operations to change to Wait on Weather. By noon on December 12 weather conditions had improved enough to resume ESCS coring. Core 22X saw 4.7 m advance, but upon adding a stand for the coring the travelling block started making noises and smoking. Further coring was suspended and the BHA pulled up to 20 m above seafloor. The cause of the issue was not found, so the any further coring operation was cancelled. Coring operations for Expedition 905 has so come to an end.

The last core barrel was slowly retrieved as pipe was pulled, and reached the deck by mid-day December 14th. However, the barrel seems to have collided with the BHA and the core was not cut. The liner was empty and the core barrel jammed inside the pipe. Core C9010G-21X is therefore the last core recovered from Expedition 905.

6 Measurement and initial results onboard

Fig. 6-1 plans the procedure of core sample measurements and sub-samplings and Fig. 6-2 shows some parts of the results for cores at each hole. At Core Cutting Area, a few technicians placed recovered core. If needed for safety, they released pressures from core liner by putting small holes. Cores were cut into sections, whose lengths were no longer than 1.4 m. ID numbers were issued for sections and their properties were recorded by using the database system. A technician took samples using a syringe for safety gas monitoring and carried out the gas analysis downstairs. The results were reported from Lab. Officer and Assistant Lab. Officer to OSI once

12 hours. JAMSTEC Curators took a sample for routine microbiological sampling (RMS) once here during the expedition.

After the sections were carried to Core Processing Deck, a technician carried out X-ray CT scan. Core sections are stored in Whole Core Reefer (approx. 4 ˚C) before and after the measurements. In QA/QC Sampling Room, some scientists took whole-round sub-samples for pore water chemistry, organic geochemistry, detrital DNA analyses and feasibility study for routine microbiological sampling (RMS). Pore waters were squeezed and measured their chemistry. After waiting several hours for the core sections temperature became the same as the room temperature (approx. 18.5 ˚C), some physical properties were measured non-destructively employing a Multi Sensor Core Logger (MSCL).

A few technicians split core section into working and archive halves. Another scientist took photographs of the archive halves by using a digital camera and described cores visually (VCD) for the archive halves. The VCDs were recorded into the database. From working halves, some half-round sub-samples were taken for organic geochemistry.

6.1 Safety gas monitoring

In order to monitor gases for safety, we took samples from the tops of the second sections of Cores C9010E-11H, 12H, 13H, 23H, 24X, 25X, C9010F-29X, 30X, C9010G-17X, 18X and 21X, between 100 and 120 m CSF and deeper than 160 m CSF at Hole C9010E, deeper than 175 m CSF at Hole C9010F and deeper than 180 m CSF at Holes C9010G. The 5 cc of sediment samples were taken by putting a syringe into cored sediments twice (to 4 cm deep from the top of the section) at Core Cutting Area immediately after core was cut into sections. The samples were put into 20 cc pre-combusted glass vials and sealed. We employed a gas chromatograph (GC) that has a flame ionization detector (FID) in order to measure concentrations of methane, ethane, propane, iso-butane, n-butane, ethylene, and propylene in the headspace gases quantitatively. Headspace gas sampler equipped with the GC introduced 5 cc gases automatically after 70˚C and 30 minutes heating.

Only methane was detected and the other six species of gases were not detected at all from any samples (the data will be available at [http://sio7.jamstec.go.jp]). The methane concentrations were between 4.3 to 24 and 13 to 26 $\times 10^3$ ppm from 101.30 to 109.13 m CSF (Cores C9010E-11H, 12H and 13H) and from 161.20 to 173.45 m CSF (Cores C9010E-23H, 24X, 25X, C9010F-29X), respectively (Fig. 6-1-1). Core C9010F-30X (178.16 m CSF) showed a quite low methane concentration (26 ppm) and methane was not detected below 216.77 m CSF (Cores C9010G-17X, 18X and 21X).

6.2 X-ray CT scanning

X-ray computed tomography (CT) scanning was carried out for the 69 pre-split whole-round section out of all the 366 sections. After measurements for Cores C9010E-1H and 2H, the X-ray CT scanner got out of order and no measurement was done for the following cores of Hole C9010E or any cores of Hole C9010F. The scanner was fixed before drilling Hole C9010G and all the sections were measured. For several selected intervals of Holes C9010E and F, the archive halves were measured for 32 Sections C9010E-9H-5 through 8, 9H-CC, 10H-1 through 12, 12H-1 through 4, 19H-5 through 7, and C9010F-14H-1 through 8. Once in every 24 hours, we measured a check piece that consists of aluminium, water and air.

Axial images were taken once in every 0.625 mm, and sections with typical lengths 1.4 m had 2,240 axial images each. Each axial image covered 96×96 mm area by 512×512 pixels. Each pixel height and width was 0.1875 mm. From each set of axial images, a coronal image was re-constructed to cross the plane between archive and working halves. In addition, another coronal image was built for each core sections measured its archive half after splitting to cross a parallel plane within the archive half. These axial and coronal image files will be available at [http://sio7.jamstec.go.jp].

6.3 Interstitial water chemistry

The main objectives of the geochemical analysis of interstitial water at Exp.905 are to (1) characterize in situ biogeochemical reactions; (2) assess potential contamination of seawater during drilling operations.

6.3.1 Methods

6.3.1.1 Interstitial water collection

Whole-round core (WRC) samples (10--20 cm) were sectioned and capped in the QA/QC Sampling Room. To minimize potential contamination, we selected sections with minimal disturbance, such as voids or cracks. Total 8 samples (C9010E-1H, 2H and C9010G) were checked using X-ray CT scanning before cutting off. In general, WRC samples were collected at a frequency of three per core above 10 m CSF. Below this depth, one sample was collected at each core, if recovery was sufficient.

These WRC samples (sample code: 905NOIW) were placed in a glove bag and flushed with nitrogen gas three times before squeezing. When there were too many samples to process immediately, samples were stored in a 4°C refrigerator until further processing. The core liner was extracted from a whole-round core while it remained in a nitrogen-filled glove bag. The surface and cross sections of each whole-round core were carefully scraped with a spatula to eliminate sediments that had potentially been contaminated from seawater, drilling fluid, oxidation, and smearing in the core liner. The clean inner parts of the core were then placed into a Manheim-type titanium squeezer (Manheim, 1966) and squeezed at ambient temperatures with a laboratory hydraulic press at gauge pressures up to 23,000 lb. Interstitial water was passed through two ultrapure water (Milli-Q) rinsed filter papers fitted on two 90 mesh titanium screens at the bottom of the squeezer. Fluids from the squeezing process were collected in an acid-washed (10% HCl) 50 mL plastic syringe. Interstitial water was subsampled in Nalgen tubes, passing through a 0.45 μm disposable polytetrafluoroethylene (PTFE) filter, for shipboard and shore-based analyses. The squeezed cakes obtained from the pore water sampling were transferred to Ziploc bags, and stored in -20˚C.

6.3.1.2 Water collection for quality control

In some intervals (C9010E-12H-2 and 17H-3), the WRC samples were sandy, making the interstitial water difficult to be extracted by squeezing. For quality control of other samples (905NOOG, 905NMA and 905HKD), the sulfate concentration (indicator of seawater contamination) in water adsorbing to sand grains were measured after the processes described below. The inner parts of these WRC samples were mixed with Milli-Q water (samples: water = 15: 17, v/v) and centrifuged with

1,500 rpm for 5 min at 4 ˚C. The supernatant was collected by an acid-washed (10% HCl) 50 mL plastic syringe. The collected water was processed by the same way as interstitial water for onboard analysis ("centrifuged water with dilution").

Some fine-grained sand intervals (C9010F-3H-4 and 4H-7) were immersed in much water between cores and core liners, but they were collected by HPCS and bounded by thick clay sections. To clarify whether these water were in situ interstitial water or contamination of seawater, the water in these intervals were directly collected by acid-washed (10% HCl) 50 mL plastic syringes, through holes of core liners drilled for void-gas escaping in the core-cutting area. The collected water was centrifuged with 1,500 rpm for 5 min at 4 ˚C. The supernatant was collected by another acid-washed (10% HCl) 50 mL plastic syringe, and was processed by the same way as interstitial water for onboard analysis ("centrifuged water").

For assessing the contamination during drilling, we collected the surface seawater from the taps in the Microbiology Laboratory (surface seawater-1) and the Core Cutting Area (surface seawater-2), and the drilling fluid used during coring operations from the mud tank. The drilling fluid was centrifuged with 3,000 rpm for 15 min at 4 ˚C. The clear layer of at the upper part was collected by another acid-washed (10% HCl) 50 mL plastic syringe. The seawater and centrifuged drilling fluid were processed by the same way as interstitial water for onboard analysis. We analyzed them for all of the species measured shipboard.

6.3.1.3 Water analysis

Interstitial water samples were routinely analyzed for salinity as total dissolved solutes with an RX-5000α refractometer (Atago). The refractive index was converted to salinity based on repeated analyses of International Association of Physical Sciences of the Oceans (IAPSO) standard seawater. Precision for salinity was <0.1 ‰.

pH and alkalinity were measured with a Metrohm autotitrator soon after (within 15 min) interstitial water was extracted. Alkalinity was measured by Gran titration. 49.55 mM sodium bicarbonate ($NaHCO_3$) solution was used as a quality control solution by repeated analysis. The average precision for alkalinity analyses was <2%.

Sulfate and bromide concentrations were measured by ICS-1500 ion chromatography (Dionex) using subsamples that were diluted 1:100 (10 µL in 990 µL) with Milli-Q water. This dilution provided quality peak detection for chloride, bromide, and sulfate. Chloride data were used only to check the quality of the dilution step. IAPSO standard seawater P-series aliquots (0.1, 0.5, 1, 2, and 5 µL in a total of 1000 µL) and KANTO anion mixed standard solution IV aliquots (10, 50, 100, 200 and 500µL in a total of 1000 µL) were analyzed at the beginning and end of each run as a quality control measure and to monitor potential drift in sensitivity throughout a particular run.

Dissolved phosphate concentration was measured within 24 hours after collecting the interstitial water sample using a colorimetric method with the aid of an UV-2550PC spectrophotometer (Shimadzu) at an absorbance of 885 nm. Because the concentration of phosphate in the analysis solution must be <10 µM, an appropriate aliquot of sample (100 or 1000 µL) was diluted with Milli-Q water (1000 or 0 µL, respectively) in a plastic tube. The 2 mL mixed solution (ammonium molybdate, sulphuric acid, ascorbic acid, and potassium antimonyl tartrate) was added to the tube and was well mixed; the tube was capped and kept at room temperature to develop colour. Calibration curves were provided from series of phosphate standard solutions

(KH_2PO_4) of 1.61, 3.23, 8.07, 16.1 and 24.2 μM for 3 samples with low concentration of phosphate (seawater-1, -2 and drilling fluid); or 16.1, 32.3, 80.7, 161, and 242 μM for other samples.

Dissolved ammonium concentration was also determined with the UV-2550PC spectrophotometer at an absorbance of 640 mM within 12 hours after collecting the interstitial water sample. Sample aliquot (0.05 or 0.1 mL) was diluted with Milli-Q water (4 or 2 mL, respectively), 0.5 mL phenol ethanol, 0.5 mL sodium nitroprusside, and 1 mL oxidization solution (sodium hypochlorite and alkaline citrate) in a capped plastic tube and was kept in the dark at room temperature for >3 hours to develop colour. Samples with very low concentration of ammonium were diluted with 0 mL Milli-Q water, 0.25 mL phenol ethanol, 0.25 mL sodium nitroprusside, and 0.5 mL oxidization solution. Calibration curves were provided from series of ammonium standard solutions (NH_4Cl) of 0.1, 0.25, 0.5, 0.75, 1.0 mM; 0.2, 0.5, 1.0, 1.5, 2.0 mM; 0.5, 1.25, 2.5, 3.75 and 5 mM; 1.0, 2.5, 5.0, 7.5 and 10 mM; or 2.5, 5.0, 7.5, 10, 12.5 mM according to the ammonium concentration of each sample.

6.3.2 Results and discussion

A total of 33 WRC samples were collected in the QA/QC Sampling Room for water analyses (23 from Hole C9010E, 6 from Hole C9010F and 4 from Hole C9010G, respectively). Among them, interstitial water was not collected from C9010E-12H-2, C9010E-17H-3, C9010F-3H-4 and C9010F-4H-7, and "centrifuged water" was collected and analysed (See Section 6.3.1.2). 2 samples of surface seawater and 1 sample of drilling fluid were also collected and analysed (See Section 6.3.1.2).

6.3.2.1 Interstitial water

Sulfate concentrations decrease monotonically from the seawater value of ~27 mM to nearly 0 mM at ~6 m CSF (Fig. 6-3-2-1A). A concomitant increase in headspace methane concentration at ~6 m CSF at Hole C9010B in Exp. 904 constrains the lower limit of sulfate-methane transition (SMT) to ~6 m CSF (Fig. 6-3-2-1B). Below the SMT, sulfate concentrations in interstitial water generally remain below 0.9 mM. The 5 samples from sediments deeper than 165 m CSF (C9010E-24X-3 and 25X-2, C9010F-30X-1 and 31X-1, C9010G-17X-1) show significant concentrations of sulfate (1.6 - 27.5 mM). Generally, the presence of sulfate and methane in a sample collected below the SMT is a clear indication of drilling-induced contamination. If the significant sulfate originates from contamination, the sulfate concentration measured in the sample can be used to estimate the amount of drill fluid introduced to the sample by taking the ratio of the sulfate measured in the sample to the sulfate concentration of surface seawater. The other analyses can be corrected based on their concentration in surface seawater using the equations used in IODP Exp.316 (Kinoshita et al. 2009: Exp. 316 methods p. 18-19):

$$[X]_{corrected} = \{[X]_{measured} - (f_{sw} \times [X]_{sw})\}/f_{pf} \qquad (1)$$

where

$[X]_{measured}$ = measured concentration of the analyte.

$[X]_{sw}$ = element concentration in surface seawater (used in drilling).

$[X]_{corrected}$ = corrected or in situ concentration of the analyte.

f_{sw} = fraction of seawater introduced into the sample during drilling.

f_{pf} = fraction of in situ pore fluid in the sample.

The fraction of seawater introduced by drilling and the fraction of in situ pore fluids are computed using Equations 2 and 3:

$$f_{sw} = [SO_4]_{measured}/[SO_4]_{sw} \quad (2)$$

and

$$f_{pf} = 1 - f_{sw} \quad (3)$$

The analysis of safe gas monitoring in Exp. 905, however, detected little or no methane in the samples from deep sediments (> 175 m CSF), making it difficult to ascertain whether the presence of sulfate in deep samples is the result of drill water contamination or if they reflect in situ pore water chemistry. Thus, pore fluid elemental concentrations were not corrected for drilling contamination based on dissolved sulfate concentration. Uncorrected concentrations of all of the elements analyzed in the interstitial water are presented in Table 6-3-2-1, and the corresponding profiles are presented in Fig. 6-3-2-1. The following results and discussion of the other analysis of interstitial water focus on the upper layer (<165 m CSF) of sediment. The data and samples from sediments deeper than 165 m CSF should be treated with caution, especially the bottom 3 samples with high concentration of sulfate.

Salinity (<165 m CSF) varies from 34.6 at 91.6 m CSF to 33.0 at 161.7 m CSF (Fig. 6-3-2-1C). The uppermost layer of sediments is characterized by a rapid decrease of salinity from near-seawater value (34.4) to 33.1 at the 6.3 m CSF. In the same interval, pH increases from 7.65 to 7.92 (Fig. 6-3-2-1D). The decrease of salinity and increase of pH may reflect sulfate reduction and subsequent precipitation of authigenic carbonates. Salinity increases up to 34.5 from 6.3 to 34.5 m CSF, shows minor variation of salinity between 34.5 and 124.2 m CSF (within 34.3--34.5), and decreases monotonically to 33.0 at 161.7 m CSF. Variation of pH below the SMT (<165 m CSF) is small (within 7.78--7.94).

Alkalinity and dissolved phosphate concentrations consistently increase to near-maximum values at 15.3 m CSF (43.0 mM and 166.5 µM, respectively: Figs. 6-3-2-1E and F). Alkalinity is nearly constant between 15.3 and 124.2 m CSF (within 42.4--45.6 mM) and decrease with minor variation to 27.3 mM at 161.7 m CSF. Phosphate concentration shows scattered variation below 15.3 m CSF from 72.4 to 172.5 µM.

Dissolved ammonium and bromide concentration continues to increase at a slower rate than alkalinity and phosphate to the maximum value (7.9 mM at 91.5 m CSF and 1.25 mM at 52.2 m CSF, respectively: Figs. 6-3-2-1G and H). Below this depth, bromide concentration decreases gradually. Below 150 m CSF, ammonium concentration shows rapid decrease.

6.3.2.2 Water collected for quality control

The results of water collected for quality control (See Section 6.3.1.2) were presented in Table 6-3-2-2. pH, alkalinity, phosphate and ammonium concentrations were not analysed in C9010E-12H-2 and 17H-3. Phosphate and ammonium concentrations were not analysed in C9010F-3H-4. The mean values of 2 surface-seawater samples are presented in Fig. 6-3-2-1 with the results of interstitial water.

In the centrifuged waters collected from C9010E-12H-2 and 17H-3 with dilution by Milli-Q water, sulfate concentrations are 1.60 and 0.25 mM, respectively. These values can be possibly corrected for dilution using salinity values. Assuming the salinity of water attached to sand grains were close to surface seawater, the original sulfate concentration would be ~7.4 and ~0.7 mM. Thus, the samples collected from C9010E-12H-2 may be contaminated with seawater during drilling, whereas those from C9010E--17H-3 may not be contaminated.

In the centrifuged waters collected from C9010F-3H-4 and 4H-7, sulfate concentrations are 5.16 and 0.71 mM, respectively. These results suggest that the water collected from C9010F-3H-4 (well below the SMT) may be contaminated with seawater, whereas the water from C9010F-4H-7 was in situ water in the sediment.

In the drilling fluids, salinity, bromide and sulfate concentrations are roughly half of those of surface seawater. Chloride concentration roughly estimated using ion chromatography is also nearly half of that of seawater (data are not shown). These values are probably the result of method to make the drilling fluid – mixing surface seawater, pure water and some chemicals. Sodium hydroxide (NaOH) mixed in the drilling fluid may contribute to the high pH value (9.5). Ammonium concentration is under the detection limit. In the surface sweaters, phosphate and ammonium concentrations are under the detection limits.

6.4 Nondestructive physical properties

For all the core sections, excepting core catcher sections, physical properties of P-wave velocity, gamma ray attenuation density, magnetic susceptibility, (non-contact) electrical resistivity and natural gamma radiation were measured by using a Multi Sensor Core Logger (MSCL) (Fig. 6-2; Numerical data of the results will be available at [http://sio7.jamstec.go.jp]). As mentioned already, some series of whole-round samples were taken before the MSCL measurements, and the physical properties measurements could not be done for such intervals.

6.5 Visual core description

6.5.1 Sediments and sedimentary rocks

Core description forms (barrel sheets) in this volume provide a summary of the data obtained during shipboard analysis of each sediment core (Appendix A). We applied the IODP visual core description (VCD) method. Detailed observations of each section were recorded initially by hand on standard IODP VCD forms. This information was subsequently entered into J-CORES software, which generates a simplified, annotated graphical description (barrel sheet) for each core. Columns on the barrel sheets include core recovery, graphic lithology, sedimentary structure, drilling disturbance, general comments, and corresponding physical property data (e.g., X-ray CT scan images, bulk gamma density, and magnetic susceptibility). Lithologies of the core intervals recovered are represented on barrel sheets by graphic patterns in the “Lithology” column. Lithology names were assigned based on macroscopic observation. Sedimentary structures formed by physical and biogenic processes, and not as a result of drilling disturbance, are represented on the “Sedimentary Structures” column in the barrel sheet. These include parallel/cross bedding, grading, degrees of bioturbation, fossils, authigenic minerals, patches, and types of volcaniclastic sediments. Depth of cores are indicated as CSF-A (core depth below seafloor, let overlap if long) scale. Information recorded on the VCD is available as a searchable database through Chikyu Laboratory Data Center (http://sio7.jamstec.go.jp).

6.5.2 Drilling disturbances

Sediment disturbances induced by the coring process are denoted on the "Drilling disturbance" column in the barrel sheet. We used the classification applied in Exp. 904; 1) slightly disturbed: bedding contacts are slightly bent, 2) moderately disturbed: bedding contacts are extremely bowed, 3) heavily disturbed: bedding is completely disturbed and, in some cases, shows symmetrical diapir-like or flow structures, and 4) soupy: intervals are water saturated and have lost all original structure. In addition, we used term 5) gas expansion: core expansion and void formation by degassing due to depressurization, 6) biscuit: core fragmentation into biscuits and highly shared zones, caused by rotation of the core in the core barrel during ESCS drilling, and 7) flow-in: intrusion of sandy materials from the core bottom due to sucking at retrieving of the HPCS core barrel, 8) drilling breccia: crushed and/or broken sediments into angular pieces due to drilling, and 9) heavily fractured by drilling: sediment cores fractured heavily by drilling or splitting.

6.5.3 Colour

Colours were determined by comparison with the Standard Soil Colour Charts (Oyama and Takehara, 2005). Colours were determined immediately after the cores were split, because chemical changes may occur when deep-sea sediments are exposed to the atmosphere (Moberly and Klein, 1976). Information on core colours is given in the text of the "Lithologic Description" on the core description forms.

6.5.4 Smear slides

Identification and semiquantification of sediment components (e.g., minerals and fossils) were performed based on microscopic observation of smear slides. Routine observations that were made include sample location, whether the lithology sampled was dominant or minor, an estimate of grain-size distribution, and relative abundance of each component, which is represented as area-% (Table 6-5-4-1). Based on the results of microscopic observations we assigned the name of sediment by following the ODP/IODP sediment classification scheme (Mazzullo et al., 1988). These data were used as complementary information for characterization of sediments.

6.5.5 Lithologic description

Intervals: 905-C9010E-1H-1, 0 cm, through 905-C9010E-29X-CC, 33 cm; 905-C9010F-1H-1, 0 cm, through 905-C9010F-31X-CC, 30 cm; 905-C9010F-1H-1, 0 cm, through 905-C9010G-21X-CC, 7 cm.

Depth: 0.0 to 190.38 m CSF-B (Hole C9010E); 0.0 to 182.905 m CSF-B (Hole C9010F); 0.0 to 236.005 m CSF-B (Hole C9010G).

Age: Pleistocene (estimated from the biostratigraphic data from Holes A through D in the same site during the Exp. 904; Shipboard Science Party, 2009).

Sediment recovered in Holes E, F, and G in the Site C9010 is composed primarily of gray through olive gray silty clay, and intercalations of light gray through black volcaniclastic sediments such as volcanic fine ash, volcanic coarse ash and lapilli ash (Fig. 6-5-5-1). The silty clay consists of clay minerals, diatoms, volcanic glass, nannofossils, quartz, feldspar and opaque materials (Table 6-5-4-1 and Fig. 6-5-5-2a). Some of they also contain certain amount of foraminifers, sponge spicules and silicoflagellata. Nannofossils are common through the core, ranging from 2 to 10% in the smear slides, but more abundant (up to 20-30%) in the stratigraphic intervals deeper than 160 m CSF. Diatoms are abundant in shallower part of this site, comprising up to 30%, but decrease in abundance with depth. Below 140 m CSF, they become a minor constituent in the silty clay intervals. Radiolarians are rare throughout the cores. Black spots, probably composed of pyrite micrograins (Fig. 6-5-5-3a), are abundant in the silty clay in the depth range between 20 and 80 m CSF. Light gray tubes with 1 to 2 mm in diameter, and their fragments are scattered in the silty clay intervals, normally three to ten grains per section (Fig. 6-5-5-3a). They are composed of sponge spicules (Fig. 6-5-5-2b), and are likely burrow walls of some benthic organisms. Thin beds and patches of volcanic fine ash are commonly observed in the silty clay layers. These patches would be formed by bioturbation or isolated during coring.

Volcaniclastic sediments such as volcanic fine ash, coarse ash and lapilli ash are roughly divided into mafic (olive black through black) (Fig. 6-5-5-3b) and felsic compositions (light gray through olive gray) (Fig. 6-5-5-3c), and a mixture of both. The felsic (pumiceous) volcanic ash is composed of porous volcanic glass, quartz and feldspar (Fig. 6-5-5-2c), while mafic (scoriaceous) volcanic ash is mainly composed of brown volcanic glass, rock fragments and feldspar. Normal grading, parallel bedding and scoured bases are frequently observed (Fig. 6-5-5-3b), indicating that most of the volcaniclastic sediment layers were deposited from turbidity current rather than ash fall deposit. Some ash layers contain fragments of planktonic and benthic foraminifers (Fig. 6-5-5-2c), suggesting that they were reworked from shallow water such as shelf and slope. Thickness of these volcaniclastic layers ranges from 1 cm to 4 m.

Physical property data well represent the lithology (Fig. 6-5-5-1 and Appendix A). For example, silty clay shows high natural gamma ray (NGR) intensity up to 10 cps, reflecting high concentration of radiogenic nuclide such as potassium, thorium and uranium. In contrast, felsic and mafic volcanic ash and lapilli ash show low NGR intensity (~0 cps). Magnetic susceptibility is useful to discriminate scoriaceous volcaniclastic sediments from felsic volcaniclastics and silty clay. The mafic (scoriaceous) volcanic ash layers show high magnetic susceptibility, generally more than 0.5 SI, and reaching 1.0 SI. Both silty clay and pumiceous volcaniclastic sediments show low magnetic susceptibility, approximately 0.2 SI.

6.5.6 Lithological unit

We identified a single lithological unit (Unit I) in this site, that is characterized by an alternation of olive gray silty clay and black through light gray volcanic ash and lapilli ash. This unit identification is consistent with that of the Exp. 904 Shipboard Science Party (2009). In this report, we further divide it into three subunits (Fig. 6-5-5-1); Subunit Ia: silty clay-rich interval, Subunit Ib: pumiceous and scoriaceous volcaniclastic-rich interval, and Subunit Ic: scoriaceous volcaniclastic-rich interval. The Subunit Ia is composed primarily of olive gray through gray silty clay, with intercalations of thin volcanic ash layers and patches. This subunit is observed in the stratigraphic intervals in 0-29, 56-72, 87-104, 114-134, 157-175, 211-220, and 229-240 m CSF. Subunit Ib is dominated by thick layers of both felsic (felsic) and mafic (scoriaceous) volcaniclastic sediments such as volcanic ash and lapilli ash, which are intercalated in silty clay. This subunit is observed in the stratigraphic intervals in 29-

56, 72-87, 104-114, and 134-157 m CSF. Subunit Ic is mainly composed of mafic (scoriaceous) volcaniclastic sediments such as volcanic coarse ash, and lapilli ash, that is intercalated in silty clay. Pumiceous volcaniclastic sediments are rare in this subunit. Granule- to pebble-size scoriaceous lapilli are frequently observed in this subunit. This subunit is observed in 175-211 and 220-240 m CSF. Subunit Ic is characterized by very low core recovery. Thus, we note that scoriaceous lapilli in Subunit Ic could be products of drilling disturbance, i.e., fine silty clay and volcanic ash could be washed out by coring.

The location of Site C9010 is close to the Niijima Canyon (Fig. 2-1). Thus, the potential provenances of the coarse volcaniclastic sediments are Toshima, Niijima, Shikinejima, Miyakejima and some submarine volcanoes. The distribution of Subunits Ib and Ic indicates that the deeper part of this site (> 170 m CSF) is dominated by mafic volcaniclastic sediments, whereas shallower part of this site contains both mafic and felsic volcaniclastic sediments. This would reflect either the history of volcanic activity in the nearby volcanoes, or a change in source area and sediment transportation system from the nearby shallow seas through the Niijima Canyon. The cycle of Subunits Ib and Ic would suggest the change in frequency of turbidity currents from the nearby shallow seas. Some of the turbidity currents might be triggered by earthquakes. We speculate that sediment recovered in this site might be used to investigate the history of seismicity in the southern Kanto and Izu Islands.

6.5.7 Stratigraphic correlation

Information of visual core description, X-ray CT scan images, magnetic susceptibility records and NGR intensities can be used for stratigraphic correlation. Above 105 m CSF, a layer-by-layer correlation can be achieved among three holes (Fig. 6-5-7-1), and we found that sediment gaps among these holes were not larger than 3 m as the CSF-A depth scale. Our correlation indicates that thicknesses of some volcaniclastic sediment layers vary significantly, even though the distance among these Holes is only several ten meters. For example, a 2.5 m-thick scoriaceous volcanic coarse ash layer in 905-C9010F-14H (section 6 to CC) is correlated to a 20 cm-thick (or slightly thicker) layer of scoriaceous lapilli ash in the bottom of the core 905-C9010E-10H (section 12 and CC), and to a 35 cm-thick (or slightly thicker) layer of scoriaceous volcanic coarse ash in the bottom of the core 905-C9010G-4H (section 8 and CC) (Fig. 6-5-7-1). The X-ray CT images of 905-C9010F-14H do not indicate any evidence of flow-in in the 2.5 m-thick layer of volcanic coarse ash. Therefore, the highly variable thickness of this layer is not a product of drilling disturbance. We attribute the variation of thicknesses of volcaniclastics to the change in topography of the ancient channels at this site. A layer-by-layer correlation and a complete splice is difficult to be established in the stratigraphic interval deeper than 105 mbsf because of low core recovery, lack of key bed, and the highly variable thicknesses of volcaniclastic sediments.

6.6 Feasibility study for routine microbiological sampling

Sample coded as 905NMB and 905NMA were taken as 10 cm Whole-Round Core (WRC). In order to evaluate the effect of timing of sampling during the core processing, samples coded as 905NMB were taken before X-ray CT scanning at Core Cutting Area, whereas those coded as 905NMA were taken at QA/QC Sampling Room after X-ray CT scanning followed by MSCL-W logging.

During the sample processing at Core Cutting Area, spatulas rubbed with alcohol and autoclaved end-caps were used for treating the cut surfaces of microbiological samples. People working for these treatments wore latex gloves and frequently wash their hands with kitchen detergent and sterilized them with rubbing alcohol.

Microbiological samples were cut from sections with rotary core cutter. Samples were sealed with end-caps and vinyl tapes, and labelled with J-CORES numbering.

6.6.1 Collection of core samples as RMS

(a) According to STPs recommendation, WRCs as Routine Microbiological Sample (RMS) were collected per IW samples during this expedition. Approximately 30 ml portions of sediment were collected from the centermost part of 24 WRCs from the Hole E by using sterilized 30-mL plastic syringes with the luer lok end cut off (Fig.6-6-1), and immersed into liquid nitrogen for at least 30 minutes (Fig.6-6-2). After quick-freeze, sediment sample was placed into 50-mL of sterilized plastic tube. The sediment samples and the WRCs after this sampling were kept at -80°C on board (Fig.6-6-3).

For optimal preservation, the initial freezing step is important. Flash freezing with liquid nitrogen is better than normal (slow) freezing.

6.6.2 Enumeration of microbial cell in cored samples

(b) Approximately 1 ml portions of sediment were collected from about the middle part of 22 WRCs from the Hole F by using sterilized 1-mL plastic syringes with the luer lok end cut off (Fig.6-6-1), and mixed with 4.5 ml of 4% paraformaldehyde and 4.5 ml of PBS. The mixtures were kept at 4 °C for 12 hours, after which the mixture was centrifuged at 3,000 g for 10 min. The pellet was suspended with 9 ml of PBS, and centrifuged at 3,000 g for 10 min. This step was performed twice. The washed pellet was suspended with 4.5 ml of PBS, and adjusts to 10 ml with 100 % ethanol. The slurry samples were kept at -20°C on board (Fig.6-6-4).

6.6.3 Preservation of RNA in cored samples

(c) Approximately 5 ml portion of sediment was collected from about the middle part of 22 WRCs from the Hole F by using sterilized 5-mL plastic syringes with the luer lok end cut off (Fig.6-6-1), and mixed with 20 ml of RNA Later® (Ambion). The mixtures were kept at 4 °C for 24 hours, after which the mixture was centrifuged at 3,000 g for 10 min. After discarding the supernatants, the pellet samples were kept at -20°C on board (Fig.6-6-5).

(d) Approximately 5 ml portions of sediment were collected from about the middle part of 22 WRCs from the Hole F by using sterilized 5-mL plastic syringes with the luer lok end cut off (Fig.6-6-1), and mixed with 20 ml of acetone. The slurry samples were kept at -20°C on board (Fig.6-6-6).

For effective preservation of RNA, the sample should be put into a commercial RNA-stabilizing solution. Sample preservation in acetone may be an alternative method to preserve RNA.

6.6.4 Evaluation of core quality for microbiological studies

(e) Approximately 30 ml portion of sediment were collected from about the middle part of 22 WRCs from the Hole F by using sterilized 30-mL plastic syringes with the luer lok end cut off (Fig.6-6-1). The sediment samples were kept at 4°C on board (Fig.6-6-7).

(f) Eight WRCs (905NMA) and one WRC (905NMB) from the Hole G were placed into Coy anaerobic bench, and opened both of end-caps, and kept at 0-4°C for 20 min. After putting the caps, each WRC was sealed in a gas-barrier bag with an O2-absorbing agent. The bag was clipped with a plastic clipper to confirm the seal. The sealed samples were kept at 4°C on board (Fig.6-6-8).

Each sample (b,c,d and e) was collected from same WRC (Fig.6-6-9). The WRCs after these sampling were kept at -80°C on board.

In evaluation of influence of the timing of sampling during the core processing, it had taken approximately 40 minutes that a time from “Core on deck” call to start subsampling from WRC coded as 905NMB. Whereas that of the WRC coded as 905NMA was approximately 1.5 to 3 hours. The difference of taken time for core processing seemed to have influence on core quality for microbiological studies.

Evaluation of collected samples for studying the subseafloor microorganisms will be performed after the expedition.

6.7 Search for detrital eukaryotic DNA fragments

The purpose of this study is to find out fragmental eukaryotic DNA from well-preserved sediment and to establish a method of extracting fragmental DNA from eukaryote including unicellular microorganisms, planktonic microalgae, and metazoans from sediment cores, and to clarify the relationship between paleoceanographic changes and population genetics.

Undegraded organic materials are well preserved because high concentration of organic matters came from the neritic province. However, the dissolved oxygen concentration in the bottom water is relatively high and the sedimentation rate of off Boso area is lower than off Shimokita area. In contrast to off Shimokita area, primary production of off Boso area fluctuate seasonally, and we will compare eukaryotic genetic assemblages at different environmental conditions both off Shimokita and off Boso area whether DNAs preserved or not, and we can clarify evolutionary relationship of ancient fragmental DNAs from sediment cores.

6.7.1 Sample processing

We took X-ray CT scan for all cores to avoid volcaniclastic layers and we decide the sampling layer, mainly silty clay, where we collect whole-round (WR) core. Unfortunately, the X-ray CT scan was in trouble, we could only take CT pictures from Cores C9010E-1H and 2H. Below core C9010E-3H, and C9010F, we observed sediments through core liner by eyes.

WR cores (10 cm in length) were cut from each section with rotary core cutter at QA/QC Sampling Room (Fig. 6-7-1). Sampling intervals are one sample per section (1.4 m in length). Ethanol-sterilized end-caps are put at each end of the WR core. The WR cores immediately collect sub-sampling with syringe in an anaerobic chamber. When the rapid sampling is difficult, we put in the refrigerator at 4˚C for up to 2 hours. After this procedure, we carried out sub-sampling in an aerobic chamber.

Discrete samples for detrital DNA analyses were collected from WR core with 1x 30 ml tip-cut syringe. Each end of the syringe sub-sample was discarded by spatulas to avoid contamination of exogenous sediments during the WR core processing. Syringes were autoclaved preliminarily. The sizes of the syringe are: 6 cm in length, 2.3 cm in diameter. Volume of the sediment is approximately 30 cc.

Collected samples are then sliced into two aliquots (upper and lower: 3 cm each in length), put into 50 ml Falcon tube (Fig. 6-7-2). From this sample, we took 0.5 ml of sediments are picked from the bottom of each aliquots from above discrete samples (upper bottom (UB) and lower bottom (LB)) with autoclaved 2.5ml syringes, then put it into 2 tubes of 1.8 ml Cryotube (Fig. 6-7-3). Samples are frozen with liquid nitrogen, and then stored in deep freezer (-80˚C) for further DNA/RNA studies on shore. For 1 sample per core, we retrieved sub-sample for RNA analyses. We insert a tip-cut 2.5 ml syringe into the WR core from the top, and then took 0.5 ml of the sample. These samples are fixed with RNAlater reagent, and stored in -80˚C. Sampling residual of 10 cm thick WR will be returned to JAMSTEC/CDEX.

6.8 Organic geochemistry sampling

Subseafloor environments represent the least explored habitats on Earth with regard to microbial life. The activity of subseafloor biosphere may play an important role in global biogeochemical cycling on the geological timescale. Given this background, the subseafloor biosphere in off Boso will be investigated by on-shore analysis of various organic molecules produced by microbes (e.g., amino acids, intact polar lipids, and trace coenzymes) using whole-round cores. Because of the diversity of geological settings around Japan, comparison of these results with the results from Nankai Trough and off Shimokita will provide a novel insight in the diversity and the biogeochemical roles of subseafloor biosphere.

Off Boso is also of interest in the discipline of paleoceanography, because it has been a transition area of two major current, the Kuroshio current and the Oyashio current. A change in circulation pattern should affect the sea surface temperature and nutrient concentration in the area, resulting in a change in primary production. Chloro-pigments and pheo-pigments such as pheophytin a, which are abundant chloro-pigments transformation products, have key information of primary production and nutrient salt condition in the sea surface. Our secondary aim is to reconstruct the change of the paleoenvironmental condition in the sea surface of Off Boso by the composition and the compound-specific nitrogen isotopic composition of chloro- and pheo-pigments in the sediments.

6.8.1 Sample processing

To study biogeochemical characteristics in sediment, total of 38 whole-round cores were taken from Holes C9010E, C9010F, and C9010G (sample code: 905NOOG). Biomolecules are expected to be sensitive to changes in temperature, oxygen and light. Therefore, the core sections designated for biogeochemical sampling were transferred as quickly as possible from the core cutting area to the refrigerator room adjacent QA/QC Sampling Room. Whole-round core samples (15-20 cm in length) were cut off and capped in the QA/QC Sampling Room. To minimize potential contamination, we selected sections with minimal disturbance, such as voids or cracks. Total 10 samples (C9010E-1H, 2H and C9010G) were checked using X-ray CT scanning before cutting off. After placed into plastic bags, they were immediately put into a freezer and stored at -20˚C for onshore biomarker analysis. In addition, a total of 9 working half cores (10-20cm in length) were taken.

In order to eliminate the effect of oxidation, outer core surfaces were scraped off with an ethanol-wiped spatula, wrapped with aluminium folio, followed to place into plastic bags, and stored at -100˚C.

7 Core quality evaluation

During this training cruise, three coring systems were employed: Hydraulic Piston Coring System (HPCS), Extended Punching Coring System (EPCS) and Extended Shoe Coring System (ESCS). The operation criteria for each coring systems had been defined as the followings: HPCS, do not apply under the overpull 100 kN or continuous partial penetration in order to avoid risky overdrill situation; EPCS, unemployable if any damages are observed on the shoe or rate of penetration (ROP) become slower than 10 m/hour; ESCS, terminate drilling if weight on bit (WOB) exceeds 60 kN. We evaluated the qualities of the recovered cores on condition that this expedition was during the training cruise and the coring was operated under such safe criteria. When cutting the deepest HPCS Core C9010E-23H, overpull was 320 kN exceeding the limit (100 kN). EPCS and ESCS cores were taken with half core operation into formation. For the evaluation of core quality, we compared VCD results (e.g., drilling disturbance and lithology) with the X-ray CT scan images (if available), recovery data, core operation logs, and geochemical data of interstitial water (Fig.7-1).

7.1 Core recovery and lithology

According to the operation geologists' reports, we used both "initial recovery" and "corrected recovery". The former is calculated as a ratio of measured core length to advance length, whereas the latter is as a ratio of corrected core length to advance length, respectively. The corrected core length is estimated by subtracting length of fills, cavings, cuttings or flow-in intervals from the measured core length.

7.1.1 HPCS

The upper 165.4 m interval of Hole E was well recovered by the HPCS (Fig. 6-5-5-1) ranging between 90 and 110% as corrected recovery (Fig. 7-1). The HPCS also recovered continuous sediments from the uppers parts of Holes F and G. The high recovery was achieved regardless of the lithology. For example the corrected recovery of core 905-C9010E-9H was 110%, even though it contains two thick layers of volcanic coarse ash. An only exception was the core 905-C9010G-3H, with a recovery of 29%, which penetrated a thick scoriaceous coarse ash interval. However, this thick scoriaceous layer has been sufficiently recovered by HPCS in Holes E and G. Therefore, we conclude that the HPCS in this ship is in most cases suitable to take continuous sediment cores with grain sizes ranging at least from clay through very coarse sand.

7.1.2 EPCS

In contrast to HPCS, recoveries of cores taken by the EPCS were significantly lower and variable (Fig. 7-1). For example, recoveries of 905-C-9010F-16X and -17X are 53% and 0.2%, respectively. These cores should have penetrated through an interval of thick volcanic ash layers, which was continuously recovered by HPCS in Hole E. It suggests that thick layers of coarse ash sediments cause insufficient core recovery.

Results of EPCS coring in this expedition also indicate that the thick layers of coarse volcanic ash are not the unique factor controlling the core recovery. The recoveries of cores 905-C9010F-7X through -11X, taken by the EPCS, range between 9 and 70%. This interval is mainly composed of silty clay with intercalations of volcanic coarse ash layers (i.e., Subunit Ia) that was continuously taken by the HPCS in Hole E (905-C9010E-7H and -8H). Magnetic susceptibility data of this equivalent stratigraphic interval in Hole E show many sharp peaks (Fig. 6-5-5-1), reflecting frequent intercalations of scoriaceous volcanic ash layers. In contrast, an exceptionally high recovery of 99% was achieved in 905-C9010F-15X by the EPCS. This stratigraphic interval is characterized by silty clay with minor intercalations of thin layers of volcanic fine ash, showing less significant variation of magnetic susceptibility and NGR.

It suggests that HPCS is much more sensitive to the presence of intercalating layer, its frequency, thickness and grain size. We interpret that sediments with high contrast in lithology and physical property, such as hard/soft and fine/coarse contrasts, are not suitable for coring with EPCS.

7.1.3 ESCS

The overall trend of recovery by ESCS resembles that of EPCS. Recoveries of cores are generally low in sediments with frequent occurrences of coarse volcanic ash layers. However, relatively higher recoveries were achieved for thick, coarse ash sediments (e.g., 905-C9010F-27X).

7.2 Drilling disturbances

Sediment disturbances induced by the coring process are denoted on the "Drilling disturbance" column in the barrel sheet. We used the classification applied in Exp. 904; 1) slightly disturbed: bedding contacts are slightly bent, 2) moderately disturbed: bedding contacts are extremely bowed, 3) heavily disturbed: bedding is completely disturbed and, in some cases, shows symmetrical diapir-like or flow structures, and 4) soupy: intervals are water saturated and have lost all original structure. In addition, we used term 5) gas expansion: core expansion and void formation by degassing due to depressurization, 6) biscuit: core fragmentation into biscuits and highly shared zones, caused by rotation of the core in the core barrel during ESCS drilling, 7) flow-in: intrusion of sandy materials from the core bottom due to sucking at retrieving of the HPCS core barrel, 8) drilling breccia: crushed and/or broken sediments into angular pieces due to drilling, and 9) heavily fractured by drilling: sediment cores fractured heavily by drilling or splitting.

The overall features of drilling disturbances are similar with those reported by Exp.904 Shipboard Science Party (2009). One of the most significant disturbance is gas expansion of clay-rich intervals (Fig. 7-1), forming many voids inside the core. Some coarse ash layers became soupy, possibly due to low degree of consolidation and high permeability. The quality of cores recovered with HPCS is generally incredibly high, without any prominent disturbance other than gas expansion. Drilling under a large heave condition often causes disturbances of coretop sediment (soupy and/or slurry), because the drilling bit could hit the underneath sediments during the standby for the next coring. During this expedition we found no core which has a heavily disturbed (soupy/slurry) coretop intervals, although several low pressures have passed during the coring. We interpret it to reflect the high stability and compensation system of this ship against heave. Although some thick intervals of volcanic coarse ash might be formed due to flow-in, we found no typical structure of flow-in in the X-ray CT scan images.

Sediments recovered by the EPCS/ESCP are more significantly disturbed by drilling (Fig. 7-1). Although gas expansion is much less significant for the deeper part of three holes recovered with EPCS/ESCS, other disturbance types such as drilling breccias, soupy intervals, fracturing are more prominent. Washout of fine sediments and brecciation would be significant in Subunit Ic (See Section 6.5.6 Lithological unit) (Fig. 7-2-1). Although sediments recovered with ESCS show slight segmentation into biscuits and sheared zones, we found no typical biscuits in those cores.

7.3 Interstitial water chemistry and core quality

Interstitial water chemistry can be used for evaluation of core quality. Because seawater contains approximately 27.2 mM SO_4^{2-} while interstitial water is highly depleted in SO_4^{2-} due to bacterial sulfate reduction, a degree of seawater contamination is represented by sulfate ion concentrations in interstitial water samples (see 6.3). Pore water samples were all squeezed from silty clay-rich sediments. The depth plot of SO_4^{2-} in interstitial water shows a significant decrease from 27.2 to 0.7 mM in the upper 7 m interval (Fig. 7-3-1). Beneath 7 m CSF, the SO_4^{2-} concentrations are mostly plotted in a narrow range between 0.4 and 0.9 mM, indicating no contamination of seawater due to drilling. The pore water chemistry data strongly suggest that samples taken by HPCS are suitable for pore water analyses.

Exceptions are observed for five samples from interval between 160 and 220 m CSF, which were recovered with EPCS and ESCS (Fig. 7-3-1). In particular, pore water samples squeezed from cores recovered with ESCS (e.g., 905-C9010F-20X-1, -21X-1 and 905-C9010G-1) show significantly high SO_4^{2-}, ranging from 12 to 27 mM. The degree of seawater contamination is roughly estimated by assuming a mixing of seawater (27.2 mM) and pore water (0.6 mM). The exceptionally high SO_4^{2-} concentrations for the ESCS samples account for 40 to 100% contamination of seawater (Fig. 7-3-1). It suggests that coring with ESCS strongly disturbs sediments, and that it is not suitable for investigation of interstitial water chemistry. The degree of contamination negatively correlates with core recovery (Fig. 7-3-1). We observed that inner barrels of poorly recovered cores are filled with sea water, which would have caused the contamination of seawater during the salvage of core onto the deck.

The sulfate ion concentrations of interstitial water from sediments recovered by EPCS (905-C9010E-24X-3 and 25X-2) range between 1.6 and 2.4 mM, corresponding to 4-7% contamination of seawater (Fig. 7-3-1). Although the degree of seawater contamination is not significantly high, a much careful attention should be paid for the pore water analyses of sediments taken by EPCS.

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Tables

Table 2-1: Holes drilled during Cruise CK09-03 Expeditions 904 and 905. Water depth at Hole C9010D was regarded as the same as Hole C9010C; the core was not taken at the seafloor surface at the hole and the mud line level was not observed.

Hole	Latitude (N) (degree)	Latitude (N) (arc minute)	Longitude (E) (degree)	Longitude (E) (arc minute)	Water Depth (meter below mean sea level)
904-C9010A	34	33.4500	139	53.4000	2028.61
904-C9010B	34	33.4500	139	53.4000	2028.57
904-C9010C	34	33.4431	139	53.4178	2028.72
904-C9010D	34	33.4431	139	53.4178	2028.72
905-C9010E	34	33.4569	139	53.3822	2027.25
905-C9010F	34	33.4637	139	53.3645	2026.35
905-C9010G	34	33.4706	139	53.3467	2025.94

Table 3-1: Section summary. Section list of each hole including section curated length and its depth. Note that CSF means core depth (below sea floor), CSF-A: let overlap if long and CSF-B: scale if long.

Expedition 905 Site C9010E
Expedition name CHIKYU TRANING CRUISE CK09-03 EXPEDITION 905

Section Summary

Section	Section curated length (m)	Top Depth [m CSF-A]	Bottom Depth [m CSF-A]	Top Depth [m CSF-B]	Bottom Depth [m CSF-B]	Core Comment	Section Comment
C9010E-1H-1	1.41	0	1.41	0	1.399		
C9010E-1H-2	1.41	1.41	2.82	1.399	2.799		
C9010E-1H-3	1.41	2.82	4.23	2.799	4.198		
C9010E-1H-4	1.41	4.23	5.64	4.198	5.598		
C9010E-1H-5	1.41	5.64	7.05	5.598	6.997		
C9010E-1H-6	0.66	7.05	7.71	6.997	7.652		
C9010E-1H-CC	0.305	7.71	8.015	7.652	7.955		
C9010E-2H-1	1.41	7.95	9.36	7.95	9.238		
C9010E-2H-2	1.44	9.36	10.8	9.238	10.553		
C9010E-2H-3	1.489	10.8	12.289	10.553	11.913		Liner Patch: btm 5 cm
C9010E-2H-4	1.533	12.289	13.822	11.913	13.314		Liner Patch: btm 3 cm
C9010E-2H-5	1.41	13.822	15.232	13.314	14.602		
C9010E-2H-6	1.42	15.232	16.652	14.602	15.899		Liner Patch: btm 1 cm
C9010E-2H-7	1.365	16.652	18.017	15.899	17.146		Liner Patch: btm 9.5 cm
C9010E-2H-CC	0.335	18.017	18.352	17.146	17.452		
C9010E-3H-1	1.405	17.45	18.855	17.45	18.689		
C9010E-3H-2	1.405	18.855	20.26	18.689	19.929		
C9010E-3H-3	0.26	20.26	20.52	19.929	20.158		Replaced Liner: expanded sediment from btm of section 2
C9010E-3H-4	1.41	20.52	21.93	20.158	21.402		
C9010E-3H-5	1.41	21.93	23.34	21.402	22.646		
C9010E-3H-6	1.445	23.34	24.785	22.646	23.92		Liner Patch: btm 3 cm
C9010E-3H-7	1.4	24.785	26.185	23.92	25.155		
C9010E-3H-8	1.01	26.185	27.195	25.155	26.046		
C9010E-3H-9	0.52	27.195	27.715	26.046	26.505		Liner Patch: btm 6 cm
C9010E-3H-CC	0.505	27.715	28.22	26.505	26.95		
C9010E-4H-1	1.4	26.95	28.35	26.95	28.254		
C9010E-4H-2	1.41	28.35	29.76	28.254	29.567		
C9010E-4H-3	1.4	29.76	31.16	29.567	30.871		
C9010E-4H-4	1.405	31.16	32.565	30.871	32.18		
C9010E-4H-5	1.4	32.565	33.965	32.18	33.484		
C9010E-4H-6	1.41	33.965	35.375	33.484	34.797		
C9010E-4H-7	1.325	35.375	36.7	34.797	36.031		Liner Patch: btm 12 cm
C9010E-4H-CC	0.455	36.7	37.155	36.031	36.455		
C9010E-5H-1	0.2	36.45	36.65	36.45	36.637		Disturbed/Replaced Liner
C9010E-5H-2	0.76	36.65	37.41	36.637	37.348		Bottom of section is filled by water
C9010E-5H-3	1.405	37.41	38.815	37.348	38.661		
C9010E-5H-4	1.405	38.815	40.22	38.661	39.975		
C9010E-5H-5	1.415	40.22	41.635	39.975	41.298		
C9010E-5H-6	1.405	41.635	43.04	41.298	42.612		
C9010E-5H-7	1.405	43.04	44.445	42.612	43.926		
C9010E-5H-8	1.415	44.445	45.86	43.926	45.249		
C9010E-5H-CC	0.75	45.86	46.61	45.249	45.95		
C9010E-6H-1	0.065	45.95	46.015	45.95	46.014		Disturbed/Replaced Liner
C9010E-6H-2	1.4	46.015	47.415	46.014	47.397		
C9010E-6H-3	1.355	47.415	48.77	47.397	48.735		Delete void
C9010E-6H-4	1.36	48.77	50.13	48.735	50.078		
C9010E-6H-5	1.07	50.13	51.2	50.078	51.134		Delete void
C9010E-6H-6	1.38	51.2	52.58	51.134	52.497		Delete void
C9010E-6H-7	0.67	52.58	53.25	52.497	53.159		Delete void
C9010E-6H-8	0.985	53.25	54.235	53.159	54.132		Delete void
C9010E-6H-9	1.085	54.235	55.32	54.132	55.203		
C9010E-6H-CC	0.255	55.32	55.575	55.203	55.455		
C9010E-7H-1	1.24	55.45	56.69	55.45	56.573		Liner Patch: top 4 cm
C9010E-7H-2	1.4	56.69	58.09	56.573	57.841		
C9010E-7H-3	0.13	58.09	58.22	57.841	57.959		Replaced Liner: Expanded from bottom of section 2.
C9010E-7H-4	1.405	58.22	59.625	57.959	59.231		
C9010E-7H-5	1.405	59.625	61.03	59.231	60.503		
C9010E-7H-6	1.41	61.03	62.44	60.503	61.78		
C9010E-7H-7	1.4	62.44	63.84	61.78	63.048		
C9010E-7H-8	0.91	63.84	64.75	63.048	63.872		
C9010E-7H-9	0.74	64.75	65.49	63.872	64.543		Liner Patch: btm 5 cm
C9010E-7H-CC	0.455	65.49	65.945	64.543	64.954		
C9010E-8H-1	0.155	64.95	65.105	64.95	65.095		Disturbed
C9010E-8H-2	1.405	65.105	66.51	65.095	66.406		
C9010E-8H-3	1.38	66.51	67.89	66.406	67.694		Delete void
C9010E-8H-4	1.41	67.89	69.3	67.694	69.009		Delete void
C9010E-8H-5	1.41	69.3	70.71	69.009	70.325		
C9010E-8H-6	1.39	70.71	72.1	70.325	71.622		Delete void
C9010E-8H-7	1.41	72.1	73.51	71.622	72.938		
C9010E-8H-8	1.32	73.51	74.83	72.938	74.17		Liner Patch: btm 5 cm
C9010E-8H-CC	0.305	74.83	75.135	74.17	74.455		
C9010E-9H-1	0.755	74.45	75.205	74.45	75.127		Disturbed
C9010E-9H-2	1.385	75.205	76.59	75.127	76.37		Delete void
C9010E-9H-3	1.12	76.59	77.71	76.37	77.374		
C9010E-9H-4	1.415	77.71	79.125	77.374	78.644		
C9010E-9H-5	1.41	79.125	80.535	78.644	79.909		
C9010E-9H-6	1.41	80.535	81.945	79.909	81.174		
C9010E-9H-7	1.405	81.945	83.35	81.174	82.434		
C9010E-9H-8	1.43	83.35	84.78	82.434	83.717		
C9010E-9H-CC	0.255	84.78	85.035	83.717	83.946		
C9010E-10H-1	0.675	83.95	84.625	83.95	84.625		
C9010E-10H-2	0.51	84.625	85.135	84.625	85.135		
C9010E-10H-3	1.5	85.135	86.635	85.135	86.635		Disturbed/Replaced Liner
C9010E-10H-4	1.5	86.635	88.135	86.635	88.135		Disturbed/Replaced Liner
C9010E-10H-5	1.5	88.135	89.635	88.135	89.635		Disturbed/Replaced Liner
C9010E-10H-6	0.555	89.635	90.19	89.635	90.19		Disturbed/Replaced Liner
C9010E-10H-7	0.41	90.19	90.6	90.19	90.6	stuck in core barrel	Disturbed/Replaced Liner
C9010E-10H-8	0.405	90.6	91.005	90.6	91.005		Disturbed/Replaced Liner
C9010E-10H-9	0.39	91.005	91.395	91.005	91.395		Disturbed/Replaced Liner
C9010E-10H-10	0.55	91.395	91.945	91.395	91.945		Disturbed/Replaced Liner
C9010E-10H-11	0.76	91.945	92.705	91.945	92.705		
C9010E-10H-12	0.215	92.705	92.92	92.705	92.92		
C9010E-10H-CC	0.05	92.92	92.97	92.92	92.97		

Section	Section curated length (m)	Top Depth [m CSF-A]	Bottom Depth [m CSF-A]	Top Depth [m CSF-B]	Bottom Depth [m CSF-B]	Core Comment	Section Comment
C9010E-11H-1	0.27	93.45	93.72	93.45	93.693		Disturbed/Replaced Liner
C9010E-11H-2	1.4	93.72	95.12	93.693	94.952		
C9010E-11H-3	1.43	95.12	96.55	94.952	96.239		
C9010E-11H-4	1.405	96.55	97.955	96.239	97.503		
C9010E-11H-5	1.405	97.955	99.36	97.503	98.767		
C9010E-11H-6	1.41	99.36	100.77	98.767	100.035		
C9010E-11H-7	1.405	100.77	102.175	100.035	101.299		
C9010E-11H-8	1.435	102.175	103.61	101.299	102.59		Liner Patch: btm 3 cm
C9010E-11H-CC	0.405	103.61	104.015	102.59	102.954		
C9010E-12H-1	1.405	102.95	104.355	102.95	104.349		
C9010E-12H-2	1.41	104.355	105.765	104.349	105.753		
C9010E-12H-3	1.41	105.765	107.175	105.753	107.157	partial penetration	
C9010E-12H-4	0.505	107.175	107.68	107.157	107.66		
C9010E-12H-CC	0.07	107.68	107.75	107.66	107.73		
C9010E-13H-1	1.405	107.73	109.135	107.73	109.126		
C9010E-13H-2	1.405	109.135	110.54	109.126	110.522	partial penetration	
C9010E-13H-3	0.185	110.54	110.725	110.522	110.706		
C9010E-13H-CC	0.105	110.725	110.83	110.706	110.81		
C9010E-14H-CC	0.31	110.81	111.12	110.81	111.11	partial penetration	
C9010E-15H-1	0.635	113.11	113.745	113.11	113.728	partial penetration	
C9010E-15H-CC	0.105	113.745	113.85	113.728	113.83	2 m drill ahead before this core recovered	
C9010E-16H	-	-	-	-	-	No Recovery	
C9010E-17H-1	1.4	123.83	125.23	123.83	125.23		
C9010E-17H-2	1.405	125.23	126.635	125.23	126.635	10 m drill ahead before this core recovered	
C9010E-17H-3	1.02	126.635	127.655	126.635	127.655		
C9010E-17H-CC	0.21	127.655	127.865	127.655	127.865		
C9010E-18H-1	1.4	127.93	129.33	127.93	129.33		
C9010E-18H-2	0.25	129.33	129.58	129.33	129.58		Expanded from bottom of section 1.
C9010E-18H-3	1.435	129.58	131.015	129.58	131.015	partial penetration	Liner Patch: btm 3 cm
C9010E-18H-4	1.24	131.015	132.255	131.015	132.255		
C9010E-18H-5	0.835	132.255	133.09	132.255	133.09		
C9010E-18H-CC	0.075	133.09	133.165	133.09	133.165		
C9010E-19H-1	1.405	134.43	135.835	134.43	135.161		
C9010E-19H-2	1.41	135.835	137.245	135.161	135.893		
C9010E-19H-3	1.405	137.245	138.65	135.893	136.624		
C9010E-19H-4	1.18	138.65	139.83	136.624	137.238	partial penetration	Delete void at bottom
C9010E-19H-5	1.2	139.83	141.03	137.238	137.861	Recovery 9.21 m ; flow-in 3.62 m.	Delete water at top
C9010E-19H-6	1.41	141.03	142.44	137.861	138.594		
C9010E-19H-7	0.775	142.44	143.215	138.594	138.997		
C9010E-19H-CC	0.255	143.215	143.47	138.997	139.13		
C9010E-20H-1	1.405	139.13	140.535	139.13	140.478		
C9010E-20H-2	1.405	140.535	141.94	140.478	141.827		
C9010E-20H-3	1.095	141.94	143.035	141.827	142.878	partial penetration	Delete void at top and bottom
C9010E-20H-4	0.54	143.035	143.575	142.878	143.396		Delete void at bottom
C9010E-20H-5	0.405	143.575	143.98	143.396	143.785		Disturbed
C9010E-20H-CC	0.355	143.98	144.335	143.785	144.125		
C9010E-21H-1	0.32	144.13	144.45	144.13	144.416		Disturbed/Replaced Liner
C9010E-21H-2	1.405	144.45	145.855	144.416	145.672		
C9010E-21H-3	1.41	145.855	147.265	145.672	146.932		
C9010E-21H-4	1.405	147.265	148.67	146.932	148.187		
C9010E-21H-5	1.405	148.67	150.075	148.187	149.443		
C9010E-21H-6	1.4	150.075	151.475	149.443	150.694		
C9010E-21H-7	1.405	151.475	152.88	150.694	151.95		
C9010E-21H-8	1.475	152.88	154.355	151.95	153.268		Liner Patch: btm 2 cm
C9010E-21H-CC	0.405	154.355	154.76	153.268	153.63		
C9010E-22H-1	1.355	153.63	154.985	153.63	154.985		
C9010E-22H-2	0.85	154.985	155.835	154.985	155.835	partial penetration	
C9010E-22H-CC	0.1	155.835	155.935	155.835	155.935		
C9010E-23H-1	0.14	155.93	156.07	155.93	156.056		Disturbed/Replaced Liner
C9010E-23H-2	1.4	156.07	157.47	156.056	157.317		
C9010E-23H-3	1.415	157.47	158.885	157.317	158.591		
C9010E-23H-4	1.405	158.885	160.29	158.591	159.856		
C9010E-23H-5	1.49	160.29	161.78	159.856	161.198	CC and lowest part: flow in	Liner Patch: btm 9 cm
C9010E-23H-6	1.435	161.78	163.215	161.198	162.49		Liner Patch: btm 3 cm
C9010E-23H-7	1.46	163.215	164.675	162.49	163.805		Liner Patch: btm 3 cm
C9010E-23H-8	1.495	164.675	166.17	163.805	165.151		Flow In: lowest part/Liner Patch: btm 6 cm
C9010E-23H-CC	0.31	166.17	166.48	165.151	165.43		Flow In
C9010E-24X-1	1.405	165.43	166.835	165.43	166.835		
C9010E-24X-2	1.41	166.835	168.245	166.835	168.245		
C9010E-24X-3	1.41	168.245	169.655	168.245	169.655	EPCS	
C9010E-24X-4	0.865	169.655	170.52	169.655	170.52		
C9010E-24X-CC	0.055	170.52	170.575	170.52	170.575		
C9010E-25X-1	1.405	171.25	172.655	171.25	172.655		
C9010E-25X-2	0.74	172.655	173.395	172.655	173.395	EPCS	
C9010E-25X-CC	0.31	173.395	173.705	173.395	173.705		
C9010E-26X-CC	0.01	175.95	175.96	175.95	175.96	EPCS	No woriking half. Archive half only.
C9010E-27X-CC	0.305	180.65	180.955	180.65	180.955	EPCS	
C9010E-28X	-	-	-	-	-	No Recovery EPCS	
C9010E-29X-CC	0.33	190.05	190.38	190.05	190.38	EPCS	

Expedition 905 Site C9010F
Expedition name CHIKYU TRANING CRUISE CK09-03 EXPEDITION 905

Section Summary

Section	Section curated length (m)	Top Depth [m CSF-A]	Bottom Depth [m CSF-A]	Top Depth [m CSF-B]	Bottom Depth [m CSF-B]	Core Comment	Section Comment
C9010F-1H-1	1.4	0	1.4	0	1.389		
C9010F-1H-2	1.41	1.4	2.81	1.389	2.787		
C9010F-1H-3	1.41	2.81	4.22	2.787	4.186		
C9010F-1H-4	1.415	4.22	5.635	4.186	5.589		
C9010F-1H-5	0.81	5.635	6.445	5.589	6.393		
C9010F-1H-6	0.71	6.445	7.155	6.393	7.097		
C9010F-1H-CC	0.255	7.155	7.41	7.097	7.35		
C9010F-2H-1	1.4	7.35	8.75	7.35	8.696		
C9010F-2H-2	1.41	8.75	10.16	8.696	10.052		
C9010F-2H-3	1.46	10.16	11.62	10.052	11.456		Liner Patch: btm 4 cm
C9010F-2H-4	1.415	11.62	13.035	11.456	12.816		
C9010F-2H-5	1.395	13.035	14.43	12.816	14.158		
C9010F-2H-6	1.41	14.43	15.84	14.158	15.514		
C9010F-2H-7	1.065	15.84	16.905	15.514	16.538		Liner Patch: btm 8 cm
C9010F-2H-CC	0.32	16.905	17.225	16.538	16.845		
C9010F-3H-1	0.21	16.85	17.06	16.85	17.039		Disturbed/Replaced Liner
C9010F-3H-2	1.4	17.06	18.46	17.039	18.3		
C9010F-3H-3	1.41	18.46	19.87	18.3	19.569		
C9010F-3H-4	1.4	19.87	21.27	19.569	20.83		
C9010F-3H-5	1.41	21.27	22.68	20.83	22.1		
C9010F-3H-6	1.41	22.68	24.09	22.1	23.369		
C9010F-3H-7	1.4	24.09	25.49	23.369	24.63		
C9010F-3H-8	1.5	25.49	26.99	24.63	25.981		Liner Patch: btm 4 cm
C9010F-3H-CC	0.41	26.99	27.4	25.981	26.35		
C9010F-4H-1	0.4	26.35	26.75	26.35	26.71		Disturbed/Replaced Liner
C9010F-4H-2	1.41	26.75	28.16	26.71	27.978		
C9010F-4H-3	1.405	28.16	29.565	27.978	29.242		
C9010F-4H-4	1.415	29.565	30.98	29.242	30.515		
C9010F-4H-5	1.4	30.98	32.38	30.515	31.775		
C9010F-4H-6	1.4	32.38	33.78	31.775	33.034		
C9010F-4H-7	1.41	33.78	35.19	33.034	34.303		
C9010F-4H-8	1.305	35.19	36.495	34.303	35.477		Liner Patch: btm 3 cm
C9010F-4H-CC	0.41	36.495	36.905	35.477	35.846		
C9010F-5H-1	1.21	35.85	37.06	35.85	36.872		Disturbed/Replaced Liner
C9010F-5H-2	1	37.06	38.06	36.872	37.716		
C9010F-5H-3	0.705	38.06	38.765	37.716	38.312		
C9010F-5H-4	1.405	38.765	40.17	38.312	39.498		
C9010F-5H-5	1.405	40.17	41.575	39.498	40.684		
C9010F-5H-6	1.4	41.575	42.975	40.684	41.867		
C9010F-5H-7	1.405	42.975	44.38	41.867	43.053		
C9010F-5H-8	1.4	44.38	45.78	43.053	44.235		
C9010F-5H-9	0.455	45.78	46.235	44.235	44.62		
C9010F-5H-10	0.76	46.235	46.995	44.62	45.261		Disturbed/Replaced Liner
C9010F-5H-CC	0.11	46.995	47.105	45.261	45.354		
C9010F-6H-1	0.415	45.35	45.765	45.35	45.732		Disturbed/Replaced Liner
C9010F-6H-2	1.405	45.765	47.17	45.732	47.024		
C9010F-6H-3	1.405	47.17	48.575	47.024	48.316		
C9010F-6H-4	1.41	48.575	49.985	48.316	49.613		
C9010F-6H-5	1.405	49.985	51.39	49.613	50.905		
C9010F-6H-6	1.41	51.39	52.8	50.905	52.201		
C9010F-6H-7	1.41	52.8	54.21	52.201	53.498		
C9010F-6H-8	1.265	54.21	55.475	53.498	54.661		
C9010F-6H-CC	0.205	55.475	55.68	54.661	54.85		
C9010F-7X-1	1.41	54.85	56.26	54.85	56.26		
C9010F-7X-2	0.18	56.26	56.44	56.26	56.44	EPCS	
C9010F-7X-CC	0.065	56.44	56.505	56.44	56.505		
C9010F-8X-1	1.4	59.55	60.95	59.55	60.95		
C9010F-8X-2	1.41	60.95	62.36	60.95	62.36	EPCS	
C9010F-8X-3	0.735	62.36	63.095	62.36	63.095		
C9010F-8X-CC	0.1	63.095	63.195	63.095	63.195		
C9010F-9X-1	0.1	64.75	64.85	64.75	64.85	EPCS	
C9010F-9X-CC	0.2	64.85	65.05	64.85	65.05		
C9010F-10X-1	1	69.45	70.45	69.45	70.45		
C9010F-10X-2	0.785	70.45	71.235	70.45	71.235	EPCS	
C9010F-10X-CC	0.16	71.235	71.395	71.235	71.395		
C9010F-11X-1	1	74.15	75.15	74.15	75.15		
C9010F-11X-2	0.675	75.15	75.825	75.15	75.825	EPCS	
C9010F-11X-CC	0.16	75.825	75.985	75.825	75.985		
C9010F-12H-1	0.775	76.75	77.525	76.75	77.509		
C9010F-12H-2	1.29	77.525	78.815	77.509	78.771	Partial penetration	Delete void at top
C9010F-12H-3	1.505	78.815	80.32	78.771	80.244		
C9010F-12H-CC	0.21	80.32	80.53	80.244	80.45		
C9010F-13H-1	1.415	80.45	81.865	80.45	81.865		
C9010F-13H-2	1	81.865	82.865	81.865	82.865		
C9010F-13H-3	1.25	82.865	84.115	82.865	84.115	Partial penetration	Delete void at top
C9010F-13H-4	1.41	84.115	85.525	84.115	85.525		
C9010F-13H-5	1.26	85.525	86.785	85.525	86.785		
C9010F-13H-CC	0.215	86.785	87	86.785	87		
C9010F-14H-1	0.305	87.37	87.675	87.37	87.675		Disturbed/Replaced Liner
C9010F-14H-2	1.505	87.675	89.18	87.675	89.18		Disturbed/Replaced Liner
C9010F-14H-3	1.5	89.18	90.68	89.18	90.68		Disturbed/Replaced Liner
C9010F-14H-4	1.305	90.68	91.985	90.68	91.985		Disturbed/Replaced Liner
C9010F-14H-5	1.335	91.985	93.32	91.985	93.32	Jammed in core barrel	Disturbed/Replaced Liner
C9010F-14H-6	0.51	93.32	93.83	93.32	93.83		Disturbed/Replaced Liner
C9010F-14H-7	1.5	93.83	95.33	93.83	95.33		Disturbed/Replaced Liner
C9010F-14H-8	0.4	95.33	95.73	95.33	95.73		Disturbed/Replaced Liner
C9010F-14H-CC	0.21	95.73	95.94	95.73	95.94		

Section	Section curated length (m)	Top Depth [m CSF-A]	Bottom Depth [m CSF-A]	Top Depth [m CSF-B]	Bottom Depth [m CSF-B]	Core Comment	Section Comment
C9010F-15X-1	1.44	96.87	98.31	96.87	98.105		
C9010F-15X-2	0.925	98.31	99.235	98.105	98.898		
C9010F-15X-3	1.325	99.235	100.56	98.898	100.035	EPCS	Delete void at bottom
C9010F-15X-4	1.07	100.56	101.63	100.035	100.952		Delete void at top and bottom
C9010F-15X-5	0.315	101.63	101.945	100.952	101.223		Delete void
C9010F-15X-CC	0.4	101.945	102.345	101.223	101.566		
C9010F-16X-1	1.41	101.57	102.98	101.57	102.98		
C9010F-16X-2	1.025	102.98	104.005	102.98	104.005	EPCS	
C9010F-16X-CC	0.1	104.005	104.105	104.005	104.105		
C9010F-17X-CC	0.01	106.27	106.28	106.27	106.28	EPCS	No woriking half. Archive half only.
C9010F-18X	-	-	-	-	-	No Recovery Liner broken in core barrel ESCS	
C9010F-19X-1	0.765	114.85	115.615	114.85	115.615	Liner broken in core barrel	Disturbed/Replaced Liner/5-27 cm: 250 micro meter sieved
C9010F-19X-CC	0.105	115.615	115.72	115.615	115.72	ESCS	
C9010F-20H-1	0.4	120.85	121.25	120.85	121.235		Disturbed/Replaced Liner
C9010F-20H-2	1.405	121.25	122.655	121.235	122.587		
C9010F-20H-3	1.41	122.655	124.065	122.587	123.945		
C9010F-20H-4	1.41	124.065	125.475	123.945	125.302		
C9010F-20H-5	1.405	125.475	126.88	125.302	126.654		
C9010F-20H-6	1.41	126.88	128.29	126.654	128.011		
C9010F-20H-7	1.405	128.29	129.695	128.011	129.363		
C9010F-20H-8	0.875	129.695	130.57	129.363	130.206		
C9010F-20H-CC	0.155	130.57	130.725	130.206	130.355		
C9010F-21X	-	-	-	-	-	No Recovery ESCS	
C9010F-22X-CC	0.105	135.05	135.155	135.05	135.155	ESCS	
C9010F-23X-1	0.2	139.75	139.95	139.75	139.95	ESCS	
C9010F-23X-CC	0.05	139.95	140	139.95	140		
C9010F-24X-1	0.81	144.45	145.26	144.45	145.26		
C9010F-24X-2	1.105	145.26	146.365	145.26	146.365	ESCS	
C9010F-24X-CC	0.26	146.365	146.625	146.365	146.625		
C9010F-25X-CC	0.03	149.15	149.18	149.15	149.18	ESCS	
C9010F-26X-1	1.28	153.15	154.43	153.15	154.43		
C9010F-26X-2	0.795	154.43	155.225	154.43	155.225		Delete void at top
C9010F-26X-3	0.9	155.225	156.125	155.225	156.125	ESCS	
C9010F-26X-4	0.74	156.125	156.865	156.125	156.865		
C9010F-26X-CC	0.315	156.865	157.18	156.865	157.18		
C9010F-27X-1	1.405	157.85	159.255	157.85	158.854		Delete void at top
C9010F-27X-2	1.41	159.255	160.665	158.854	159.861		
C9010F-27X-3	1.265	160.665	161.93	159.861	160.764	ESCS	
C9010F-27X-4	1.395	161.93	163.325	160.764	161.761		
C9010F-27X-5	0.91	163.325	164.235	161.761	162.411		
C9010F-27X-CC	0.2	164.235	164.435	162.411	162.554		
C9010F-28X-1	1.34	162.55	163.89	162.55	163.89		
C9010F-28X-2	1.5	163.89	165.39	163.89	165.39		
C9010F-28X-3	1.385	165.39	166.775	165.39	166.775		
C9010F-28X-4	0.91	166.775	167.685	166.775	167.685	ESCS	
C9010F-28X-5	1.165	167.685	168.85	167.685	168.85		
C9010F-28X-6	1.085	168.85	169.935	168.85	169.935		
C9010F-28X-CC	0.41	169.935	170.345	169.935	170.345		
C9010F-29X-1	1.4	172.05	173.45	172.05	173.45		
C9010F-29X-2	1.235	173.45	174.685	173.45	174.685	ESCS	
C9010F-29X-CC	0.2	174.685	174.885	174.685	174.885		
C9010F-30X-1	1.405	176.75	178.155	176.75	178.155		
C9010F-30X-2	1.015	178.155	179.17	178.155	179.17	ESCS	
C9010F-30X-CC	0.26	179.17	179.43	179.17	179.43		
C9010F-31X-1	1.155	181.45	182.605	181.45	182.605	ESCS	
C9010F-31X-CC	0.3	182.605	182.905	182.605	182.905		

Expedition 905 Site C9010G
Expedition name CHIKYU TRANING CRUISE CK09-03 EXPEDITION 905

Section Summary

Section	Section curated length (m)	Top Depth [m CSF-A]	Bottom Depth [m CSF-A]	Top Depth [m CSF-B]	Bottom Depth [m CSF-B]	Core Comment	Section Comment
C9010G-1H-1	1.405	0	1.405	0	1.397		
C9010G-1H-2	1.405	1.405	2.81	1.397	2.793		
C9010G-1H-3	1.41	2.81	4.22	2.793	4.195		
C9010G-1H-4	1.405	4.22	5.625	4.195	5.592		
C9010G-1H-5	0.92	5.625	6.545	5.592	6.506		
C9010G-1H-CC	0.255	6.545	6.8	6.506	6.76		
C9010G-2H-1	1.435	80	81.435	80	81.435	Jetted down before this core recovered	
C9010G-2H-2	0.94	81.435	82.375	81.435	82.375		
C9010G-2H-3	0.375	82.375	82.75	82.375	82.75		
C9010G-2H-CC	0.055	82.75	82.805	82.75	82.805		
C9010G-3H-1	0.88	82.81	83.69	82.81	83.69	Core Dropped: probably dropped	
C9010G-3H-CC	0.09	83.69	83.78	83.69	83.78		
C9010G-4H-1	1.015	86.08	87.095	86.08	86.983		Disturbed/Replaced Liner
C9010G-4H-2	1.405	87.095	88.5	86.983	88.233		
C9010G-4H-3	1.41	88.5	89.91	88.233	89.487		
C9010G-4H-4	1.41	89.91	91.32	89.487	90.741		
C9010G-4H-5	1.31	91.32	92.63	90.741	91.906		deleted void at top
C9010G-4H-6	1.4	92.63	94.03	91.906	93.152		
C9010G-4H-7	1.415	94.03	95.445	93.152	94.41		
C9010G-4H-8	1.21	95.445	96.655	94.41	95.487		
C9010G-4H-CC	0.105	96.655	96.76	95.487	95.58		
C9010G-5H-1	1.4	95.58	96.98	95.58	96.871		
C9010G-5H-2	1	96.98	97.98	96.871	97.794		
C9010G-5H-3	0.57	97.98	98.55	97.794	98.319		Liner Patch: btm 15.5 cm
C9010G-5H-4	1.41	98.55	99.96	98.319	99.62		
C9010G-5H-5	1.41	99.96	101.37	99.62	100.92		
C9010G-5H-6	1.405	101.37	102.775	100.92	102.216		
C9010G-5H-7	1.41	102.775	104.185	102.216	103.517		
C9010G-5H-8	1.4	104.185	105.585	103.517	104.808		
C9010G-5H-CC	0.3	105.585	105.885	104.808	105.085		
C9010G-6X-1	1.44	169.76	171.2	169.76	171.2	Drill down to 2224 mBRT before this core recovered EPCS	
C9010G-6X-2	0.72	171.2	171.92	171.2	171.92		
C9010G-6X-CC	0.265	171.92	172.185	171.92	172.185		
C9010G-7X-CC	0.25	174.46	174.71	174.46	174.71	EPCS	
C9010G-8X-CC	0.29	179.16	179.45	179.16	179.45	jammed at shoe EPCS	
C9010G-9X-CC	0.305	179.56	179.865	179.56	179.865	jammed at shoe EPCS	
C9010G-10X-CC	0.01	184.26	184.27	184.26	184.27	Core Dropped washed EPCS	Archive half only. No working half.
C9010G-11X-1	0.3	188.96	189.26	188.96	189.26	ESCS	
C9010G-11X-CC	0.25	189.26	189.51	189.26	189.51		
C9010G-12X-1	0.325	193.66	193.985	193.66	193.985	ESCS	
C9010G-12X-CC	0.405	193.985	194.39	193.985	194.39		
C9010G-13X	-	-	-	-	-	No Recovery ESCS	
C9010G-14X-CC	0.205	201.26	201.465	201.26	201.465	jammed at shoe ESCS	
C9010G-15X-CC	0.13	205.96	206.09	205.96	206.09	probably jammed at finger ESCS	
C9010G-16X-CC	0.315	210.66	210.975	210.66	210.975	jammed at shoe ESCS	
C9010G-17X-1	1.405	215.36	216.765	215.36	216.765	ESCS	
C9010G-17X-2	1.45	216.765	218.215	216.765	218.215		
C9010G-17X-CC	0.37	218.215	218.585	218.215	218.585		
C9010G-18X-1	1.405	220.06	221.465	220.06	221.465	ESCS	
C9010G-18X-2	0.6	221.465	222.065	221.465	222.065		
C9010G-18X-CC	0.35	222.065	222.415	222.065	222.415		
C9010G-19X-CC	0.91	224.76	225.67	224.76	225.67	ESCS	
C9010G-20X-CC	0.46	229.46	229.92	229.46	229.92	ESCS	
C9010G-21X-1	1.005	234.16	235.165	234.16	235.165	ESCS	
C9010G-21X-2	0.77	235.165	235.935	235.165	235.935		
C9010G-21X-CC	0.07	235.935	236.005	235.935	236.005		
C9010G-22X	-	-	-	-	-	No Recovery ESCS	

Table 4-1: Sample request summary. Summarized table of sample requests submitted and approved to Expedition 905.

