THIN SECTION LABEL ID: **359-U1466A-18X-1-W 7/9-TSB-TS_04** Thin section no.: 4

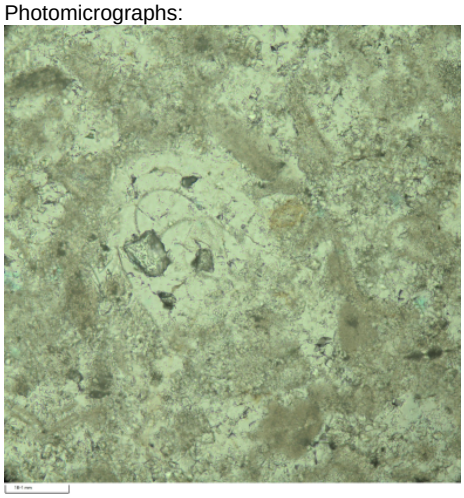
Unit/Subunit: Observer: JR

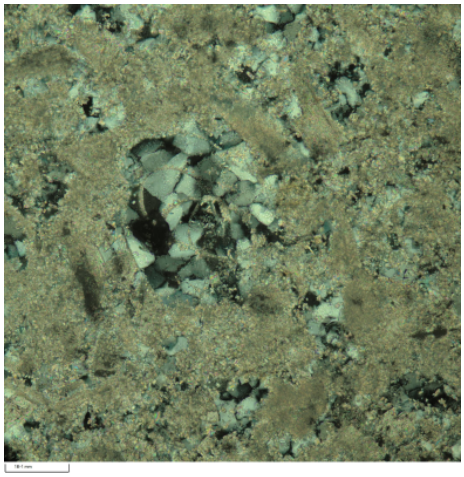
Thin section summary: The facies consists of fine grained wackestone with abundant bioclasts, common benthic foraminifera (miliolids) and presence of planktic foraminifera in a micritic matrix. There are some moldic porosities that contributes to the 5% - 7% total porosity. Most of the cements are quartz with minor micro-granular calcite. Iron oxides and organic matter are also present.

Whole thin section (plane-polarized):

Whole thin section (cross-polarized):

Photomicrographs:





Position	Photomicrograph description
Row 1, left	quartz cements

SEDIMENT/SEDIMENTARY ROCK

Lithology: wackestone

Skeletal components	major	intermediate	minor
type	foraminifera (benthic)	foraminifera (planktic)	
comment	Bioclasts abundant, Benthic foraminifera - miliolids		

Cement type: micrite cement

Porosity (major): moldic

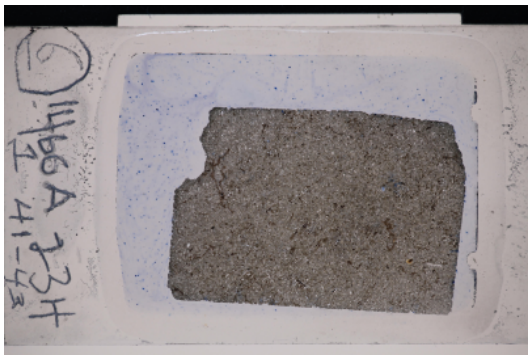
General comments: mostly quartz cements with minor micro granular calcite. There are iron oxides.

THIN SECTION LABEL ID: **359-U1466A-23H-1-W 41/43-TSB-TS_06** Thin section no.: 6

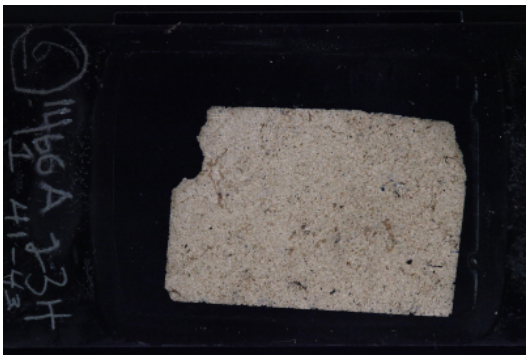
Unit/Subunit: Observer: JR/JCL/AL

Thin section summary: The facies consists of fine grained packstone with common planktic and benthic foraminifera, a few ostracods and abundant bioclasts in a micritic matrix. Most of the components are dissolved and partially infilled by microgranular calcitic cements including acicular to fibrous calcite and dog-tooth cements. Some areas are ocher colored, probably by precipitation of iron oxides. Some bioclasts probably fish remains occur in this mineralogy (apatite?). The major pore type is moldic porosity. Porosity in this facies can be up to 3 %.

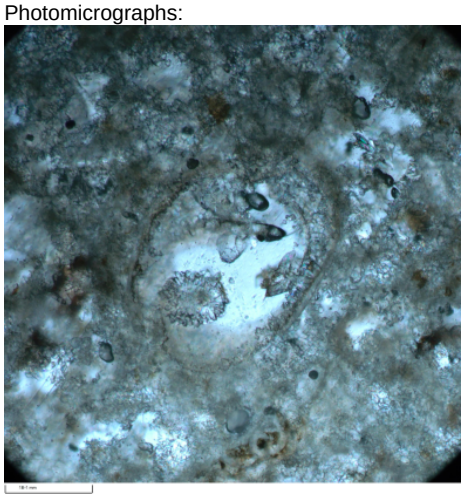
Whole thin section (plane-polarized):

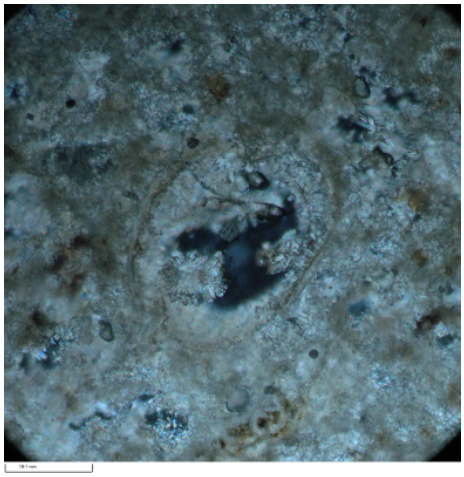


Whole thin section (cross-polarized):



Photomicrographs:





Position	Photomicrograph description
Row 1, left	Image of an ostracod with aragonitic and calcitic crystals. There are also acicular to fibrous crystals and dog-tooth crystals.