905 Sample Request Summary

#	Requester	Sample Code	Requesting Materials	Storing Condition	Status
1	Naokazu Ahagon Takamitsu Sugihara	905NAE	**Educational Purpose** We do not request specific horizon, core section, or core lithology beforehand Need soft to consolidated sediment samples that are cored by several coring tools (HPCS, EPCS, ESCS and RCB) Sample will be requested after core is recovered.	N/A	Approved on 20th Nov. 2009. But detailed request will be need after sampling for request No. 3, 5 and 6 finish.
		N/A	**Educational Purpose** Data of onboard measurements acquired during EXP 904 and 905 The requested measurement data: ・X-ray CT scanner, ・MSCL-W, ・Moisture and Density, ・Interstitial Water chemistry (e.g., refractive index (salinity), alkalinity, pHm, Cl content, major cations, minor to trace cations, and anions), ・Thermal Conductivity, ・Bulk Chemistry (major and trace elements), ・MSCL-I, ・MSCL-C, ・Visual Core Description, ・Electrical Resistivity, ・P-wave Velocity for discrete sample. Data is requested **if measured**.	N/A	
2	Naokazu Ahagon Takamitsu Sugihara	905NAQ	**Quality control Purpose** We do not request specific horizon, core section, or core lithology beforehand Need soft to consolidated sediment samples that are cored by several coring tools (HPCS, EPCS, ESCS and RCB) Specific samples will be requested after core is recovered.	N/A	Approved on 20th Nov. 2009. But detailed request will be need after sampling for request No. 3, 5 and 6 finish.
		N/A	**Quality control Purpose** The requested measurement data: ・X-ray CT scanner, ・MSCL-W, ・Moisture and Density, ・Interstitial Water chemistry (e.g., refractive index (salinity), alkalinity, pHm, Cl content, major cations, minor to trace cations, and anions), ・Thermal Conductivity, ・Bulk Chemistry (major and trace elements), ・MSCL-I, ・MSCL-C, ・Visual Core Description, ・Electrical Resistivity, ・P-wave Velocity for discrete sample. Data is requested **if measured**.	N/A	
3	Noriaki Masui	905NMA ~~RMS~~	Take sample **AFTER** CT scan Each Sample Amount: 10 cm WRC Sampling Interval: 1 per section (< 10 mbsf) 1 per core (> 10 mbsf) The WRC should be collected in close proximity (within a few centimeters) to the IW sample. *Sections should be stored in the refrigerator before and after CT scan. *If coring with fluorescent beads is conducted, take WRC samples from all sections even if depth is over 10 mbsf. *If there's no IW sample, take sample from the bottom of the sections.	Frozen. Scientists will arrange the use of Deep Freezers.	Approved on 20th Nov. 2009. Completed
		905NMB	Take sample **BEFORE** CT scan 2 WRC samples are taken by the requester. 1 sample is ~~from section 6 (< 10 mbsf)~~ at the depth near 10 mbsf at Hole C →This sample has been taken during Exp. 904 1 sample is from section ? (> 10 mbsf) ~~at Hole D~~ →This sample was not taken because the EPCS and ESCS core recovery was low. **→Take sample from the deepest HPCS core during Exp.905** ***If samples are not taken during Exp.904, take samples during Exp.905.**	Frozen. Scientists will arrange the use of Deep Freezers.	Completed

905 Sample Request Summary

#	Requester	Sample Code	Requesting Materials	Storing Condition	Status	
		N/A	Overall core lithology is planned to be described with naked eyes (VCD) .	N/A		N/A
		N/A	Take X-ray CT scan for all cores.	N/A		N/A
5	Hiroshi Kitazato	905HKD	Discrete samples for detrital DNA are planned to collect from WRC core (10cm in length) with 1x 30ml syringe. Sampling intervals are one sample per section core (1.5m length).	Sampling residual of 10cm thick WRC will be returned to JAMSTEC/CDEX. 4C	Approved on 20th Nov. 2009.	Completed
			Collected samples are sliced in two aliquots, put into 50ml falcon tube. Samples are frozen with liquid nitrogen, and then stored in deep freezer (-80 ℃) for DNA/RNA studies. From this sample, take few ml of sediment are picked from 1x 30ml syringe sample put into 4.5ml cryotube (3 tubes) containing 4x volume of RNAlater reagent for RNA analyses/cell counting, then stored in -80˚C.			
6	Naohiko Ohkouchi Yasuhiko Yamaguchi Hisami Suga Yoshinori Takano	905NOOG	Organic-geochemistry sampling: We need the whole round core samples (around 20 cm in length) for the analysis of organic molecules (i.e. intact polar lipids, amino acids). We plan to take 3 WRC samples/core in the shallow depth (0~9 mbsf) and 1 WRC samples/core in the depth deeper than 9 mbsf (the samples will be collected from the adjacent location of pore water samples described below), and also from specific lithologies, such as high organic content (blackish layers) and thin laminated layers. **Take sample AFTER CT scan**	The WRC samples are capped and transferred to Ziploc bags, and stored in -20˚C.	Approved on 20th Nov. 2009.	Completed
		905NOIW	Pore-water sampling and analysis: We need the whole round core samples (around 20 cm in length) to extract pore water. We plan to take 3 WRC samples/core in the shallow depth (0~9 mbsf), and 1 WRC samples/core in the depth deeper than 9 mbsf. **Take sample AFTER CT scan**	N/A		Completed
			The extracted pore water is put into Nalgen tubes. A part of the pore water is analyzed on-board for determination of salinity, pH, alkalinity, [SO4-], [Br-], [NH4+] and [PO4-] by the IODP-standard procedure.	The residues of pore water are stored in -20˚C for the on-shore analysis.		
			The residues ("squeezed cake") (ca. 10 cm3) obtained from the pore water sampling	Squeezed cakes are transferred to Ziploc bags, and stored in -20˚C.		

Table 4-2: Sample summary. Sample list of each sample code including sampling horizon and its depth. Note that CSF means core depth (below sea floor), CSF-A: let overlap if long and CSF-B: scale if long.

Exp.905 Sample Summary

	C9010E	C9010F	C9010G	Total
HS	6	2	3	11
SS	57	14	27	98

Ship samples: 109

	C9010E	C9010F	C9010G	Total
905HKD	60	25	13	98
905NMA	27	22	7	56
905NMB	0	0	1	1
905NOOG	31	11	5	47
905NOIW	23	6	4	33

Personal samples: 235

Total number of samples taken: 344

Exp.905 HS sample list

J-CORES sample ID	Sample source	Sample code	Sample volume (cm3)	Sample comment	Top Depth [m CSF-A]	Bottom Depth [m CSF-A]	Top Depth [m CSF-B]	Bottom Depth [m CSF-B]
CKY000000000000054150	C9010E-11H-8 WR, 0.0--4.0 cm	HS	5		102.175	102.215	101.299	101.335
CKY000000000000054250	C9010E-12H-2 WR, 0.0--4.0 cm	HS	5		104.355	104.395	104.349	104.389
CKY000000000000055150	C9010E-13H-2 WR, 0.0--4.0 cm	HS	5		109.135	109.175	109.126	109.166
CKY000000000000061050	C9010E-23H-6 WR, 0.0--4.0 cm	HS	5		161.78	161.82	161.198	161.234
CKY000000000000061550	C9010E-24X-2 WR, 0.0--4.0 cm	HS	5		166.835	166.875	166.835	166.875
CKY000000000000062350	C9010E-25X-2 WR, 0.0--4.0 cm	HS	5		172.655	172.695	172.655	172.695
CKY000000000000072150	C9010F-29X-2 WR, 0.0--4.0 cm	HS	5		173.45	173.49	173.45	173.49
CKY000000000000072250	C9010F-30X-2 WR, 0.0--4.0 cm	HS	5		178.155	178.195	178.155	178.195
CKY000000000000078150	C9010G-17X-2 WR, 0.0--4.0 cm	HS	5		216.765	216.805	216.765	216.805
CKY000000000000078650	C9010G-18X-2 WR, 0.0--4.0 cm	HS	5		221.465	221.505	221.465	221.505
CKY000000000000079950	C9010G-21X-2 WR, 0.0--4.0 cm	HS	5		235.165	235.205	235.165	235.205

Exp.905 SS sample list

J-CORES sample ID	Sample source	Sample code	Sample volume	Sample comment	Top Depth [m CSF-A]	Bottom Depth [m CSF-A]	Top Depth [m CSF-B]	Bottom Depth [m CSF-B]
CKY000000000000051850	C9010E-1H-1 A, 116.0 cm	SS	0.1		1.16	1.16	1.151	1.151
CKY000000000000051950	C9010E-1H-2 A, 24.0 cm	SS	0.1		1.65	1.65	1.638	1.638
CKY000000000000052050	C9010E-1H-2 A, 70.0 cm	SS	0.1		2.11	2.11	2.094	2.094
CKY000000000000052150	C9010E-1H-2 A, 80.0 cm	SS	0.1		2.21	2.21	2.193	2.193
CKY000000000000052250	C9010E-1H-5 A, 13.0 cm	SS	0.1		5.77	5.77	5.727	5.727
CKY000000000000052350	C9010E-1H-5 A, 139.0 cm	SS	0.1		7.03	7.03	6.977	6.977
CKY000000000000055250	C9010E-2H-1 A, 40.0 cm	SS	0.1		8.35	8.35	8.315	8.315
CKY000000000000055350	C9010E-2H-4 A, 49.0 cm	SS	0.1		12.779	12.779	12.361	12.361
CKY000000000000055450	C9010E-2H-4 A, 112.0 cm	SS	0.1		13.409	13.409	12.937	12.937
CKY000000000000055550	C9010E-2H-5 A, 25.0 cm	SS	0.1		14.072	14.072	13.542	13.542
CKY000000000000055650	C9010E-2H-5 A, 75.0 cm	SS	0.1		14.572	14.572	13.999	13.999
CKY000000000000056050	C9010E-3H-2 A, 12.0 cm	SS	0.1		18.975	18.975	18.795	18.795
CKY000000000000056150	C9010E-3H-5 A, 40.0 cm	SS	0.1		22.33	22.33	21.755	21.755
CKY000000000000056650	C9010E-3H-6 A, 90.0 cm	SS	0.1		24.24	24.24	23.439	23.439
CKY000000000000057050	C9010E-3H-8 A, 36.0 cm	SS	0.1		26.545	26.545	25.472	25.472
CKY000000000000057150	C9010E-4H-1 A, 40.0 cm	SS	0.1		27.35	27.35	27.323	27.323
CKY000000000000057250	C9010E-4H-3 A, 40.0 cm	SS	0.1		30.16	30.16	29.94	29.94
CKY000000000000057350	C9010E-4H-6 A, 77.0 cm	SS	0.1		34.735	34.735	34.201	34.201
CKY000000000000057450	C9010E-4H-7 A, 108.0 cm	SS	0.1		36.455	36.455	35.803	35.803
CKY000000000000058650	C9010E-5H-2 A, 50.0 cm	SS	0.1		37.15	37.15	37.104	37.104
CKY000000000000058750	C9010E-5H-3 A, 100.0 cm	SS	0.1		38.41	38.41	38.283	38.283
CKY000000000000058850	C9010E-5H-8 A, 100.0 cm	SS	0.1		45.445	45.445	44.861	44.861
CKY000000000000059950	C9010E-6H-2 A, 45.0 cm	SS	0.1		46.465	46.465	46.459	46.459
CKY000000000000060050	C9010E-6H-4 A, 50.0 cm	SS	0.1		49.27	49.27	49.229	49.229
CKY000000000000060150	C9010E-6H-6 A, 129.0 cm	SS	0.1		52.49	52.49	52.408	52.408
CKY000000000000062050	C9010E-7H-1 A, 45.0 cm	SS	0.1		55.9	55.9	55.857	55.857
CKY000000000000062150	C9010E-7H-4 A, 70.0 cm	SS	0.1		58.92	58.92	58.592	58.592
CKY000000000000062250	C9010E-7H-5 A, 125.0 cm	SS	0.1		60.875	60.875	60.363	60.363
CKY000000000000062850	C9010E-8H-3 A, 27.0 cm	SS	0.1		66.78	66.78	66.658	66.658
CKY000000000000062950	C9010E-8H-4 A, 35.0 cm	SS	0.1		68.24	68.24	68.02	68.02
CKY000000000000063050	C9010E-8H-5 A, 131.0 cm	SS	0.1		70.61	70.61	70.232	70.232
CKY000000000000063150	C9010E-8H-6 A, 103.0 cm	SS	0.1		71.74	71.74	71.286	71.286
CKY000000000000063250	C9010E-9H-8 A, 70.0 cm	SS	0.1		84.05	84.05	83.062	83.062
CKY000000000000063350	C9010E-10H-3 A, 29.0 cm	SS	0.1		85.425	85.425	85.425	85.425
CKY000000000000063450	C9010E-10H-3 A, 70.0 cm	SS	0.1		85.835	85.835	85.835	85.835
CKY000000000000063550	C9010E-10H-4 A, 25.0 cm	SS	0.1		86.885	86.885	86.885	86.885
CKY000000000000065450	C9010E-11H-2 A, 40.0 cm	SS	0.1		94.12	94.12	94.053	94.053
CKY000000000000065550	C9010E-11H-3 A, 53.0 cm	SS	0.1		95.65	95.65	95.429	95.429
CKY000000000000065650	C9010E-11H-4 A, 109.0 cm	SS	0.1		97.64	97.64	97.219	97.219
CKY000000000000065750	C9010E-11H-5 A, 50.0 cm	SS	0.1		98.455	98.455	97.953	97.953
CKY000000000000065850	C9010E-11H-7 A, 23.0 cm	SS	0.1		101	101	100.242	100.242
CKY000000000000065950	C9010E-12H-3 A, 80.0 cm	SS	0.1		106.565	106.565	106.55	106.55
CKY000000000000066050	C9010E-17H-2 A, 70.0 cm	SS	0.1		125.93	125.93	125.93	125.93
CKY000000000000066550	C9010E-18H-1 A, 65.0 cm	SS	0.1		128.58	128.58	128.58	128.58
CKY000000000000066650	C9010E-18H-3 A, 62.0 cm	SS	0.1		130.2	130.2	130.2	130.2
CKY000000000000066750	C9010E-18H-5 A, 20.0 cm	SS	0.1		132.455	132.455	132.455	132.455
CKY000000000000067650	C9010E-19H-3 A, 85.0 cm	SS	0.1		138.095	138.095	136.335	136.335
CKY000000000000068150	C9010E-21H-5 A, 30.0 cm	SS	0.1		148.97	148.97	148.456	148.456
CKY000000000000068550	C9010E-23H-8 A, 20.0 cm	SS	0.1		164.875	164.875	163.985	163.985
CKY000000000000068650	C9010E-24X-1 A, 55.0 cm	SS	0.1		165.98	165.98	165.98	165.98
CKY000000000000068750	C9010E-24X-2 A, 97.0 cm	SS	0.1		167.805	167.805	167.805	167.805
CKY000000000000068850	C9010E-24X-4 A, 55.0 cm	SS	0.1		170.205	170.205	170.205	170.205
CKY000000000000070150	C9010E-25X-1 A, 20.0 cm	SS	0.1		171.45	171.45	171.45	171.45
CKY000000000000070250	C9010E-25X-1 A, 36.0 cm	SS	0.1		171.61	171.61	171.61	171.61
CKY000000000000070350	C9010E-25X-1 A, 120.0 cm	SS	0.1		172.45	172.45	172.45	172.45
CKY000000000000070450	C9010E-25X-2 A, 67.0 cm	SS	0.1		173.325	173.325	173.325	173.325
CKY000000000000070550	C9010E-29X-CC A, 3.0 cm	SS	0.1		190.08	190.08	190.08	190.08
CKY000000000000074050	C9010F-1H-1 A, 125.0 cm	SS	0.1		1.25	1.25	1.24	1.24
CKY000000000000073250	C9010F-8X-1 A, 80.0 cm	SS	0.1		60.35	60.35	60.35	60.35
CKY000000000000073350	C9010F-8X-2 A, 77.0 cm	SS	0.1		61.72	61.72	61.72	61.72
CKY000000000000073450	C9010F-9X-CC A, 15.0 cm	SS	0.1		65	65	65	65
CKY000000000000073550	C9010F-10X-CC A, 7.0 cm	SS	0.1		71.305	71.305	71.305	71.305
CKY000000000000073650	C9010F-11X-2 A, 20.0 cm	SS	0.1		75.35	75.35	75.35	75.35
CKY000000000000073750	C9010F-11X-2 A, 30.0 cm	SS	0.1		75.45	75.45	75.45	75.45
CKY000000000000073850	C9010F-12H-2 A, 25.0 cm	SS	0.1		77.775	77.775	77.753	77.753
CKY000000000000073950	C9010F-12H-2 A, 90.0 cm	SS	0.1		78.425	78.425	78.39	78.39
CKY000000000000074150	C9010F-29X-1 A, 50.0 cm	SS	0.1		172.55	172.55	172.55	172.55
CKY000000000000074250	C9010F-29X-1 A, 60.0 cm	SS	0.1		172.65	172.65	172.65	172.65
CKY000000000000074350	C9010F-30X-2 A, 5.0 cm	SS	0.1		178.205	178.205	178.205	178.205
CKY000000000000074450	C9010F-31X-1 A, 60.0 cm	SS	0.1		182.05	182.05	182.05	182.05
CKY000000000000074550	C9010F-31X-CC A, 25.0 cm	SS	0.1		182.855	182.855	182.855	182.855
CKY000000000000076250	C9010G-1H-1 A, 50.0 cm	SS	0.1		0.5	0.5	0.497	0.497
CKY000000000000076350	C9010G-1H-1 A, 118.0 cm	SS	0.1		1.18	1.18	1.173	1.173
CKY000000000000076450	C9010G-1H-1 A, 128.0 cm	SS	0.1		1.28	1.28	1.273	1.273
CKY000000000000076550	C9010G-1H-2 A, 56.0 cm	SS	0.1		1.965	1.965	1.953	1.953
CKY000000000000076650	C9010G-1H-4 A, 68.0 cm	SS	0.1		4.9	4.9	4.871	4.871
CKY000000000000076750	C9010G-2H-1 A, 23.0 cm	SS	0.1		80.23	80.23	80.23	80.23
CKY000000000000076850	C9010G-2H-2 A, 26.0 cm	SS	0.1		81.695	81.695	81.695	81.695
CKY000000000000076950	C9010G-2H-2 A, 50.0 cm	SS	0.1		81.935	81.935	81.935	81.935
CKY000000000000077850	C9010G-4H-2 A, 60.0 cm	SS	0.1		87.695	87.695	87.517	87.517
CKY000000000000077950	C9010G-4H-3 A, 50.0 cm	SS	0.1		89	89	88.677	88.677
CKY000000000000078050	C9010G-4H-5 A, 60.0 cm	SS	0.1		91.92	91.92	91.275	91.275
CKY000000000000078750	C9010G-5H-2 A, 59.0 cm	SS	0.1		97.57	97.57	97.415	97.415
CKY000000000000078850	C9010G-5H-3 A, 19.0 cm	SS	0.1		98.17	98.17	97.969	97.969
CKY000000000000078950	C9010G-5H-4 A, 107.0 cm	SS	0.1		99.62	99.62	99.306	99.306
CKY000000000000079050	C9010G-5H-6 A, 20.0 cm	SS	0.1		101.57	101.57	101.105	101.105
CKY000000000000079150	C9010G-5H-8 A, 76.0 cm	SS	0.1		104.945	104.945	104.218	104.218
CKY000000000000079250	C9010G-6X-1 A, 92.0 cm	SS	0.1		170.68	170.68	170.68	170.68
CKY000000000000079350	C9010G-6X-2 A, 7.0 cm	SS	0.1		171.27	171.27	171.27	171.27
CKY000000000000079450	C9010G-6X-CC A, 13.0 cm	SS	0.1		172.05	172.05	172.05	172.05
CKY000000000000079550	C9010G-12X-1 A, 10.0 cm	SS	0.1		193.76	193.76	193.76	193.76
CKY000000000000079650	C9010G-12X-CC A, 11.0 cm	SS	0.1		194.095	194.095	194.095	194.095
CKY000000000000079750	C9010G-12X-CC A, 35.0 cm	SS	0.1		194.335	194.335	194.335	194.335
CKY000000000000080050	C9010G-17X-1 A, 35.0 cm	SS	0.1		215.71	215.71	215.71	215.71
CKY000000000000080150	C9010G-17X-2 A, 59.0 cm	SS	0.1		217.355	217.355	217.355	217.355
CKY000000000000080250	C9010G-17X-2 A, 134.0 cm	SS	0.1		218.105	218.105	218.105	218.105
CKY000000000000080550	C9010G-18X-CC A, 30.0 cm	SS	0.1		222.365	222.365	222.365	222.365
CKY000000000000080650	C9010G-21X-2 A, 46.0 cm	SS	0.1		235.625	235.625	235.625	235.625

905HKD sample list

J-CORES sample ID	Sample source	Sample code	Sample volume	Sample comment	Top Depth [m CSF-A]	Bottom Depth [m CSF-A]	Top Depth [m CSF-B]	Bottom Depth [m CSF-B]
CKY000000000000046150	C9010E-1H-1 WR, 20.0--30.0 cm	905HKD	50		0.2	0.3	0.199	0.298
CKY000000000000046550	C9010E-1H-2 WR, 121.0--131.0 cm	905HKD	50		2.62	2.72	2.6	2.7
CKY000000000000046750	C9010E-1H-3 WR, 40.0--50.0 cm	905HKD	50		3.22	3.32	3.196	3.295
CKY000000000000047150	C9010E-1H-4 WR, 121.0--131.0 cm	905HKD	50		5.44	5.54	5.399	5.498
CKY000000000000047350	C9010E-1H-5 WR, 30.0--40.0 cm	905HKD	50		5.94	6.04	5.896	5.995
CKY000000000000047750	C9010E-1H-6 WR, 46.0--56.0 cm	905HKD	50		7.51	7.61	7.454	7.553
CKY000000000000047950	C9010E-2H-1 WR, 81.0--91.0 cm	905HKD	50		8.76	8.86	8.69	8.781
CKY000000000000048350	C9010E-2H-2 WR, 30.0--40.0 cm	905HKD	50		9.66	9.76	9.512	9.603
CKY000000000000048550	C9010E-2H-3 WR, 0.0--10.0 cm	905HKD	50		10.8	10.9	10.553	10.645
CKY000000000000048650	C9010E-2H-4 WR, 20.0--30.0 cm	905HKD	50		12.489	12.589	12.096	12.188
CKY000000000000048750	C9010E-2H-5 WR, 0.0--10.0 cm	905HKD	50		13.822	13.922	13.314	13.405
CKY000000000000048850	C9010E-2H-6 WR, 40.0--50.0 cm	905HKD	50		15.632	15.732	14.967	15.059
CKY000000000000049250	C9010E-2H-7 WR, 25.0--35.0 cm	905HKD	50		16.902	17.002	16.127	16.219
CKY000000000000049750	C9010E-3H-1 WR, 130.5--140.5 cm	905HKD	50		18.755	18.855	18.601	18.689
CKY000000000000049850	C9010E-3H-4 WR, 46.0--56.0 cm	905HKD	50		20.98	21.08	20.564	20.652
CKY000000000000049950	C9010E-3H-5 WR, 22.0--32.0 cm	905HKD	50		22.15	22.25	21.596	21.684
CKY000000000000050050	C9010E-3H-6 WR, 25.0--35.0 cm	905HKD	50		23.59	23.69	22.866	22.954
CKY000000000000050150	C9010E-3H-7 WR, 110.0--120.0 cm	905HKD	50		25.885	25.985	24.89	24.979
CKY000000000000049350	C9010E-3H-8 WR, 41.0--51.0 cm	905HKD	50		26.595	26.695	25.517	25.605
CKY000000000000050250	C9010E-3H-9 WR, 30.0--40.0 cm	905HKD	50		27.495	27.595	26.31	26.399
CKY000000000000050750	C9010E-4H-1 WR, 130.0--140.0 cm	905HKD	50		28.25	28.35	28.161	28.254
CKY000000000000050850	C9010E-4H-2 WR, 45.0--55.0 cm	905HKD	50		28.8	28.9	28.673	28.766
CKY000000000000050950	C9010E-4H-4 WR, 130.5--140.5 cm	905HKD	50		32.465	32.565	32.086	32.18
CKY000000000000051050	C9010E-4H-5 WR, 105.0--115.0 cm	905HKD	50		33.615	33.715	33.158	33.251
CKY000000000000050350	C9010E-4H-6 WR, 40.0--50.0 cm	905HKD	50		34.365	34.465	33.856	33.949
CKY000000000000051150	C9010E-4H-7 WR, 85.0--95.0 cm	905HKD	50		36.225	36.325	35.589	35.682
CKY000000000000051650	C9010E-5H-2 WR, 0.0--10.0 cm	905HKD	50		36.65	36.75	36.637	36.73
CKY000000000000051750	C9010E-5H-5 WR, 131.5--141.5 cm	905HKD	50		41.535	41.635	41.205	41.298
CKY000000000000051550	C9010E-5H-6 WR, 130.5--140.5 cm	905HKD	50		42.94	43.04	42.518	42.612
CKY000000000000052850	C9010E-6H-4 WR, 126.0--136.0 cm	905HKD	50		50.03	50.13	49.979	50.078
CKY000000000000052950	C9010E-6H-5 WR, 97.0--107.0 cm	905HKD	50		51.1	51.2	51.036	51.134
CKY000000000000052750	C9010E-6H-6 WR, 68.0--78.0 cm	905HKD	50		51.88	51.98	51.806	51.905
CKY000000000000053450	C9010E-7H-1 WR, 30.0--40.0 cm	905HKD	50		55.75	55.85	55.722	55.812
CKY000000000000053550	C9010E-7H-2 WR, 40.0--50.0 cm	905HKD	50		57.09	57.19	56.935	57.026
CKY000000000000053650	C9010E-7H-4 WR, 0.0--10.0 cm	905HKD	50		58.22	58.32	57.959	58.049
CKY000000000000053750	C9010E-7H-5 WR, 0.0--10.0 cm	905HKD	50		59.625	59.725	59.231	59.321
CKY000000000000053850	C9010E-7H-6 WR, 80.0--90.0 cm	905HKD	50		61.83	61.93	61.228	61.319
CKY000000000000053050	C9010E-7H-7 WR, 63.0--73.0 cm	905HKD	50		63.07	63.17	62.351	62.441
CKY000000000000053950	C9010E-7H-8 WR, 39.0--49.0 cm	905HKD	50		64.23	64.33	63.401	63.492
CKY000000000000054050	C9010E-7H-9 WR, 15.0--25.0 cm	905HKD	50		64.9	65	64.008	64.099
CKY000000000000054750	C9010E-8H-3 WR, 0.0--10.0 cm	905HKD	50		66.51	66.61	66.406	66.499
CKY000000000000054350	C9010E-8H-4 WR, 0.0--10.0 cm	905HKD	50		67.89	67.99	67.694	67.787
CKY000000000000054850	C9010E-8H-5 WR, 65.0--75.0 cm	905HKD	50		69.95	70.05	69.616	69.709
CKY000000000000054950	C9010E-8H-6 WR, 55.0--65.0 cm	905HKD	50		71.26	71.36	70.839	70.932
CKY000000000000055050	C9010E-8H-8 WR, 96.5--106.5 cm	905HKD	50		74.475	74.575	73.839	73.932
CKY000000000000056750	C9010E-11H-4 WR, 89.0--99.0 cm	905HKD	50		97.44	97.54	97.039	97.13
CKY000000000000056850	C9010E-11H-5 WR, 97.0--107.0 cm	905HKD	50		98.925	99.025	98.375	98.465
CKY000000000000056950	C9010E-11H-6 WR, 131.0--141.0 cm	905HKD	50		100.67	100.77	99.945	100.035
CKY000000000000056250	C9010E-11H-8 WR, 70.0--80.0 cm	905HKD	50		102.875	102.975	101.929	102.019
CKY000000000000058450	C9010E-18H-3 WR, 50.0--60.0 cm	905HKD	50		130.08	130.18	130.08	130.18
CKY000000000000058550	C9010E-18H-4 WR, 0.0--10.0 cm	905HKD	50		131.015	131.115	131.015	131.115
CKY000000000000058950	C9010E-19H-2 WR, 10.0--20.0 cm	905HKD	50		135.935	136.035	135.212	135.264
CKY000000000000059450	C9010E-19H-3 WR, 50.0--60.0 cm	905HKD	50		137.745	137.845	136.154	136.206
CKY000000000000059350	C9010E-19H-4 WR, 0.0--10.0 cm	905HKD	50		138.65	138.75	136.624	136.676
CKY000000000000059850	C9010E-20H-2 WR, 0.0--10.0 cm	905HKD	50		140.535	140.635	140.478	140.574
CKY000000000000060250	C9010E-21H-8 WR, 60.0--70.0 cm	905HKD	50		153.48	153.58	152.486	152.575
CKY000000000000060650	C9010E-22H-1 WR, 75.5--85.5 cm	905HKD	50		154.385	154.485	154.385	154.485
CKY000000000000061450	C9010E-23H-6 WR, 99.5--109.5 cm	905HKD	50		162.775	162.875	162.094	162.184
CKY000000000000061950	C9010E-24X-3 WR, 58.0--68.0 cm	905HKD	50		168.825	168.925	168.825	168.925
CKY000000000000062750	C9010E-25X-2 WR, 50.0--60.0 cm	905HKD	50		173.155	173.255	173.155	173.255
CKY000000000000063750	C9010F-1H-2 WR, 121.0--131.0 cm	905HKD	50		2.61	2.71	2.589	2.688
CKY000000000000064450	C9010F-2H-2 WR, 121.0--131.0 cm	905HKD	50		9.96	10.06	9.86	9.956
CKY000000000000065150	C9010F-3H-7 WR, 130.0--140.0 cm	905HKD	50		25.39	25.49	24.54	24.63
CKY000000000000064750	C9010F-4H-7 WR, 131.0--141.0 cm	905HKD	50		35.09	35.19	34.213	34.303
CKY000000000000066150	C9010F-5H-7 WR, 8.0--18.0 cm	905HKD	50		43.055	43.155	41.934	42.019
CKY000000000000066850	C9010F-6H-6 WR, 81.0--91.0 cm	905HKD	50		52.2	52.3	51.65	51.742
CKY000000000000067250	C9010F-7X-1 WR, 81.0--91.0 cm	905HKD	50		55.66	55.76	55.66	55.76
CKY000000000000067750	C9010F-8X-3 WR, 63.5--73.5 cm	905HKD	50		62.995	63.095	62.995	63.095
CKY000000000000067950	C9010F-10X-1 WR, 0.0--10.0 cm	905HKD	50		69.45	69.55	69.45	69.55
CKY000000000000068050	C9010F-11X-1 WR, 90.0--100.0 cm	905HKD	50		75.05	75.15	75.05	75.15
CKY000000000000068250	C9010F-12H-3 WR, 0.0--10.0 cm	905HKD	50		78.815	78.915	78.771	78.869
CKY000000000000068950	C9010F-15X-1 WR, 124.0--134.0 cm	905HKD	50		98.11	98.21	97.934	98.019
CKY000000000000069150	C9010F-16X-1 WR, 121.0--131.0 cm	905HKD	50		102.78	102.88	102.78	102.88
CKY000000000000070650	C9010F-20H-3 WR, 131.0--141.0 cm	905HKD	50		123.965	124.065	123.848	123.945
CKY000000000000071050	C9010F-20H-4 WR, 50.0--60.0 cm	905HKD	50		124.565	124.665	124.426	124.522
CKY000000000000071150	C9010F-20H-5 WR, 130.5--140.5 cm	905HKD	50		126.78	126.88	126.558	126.654
CKY000000000000071250	C9010F-20H-6 WR, 131.0--141.0 cm	905HKD	50		128.19	128.29	127.915	128.011
CKY000000000000071350	C9010F-20H-7 WR, 130.5--140.5 cm	905HKD	50		129.595	129.695	129.267	129.363
CKY000000000000071450	C9010F-20H-8 WR, 77.5--87.5 cm	905HKD	50		130.47	130.57	130.109	130.206
CKY000000000000071550	C9010F-24X-2 WR, 60.0--70.0 cm	905HKD	50		145.86	145.96	145.86	145.96
CKY000000000000071850	C9010F-28X-3 WR, 128.5--138.5 cm	905HKD	50		166.675	166.775	166.675	166.775
CKY000000000000072050	C9010F-28X-5 WR, 106.5--116.5 cm	905HKD	50		168.75	168.85	168.75	168.85
CKY000000000000072350	C9010F-29X-1 WR, 130.0--140.0 cm	905HKD	50		173.35	173.45	173.35	173.45
CKY000000000000072750	C9010F-30X-1 WR, 80.5--90.5 cm	905HKD	50		177.555	177.655	177.555	177.655
CKY000000000000072850	C9010F-31X-1 WR, 55.5--65.5 cm	905HKD	50		182.005	182.105	182.005	182.105
CKY000000000000075750	C9010G-4H-3 WR, 131.0--141.0 cm	905HKD	50		89.81	89.91	89.398	89.487
CKY000000000000075850	C9010G-4H-4 WR, 89.0--99.0 cm	905HKD	50		90.8	90.9	90.279	90.368
CKY000000000000075350	C9010G-4H-5 WR, 121.0--131.0 cm	905HKD	50		92.53	92.63	91.817	91.906
CKY000000000000075950	C9010G-4H-6 WR, 115.0--125.0 cm	905HKD	50		93.78	93.88	92.929	93.018
CKY000000000000076050	C9010G-4H-7 WR, 77.0--87.0 cm	905HKD	50		94.8	94.9	93.837	93.925
CKY000000000000076150	C9010G-4H-8 WR, 41.0--51.0 cm	905HKD	50		95.855	95.955	94.775	94.864
CKY000000000000077450	C9010G-5H-4 WR, 131.0--141.0 cm	905HKD	50		99.86	99.96	99.528	99.62
CKY000000000000077550	C9010G-5H-5 WR, 131.0--141.0 cm	905HKD	50		101.27	101.37	100.828	100.92
CKY000000000000077650	C9010G-5H-6 WR, 97.0--107.0 cm	905HKD	50		102.34	102.44	101.815	101.907
CKY000000000000077050	C9010G-5H-7 WR, 131.0--141.0 cm	905HKD	50		104.085	104.185	103.424	103.517
CKY000000000000077750	C9010G-5H-8 WR, 90.0--100.0 cm	905HKD	50		105.085	105.185	104.347	104.439
CKY000000000000078550	C9010G-17X-1 WR, 93.0--98.0 cm	905HKD	25		216.29	216.34	216.29	216.34
CKY000000000000080450	C9010G-21X-2 WR, 27.0--37.0 cm	905HKD	50		235.435	235.535	235.435	235.535

905NMA sample list

J-CORES sample ID	Sample source	Sample code	Sample volume	Sample comment	Top Depth [m CSF-A]	Bottom Depth [m CSF-A]	Top Depth [m CSF-B]	Bottom Depth [m CSF-B]
CKY000000000000046450	C9010E-1H-1 WR, 70.0--80.0 cm	905NMA	350		0.7	0.8	0.695	0.794
CKY000000000000046650	C9010E-1H-2 WR, 131.0--141.0 cm	905NMA	350		2.72	2.82	2.7	2.799
CKY000000000000047050	C9010E-1H-3 WR, 90.0--100.0 cm	905NMA	350		3.72	3.82	3.692	3.791
CKY000000000000047250	C9010E-1H-4 WR, 131.0--141.0 cm	905NMA	350		5.54	5.64	5.498	5.598
CKY000000000000047650	C9010E-1H-5 WR, 80.0--90.0 cm	905NMA	350		6.44	6.54	6.392	6.491
CKY000000000000047850	C9010E-1H-6 WR, 56.0--66.0 cm	905NMA	350		7.61	7.71	7.553	7.652
CKY000000000000048250	C9010E-2H-1 WR, 131.0--141.0 cm	905NMA	350		9.26	9.36	9.147	9.238
CKY000000000000048450	C9010E-2H-2 WR, 130.5--140.5 cm	905NMA	350		10.665	10.765	10.43	10.521
CKY000000000000049150	C9010E-2H-6 WR, 90.0--100.0 cm	905NMA	350		16.132	16.232	15.424	15.515
CKY000000000000049650	C9010E-3H-8 WR, 91.0--101.0 cm	905NMA	350		27.095	27.195	25.958	26.046
CKY000000000000050650	C9010E-4H-6 WR, 120.0--130.0 cm	905NMA	350		35.165	35.265	34.601	34.694
CKY000000000000051250	C9010E-5H-6 WR, 47.0--57.0 cm	905NMA	350		42.105	42.205	41.738	41.831
CKY000000000000052450	C9010E-6H-6 WR, 118.0--128.0 cm	905NMA	350		52.38	52.48	52.3	52.398
CKY000000000000053350	C9010E-7H-7 WR, 113.0--123.0 cm	905NMA	350		63.57	63.67	62.804	62.894
CKY000000000000054650	C9010E-8H-4 WR, 76.0--86.0 cm	905NMA	350		68.65	68.75	68.403	68.496
CKY000000000000055750	C9010E-9H-2 WR, 0.0--10.0 cm	905NMA	350		75.205	75.305	75.127	75.217
CKY000000000000056550	C9010E-11H-8 WR, 133.5--143.5 cm	905NMA	350		103.51	103.61	102.5	102.59
CKY000000000000057750	C9010E-12H-2 WR, 131.0--141.0 cm	905NMA	350		105.665	105.765	105.654	105.753
CKY000000000000058050	C9010E-17H-3 WR, 92.0--102.0 cm	905NMA	350		127.555	127.655	127.555	127.655
CKY000000000000058150	C9010E-18H-3 WR, 0.0--10.0 cm	905NMA	350		129.58	129.68	129.58	129.68
CKY000000000000059050	C9010E-19H-3 WR, 0.0--10.0 cm	905NMA	350		137.245	137.345	135.893	135.945
CKY000000000000059550	C9010E-20H-2 WR, 10.0--20.0 cm	905NMA	350		140.635	140.735	140.574	140.67
CKY000000000000060450	C9010E-21H-8 WR, 100.0--110.0 cm	905NMA	350		153.88	153.98	152.844	152.933
CKY000000000000060950	C9010E-22H-1 WR, 125.5--135.5 cm	905NMA	350		154.885	154.985	154.885	154.985
CKY000000000000061150	C9010E-23H-6 WR, 36.5--46.5 cm	905NMA	350		162.145	162.245	161.526	161.617
CKY000000000000061650	C9010E-24X-3 WR, 8.0--18.0 cm	905NMA	350		168.325	168.425	168.325	168.425
CKY000000000000062450	C9010E-25X-2 WR, 0.0--10.0 cm	905NMA	350		172.655	172.755	172.655	172.755
CKY000000000000063650	C9010F-1H-1 WR, 130.0--140.0 cm	905NMA	350		1.3	1.4	1.289	1.389
CKY000000000000063850	C9010F-1H-2 WR, 131.0--141.0 cm	905NMA	350		2.71	2.81	2.688	2.787
CKY000000000000063950	C9010F-1H-3 WR, 131.0--141.0 cm	905NMA	350		4.12	4.22	4.087	4.186
CKY000000000000064050	C9010F-1H-4 WR, 131.5--141.5 cm	905NMA	350		5.535	5.635	5.49	5.589
CKY000000000000064150	C9010F-1H-5 WR, 71.0--81.0 cm	905NMA	350		6.345	6.445	6.294	6.393
CKY000000000000064250	C9010F-1H-6 WR, 61.0--71.0 cm	905NMA	350		7.055	7.155	6.998	7.097
CKY000000000000064350	C9010F-2H-1 WR, 130.0--140.0 cm	905NMA	350		8.65	8.75	8.6	8.696
CKY000000000000064550	C9010F-2H-2 WR, 131.0--141.0 cm	905NMA	350		10.06	10.16	9.956	10.052
CKY000000000000064850	C9010F-3H-4 WR, 93.0--103.0 cm	905NMA	350		20.8	20.9	20.407	20.497
CKY000000000000064650	C9010F-4H-2 WR, 131.0--141.0 cm	905NMA	350		28.06	28.16	27.888	27.978
CKY000000000000066350	C9010F-5H-7 WR, 38.0--48.0 cm	905NMA	350		43.355	43.455	42.188	42.272
CKY000000000000067150	C9010F-6H-6 WR, 131.0--141.0 cm	905NMA	350		52.7	52.8	52.109	52.201
CKY000000000000067550	C9010F-7X-1 WR, 131.0--141.0 cm	905NMA	350		56.16	56.26	56.16	56.26
CKY000000000000068450	C9010F-12H-3 WR, 30.0--40.0 cm	905NMA	350		79.115	79.215	79.065	79.163
CKY000000000000069050	C9010F-15X-1 WR, 134.0--144.0 cm	905NMA	350		98.21	98.31	98.019	98.105
CKY000000000000069250	C9010F-16X-1 WR, 131.0--141.0 cm	905NMA	350		102.88	102.98	102.88	102.98
CKY000000000000070950	C9010F-20H-4 WR, 40.0--50.0 cm	905NMA	350		124.465	124.565	124.329	124.426
CKY000000000000071650	C9010F-24X-2 WR, 70.0--80.0 cm	905NMA	350		145.96	146.06	145.96	146.06
CKY000000000000071750	C9010F-27X-2 WR, 131.0--141.0 cm	905NMA	350		160.565	160.665	159.789	159.861
CKY000000000000071950	C9010F-28X-3 WR, 118.5--128.5 cm	905NMA	350		166.575	166.675	166.575	166.675
CKY000000000000072650	C9010F-30X-1 WR, 90.5--100.5 cm	905NMA	350		177.655	177.755	177.655	177.755
CKY000000000000073150	C9010F-31X-1 WR, 90.5--100.5 cm	905NMA	350		182.355	182.455	182.355	182.455
CKY000000000000074750	C9010G-1H-3 WR, 131.0--141.0 cm	905NMA	350		4.12	4.22	4.096	4.195
CKY000000000000075050	C9010G-2H-2 WR, 74.0--84.0 cm	905NMA	350		82.175	82.275	82.175	82.275
CKY000000000000075650	C9010G-4H-5 WR, 71.0--81.0 cm	905NMA	350		92.03	92.13	91.373	91.462
CKY000000000000077350	C9010G-5H-7 WR, 81.0--91.0 cm	905NMA	350		103.585	103.685	102.963	103.055
CKY000000000000078250	C9010G-17X-1 WR, 43.0--53.0 cm	905NMA	350		215.79	215.89	215.79	215.89
CKY000000000000079850	C9010G-18X-1 WR, 70.0--80.0 cm	905NMA	350		220.76	220.86	220.76	220.86
CKY000000000000080350	C9010G-21X-1 WR, 50.0--60.0 cm	905NMA	350		234.66	234.76	234.66	234.76

905NMB sample list

J-CORES sample ID	Sample source	Sample code	Sample volume	Sample comment	Top Depth [m CSF-A]	Bottom Depth [m CSF-A]	Top Depth [m CSF-B]	Bottom Depth [m CSF-B]
CKY000000000000074950	C9010G-2H-2 WR, 84.0--94.0 cm	905NMB	350		82.275	82.375	82.275	82.375

905NOOG sample list

J-CORES sample ID	Sample source	Sample code	Sample volume	Sample comment	Top Depth [m CSF-A]	Bottom Depth [m CSF-A]	Top Depth [m CSF-B]	Bottom Depth [m CSF-B]
CKY000000000000046250	C9010E-1H-1 WR, 30.0--50.0 cm	905NOOG	700		0.3	0.5	0.298	0.496
CKY000000000000069350	C9010E-1H-3 W, 40.0--50.0 cm	905NOOG	175	half round sampled	3.22	3.32	3.196	3.295
CKY000000000000046850	C9010E-1H-3 WR, 50.0--70.0 cm	905NOOG	700		3.32	3.52	3.295	3.494
CKY000000000000047450	C9010E-1H-5 WR, 40.0--60.0 cm	905NOOG	700		6.04	6.24	5.995	6.193
CKY000000000000048050	C9010E-2H-1 WR, 91.0--111.0 cm	905NOOG	700		8.86	9.06	8.781	8.964
CKY000000000000048950	C9010E-2H-6 WR, 50.0--70.0 cm	905NOOG	700		15.732	15.932	15.059	15.241
CKY000000000000049450	C9010E-3H-8 WR, 51.0--71.0 cm	905NOOG	700		26.695	26.895	25.605	25.781
CKY000000000000050450	C9010E-4H-6 WR, 80.0--100.0 cm	905NOOG	700		34.765	34.965	34.229	34.415
CKY000000000000069450	C9010E-4H-7 W, 65.0--85.0 cm	905NOOG	350	half round sampled	36.025	36.225	35.402	35.589
CKY000000000000051450	C9010E-5H-6 WR, 77.0--97.0 cm	905NOOG	700		42.405	42.605	42.018	42.205
CKY000000000000052650	C9010E-6H-6 WR, 78.0--98.0 cm	905NOOG	700		51.98	52.18	51.905	52.102
CKY000000000000069550	C9010E-7H-6 W, 91.0--111.0 cm	905NOOG	350	half round sampled	61.94	62.14	61.327	61.509
CKY000000000000053150	C9010E-7H-7 WR, 73.0--93.0 cm	905NOOG	700		63.17	63.37	62.441	62.623
CKY000000000000054450	C9010E-8H-4 WR, 36.0--56.0 cm	905NOOG	700		68.25	68.45	68.03	68.216
CKY000000000000069650	C9010E-8H-8 W, 20.0--40.0 cm	905NOOG	350	half round sampled	73.71	73.91	73.125	73.312
CKY000000000000055950	C9010E-9H-2 WR, 30.0--50.0 cm	905NOOG	700		75.505	75.705	75.396	75.576
CKY000000000000056350	C9010E-11H-8 WR, 93.5--113.5 cm	905NOOG	700		103.11	103.31	102.14	102.32
CKY000000000000057550	C9010E-12H-2 WR, 91.0--111.0 cm	905NOOG	700		105.265	105.465	105.255	105.454
CKY000000000000057850	C9010E-17H-3 WR, 52.0--72.0 cm	905NOOG	700		127.155	127.355	127.155	127.355
CKY000000000000069850	C9010E-18H-1 W, 120.0--140.0 cm	905NOOG	350	half round sampled	129.13	129.33	129.13	129.33
CKY000000000000058350	C9010E-18H-3 WR, 30.0--50.0 cm	905NOOG	700		129.88	130.08	129.88	130.08
CKY000000000000059250	C9010E-19H-3 WR, 30.0--50.0 cm	905NOOG	700		137.545	137.745	136.049	136.154
CKY000000000000069750	C9010E-19H-4 W, 10.0--30.0 cm	905NOOG	350	half round sampled	138.75	138.95	136.676	136.78
CKY000000000000059750	C9010E-20H-2 WR, 40.0--60.0 cm	905NOOG	700		140.935	141.135	140.862	141.054
CKY000000000000060350	C9010E-21H-8 WR, 80.0--100.0 cm	905NOOG	700		153.68	153.88	152.665	152.844
CKY000000000000060750	C9010E-22H-1 WR, 85.5--105.5 cm	905NOOG	700		154.485	154.685	154.485	154.685
CKY000000000000069950	C9010E-22H-2 W, 55.0--75.0 cm	905NOOG	350	half round sampled	155.535	155.735	155.535	155.735
CKY000000000000061350	C9010E-23H-6 WR, 66.5--86.5 cm	905NOOG	700		162.445	162.645	161.797	161.977
CKY000000000000061850	C9010E-24X-3 WR, 38.0--58.0 cm	905NOOG	700		168.625	168.825	168.625	168.825
CKY000000000000070050	C9010E-24X-4 W, 40.0--60.0 cm	905NOOG	350	half round sampled	170.055	170.255	170.055	170.255
CKY000000000000062650	C9010E-25X-2 WR, 30.0--50.0 cm	905NOOG	700		172.955	173.155	172.955	173.155
CKY000000000000065050	C9010F-3H-4 WR, 123.0--140.0 cm	905NOOG	595		21.1	21.27	20.677	20.83
CKY000000000000065250	C9010F-4H-7 WR, 0.0--20.0 cm	905NOOG	700		33.78	33.98	33.034	33.214
CKY000000000000066250	C9010F-5H-7 WR, 18.0--38.0 cm	905NOOG	700		43.155	43.355	42.019	42.188
CKY000000000000066950	C9010F-6H-6 WR, 91.0--111.0 cm	905NOOG	700		52.3	52.5	51.742	51.925
CKY000000000000067350	C9010F-7X-1 WR, 91.0--111.0 cm	905NOOG	700		55.76	55.96	55.76	55.96
CKY000000000000067850	C9010F-8X-3 WR, 43.5--63.5 cm	905NOOG	700		62.795	62.995	62.795	62.995
CKY000000000000068350	C9010F-12H-3 WR, 10.0--30.0 cm	905NOOG	700		78.915	79.115	78.869	79.065
CKY000000000000070750	C9010F-20H-4 WR, 0.0--20.0 cm	905NOOG	700		124.065	124.265	123.945	124.137
CKY000000000000072450	C9010F-30X-1 WR, 120.5--140.5 cm	905NOOG	700		177.955	178.155	177.955	178.155
CKY000000000000074650	C9010F-30X-2 W, 65.0--85.0 cm	905NOOG	350	half round sampled	178.805	179.005	178.805	179.005
CKY000000000000072950	C9010F-31X-1 WR, 65.5--80.5 cm	905NOOG	525		182.105	182.255	182.105	182.255
CKY000000000000074850	C9010G-1H-3 WR, 111.0--131.0 cm	905NOOG	700		3.92	4.12	3.897	4.096
CKY000000000000075250	C9010G-2H-3 WR, 0.0--20.0 cm	905NOOG	700		82.375	82.575	82.375	82.575
CKY000000000000075450	C9010G-4H-5 WR, 101.0--121.0 cm	905NOOG	700		92.33	92.53	91.64	91.817
CKY000000000000077150	C9010G-5H-7 WR, 111.0--131.0 cm	905NOOG	700		103.885	104.085	103.24	103.424
CKY000000000000078450	C9010G-17X-1 WR, 73.0--93.0 cm	905NOOG	700		216.09	216.29	216.09	216.29

905NOIW sample list

J-CORES sample ID	Sample source	Sample code	Sample volume	Sample comment	Top Depth [m CSF-A]	Bottom Depth [m CSF-A]	Top Depth [m CSF-B]	Bottom Depth [m CSF-B]
CKY000000000000046350	C9010E-1H-1 WR, 50.0--70.0 cm	905NOIW	700		0.5	0.7	0.496	0.695
CKY000000000000046950	C9010E-1H-3 WR, 70.0--90.0 cm	905NOIW	700		3.52	3.72	3.494	3.692
CKY000000000000047550	C9010E-1H-5 WR, 60.0--80.0 cm	905NOIW	700		6.24	6.44	6.193	6.392
CKY000000000000048150	C9010E-2H-1 WR, 111.0--131.0 cm	905NOIW	700		9.06	9.26	8.964	9.147
CKY000000000000049050	C9010E-2H-6 WR, 70.0--90.0 cm	905NOIW	700		15.932	16.132	15.241	15.424
CKY000000000000049550	C9010E-3H-8 WR, 71.0--91.0 cm	905NOIW	700		26.895	27.095	25.781	25.958
CKY000000000000050550	C9010E-4H-6 WR, 100.0--120.0 cm	905NOIW	700		34.965	35.165	34.415	34.601
CKY000000000000051350	C9010E-5H-6 WR, 57.0--77.0 cm	905NOIW	700		42.205	42.405	41.831	42.018
CKY000000000000052550	C9010E-6H-6 WR, 98.0--118.0 cm	905NOIW	700		52.18	52.38	52.102	52.3
CKY000000000000053250	C9010E-7H-7 WR, 93.0--113.0 cm	905NOIW	700		63.37	63.57	62.623	62.804
CKY000000000000054550	C9010E-8H-4 WR, 56.0--76.0 cm	905NOIW	700		68.45	68.65	68.216	68.403
CKY000000000000055850	C9010E-9H-2 WR, 10.0--30.0 cm	905NOIW	700		75.305	75.505	75.217	75.396
CKY000000000000056450	C9010E-11H-8 WR, 113.5--133.5 cm	905NOIW	700		103.31	103.51	102.32	102.5
CKY000000000000057650	C9010E-12H-2 WR, 111.0--131.0 cm	905NOIW	700		105.465	105.665	105.454	105.654
CKY000000000000057950	C9010E-17H-3 WR, 72.0--92.0 cm	905NOIW	700		127.355	127.555	127.355	127.555
CKY000000000000058250	C9010E-18H-3 WR, 10.0--30.0 cm	905NOIW	700		129.68	129.88	129.68	129.88
CKY000000000000059150	C9010E-19H-3 WR, 10.0--30.0 cm	905NOIW	700		137.345	137.545	135.945	136.049
CKY000000000000059650	C9010E-20H-2 WR, 20.0--40.0 cm	905NOIW	700		140.735	140.935	140.67	140.862
CKY000000000000060550	C9010E-21H-8 WR, 110.0--130.0 cm	905NOIW	700		153.98	154.18	152.933	153.112
CKY000000000000060850	C9010E-22H-1 WR, 105.5--125.5 cm	905NOIW	700		154.685	154.885	154.685	154.885
CKY000000000000061250	C9010E-23H-6 WR, 46.5--66.5 cm	905NOIW	700		162.245	162.445	161.617	161.797
CKY000000000000061750	C9010E-24X-3 WR, 18.0--38.0 cm	905NOIW	700		168.425	168.625	168.425	168.625
CKY000000000000062550	C9010E-25X-2 WR, 10.0--30.0 cm	905NOIW	700		172.755	172.955	172.755	172.955
CKY000000000000064950	C9010F-3H-4 WR, 103.0--123.0 cm	905NOIW	700		20.9	21.1	20.497	20.677
CKY000000000000065350	C9010F-4H-7 WR, 20.0--40.0 cm	905NOIW	700		33.98	34.18	33.214	33.394
CKY000000000000066450	C9010F-5H-7 WR, 48.0--68.0 cm	905NOIW	700		43.455	43.655	42.272	42.441
~~CKY000000000000067050~~	~~C9010F-6H-6 WR, 111.0--131.0 cm~~	~~905NOIW~~	~~700~~	returned pristine residue as section	~~52.5~~	~~52.7~~	~~51.925~~	~~52.109~~
~~CKY000000000000067450~~	~~C9010F-7X-1 WR, 111.0--131.0 cm~~	~~905NOIW~~	~~700~~	returned pristine residue as section	~~55.96~~	~~56.16~~	~~55.96~~	~~56.16~~
CKY000000000000070850	C9010F-20H-4 WR, 20.0--40.0 cm	905NOIW	700		124.265	124.465	124.137	124.329
CKY000000000000072550	C9010F-30X-1 WR, 100.5--120.5 cm	905NOIW	700	lost squeezed cake	177.755	177.955	177.755	177.955
CKY000000000000073050	C9010F-31X-1 WR, 80.5--90.5 cm	905NOIW	350		182.255	182.355	182.255	182.355
CKY000000000000075150	C9010G-2H-2 WR, 54.0--74.0 cm	905NOIW	700		81.975	82.175	81.975	82.175
CKY000000000000075550	C9010G-4H-5 WR, 81.0--101.0 cm	905NOIW	700		92.13	92.33	91.462	91.64
CKY000000000000077250	C9010G-5H-7 WR, 91.0--111.0 cm	905NOIW	700		103.685	103.885	103.055	103.24
CKY000000000000078350	C9010G-17X-1 WR, 53.0--73.0 cm	905NOIW	700		215.89	216.09	215.89	216.09

Table 6-3-2-1: Uncorrected geochemistry results from interstitial waters at the Site C9010 Holes E-G. Yellow bars indicate samples with significant concentration of sulfate below the sulfate-methane transition.

Core	Type	Section	Interval (cm) Top	Interval (cm) Bottom	Depth (m CSF)	Refractive Index	Salinity	pH	Alkalinity (mM)	PO_4 (μM)	NH_4 (mM)	Br^- (mM)	SO_4^{2-} (mM)
905-C9010E-													
1	H	1	50	70	0.6	1.33938	34.41	7.65	5.7	33.3	0.37	0.92	27.30
1	H	3	70	90	3.6	1.33920	33.44	7.84	24.0	107.0	1.73	0.98	9.18
1	H	5	60	80	6.3	1.33914	33.11	7.92	36.1	135.9	2.24	0.96	0.74
2	H	1	111	131	9.1	1.33920	33.44	7.87	39.4	157.6	2.57	0.99	0.68
2	H	6	70	90	15.3	1.33928	33.87	7.81	43.0	166.5	4.18	1.02	0.56
3	H	8	71	91	25.9	1.33933	34.14	7.81	42.4	130.0	5.42	1.09	0.58
4	H	6	100	120	34.5	1.33940	34.51	7.78	45.6	153.8	5.72	1.17	0.62
5	H	6	57	77	41.9	1.33938	34.41	7.84	44.0	101.4	5.95	1.20	0.56
6	H	6	98	118	52.2	1.33940	34.51	7.84	44.1	172.5	6.33	1.25	0.56
7	H	7	93	113	62.7	1.33938	34.41	7.94	44.6	96.0	6.92	1.22	0.58
8	H	4	56	76	68.3	1.33937	34.35	7.84	43.6	126.0	7.12	1.21	0.60
9	H	2	10	30	75.3	1.33936	34.30	7.85	42.4	149.2	6.58	1.21	0.72
11	H	8	113.5	133.5	102.4	1.33939	34.46	7.89	45.2	72.4	6.42	1.18	0.60
18	H	3	10	30	129.8	1.33934	34.19	7.86	42.6	119.2	6.75	1.12	0.44
19	H	3	10	30	136.0	1.33928	33.87	7.87	39.3	106.3	6.71	1.10	0.39
20	H	2	20	40	140.8	1.33928	33.87	7.82	39.7	125.9	6.79	1.15	0.65
21	H	8	110	130	153.0	1.33917	33.27	7.84	31.4	103.7	6.51	1.15	0.60
22	H	1	105.5	125.5	154.8	1.33915	33.17	7.83	31.0	159.5	6.18	1.13	0.66
23	H	6	46.5	66.5	161.7	1.33912	33.00	7.87	27.3	100.4	5.46	1.13	0.63
24	X	3	18	38	168.5	1.33909	32.84	7.84	22.3	79.7	4.49	1.07	2.35
25	X	2	10	30	172.9	1.33905	32.63	7.91	21.4	64.2	3.83	0.99	1.61
905-C9010F-													
5	H	7	48	68	42.4	1.33938	34.41	7.83	44.4	131.3	5.84	1.13	0.62
20	H	4	20	40	124.2	1.33936	34.30	7.89	44.2	99.5	6.73	1.15	0.85
30	X	1	100.5	120.5	177.9	1.33912	33.00	8.13	12.9	20.2	2.58	0.94	11.65
31	X	1	80.5	90.5	182.3	1.33927	33.81	7.74	9.0	9.2	1.83	0.93	15.76
905-C9010G-													
2	H	2	54	74	82.1	1.33937	34.35	7.80	42.1	107.8	7.78	1.14	0.80
4	H	5	81	101	91.6	1.33941	34.57	7.86	43.8	110.4	7.88	1.17	0.70
5	H	7	91	111	103.1	1.33940	34.51	7.86	44.2	92.4	7.53	1.14	0.63
17	X	1	53	73	216.0	1.33940	34.51	7.61	3.6	0.0	0.12	0.87	27.48

Table 6-3-2-2: Uncorrected geochemistry results from waters collected for quality control at the Site C9010.

Core	Type	Section	Interval (cm) Top	Interval (cm) Bottom	Depth (m CSF)	Refractive Index	Salinity	pH	Alkalinity (mM)	PO_4 (μM)	NH_4 (mM)	Br^- (mM)	SO_4^{2-} (mM)	Type
905-C9010E-														
12	H	2	111	131	105.6	1.33438	7.44	-	-	-	-	0.25	1.60	Centrifuged water with dillution
17	H	3	72	92	127.5	1.33517	11.70	-	-	-	-	0.38	0.25	Centrifuged water with dillution
905-C9010F-														
3	H	4	103	123	20.6	1.33933	34.14	7.87	36.2	-	-	1.02	5.16	Centrifuged water
4	H	7	20	40	33.3	1.33938	34.41	7.91	46.9	56.6	5.25	1.09	0.71	Centrifuged water
Seawater and drilling fluid														
-	-	-	-	-	-	1.33937	34.35	7.97	2.1	0.0	0.00	0.85	27.31	Surface seawater-1
-	-	-	-	-	-	1.33937	34.35	7.90	2.3	0.0	0.00	0.86	27.11	Surface seawater-2
-	-	-	-	-	-	1.33637	18.17	9.50	2.7	1.0	0.00	0.43	14.63	Drilling fluid

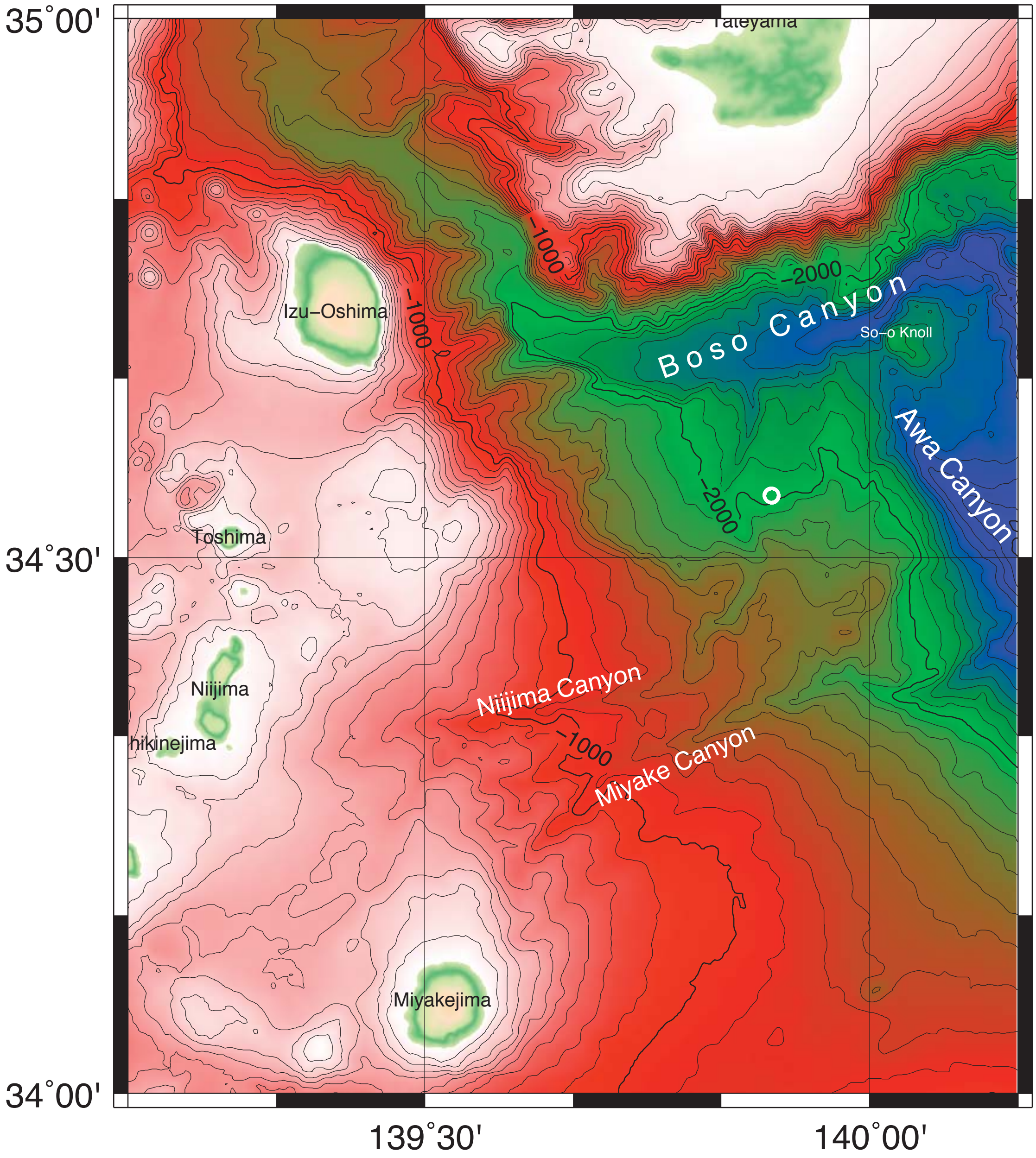
Table 6-5-4-1: Relative abundances of sediment components for the toothpick samples, and the sediment names assigned based on the relative abundances of sediment components. All data are represented as relative area-%. T: trace (<1%).

Table 6-5-4-1.

Core, Section	Int. (cm)	Clay Mineral	Quartz	Feldspar	Hornblend	Volcanic Glass	Rock fragment	Nannofossils	Foraminifers	Diatoms	Radiolarians	Silicoflagellates	Spicules	Wood fragments	Opaque	Lithology: major or minor	Lithology name
Hole E																	
905-C9010E-1H-1	116	3	25			60	10	2						T		minor	Vitric volcanic ash with quartz
905-C9010E-1H-2	24	5	10			75	2	5							3	minor	Volcanic ash
905-C9010E-1H-2	70	3	3			45	40	1							8	minor	Vitric-lithic volcanic ash
905-C9010E-1H-2	80	40	7			10		6 T		30			3		4	major	Diatom clay
905-C9010E-1H-5	13	2	5			40	40	5	1		1		1		5	minor	Vitric-lithic volcanic ash
905-C9010E-1H-5	139	2	15			35	35	5	1		1		1		5	minor	Vitric-lithic volcanic ash with quartz
905-C9010E-2H-1	40	40	6			10		5		30	1		3		5	major	Diatom clay
905-C9010E-2H-4	49	5	17			40	30	3							5	minor	Vitric-lithic volcanic ash with quartz
905-C9010E-2H-4	112	5	10 T			45	27	8 T		2					3	minor	Vitric volcanic ash
905-C9010E-2H-5	25	40	7			8		8		30	1		1		5	major	Diatom clay
905-C9010E-2H-5	75	2	12			75	5	3							3	minor	Vitric volcanic ash with quartz
905-C9010E-3H-2	12	4	4			80	5	7						T		minor	Vitric volcanic ash
905-C9010E-3H-5	40	50	4			5	5	5 T		27		T			4	major	Diatom clay
905-C9010E-3H-6	90	50	5			5		8		25		T			7	major	Diatom clay
905-C9010E-3H-8	36	50	5			10		3		20		T			12	minor	Clay with diatom and opaque
905-C9010E-4H-1	40	3 T			T			2		18			75		2	minor	(A light gray tube, burrow wall)
905-C9010E-4H-3	40	4	15	1		55	15	3	1	3		T			3	minor	Vitric volcanic ash with quartz and rock fragments
905-C9010E-4H-6	77	48	6			8		10		20			1		7	major	Clay with diatom
905-C9010E-4H-7	108	3	2		T			1		5			85		4	minor	(A light gray tube, burrow wall)
905-C9010E-5H-2	50	45	8			10 T		5	2	20			2		8	major	Clay with diatoms
905-C9010E-5H-3	100	4	7	2		40	40	2				T			5	minor	Vitric-lithic volcanic ash
905-C9010E-5H-8	100	3	8	2		55	25	2							5	minor	Vitric volcanic ash
905-C9010E-6H-2	45	5	10 T			70	8	2	T		T				5	minor	Vitric volcanic ash
905-C9010E-6H-4	50	50	5			7		10		20 T		1	2		5	major	Clay with diatoms
905-C9010E-6H-6	129	50	5			10		6		20	T		1		8	major	Clay with diatoms
905-C9010E-7H-1	45	7	4	2 T		20	55	2 T							10	minor	Lithic volcanic ash
905-C9010E-7H-4	70	60	5			5		8 T		15			2		5	major	Clay with diatoms
905-C9010E-7H-5	125	3	6	4 T		20	55	7 T							5	minor	Lithic volcanic ash
905-C9010E-8H-2	27	25	3	2		30	30 T			3					7	minor	Vitric-lithic volcanic ash
905-C9010E-8H-4	35	55	8			8		10		12		T			7	major	Clay with diatoms
905-C9010E-8H-5	131	3	10 T	T		70	8 T								8	minor	Vitric volcanic ash
905-C9010E-8H-6	103	4	5	1		80		2		4					4	minor	Lithic volcanic ash
905-C9010E-9H-8	70	7	5	5		15	60	2 T							6	major	Lithic volcanic ash
905-C9010E-10H-3	29		10 T			40	30	10 T		5	T				5	minor	Vitric volcanic ash with rock fragments
905-C9010E-10H-3	70	55	3 T			7		5		20			5		5	major	Clay with diatoms
905-C9010E-10H-4	25	40	2			5		15	1	30	1		1		5	major	Diatom clay with nannofossils
905-C9010E-11H-2	40	1	1	15		15	60	1 T		2					5	minor	Lithic volcanic ash
905-C9010E-11H-3	53	10	1	2 T		30	30	8	3	10 T			1		5	minor	Vitric-lithic volanic ash
905-C9010E-11H-4	109	15	2			5	1	2		5				60	10	minor	(Wood fragment)
905-C9010E-11H-5	50	35	5			12		15		27 T			1		5	major	Diatom clay with nannofossils
905-C9010E-11H-7	23	7	2 T			70	15	1		2					3	minor	Vitric volcanic ash
905-C9010E-12H-3	80	2 T		10 T		20	60								8	minor	Lithic volcanic ash
905-C9010E-17H-2	70	2	2	10 T		35	40 T		5				1		5	minor	Vitric-lithic volcanic ash
905-C9010E-18H-1	65	55	4	2		8		7		15			1		8	major	Clay with diatoms
905-C9010E-18H-3	62	40	7	2		8		12 T		25			1		5	major	Diatom clay with nannofossils
905-C9010E-18H-5	20	45	7	1		9		7 T		25			1		5	major	Diatom clay
905-C9010E-19H-3	85	15	2			5	1	2		5				60	10	minor	(Wood fragment)
905-C9010E-21H-5	30	50	7	1		8	1	3		20			2		8	major	Clay with diatoms
905-C9010E-23H-8	20	15	7	1		65		2		2		T			8	minor	Vitric volcanic ash
905-C9010E-24X-1	55	18	2	7		25	40 T								8	minor	Lithic volcanic ash
905-C9010E-24X-2	97	40	4	1		10		20	1	10	2		4		8	major	Clay with nannofossils
905-C9010E-24X-4	55	45	2	1		8		20	1	15	1		2		5	major	Clay with diatoms and nannofossils
905-C9010E-25X-1	20	2	1	3	1	40	40	5							8	minor	Vitric-lithic volcanic ash
905-C9010E-25X-1	36	5	2	1		50	20	15			1		1		5	minor	Vitric volcanic ash
905-C9010E-25X-1	120	45	5	1		10		20		10	1	1	2		5	major	Clay with nannofossils
905-C9010E-25X-2	67	8	1	2 T		35	15	18	7	3	1		4		6	minor	Vitric volcanic ash with nannofossils
905-C9010E-29X-CC	3	5	1	4 T		20	30	20	8	1	1		5		5	minor	Lithic-vitric ash with nannofossils
Hole F																	
905-C9010F-1H-1	125	5	2	1		75	3	10					2		2	minor	Vitric volcanic ash
905-C9010F-8X-1	80	45	2	1		8		10		25	1	1	2		5	major	Diatom clay
905-C9010F-8X-2	77	10	1	1		35	35	8		5					5	minor	Vitric-lithic volcanic ash
905-C9010F-9X-CC	15	15	1	2		30	25	10		10			2		5	minor	Vitric-lithic volcanic ash
905-C9010F-10X-CC	7	20	1			75		2							2	minor	Vitric volcanic ash
905-C9010F-11X-2	20	15	4	2	1	70		3	2			T			3	minor	Vitric volcanic ash
905-C9010F-11X-2	30	40	5	1		8		15		25			1		5	major	Diatom clay with nannofossils
905-C9010F-12H-2	25	10	7	8		70		1					1		3	minor	Vitric volcanic ash
905-C9010F-12H-2	90	45	5	3		10		15	1	15			1		5	major	Clay with diatoms and nannofossils
905-C9010F-29X-1	50	40	5	1		5		30	3	8	1	2	2		3	major	Nannofossil clay
905-C9010F-29X-1	60	40	5	1		3		35	1	7	1		3		4	major	Nannofossil clay
905-C9010F-30X-2	5	55	5	1		8	10	8		2			3		8	major	Clay
905-C9010F-31X-1	60	50	7	1 T				35 T	T				2		5	major	Nannofossil clay
905-C9010F-31X-CC	25	40	5	4		10	2	30		1	1		2		5	major	Nannofossil clay
Hole G																	
905-C9010G-1H-1	50	60	5					20	1	10			4			major	Clay with nannofossils
905-C9010G-1H-1	118		2	6		60			2						30	minor	Vitric volcanic ash
905-C9010G-1H-1	128		3	4		93										minor	Vitric volcanic ash
905-C9010G-1H-2	56	65	10	1				22	1 T						1	major	Clay with nannofossil
905-C9010G-1H-4	68	49	2			1		29	1	15			1		2	major	Nannofossil clay with diatoms
905-C9010G-2H-1	23	58	5	1		8		15 T		9			1		3	major	Clay with nannofossils
905-C9010G-2H-2	26	65	5	3		7		8		6			1		5	major	Clay
905-C9010G-2H-2	50	65	5	2		8		9		6	T		2		3	major	Clay
905-C9010G-4H-2	60	65	5	2		6		8 T		10 T			1		3	major	Clay with diatoms
905-C9010G-4H-3	50		22			70		3 T	T			T			5	minor	Vitric volcanic ash with quartz
905-C9010G-4H-5	60	65	5	2		6		8 T		9 T			1		4	major	Clay
905-C9010G-5H-2	39	70	3	2		3		10		10					2	major	Clay with nannofossils and diatoms
905-C9010G-5H-3	10	80				5		2 T		3					10	minor	Clay with opaques
905-C9010G-5H-4	107	70	20												10	major	Clay with quartz and opaques
905-C9010G-5H-6	20		2	3		90									5	major	vitric volcanic ash
905-C9010G-5H-8	76		40	35		12	T		1	10					2	minor	Volcanic sand
905-C9010G-6H-1	92	50	3	2				30		10					5	minor	Nannofossil clay with diatoms
905-C9010G-6H-2	7	65						30		5				T		minor	Nannofossil clay
905-C9010G-6H-CC	13	65	4					25		6				T		minior	Nannofossil clay
905-C9010G-12X-1	10	50	5	2		12		25 T		1			1		4	major	Nannofossil clay with volcanic glass
905-C9010G-12X-CC	11	50	5	2		15	4	17	1	1			1		4	major	Clay with nannofossils and volcanic glass
905-C9010G-12X-CC	35	50	5	2		15	3	15	1	2	1		1		5	major	Clay with nannofossils and volcanic glass
905-C9010G-17X-1	35	60	5	2		8	2	15							8	major	Clay with volcanic glass
905-C9010G-17X-2	59	70	5	3		9	3	2							8	major	Clay
905-C9010G-17X-2	134	3	2	1		90		1		T					3	minor	Vitric volcanic ash
905-C9010G-18X-CC	30	40	8	5		25	7	6	T	T			1		8	major	Clay with volcanic glass
905-C9010G-21X-2	46	20	15	15		10		30	1	2			1		5	msjor	Nannofossil-rich clayey silt

Figures

Fig. 2-1: Site location and bathymetry. White open circles indicate holes of Site C9010.



35°00'
34°30'
34°00'
139°30'
140°00'
Tateyama
Izu–Oshima
Toshima
Niijima
hikinejima
Miyakejima
Boso Canyon
So–o Knoll
Awa Canyon
Niijima Canyon
Miyake Canyon
−1000
−2000

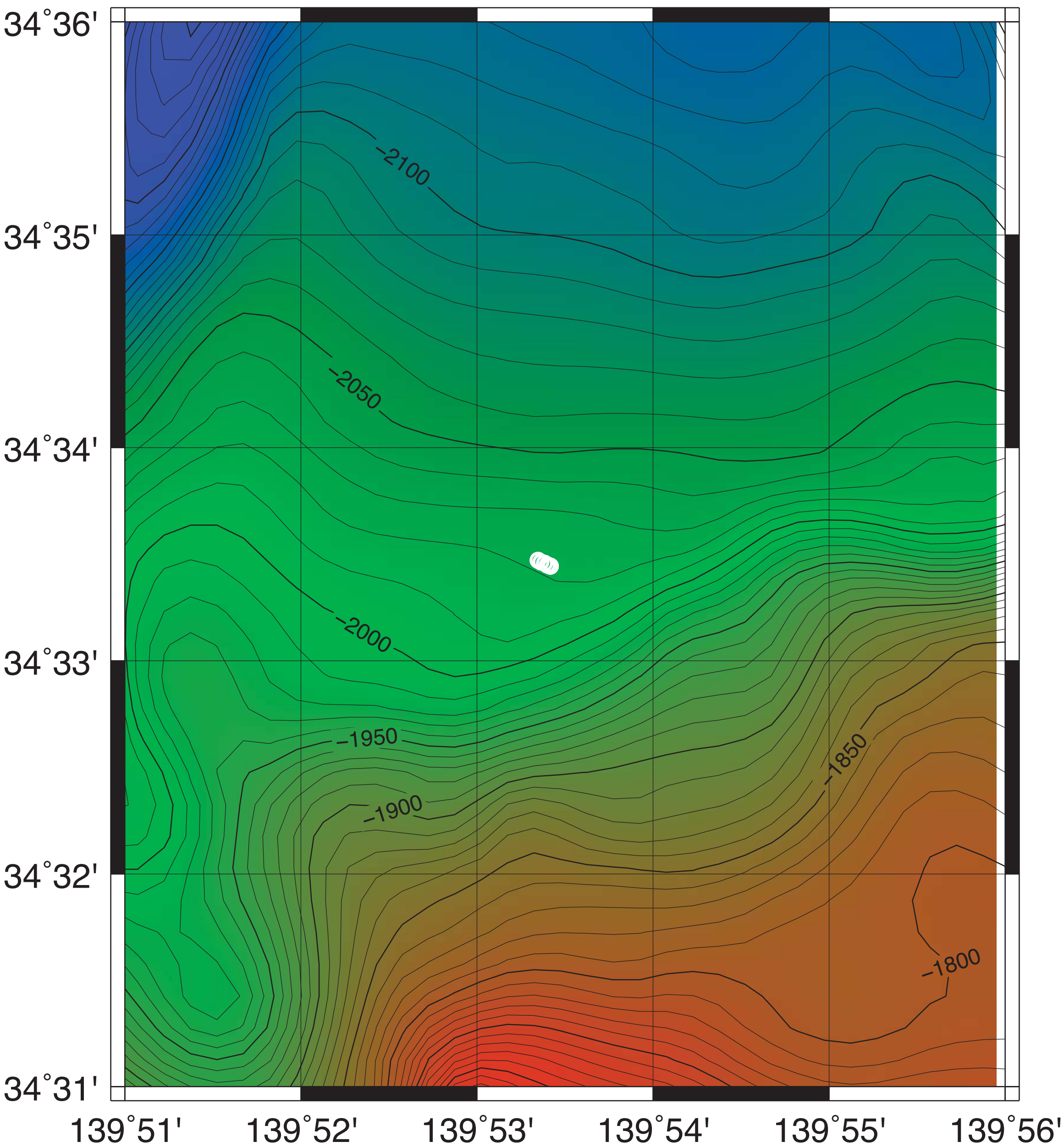
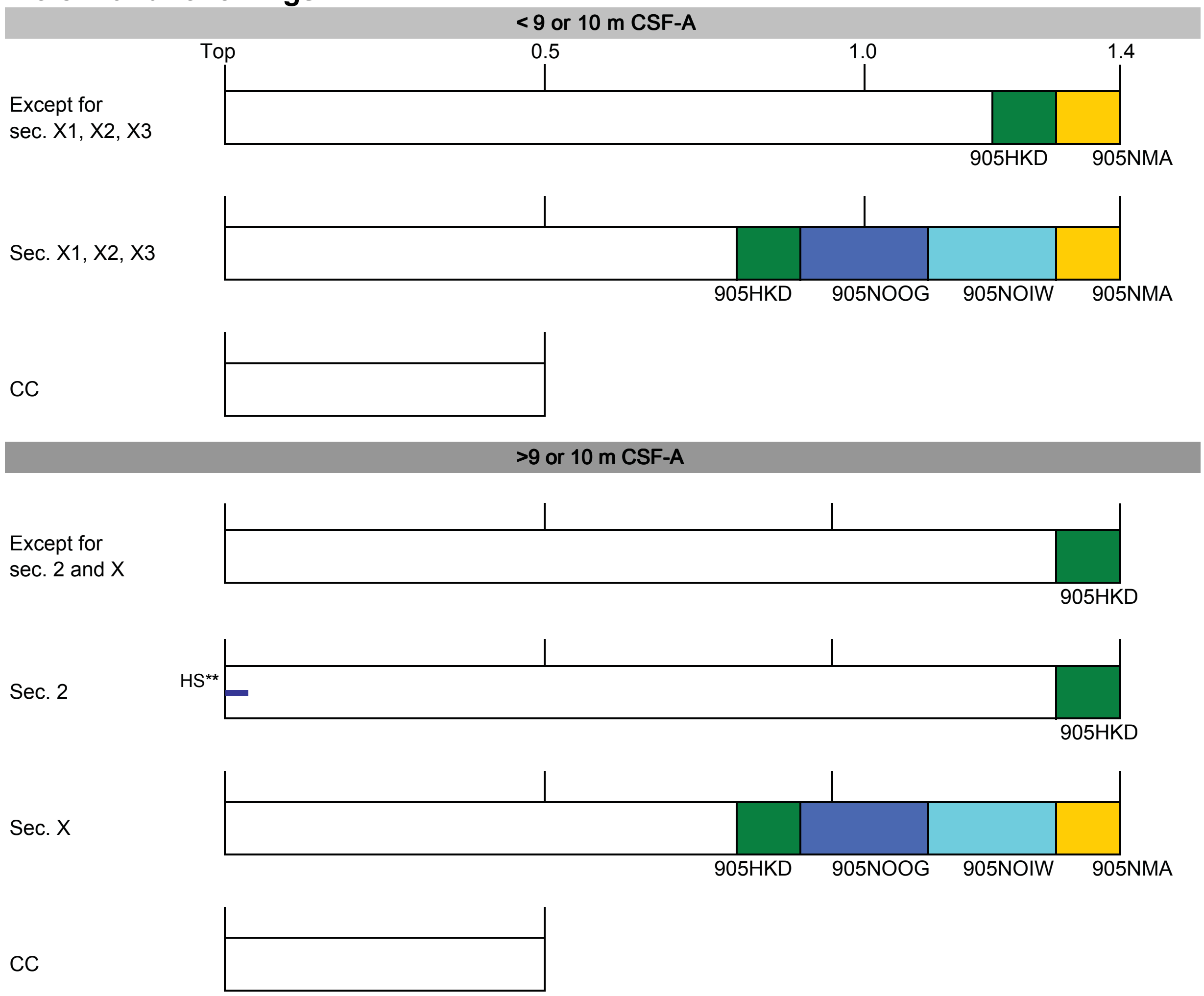

34°36'
34°35'
34°34'
34°33'
34°32'
34°31'
139°51'
139°52'
139°53'
139°54'
139°55'
139°56'
−2100
−2050
−2000
−1950
−1900
−1850
−1800

Fig. 4-1: Visualized sampling plan. Visualized sampling plan showing where to take samples from cores.

Exp.905 Sampling Plan

Hole E and followings



Whole Round Sample

- 905NMA — 10 cm WR sample **after** CT scan
  0 - 10 m CSF-A: 1/section; deeper than 10 m CSF-A: 1/core
- 905NMB — 10 cm WR sample **before** CT scan
  From 1 sample from a section deeper than 10 m CSF-A
- 905HKD — 10 cm WR sample **after** CT scan
  1/section
- 905NOOG — 20 cm WR sample **after** CT scan
  0 - 9 m CSF-A: 3/core; deeper than 9 m CSF-A: 1/core; specific lithology
- 905NOIW — 20 cm WR sample **after** CT scan
  0 - 9 m CSF-A: 3/core; deeper than 9 m CSF-A: 1/core

HS : 4 cm long, 5 cc

**** Take samples from core X from 100-120 m and deeper than 160 m CSF-A**

To change sampling position, ask Curator before doing that.
To take another sample, another Sample Request needs to be approved by Azuma, Director General, CDEX. Contact EPM first.

Fig. 6-1: Core processing flow.

Expedition 905 Core Flow

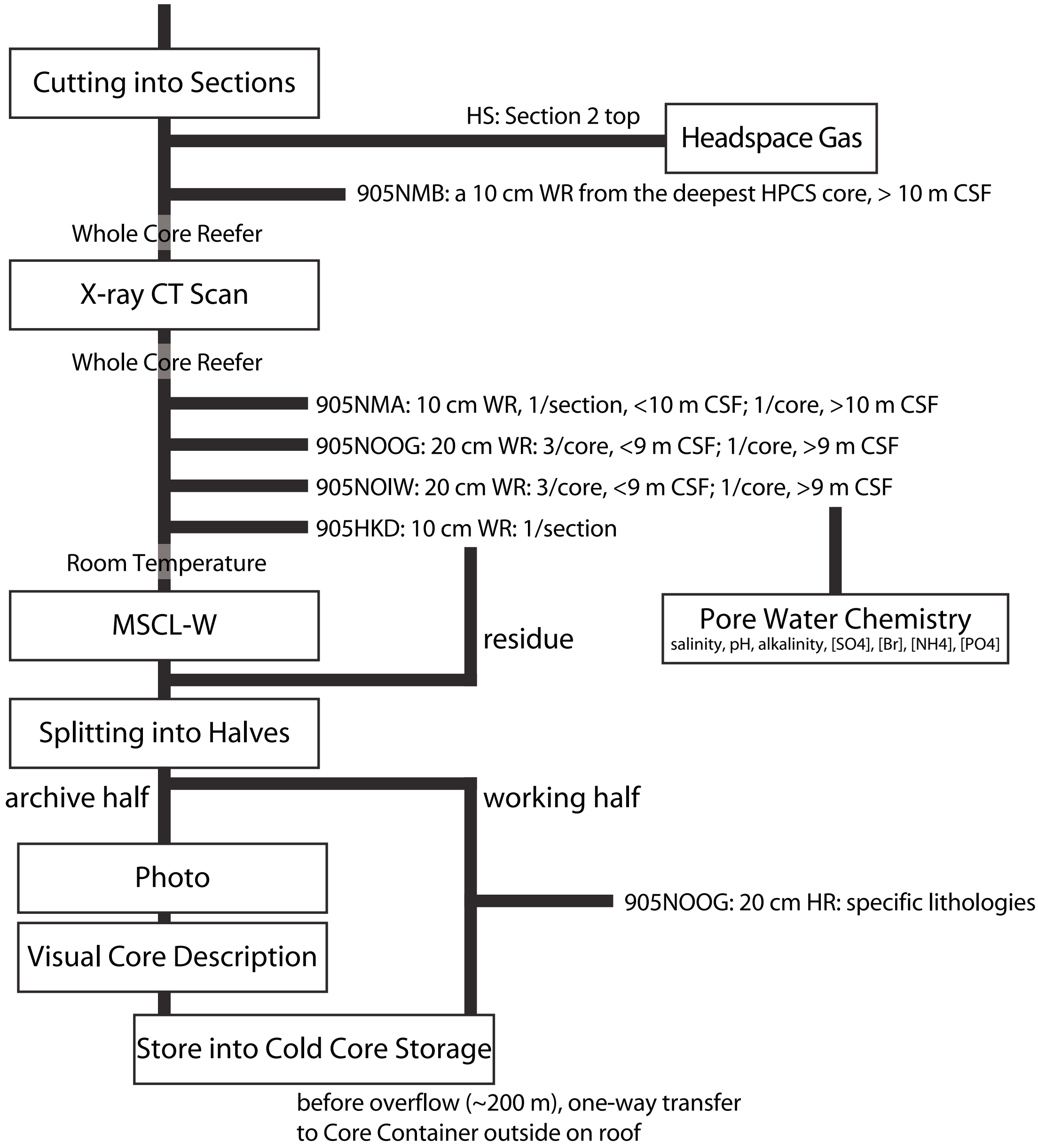
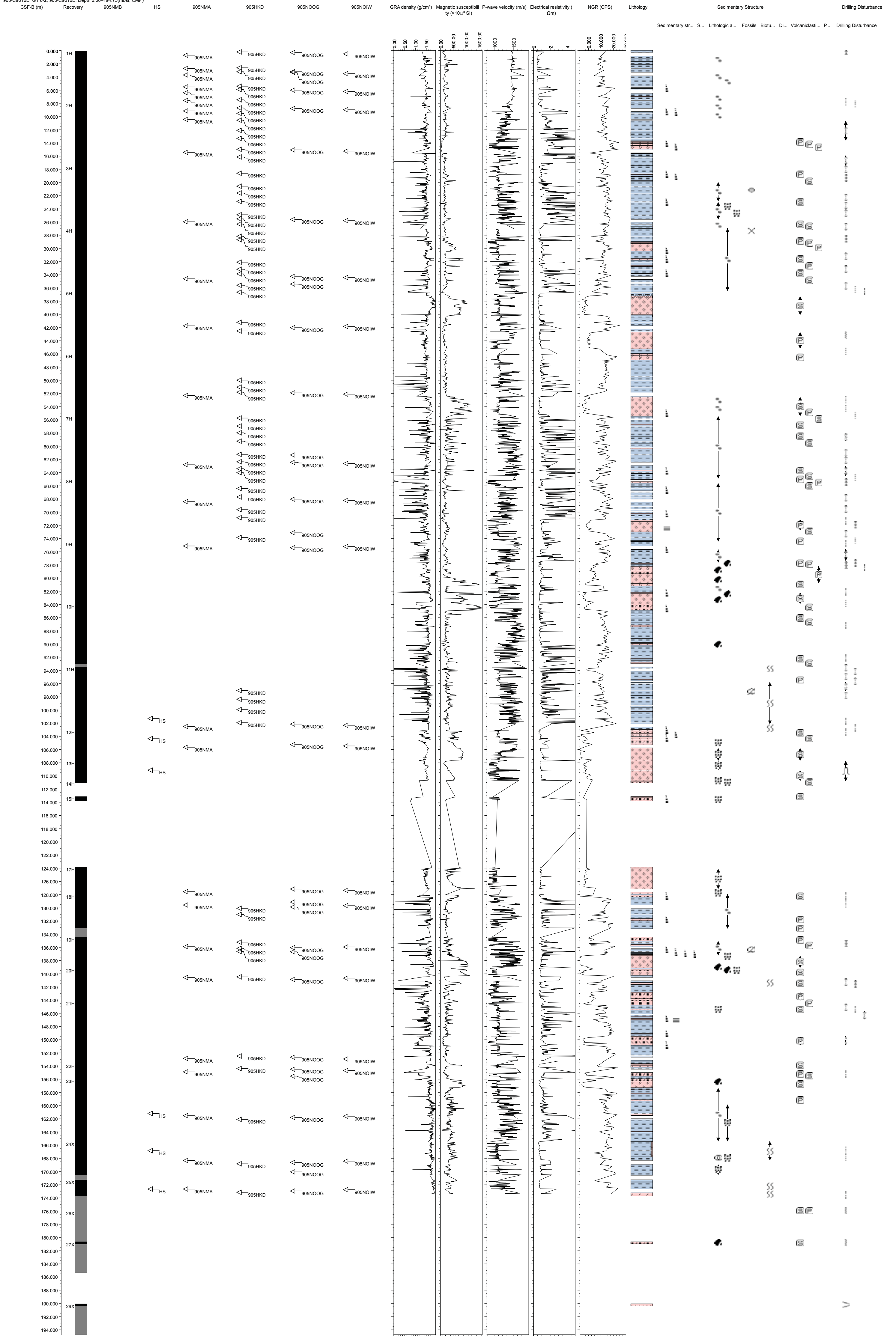
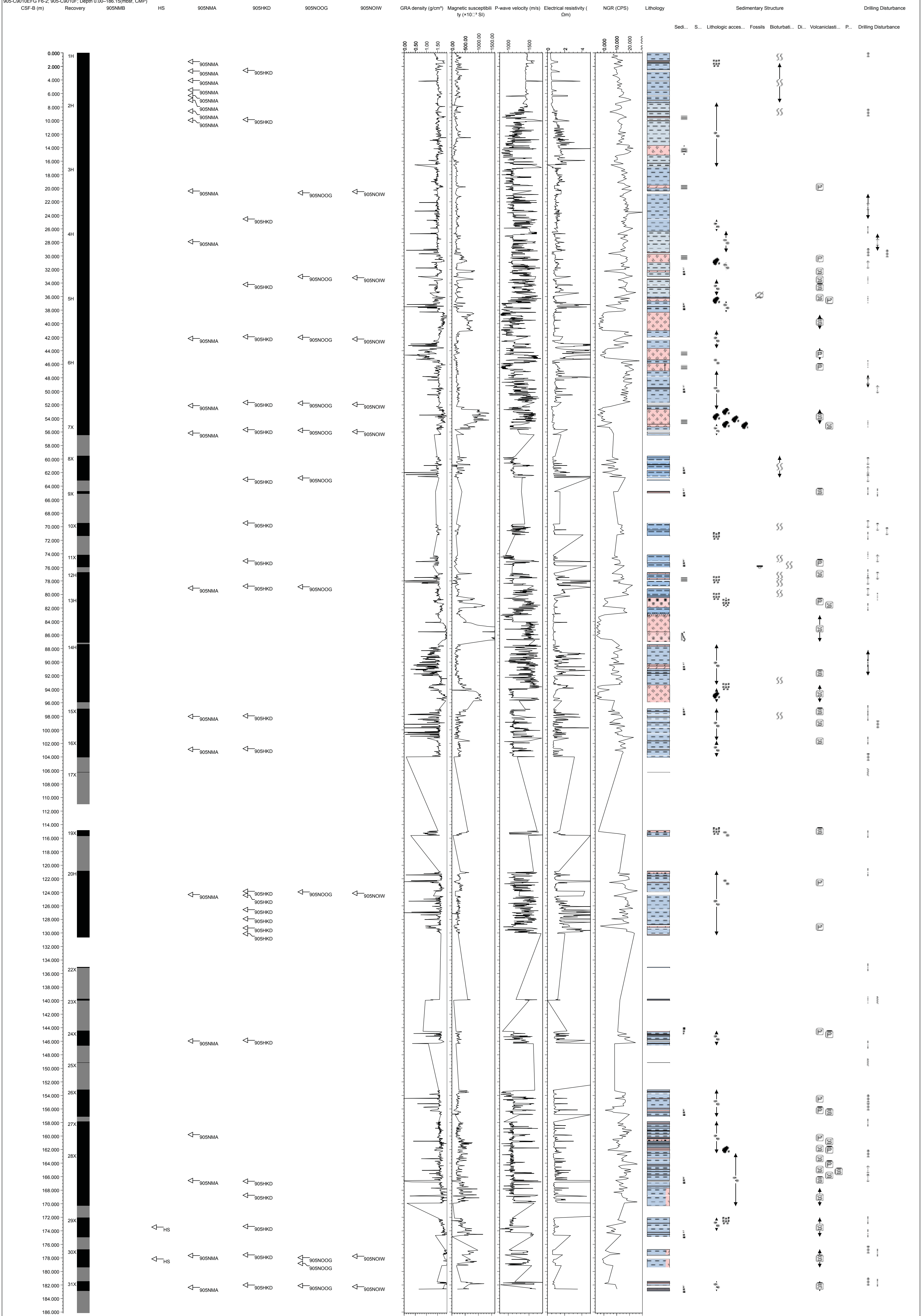


Fig. 6-2: Stratigraphic changes in various parameters at Holes 905-C9010E, F and G: Core recovery, sampling horizons for headspace gas analyses (HS), pore water chemistry and post-expedition researches, gamma ray attenuation density (g/cm^3), magnetic susceptibility ($\times 10^{-3}$ SI), P-wave velocity (m/s), electrical resistivity (Ωm) and natural gamma radiation (CPS) measured by using a Multi Sensor Core Logger (MSCL), lithology, sedimentary structures and drilling disturbances observed in split core section halves.

905-C9010EFG F6-2; 905-C9010E; Depth 0.00–194.75(mbsf, CMP)



905-C9010EFG F6-2; 905-C9010F; Depth 0.00–186.15(mbsf, CMP)



905-C9010EFG F6-2; 905-C9010G; Depth 0.00–238.86(mbsf, CMP)

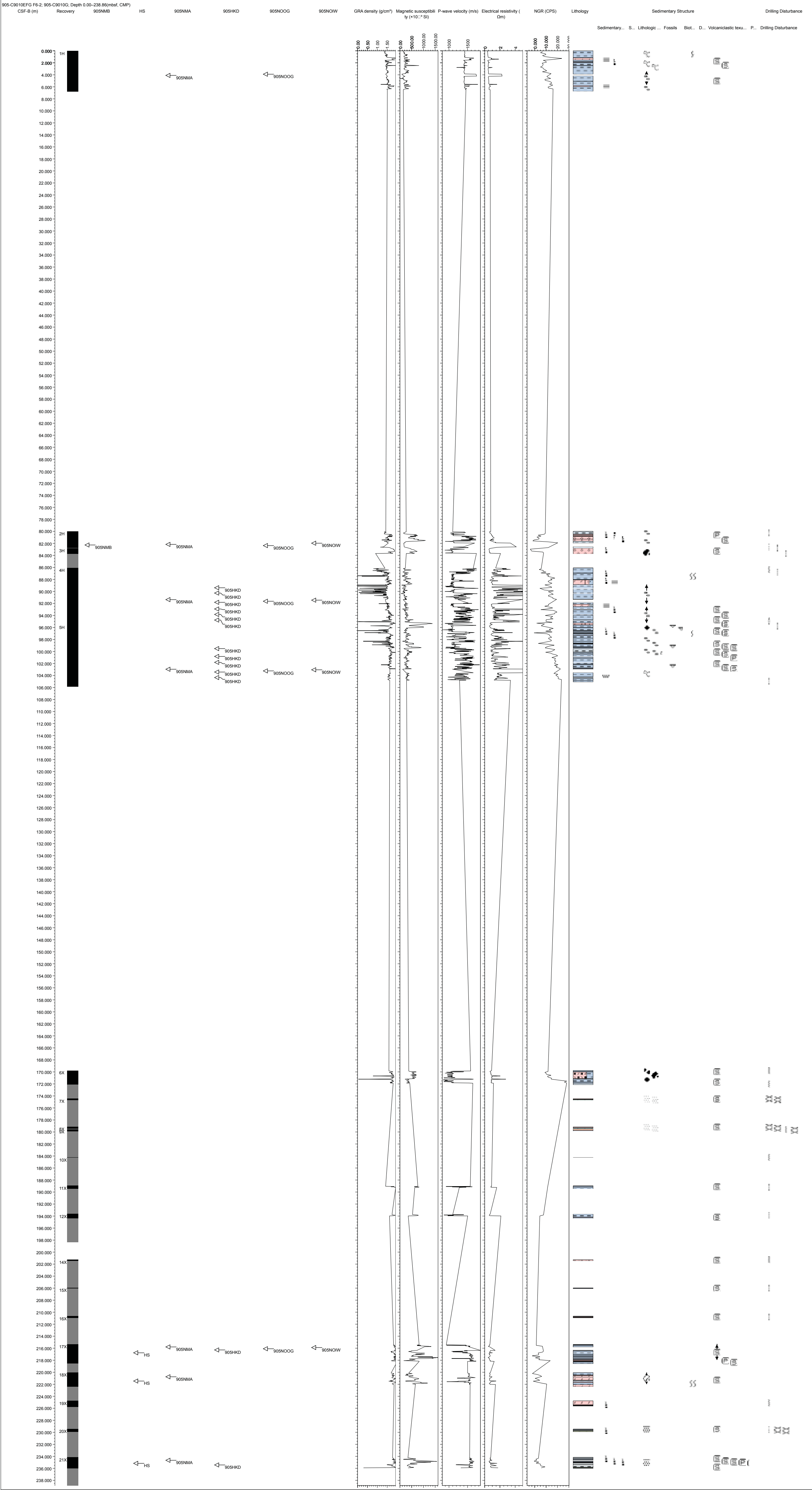


Fig. 6-1-1: Stratigraphic change in methane concentration (ppm) in headspace gases at Holes 905-C9010E, F and G. The same parameter at 904-C9010A, B, C and D is also shown (Expedition 904 Shipboard Science Party, 2009).

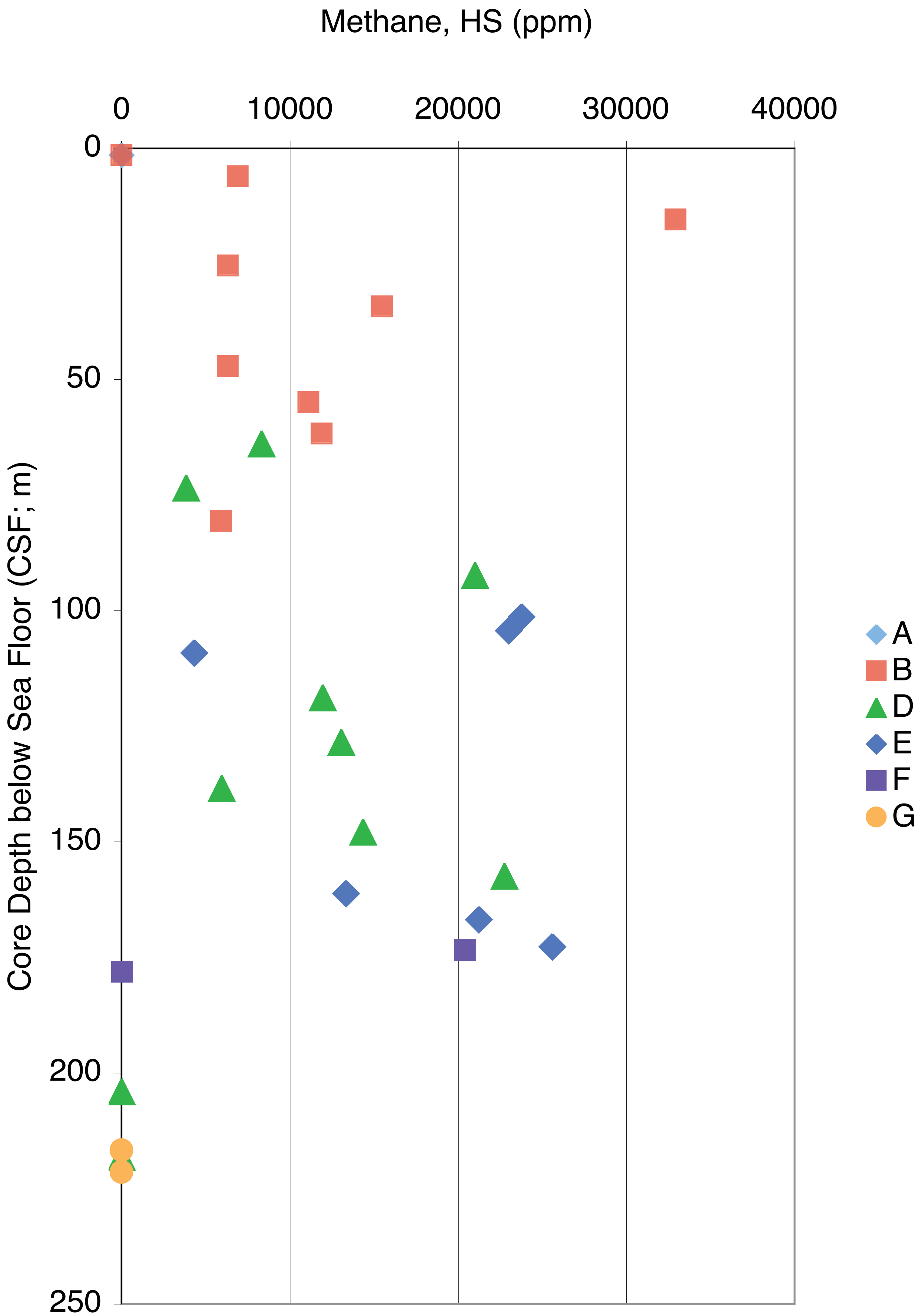
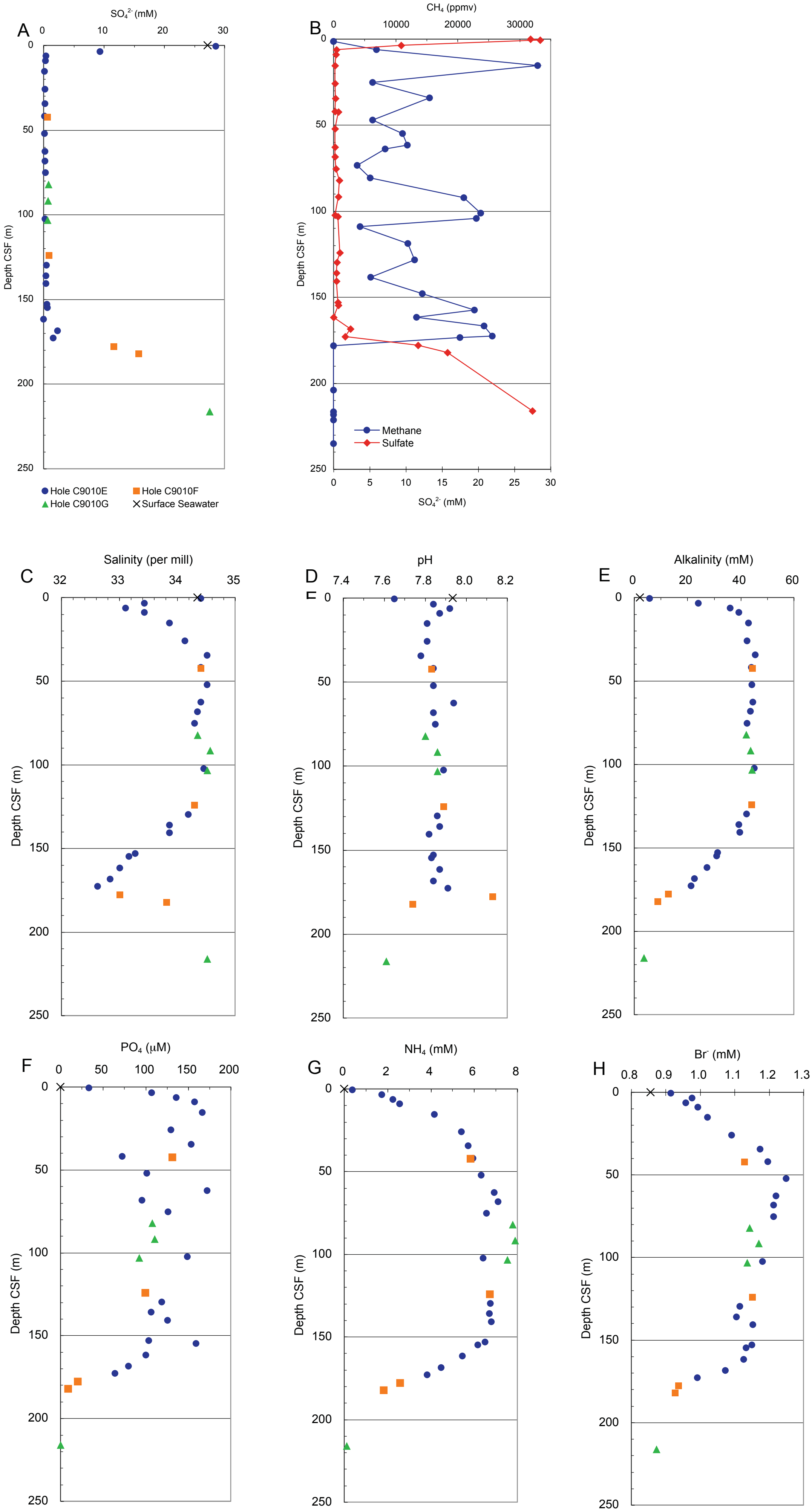
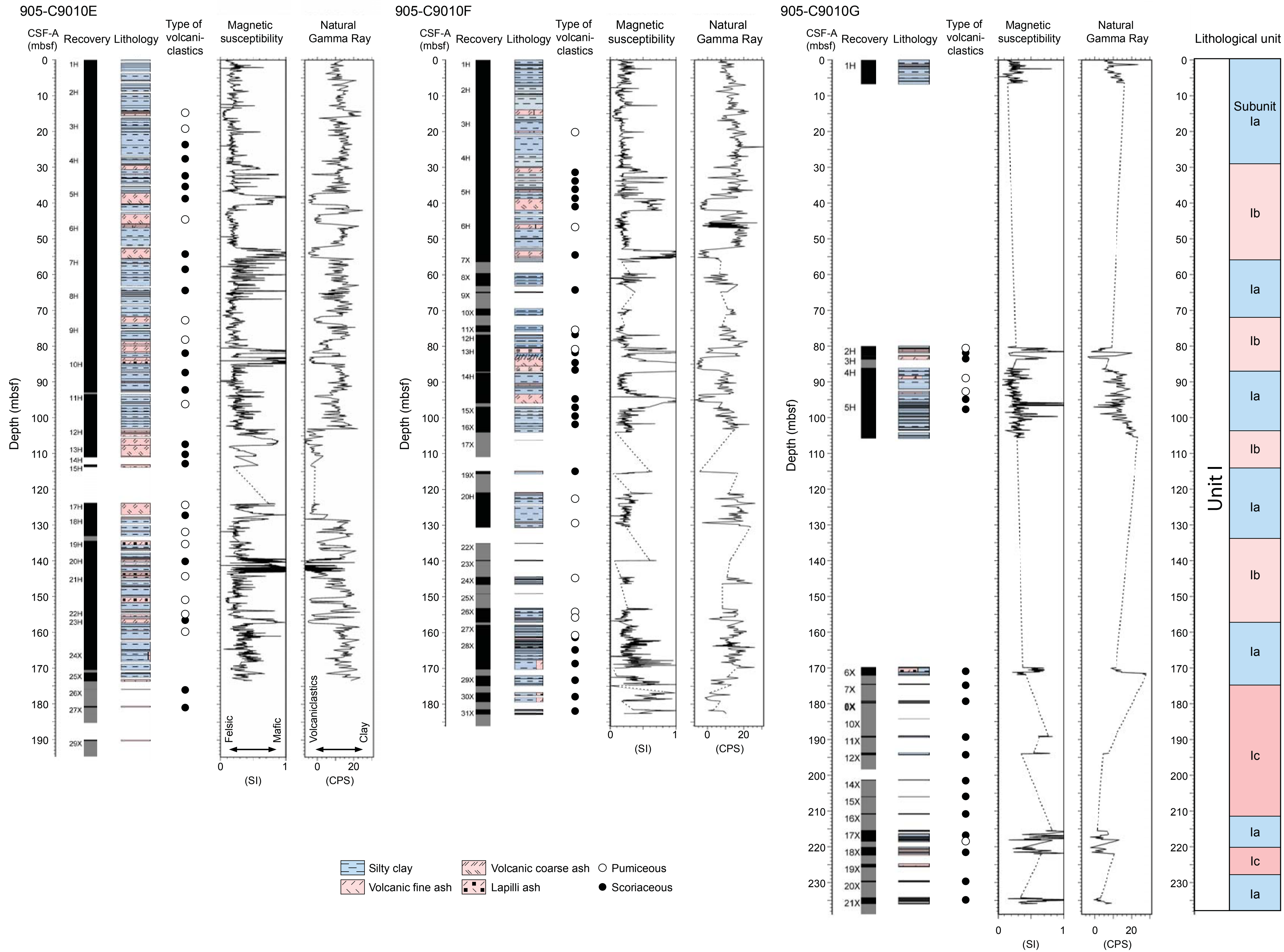

Methane, HS (ppm)
0
10000
20000
30000
40000
Core Depth below Sea Floor (CSF; m)
0
50
100
150
200
250
A
B
D
E
F
G

Fig. 6-3-2-1: (A) Concentrations of sulfate, (C) salinity, (D) pH, (E) alkalinity, concentrations of (F) phosphate, (G) ammonium, and (H) bromide in interstitial water samples. (B) Sulfate concentration in interstitial water samples and methane concentration from safety gas monitoring. CSF = core depth below seafloor.



A
SO_4^{2-} (mM)
0
10
20
30
Depth CSF (m)
0
50
100
150
200
250
Hole C9010E
Hole C9010F
Hole C9010G
Surface Seawater
B
CH_4 (ppmv)
0
10000
20000
30000
Depth CSF (m)
Methane
Sulfate
0
5
10
15
20
25
30
SO_4^{2-} (mM)
C
Salinity (per mill)
32
33
34
35
Depth CSF (m)
D
pH
7.4
7.6
7.8
8.0
8.2
Depth CSF (m)
E
Alkalinity (mM)
0
20
40
60
Depth CSF (m)
F
PO_4 (μM)
0
50
100
150
200
Depth CSF (m)
G
NH_4 (mM)
0
2
4
6
8
Depth CSF (m)
H
Br^- (mM)
0.8
0.9
1.0
1.1
1.2
1.3
Depth CSF (m)

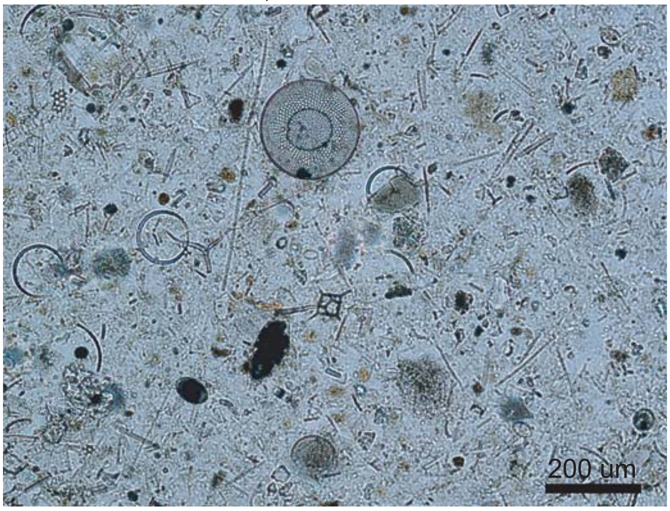
Fig. 6-5-5-1: Recovery, lithology, type of volcaniclastic sediment, magnetic susceptibility and natural gamma ray intensity for Holes E, F and G, and lithological unit distribution.



905-C9010E
905-C9010F
905-C9010G
CSF-A (mbsf)
Recovery
Lithology
Type of volcaniclastics
Magnetic susceptibility
Natural Gamma Ray
Lithological unit
Depth (mbsf)
(SI)
(CPS)
Felsic
Mafic
Volcaniclastics
Clay
Subunit Ia
Ib
Ia
Ic
Unit I
Silty clay
Volcanic fine ash
Volcanic coarse ash
Lapilli ash
Pumiceous
Scoriaceous

Fig. 6-5-5-2: Photomicrographs of smear slides. a: diatom clay, 905-C9010E-1H-2, 80 cm, b: light gray burrow wall, 905-C9010E-4H-7, 108 cm, c: vitric volcanic ash with rock fragments, Gl: volcanic glass, Fo: foraminifer, Fs: feldspar.

905-C9010E-1H-2, 80 cm **a**



905-C9010E-4H-7, 108 cm **b**

905-C9010E-10H-3, 29 cm **c**

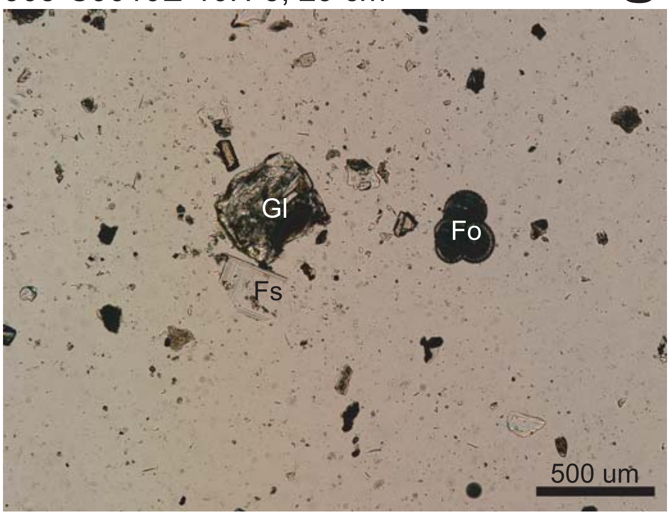
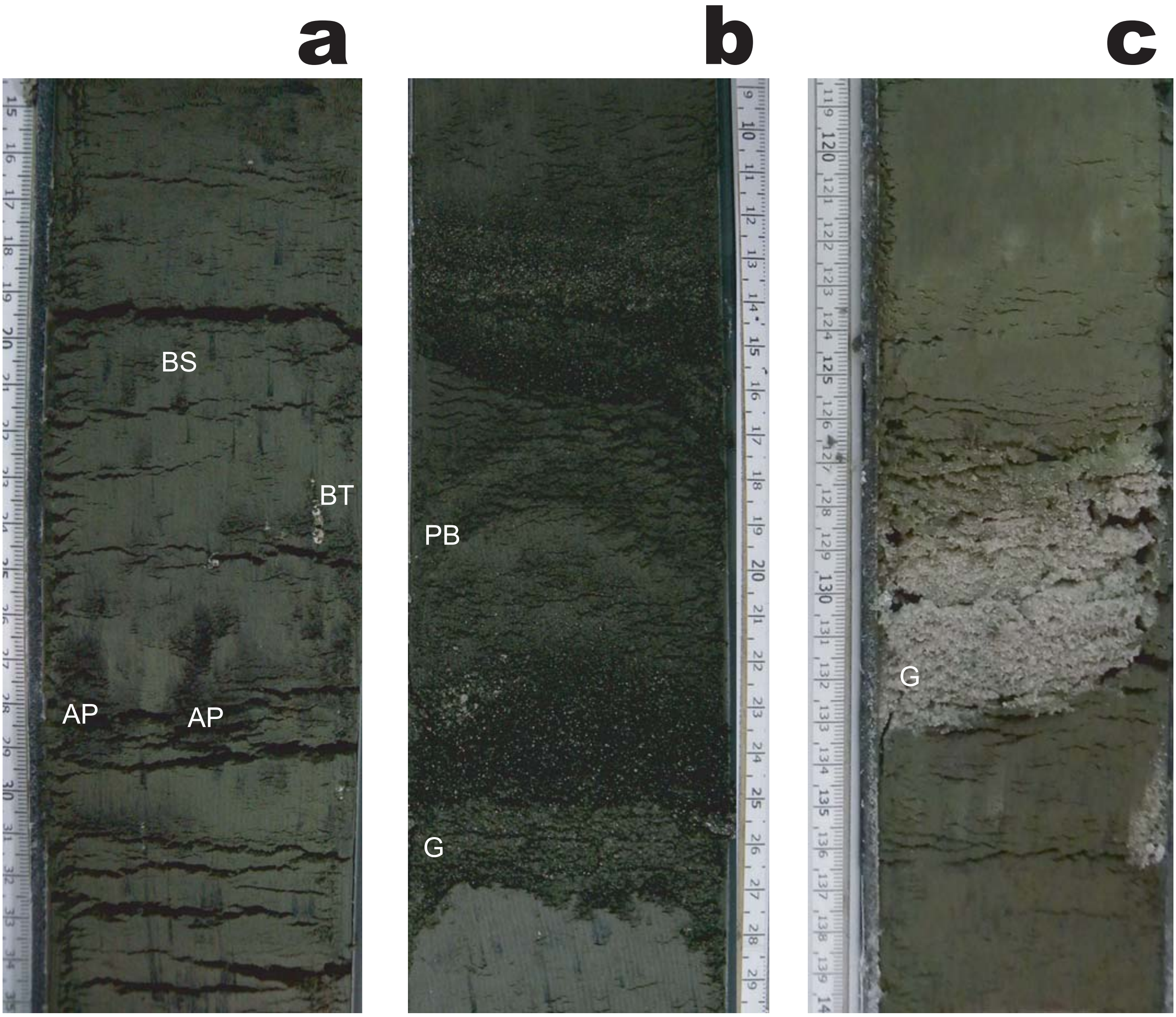
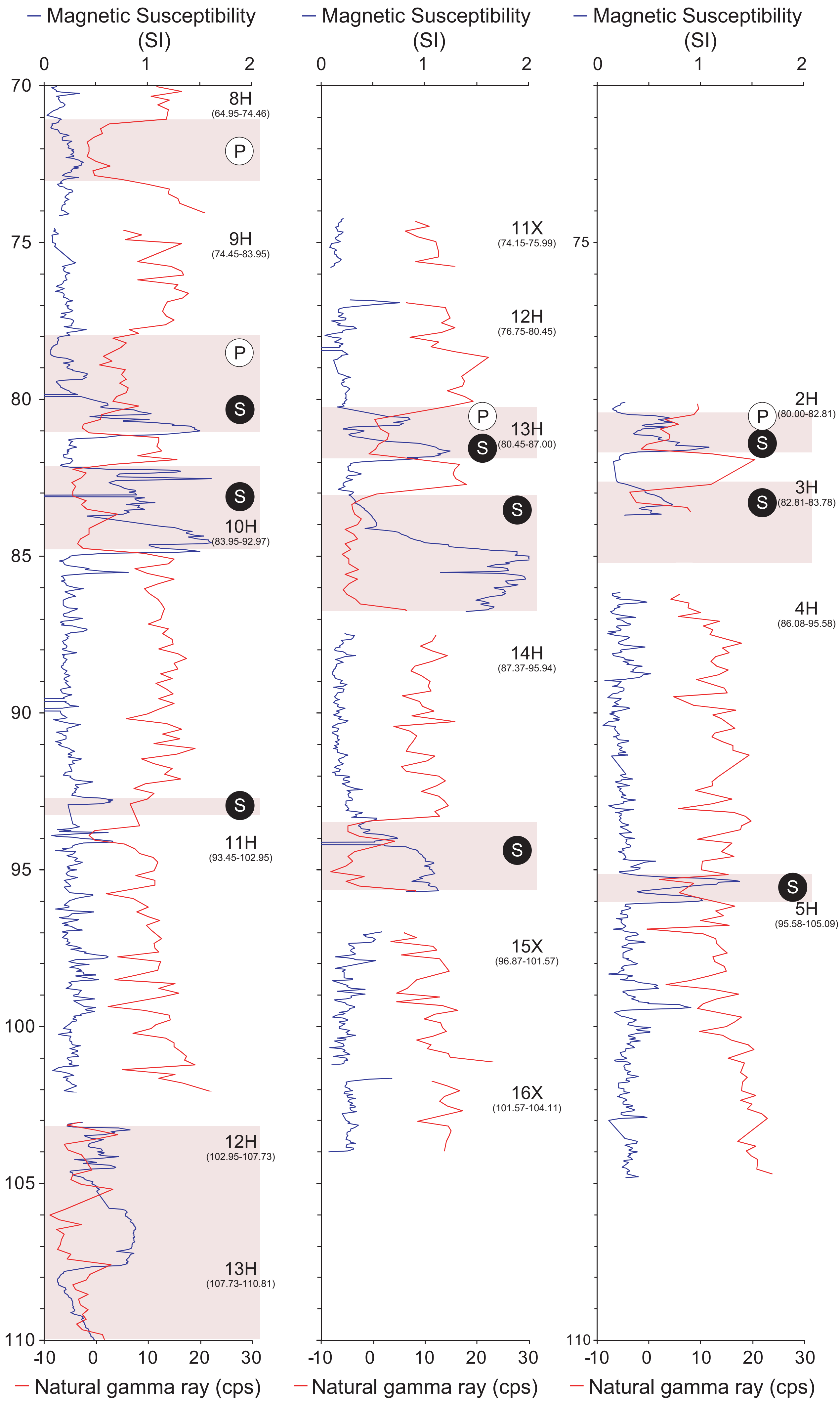


Fig. 6-5-5-3: Core photographs. a: 905-C9010E-7H-7, 15-35 cm, b: 905-C9010E-7H-2, 9-29 cm, c: 905-C9010E-8H-5, 119-139 cm. BS: black spots (pyrite micrograins), BT: light gray burrow tube, AP: ash patch, G: grading, PB: parallel bedding.



905-C9010E-7H-7 905-C9010E-7H-2 905-C9010E-8H-5

Fig. 6-5-7-1: Correlation of magnetic susceptibility (blue) and natural gamma ray intensity (red) in the stratigraphic interval between 70 and 110 m CSF-B, for Holes E, F and G. Shaded intervals indicate volcaniclastic sediments. P: pumice-rich (felsic), S: scoria-rich (mafic) volcaniclastic sediments.



Magnetic Susceptibility (SI)
0
1
2
70
75
80
85
90
95
100
105
110
8H
(64.95-74.46)
P
9H
(74.45-83.95)
P
S
S
10H
(83.95-92.97)
S
11H
(93.45-102.95)
12H
(102.95-107.73)
13H
(107.73-110.81)
-10
0
10
20
30
Natural gamma ray (cps)
Magnetic Susceptibility (SI)
11X
(74.15-75.99)
12H
(76.75-80.45)
P
13H
S
(80.45-87.00)
S
14H
(87.37-95.94)
S
15X
(96.87-101.57)
16X
(101.57-104.11)
Natural gamma ray (cps)
Magnetic Susceptibility (SI)
75
2H
P
(80.00-82.81)
S
3H
S
(82.81-83.78)
4H
(86.08-95.58)
S
5H
(95.58-105.09)
110
Natural gamma ray (cps)

Fig. 6-6-1: Plastic syringes with the luer lok end cut off. Top: 30-mL, Middle: 5-mL, Bottom: 1-mL.


2009/12/13

Fig. 6-6-2: A sediment sample immersed in liquid nitrogen.


2009/12/13

Fig. 6-6-3: Tube samples and WRCs as RMS.


2009/12/13

Fig. 6-6-4: Slurry samples for enumeration of microbial cells.


905-C9010F
00001H-01-WR
+130.0//+140.0
905-C9010F
00005H-07-WR
905NMA PF+P
905NMA PF+P
905NMA PF+P
905NMA PF+P
905NMA PF+P
2009/12/13

Fig. 6-6-5: Pellet samples for preservation of RNA.


905-C9010F
00027X-02-WR
905NMA
2009/12/13

Fig. 6-6-6: Slurry samples for preservation of RNA.


JAMSTEC
2009/12/13

Fig. 6-6-7: Sediment samples for evaluation of core quality.


905-C9010F
00027X-02-WR
+131.0//+141.0
905NMA Moro
CHIKYU
905NMA Moro
905NMA Moro
+090.5//+100.5
905NMA Moro
+090.5//+100.5
2009/12/13

Fig. 6-6-8: WRCs under anaerobic condition for evaluation of core quality.


2009/12/13

Fig. 6-6-9: A WRC after subsampling by using the three kinds of syringes.

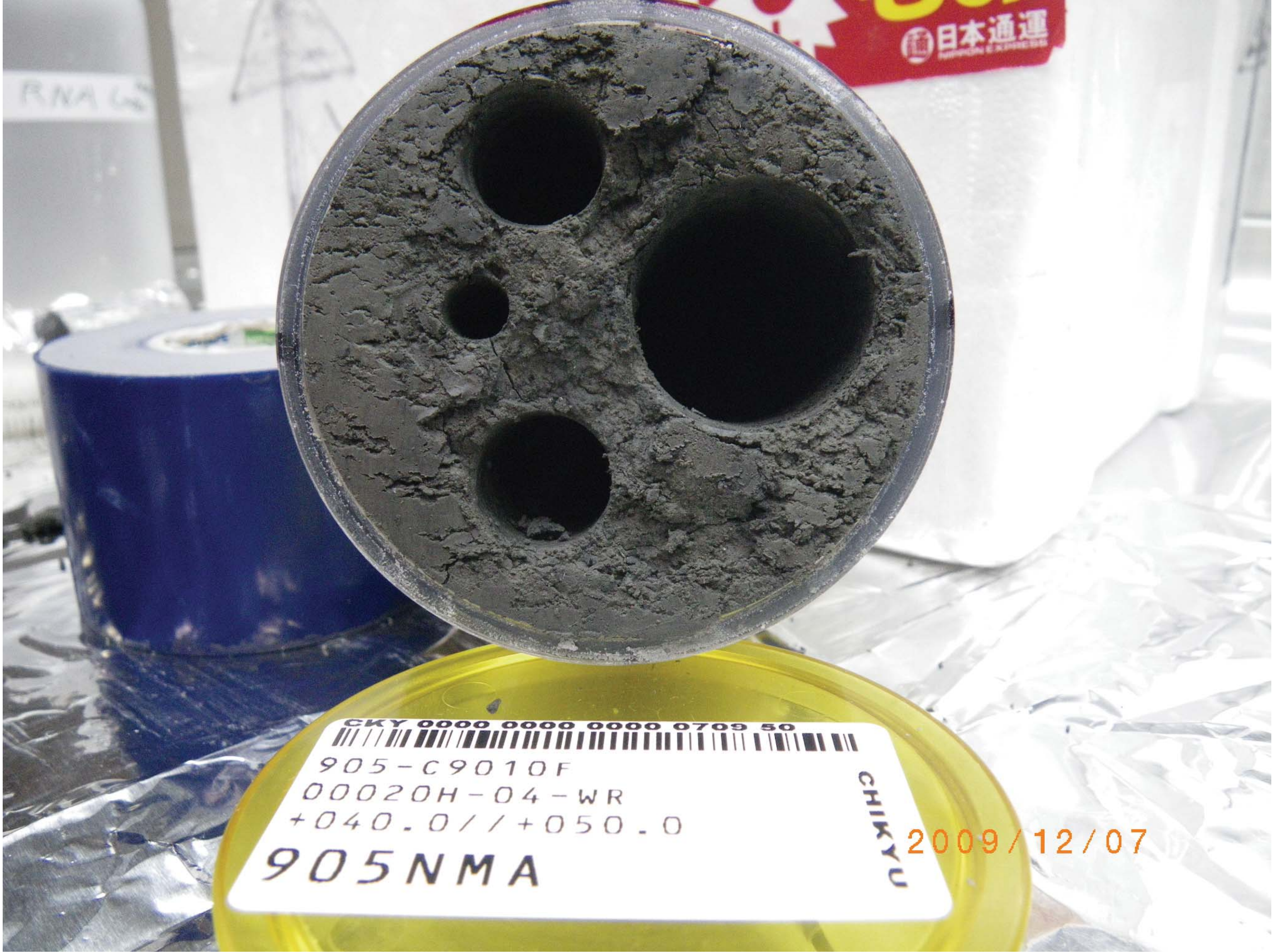

日本通運
NIPPON EXPRESS
CKY 0000 0000 0000 0709 50
905-C9010F
00020H-04-WR
+040.0//+050.0
905NMA
CHIKYU
2009/12/07

Fig. 6-7-1: WR core sampling. WR cores are cut with rotary core cutter (A), WR cores are sliced with EtOH-sterilized spatula (B), and then capped with yellow EtOH-sterilized end-caps (C).

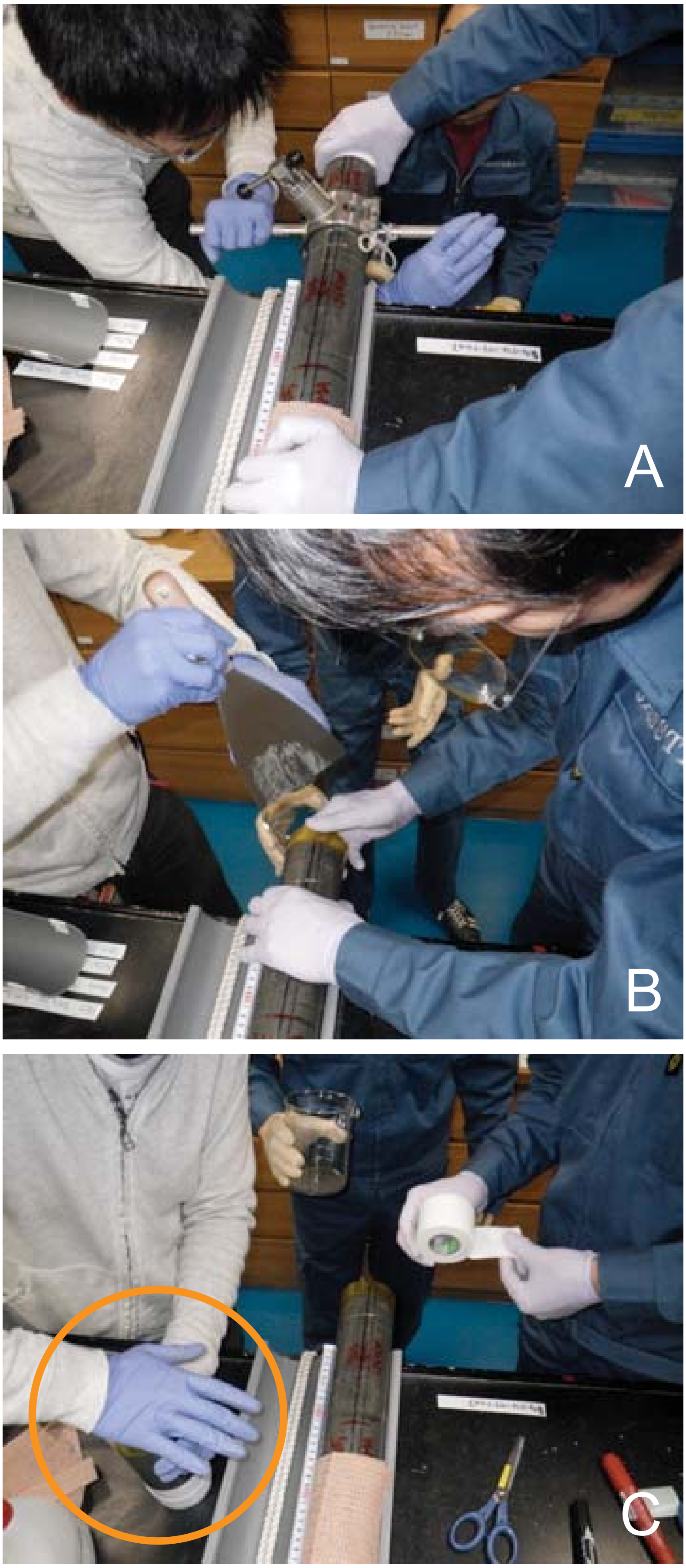


Fig. 6-7-1 WR core sampling. WR cores are cut with rotary core cutter (A), WR cores are sliced with EtOH-sterilized spatula (B), and then capped with yellow EtOH-sterilized end-caps (C).

Fig. 6-7-2: Discrete samples for detrital DNA were collected from WR core. Collected samples are then sliced into two aliquots (1. Upper and 2. Lower) and also took 0.5 ml of sediment from the bottom of each aliquots from discrete samples (3. upper bottom and 4. lower bottom). We retrieved sub-sample for RNA analyses from 1 sample per core. We insert a tip-cut 2.5 ml syringe into the WR core from the top, and then take 0.5 ml of the sample (4).

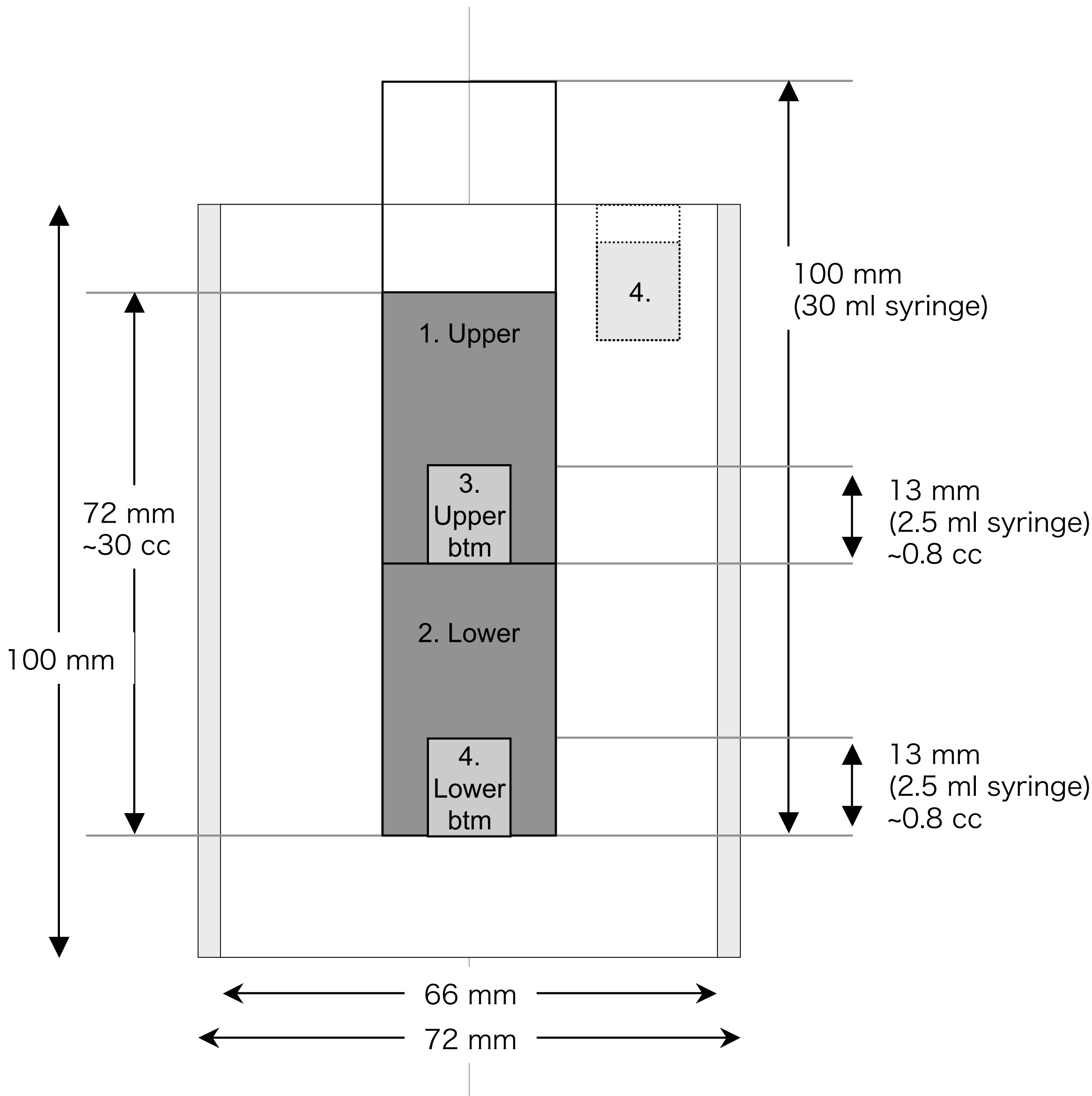


Fig. 6-7-2 Discrete samples for detrital DNA were collected from WR core. Collected samples are then sliced into two aliquots (1. Upper and 2. Lower) and also took 0.5 ml of sediment from the bottom of each aliquots from discrete samples (3. upper bottom and 4. lower bottom). We retrieved sub-sample for RNA analyses from 1 sample per core. We insert a tip-cut 2.5 ml syringe into the WR core from the top, and then take 0.5 ml of the sample (4).

Fig. 6-7-3: We carried out sub-sampling in an aerobic chamber. Insert tip-cut 30 ml syringe into a WR core from the top (A), sub-samples are also taken from syringe sample (B).

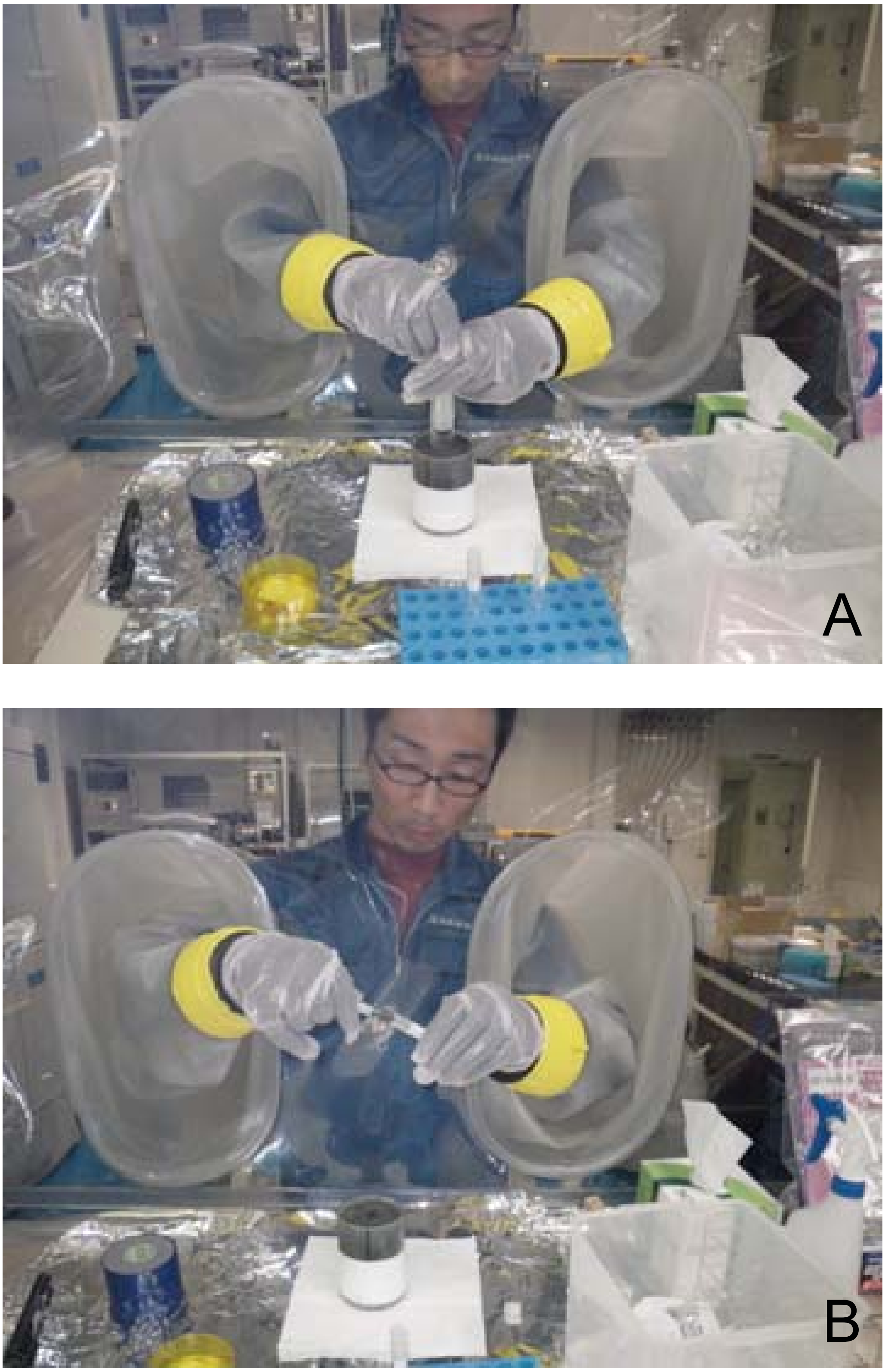
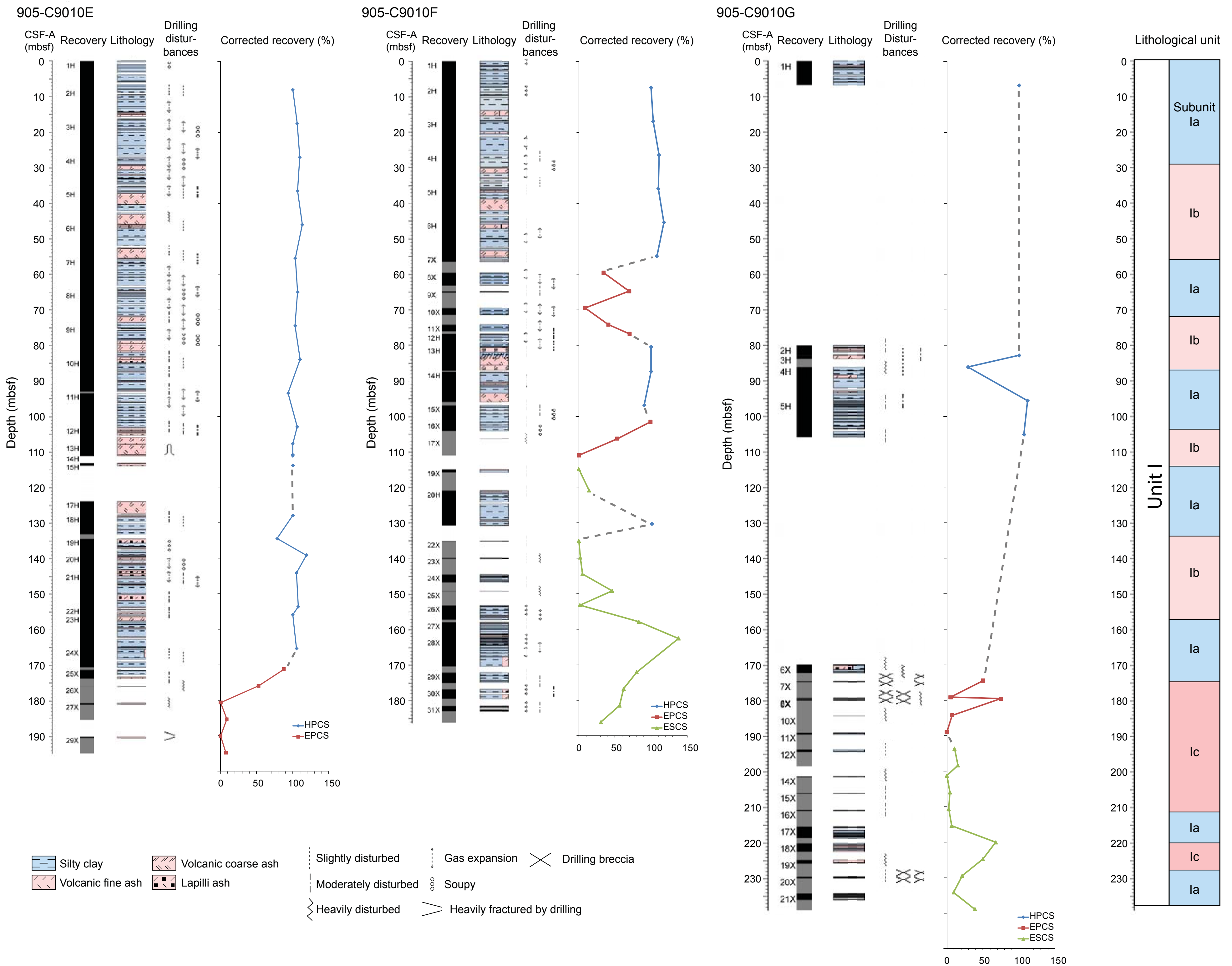


Fig. 6-7-3 We carried out sub-sampling in an aerobic chamber. Insert tip-cut 30 ml syringe into a WR core from the top (A), sub-samples are also taken from syringe sample (B)

Fig. 7-1: Recovery, lithology, drilling disturbances, and corrected recovery for Holes E, F and G. The depth of corrected recovery plot is core bottom depth.