SEDIMENT/SEDIMENTARY ROCK

Lithology: packstone

Skeletal components	major	intermediate	minor
type	foraminifera (benthic)	foraminifera (planktic)	
comment			Ostracods, bioclasts

Cement type: micrite cement

Porosity (major): moldic

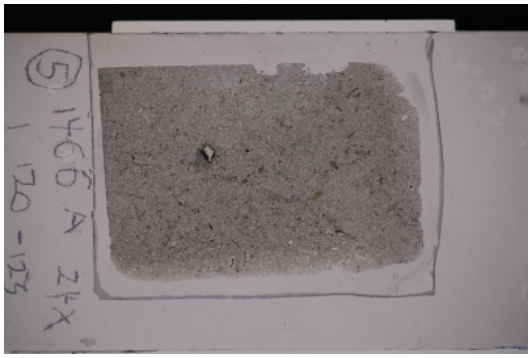
General comments: acicular cements, dog tooth cements, microcrystalline dolomite (?). Some areas have iron oxide present as precipitation. There is a large fish remain totally preserved in black-reddish mineral (apatite). Organic matter. Photos: 31799991, 31799971, 31799931, 31789791, 31799911

THIN SECTION LABEL ID: **359-U1466A-24X-1-W 120/123-TSB-TS_05** Thin section no.: 5

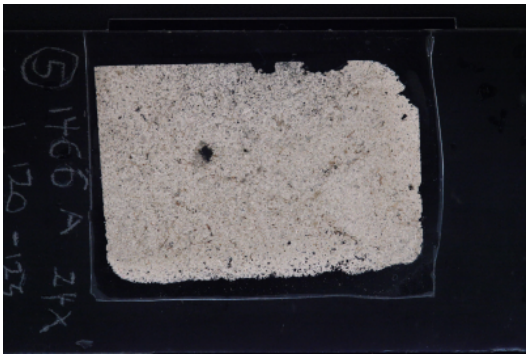
Unit/Subunit: Observer:

Thin section summary: The facies consists of fine grained wackestone to packstone with common bioclasts and some planktic and benthic foraminifera in a recrystallized micritic matrix. Most of the components are dissolved and partially infilled by microgranular calcitic cements and rarely by dolomite. Some areas are ocher colored, probably by precipitation of iron oxides and there are organic matter present. Largest pores (up to 1mm) present precipitates of a black mineral. Porosity in this facies can be up to 3 %.

Whole thin section (plane-polarized):



Whole thin section (cross-polarized):



Photomicrographs:

SEDIMENT/SEDIMENTARY ROCK

Lithology: wackestone

Skeletal components	major	intermediate	minor
type		foraminifera (benthic)	foraminifera (planktic)
comment			bioclasts also present

Cement type: granular

Porosity (major): moldic

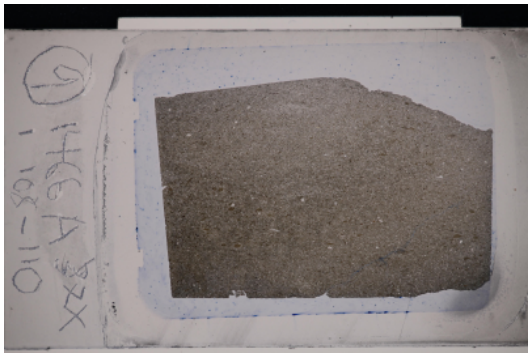
General comments: The facies consists of fine grained wackestone to packstone with common bioclasts and some planktic and benthic foraminifera in a recrystallized micritic matrix. Most of the components are dissolved and partially infilled by microgranular calcitic cements and rarely by dolomite. Some areas are ocher colored, probably by precipitation of iron oxides. Largest pores (up to 1mm) present precipitates of a black mineral. Porosity in this facies can be up to 3 %. organic matter present.

THIN SECTION LABEL ID: **359-U1466A-37X-1-W 108/110-TSB-TS_09** Thin section no.: 9

Unit/Subunit: Observer:

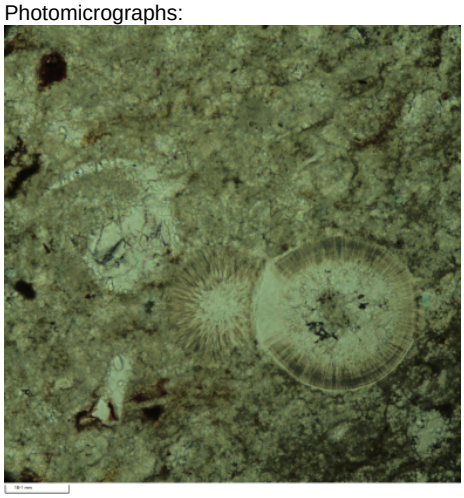
Thin section summary: The facies consists of a very fine grained packstone to wackestone with abundant bioclasts and some planktic and benthic foraminifera in a recrystallized micritic matrix. Most of the components are preserved in microgranular calcitie, rarely in acicular calcite. Porosity in this facies is less than 1 %.

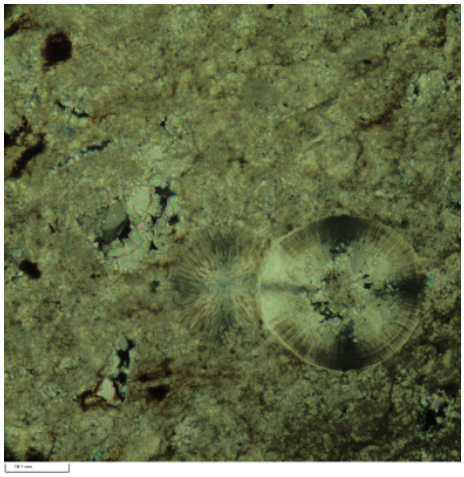
Whole thin section (plane-polarized):



Whole thin section (cross-polarized):

Photomicrographs:





Position	Photomicrograph description
Row 1, left	The image of a planktic foram in PPL and XPL showing acicular cements and blocky cements. There is also iron oxide.