905-C9010E
905-C9010F
905-C9010G
CSF-A (mbsf)
Recovery
Lithology
Drilling disturbances
Corrected recovery (%)
Depth (mbsf)
HPCS
EPCS
ESCS
Lithological unit
Subunit Ia
Ib
Ia
Ic
Unit I
Silty clay
Volcanic fine ash
Volcanic coarse ash
Lapilli ash
Slightly disturbed
Moderately disturbed
Heavily disturbed
Gas expansion
Soupy
Heavily fractured by drilling
Drilling breccia

Fig. 7-2-1: X-ray CT scan image of 905-C9010G-9X-CC (179.560-179.865 m CSF-A, Subunit Ic), illustrating washout of fine sediments and brecciation.

905-C9010G-9X-CC

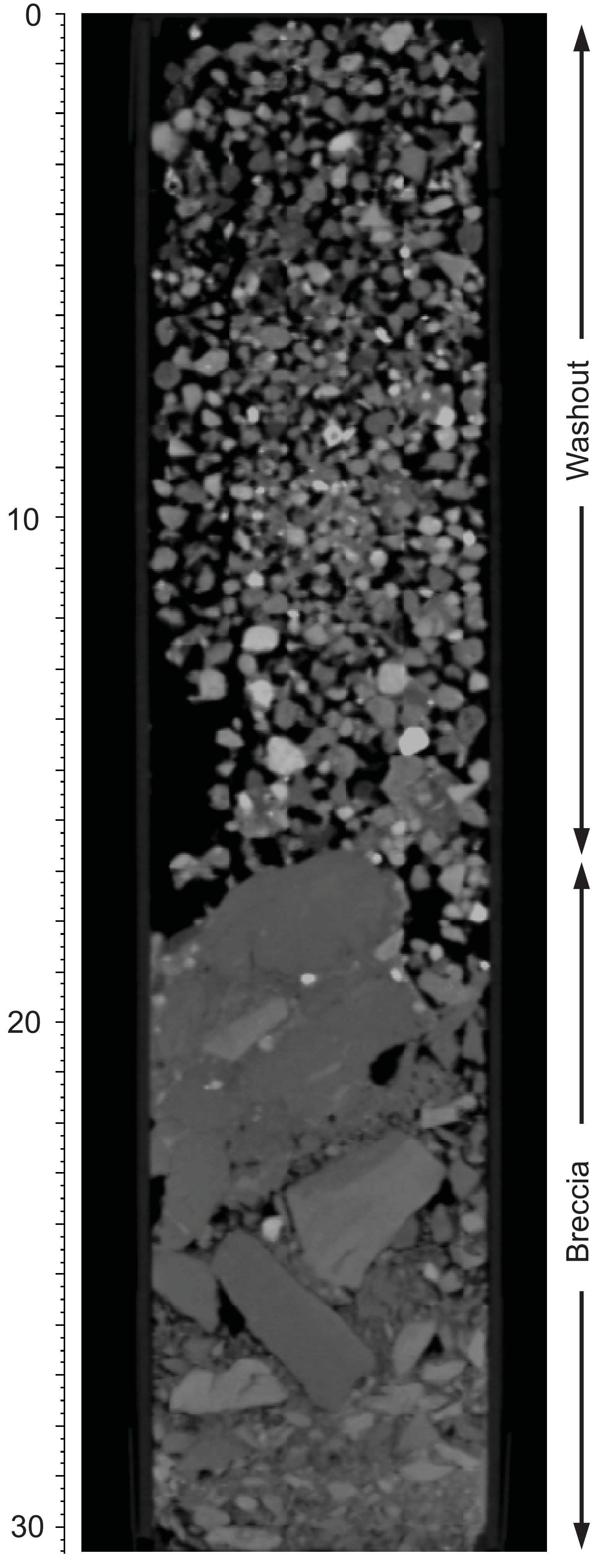
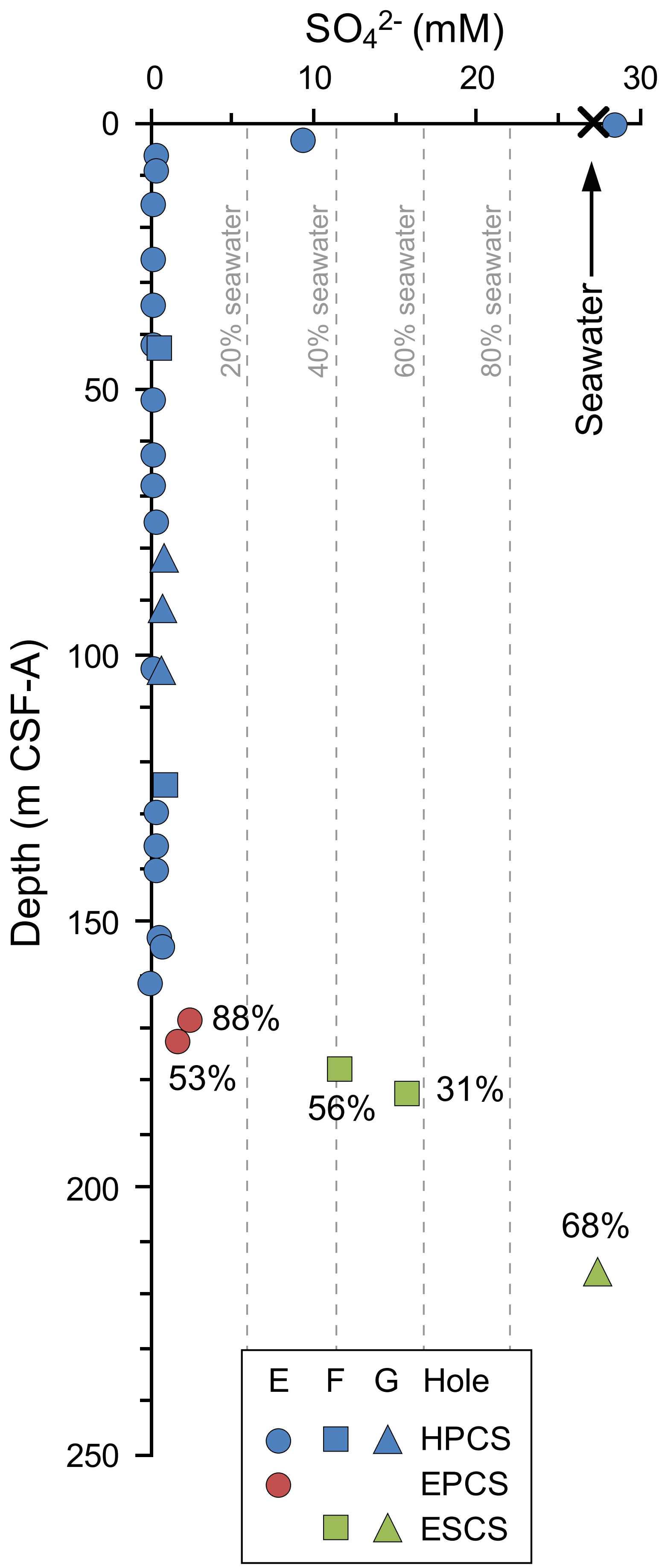


Fig. 7-3-1: Depth profile of sulfate ion concentration in interstitial water samples for Holes E, F and G. circle: Hole E, square: Hole F, triangle: Hole G, cross: seawater mean value (reference). Colours indicate HPCS (cyan), EPCS (magenta) and ESCS (green). Mixing lines of seawater and interstitial water are also shown as broken lines. Recoveries of samples less than 90% are annotated. Samples without annotation have recovery between 90 and 120%.



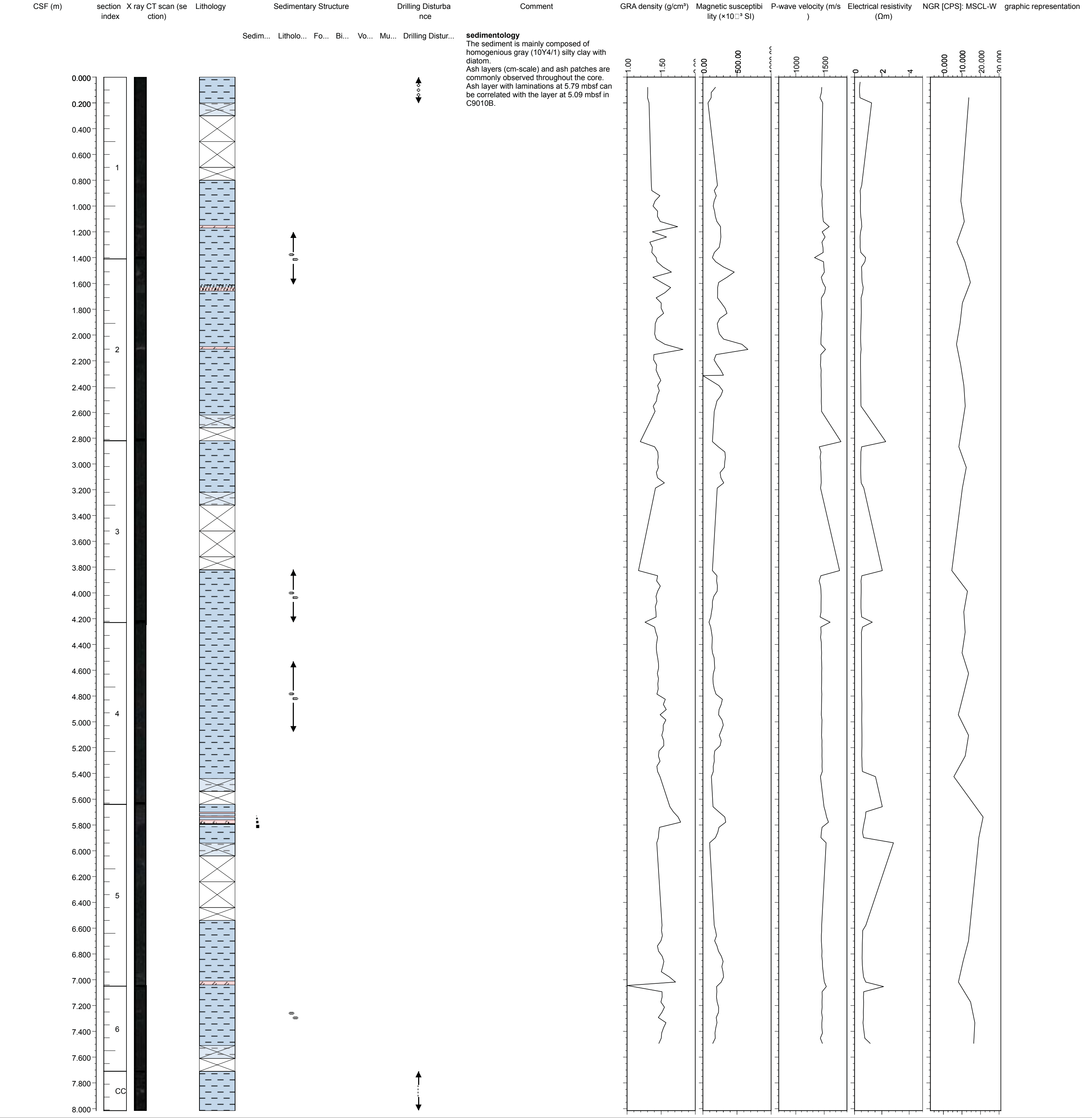
SO_4^{2-} (mM)
0
10
20
30
0
50
100
150
200
250
Depth (m CSF-A)
20% seawater
40% seawater
60% seawater
80% seawater
Seawater
88%
53%
56%
31%
68%
E F G Hole
HPCS
EPCS
ESCS

Appendices

A: Visual core descriptions for each core shown with some physical properties measured by a Multi Sensor Core Logger (MSCL). Re-constructed coronal images of X-ray CT scan were also shown for if measured.

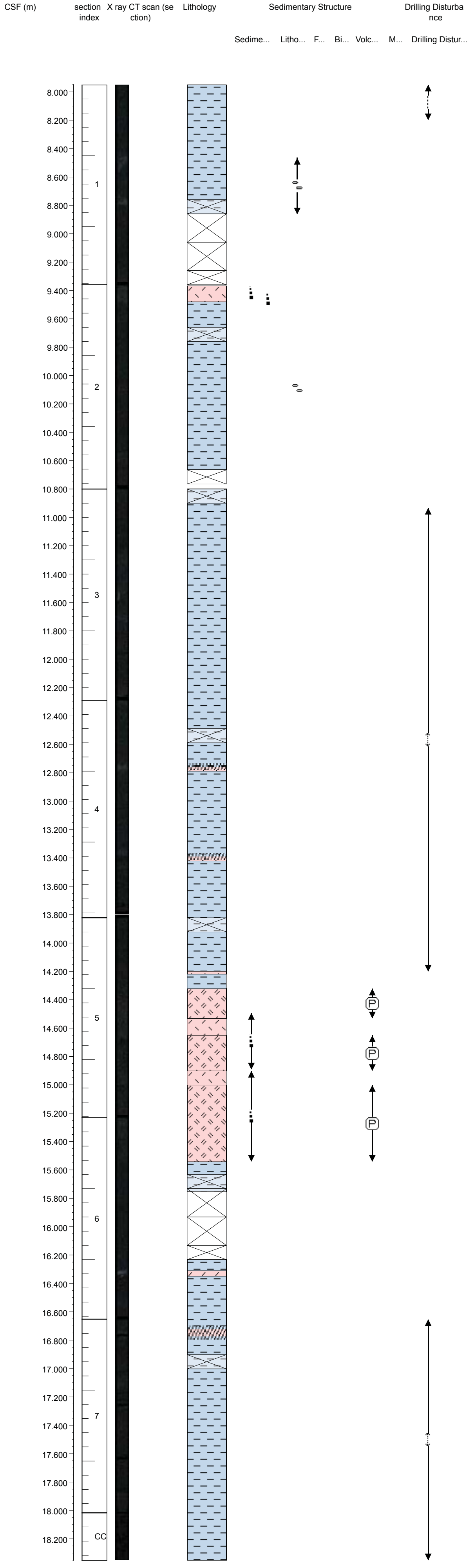
B: Photographs of archive halves of split core sections and close-up photographs of all the recovered grains for poorly recovered cores. In the photographs of archive halves, core tops direct to the right side of photographs. Sections are lined up from the bottom to the top of the photographs. The latest section in each photograph is with its identification label.

905 VCD; 905-C9010E-1H; Depth 0.00–8.02(mbsf)



sedimentology
The sediment is mainly composed of homogenious gray (10Y4/1) silty clay with diatom.
Ash layers (cm-scale) and ash patches are commonly observed throughout the core.
Ash layer with laminations at 5.79 mbsf can be correlated with the layer at 5.09 mbsf in C9010B.

905 VCD; 905-C9010E-2H; Depth 7.95–18.35(mbsf)



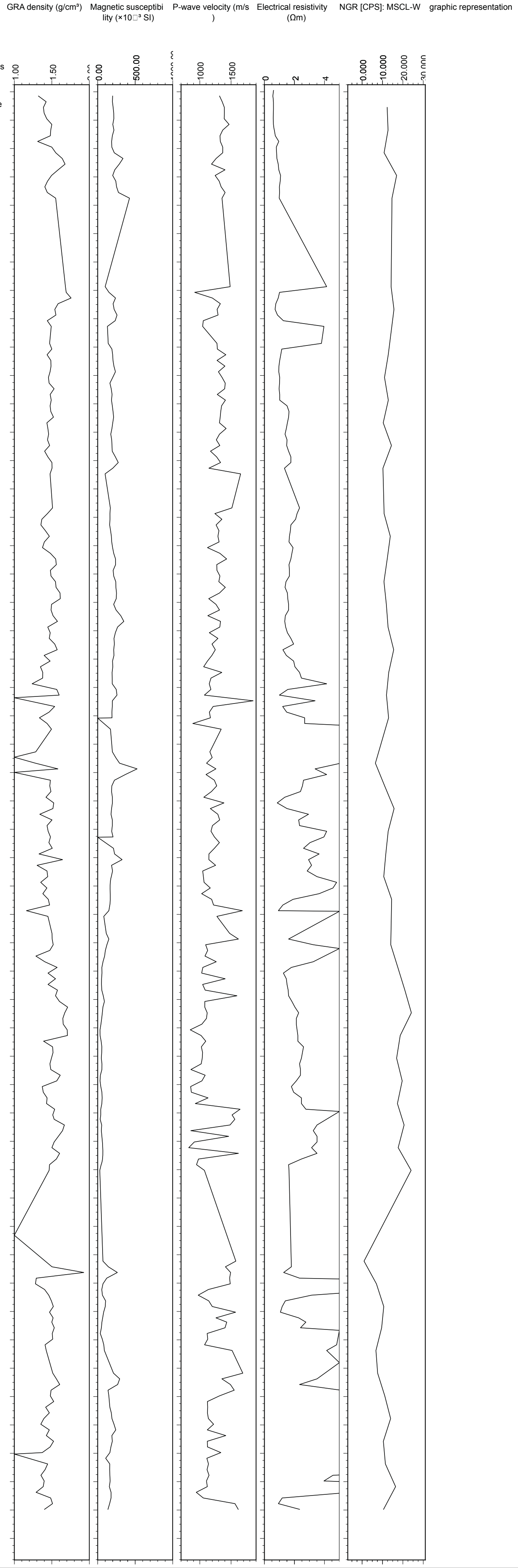
Comment

sedimentology

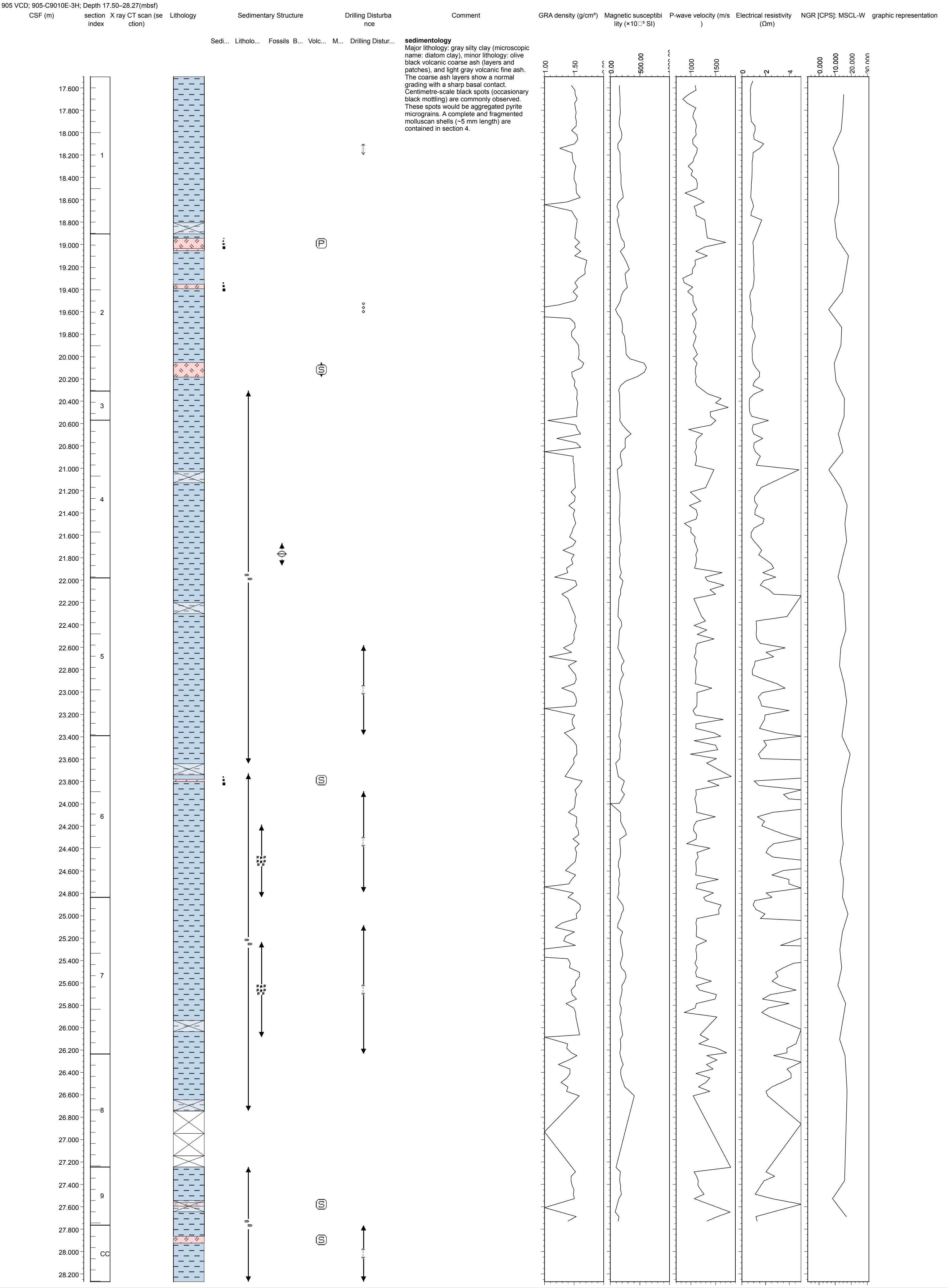
The sediment is mainly composed of gray (10Y 4/1), massive silty clay with diatom. Centimeter-scale ash layers and ash patches (burrow filling) are observed throughout the core.

Alternation of gray (10Y 6/1-5/1), coarse-fine ash layers containing pumice grains are observed in sec.5-6.

Slight disturbance by gas expansion is observed in sec.3-5, 7-cc.



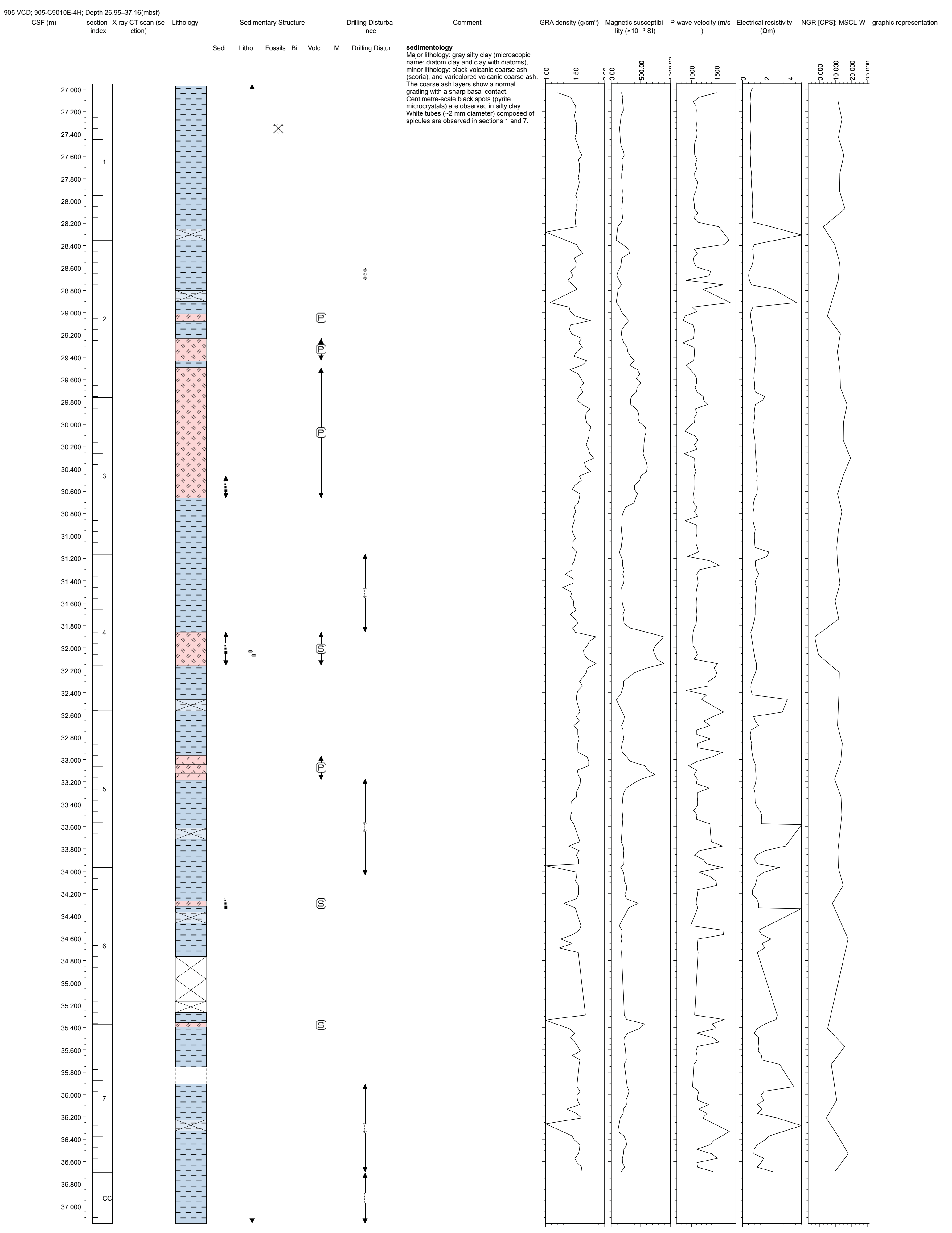
905 VCD; 905-C9010E-3H; Depth 17.50–28.27(mbsf)



sedimentology

Major lithology: gray silty clay (microscopic name: diatom clay), minor lithology: olive black volcanic coarse ash (layers and patches), and light gray volcanic fine ash. The coarse ash layers show a normal grading with a sharp basal contact. Centimetre-scale black spots (occasionary black mottling) are commonly observed. These spots would be aggregated pyrite micrograins. A complete and fragmented molluscan shells (~5 mm length) are contained in section 4.

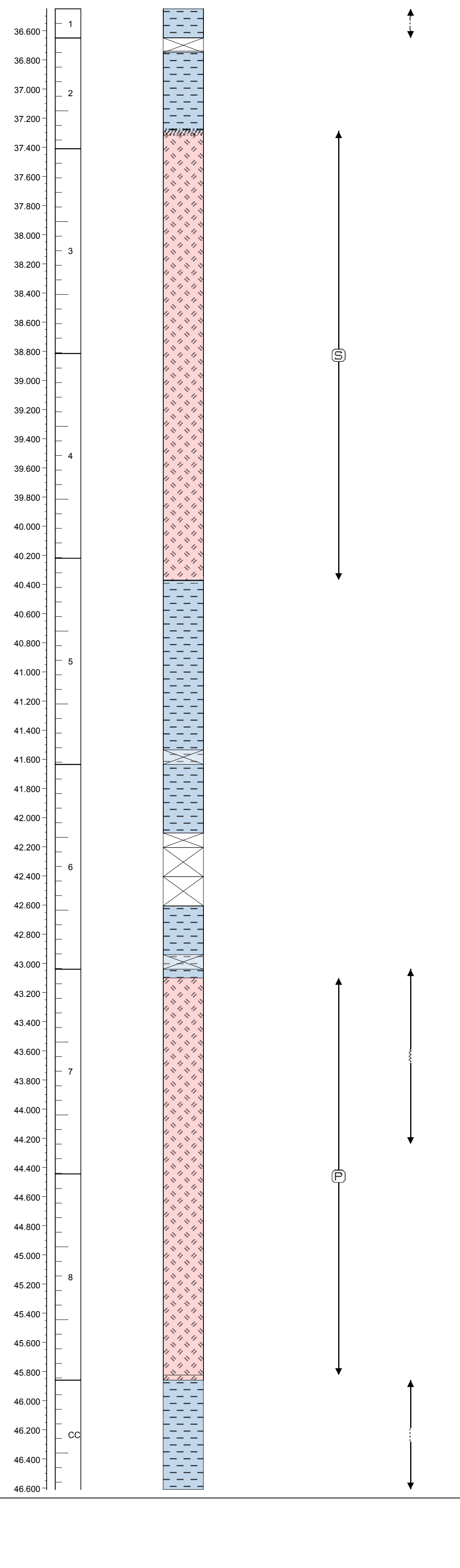
905 VCD; 905-C9010E-4H; Depth 26.95–37.16(mbsf)



905 VCD; 905-C9010E-5H; Depth 36.45–46.61(mbsf)

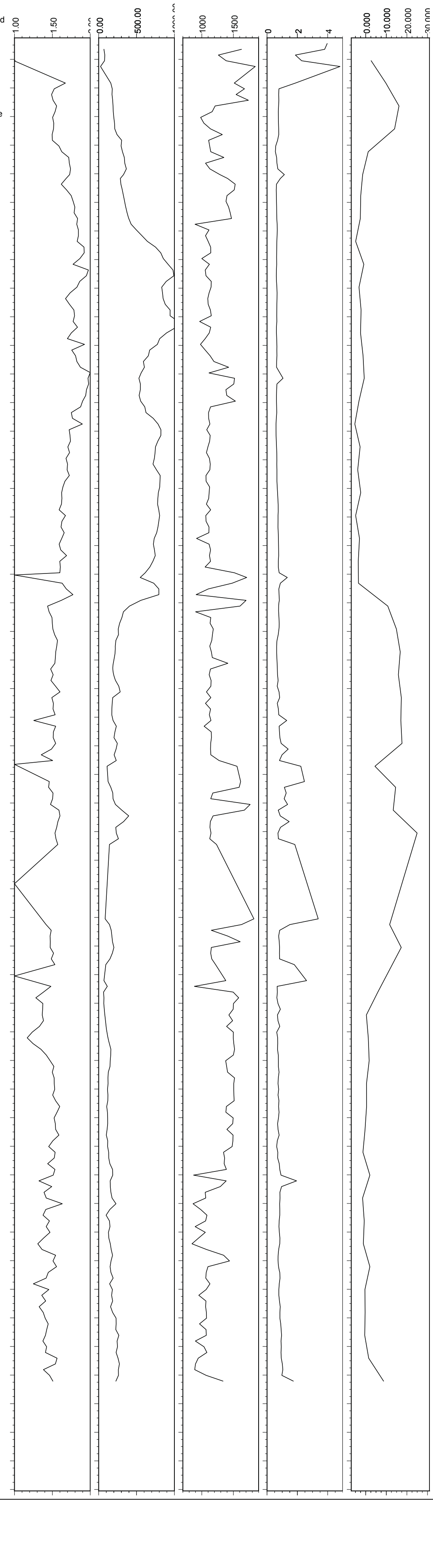
CSF (m)	section index	X ray CT scan (section)	Lithology	Sedimentary Structure	Drilling Disturbance	Comment	GRA density (g/cm³)	Magnetic susceptibility (×10⁻⁸ SI)	P-wave velocity (m/s)	Electrical resistivity (Ωm)	NGR [CPS]: MSCL-W	graphic representation

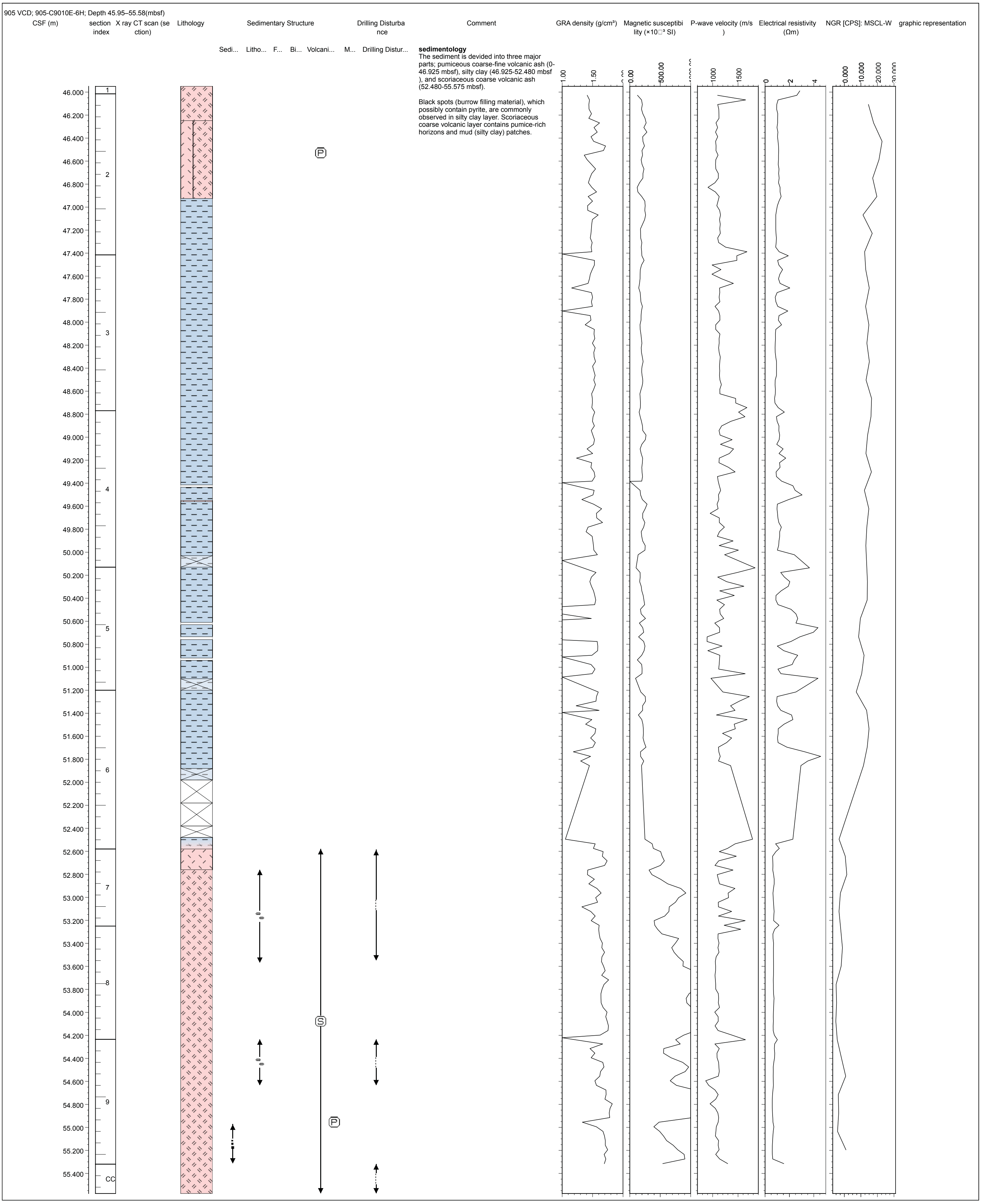
Se... Lith... Fos... Bio... Volcani... Mu... Drilling Distur...



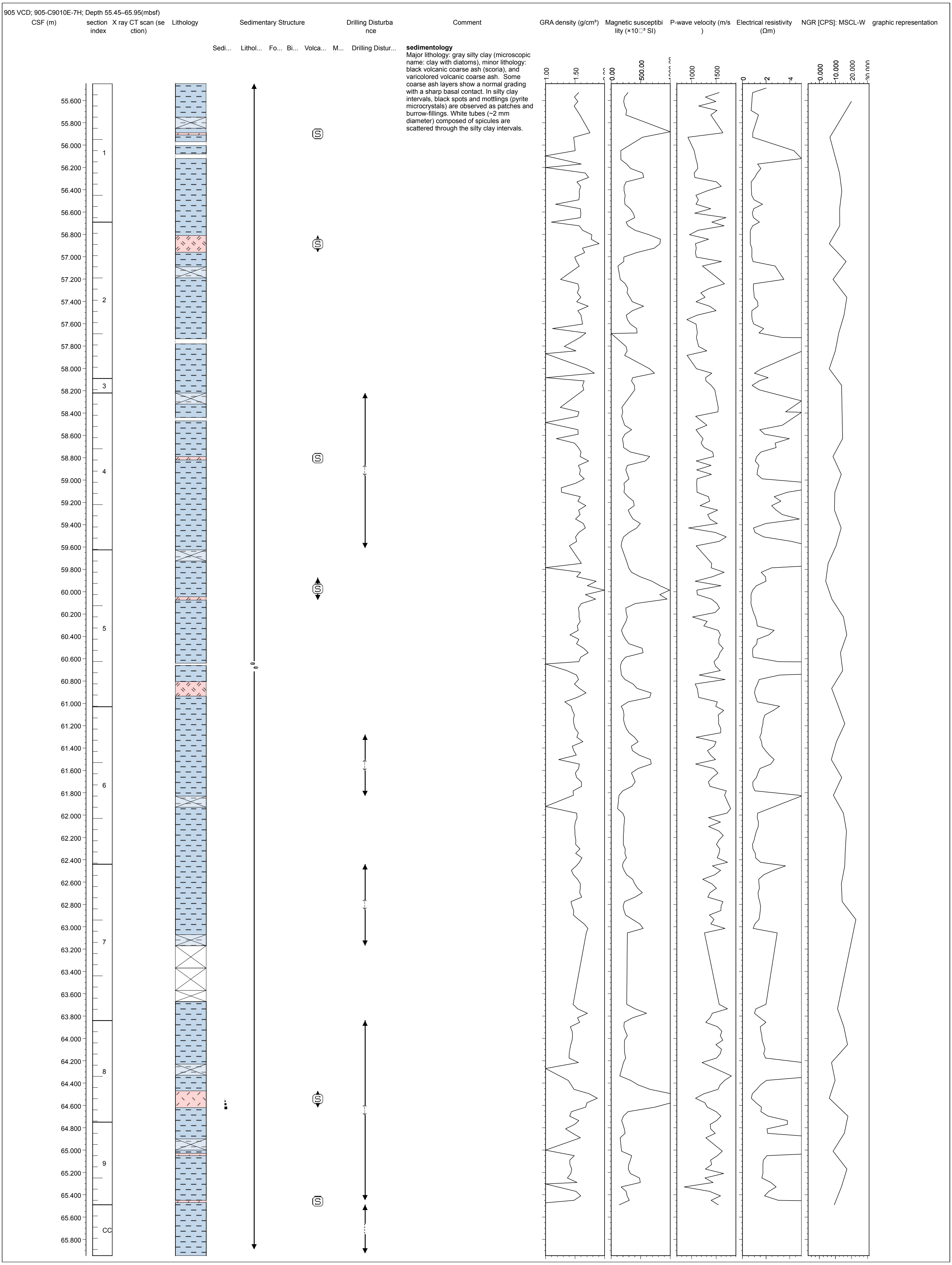
sedimentology
The sediment is devided into the fllowing lithologies; gray (10Y 4/1) silty clay, scoriaceous black (10Y 2/1) volcanic ash and pumiceous gray to light gray (10Y 6/1-7/1) volcanic ash.

Black spots (burrow filling) are common in silty clay faces.
Coarse/fine alternation is observed inash layers.
A part of lower ash layer containing aboundant pumice grains is moderete to highly disturbed, possibly by flow in the core liner (sec.5, 0-120cm).

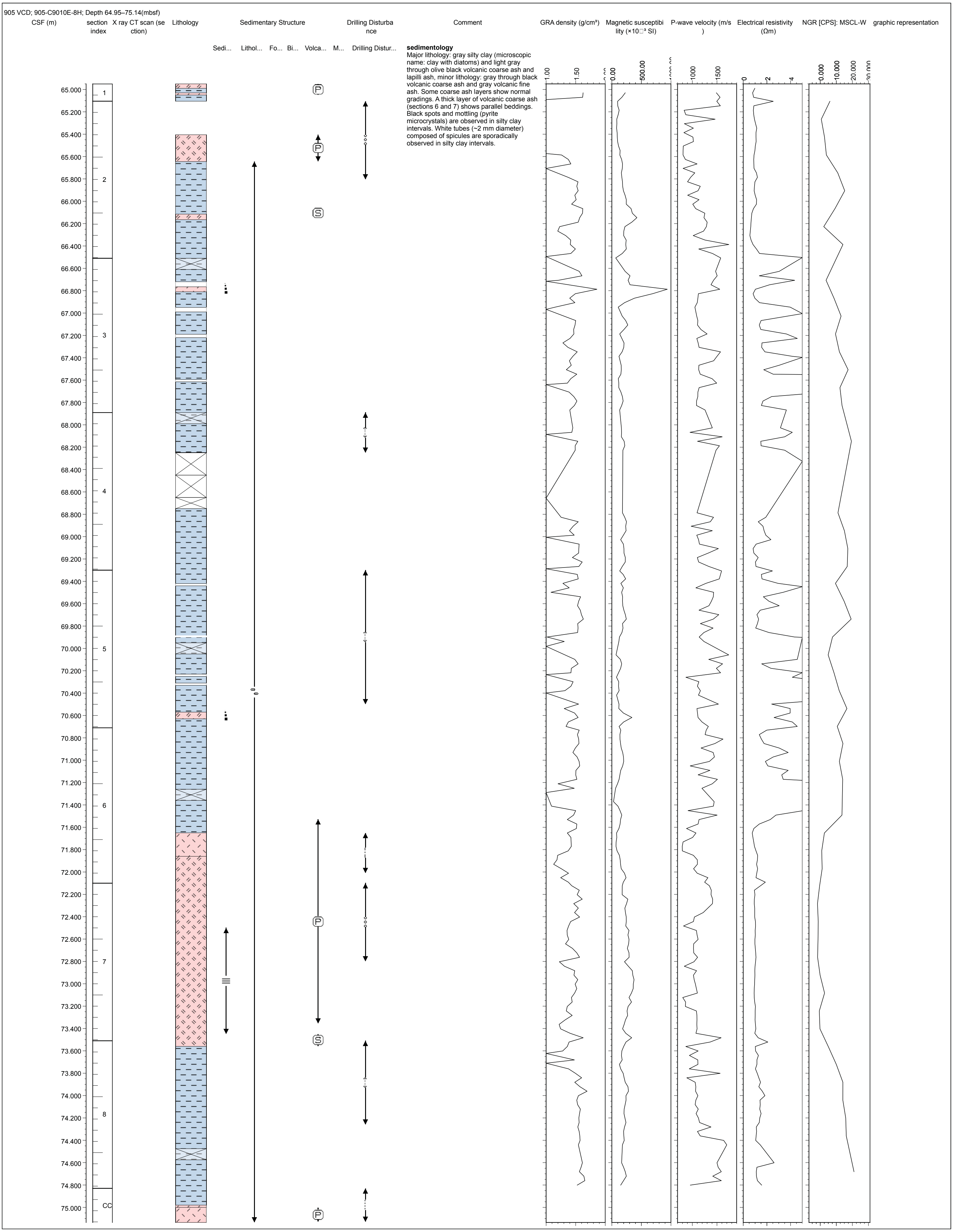



905 VCD; 905-C9010E-6H; Depth 45.95–55.58(mbsf)
CSF (m)
section index
X ray CT scan (section)
Lithology
Sedimentary Structure
Drilling Disturbance
Comment
GRA density (g/cm³)
Magnetic susceptibility (×10⁻³ SI)
P-wave velocity (m/s)
Electrical resistivity (Ωm)
NGR [CPS]: MSCL-W
graphic representation
Sedi...
Litho...
F...
Bi...
Volcani...
M...
Drilling Distur...
sedimentology
The sediment is devided into three major parts; pumiceous coarse-fine volcanic ash (0-46.925 mbsf), silty clay (46.925-52.480 mbsf), and scoriaceous coarse volcanic ash (52.480-55.575 mbsf).
Black spots (burrow filling material), which possibly contain pyrite, are commonly observed in silty clay layer. Scoriaceous coarse volcanic layer contains pumice-rich horizons and mud (silty clay) patches.
1.00
1.50
0.00
500.00
1000
1500
0
2
4
0.000
10.000
20.000
46.000
46.200
46.400
46.600
46.800
47.000
47.200
47.400
47.600
47.800
48.000
48.200
48.400
48.600
48.800
49.000
49.200
49.400
49.600
49.800
50.000
50.200
50.400
50.600
50.800
51.000
51.200
51.400
51.600
51.800
52.000
52.200
52.400
52.600
52.800
53.000
53.200
53.400
53.600
53.800
54.000
54.200
54.400
54.600
54.800
55.000
55.200
55.400
1
2
3
4
5
6
7
8
9
CC
P
S
P

905 VCD; 905-C9010E-7H; Depth 55.45–65.95(mbsf)

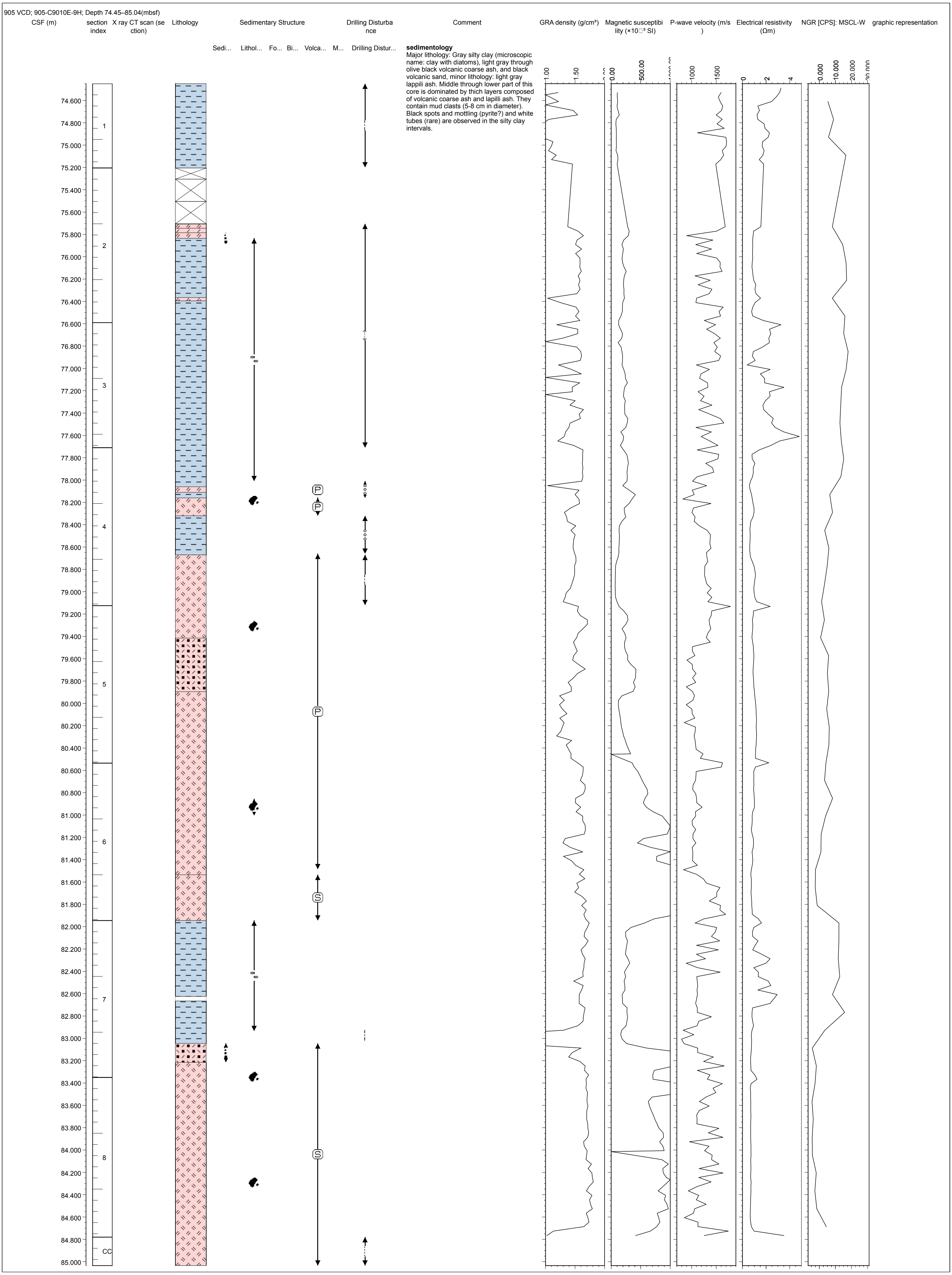


905 VCD; 905-C9010E-8H; Depth 64.95–75.14(mbsf)

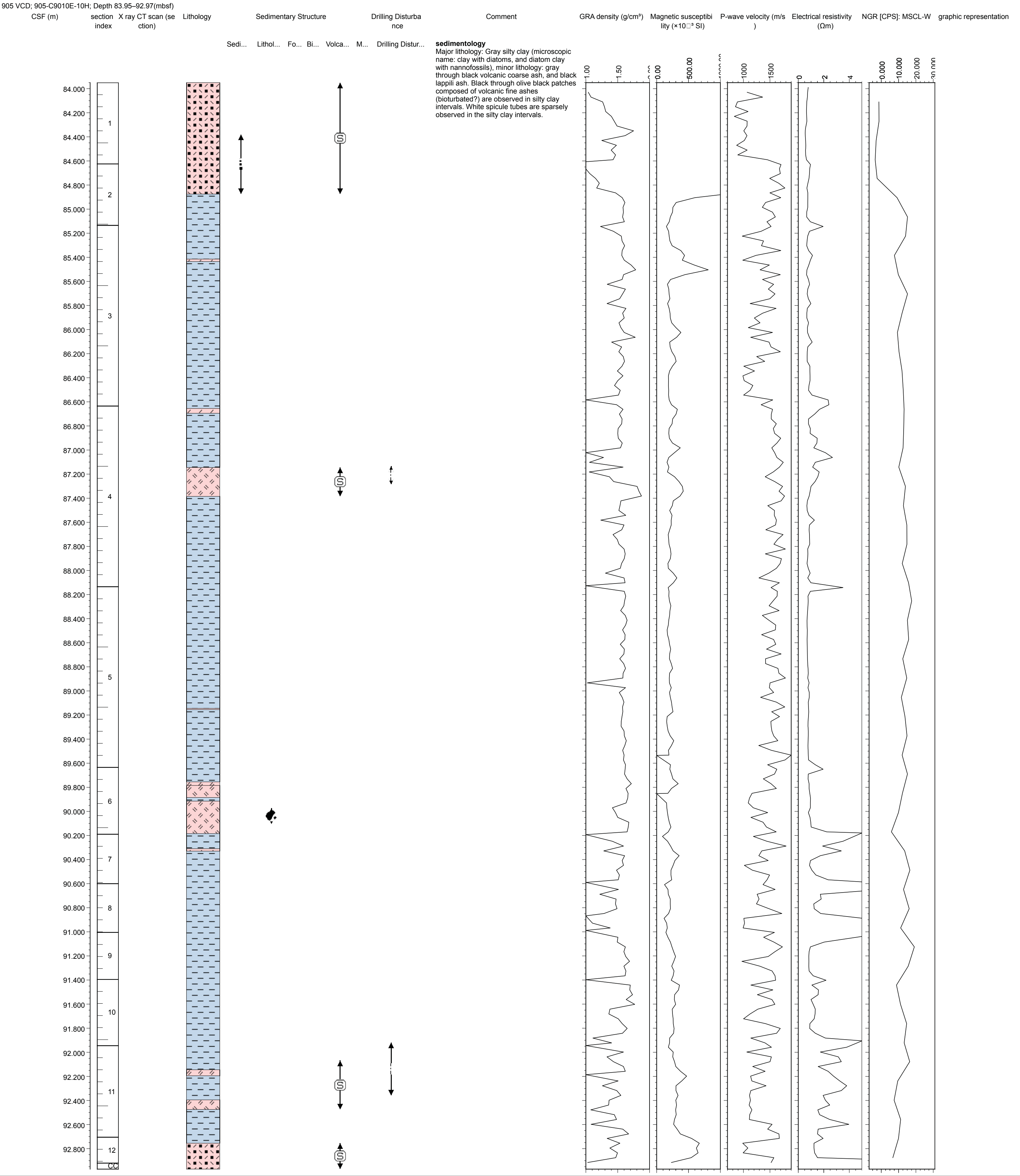


sedimentology
Major lithology: gray silty clay (microscopic name: clay with diatoms) and light gray through olive black volcanic coarse ash and lapilli ash, minor lithology: gray through black volcanic coarse ash and gray volcanic fine ash. Some coarse ash layers show normal gradings. A thick layer of volcanic coarse ash (sections 6 and 7) shows parallel beddings. Black spots and mottling (pyrite microcrystals) are observed in silty clay intervals. White tubes (~2 mm diameter) composed of spicules are sporadically observed in silty clay intervals.

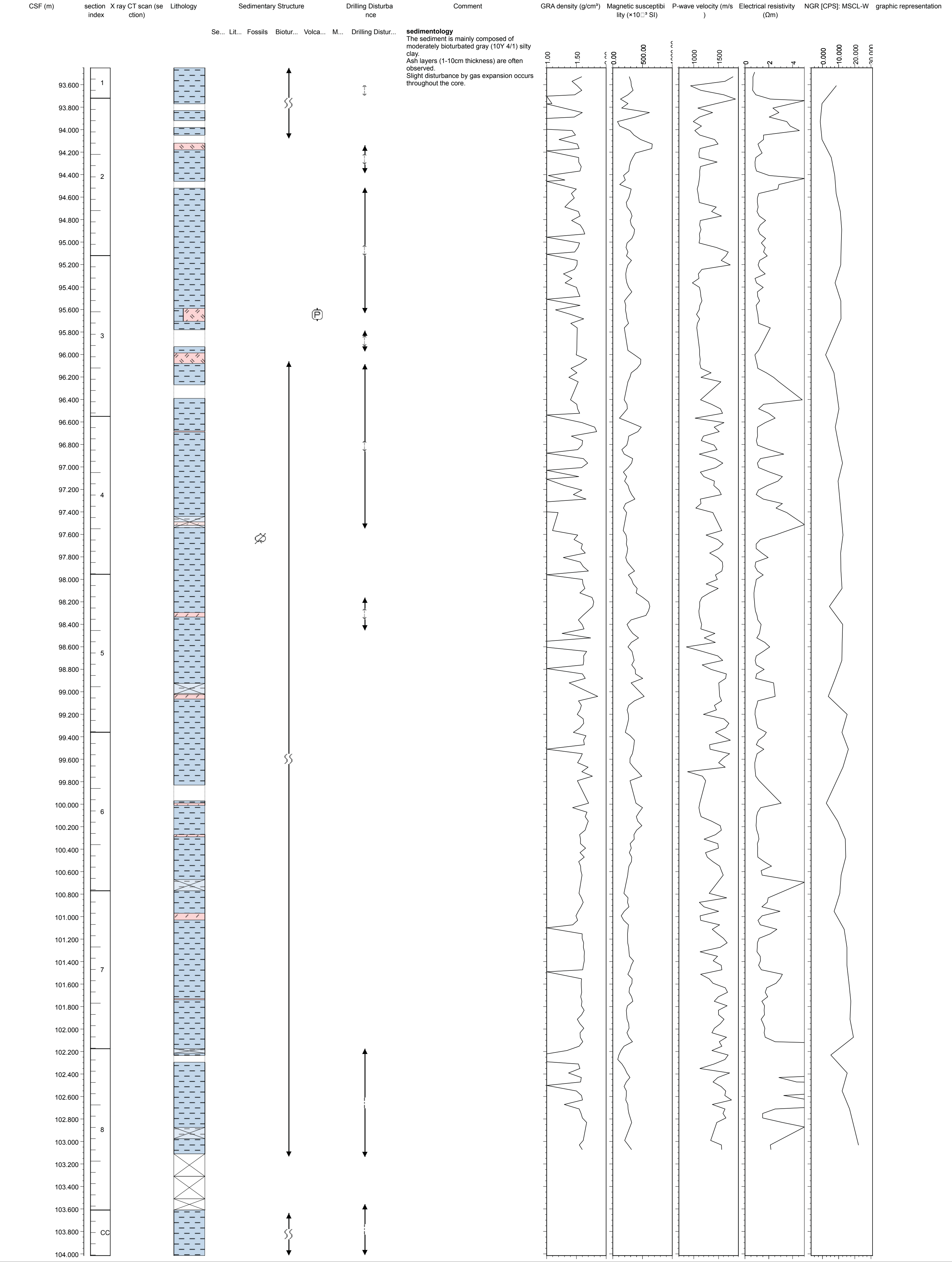
905 VCD; 905-C9010E-9H; Depth 74.45–85.04(mbsf)



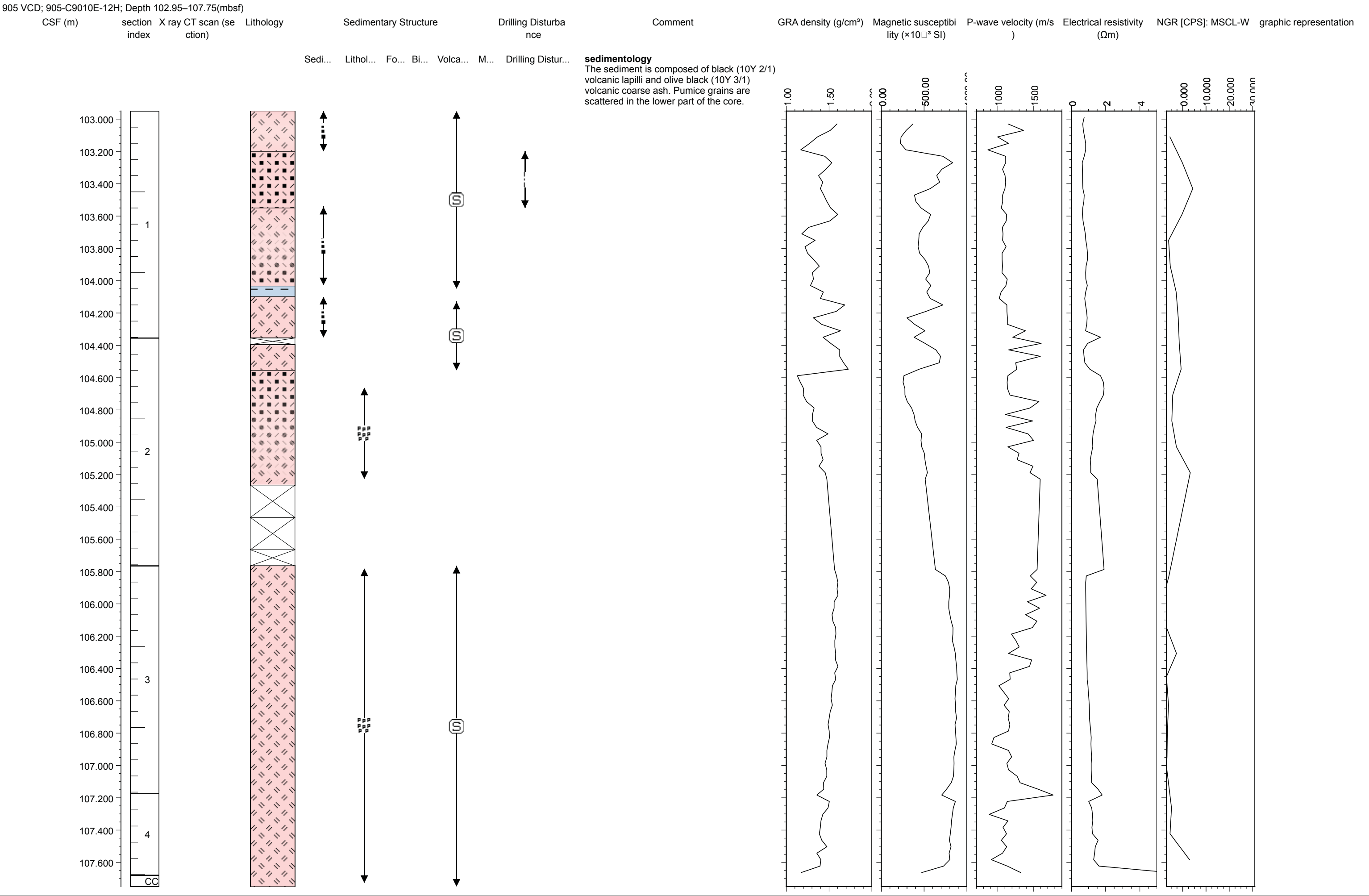
905 VCD; 905-C9010E-10H; Depth 83.95–92.97(mbsf)



905 VCD; 905-C9010E-11H; Depth 93.45–104.02(mbsf)

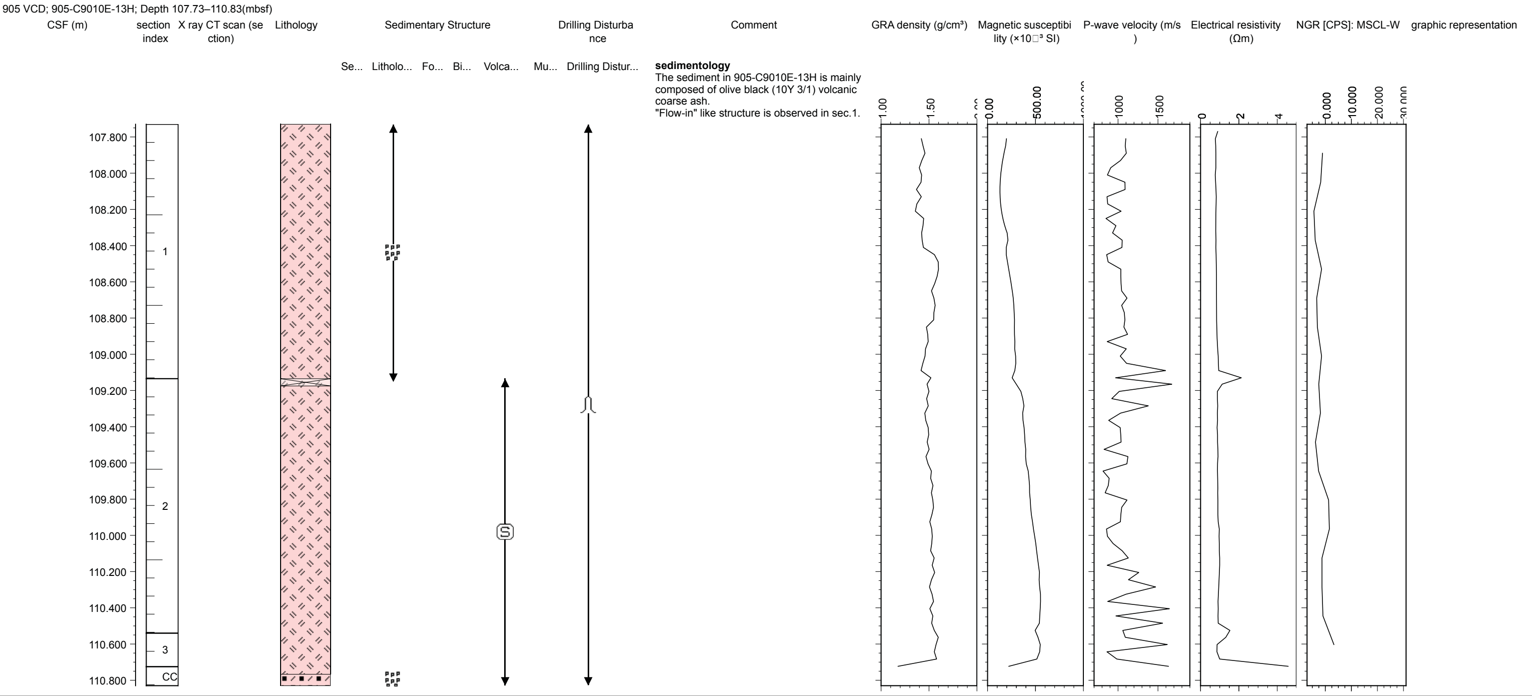


905 VCD; 905-C9010E-12H; Depth 102.95–107.75(mbsf)



sedimentology
The sediment is composed of black (10Y 2/1) volcanic lapilli and olive black (10Y 3/1) volcanic coarse ash. Pumice grains are scattered in the lower part of the core.

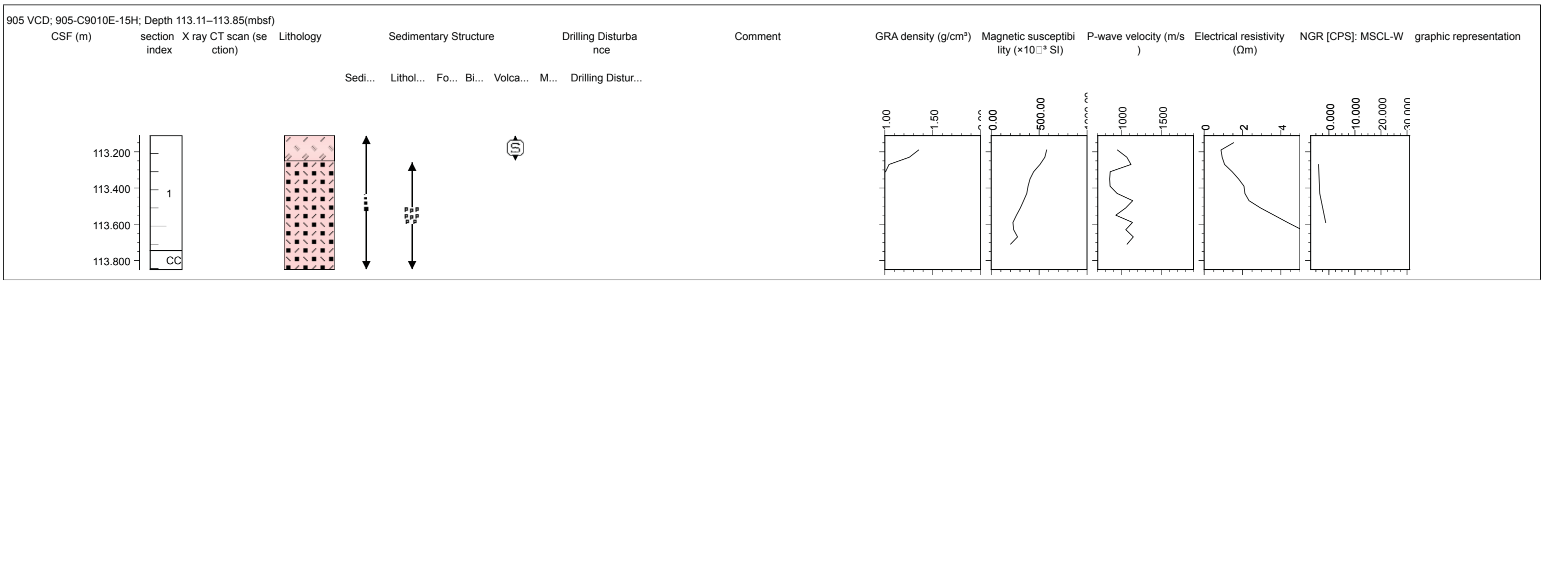
905 VCD; 905-C9010E-13H; Depth 107.73–110.83(mbsf)



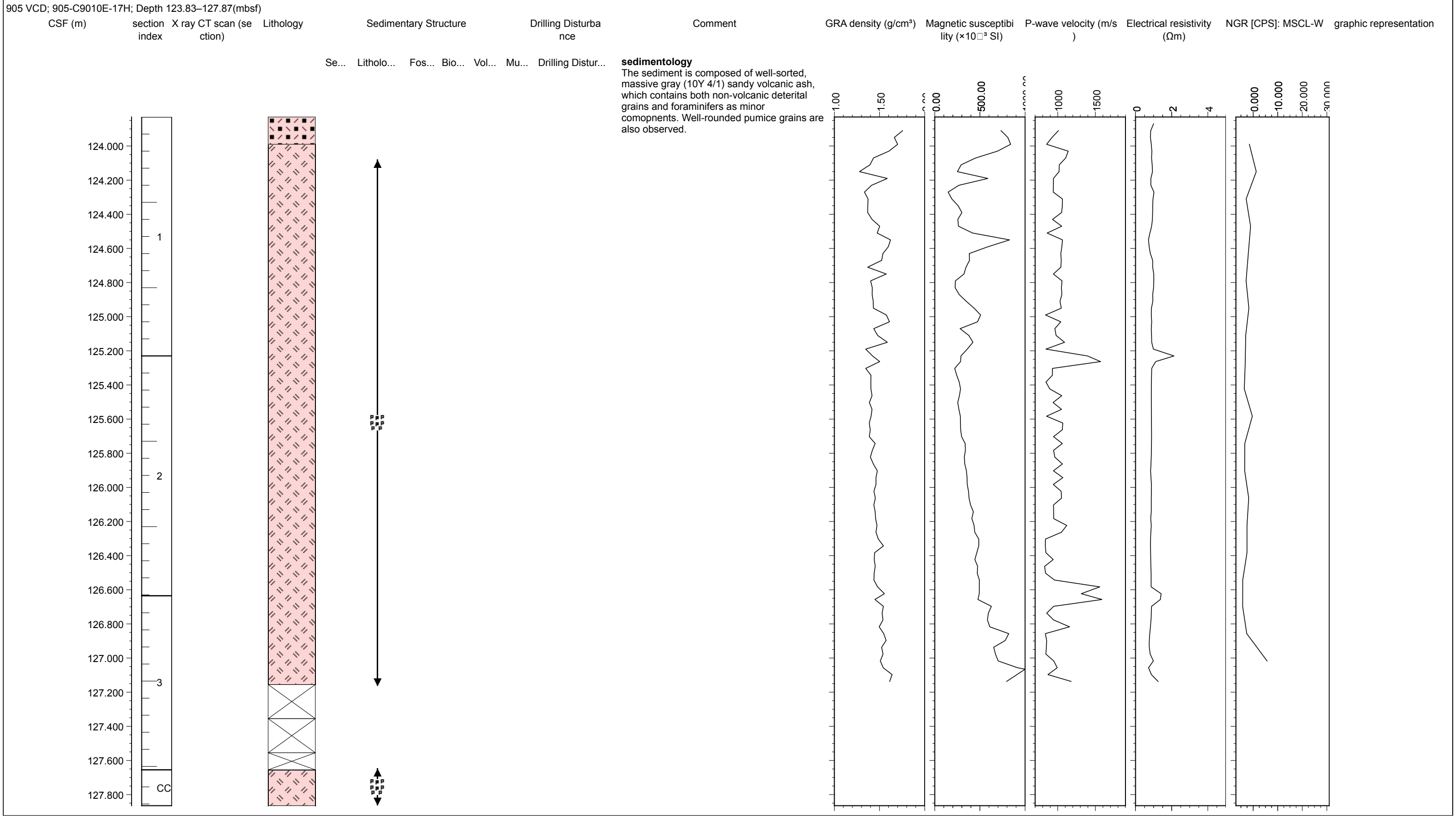
905 VCD; 905-C9010E-14H; Depth 110.81–111.12(mbsf)

CSF (m)	section index	X ray CT scan (section)	Lithology	Sedimentary Structure					Drilling Disturbance		Comment	GRA density (g/cm³)	Magnetic susceptibility (×10⁻³ SI)	P-wave velocity (m/s)	Electrical resistivity (Ωm)	NGR [CPS]: MSCL-W	graphic representation
				Se...	Litholo...	Fo...	Bi...	Volca...	Mu...	Drilling Distur...							
111.000	CC																

905 VCD; 905-C9010E-15H; Depth 113.11–113.85(mbsf)



905 VCD; 905-C9010E-17H; Depth 123.83–127.87(mbsf)

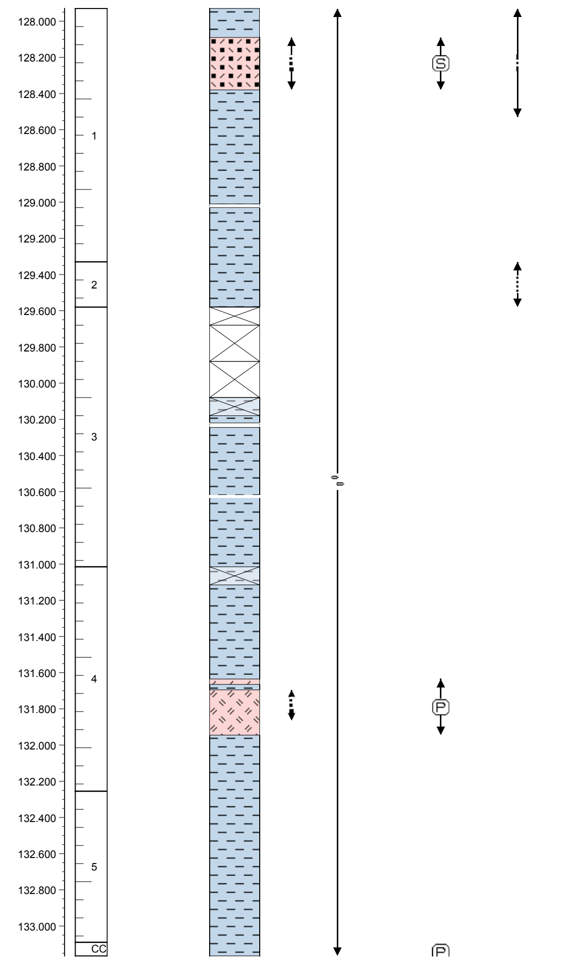


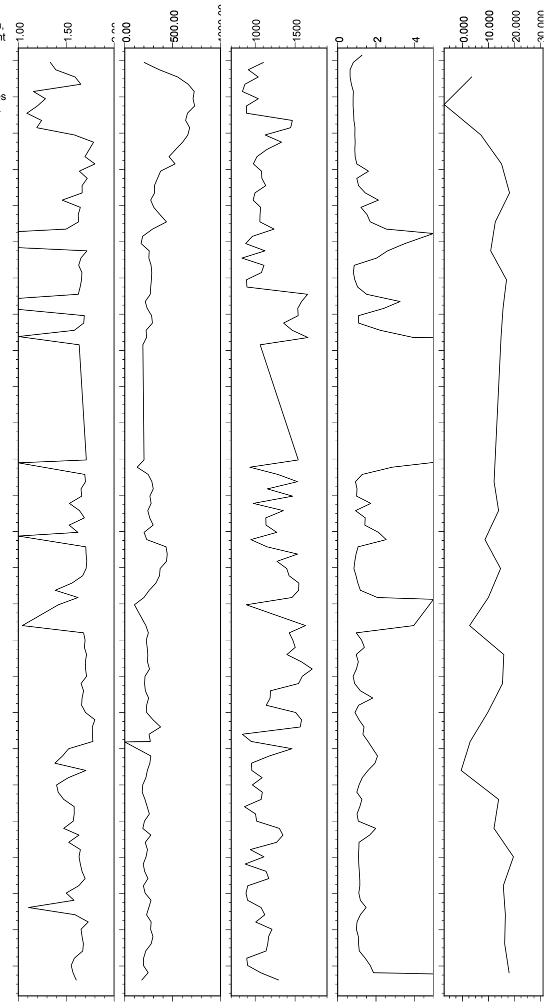
905 VCD; 905-C9010E-18H; Depth 127.93–133.17(mbsf)

CSF (m) | section index | X ray CT scan (section) | Lithology | Sedimentary Structure | Drilling Disturbance | Comment | GRA density (g/cm³) | Magnetic susceptibility (Ý10□þSI) | P-wave velocity (m/s) | Electrical resistivity (Ωm) | NGR [CPS]: MSCL-W | graphic representation

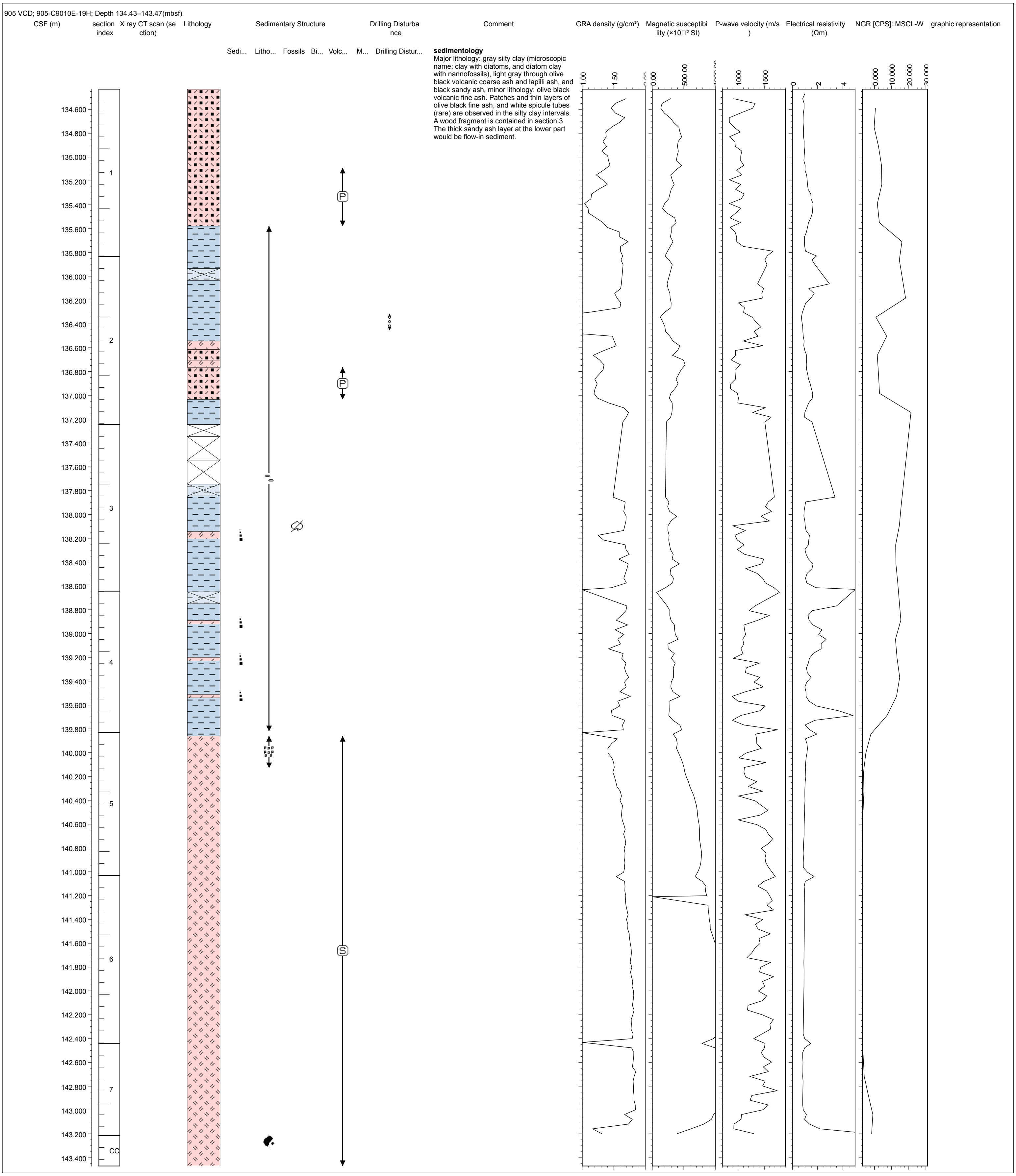
Sedi... Lithol... Fo... Bi... Volca... M... Drilling Distur...

sedimentology
Major lithology: gray silty clay (microscopic name: diatom clay with nannofossils), light gray through olive black volcanic coarse ash, and black volcanic sand, minor lithology: light gray through gray volcanic coarse ash with lappili (pumiceous), olive black lapilli ash (scoriaceous), and olive black volcanic fine ash (thin layers and patches). Black spots and mottling (pyrite?) and white spicule tubes (rare) are observed in the silty clay intervals.



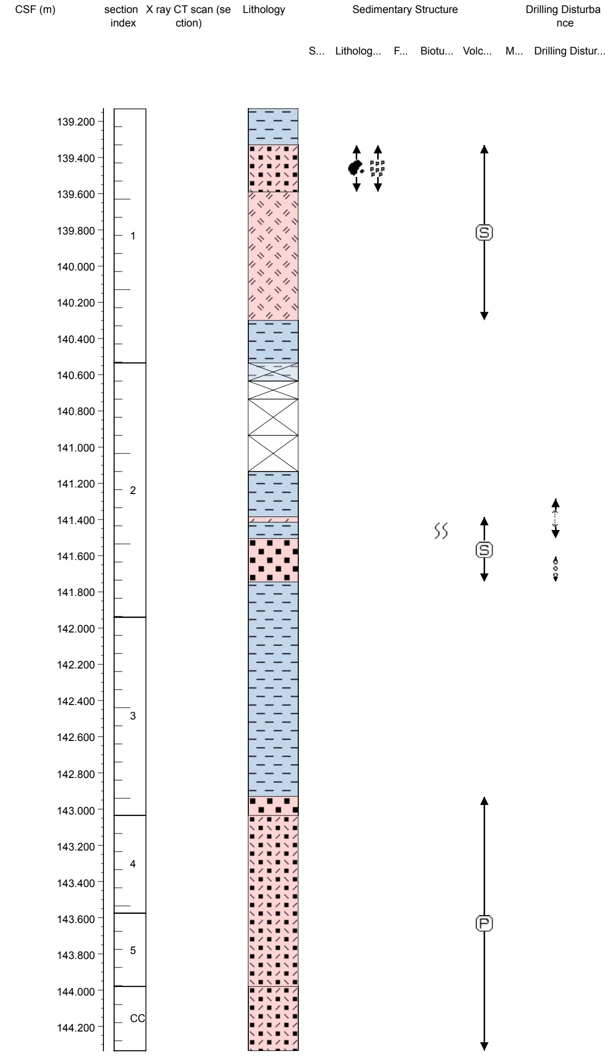


905 VCD; 905-C9010E-19H; Depth 134.43–143.47(mbsf)



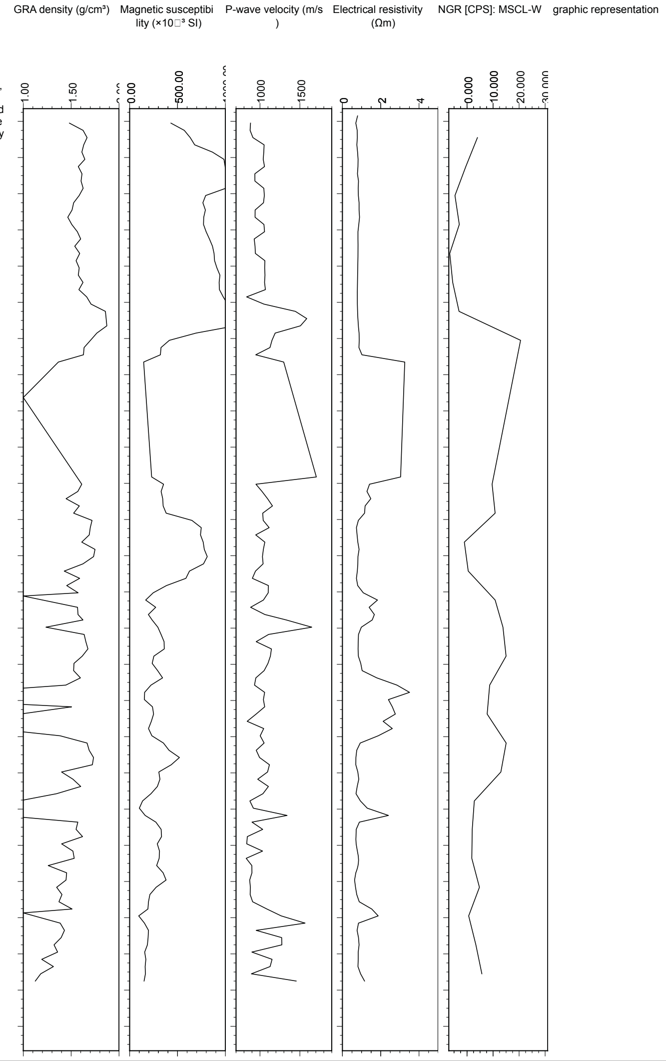
sedimentology
Major lithology: gray silty clay (microscopic name: clay with diatoms, and diatom clay with nannofossils), light gray through olive black volcanic coarse ash and lapilli ash, and black sandy ash, minor lithology: olive black volcanic fine ash. Patches and thin layers of olive black fine ash, and white spicule tubes (rare) are observed in the silty clay intervals. A wood fragment is contained in section 3. The thick sandy ash layer at the lower part would be flow-in sediment.

905 VCD; 905-C9010E-20H; Depth 139.13–144.34(mbsf)

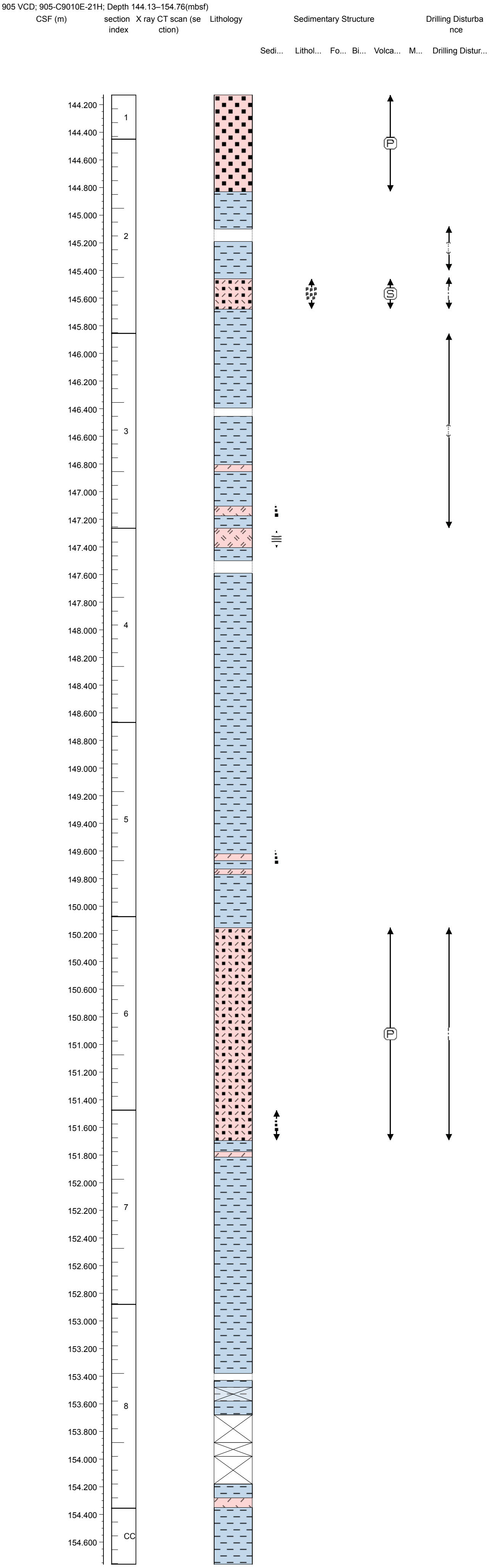


Comment

sedimentology
Major lithology: gray silty clay (microscopic name: clay with diatoms, and diatom clay with nannofossils), black sandy coarse ash, gray through light gray lapilli ash, minor lithology: olive black lapilli ash. Patches and thin layers of olive black fine ash, and white spicule tubes (rare) are observed in the silty clay intervals.

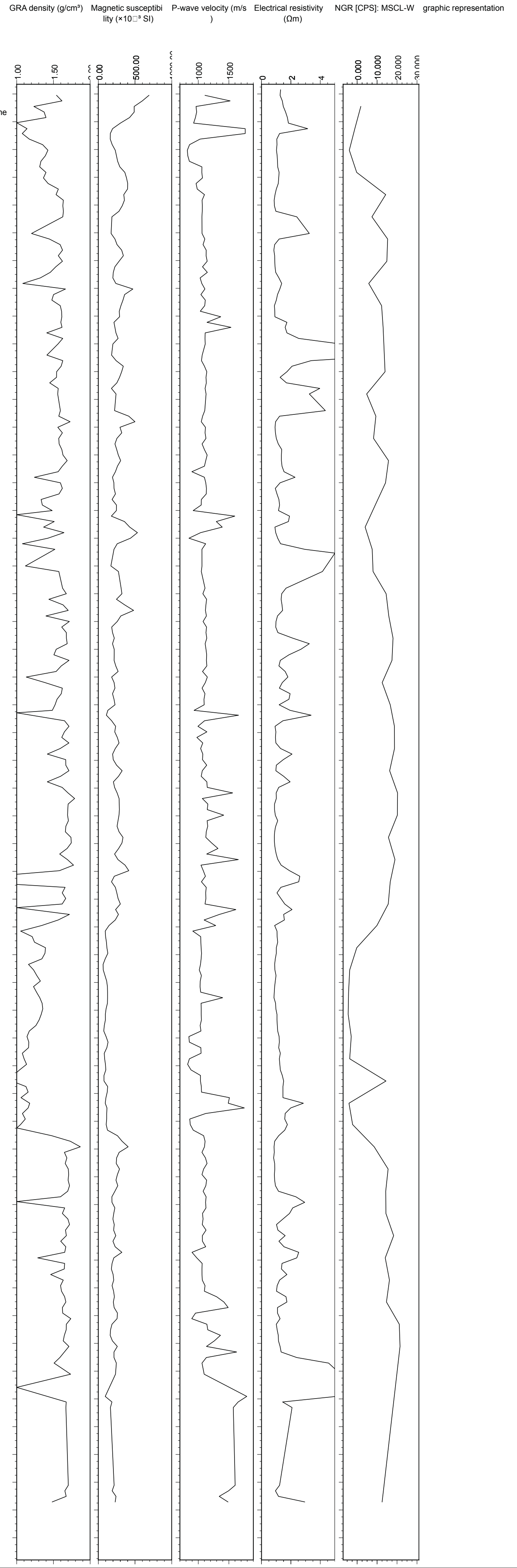


905 VCD; 905-C9010E-21H; Depth 144.13–154.76(mbsf)



Comment

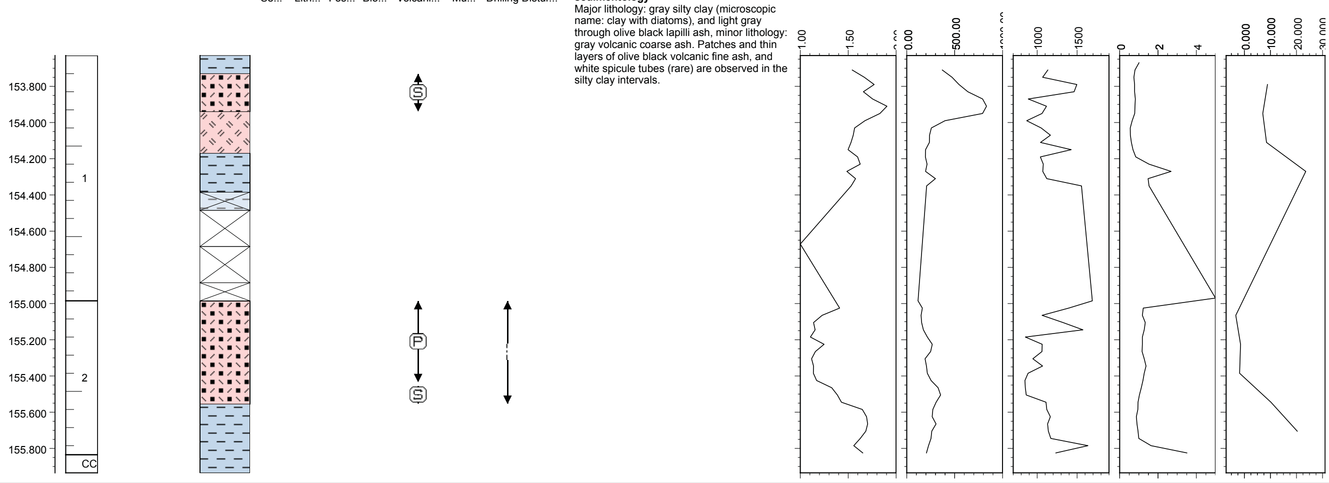
sedimentology
Major lithology: gray silty clay (microscopic name: clay with diatoms, and diatom clay with nannofossils), and light gray through gray lapilli and lapilli ash, minor lithology: olive black volcanic fine ash, and light gray through gray fine ash. Patches and thin layers of olive black volcanic fine ash, and white spicule tubes (rare) are observed in the silty clay intervals. A pebble size piece of scoria (~3 cm) is contained at 110 cm in section 2.



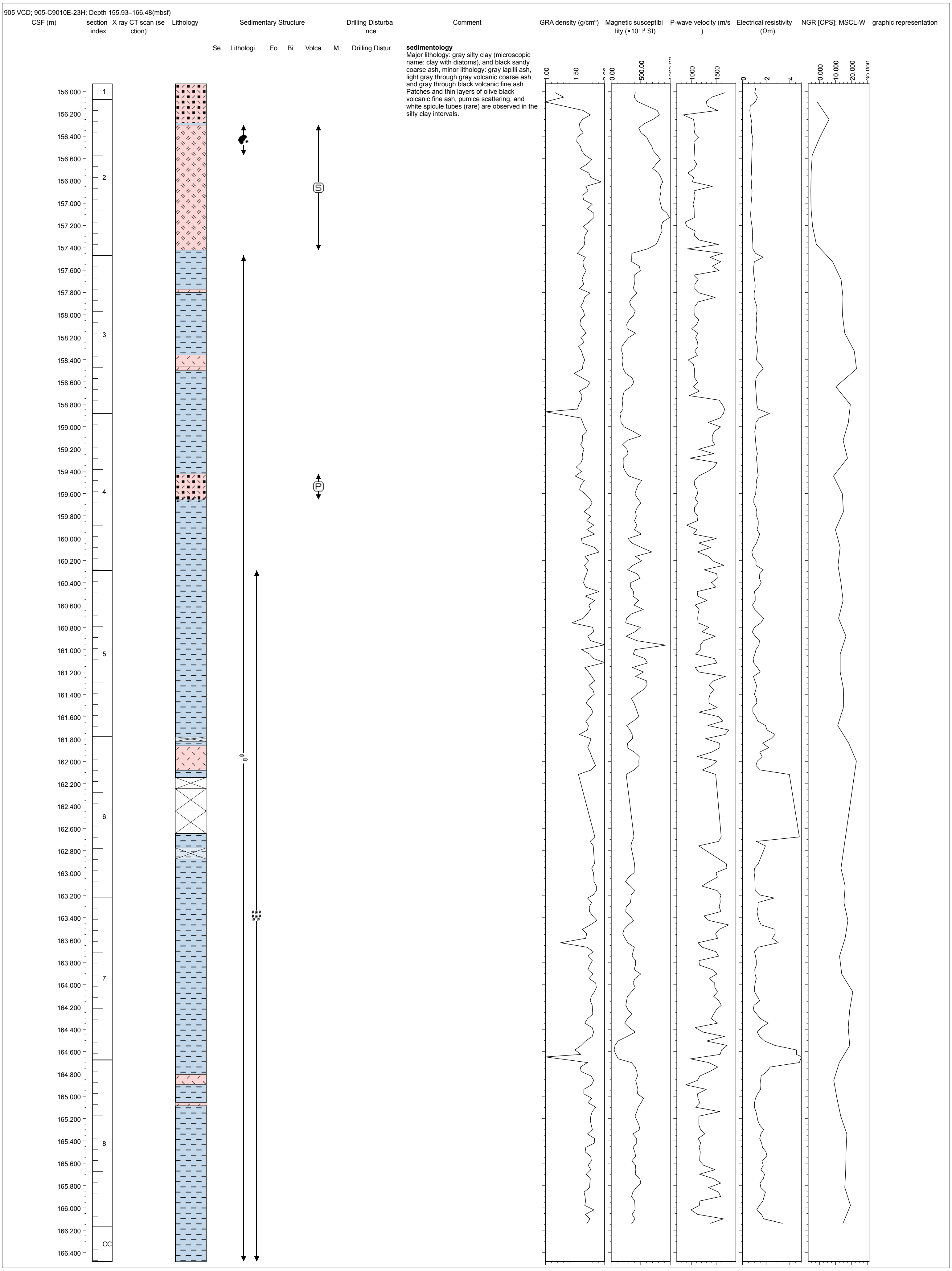
905 VCD; 905-C9010E-22H; Depth 153.63–155.94(mbsf)

CSF (m)	section index	X ray CT scan (section)	Lithology	Sedimentary Structure	Drilling Disturbance	Comment	GRA density (g/cm³)	Magnetic susceptibility (×10□⁻³ SI)	P-wave velocity (m/s)	Electrical resistivity (Ωm)	NGR [CPS]: MSCL-W	graphic representation
				Se... Lith... Fos... Bio... Volcani... Mu...	Drilling Distur...							

sedimentology
Major lithology: gray silty clay (microscopic name: clay with diatoms), and light gray through olive black lapilli ash, minor lithology: gray volcanic coarse ash. Patches and thin layers of olive black volcanic fine ash, and white spicule tubes (rare) are observed in the silty clay intervals.



905 VCD; 905-C9010E-23H; Depth 155.93–166.48(mbsf)



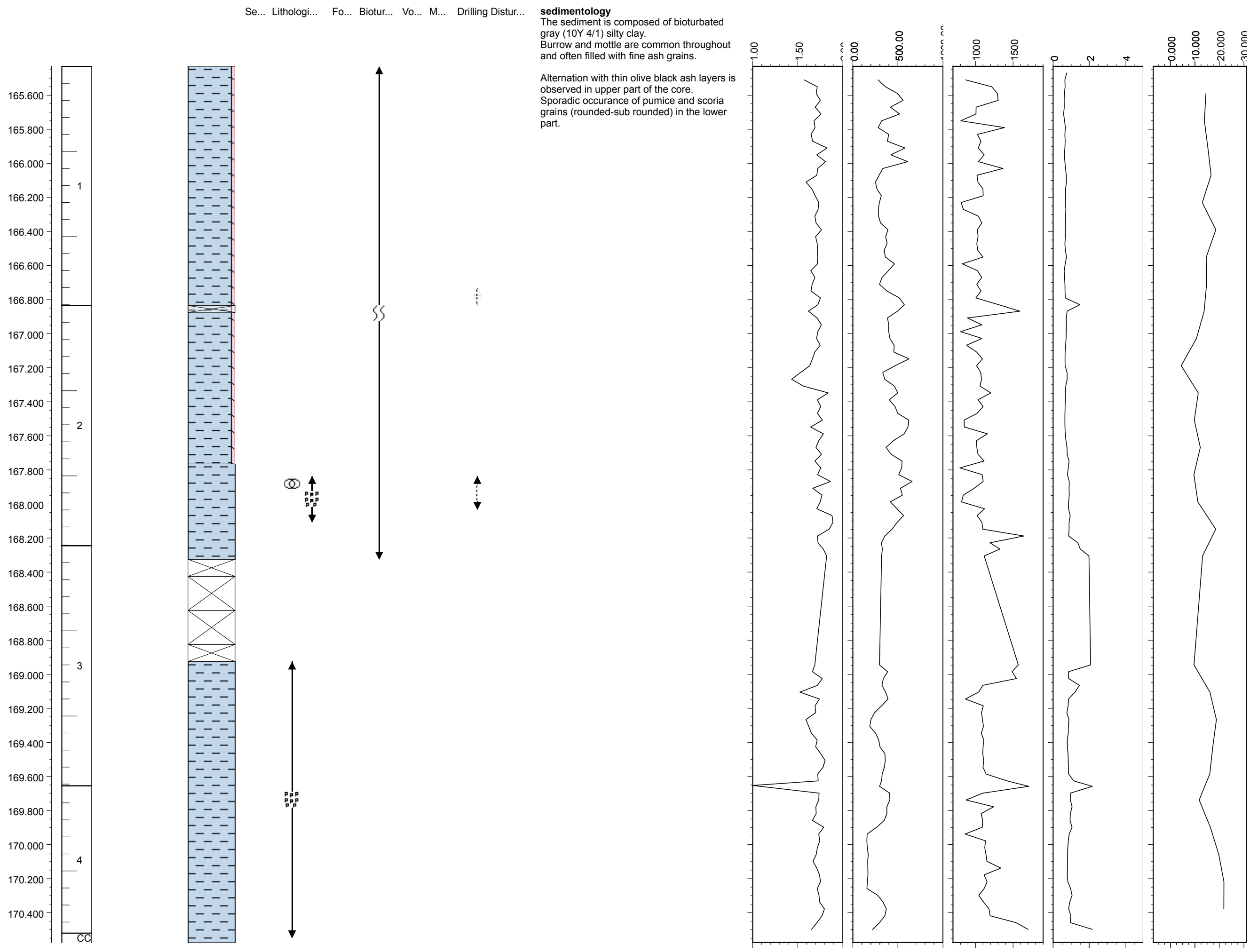
905 VCD; 905-C9010E-24X; Depth 165.43–170.58(mbsf)

CSF (m) | section index | X ray CT scan (section) | Lithology | Sedimentary Structure | Drilling Disturbance | Comment | GRA density (g/cm³) | Magnetic susceptibility (×10⁻³ SI) | P-wave velocity (m/s) | Electrical resistivity (Ωm) | NGR [CPS]: MSCL-W | graphic representation

Se... Lithologi... Fo... Biotur... Vo... M... Drilling Distur...

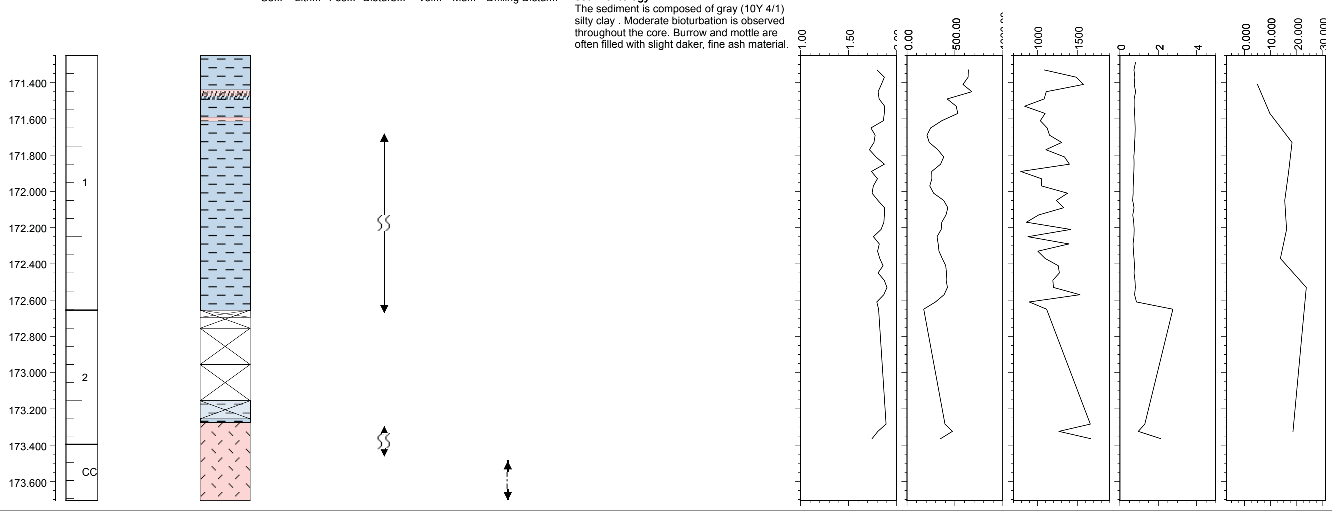
sedimentology
The sediment is composed of bioturbated gray (10Y 4/1) silty clay.
Burrow and mottle are common throughout and often filled with fine ash grains.

Alternation with thin olive black ash layers is observed in upper part of the core.
Sporadic occurance of pumice and scoria grains (rounded-sub rounded) in the lower part.



905 VCD; 905-C9010E-25X; Depth 171.25–173.71(mbsf)

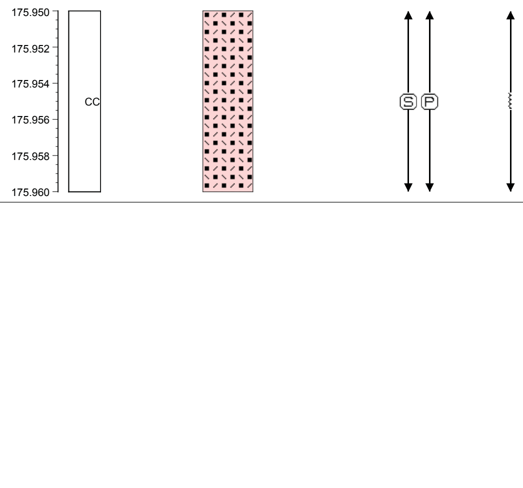
CSF (m)	section index	X ray CT scan (section)	Lithology	Sedimentary Structure	Drilling Disturbance	Comment	GRA density (g/cm³)	Magnetic susceptibility (×10⁻³ SI)	P-wave velocity (m/s)	Electrical resistivity (Ωm)	NGR [CPS]: MSCL-W	graphic representation



sedimentology
The sediment is composed of gray (10Y 4/1) silty clay . Moderate bioturbation is observed throughout the core. Burrow and mottle are often filled with slight daker, fine ash material.

905 VCD; 905-C9010E-26X; Depth 175.95–175.96(mbsf)

CSF (m)	section index	X ray CT scan (section)	Lithology	Sedimentary Structure	Drilling Disturbance	Comment	GRA density (g/cm³)	Magnetic susceptibility (×10⁻³ SI)	P-wave velocity (m/s)	Electrical resistivity (Ωm)	NGR [CPS]: MSCL-W	graphic representation
175.950–175.960	CC			Se... Lit... Fo... Bi... Volcanicl... Mu...	Drilling Distur...	**sedimentology** Highly disturbed section. Only small amount of well -rounded both scoria and pumice grains (>2mm) are recovered.						



905 VCD; 905-C9010E-27X; Depth 180.65–180.96(mbsf)

CSF (m)	section index	X ray CT scan (section)	Lithology	Sedimentary Structure						Drilling Disturbance	Comment	GRA density (g/cm³)	Magnetic susceptibility (×10⁻³ SI)	P-wave velocity (m/s)	Electrical resistivity (Ωm)	NGR [CPS]: MSCL-W	graphic representation
				Se...	Litholo...	Fo...	Bi...	Volca...	Mu...	Drilling Distur...	**sedimentology** The sediment is composed of black (10Y 2/1) volcanic lapilli (scoria). Grains show sub-rounded form.						
180.800	CC																

905 VCD; 905-C9010E-29X; Depth 190.05–190.38(mbsf)

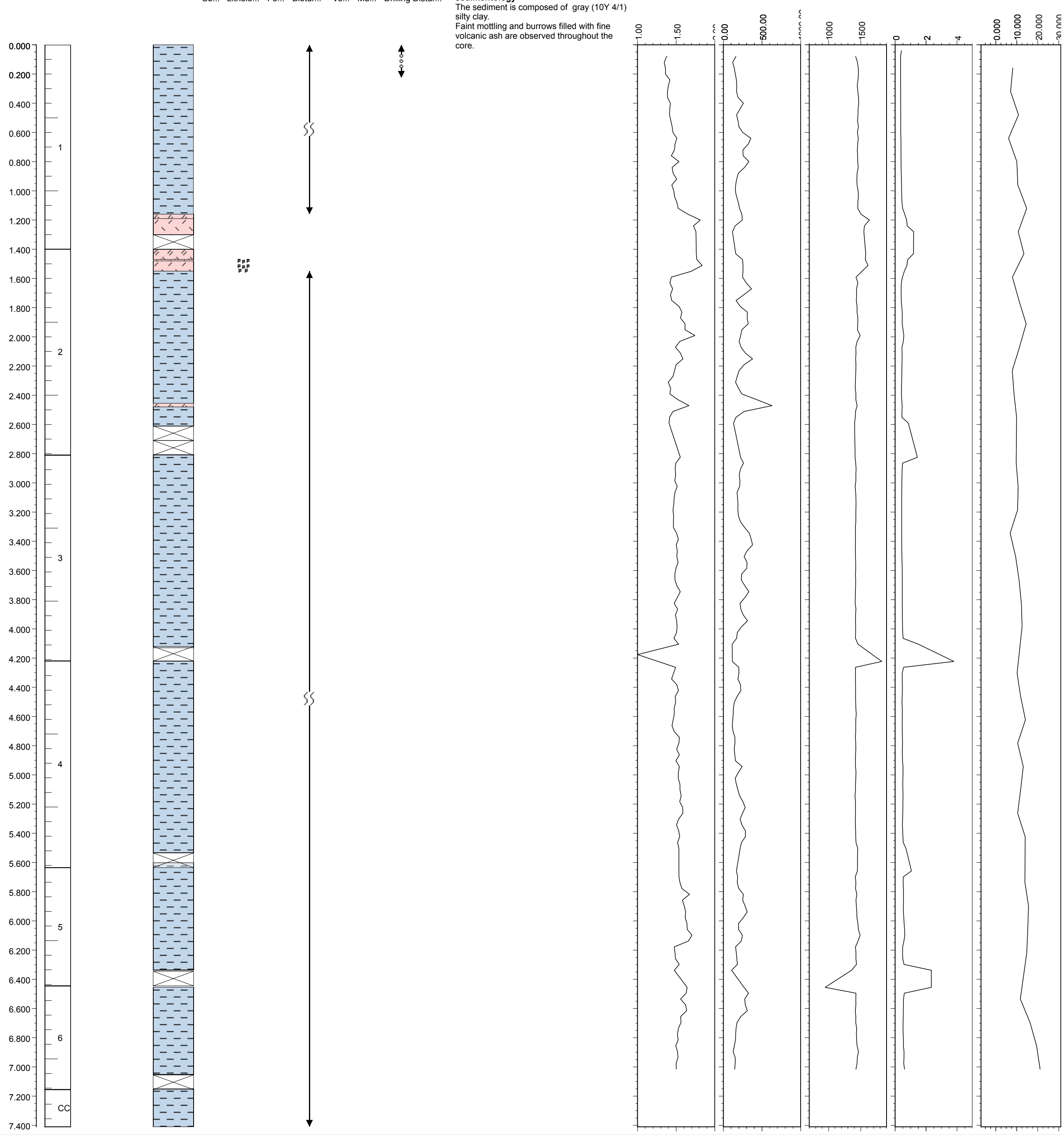
CSF (m)	section index	X ray CT scan (section)	Lithology	Sedimentary Structure						Drilling Disturbance	Comment	GRA density (g/cm³)	Magnetic susceptibility (×10⁻⁵ SI)	P-wave velocity (m/s)	Electrical resistivity (Ωm)	NGR [CPS]: MSCL-W	graphic representation
				Sed...	Lith...	Fossils	Biot...	Vol...	Mun...	Drilling Distur...	**sedimentology** The sediment is composed of gray (5Y 4/1) sandy volcanic ash. Heavily fractured by drilling.						
190.200	CC																

905 VCD; 905-C9010F-1H; Depth 0.00–7.41(mbsf)

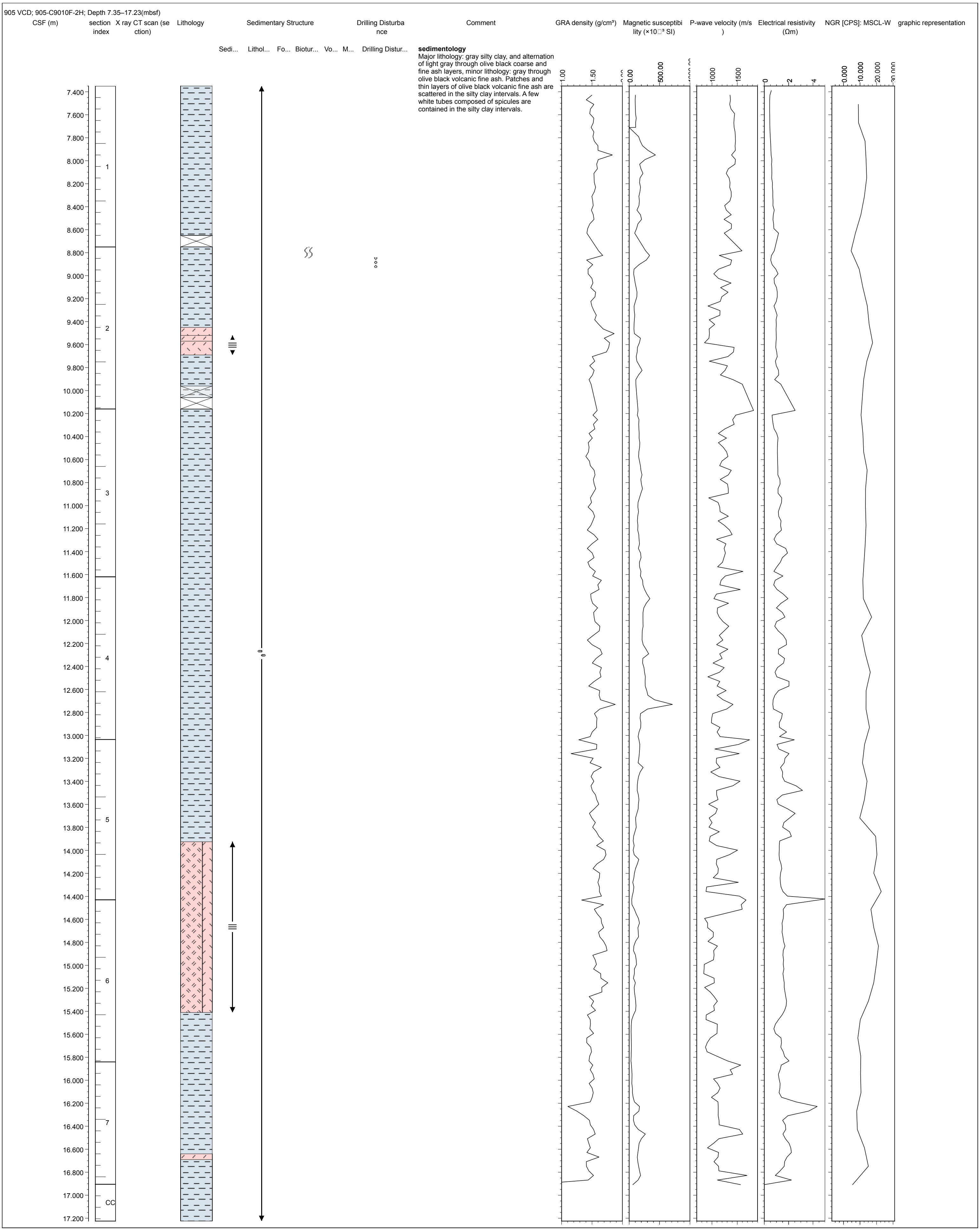
CSF (m)	section index	X ray CT scan (section)	Lithology	Sedimentary Structure	Drilling Disturbance	Comment	GRA density (g/cm³)	Magnetic susceptibility (×10⁻³ SI)	P-wave velocity (m/s)	Electrical resistivity (Ωm)	NGR [CPS]: MSCL-W	graphic representation

Se... Litholo... Fo... Biotur... Vo... Mu... Drilling Distur...

sedimentology
The sediment is composed of gray (10Y 4/1) silty clay.
Faint mottling and burrows filled with fine volcanic ash are observed throughout the core.

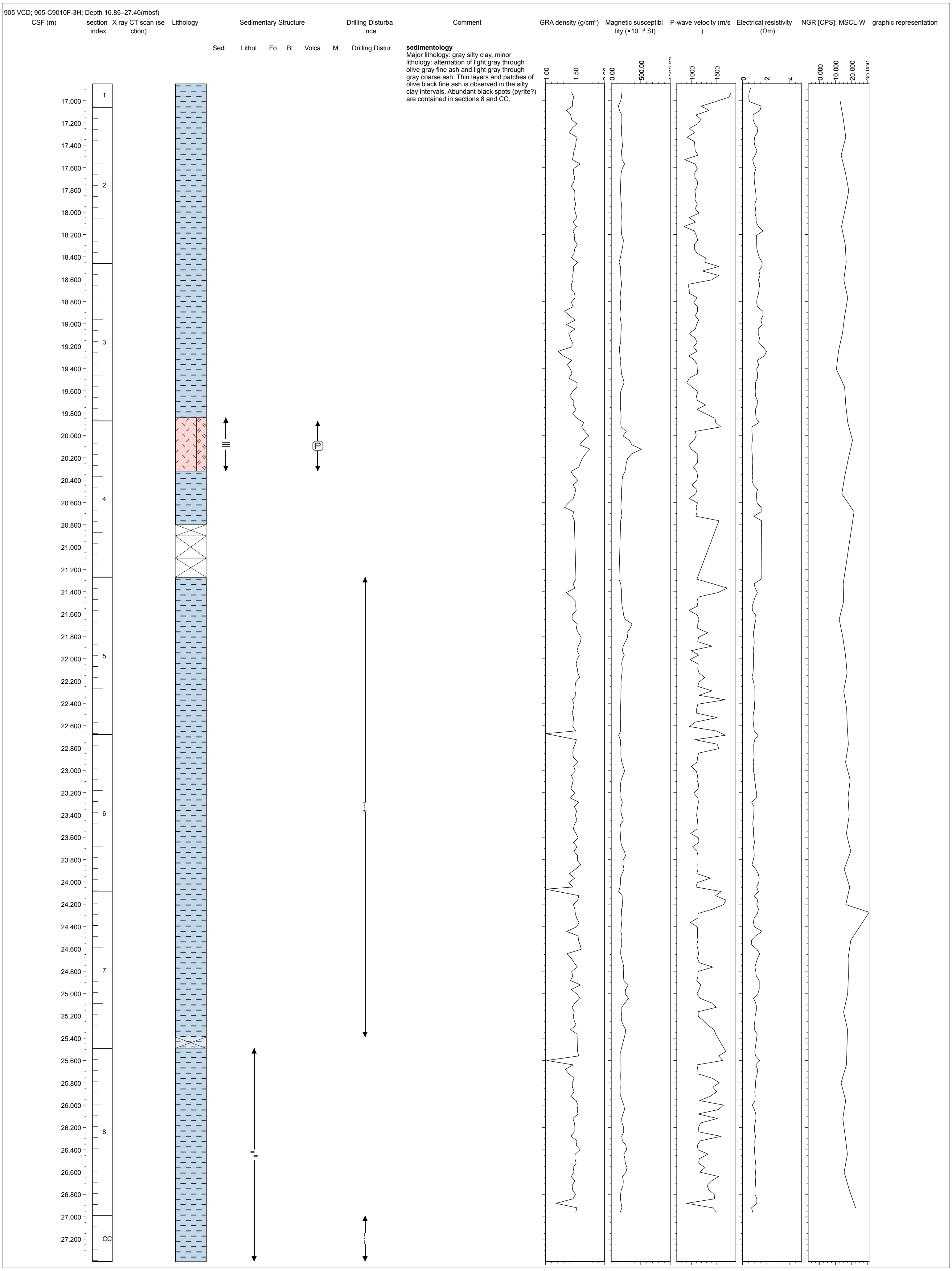


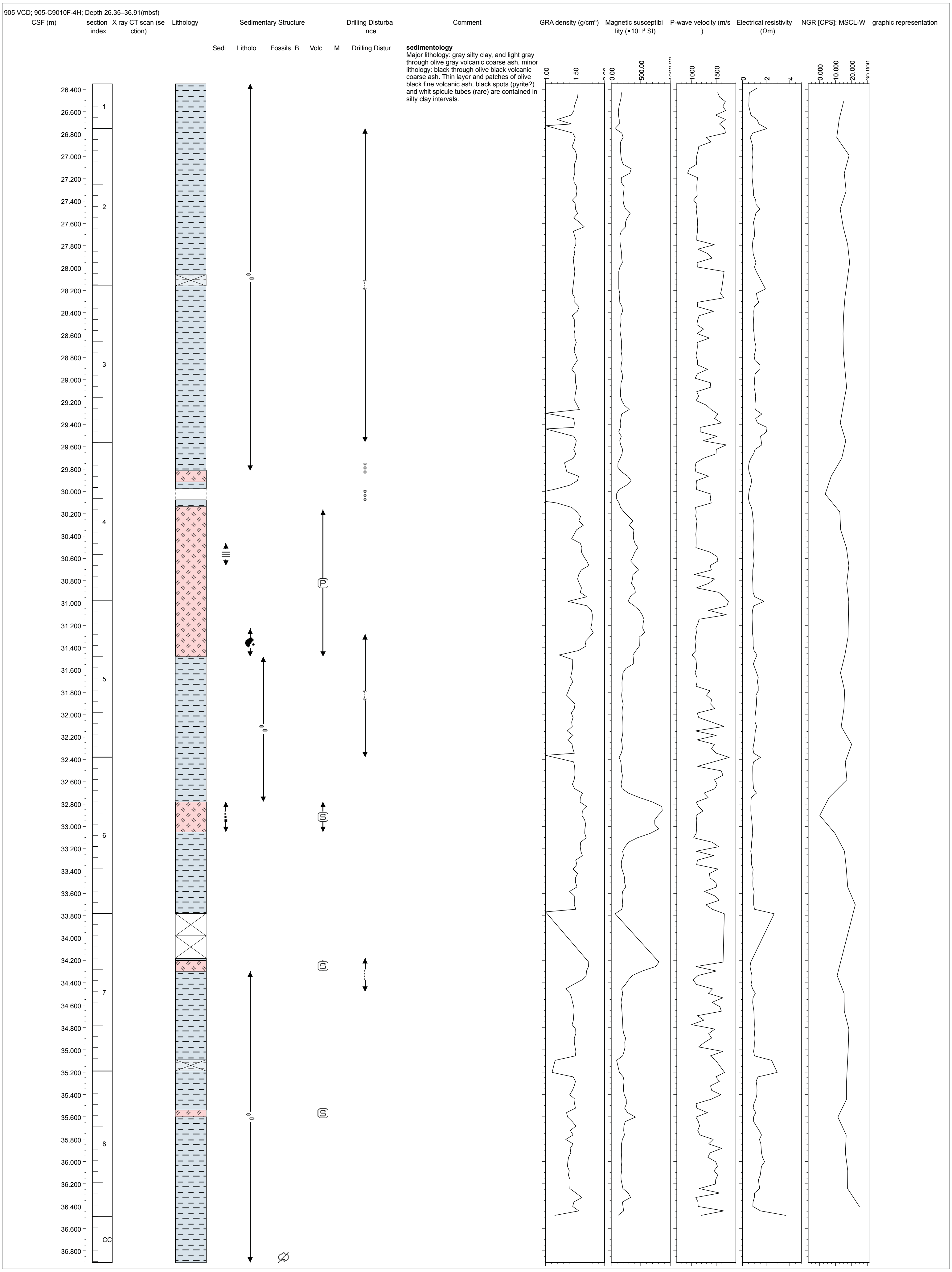
905 VCD; 905-C9010F-2H; Depth 7.35–17.23(mbsf)



sedimentology
Major lithology: gray silty clay, and alternation of light gray through olive black coarse and fine ash layers, minor lithology: gray through olive black volcanic fine ash. Patches and thin layers of olive black volcanic fine ash are scattered in the silty clay intervals. A few white tubes composed of spicules are contained in the silty clay intervals.

905 VCD; 905-C9010F-3H; Depth 16.85–27.40(mbsf)




905 VCD; 905-C9010F-4H; Depth 26.35–36.91(mbsf)
CSF (m)
section index
X ray CT scan (section)
Lithology
Sedimentary Structure
Sedi... Litholo... Fossils B... Volc... M...
Drilling Disturbance
Drilling Distur...
Comment
sedimentology
Major lithology: gray silty clay, and light gray through olive gray volcanic coarse ash, minor lithology: black through olive black volcanic coarse ash. Thin layer and patches of olive black fine volcanic ash, black spots (pyrite?) and whit spicule tubes (rare) are contained in silty clay intervals.
GRA density (g/cm³)
Magnetic susceptibility (×10⁻³ SI)
P-wave velocity (m/s)
Electrical resistivity (Ωm)
NGR [CPS]: MSCL-W
graphic representation
1.00
1.50
0.00
500.00
1000
1500
0
2
4
0.000
10.000
20.000
26.400
26.600
26.800
27.000
27.200
27.400
27.600
27.800
28.000
28.200
28.400
28.600
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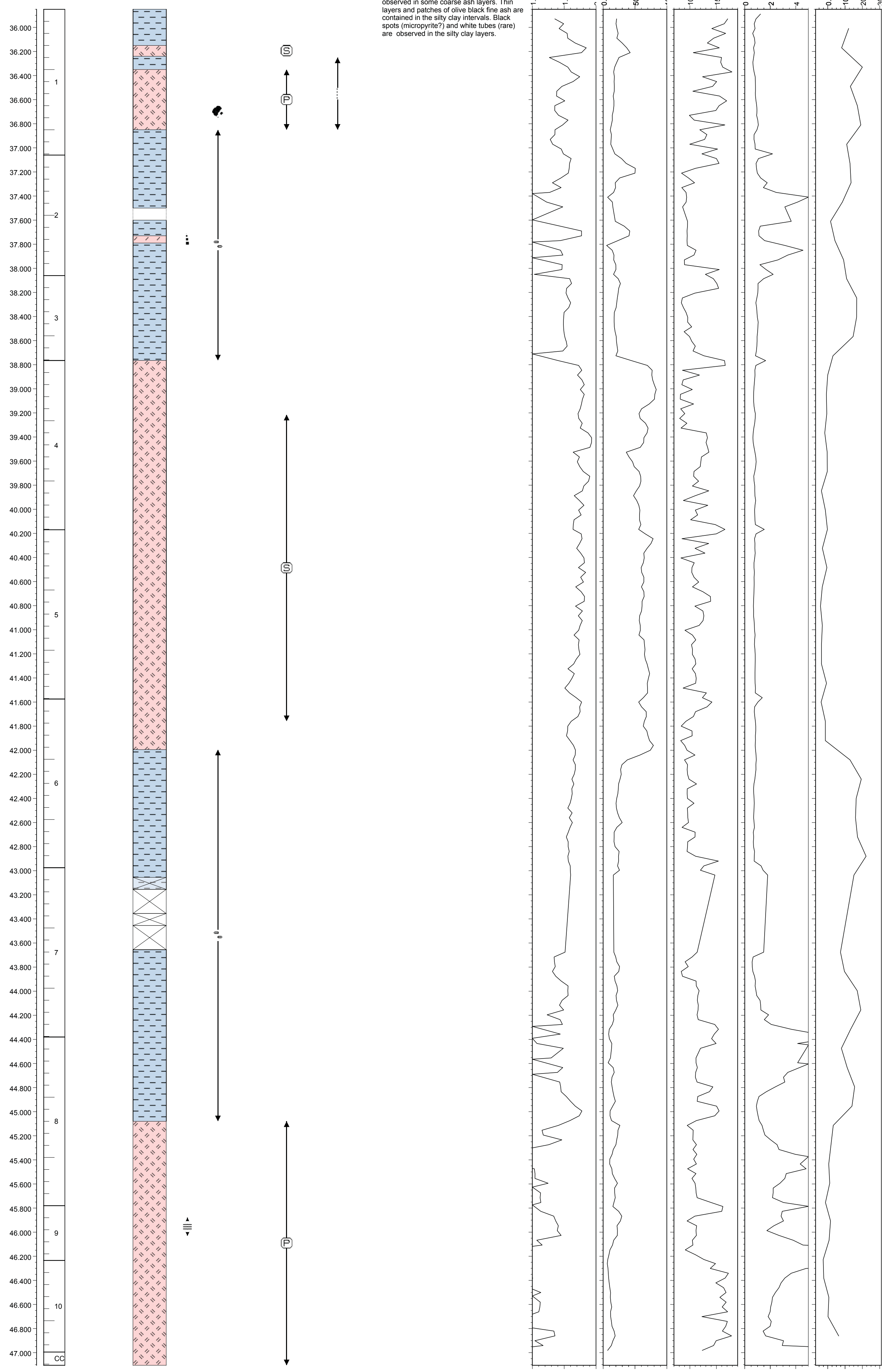
35.400
35.600
35.800
36.000
36.200
36.400
36.600
36.800
1
2
3
4
5
6
7
8
CC
P
S
S
S

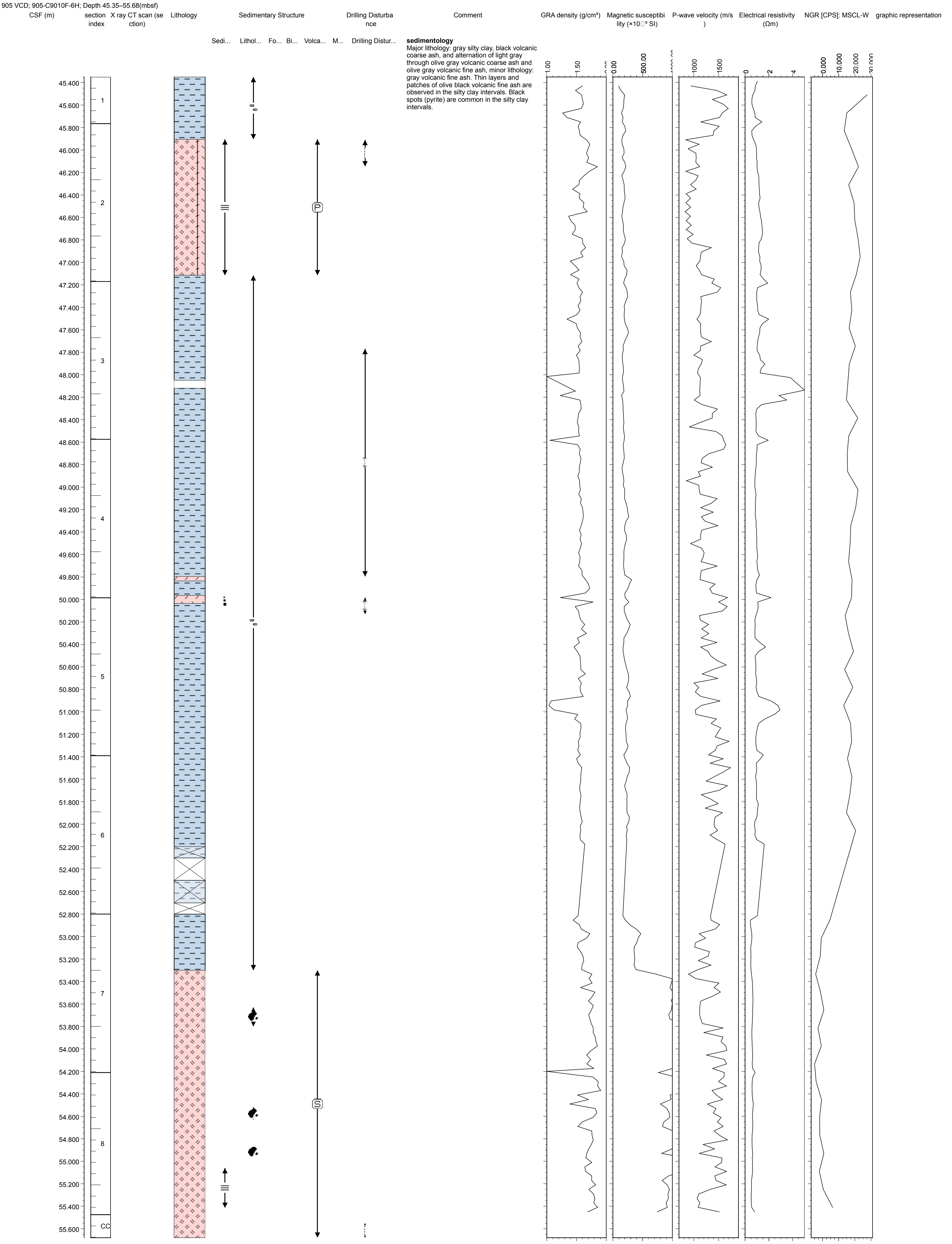
905 VCD; 905-C9010F-5H; Depth 35.85–47.11(mbsf)

CSF (m)	section index	X ray CT scan (section)	Lithology	Sedimentary Structure	Drilling Disturbance	Comment	GRA density (g/cm³)	Magnetic susceptibility (×10⁻³ SI)	P-wave velocity (m/s)	Electrical resistivity (Ωm)	NGR [CPS]: MSCL-W	graphic representation
				Sedi... Lithol... Fo... Bi... Volca... M...	Drilling Distur...							

sedimentology
Major lithology: gray silty clay, black sandy ash, light gray through gray volcanic coarse ash. Gradings and parallel beddings are observed in some coarse ash layers. Thin layers and patches of olive black fine ash are contained in the silty clay intervals. Black spots (micropyrite?) and white tubes (rare) are observed in the silty clay layers.



905 VCD; 905-C9010F-6H; Depth 45.35–55.68(mbsf)



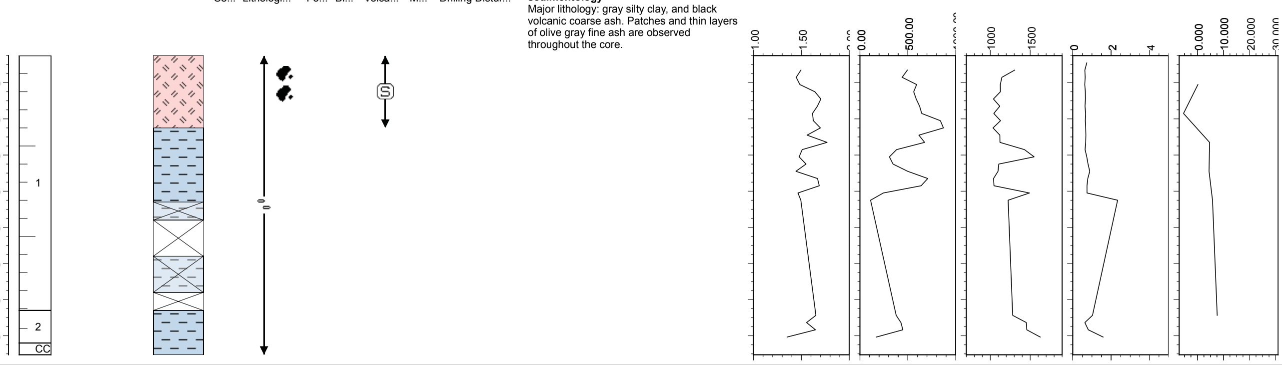
sedimentology
Major lithology: gray silty clay, black volcanic coarse ash, and alternation of light gray through olive gray volcanic coarse ash and olive gray volcanic fine ash, minor lithology: gray volcanic fine ash. Thin layers and patches of olive black volcanic fine ash are observed in the silty clay intervals. Black spots (pyrite) are common in the silty clay intervals.

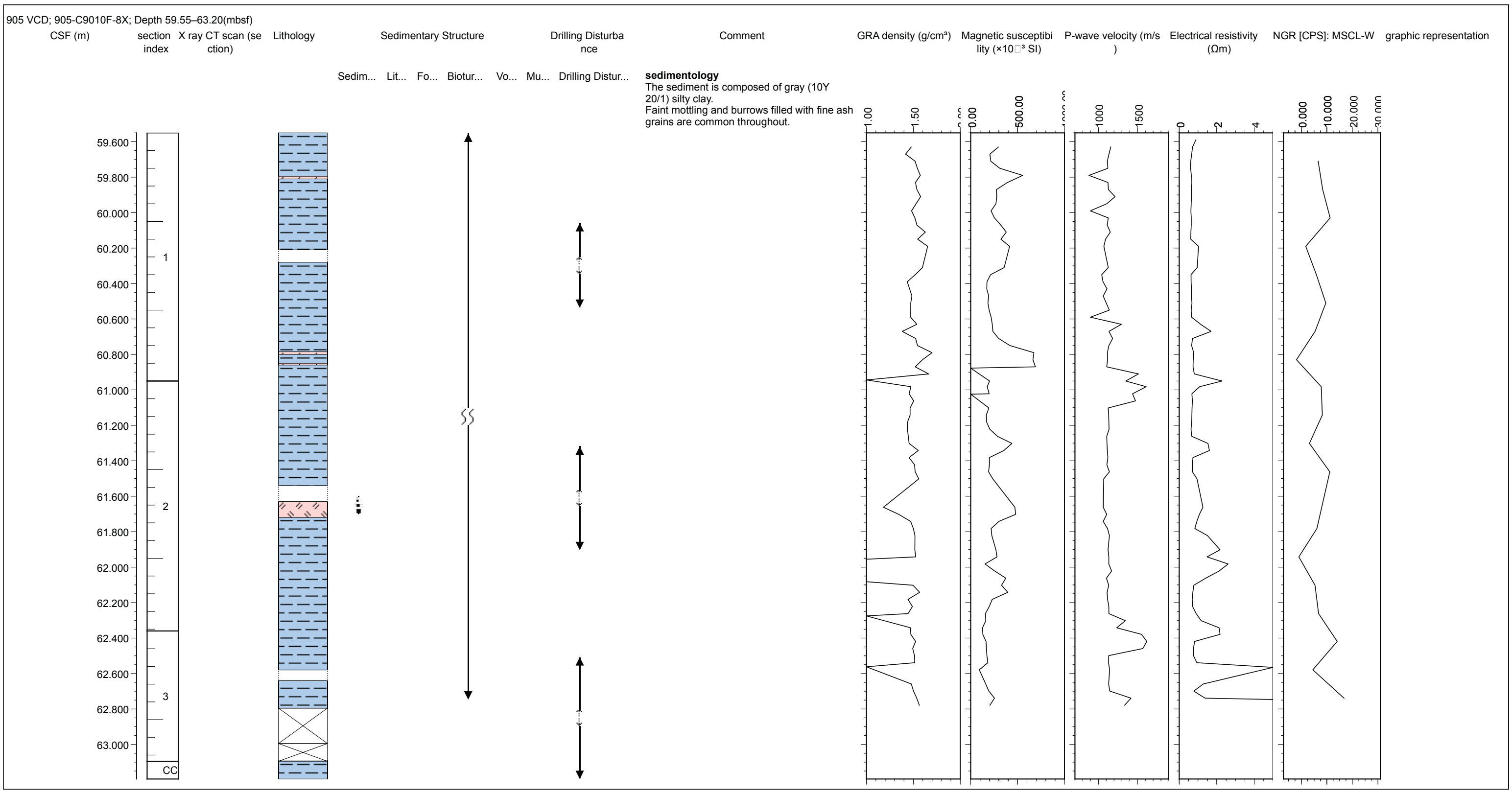
905 VCD; 905-C9010F-7X; Depth 54.85–56.51(mbsf)

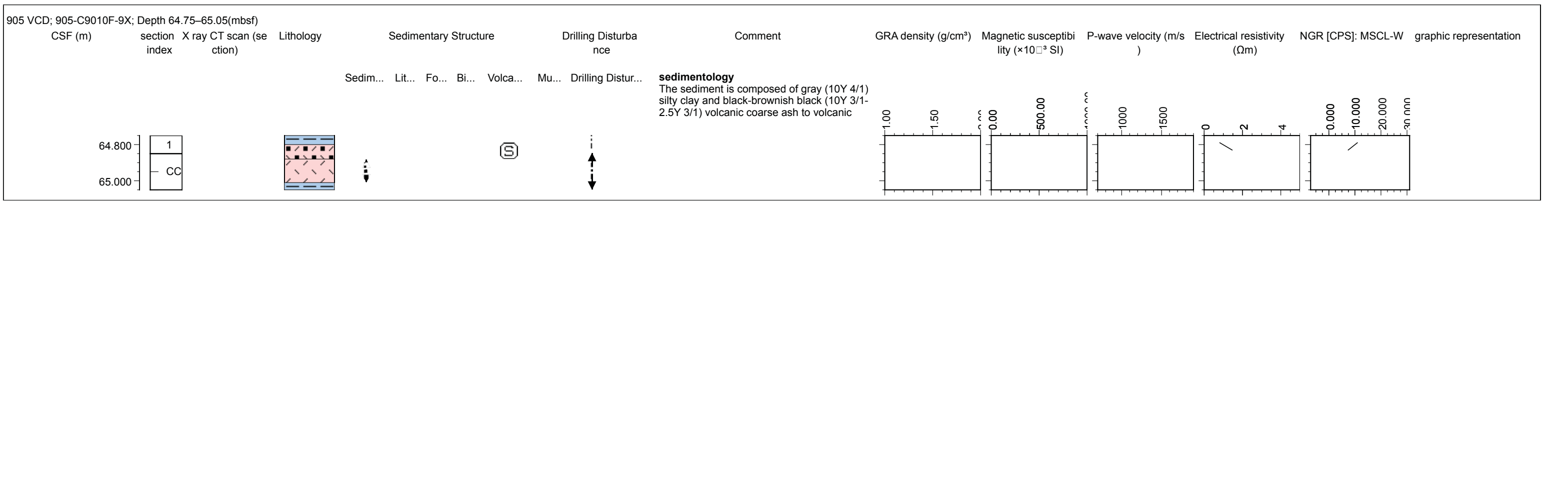
CSF (m) | section index | X ray CT scan (section) | Lithology | Sedimentary Structure | Drilling Disturbance | Comment | GRA density (g/cm³) | Magnetic susceptibility (×10⁻³ SI) | P-wave velocity (m/s) | Electrical resistivity (Ωm) | NGR [CPS]: MSCL-W | graphic representation

Se... Lithologi... Fo... Bi... Volca... M... Drilling Distur...

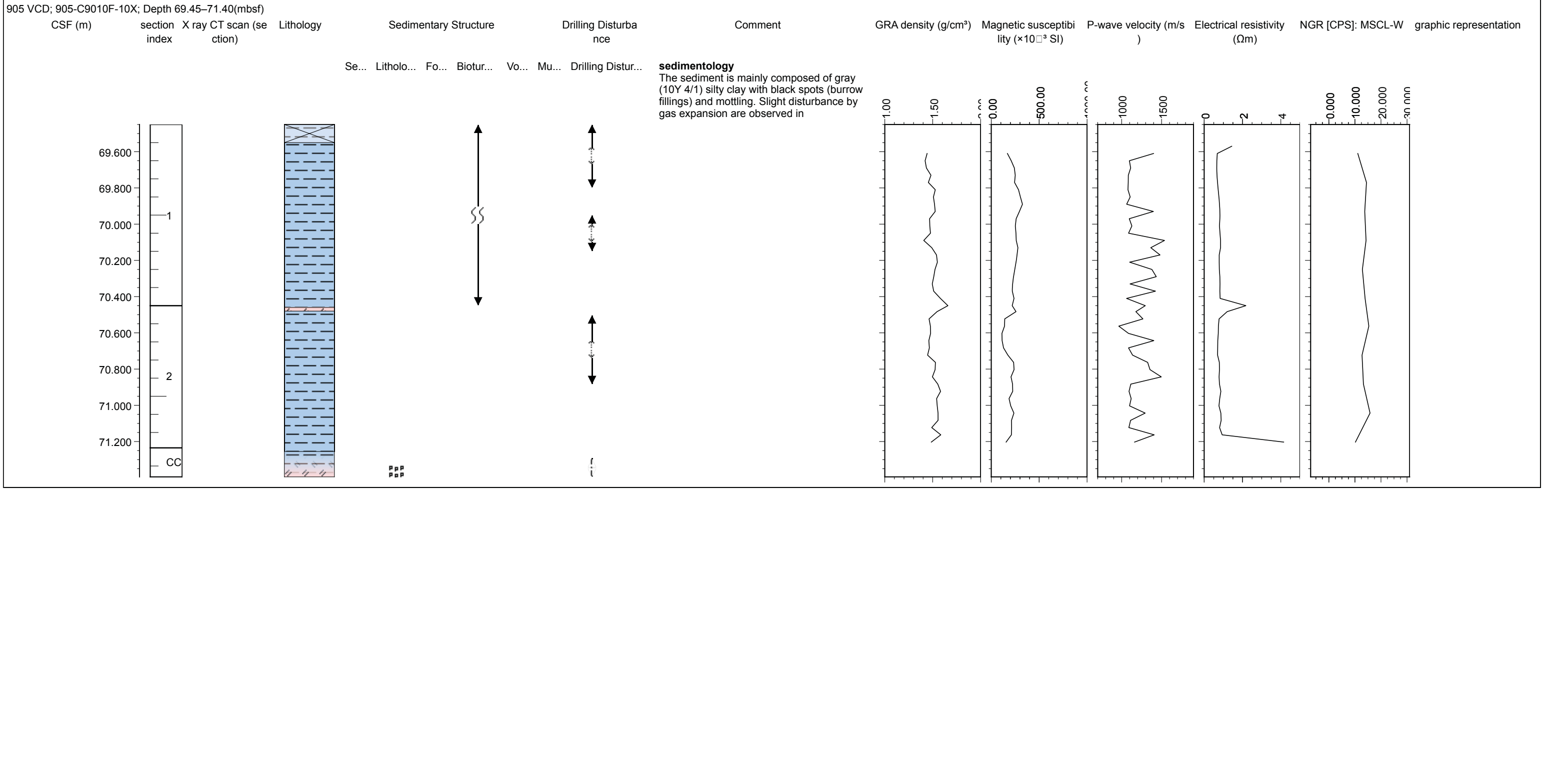
sedimentology
Major lithology: gray silty clay, and black volcanic coarse ash. Patches and thin layers of olive gray fine ash are observed throughout the core.