SEDIMENT/SEDIMENTARY ROCK

Lithology: packstone

Cement type: granular

Porosity (major): moldic

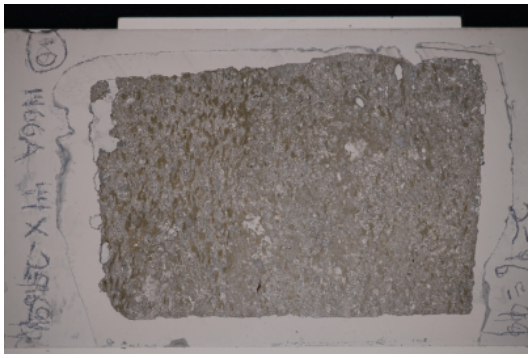
General comments: The facies consists of a very fine grained packstone to wackestone with abundant bioclasts and some planktic and benthic foraminifera in a recrystallized micritic matrix. Most of the components are preserved in microgranular calcite, rarely in acicular calcite. Porosity in this facies is less than 1 %.

THIN SECTION LABEL ID: **359-U1466A-44X-2-W 96/99-TSB-TS_10** Thin section no.: 10

Unit/Subunit: Observer:

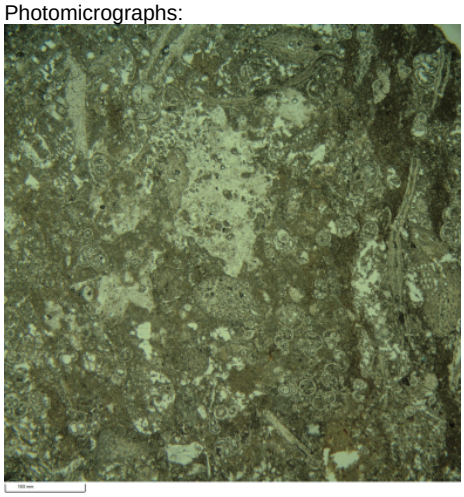
Thin section summary: The facies consists of fine grained packstone with abundant planktic and benthic foraminifera (miogypsinids, Lepidociclina (?), Amphistegina (?) and Borelis (?)), and abundant bioclasts in a dense to clotted micritic matrix. Bivalve and echinoid fragments are present in the section. Microgranular calcitic cements occur in some bioclasts. Porosity is up to a 5 % and can be divided in (1) primary porosity, inside of burrows, and (2) secondary porosity, after dissolution of planktic foraminifera.

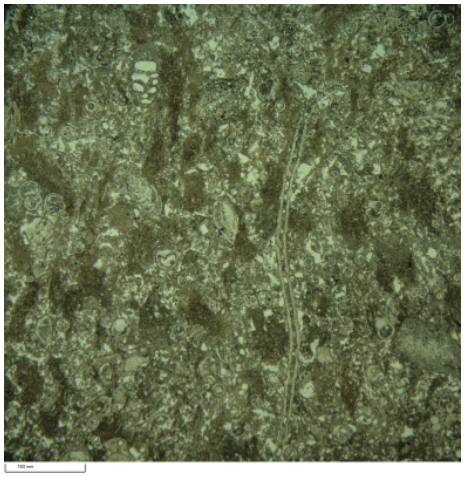
Whole thin section (plane-polarized):



Whole thin section (cross-polarized):

Photomicrographs:





Position	Photomicrograph description
Row 1, left	overal image of large benthics
Row 1, center	overall images of large benthics

SEDIMENT/SEDIMENTARY ROCK

Lithology: packstone

Skeletal components	major	intermediate	minor
type	foraminifera (planktic)	foraminifera (benthic)	bivalve
comment		Large and small benthics (Amphistegina?, Miogipsina?, Lepidociclina?, Borelis?)	echinoid fragment

Cement type: granular

Porosity (major): moldic

General comments: microgranular calcite, micrite (dolomicrite?) - dense to dotted micrite, primary pore spaces inside burrow and secondary pores usually after the dissoulution of planktic forams

THIN SECTION LABEL ID: **359-U1466A-50X-CC-PAL-TSB-TS_07** Thin section no.: 7

Unit/Subunit: Observer:

Thin section summary: The facies consists of fine grained packstone with common planktic foraminifera, a few benthic foraminifera, some mollusk fragments, and abundant bioclasts in a micritic (partially recrystallized) matrix. Most of the components are preserved in granular to microgranular calcitic cements. There are organic material present. This facies present nearly no porosity.

Whole thin section (plane-polarized):

Whole thin section (cross-polarized):

Photomicrographs:

SEDIMENT/SEDIMENTARY ROCK

Lithology: packstone

Skeletal components	major	intermediate	minor
type	foraminifera (planktic)	foraminifera (benthic)	bivalve
comment			bivalve fragments, ostracods

Cement type: granular

Porosity (major):

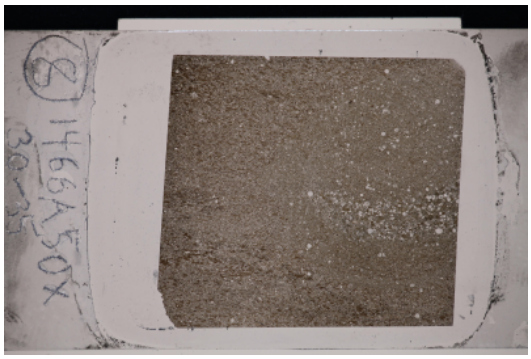
General comments: abundant ocher grains (Fe?), micritic, partially recrystallized