905 VCD; 905-C9010F-8X; Depth 59.55–63.20(mbsf)
CSF (m)
section index
X ray CT scan (section)
Lithology
Sedimentary Structure
Drilling Disturbance
Comment
GRA density (g/cm³)
Magnetic susceptibility (×10□³ SI)
P-wave velocity (m/s)
Electrical resistivity (Ωm)
NGR [CPS]: MSCL-W
graphic representation
Sedim... Lit... Fo... Biotur... Vo... Mu... Drilling Distur...
sedimentology
The sediment is composed of gray (10Y 20/1) silty clay.
Faint mottling and burrows filled with fine ash grains are common throughout.
59.600
59.800
60.000
60.200
60.400
60.600
60.800
61.000
61.200
61.400
61.600
61.800
62.000
62.200
62.400
62.600
62.800
63.000
1
2
3
CC
1.00
1.50
0.00
500.00
1000
1500
0
2
4
0.000
10.000
20.000

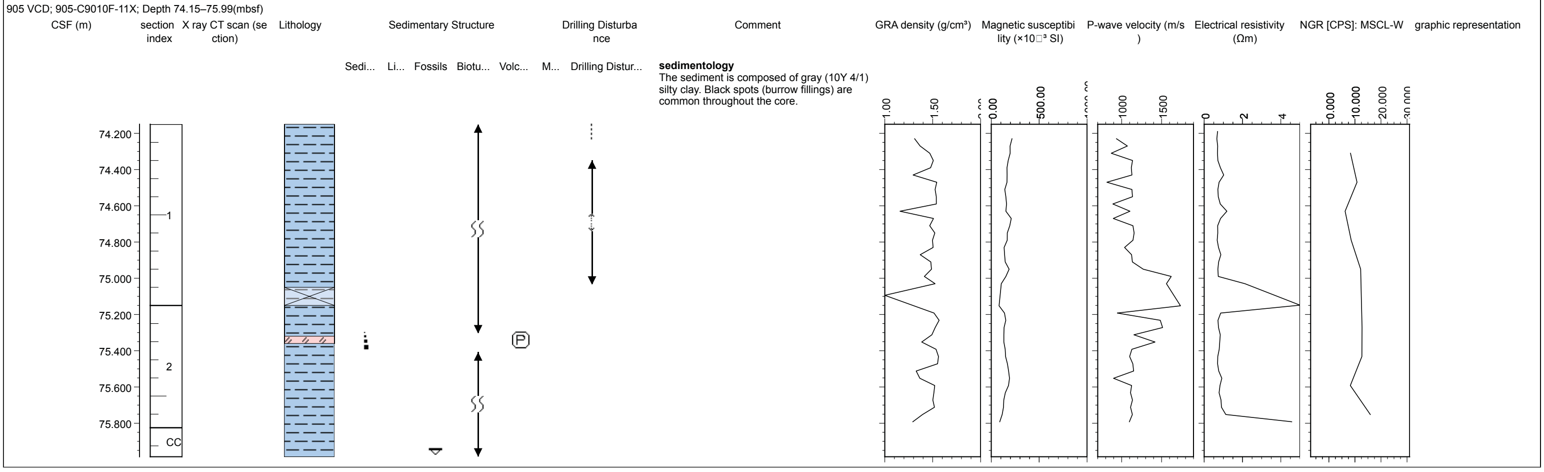

905 VCD; 905-C9010F-9X; Depth 64.75–65.05(mbsf)
CSF (m)
section index
X ray CT scan (section)
Lithology
Sedimentary Structure
Drilling Disturbance
Comment
GRA density (g/cm³)
Magnetic susceptibility (×10⁻³ SI)
P-wave velocity (m/s)
Electrical resistivity (Ωm)
NGR [CPS]: MSCL-W
graphic representation
Sedim...
Lit...
Fo...
Bi...
Volca...
Mu...
Drilling Distur...
sedimentology
The sediment is composed of gray (10Y 4/1) silty clay and black-brownish black (10Y 3/1-2.5Y 3/1) volcanic coarse ash to volcanic
64.800
65.000
1
CC
1.00
1.50
0.00
500.00
1000
1500
0
2
4
0.000
10.000
20.000

905 VCD; 905-C9010F-10X; Depth 69.45–71.40(mbsf)



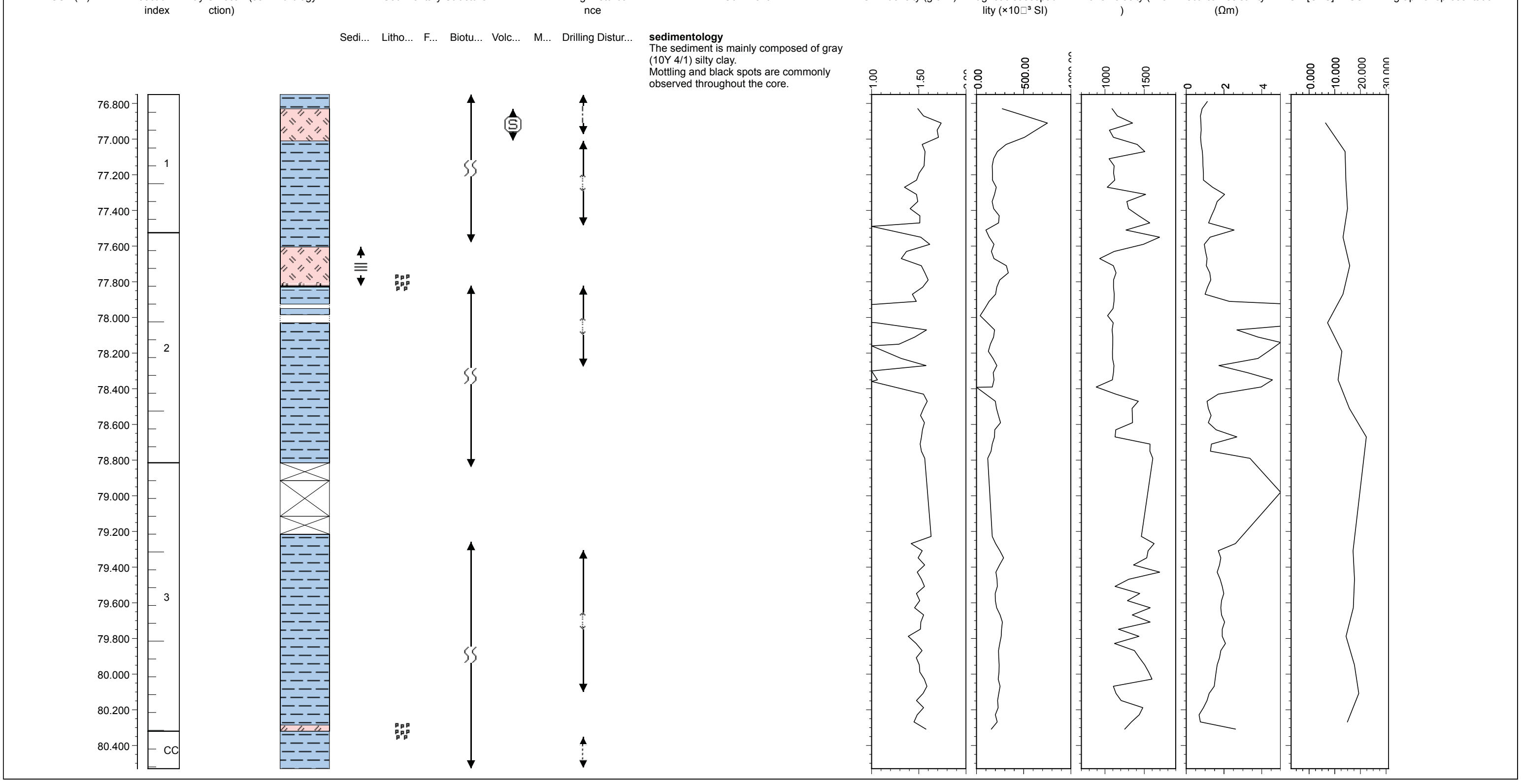
sedimentology
The sediment is mainly composed of gray (10Y 4/1) silty clay with black spots (burrow fillings) and mottling. Slight disturbance by gas expansion are observed in

905 VCD; 905-C9010F-11X; Depth 74.15–75.99(mbsf)



sedimentology
The sediment is composed of gray (10Y 4/1) silty clay. Black spots (burrow fillings) are common throughout the core.

905 VCD; 905-C9010F-12H; Depth 76.75–80.53(mbsf)

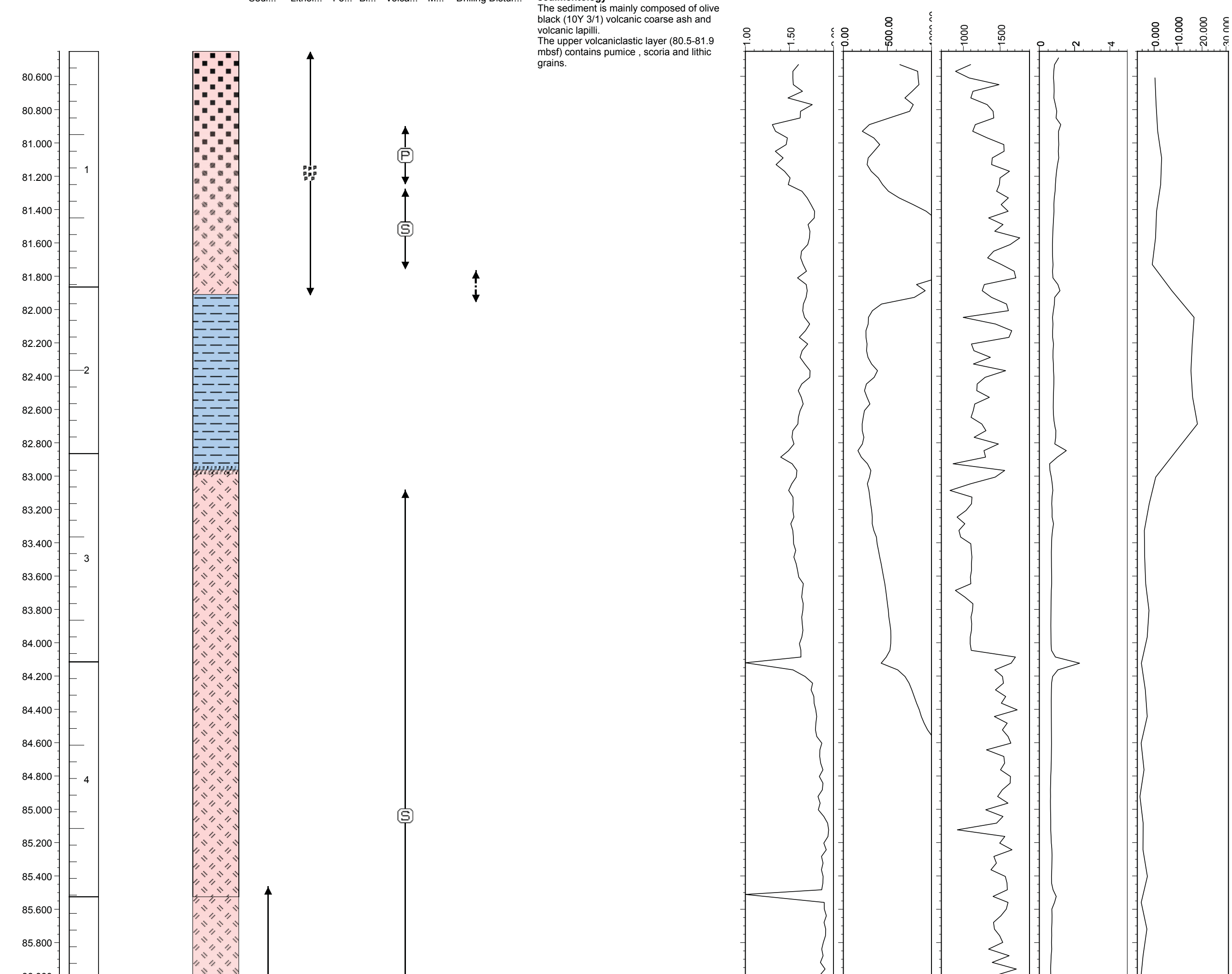


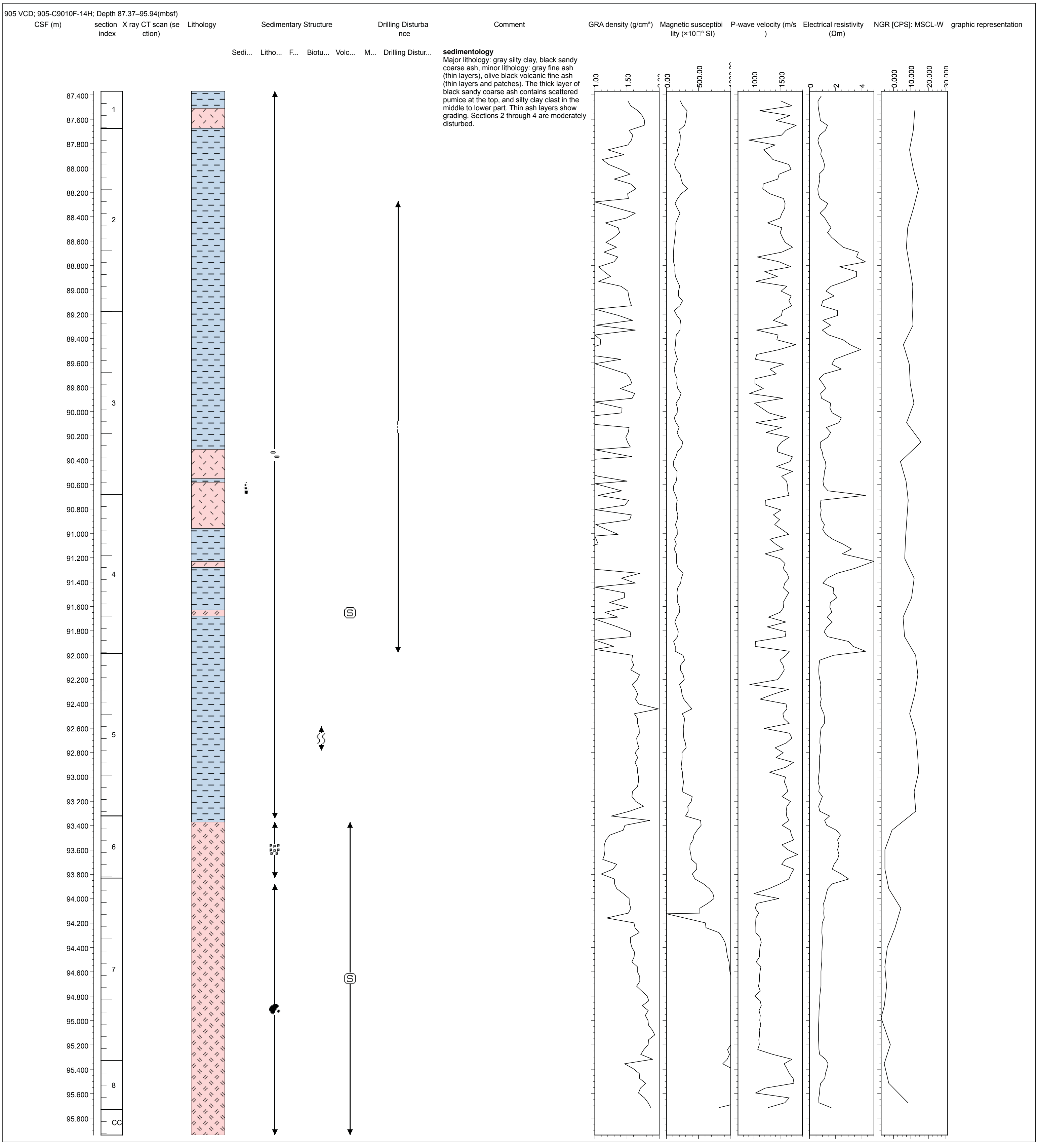
sedimentology
The sediment is mainly composed of gray (10Y 4/1) silty clay.
Mottling and black spots are commonly observed throughout the core.

905 VCD; 905-C9010F-13H; Depth 80.45–87.00(mbsf)

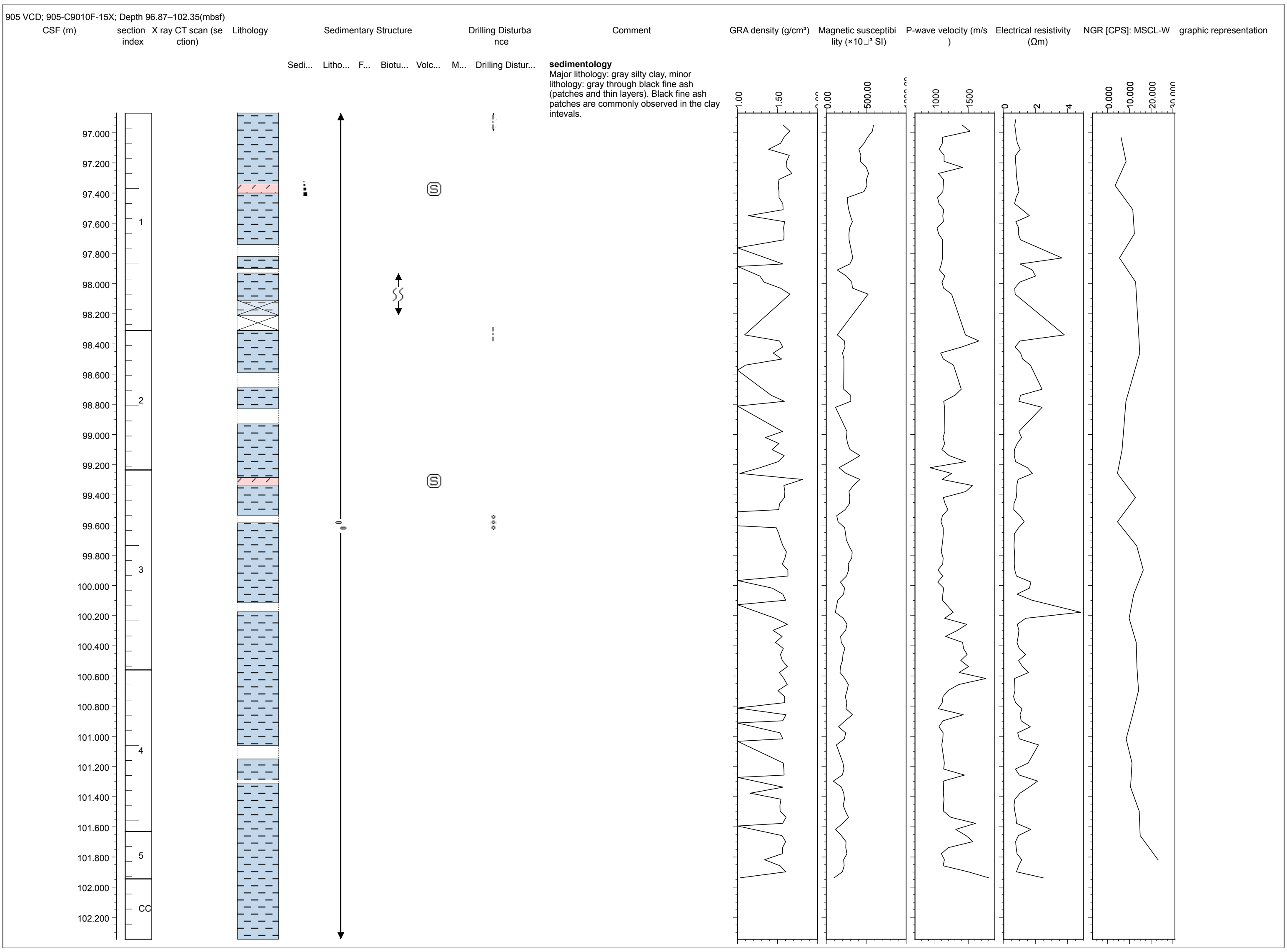
CSF (m)	section index	X ray CT scan (section)	Lithology	Sedimentary Structure	Drilling Disturbance	Comment	GRA density (g/cm³)	Magnetic susceptibility (×10⁻⁵ SI)	P-wave velocity (m/s)	Electrical resistivity (Ωm)	NGR [CPS]: MSCL-W	graphic representation
				Sedi... Lithol... Fo... Bi... Volca... M...	Drilling Distur...							

sedimentology
The sediment is mainly composed of olive black (10Y 3/1) volcanic coarse ash and volcanic lapilli.
The upper volcaniclastic layer (80.5-81.9 mbsf) contains pumice , scoria and lithic grains.




905 VCD; 905-C9010F-14H; Depth 87.37–95.94(mbsf)
CSF (m)
section index
X ray CT scan (section)
Lithology
Sedimentary Structure
Drilling Disturbance
Comment
GRA density (g/cm³)
Magnetic susceptibility (×10⁻³ SI)
P-wave velocity (m/s)
Electrical resistivity (Ωm)
NGR [CPS]: MSCL-W
graphic representation
Sedi...
Litho...
F...
Biotu...
Volc...
M...
Drilling Distur...
sedimentology
Major lithology: gray silty clay, black sandy coarse ash, minor lithology: gray fine ash (thin layers), olive black volcanic fine ash (thin layers and patches). The thick layer of black sandy coarse ash contains scattered pumice at the top, and silty clay clast in the middle to lower part. Thin ash layers show grading. Sections 2 through 4 are moderately disturbed.
87.400
87.600
87.800
88.000
88.200
88.400
88.600
88.800
89.000
89.200
89.400
89.600
89.800
90.000
90.200
90.400
90.600
90.800
91.000
91.200
91.400
91.600
91.800
92.000
92.200
92.400
92.600
92.800
93.000
93.200
93.400
93.600
93.800
94.000
94.200
94.400
94.600
94.800
95.000
95.200
95.400
95.600
95.800
1
2
3
4
5
6
7
8
CC
1.00
1.50
0.00
500.00
1000
1500
0
2
4
0.000
10.000
20.000

905 VCD; 905-C9010F-15X; Depth 96.87–102.35(mbsf)

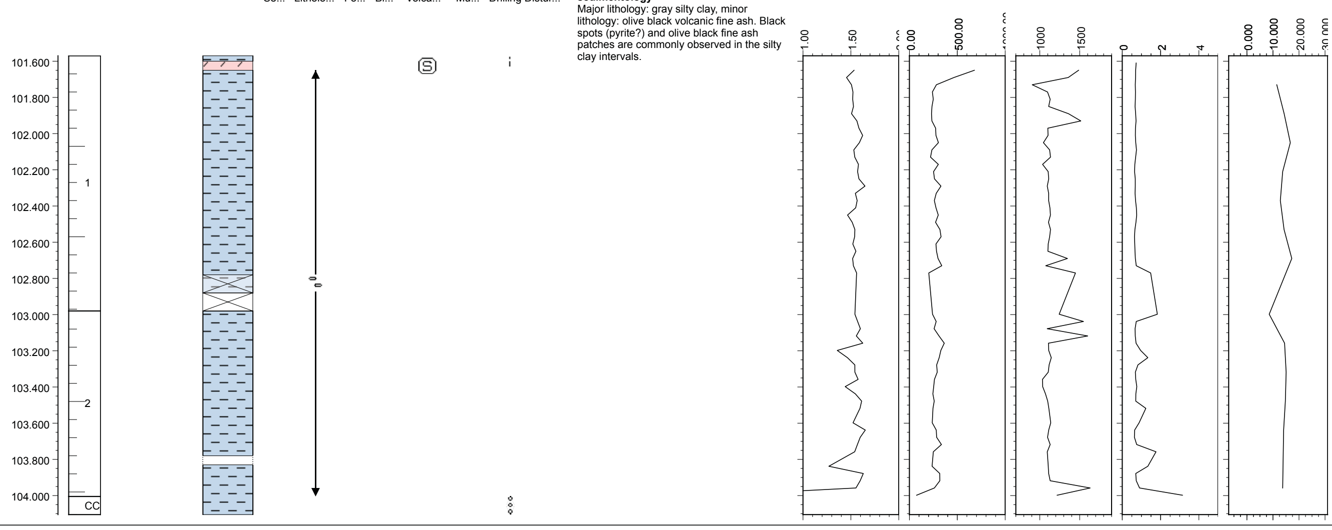


905 VCD; 905-C9010F-16X; Depth 101.57–104.11(mbsf)

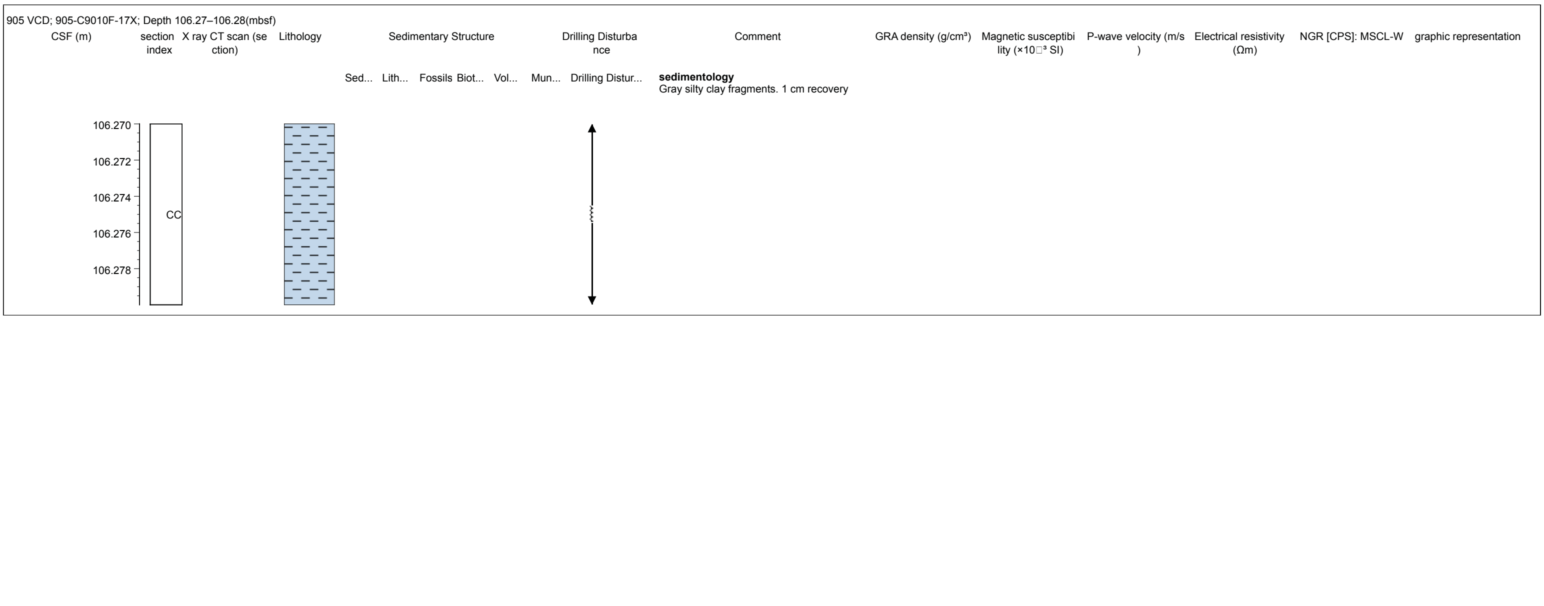
CSF (m)	section index	X ray CT scan (section)	Lithology	Sedimentary Structure	Drilling Disturbance	Comment	GRA density (g/cm³)	Magnetic susceptibility (×10⁻⁵ SI)	P-wave velocity (m/s)	Electrical resistivity (Ωm)	NGR [CPS]: MSCL-W	graphic representation

Se... Litholo... Fo... Bi... Volca... Mu... Drilling Distur...

sedimentology
Major lithology: gray silty clay, minor lithology: olive black volcanic fine ash. Black spots (pyrite?) and olive black fine ash patches are commonly observed in the silty clay intervals.



905 VCD; 905-C9010F-17X; Depth 106.27–106.28(mbsf)



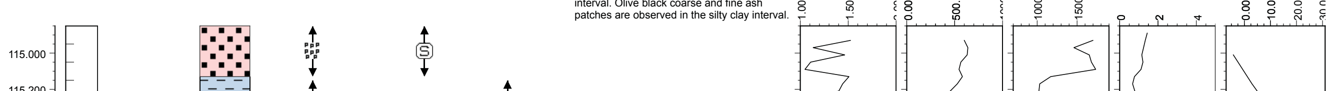
sedimentology
Gray silty clay fragments. 1 cm recovery

905 VCD; 905-C9010F-19X; Depth 114.85–115.72(mbsf)

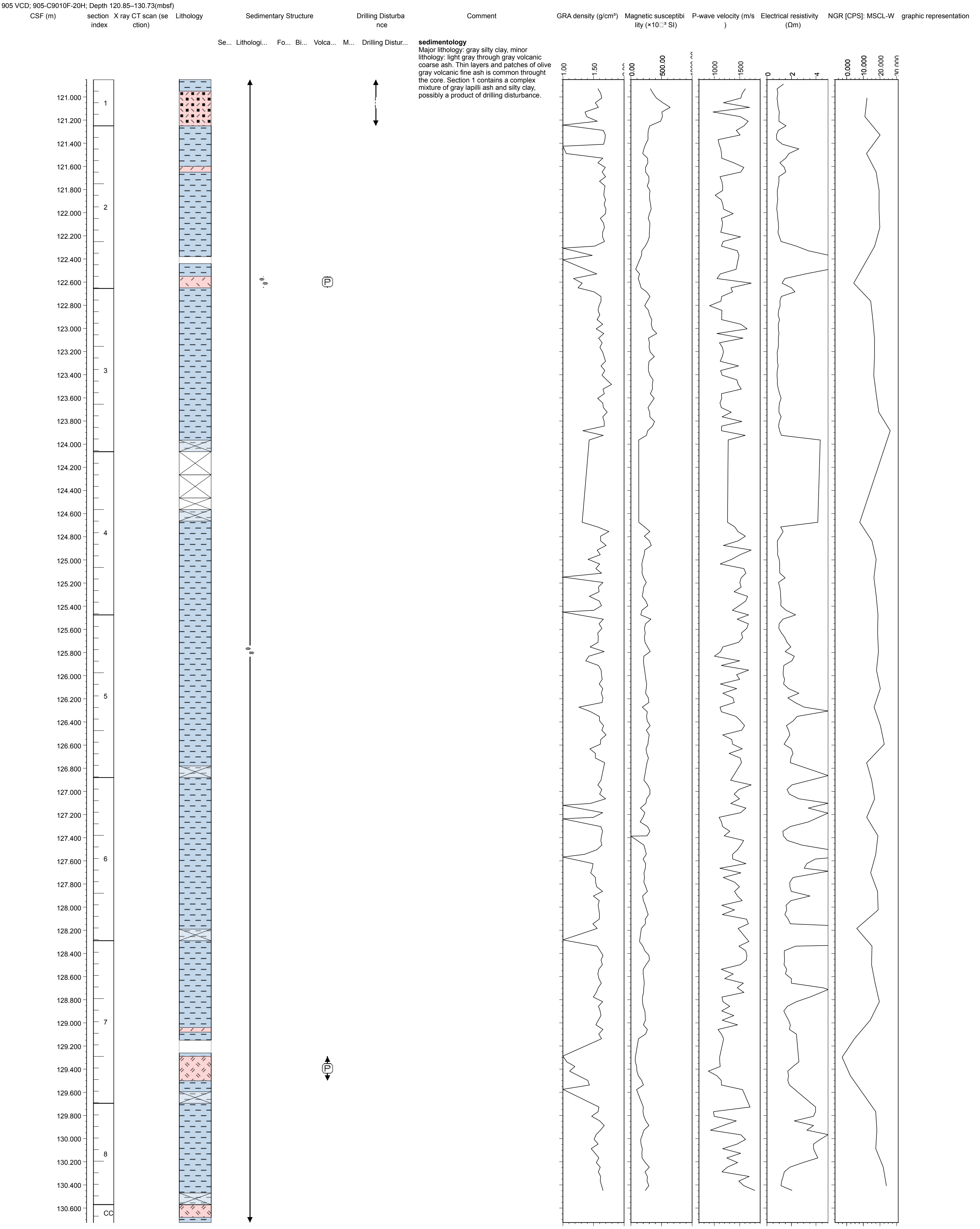
CSF (m)	section index	X ray CT scan (section)	Lithology	Sedimentary Structure	Drilling Disturbance	Comment	GRA density (g/cm³)	Magnetic susceptibility (×10□³ SI)	P-wave velocity (m/s)	Electrical resistivity (Ωm)	NGR [CPS]: MSCL-W	graphic representation

Se... Litholo... Fo... Bi... Volca... Mu... Drilling Distur...

sedimentology
Major lithology: gray silty clay, black lapilli. Pumice grains are scattered in the lapilli interval. Olive black coarse and fine ash patches are observed in the silty clay interval.



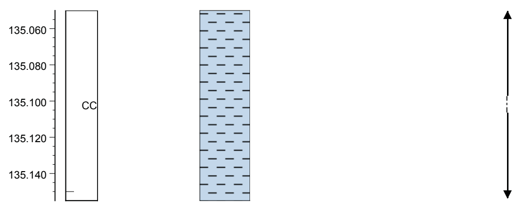
905 VCD; 905-C9010F-20H; Depth 120.85–130.73(mbsf)



sedimentology
Major lithology: gray silty clay, minor lithology: light gray through gray volcanic coarse ash. Thin layers and patches of olive gray volcanic fine ash is common throught the core. Section 1 contains a complex mixture of gray lapilli ash and silty clay, possibly a product of drilling disturbance.

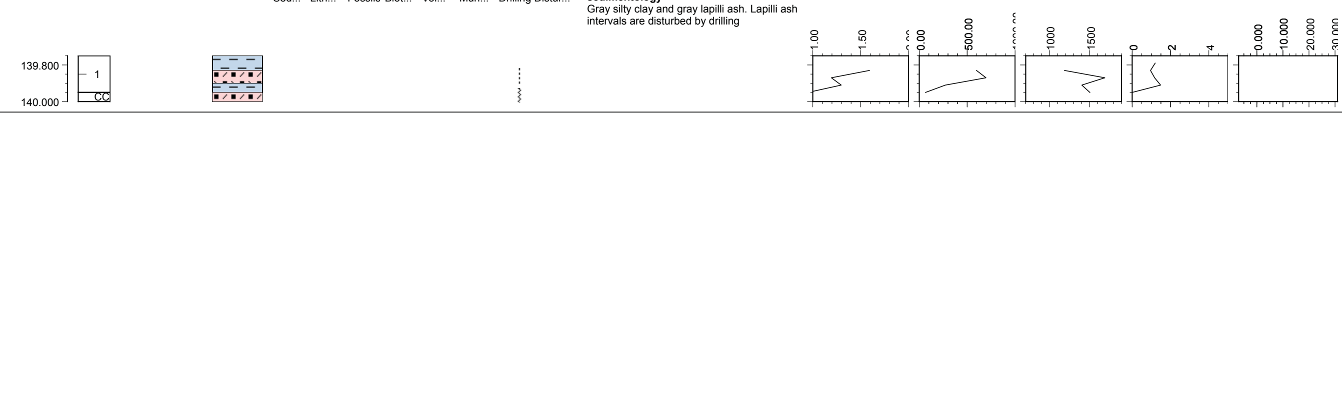
905 VCD; 905-C9010F-22X; Depth 135.05–135.16(mbsf)

CSF (m)	section index	X ray	CT scan (section)	Lithology	Sedimentary Structure						Drilling Disturbance	Comment	GRA density (g/cm³)	Magnetic susceptibility (×10⁻³ SI)	P-wave velocity (m/s)	Electrical resistivity (Ωm)	NGR [CPS]: MSCL-W	graphic representation
					Sed...	Lith...	Fossils	Biot...	Vol...	Mun...	Drilling Distur...	**sedimentology** Gray silty clay. Moderately disturbed						



905 VCD; 905-C9010F-23X; Depth 139.75–140.00(mbsf)

CSF (m)	section index	X ray CT scan (section)	Lithology	Sedimentary Structure	Drilling Disturbance	Comment	GRA density (g/cm³)	Magnetic susceptibility (×10⁻³ SI)	P-wave velocity (m/s)	Electrical resistivity (Ωm)	NGR [CPS]: MSCL-W	graphic representation
				Sed... Lith... Fossils Biot... Vol... Mun...	Drilling Distur...	**sedimentology** Gray silty clay and gray lapilli ash. Lapilli ash intervals are disturbed by drilling						

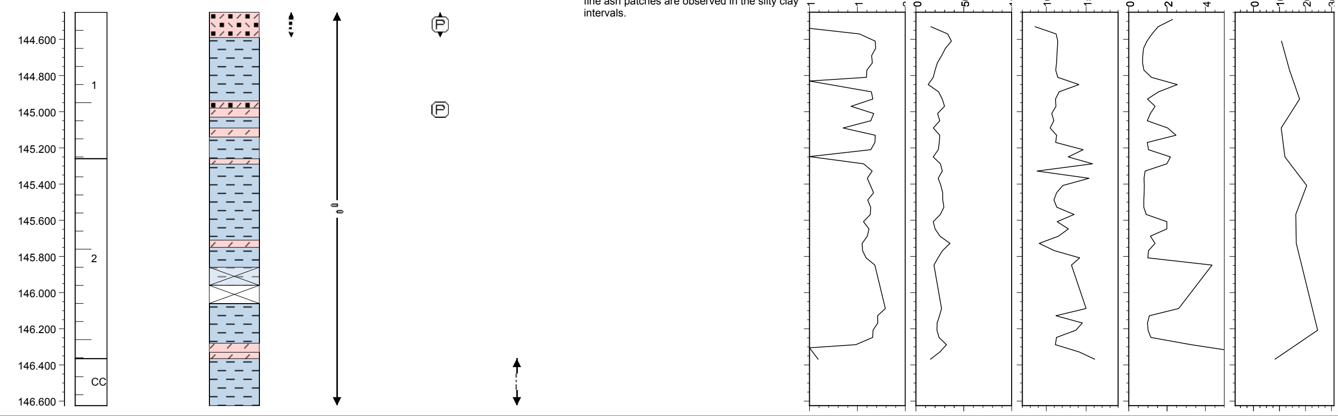


905 VCD; 905-C9010F-24X; Depth 144.45–146.63(mbsf)

CSF (m) | section index | X ray CT scan (section) | Lithology | Sedimentary Structure | Drilling Disturbance | Comment | GRA density (g/cm³) | Magnetic susceptibility (×10⁻³ SI) | P-wave velocity (m/s) | Electrical resistivity (Ωm) | NGR [CPS]: MSCL-W | graphic representation

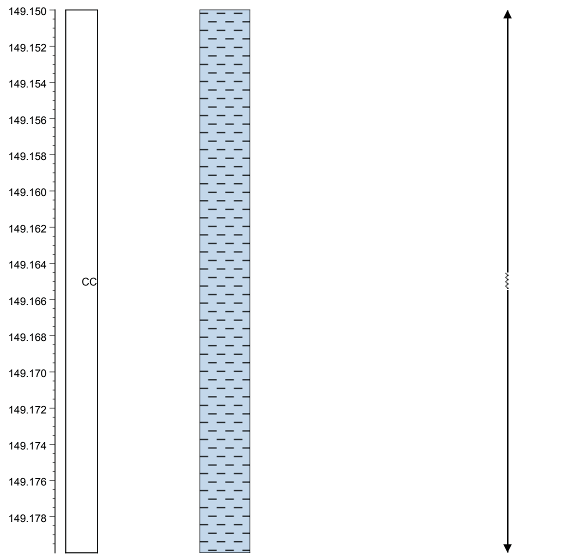
Sedi... Lithol... Fo... Bi... Volca... M... Drilling Distur...

sedimentology
Major lithology: gray silty clay, minor lithology: light gray through olive gray lapilli ash, olive black black fine ash. Olive black fine ash patches are observed in the silty clay intervals.



905 VCD; 905-C9010F-25X; Depth 149.15–149.18(mbsf)

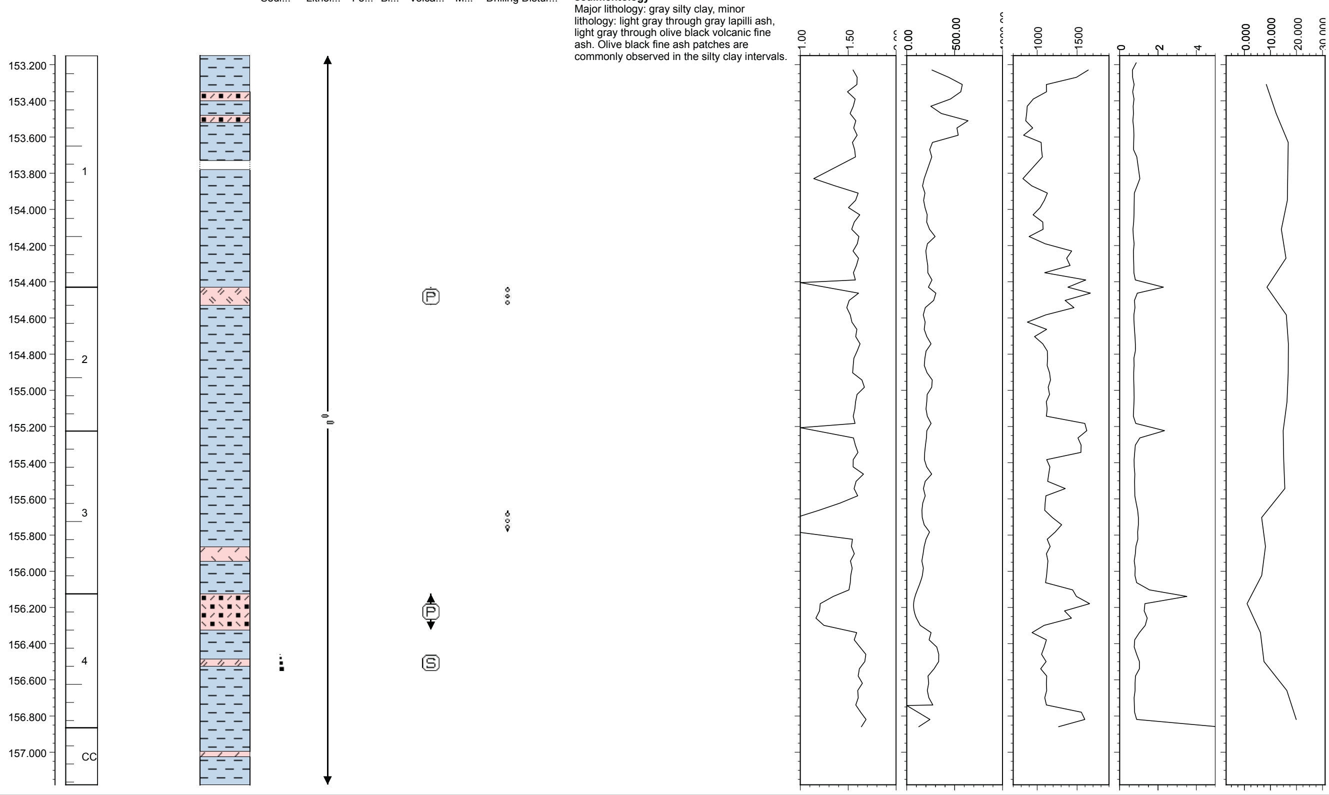
CSF (m)	section index	X ray CT scan (section)	Lithology	Sedimentary Structure	Drilling Disturbance	Comment	GRA density (g/cm³)	Magnetic susceptibility (×10⁻³ SI)	P-wave velocity (m/s)	Electrical resistivity (Ωm)	NGR [CPS]: MSCL-W	graphic representation
				Sed... Lith... Fossils Biot... Vol... Mun...	Drilling Distur...	**sedimentology** Gray silty clay. Heavily disturbed						

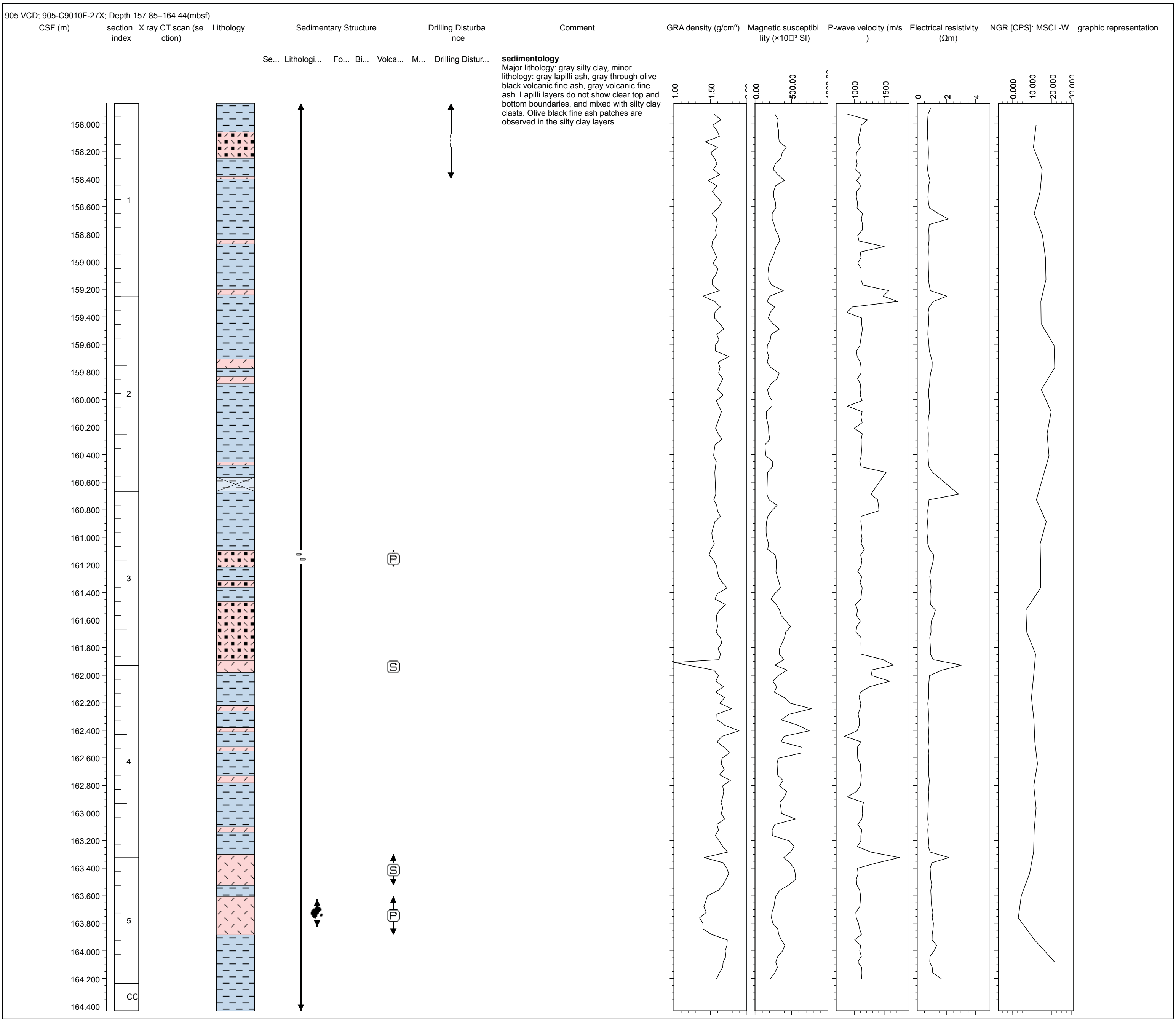


905 VCD; 905-C9010F-26X; Depth 153.15–157.18(mbsf)

CSF (m)	section index	X ray CT scan (section)	Lithology	Sedimentary Structure						Drilling Disturbance	Comment	GRA density (g/cm³)	Magnetic susceptibility (×10⁻³ SI)	P-wave velocity (m/s)	Electrical resistivity (Ωm)	NGR [CPS]: MSCL-W	graphic representation
				Sedi...	Lithol...	Fo...	Bi...	Volca...	M...	Drilling Distur...							

sedimentology
Major lithology: gray silty clay, minor lithology: light gray through gray lapilli ash, light gray through olive black volcanic fine ash. Olive black fine ash patches are commonly observed in the silty clay intervals.

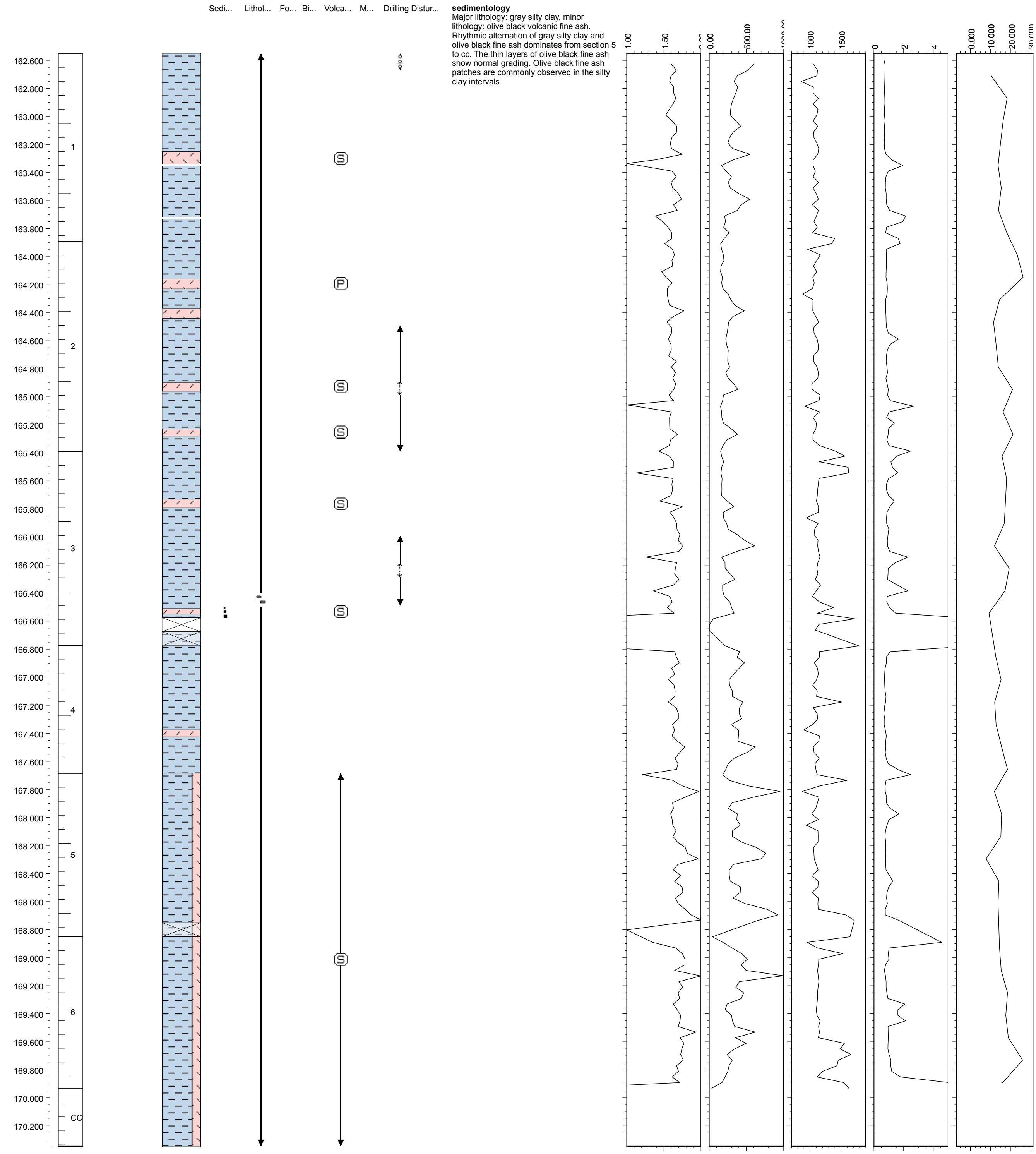



905 VCD; 905-C9010F-27X; Depth 157.85–164.44(mbsf)
CSF (m)
section index
X ray CT scan (section)
Lithology
Sedimentary Structure
Drilling Disturbance
Comment
GRA density (g/cm³)
Magnetic susceptibility (×10⁻³ SI)
P-wave velocity (m/s)
Electrical resistivity (Ωm)
NGR [CPS]: MSCL-W
graphic representation
Se... Lithologi... Fo... Bi... Volca... M... Drilling Distur...
sedimentology
Major lithology: gray silty clay, minor lithology: gray lapilli ash, gray through olive black volcanic fine ash, gray volcanic fine ash. Lapilli layers do not show clear top and bottom boundaries, and mixed with silty clay clasts. Olive black fine ash patches are observed in the silty clay layers.
158.000
158.200
158.400
158.600
158.800
159.000
159.200
159.400
159.600
159.800
160.000
160.200
160.400
160.600
160.800
161.000
161.200
161.400
161.600
161.800
162.000
162.200
162.400
162.600
162.800
163.000
163.200
163.400
163.600
163.800
164.000
164.200
164.400
1
2
3
4
5
CC
1.00
1.50
0.00
500.00
1000
1500
0
2
4
0.000
10.000
20.000

905 VCD; 905-C9010F-28X; Depth 162.55–170.35(mbsf)

CSF (m)	section index	X ray CT scan (section)	Lithology	Sedimentary Structure	Drilling Disturbance	Comment	GRA density (g/cm³)	Magnetic susceptibility (×10⁻³ SI)	P-wave velocity (m/s)	Electrical resistivity (Ωm)	NGR [CPS]: MSCL-W	graphic representation

sedimentology
Major lithology: gray silty clay, minor lithology: olive black volcanic fine ash. Rhythmic alternation of gray silty clay and olive black fine ash dominates from section 5 to cc. The thin layers of olive black fine ash show normal grading. Olive black fine ash patches are commonly observed in the silty clay intervals.

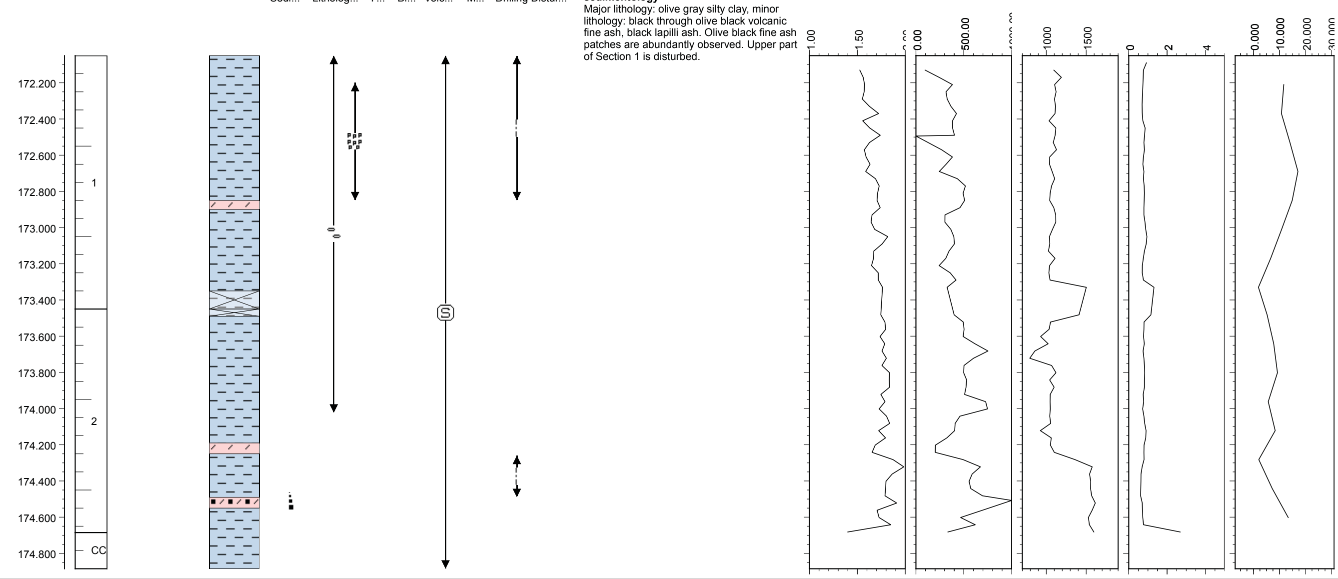


905 VCD; 905-C9010F-29X; Depth 172.05–174.89(mbsf)

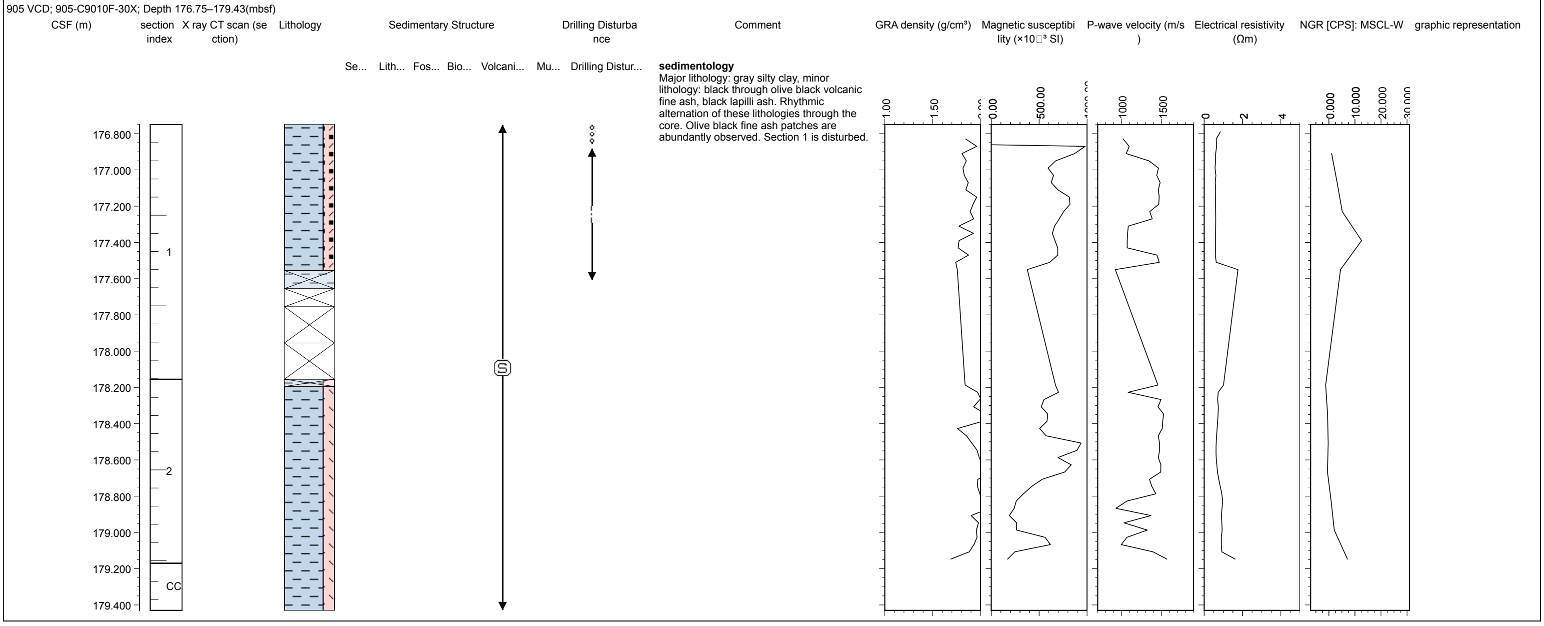
CSF (m)	section index	X ray CT scan (section)	Lithology	Sedimentary Structure	Drilling Disturbance	Comment	GRA density (g/cm³)	Magnetic susceptibility (×10⁻³ SI)	P-wave velocity (m/s)	Electrical resistivity (Ωm)	NGR [CPS]: MSCL-W	graphic representation

Sedi... Litholog... F... Bi... Volc... M... Drilling Distur...

sedimentology
Major lithology: olive gray silty clay, minor lithology: black through olive black volcanic fine ash, black lapilli ash. Olive black fine ash patches are abundantly observed. Upper part of Section 1 is disturbed.

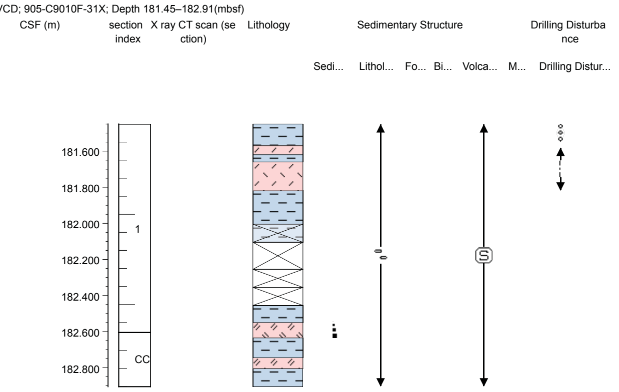


905 VCD; 905-C9010F-30X; Depth 176.75–179.43(mbsf)



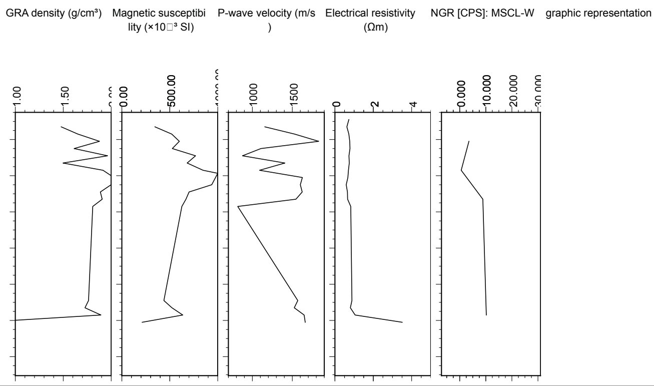
sedimentology
Major lithology: gray silty clay, minor lithology: black through olive black volcanic fine ash, black lapilli ash. Rhythmic alternation of these lithologies through the core. Olive black fine ash patches are abundantly observed. Section 1 is disturbed.

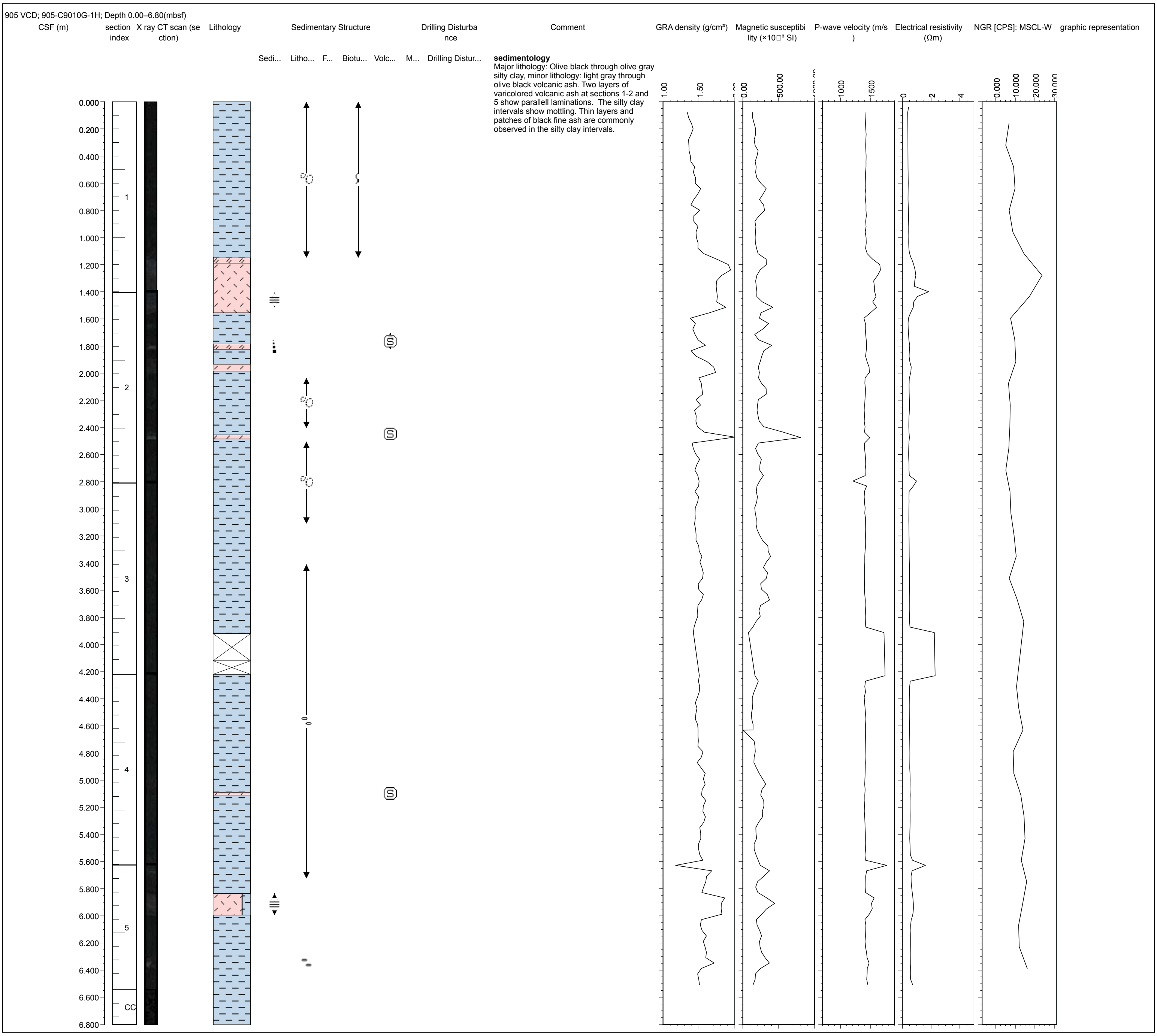
905 VCD; 905-C9010F-31X; Depth 181.45–182.91(mbsf)



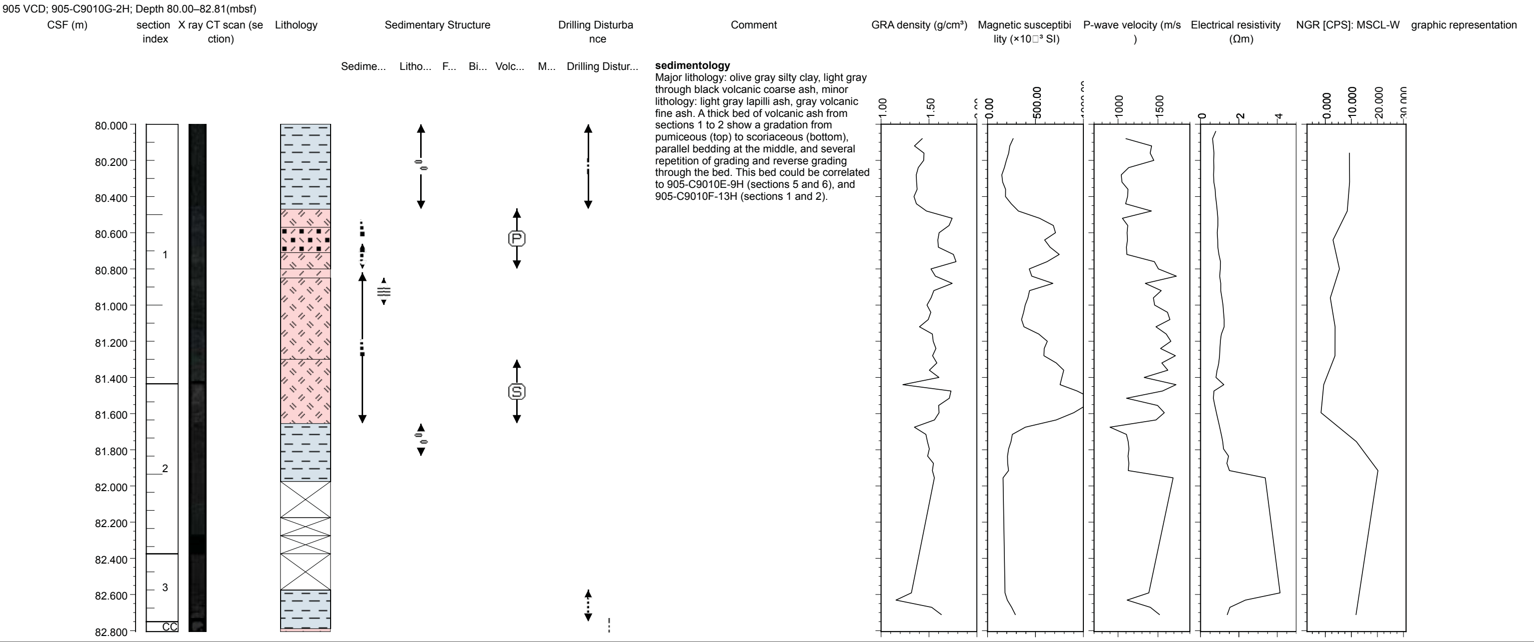
Comment

sedimentology
Major lithology: olive black silty clay, minor lithology: black volcanic fine ash, olive black volcanic coarse ash. Olive black fine ash patches are commonly observed through the core.




905 VCD; 905-C9010G-1H; Depth 0.00–6.80(mbsf)
CSF (m)
section index
X ray CT scan (section)
Lithology
Sedimentary Structure
Sedi... Litho... F... Biotu... Volc... M...
Drilling Disturbance
Drilling Distur...
Comment
sedimentology
Major lithology: Olive black through olive gray silty clay, minor lithology: light gray through olive black volcanic ash. Two layers of varicolored volcanic ash at sections 1-2 and 5 show parallell laminations. The silty clay intervals show mottling. Thin layers and patches of black fine ash are commonly observed in the silty clay intervals.
GRA density (g/cm³)
Magnetic susceptibility (×10⁻⁵ SI)
P-wave velocity (m/s)
Electrical resistivity (Ωm)
NGR [CPS]: MSCL-W
graphic representation
1.00
1.50
0.00
500.00
1000
1500
0
2
4
0.000
10.000
20.000
0.000
0.200
0.400
0.600
0.800
1.000
1.200
1.400
1.600
1.800
2.000
2.200
2.400
2.600
2.800
3.000
3.200
3.400
3.600
3.800
4.000
4.200
4.400
4.600
4.800
5.000
5.200
5.400
5.600
5.800
6.000
6.200
6.400
6.600
6.800
1
2
3
4
5
CC

905 VCD; 905-C9010G-2H; Depth 80.00–82.81(mbsf)

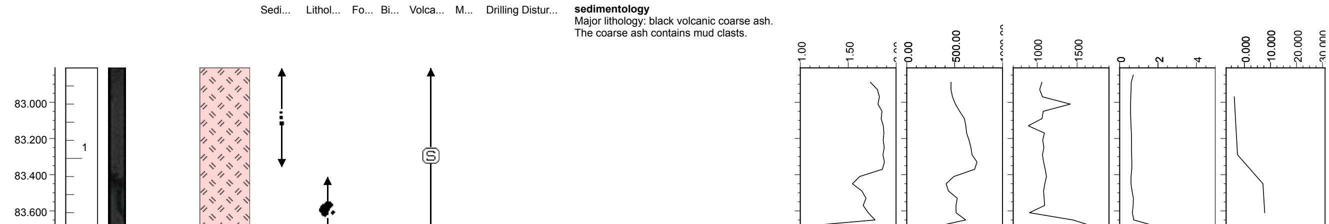


sedimentology

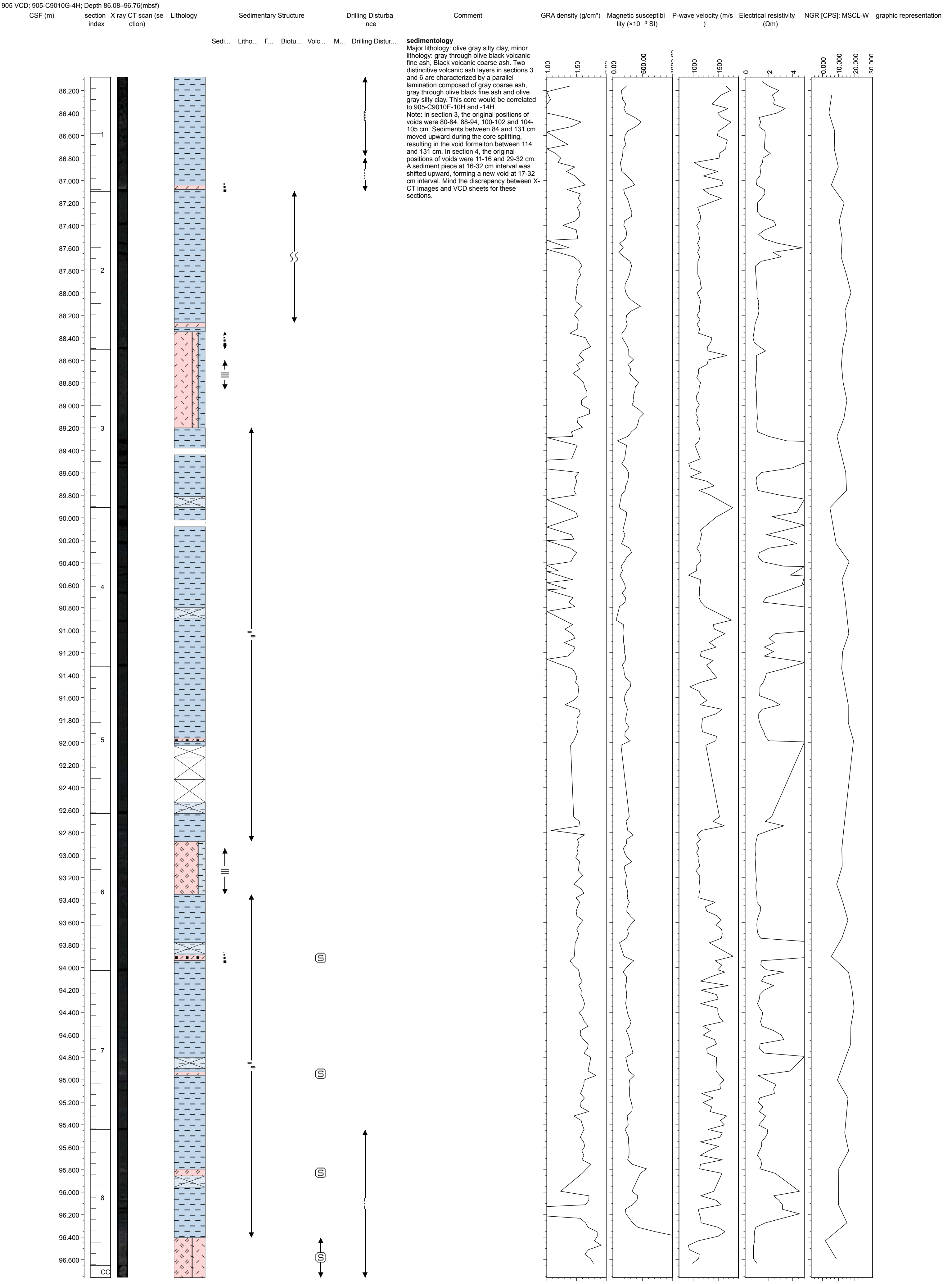
Major lithology: olive gray silty clay, light gray through black volcanic coarse ash, minor lithology: light gray lapilli ash, gray volcanic fine ash. A thick bed of volcanic ash from sections 1 to 2 show a gradation from pumiceous (top) to scoriaceous (bottom), parallel bedding at the middle, and several repetition of grading and reverse grading through the bed. This bed could be correlated to 905-C9010E-9H (sections 5 and 6), and 905-C9010F-13H (sections 1 and 2).

905 VCD; 905-C9010G-3H; Depth 82.81–83.78(mbsf)

CSF (m)	section index	X ray CT scan (section)	Lithology	Sedimentary Structure						Drilling Disturbance	Comment	GRA density (g/cm³)	Magnetic susceptibility (×10⁻⁵ SI)	P-wave velocity (m/s)	Electrical resistivity (Ωm)	NGR [CPS]: MSCL-W	graphic representation
				Sedi...	Lithol...	Fo...	Bi...	Volca...	M...	Drilling Distur...	**sedimentology** Major lithology: black volcanic coarse ash. The coarse ash contains mud clasts.						