THIN SECTION LABEL ID: **359-U1466A-50X-CC-PAL-TSB-TS_08** Thin section no.: 8

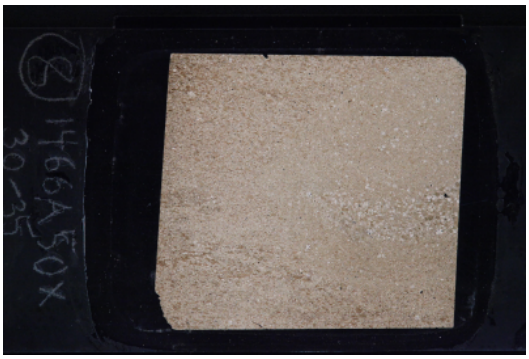
Unit/Subunit: Observer:

Thin section summary: The facies consists of fine grained packstone with abundant planktic foraminifera, common benthic foraminifera, rarely bryozoan and mollusk fragments, and abundant bioclasts in a micritic (partially recrystallized) matrix. Planktic foraminifera are especially abundant in a burrow. Most of the components are preserved in granular to microgranular calcitic cements. The porosity is moldic and less than 1%.

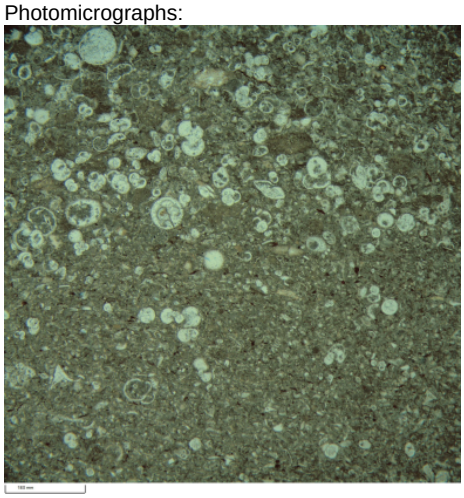
Whole thin section (plane-polarized):



Whole thin section (cross-polarized):



Photomicrographs:



Position	Photomicrograph description
Row 1, left	contact between planktic foraminifera rich burrow to the original background sediment

SEDIMENT/SEDIMENTARY ROCK

Lithology: packstone

Skeletal components	major	intermediate	minor
type	foraminifera (planktic)	foraminifera (benthic)	bryozoa
comment			bivalve or gastropod fragments and bioclasts present

Cement type: micrite cement

Porosity (major): moldic

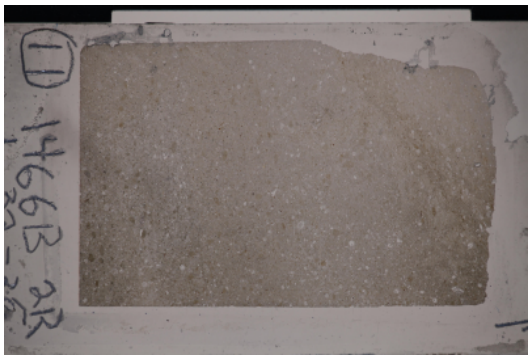
General comments: granular-microgranular calcite, there is a lense or burrow infill, full planktic foraminifera

THIN SECTION LABEL ID: **359-U1466B-2R-1-W 32/36-TSB-TS_11** Thin section no.: 11

Unit/Subunit: Observer: JR

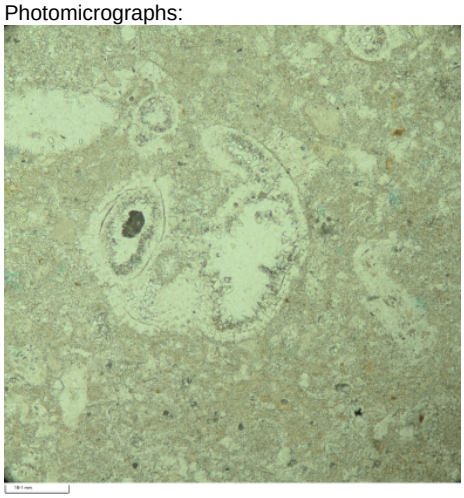
Thin section summary: The facies consists of a fine-grained gradually changing wackestone at the top to packstone at the bottom with abundant bioclasts and planktic foraminifera, benthic foraminifera and bryozoan fragments are present in micritic matrix. Most of the components are dissolved and partially infilled by granular to microgranular calcitic cements including dog-tooth cements locally. Some areas are ocher colored, probably by precipitation of iron oxides and organic matter; and probably burrowing by Phycosiphon. Porosity in this facies can be up to 3 %.

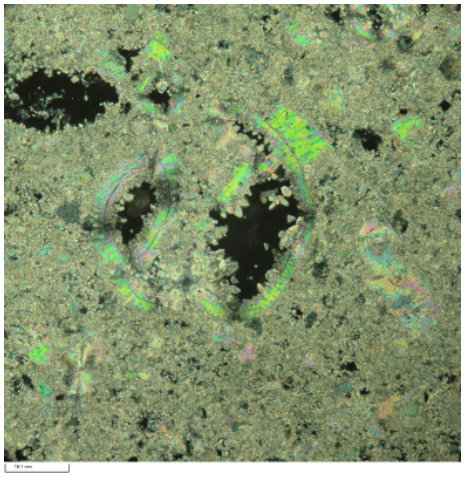
Whole thin section (plane-polarized):



Whole thin section (cross-polarized):

Photomicrographs:





Position	Photomicrograph description
Row 1, left	PPL and XPL comparison of granular to microgranular colourful calcite crystals. Dog-tooth cements.

SEDIMENT/SEDIMENTARY ROCK

Lithology: wackestone

Skeletal components	major	intermediate	minor
type	foraminifera (planktic)	foraminifera (benthic)	ostracod
comment	Bioclast abundant		

Cement type: micrite cement

Porosity (major): moldic

General comments: granular to microgranular calcite, locally dog tooth cements, Phycosiphon burrowing and some iron oxides, gradual change from wacke on top to packstone at the bottom

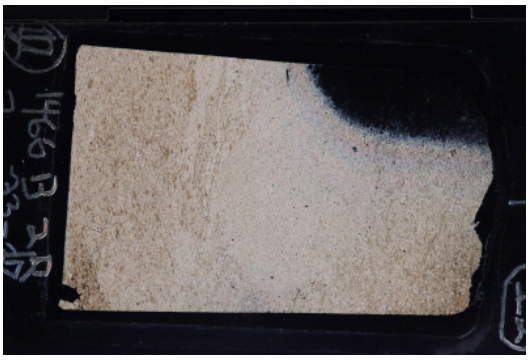
THIN SECTION LABEL ID: **359-U1466B-2R-2-W 33/37-TSB-TS_12** Thin section no.: 12

Unit/Subunit: Observer:

Thin section summary: The sample has been classified as wackestone to packestone with abundant planktic and benthic foraminifera (Nummulites) common echinoid spines, pellets and undifferentiated bioclasts, also, few ostracods (Bairdoppilata sp.) are present in a micritic matrix. Most of the bioclastic grains are dissolved and filled by dogtooth and drusy cements. Isolated burrow is present (Thalassinoides?) which change the texture from poorly sorted to moderate sorted inside the bioturbation. Only micro porosity can be reported in the sample that cannot be estimated by visual analysis.

Whole thin section (plane-polarized):

Whole thin section (cross-polarized):



Photomicrographs:

SEDIMENT/SEDIMENTARY ROCK

Lithology: wackestone

Skeletal components	major	intermediate	minor
type	foraminifera (planktic)	foraminifera (benthic)	echinoderm
comment			Spine

Cement type: dog tooth

Porosity (major): moldic

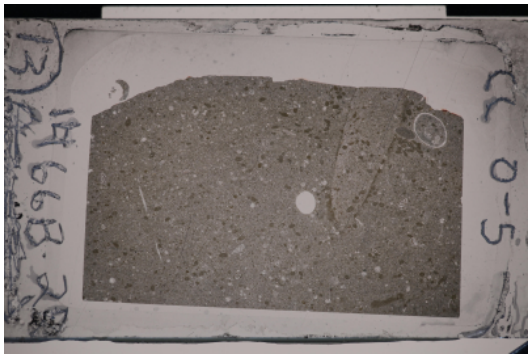
General comments: Most of the bioclastic grains are dissolved and filled by dogtooth and drusy cements. Isolated borrow is present (Thalassinoides?) which change the texture from poorly sorted to moderate sorted inside the bioturbation. Only micro porosity can be reported for the sample that cannot be estimated by visual analysis.

THIN SECTION LABEL ID: **359-U1466B-2R-CC-PAL-TSB-TS_13** Thin section no.: 13

Unit/Subunit: Observer:

Thin section summary: The sample has been classified as wackestone with abundant planktic and benthic foraminifera common, pellets and undifferentiated bioclasts. There are few grains which are dissolved and filled by drusy and granular cements also, very rare dolomite. Isolated borrow is present (Palaeophycus?) which shows a micrite coating but does not change the internal texture of the sediments. Only micro porosity can be reported for the sample that cannot be estimated by visual analysis.

Whole thin section (plane-polarized):



Whole thin section (cross-polarized):

Photomicrographs:

SEDIMENT/SEDIMENTARY ROCK

Lithology: wackestone

Skeletal components	major	intermediate	minor
type	foraminifera (planktic)	foraminifera (benthic)	
comment			

Cement type: drusy

Porosity (major): intraparticle

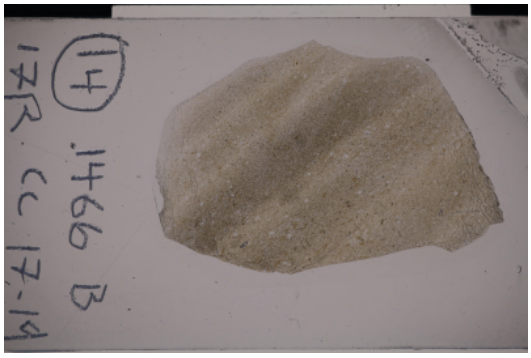
General comments: The sample has been classified as wackestone with abundant planktic and benthic foraminifera common, pellets and undifferentiated bioclasts. There are few grains which are dissolved and filled by drusy and granular cements also, very rare dolomite. Isolated borrow is present (Palaeophycus?) which shows a micrite coating but does not change the internal texture of the sediments. Only micro porosity can be reported for the sample that cannot be estimated by visual analysis.

THIN SECTION LABEL ID: **359-U1466B-17R-CC-PAL-TSB-TS_14** Thin section no.: 14

Unit/Subunit: Observer:

Thin section summary: The sample comprises of laminated wackestone with abundant planktic and benthic foraminifera, also, organic matter is present. Lamination is formed by alternation of silica cementation. Also, isolated pyrite crystals are present in some areas. Only micro porosity can be reported for the sample that cannot be estimated by visual analysis.

Whole thin section (plane-polarized):



Whole thin section (cross-polarized):

Photomicrographs:

SEDIMENT/SEDIMENTARY ROCK

Lithology: wackestone

Skeletal components	major	intermediate	minor
type	foraminifera (planktic)	foraminifera (benthic)	
comment			

Cement type: acicular

Porosity (major):

General comments: The sample comprises of laminated wackestone with abundant planktic and benthic foraminifera, also, organic matter is present. Lamination is formed by alternation of silica cementation. Also, Isolated pyrite crystals are present in some areas. Only micro porosity can be reported for the sample that cannot be estimated by visual analysis.

THIN SECTION LABEL ID: **359-U1466B-18R-1-W 29/32-TSB-TS_15** Thin section no.: 15

Unit/Subunit: Observer:

Thin section summary: The sample consists of a very fine-grained wackestone with abundant planktic foraminifera, large benthic foraminifera and just few radiolarian are present. Silicification process is taking place filling microporosity and internal microfossil cavities. Silica cements show botryoidal geometry typical of chalcedony quartz. Visual porosity cannot be estimated.