905 VCD; 905-C9010G-4H; Depth 86.08–96.76(mbsf)

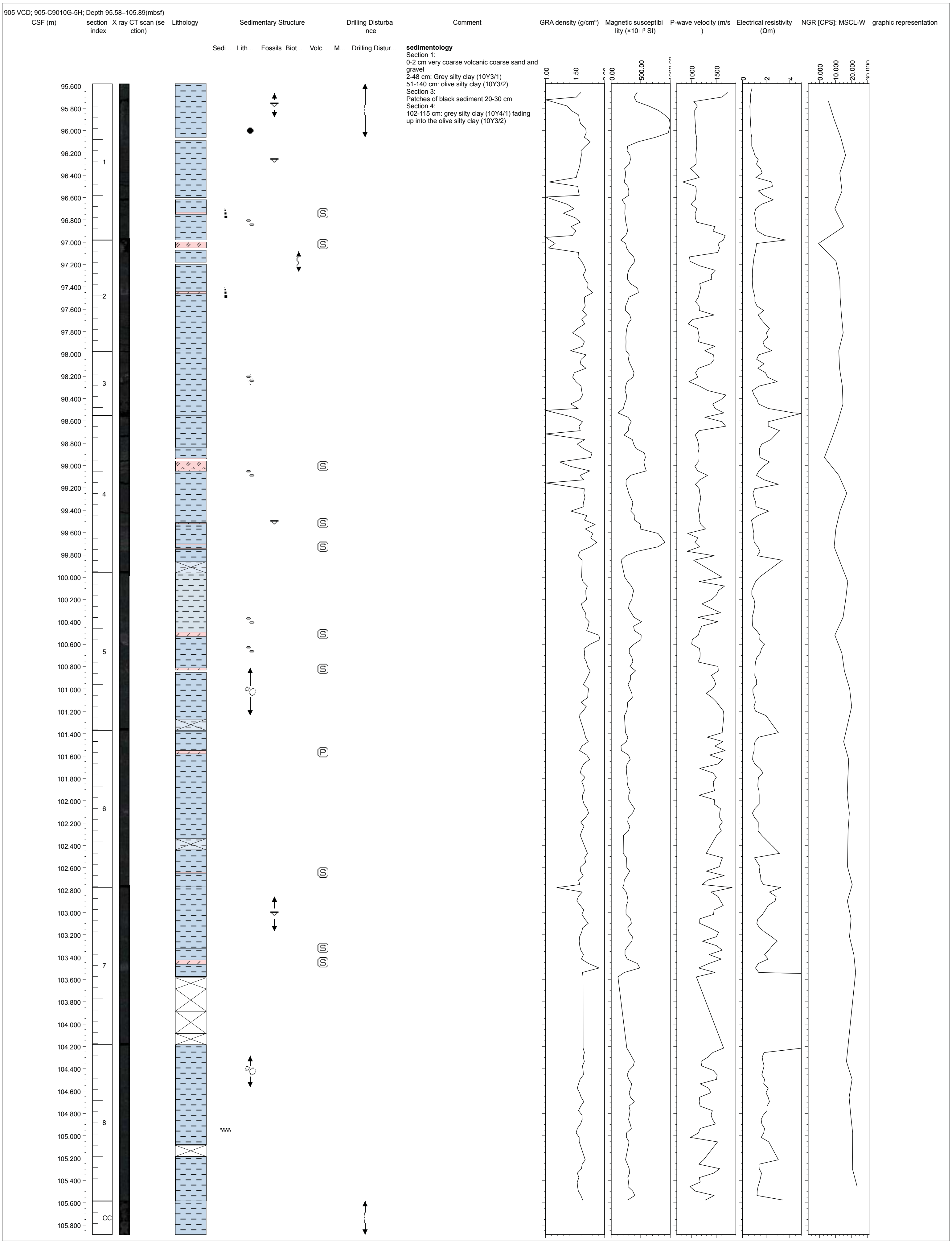


sedimentology

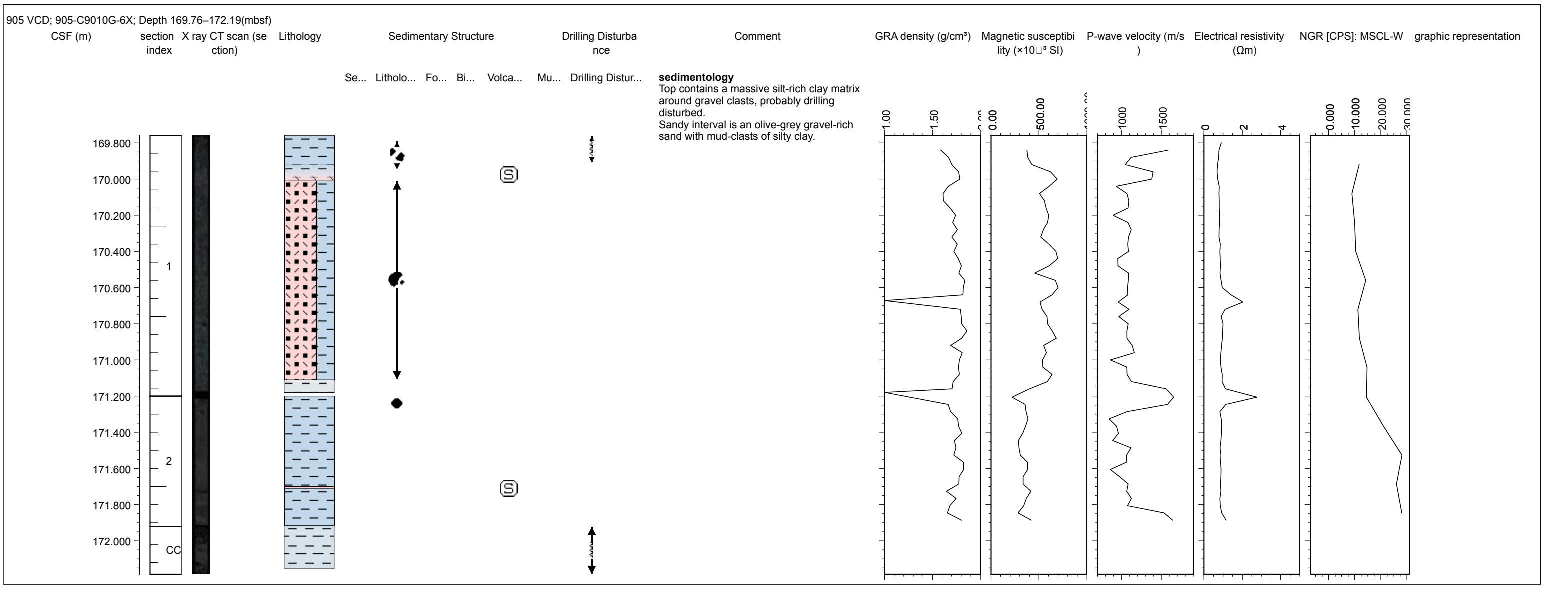
Major lithology: olive gray silty clay, minor lithology: gray through olive black volcanic fine ash, Black volcanic coarse ash. Two distinctive volcanic ash layers in sections 3 and 6 are characterized by a parallel lamination composed of gray coarse ash, gray through olive black fine ash and olive gray silty clay. This core would be correlated to 905-C9010E-10H and -14H.

Note: in section 3, the original positions of voids were 80-84, 88-94, 100-102 and 104-105 cm. Sediments between 84 and 131 cm moved upward during the core splitting, resulting in the void formaiton between 114 and 131 cm. In section 4, the original positions of voids were 11-16 and 29-32 cm. A sediment piece at 16-32 cm interval was shifted upward, forming a new void at 17-32 cm interval. Mind the discrepancy between X-CT images and VCD sheets for these sections.

905 VCD; 905-C9010G-5H; Depth 95.58–105.89(mbsf)



905 VCD; 905-C9010G-6X; Depth 169.76–172.19(mbsf)

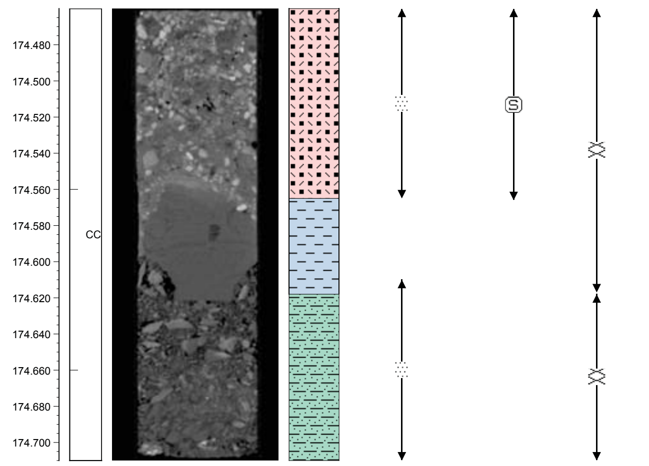


905 VCD; 905-C9010G-7X; Depth 174.46–174.71(mbsf)

CSF (m)	section index	X ray CT scan (section)	Lithology	Sedimentary Structure	Drilling Disturbance	Comment	GRA density (g/cm³)	Magnetic susceptibility (×10⁻³ SI)	P-wave velocity (m/s)	Electrical resistivity (Ωm)	NGR [CPS]: MSCL-W	graphic representa

Se... Litholo... Fo... Bi... Volca... Mu... Drilling Distur...

sedimentology
Whole CC is churned-up sediment; partly washed gravel and silty clay at the top, a compressed lump of silty clay in the center, and a breccia of silty clay clasts at the base.

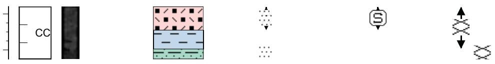


905 VCD; 905-C9010G-8X; Depth 179.16–179.45(mbsf)

CSF (m)	section index	X ray CT scan (section)	Lithology	Sedimentary Structure	Drilling Disturbance	Comment	GRA density (g/cm³)	Magnetic susceptibility (×10□³ SI)	P-wave velocity (m/s)	Electrical resistivity (Ωm)	NGR [CPS]: MSCL-W	graphic representation
				Se... Litholo... Fo... Bi... Volca... Mu...	Drilling Distur...	**sedimentology** Similar to 9010G-7X						

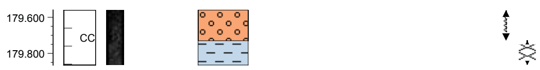
179.200

179.400



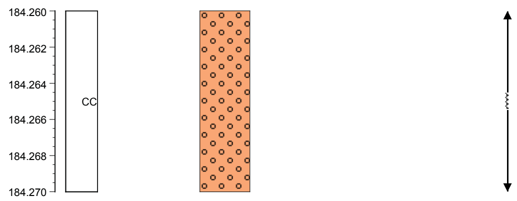
905 VCD; 905-C9010G-9X; Depth 179.56–179.87(mbsf)

CSF (m)	section index	X ray CT scan (section)	Lithology	Sedimentary Structure						Drilling Disturbance	Comment	GRA density (g/cm^3)	Magnetic susceptibility (×10^{-3} SI)	P-wave velocity (m/s)	Electrical resistivity (Ωm)	NGR [CPS]: MSCL-W	graphic representation
				Sed...	Lith...	Fossils	Biot...	Vol...	Mun...	Drilling Distur...	**sedimentology** Wash-out gravel at the top followed by brecciated clasts of silty clay.						

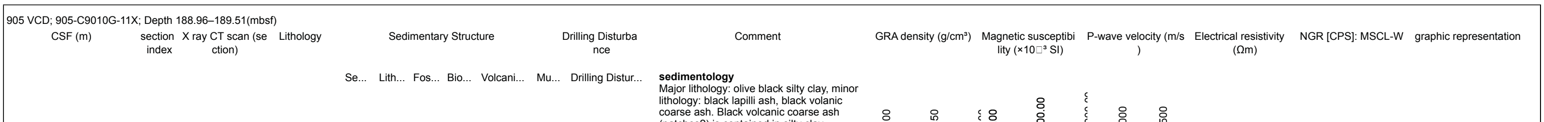


905 VCD; 905-C9010G-10X; Depth 184.26–184.27(mbsf)

CSF (m)	section index	X ray CT scan (section)	Lithology	Sedimentary Structure						Drilling Disturbance	Comment	GRA density (g/cm³)	Magnetic susceptibility (×10⁻³ SI)	P-wave velocity (m/s)	Electrical resistivity (Ωm)	NGR [CPS]: MSCL-W	graphic representation
				Sed...	Lith...	Fossils	Biot...	Vol...	Mun...	Drilling Distur...	**sedimentology** Washed scoriaceous gravel.						



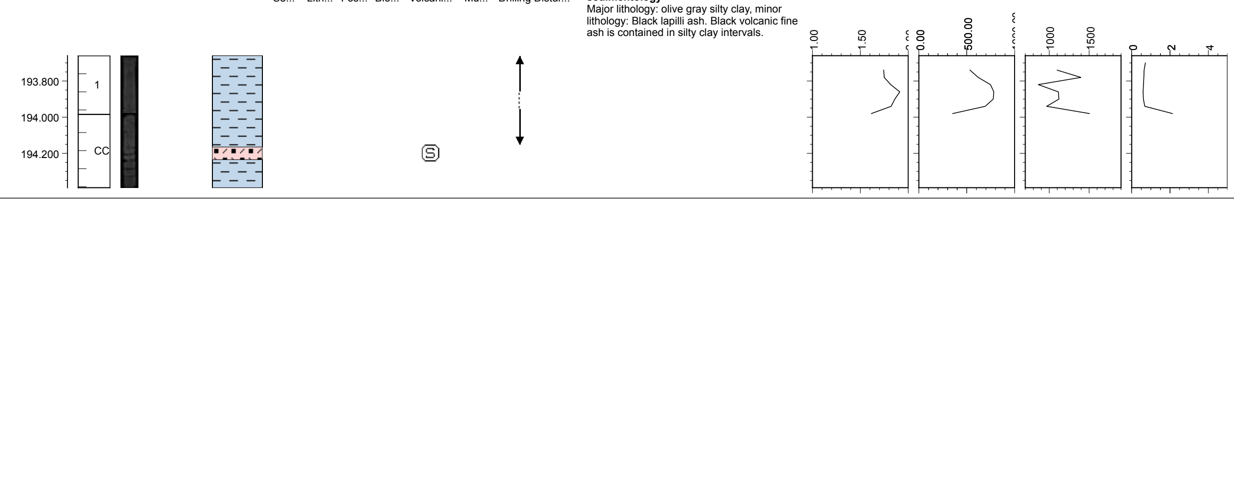
905 VCD; 905-C9010G-11X; Depth 188.96–189.51(mbsf)



sedimentology
Major lithology: olive black silty clay, minor lithology: black lapilli ash, black volanic coarse ash. Black volcanic coarse ash (patches?) is contained in silty clay.
Moderately disturbed.
Washed gravel at top.

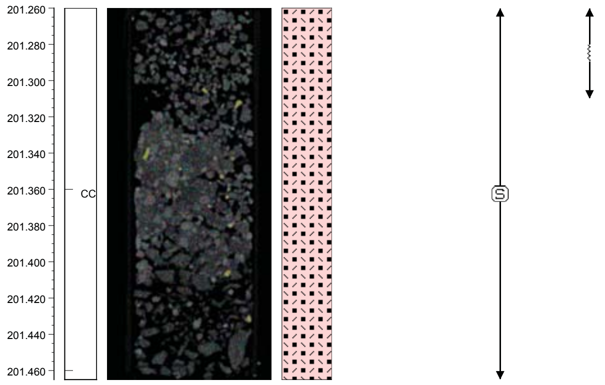
905 VCD; 905-C9010G-12X; Depth 193.66–194.39(mbsf)

CSF (m)	section index	X ray CT scan (section)	Lithology	Sedimentary Structure						Drilling Disturbance	Comment	GRA density (g/cm³)	Magnetic susceptibility (×10⁻³ SI)	P-wave velocity (m/s)	Electrical resistivity (Ωm)	NGR [CPS]: MSCL-W	graphic representation
				Se...	Lith...	Fos...	Bio...	Volcani...	Mu...	Drilling Distur...	**sedimentology** Major lithology: olive gray silty clay, minor lithology: Black lapilli ash. Black volcanic fine ash is contained in silty clay intervals.						



905 VCD; 905-C9010G-14X; Depth 201.26–201.47(mbsf)

CSF (m)	section index	X ray CT scan (section)	Lithology	Sedimentary Structure						Drilling Disturbance	Comment	GRA density (g/cm³)	Magnetic susceptibility (×10⁻³ SI)	P-wave velocity (m/s)	Electrical resistivity (Ωm)	NGR [CPS]: MSCL-W	graphic representa…
				Se...	Lith...	Fos...	Bio...	Volcani...	Mu...	Drilling Distur...	**sedimentology** Major lithology: black through olive black lapilli. Top 5 cm is heavily disturbed (fall-in lapilli).						



905 VCD; 905-C9010G-15X; Depth 205.96–206.09(mbsf)

CSF (m)	section index	X ray CT scan (section)	Lithology	Sedimentary Structure	Drilling Disturbance	Comment	GRA density (g/cm³)	Magnetic susceptibility (×10⁻³ SI)	P-wave velocity (m/s)	Electrical resistivity (Ωm)	NGR [CPS]: MSCL-W	graphic representa

Se... Lith... Fos... Bio... Volcani... Mu... Drilling Distur...

sedimentology
Major lithology: olive black lapilli ash, olive black silty clay. Moderately disturbed.

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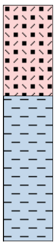

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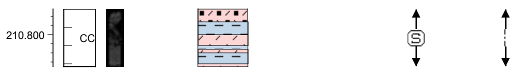
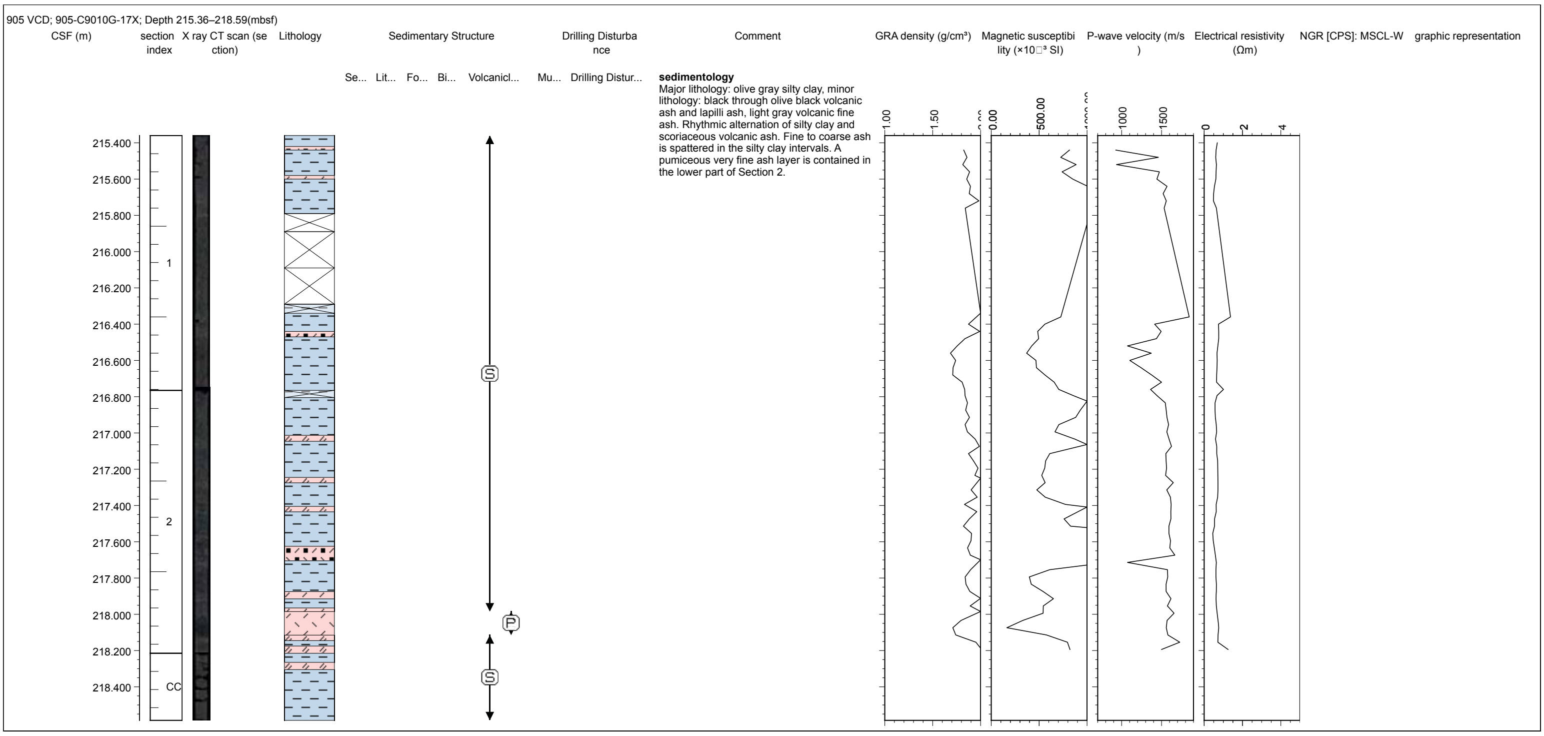
905 VCD; 905-C9010G-16X; Depth 210.66–210.98(mbsf)

CSF (m) | section index | X ray CT scan (section) | Lithology | Sedimentary Structure | Drilling Disturbance | Comment | GRA density (g/cm³) | Magnetic susceptibility (×10□³ SI) | P-wave velocity (m/s) | Electrical resistivity (Ωm) | NGR [CPS]: MSCL-W | graphic representation

Se... | Lith... | Fos... | Bio... | Volcani... | Mu... | Drilling Distur...



sedimentology
Major lithology: black lapilli ash, olive black volcanic fine ash, olive gray silty clay. This core catcher is moderately disturbed.



905 VCD; 905-C9010G-17X; Depth 215.36–218.59(mbsf)
CSF (m)
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X ray CT scan (section)
Lithology
Sedimentary Structure
Drilling Disturbance
Comment
GRA density (g/cm³)
Magnetic susceptibility (×10⁻⁵ SI)
P-wave velocity (m/s)
Electrical resistivity (Ωm)
NGR [CPS]: MSCL-W
graphic representation
Se...
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Mu...
Drilling Distur...
sedimentology
Major lithology: olive gray silty clay, minor lithology: black through olive black volcanic ash and lapilli ash, light gray volcanic fine ash. Rhythmic alternation of silty clay and scoriaceous volcanic ash. Fine to coarse ash is spattered in the silty clay intervals. A pumiceous very fine ash layer is contained in the lower part of Section 2.
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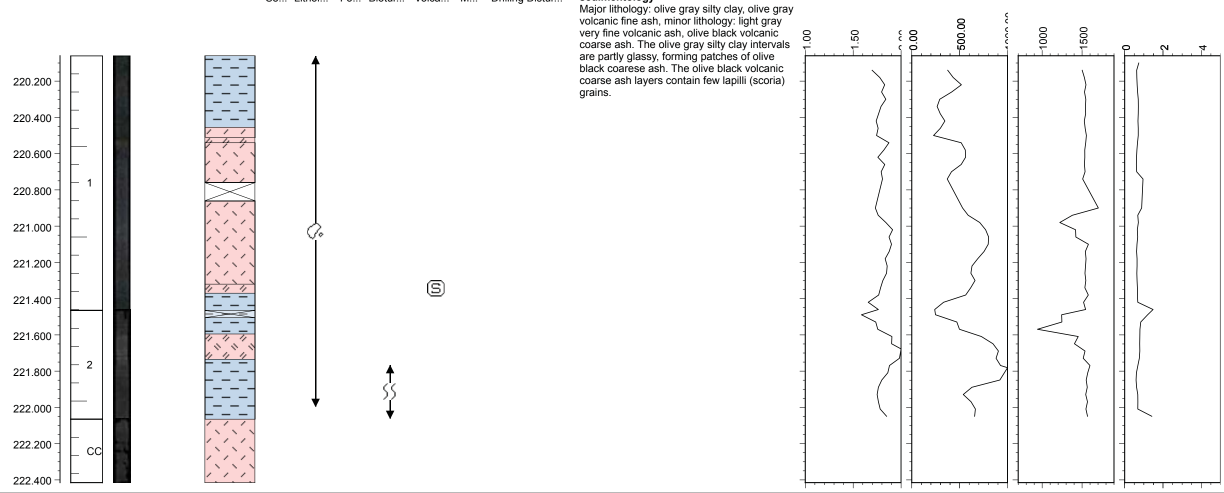
905 VCD; 905-C9010G-18X; Depth 220.06–222.42(mbsf)

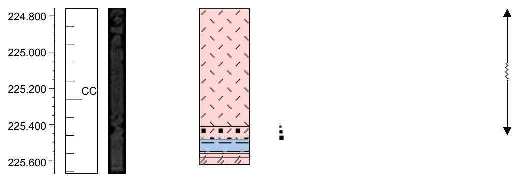
CSF (m)	section index	X ray CT scan (section)	Lithology	Sedimentary Structure	Drilling Disturbance	Comment	GRA density (g/cm³)	Magnetic susceptibility (×10⁻³ SI)	P-wave velocity (m/s)	Electrical resistivity (Ωm)	NGR [CPS]: MSCL-W	graphic representation
				Se... Lithol... Fo... Biotur... Volca... M...	Drilling Distur...	**sedimentology** Major lithology: olive gray silty clay, olive gray volcanic fine ash, minor lithology: light gray very fine volcanic ash, olive black volcanic coarse ash. The olive gray silty clay intervals are partly glassy, forming patches of olive black coarese ash. The olive black volcanic coarse ash layers contain few lapilli (scoria) grains.						



905 VCD; 905-C9010G-19X; Depth 224.76–225.67(mbsf)

CSF (m)	section index	X ray CT scan (section)	Lithology	Sedimentary Structure	Drilling Disturbance	Comment	GRA density (g/cm³)	Magnetic susceptibility (×10⁻³ SI)	P-wave velocity (m/s)	Electrical resistivity (Ωm)	NGR [CPS]: MSCL-W	graphic representation

Sedime... Lith... Fos... Bio... Vol... Mu... Drilling Distur...

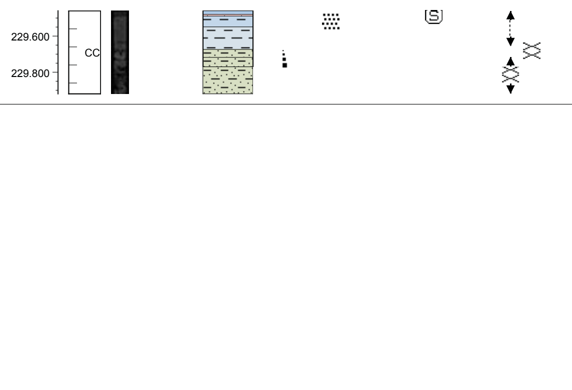


sedimentology
Major lithology: olive gray volcanic fine ash, minor lithology: olive black clay, light gray very fine ash, olive black volcanic coarse ash. Heavily disturbed. Note that the pieces of sediments in the lower part of core catcher would be shifted upward due to splitting.

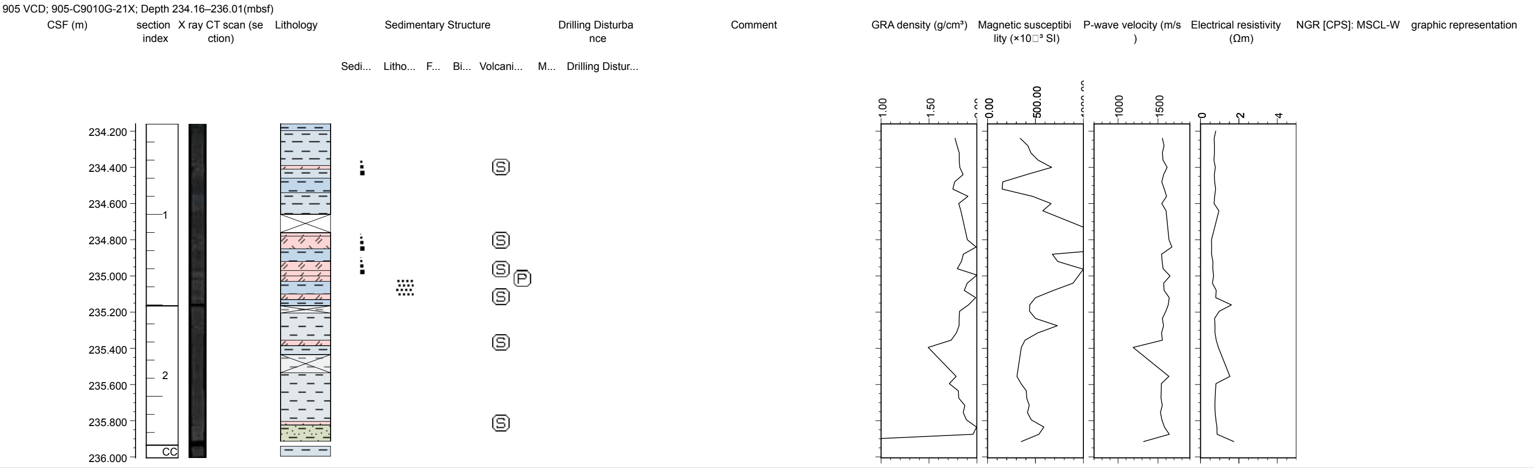
905 VCD; 905-C9010G-20X; Depth 229.46–229.92(mbsf)

CSF (m) | section index | X ray CT scan (section) | Lithology | Sedimentary Structure | Drilling Disturbance | Comment | GRA density (g/cm³) | Magnetic susceptibility (×10⁻⁵ SI) | P-wave velocity (m/s) | Electrical resistivity (Ωm) | NGR [CPS]: MSCL-W | graphic representation

Sedi... Lithol... Fo... Bi... Volca... M... Drilling Distur...