Whole thin section (plane-polarized):

Whole thin section (cross-polarized):

Photomicrographs:

SEDIMENT/SEDIMENTARY ROCK

Lithology: wackestone

Skeletal components	major	intermediate	minor
type	foraminifera (planktic)	foraminifera (benthic)	foraminifera (large benthic)
comment			Radiolaria?

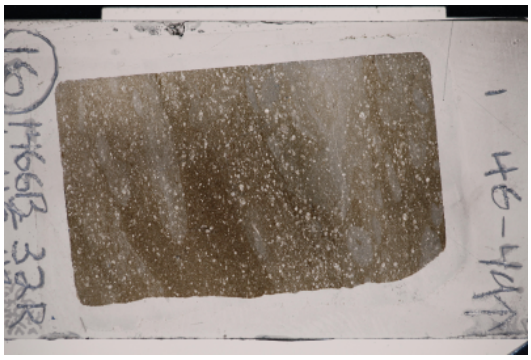
General comments: The sample consists of a very fine-grained wackestone with abundant planktic foraminifera, large benthic foraminifera and just few radiolarian are present. Silicification process is taking place filling microporosity and internal microfossil cavities. Silica cements show botryoidal geometry typical of chalcedony quartz. Visual porosity cannot be estimated

THIN SECTION LABEL ID: **359-U1466B-32R-1-W 46/49-TSB-TS_16** Thin section no.: 16

Unit/Subunit: Observer:

Thin section summary: The sample consists of a very fine-grained wackestone with abundant planktic foraminifera, large benthic foraminifera and just few shell fragments. Dissolution is affecting planktic foraminifera and voids left have been infilled by microcrystalline calcite. Estimated visual porosity is approximately 10% of moldic pores. Bioturbation is present in the sample showing an oval shape probably Planolites

Whole thin section (plane-polarized):



Whole thin section (cross-polarized):

Photomicrographs:

SEDIMENT/SEDIMENTARY ROCK

Lithology: wackestone

Skeletal components	major	intermediate	minor
type	foraminifera (planktic)	foraminifera (large benthic)	shell fragment
comment			

Cement type:

Porosity (major): moldic

General comments: The sample consists of a very fine-grained wackestone with abundant planktic foraminifera, large benthic foraminifera and just few shell fragments. Dissolution is affecting planktic foraminifera and void left have been infilled by microcrystalline calcite. . Estimated visual porosity is approximately 10% of moldic pores. Bioturbation is present in the sample showing an oval shape probably Planolites (Pl).

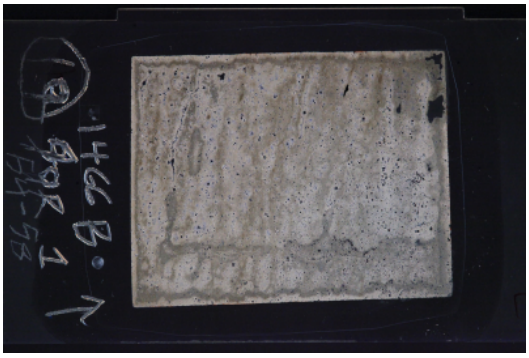
THIN SECTION LABEL ID: **359-U1466B-49R-1-W 54/58-TSB-TS_19** Thin section no.: 19

Unit/Subunit: Observer:

Thin section summary: The sample consists of planktic foraminifera wackestone with present benthic foraminifera. Large planktic foraminifera are flattened and present syntaxial overgrowth. There is 10 % porosity contributed by intraparticle porosity. Well laminated (slightly bioturbated).

Whole thin section (plane-polarized):

Whole thin section (cross-polarized):



Photomicrographs:

SEDIMENT/SEDIMENTARY ROCK

Lithology: wackestone

Skeletal components	major	intermediate	minor
type	foraminifera (planktic)	foraminifera (small benthic)	
comment		Amphistegina	

Cement type: syntaxial calcite overgrowth cement

Porosity (major): intraparticle

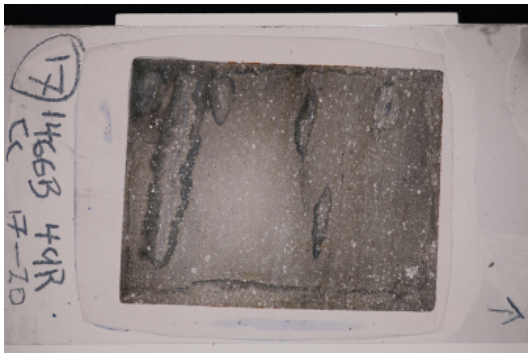
General comments: some compaction, large planktic flattened

THIN SECTION LABEL ID: **359-U1466B-49R-CC-W 17/20-TSB-TS_17** Thin section no.: 17

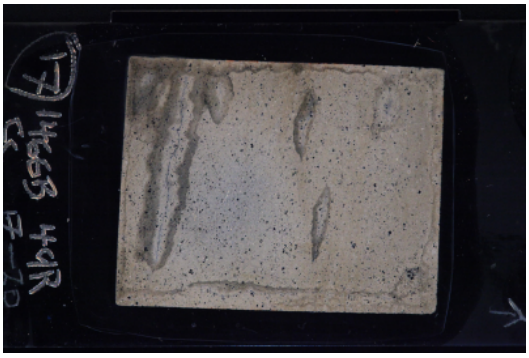
Unit/Subunit: Observer:

Thin section summary: The sample consists of a fine grained wackestone with abundant planktic foraminifera in 60% - 70% micritic matrix. Only one benthic foraminifera and echinoid spine was found. There is 10% porosity contributed by intraparticle porosity within the chambers of the foraminifera. A photo of a likely 'burrow' filled with foraminifera is taken.

Whole thin section (plane-polarized):



Whole thin section (cross-polarized):



Photomicrographs:

SEDIMENT/SEDIMENTARY ROCK

Lithology: wackestone

Skeletal components	major	intermediate	minor
type	foraminifera (planktic)		foraminifera (benthic)
comment			echinoid spine

Cement type: micrite cement

Porosity (major): intraparticle

General comments: The sample consists of a planktic foraminifera wackestone with 60-70% micrite

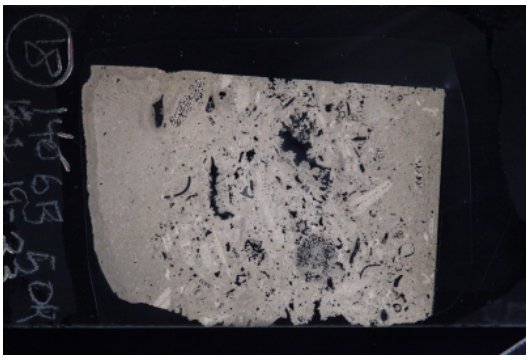
THIN SECTION LABEL ID: **359-U1466B-50R-1-W 19/23-TSB-TS_18** Thin section no.: 18

Unit/Subunit: Observer:

Thin section summary: The sample consists of a bio-wackestone with abundant bioclasts. There were benthic foraminifera (Lepidocyclina (Eulepidina), Amphistegina, Borelis, Heterostegina, Miogypsina), coral fragments, red algae, planktic foraminifera, bryozoan fragments and echinoid fragments. There is 5% porosity contributed by moldic porosity. Two photos representing the bioclasts are taken.

Whole thin section (plane-polarized):

Whole thin section (cross-polarized):



Photomicrographs:

SEDIMENT/SEDIMENTARY ROCK

Lithology: wackestone

Skeletal components	major	intermediate	minor
type	foraminifera (large benthic)	foraminifera (benthic)	coral (solitary)
comment	Lepidocyclina (Eulepidina), Amphistegina	Heterostegina, Miogypsina	red algae, planktic forams, bryozoa, echinoid fragment

Cement type: micrite cement

Porosity (major): moldic

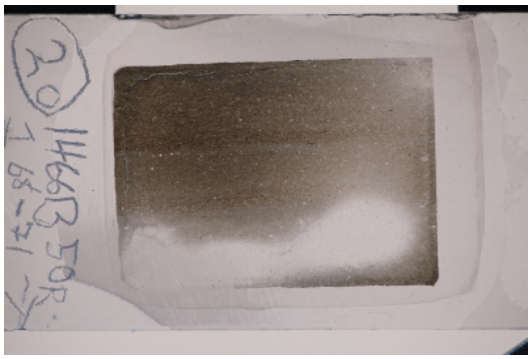
General comments: No orientation on thin section, silica infill, mix shallow-water benthic + planktic, turbidite?

THIN SECTION LABEL ID: **359-U1466B-50R-1-W 68/71-TSB-TS_20** Thin section no.: 20

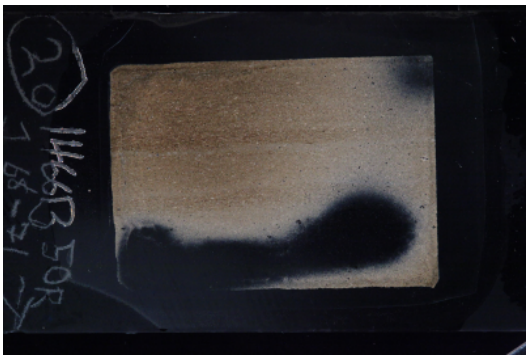
Unit/Subunit: Observer:

Thin section summary: The sample consists of a very small planktic foraminifera wackestone. There were few benthic foraminifera and thin shelled bivalve fragments. There is 1% porosity contributed by intraparticle porosity. Sediment in the section has burrows with other colored sediments that is darker. There are slight compaction seams with thin layers. One photos representing the bioclasts is taken with the top orientation.

Whole thin section (plane-polarized):



Whole thin section (cross-polarized):



Photomicrographs:

SEDIMENT/SEDIMENTARY ROCK

Lithology: wackestone

Skeletal components	major	intermediate	minor
type	foraminifera (planktic)	foraminifera (benthic)	bivalve
comment	very small	very few	thin shelled

Cement type: micrite cement

Porosity (major): intraparticle

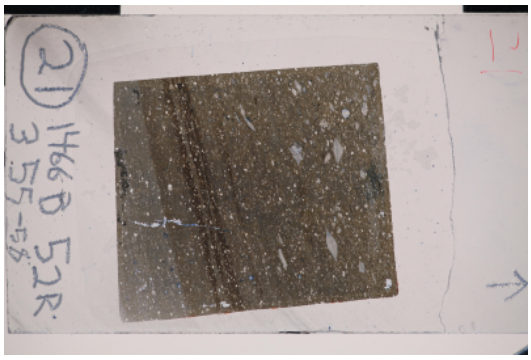
General comments: sediment slightly compacted, burrows (other colour sediment - more black), slight compaction seams, thin layers

THIN SECTION LABEL ID: **359-U1466B-52R-3-W 55/58-TSB-TS_21** Thin section no.: 21

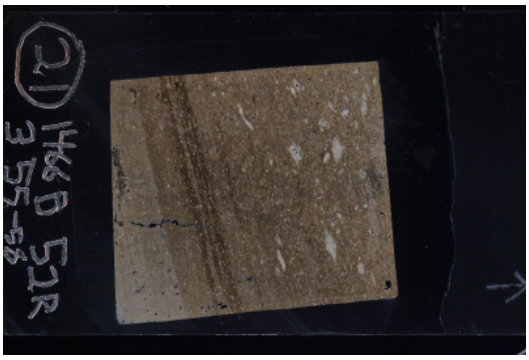
Unit/Subunit: Observer:

Thin section summary: The sample consists of planktic foraminifera wackestone. There were large benthic foraminifera (Lepidocyclina, Amphistegina, Miogypsinoides, Heterostegina) floating in the matrix. There is 1% porosity contributed by intraparticle porosity. Sediment in the section has thin layers that are most likely compacted. 2 photos representing the bioclasts is taken with the top orientation.