905 VCD; 905-C9010G-21X; Depth 234.16–236.01(mbsf)

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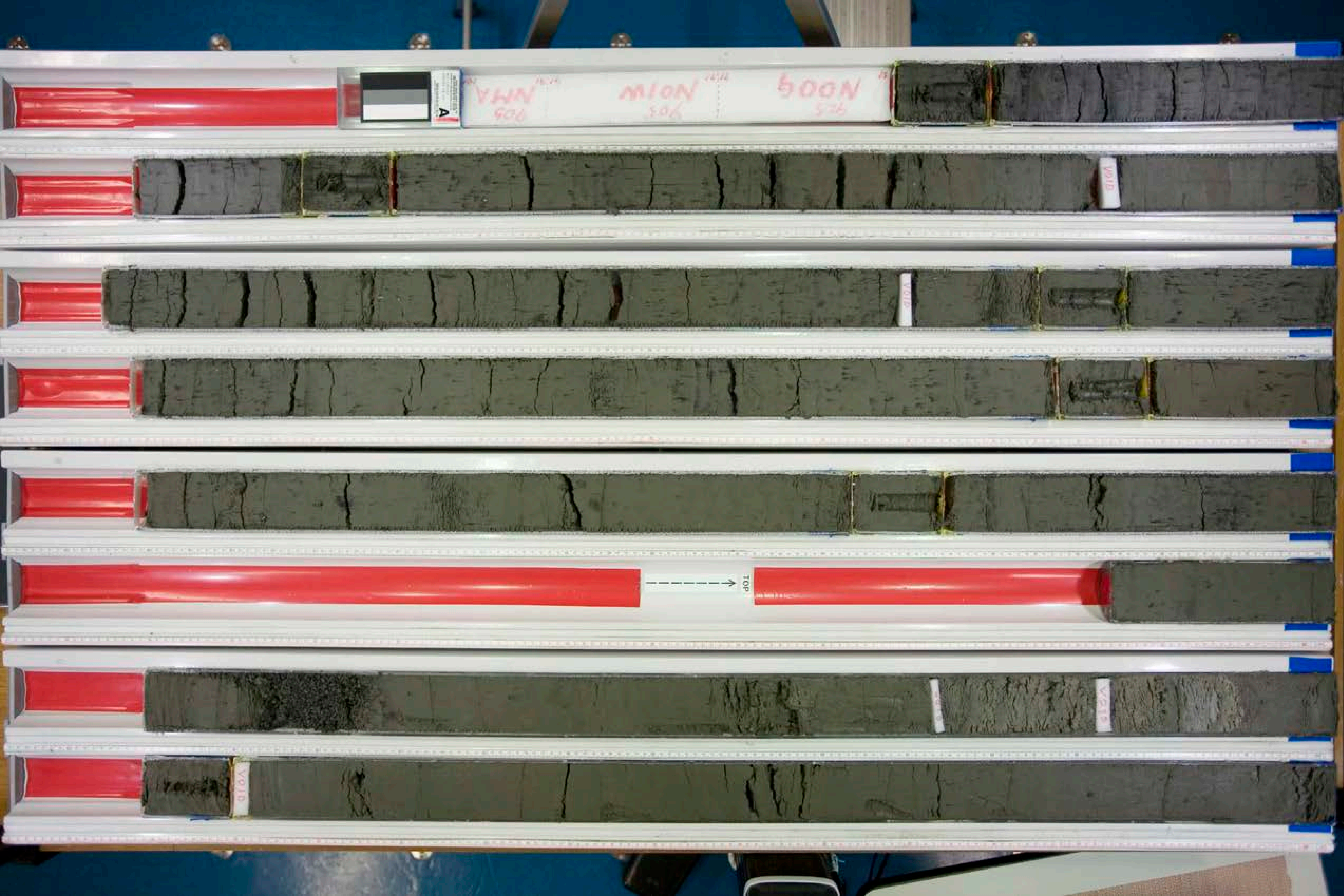
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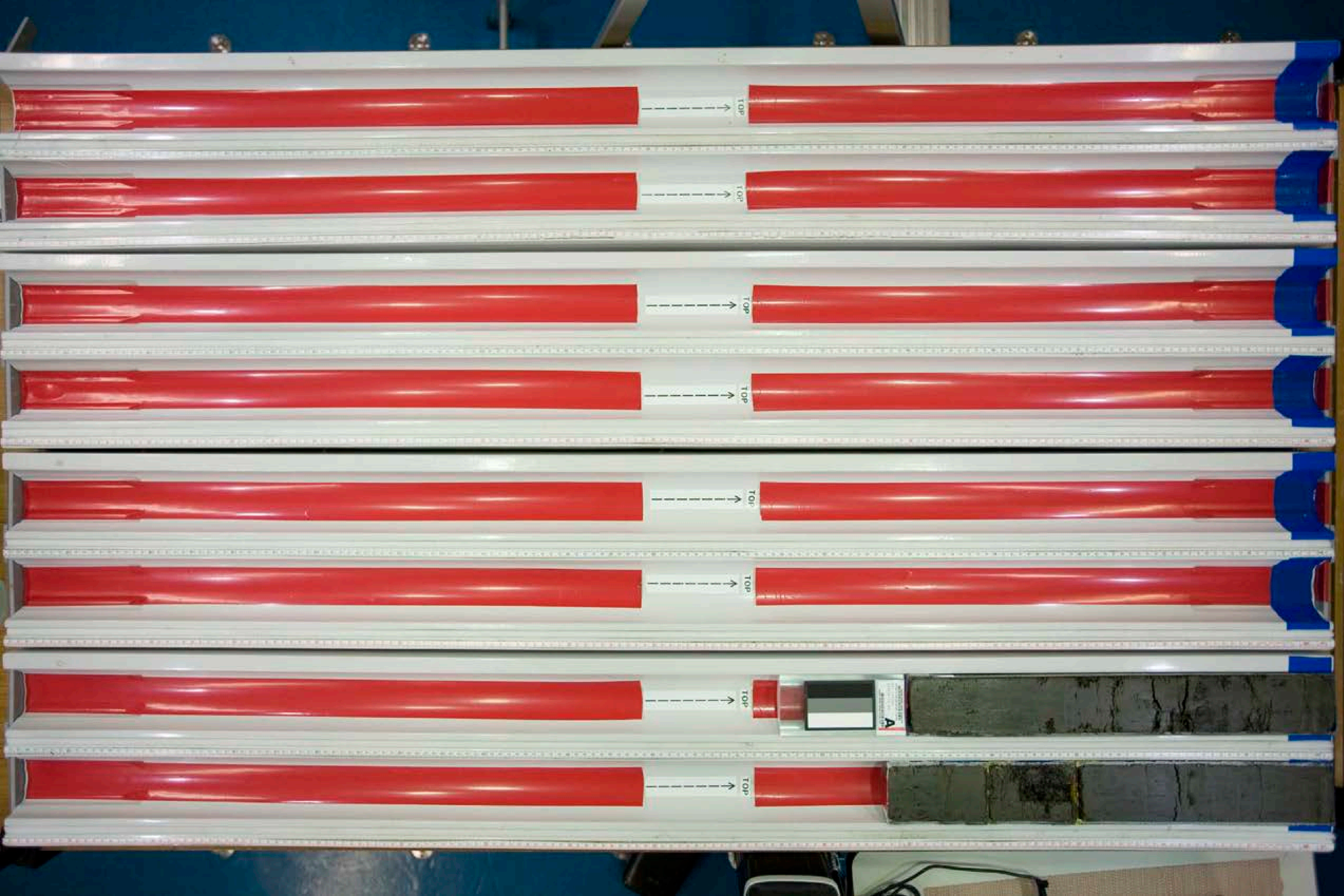
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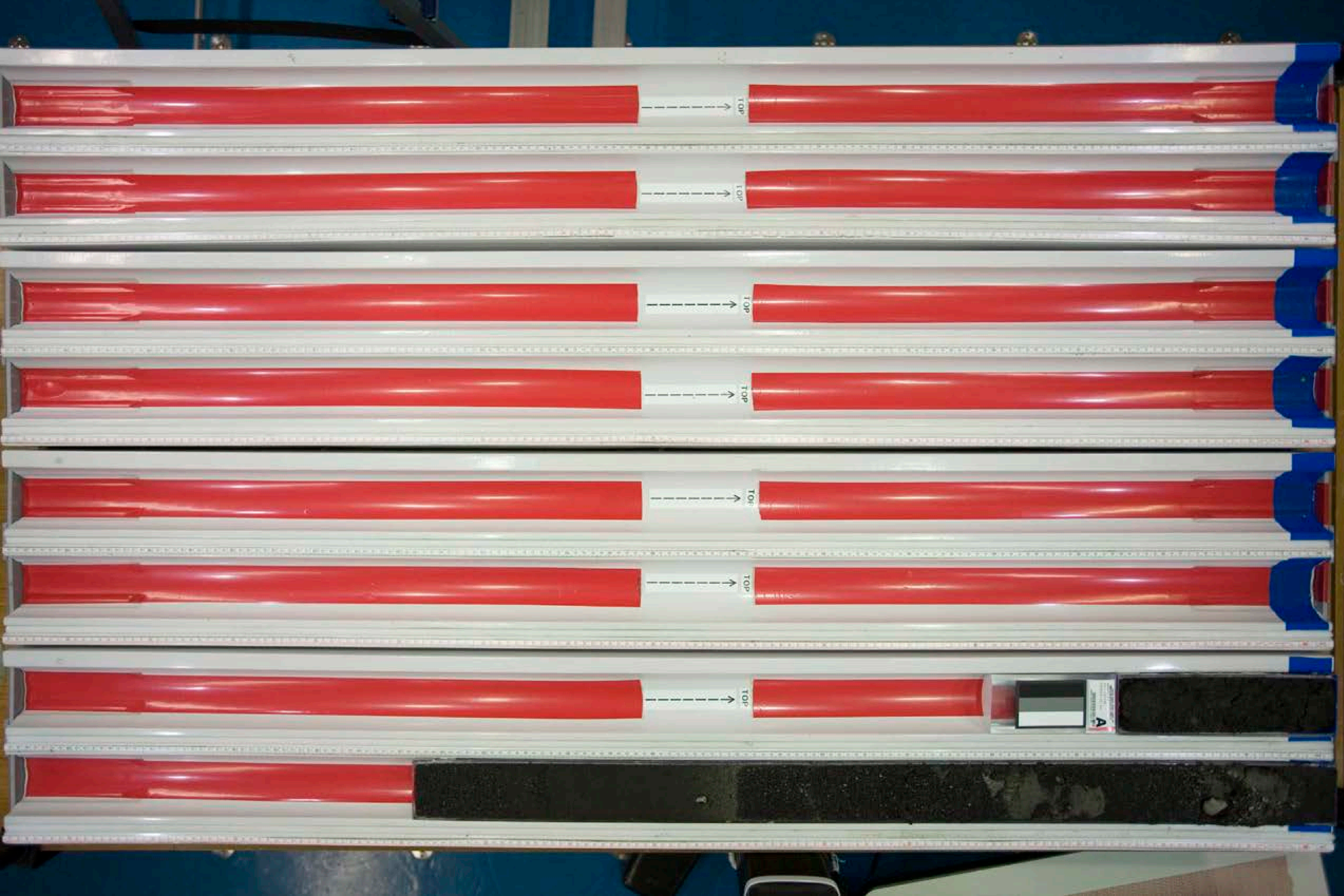
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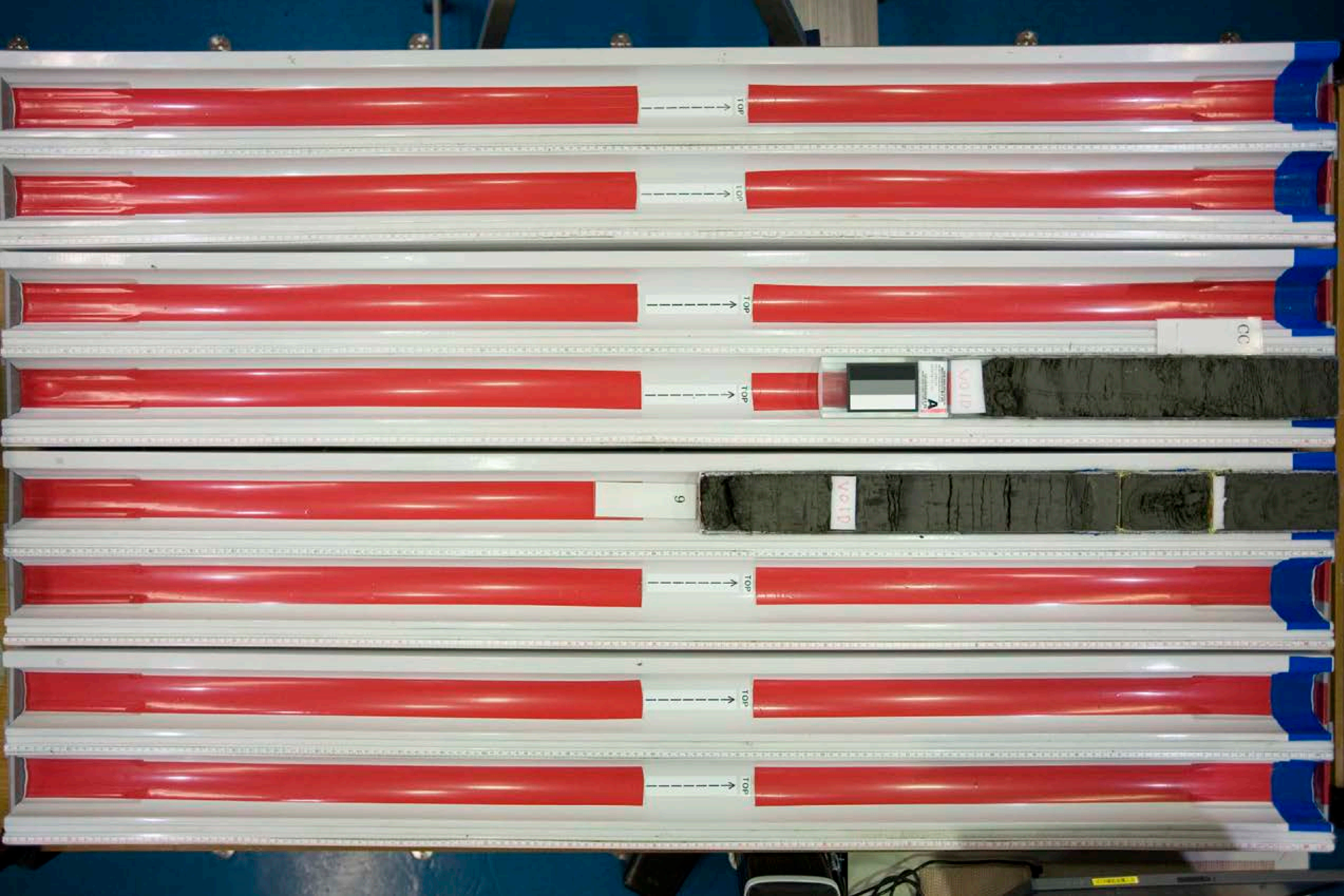
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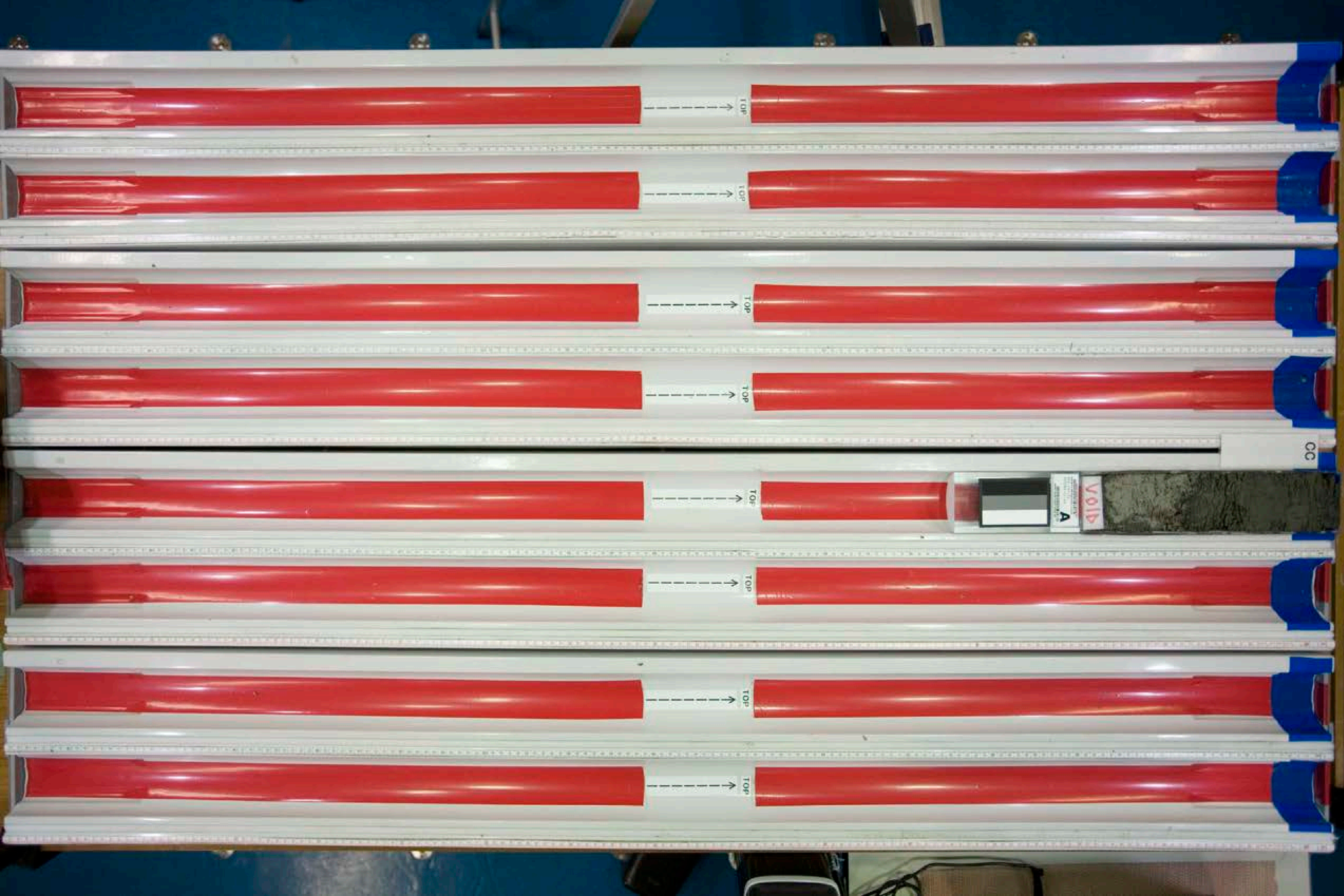
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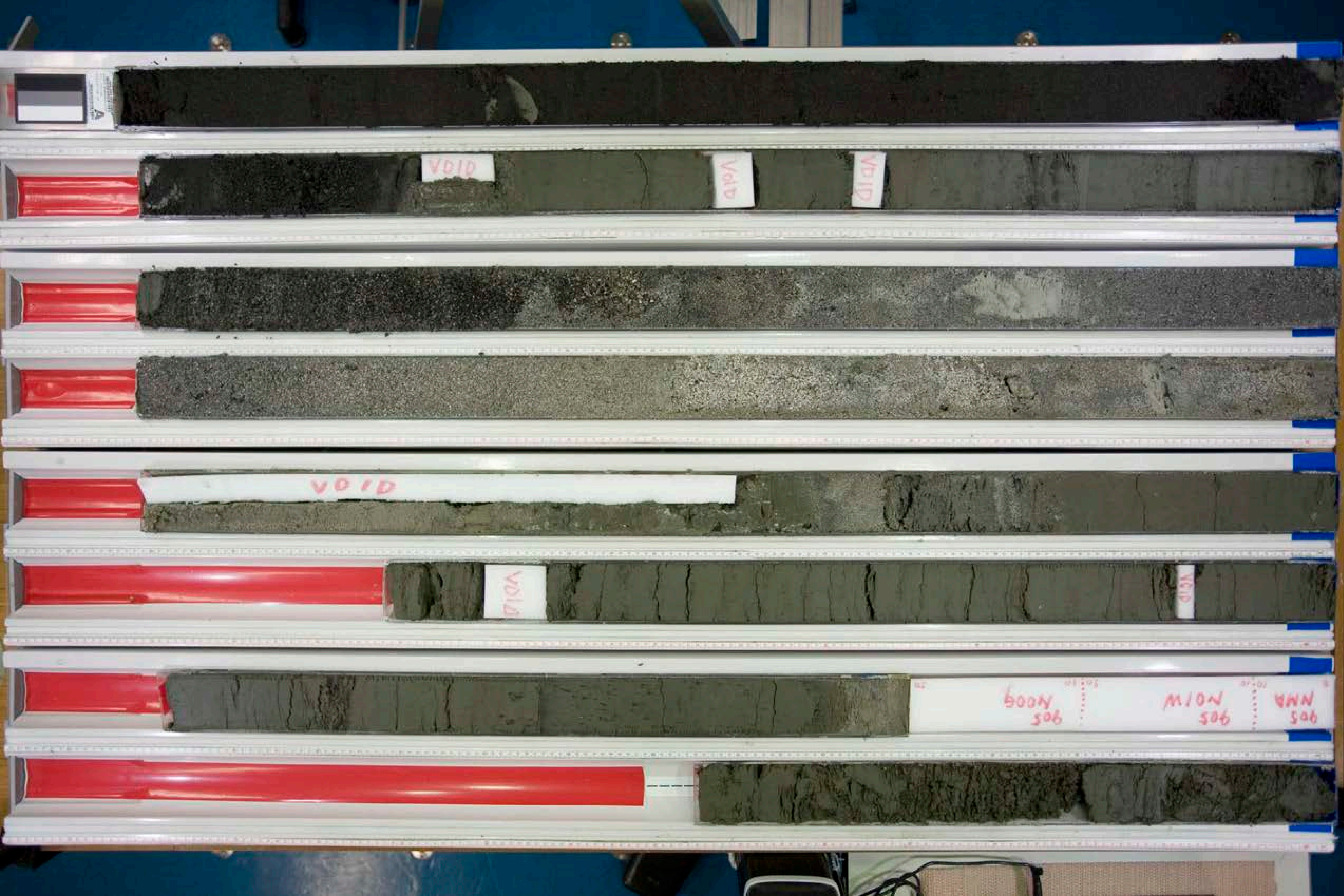
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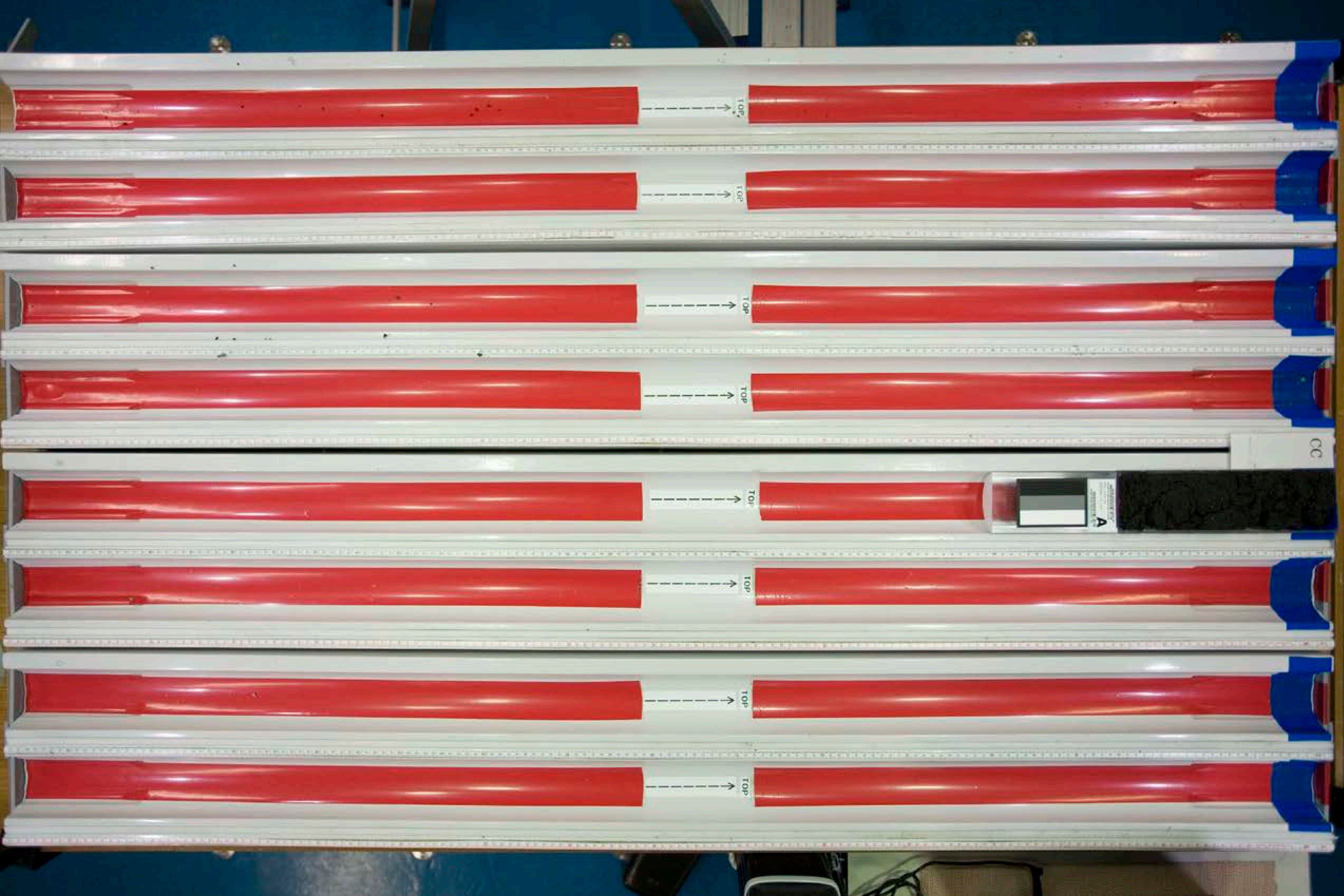
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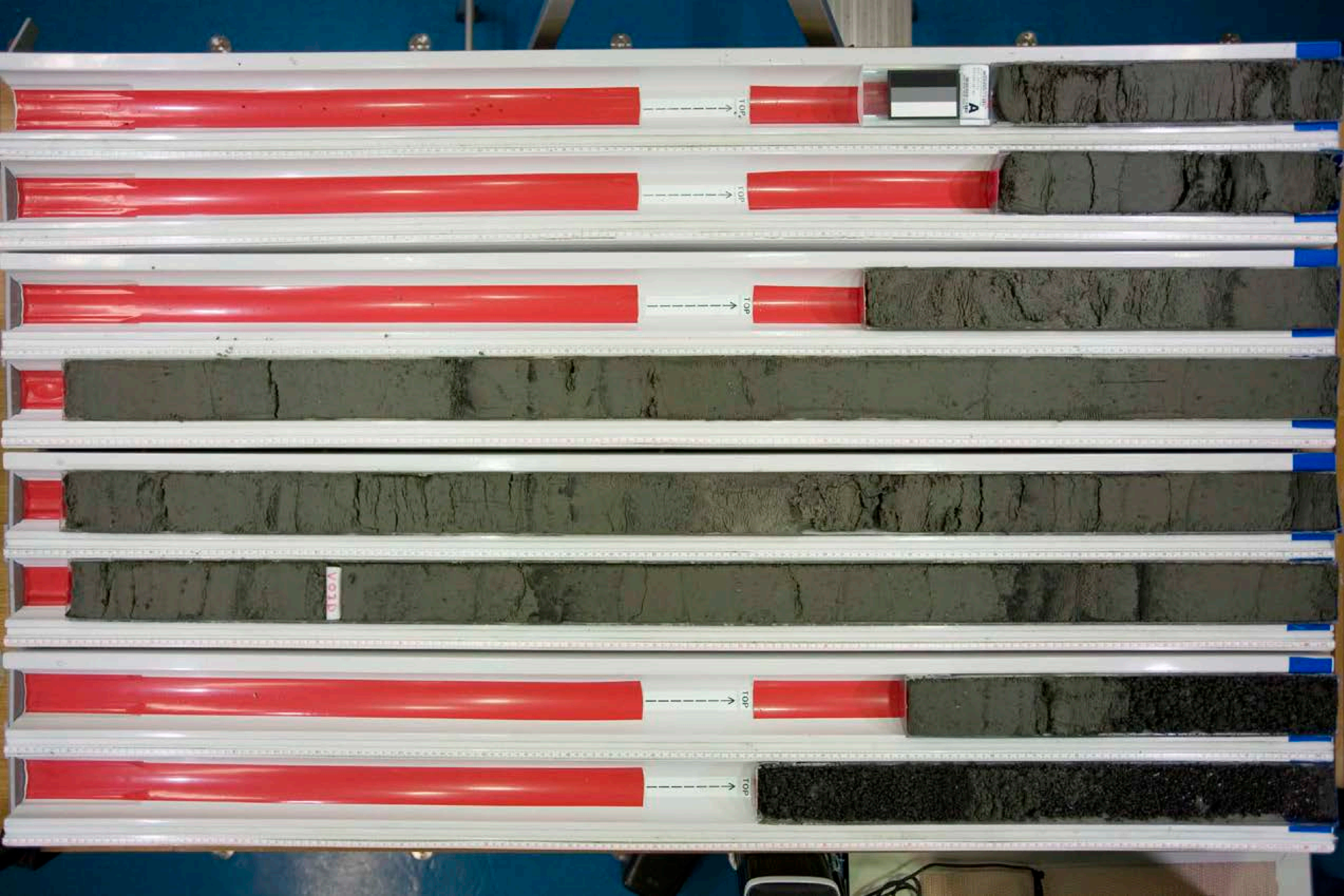
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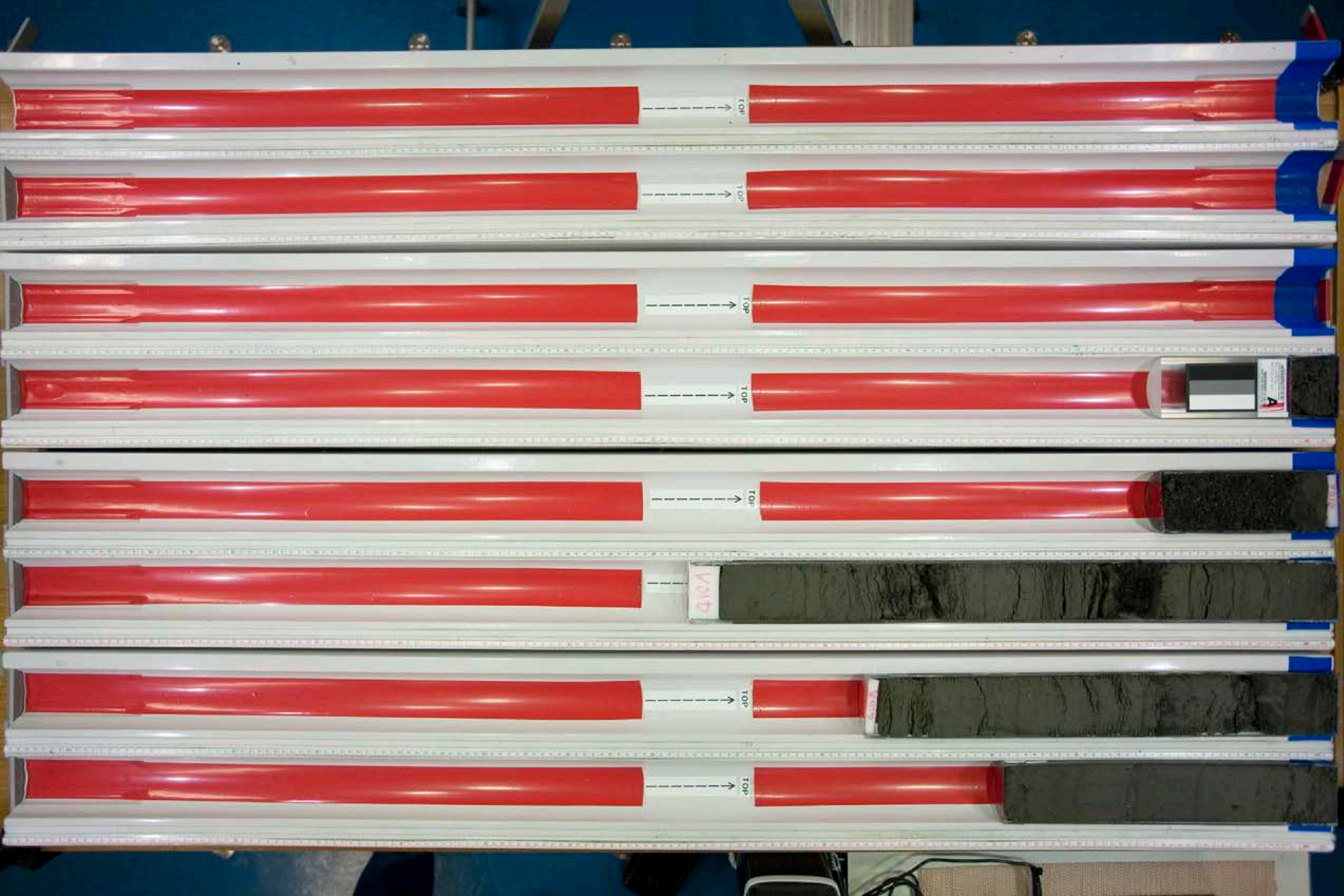
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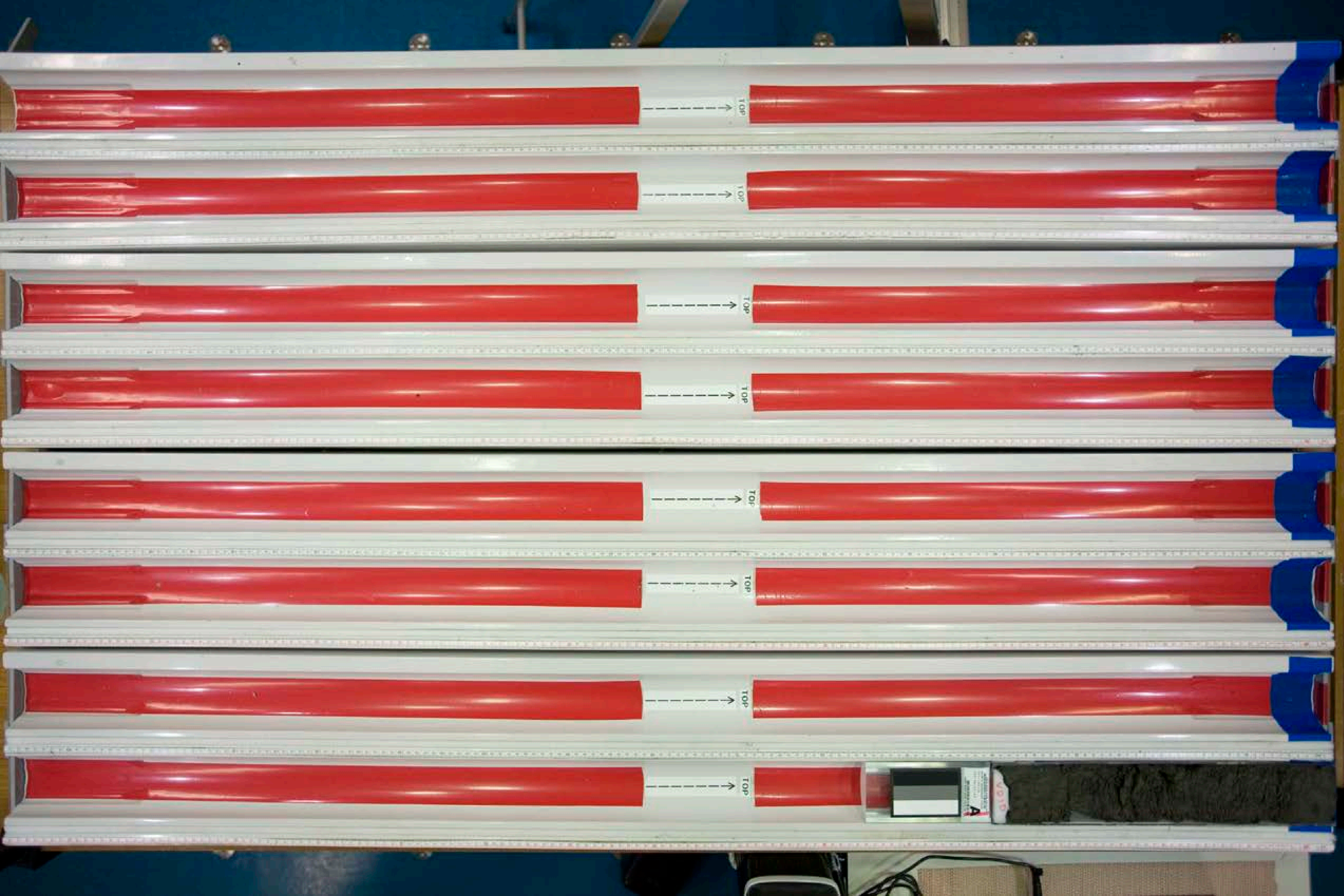
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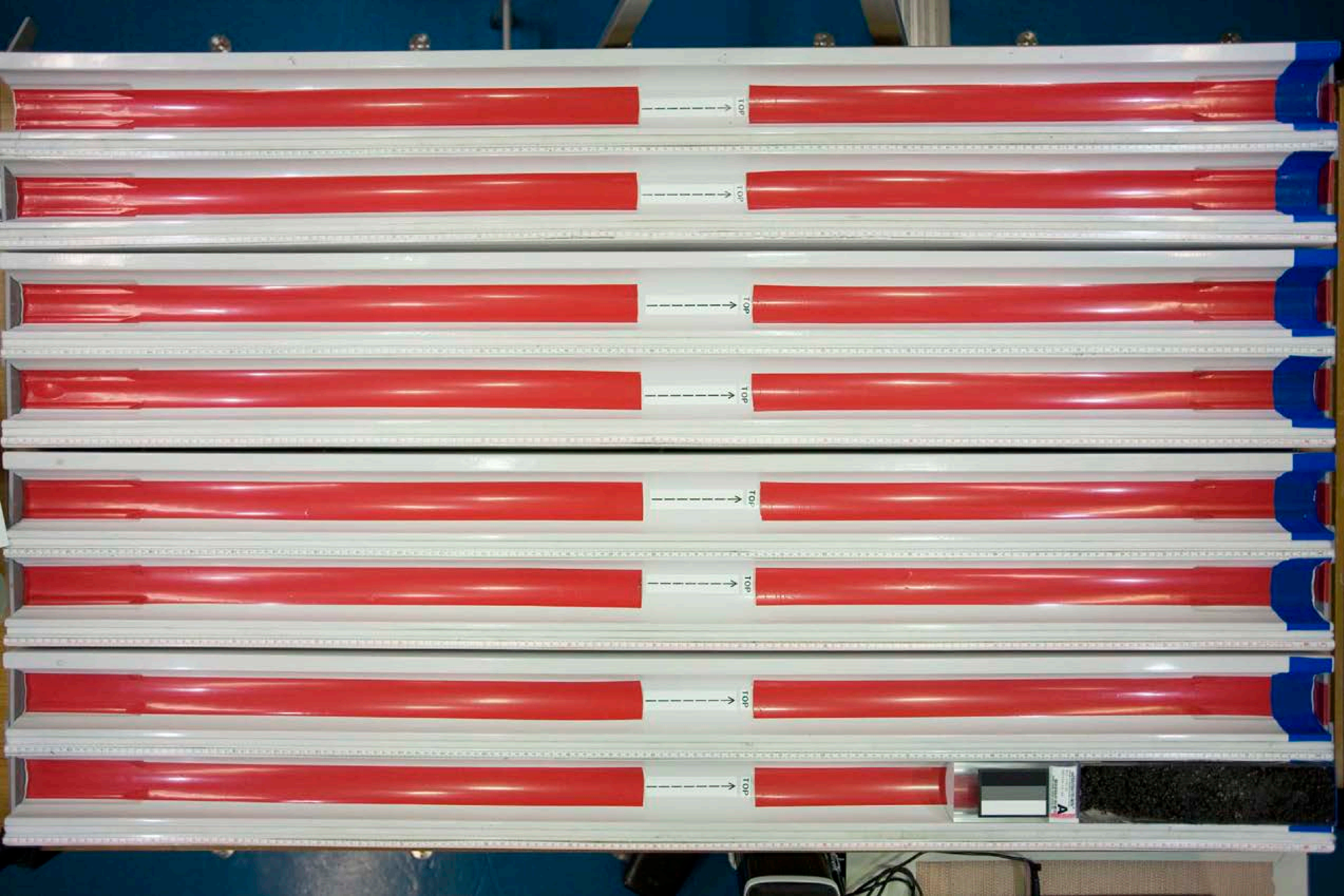
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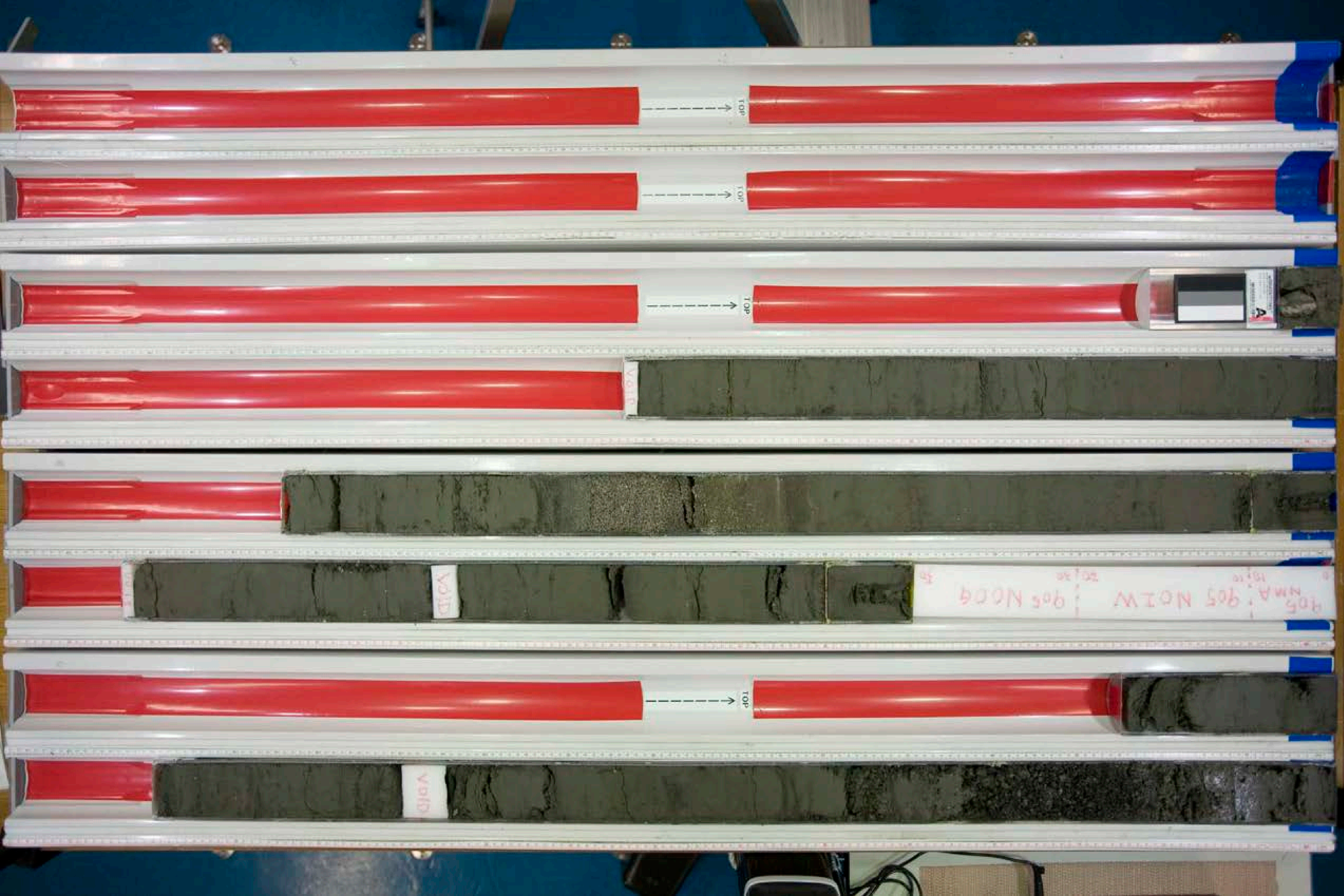
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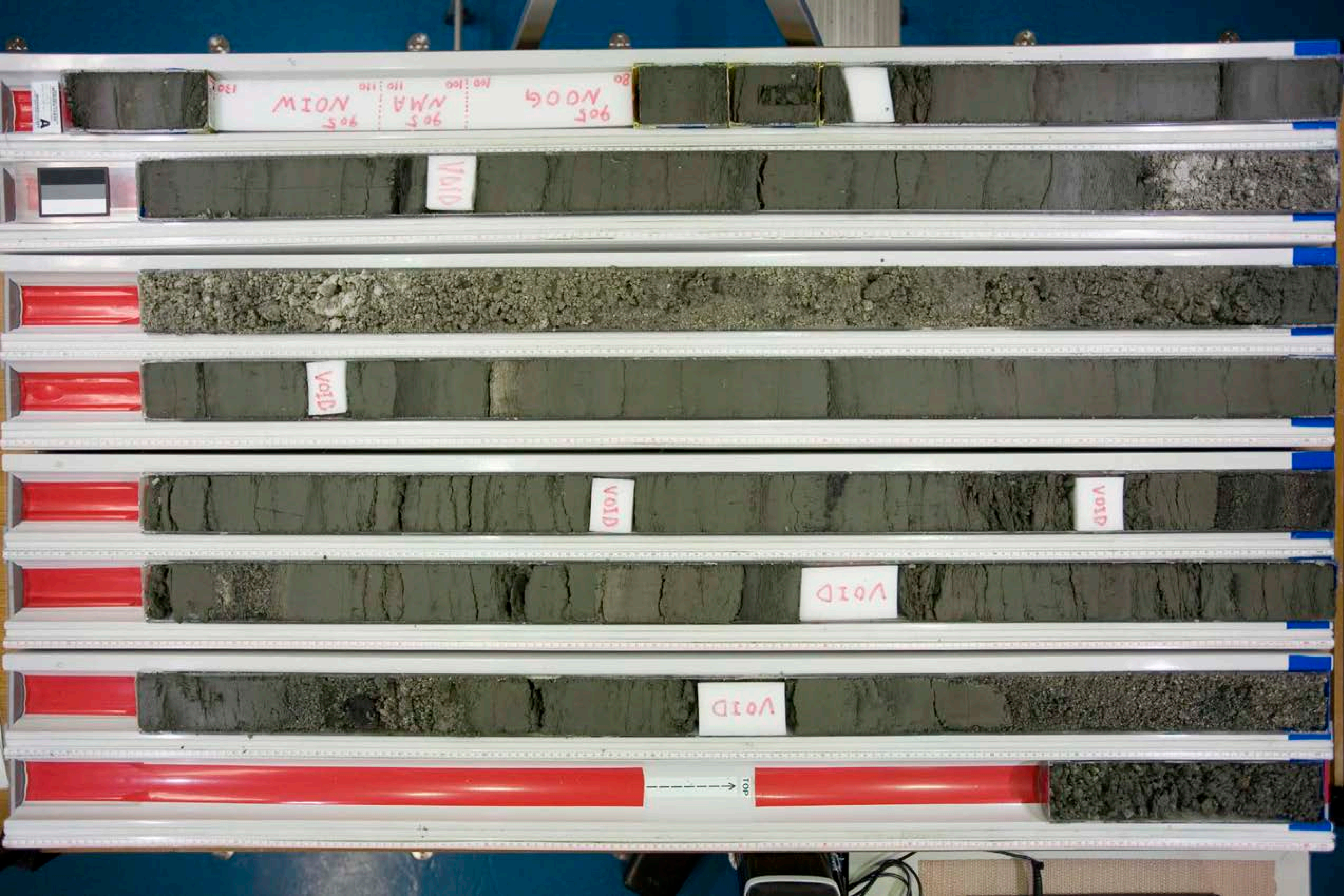
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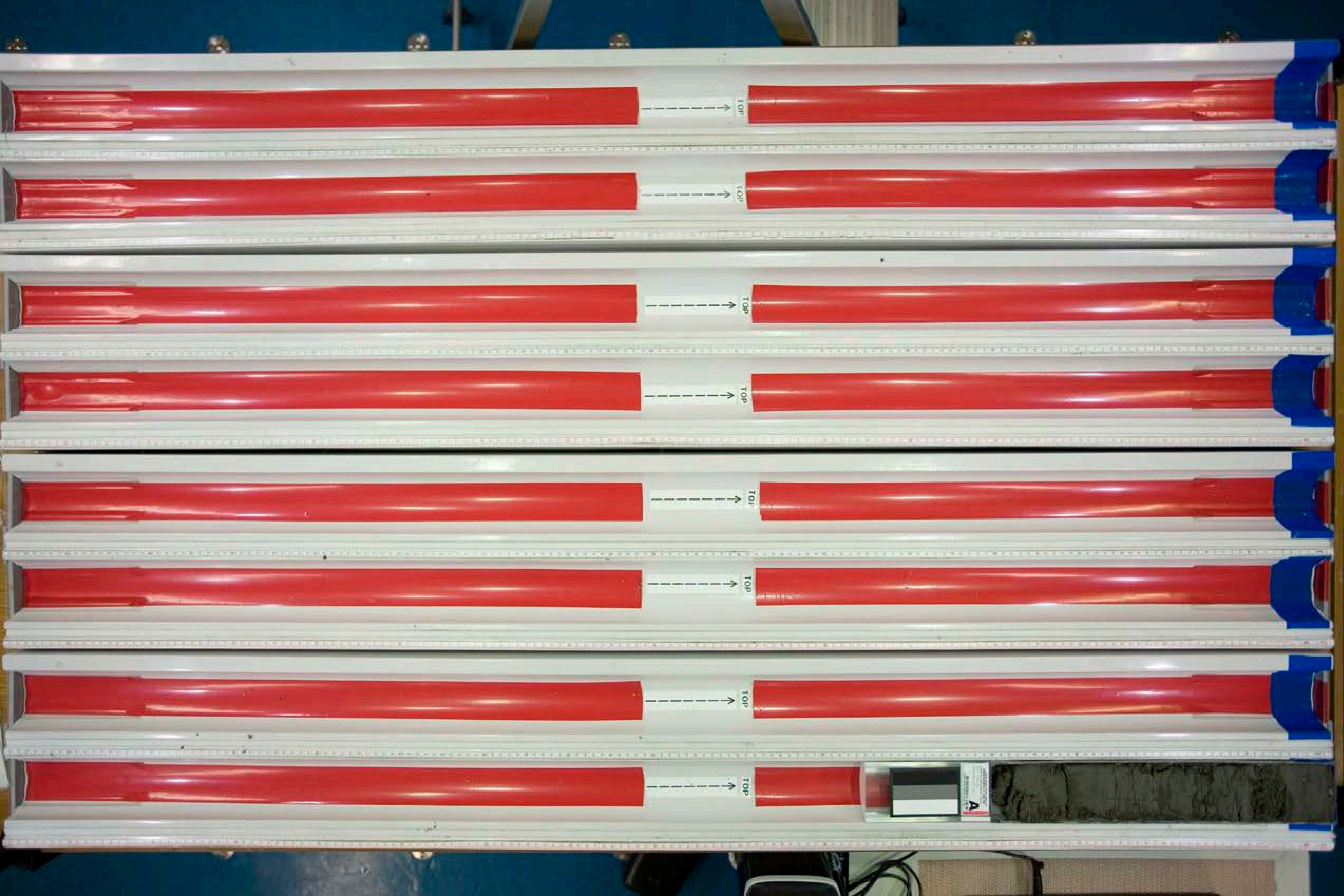
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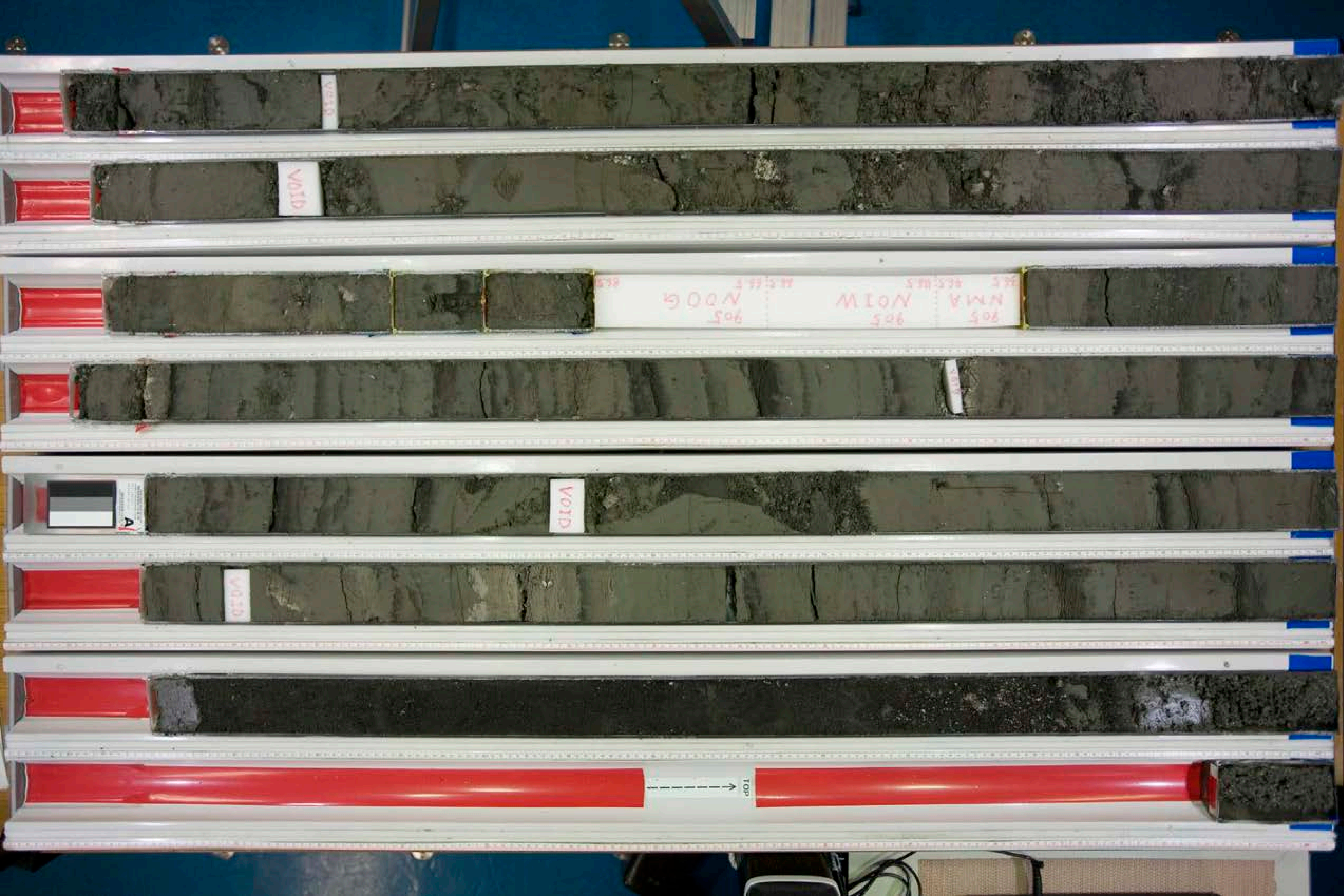
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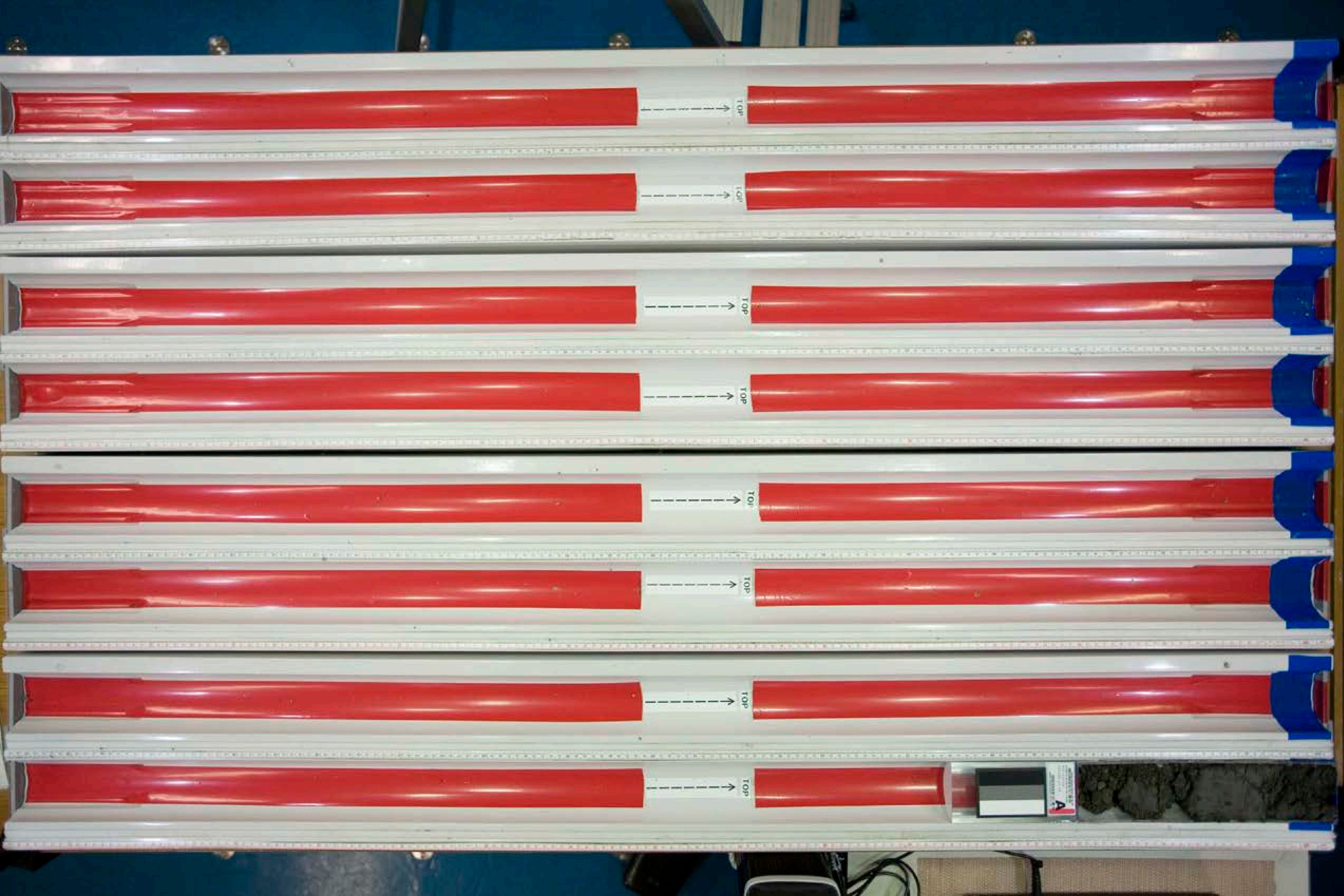
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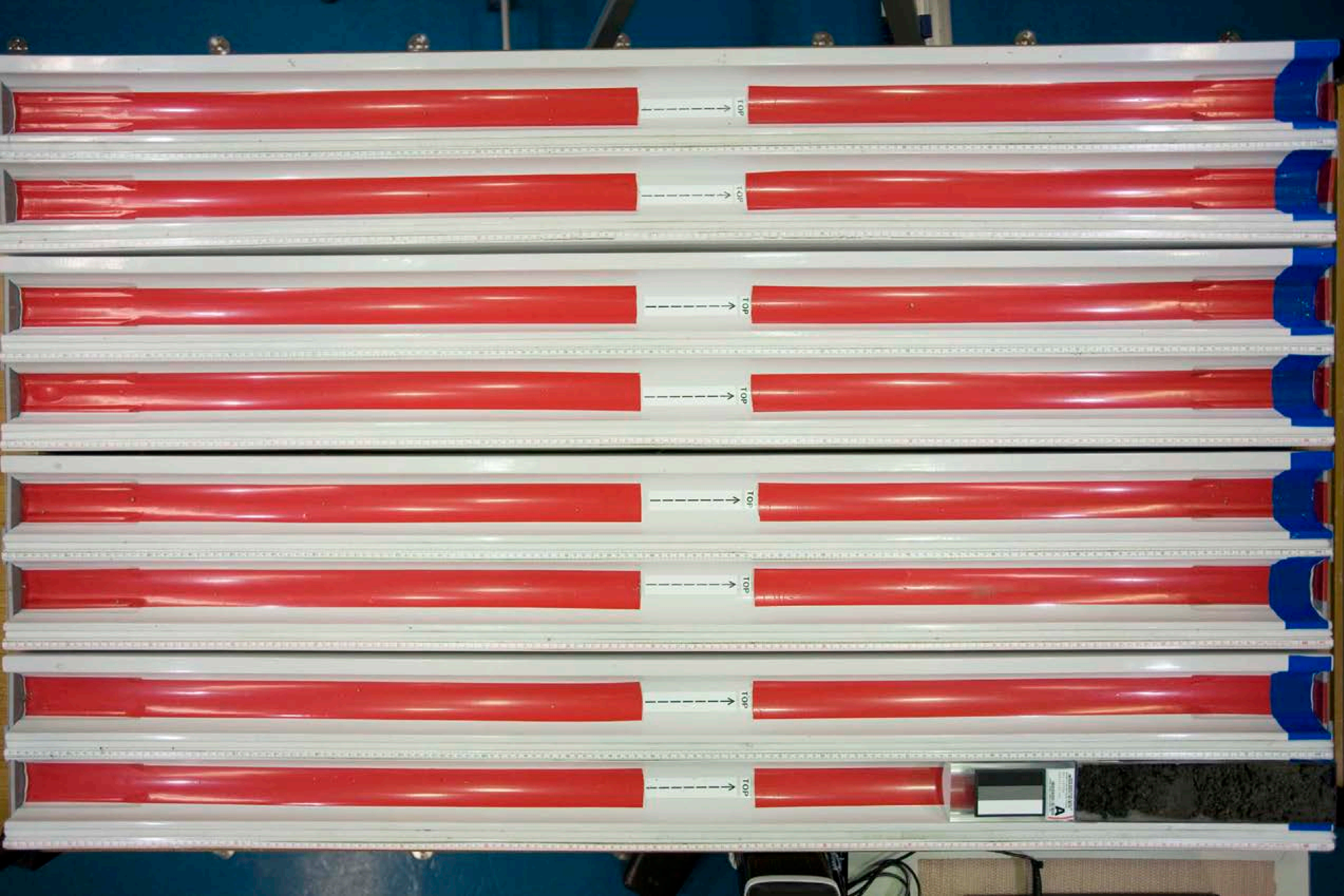
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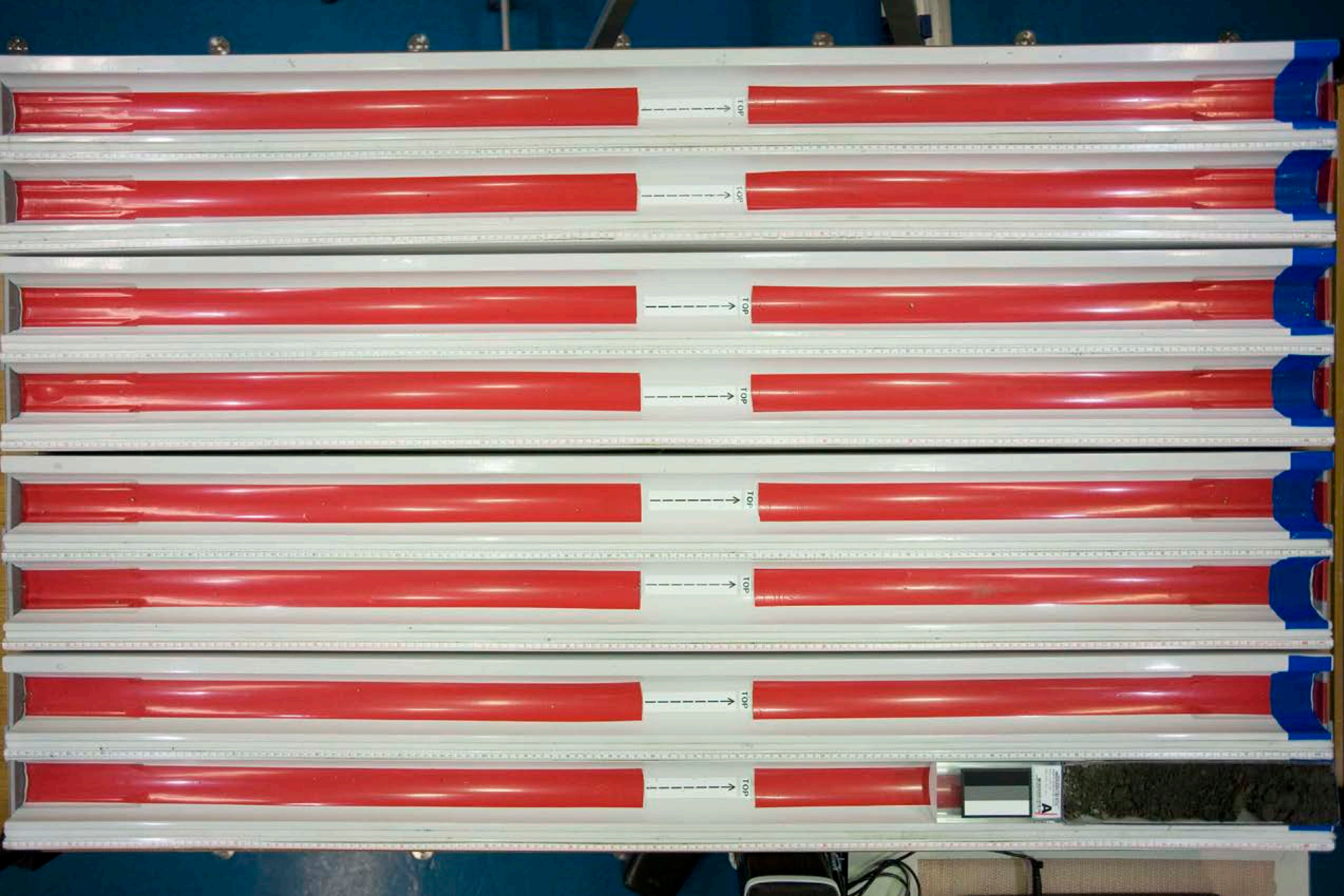
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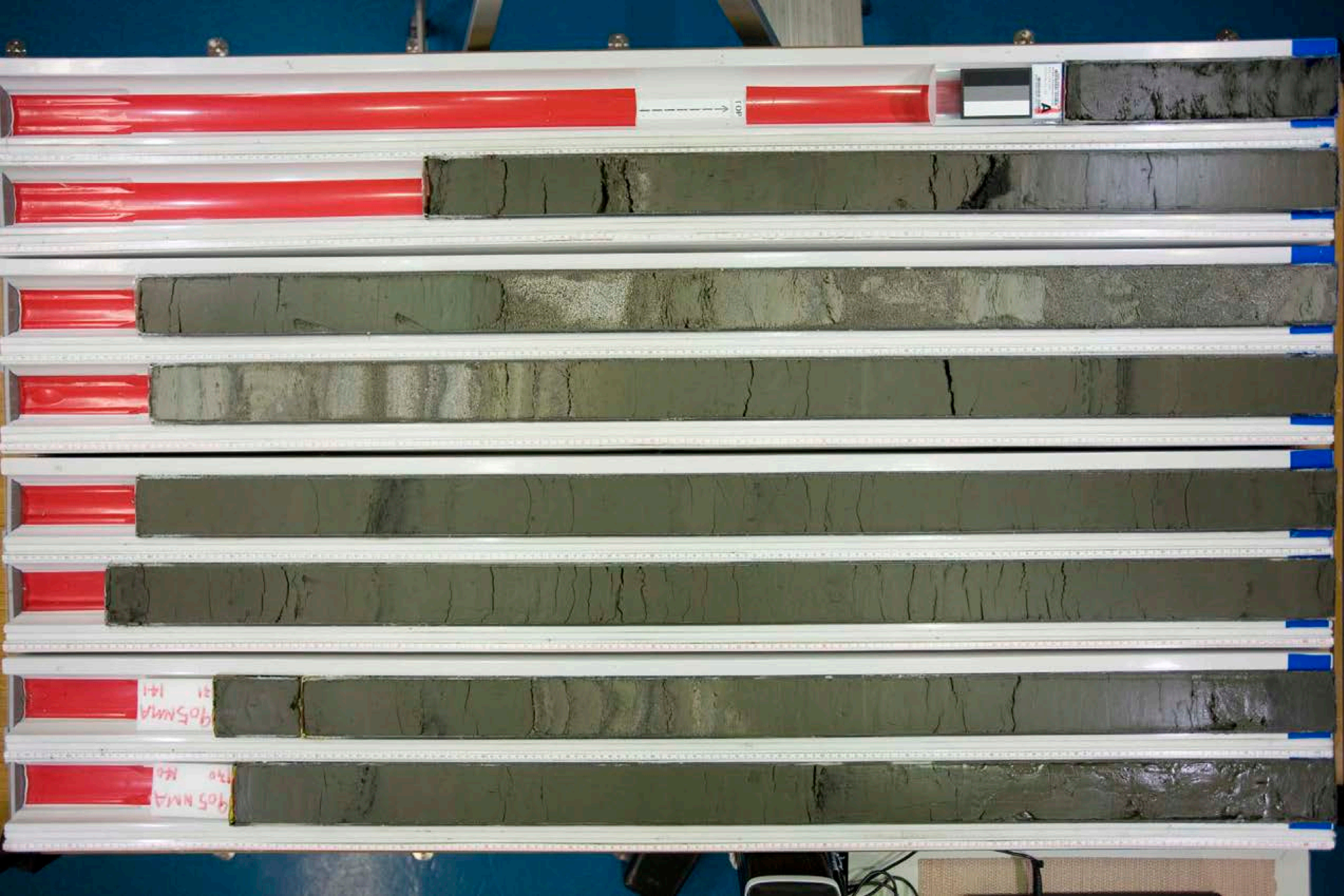
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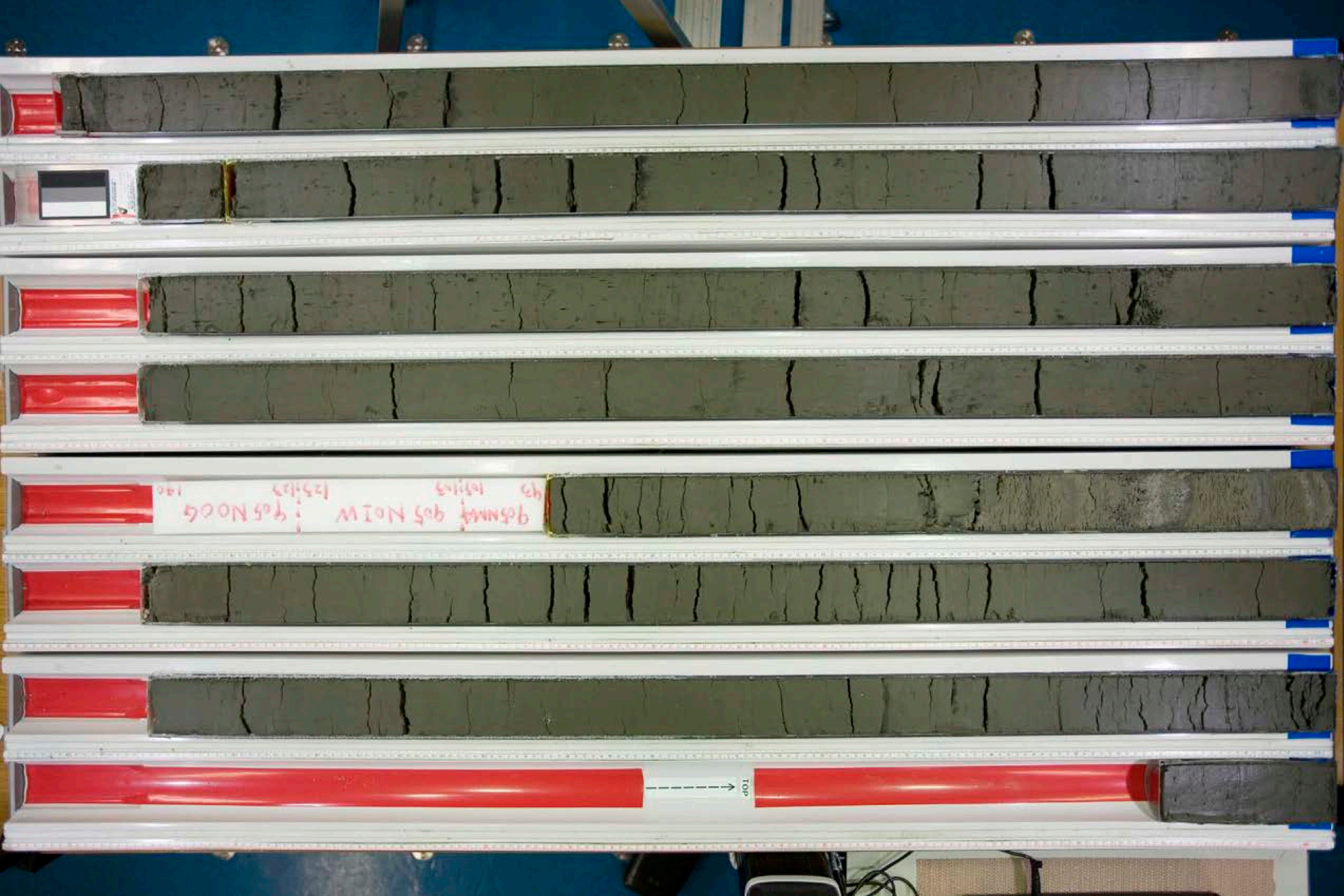
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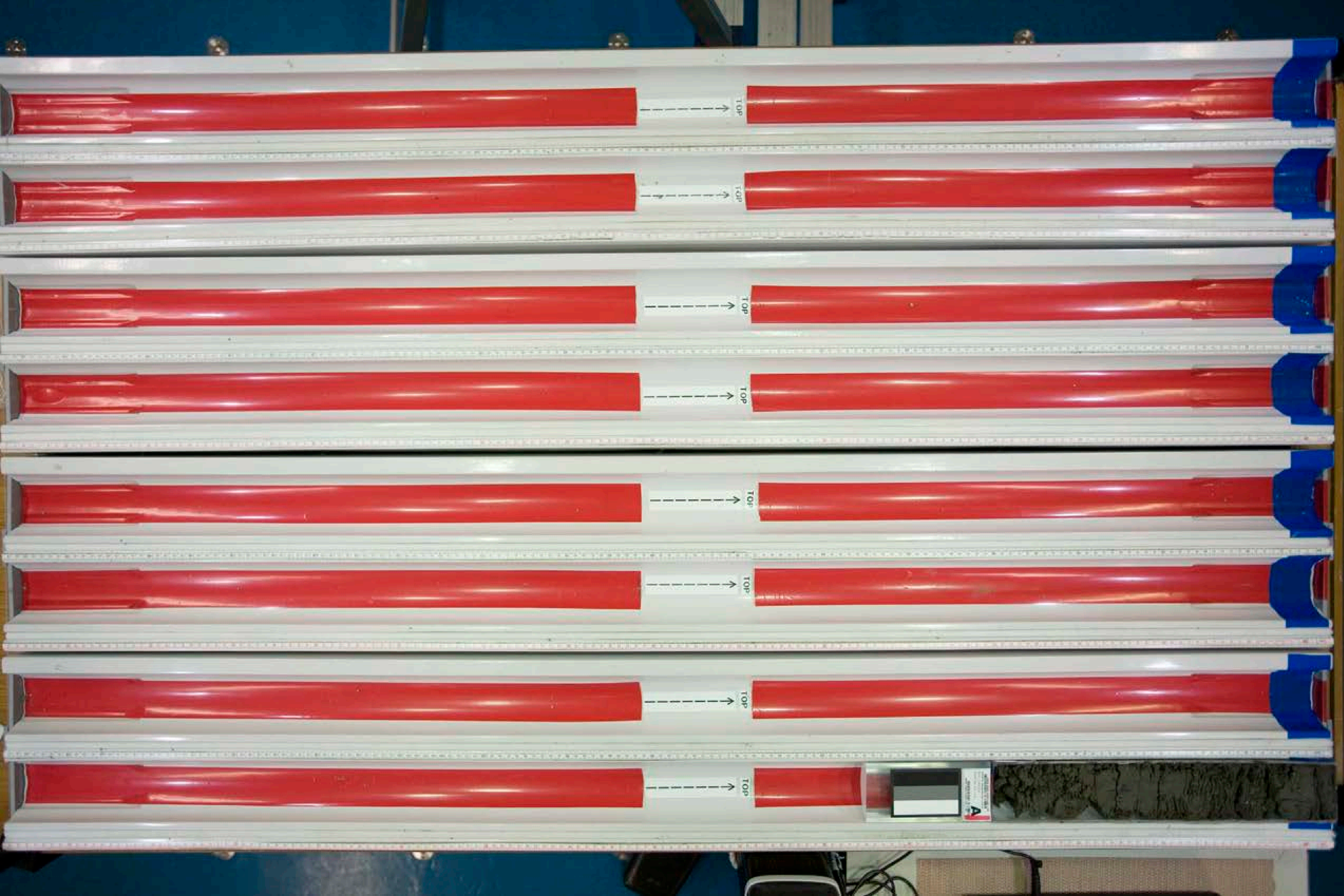
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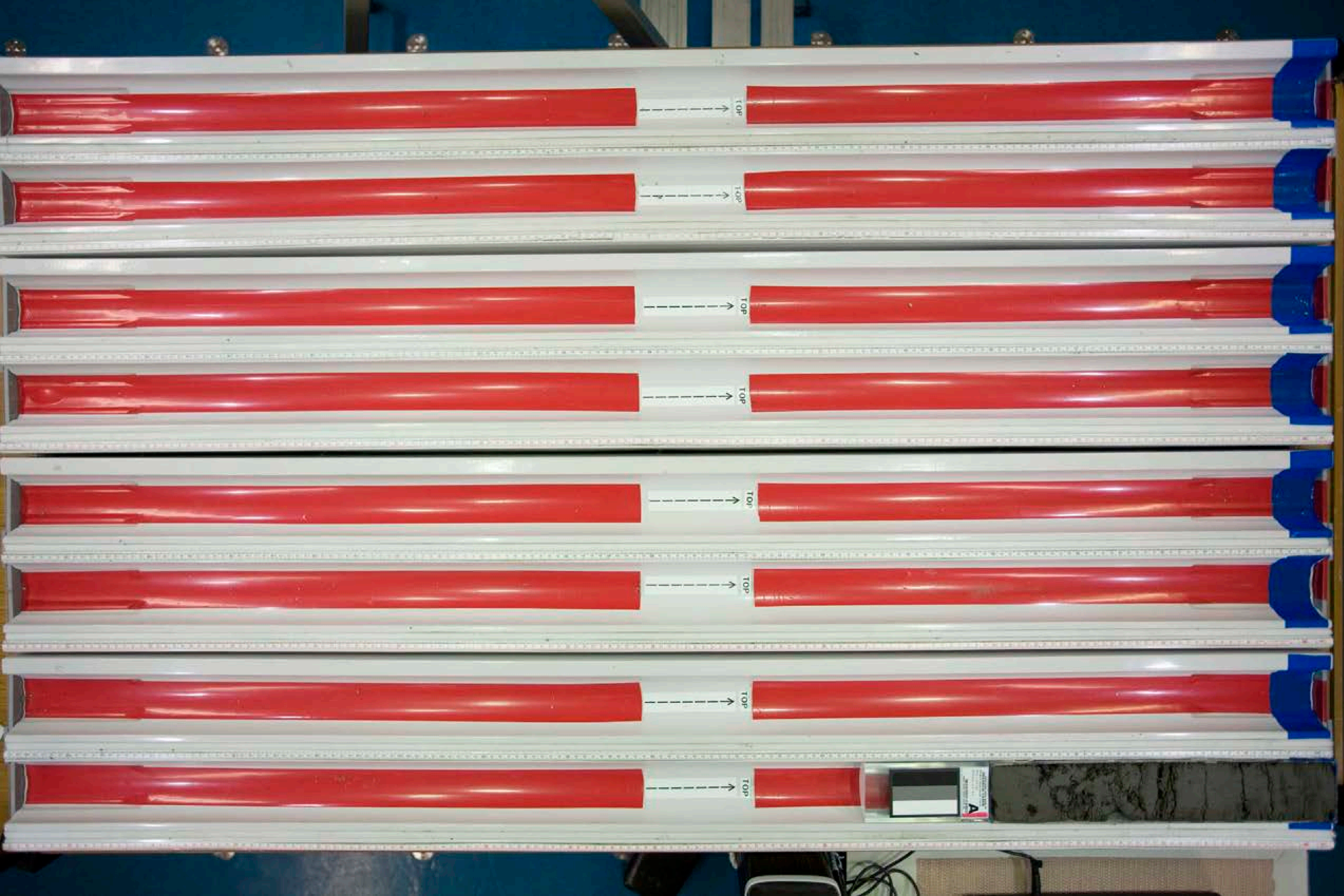
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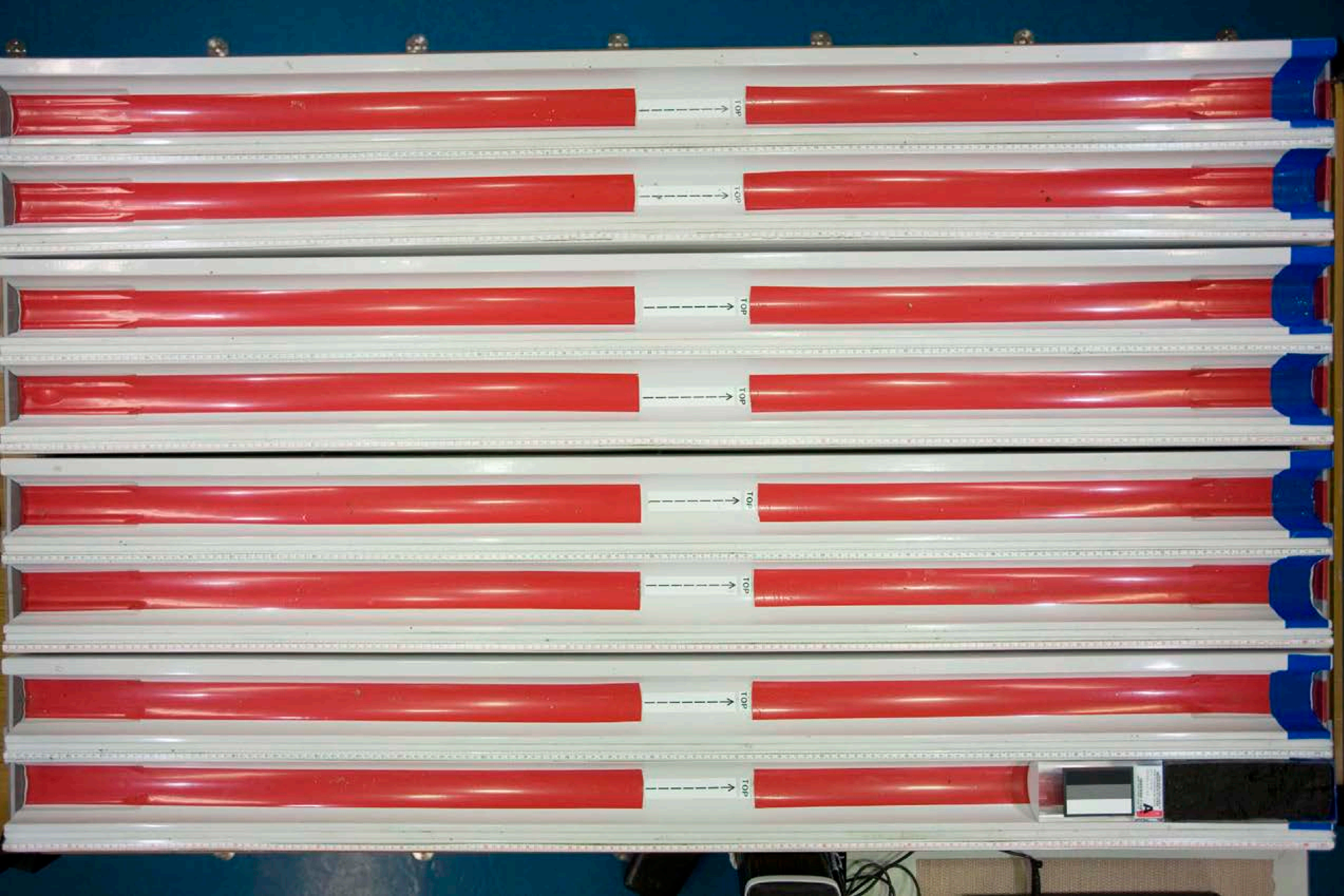
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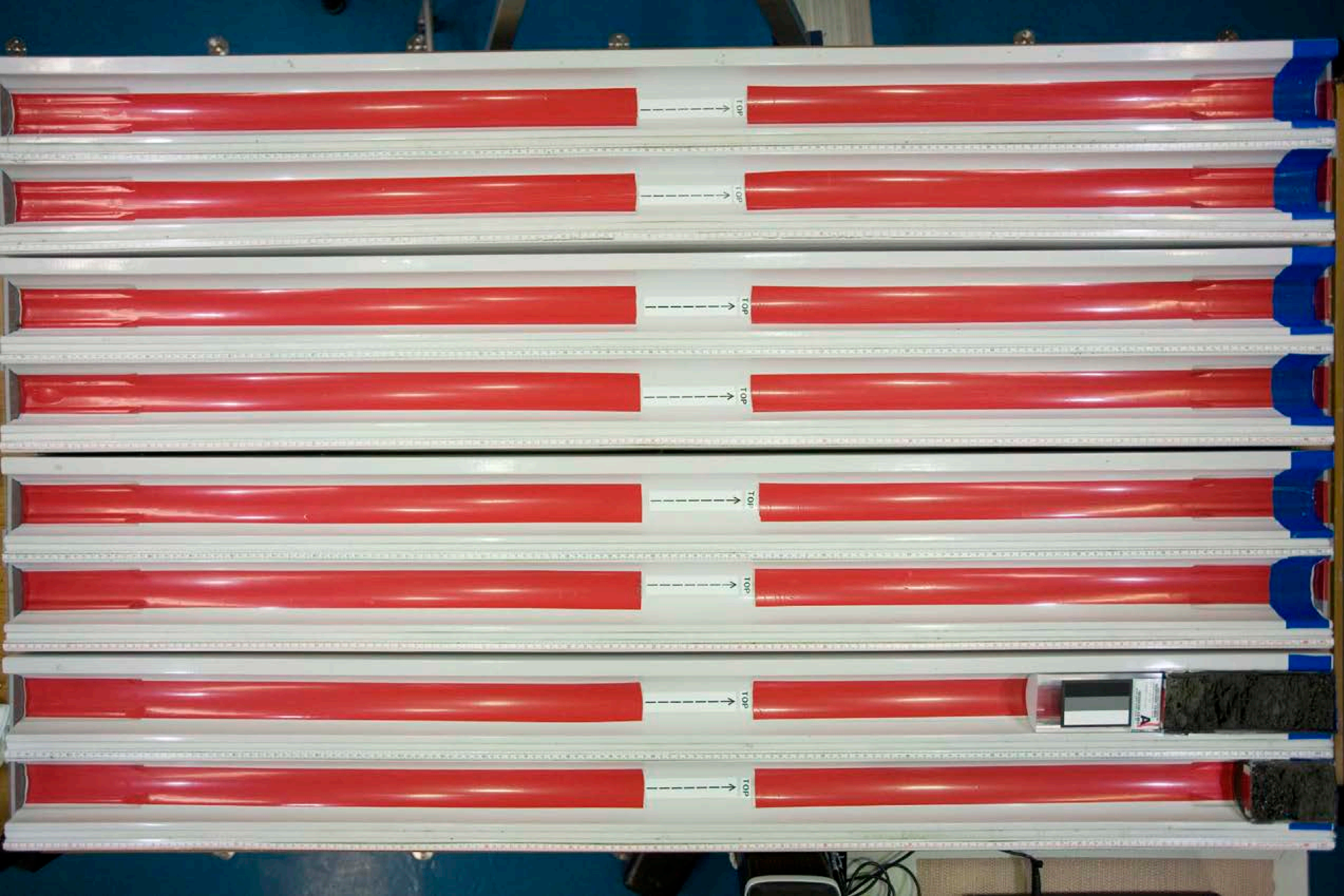
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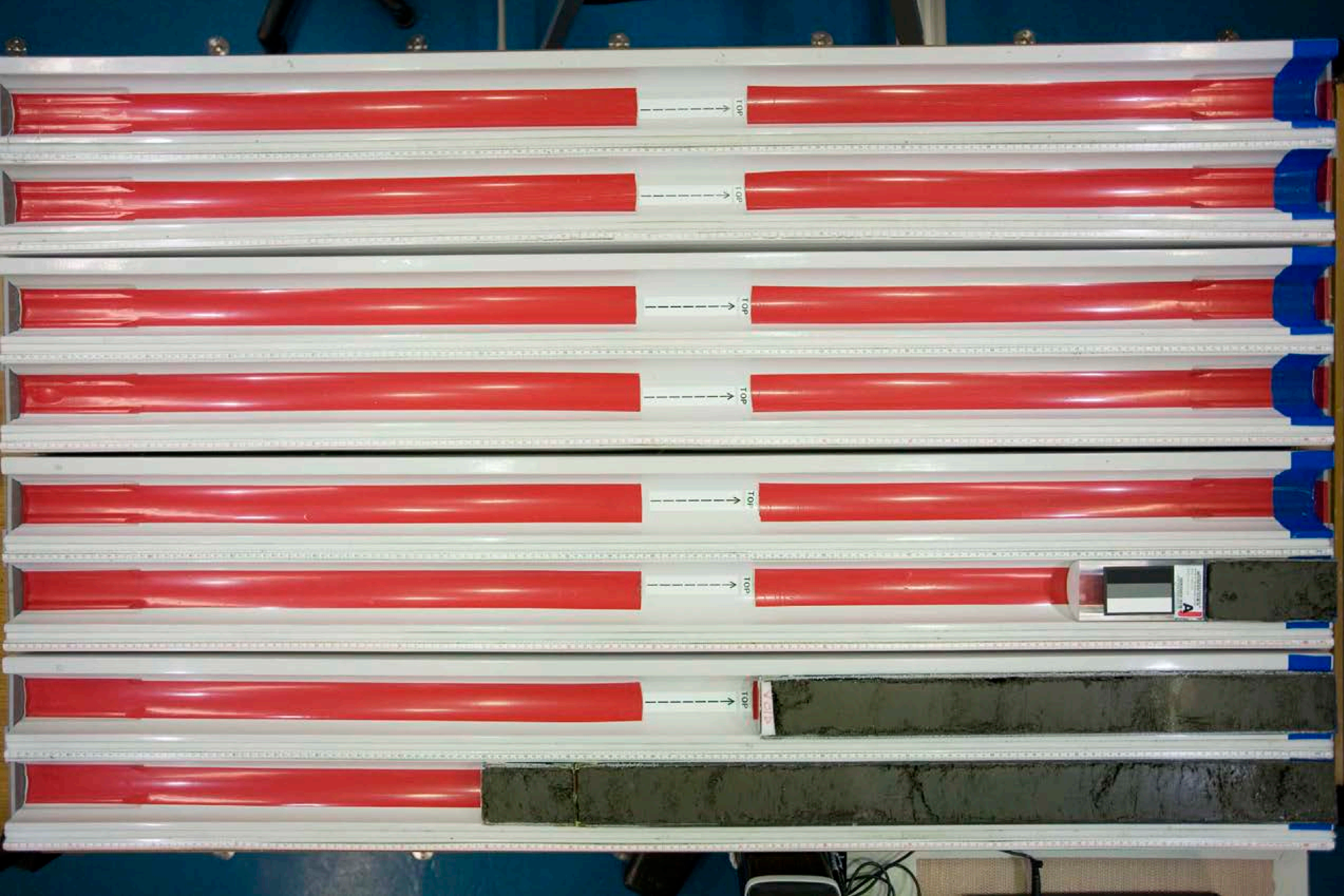
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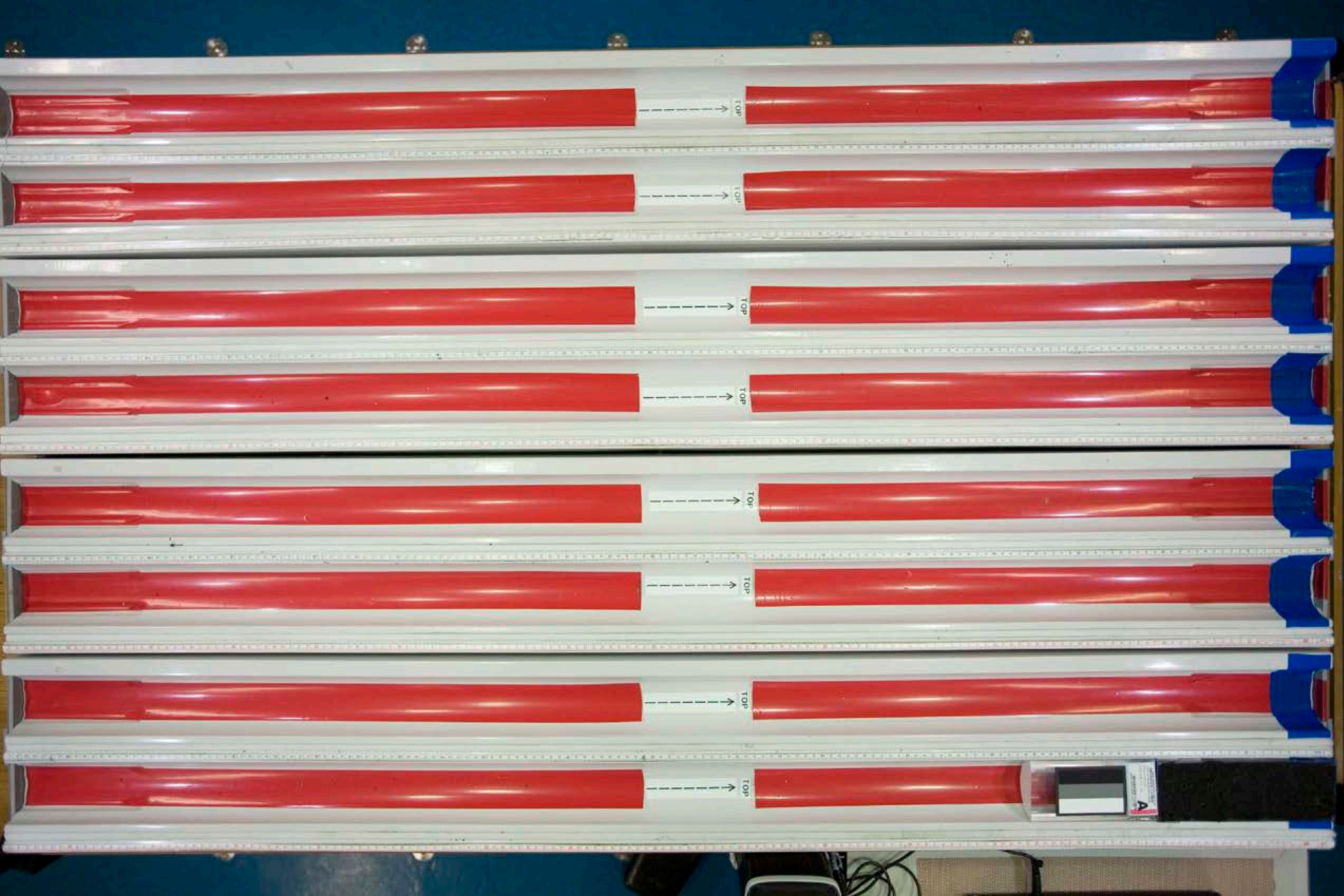
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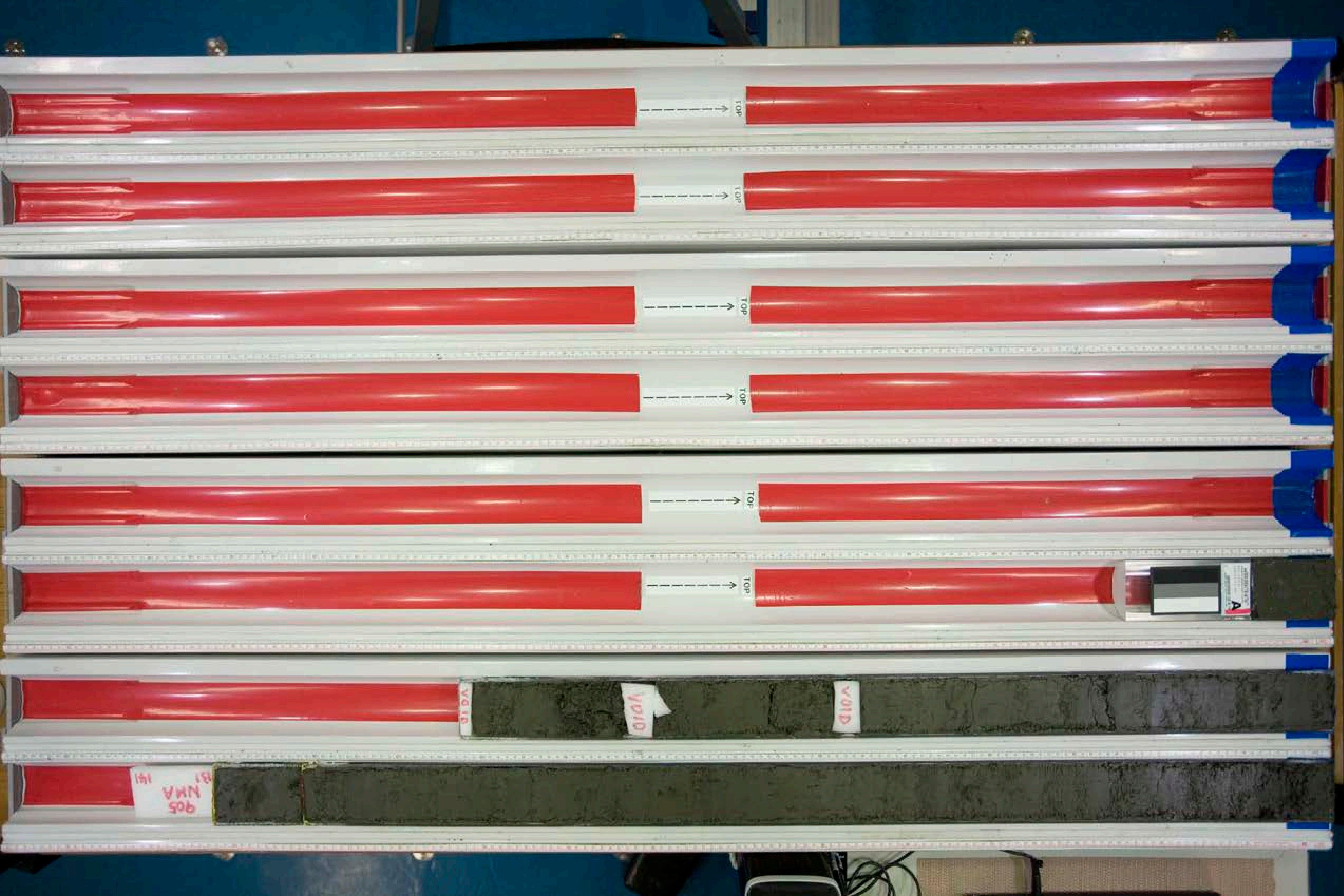
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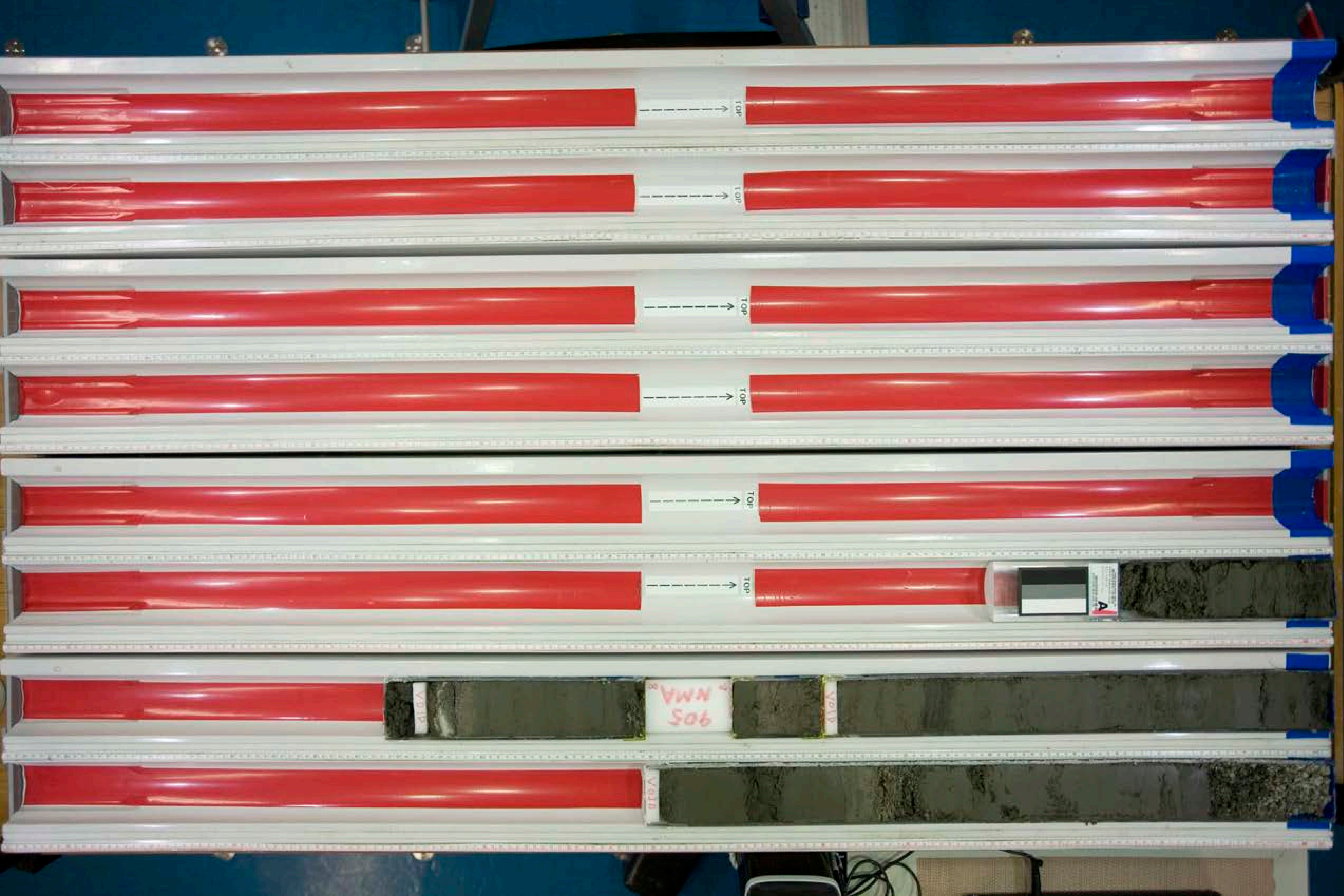
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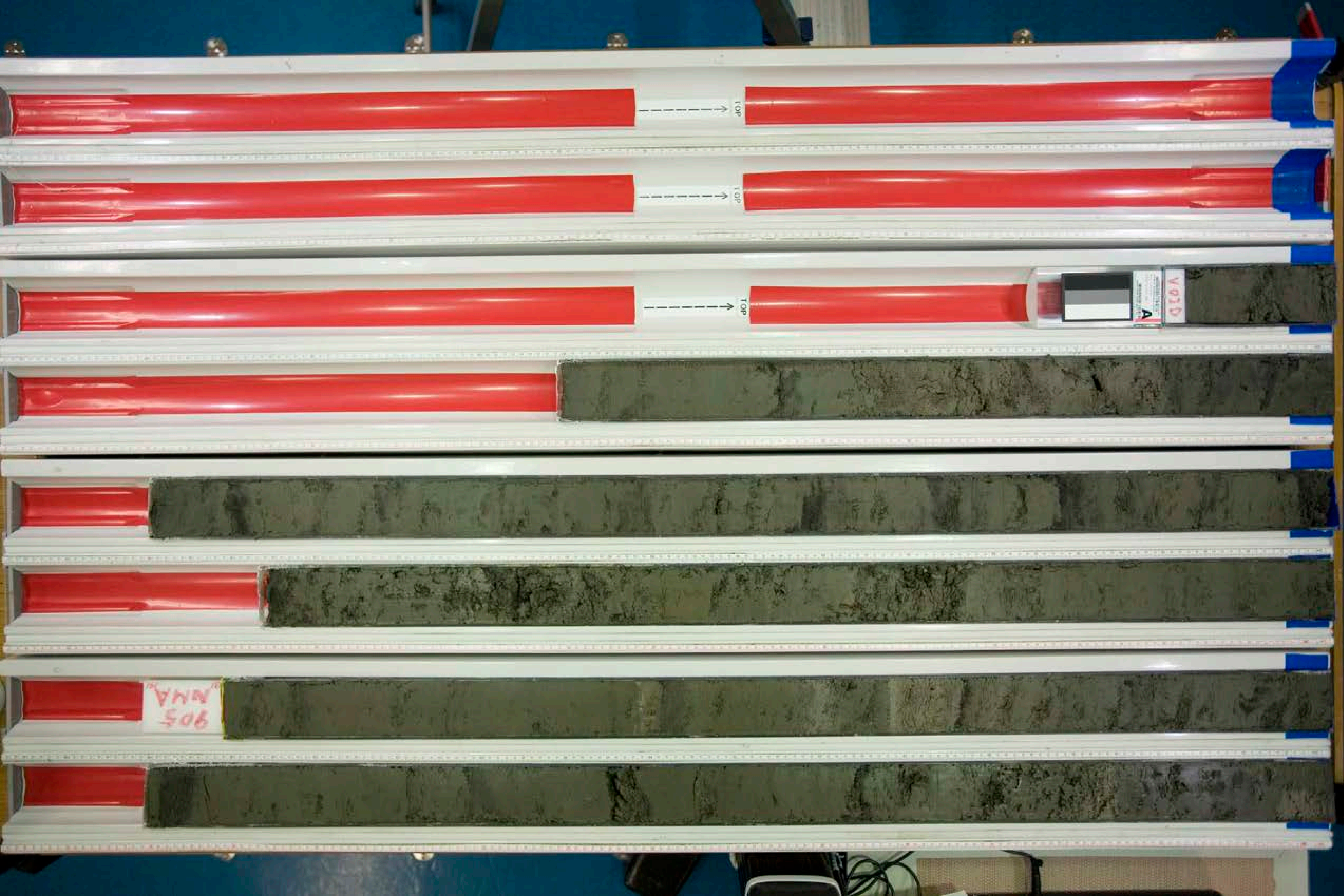
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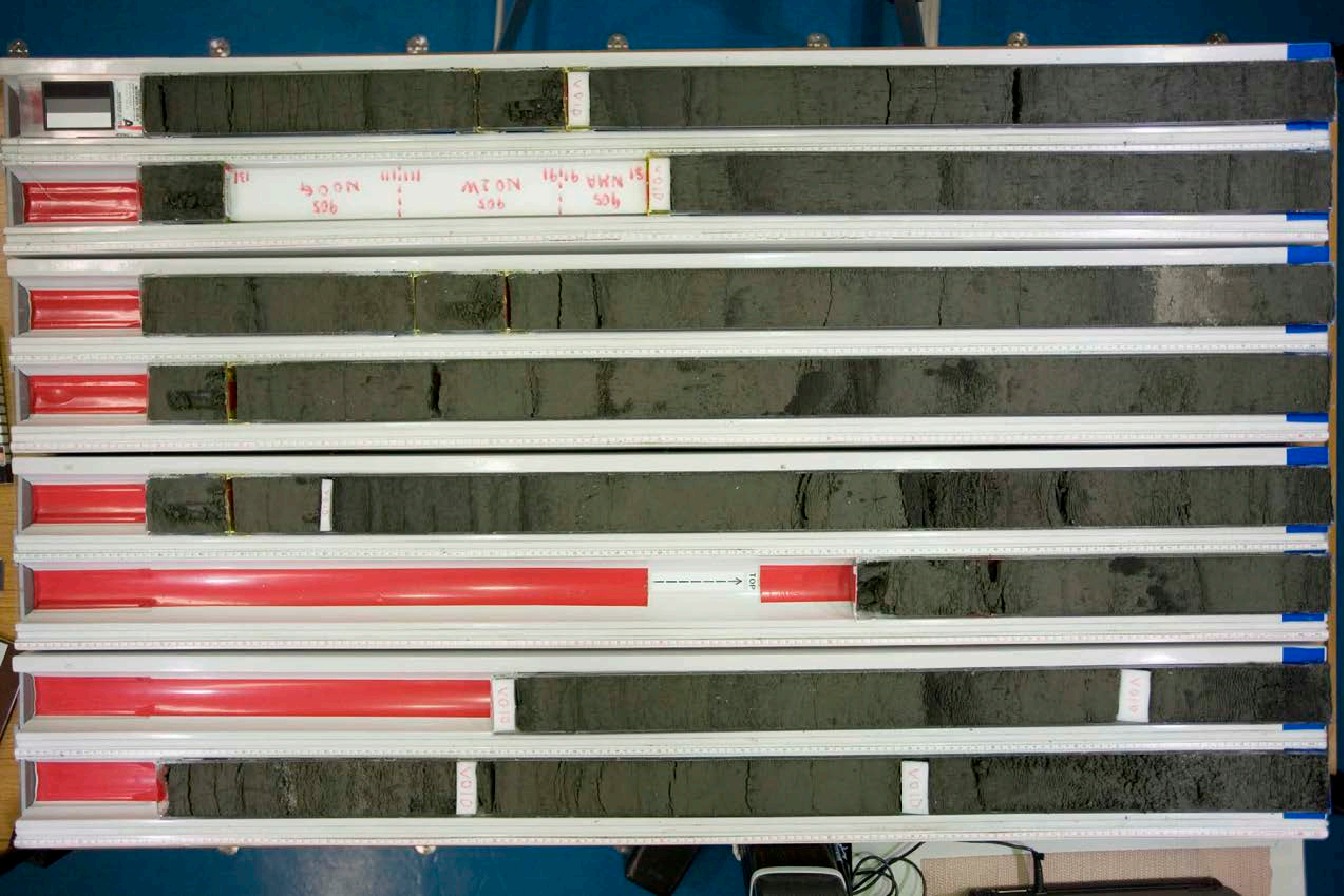
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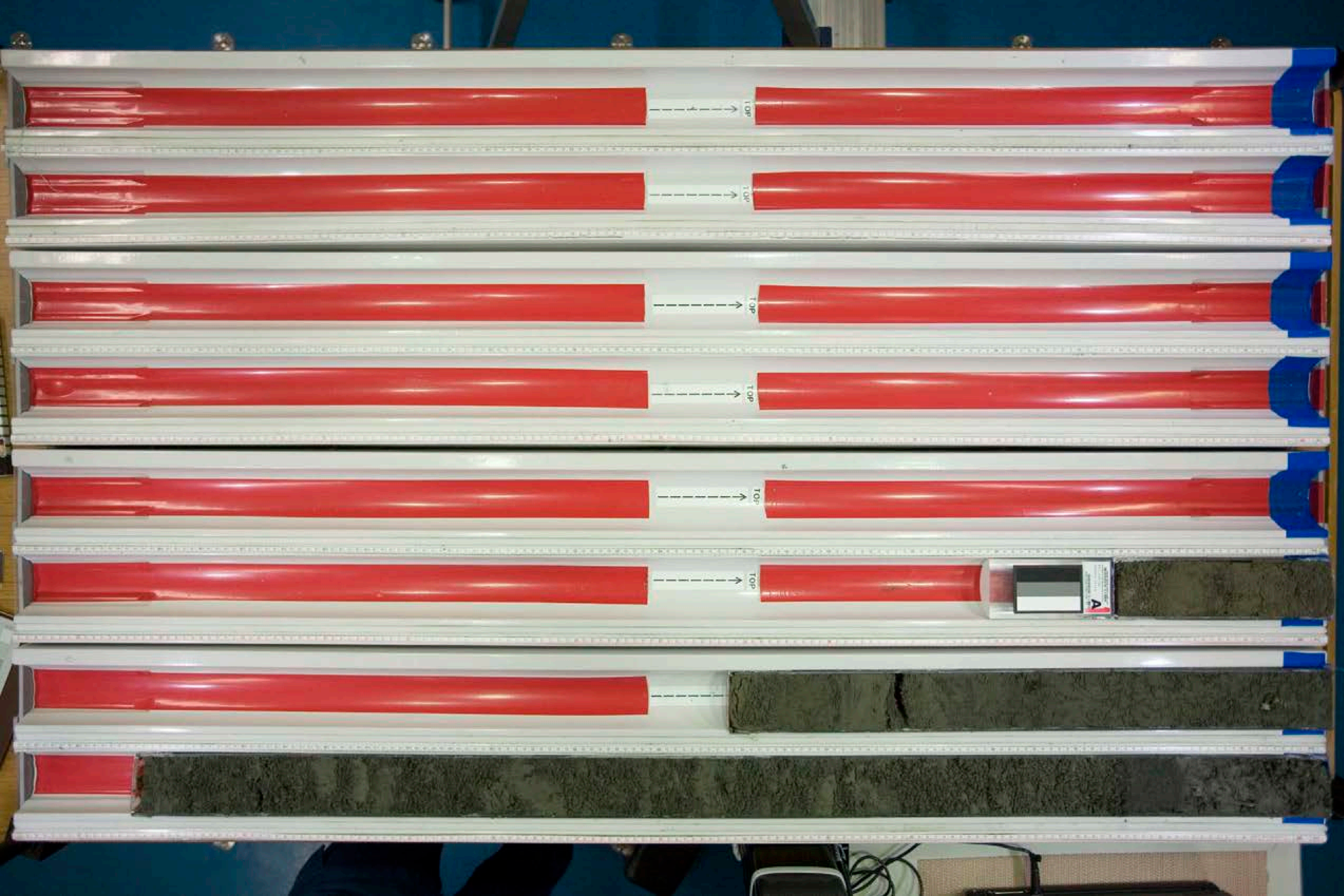
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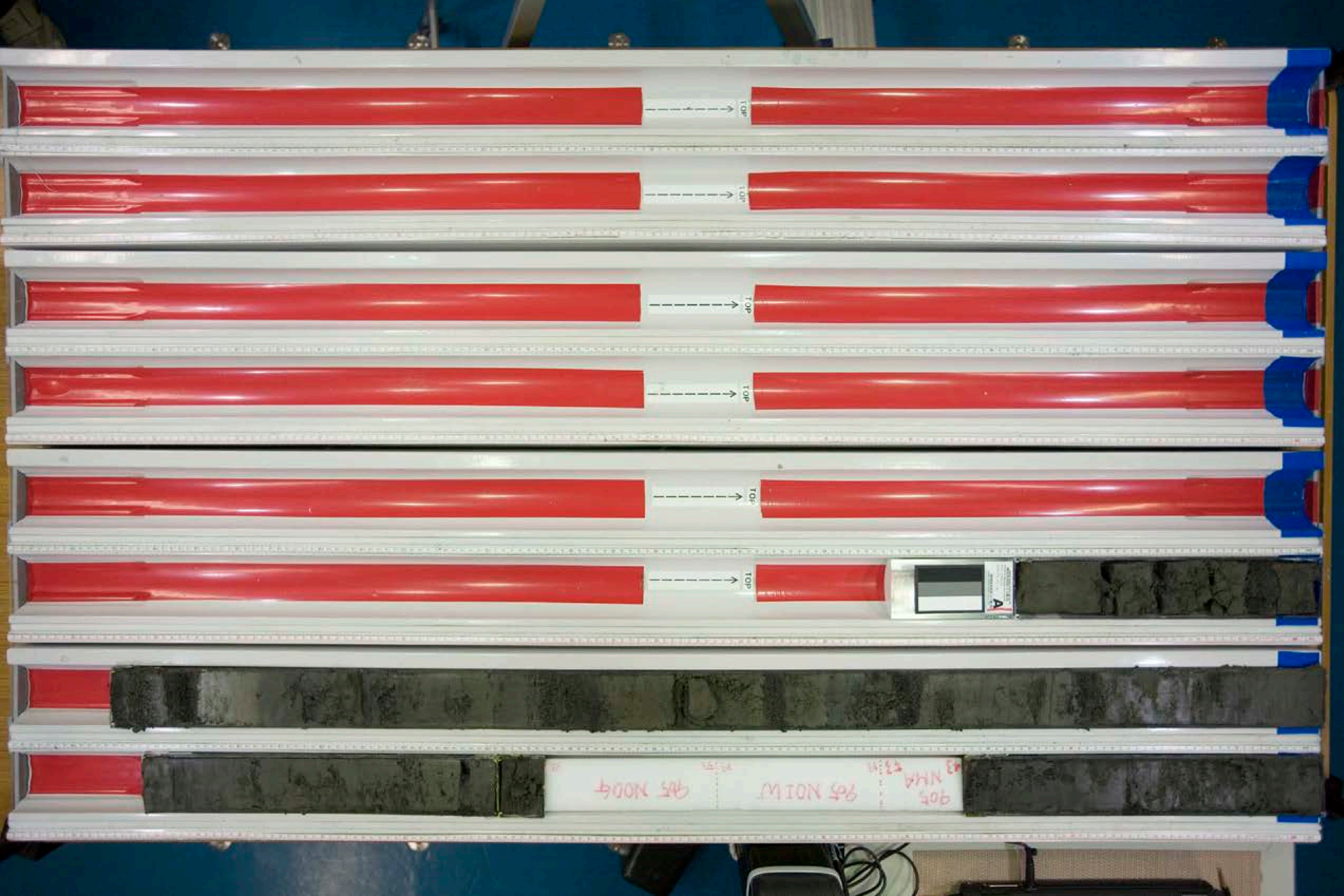
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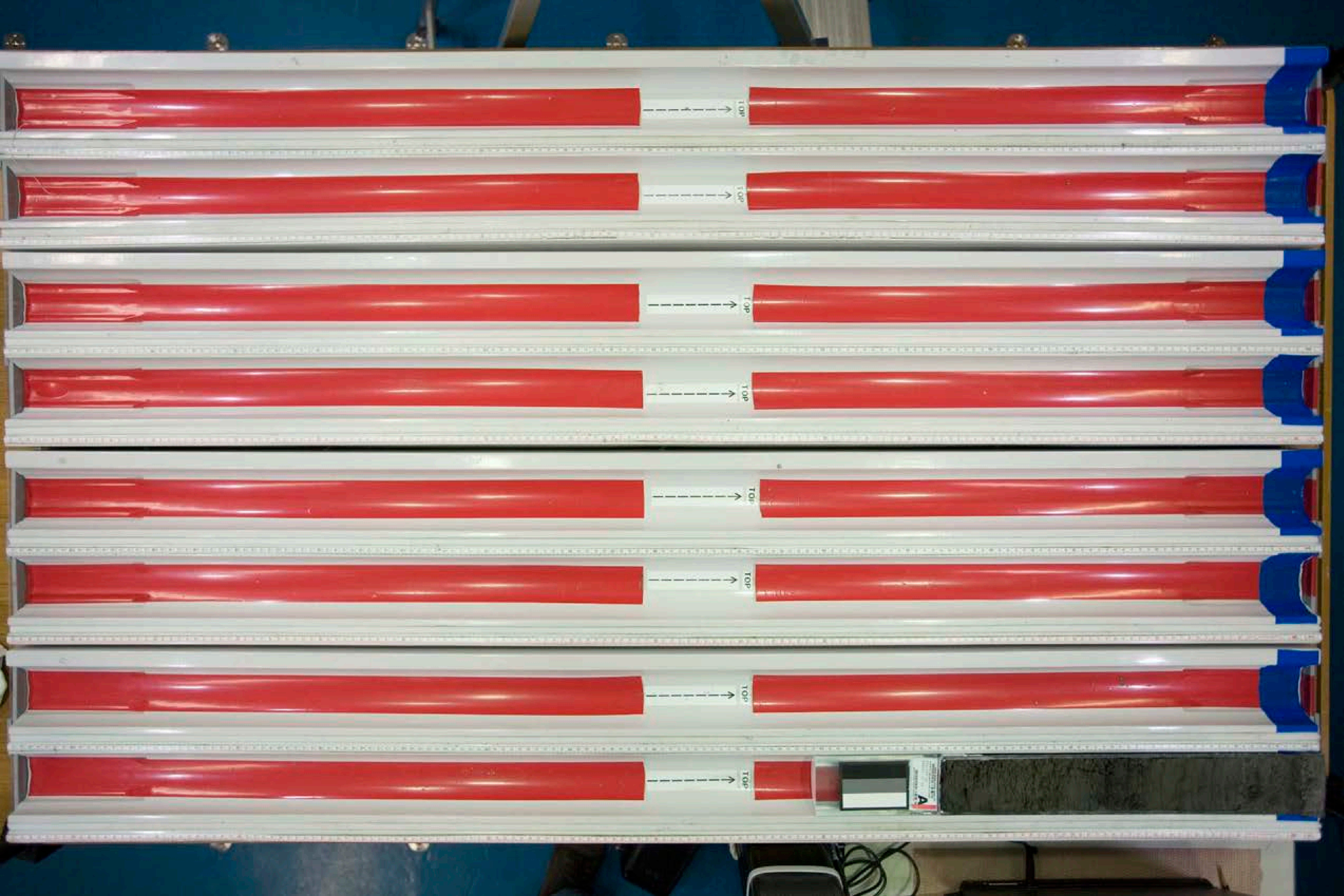
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