Whole thin section (plane-polarized):



Whole thin section (cross-polarized):



Photomicrographs:

SEDIMENT/SEDIMENTARY ROCK

Lithology: wackestone

Skeletal components	major	intermediate	minor
type	foraminifera (planktic)	foraminifera (large benthic)	
comment		Lepidocyclina, Amphistegina, Miogypinoides, Heterostegina	

Cement type: micrite cement

Porosity (major): intraparticle

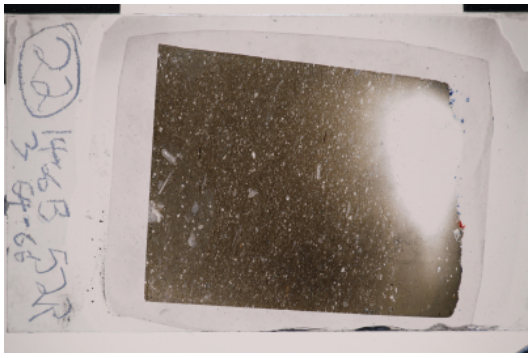
General comments: thin layers, compacted

THIN SECTION LABEL ID: **359-U1466B-52R-3-W 64/68-TSB-TS_22** Thin section no.: 22

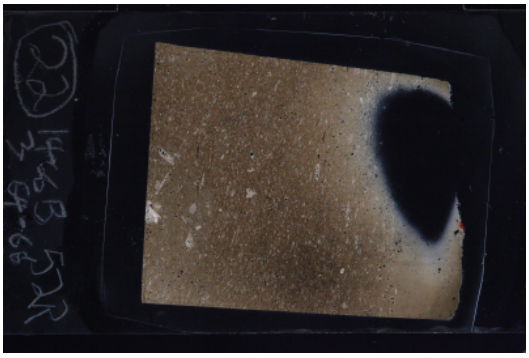
Unit/Subunit: Observer:

Thin section summary: The sample consists of planktic foraminifera wackestone. There were large benthic foraminifera (Miogypsinoides, Heterostegina) floating in the matrix. There is 1% porosity contributed by intraparticle porosity. Sediment in the section has compaction seams. 2 photos representing the bioclasts is taken.

Whole thin section (plane-polarized):



Whole thin section (cross-polarized):



Photomicrographs:

SEDIMENT/SEDIMENTARY ROCK

Lithology: wackestone

Skeletal components	major	intermediate	minor
type	foraminifera (planktic)	foraminifera (large benthic)	
comment	abundant	Heterostegina (v. rare); Miogypsinoides (v. rare)	

Cement type: micrite cement

Porosity (major): intraparticle

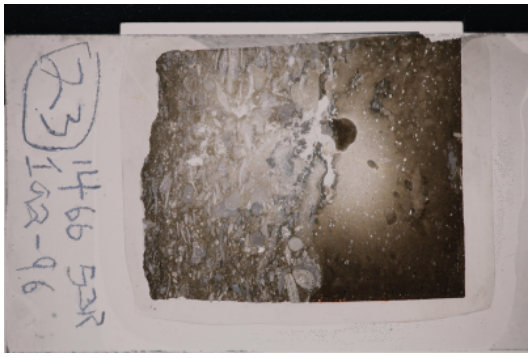
General comments: compacted wackestone, compaction seams

THIN SECTION LABEL ID: **359-U1466B-53R-1-W 92/96-TSB-TS_23** Thin section no.: 23

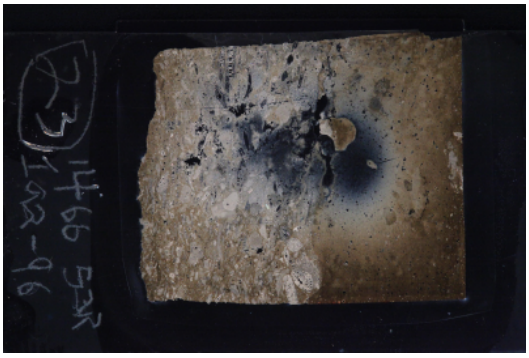
Unit/Subunit: Observer:

Thin section summary: The sample consists of bioclast wackestone. There were planktic and large benthic foraminifera (Lepidocyclina, Amphistegina, Heterostegina, Nummulid?, Operculina?) and bryozoans. There is 1% porosity contributed by interparticle porosity. There are burrows present. 3 photos representing the bioclasts is taken.

Whole thin section (plane-polarized):



Whole thin section (cross-polarized):



Photomicrographs:

SEDIMENT/SEDIMENTARY ROCK

Lithology: wackestone

Skeletal components	major	intermediate	minor
type	foraminifera (large benthic)	foraminifera (planktic)	bryozoa
comment	Heterostegina, Amphistegina, Lepidocyclina, nummulid?, Operculina?		

Cement type: micrite cement

Porosity (major): interparticle

General comments: burrows present

THIN SECTION LABEL ID: **359-U1466B-57R-CC-PAL-TSB-TS_24** Thin section no.: 24

Unit/Subunit: Observer:

Thin section summary: The sample consists of planktic foraminifera wackestone. Large planktic foraminifera are flattened. There is 1% porosity contributed by interparticle porosity. Sediment in the section has wispy seam horizon from compaction. 2 photos representing the bioclasts is taken.

Whole thin section (plane-polarized):

Whole thin section (cross-polarized):

Photomicrographs:

SEDIMENT/SEDIMENTARY ROCK

Lithology: wackestone

Skeletal components	major	intermediate	minor
type	foraminifera (planktic)		
comment	large planktic flattebed		

Cement type: micrite cement

Porosity (major): interparticle

General comments: some compaction, large planktic flattened, wispy seam horizon,