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Stratigraphic descriptions

Russian Platform stratigraphy is subdivided into lithostratigraphic formations. The correlation of formations to biostratigraphic zonation is shown on figures 5 and 6.

Teplyi Stan (M1)

This well is located in southern Moscow city near the Teplyi Stan metro station, altitude 253 m, depth 144.6 m.

Unit	Lithology	Thickness (m)
Quaternary		
34	Clay and mud with pebbles, moraine deposits	11.8
Cretaceous		
Tentikovskaya Formation (Upper Santonian)		
33	Silty clay with silica; greenish gray; lenses and layers of quartz-glauconitic silt and very fine sand; fragments of light gray siliceous ooze	2.4
Dmitrovskaya Formation (Upper Santonian)		
32	Clayey sand; greenish gray, brown limonite mottles; micaceous; thin layers of quartz-glauconitic sandstone; erosional unconformity at the lower contact	1.0
Zagorskaya Formation (Upper Coniacian-Lower Santonian)		
31	Unsorted quartz sand; rusty yellow; predominantly fine-medium grained with quartz gravel; layers of greenish gray silty clays; quartz-glauconitic sandstone concretions with siliceous cement	5.8
30	Unsorted predominantly fine sand; light brown; quartz and chert gravel with basal erosional unconformity	2.5
Jakhromskaya Formation (Lower Cenomanian-Upper Albian)		
29	Fine quartz sand; greenish gray; massive, ferrous in lower part	3.8
28	Fine sand; greenish to light gray; clayey erosional unconformity at the lower contact	1.4
Paramonovskaya Formation (Upper Albian)		
27	Clayey silt; greenish gray to dark gray; brown limonite mottles, micaceous; thin layers of black clay; *Nereites* and *Zoophycos* trace fossils	16.6
26	Silty clay to fine clayey silt; dark gray to black; horizontally laminated rare small horizontal trace fossils	5.0

25	Very fine quartz-glauconitic clayey sand; black, massive	0.8
24	Intercalation of dark gray clayey silts, black silty clays, and fine clayey sands; clayey phosphorite concretions; lenses of very fine sand in the lower part	6.1
23	Fine-medium glauconitic-quartz sand, dark gray to black; quartz gravel and phosphorite pebbles in the lower part; erosional unconformity at the lower contact	0.7

Gavrilkovskaya Formation (Middle Albian)

22	Medium-fine quartz sand; dark gray; small sandy phosphorite concretions in the lower part; erosional unconformity at the base	5.1

Volgushinskaya Formation (Upper Aptian)

21	Fine sand and silt; light to bluish gray; clayey, micaceous; thin lenses and layers of clay in the lower part, flaser bedding sedimentary structure	5.7
20	Poorly sorted, predominantly medium sand; brownish gray; quartz gravel thin layer of phosphorite in the lower part	1.5

Vorokhobinskaya Formation (Lower Aptian)

19	Fine clayey quartz sand; dark gray; micaceous, horizontal trace fossils layer of sandstone with siderite cement; wavy erosional surface at the base	7.1

Ikshinskaya Formation (Lower Aptian)

18	Fine sand; dark to brownish gray; clayey, micaceous; horizontally laminated, thin layers of black clay; plant detritus; erosional surface at the base	3.8

Butovskaya Formation (Barremian)

17	Intercalation of black silty clays and brown fine sands; mean thickness of layers is ~5cm; trough cross-bedding in sands, flaser bedding in some places; concretion of siderite sand in the lower part; lower contact is very distinct but with no evidence of erosion	4.7

Kotelnikovskaya Formation (Upper Hauterivian)

16	clay; dark gray to black; massive	1.4

Gremyachevskaya Formation (Upper Hauterivian)

15	Unsorted quartz sand and sandstone; grayish brown; predominantly fine-grained, small quartz gravels; siderite cement	5.7

Savelievskaya Formation (Upper Hauterivian)

14	Fine quartz sand; dark gray; clayey, micaceous; layers of clay; hummocky cross-stratified; erosional unconformity at the lower contact	4.6

Jurassic

Kuntsevskaya Formation (Upper Volgian, zone C. nodiger)

13	Fine quartz sand; gray; micaceous, clayey; lenticular bedding in lower part	13.6
12	Fine sand; greenish gray; micaceous, clayey; plant detritus; wavy to lenticular bedding	4.6

Lopatinskaya Formation (Middle-Upper Volgian)

11	Fine clayey sand; greenish black; shell detritus, fragments of belemnites, fragment of mid Volgian ammonite; erosional surface at the base	3.7

Philevskaya Formation (Middle Volgian)

10	Coarse silt; brownish to dark gray; clayey, micaceous, limy in some places fragments of thin bivalve shells; Virgatites sp.	4.5

Egorievskaya Formation (Middle Volgian, zone V.virgatus)

9	Fine sand; black; clayey, glauconite; abundant shell detritus; abundant phosphorite concretions in the lowermost part; Erosional unconformity at the base, ammonite imprints: Virgatites sp.	0.9

Ermolinskaya Formation (Lower Kimmeridgian-Upper Oxfordian)

8	Silty rich clay; dark gray to black; abundant shell detritus, pyrite; bivalve shells and ammonite imprints; Amoeboceras sp., Cylindrotheutis costromensis	11.2

Kolomenskaya Formation (Upper Oxfordian)

7	Silty clay; gray; small shell detritus; small deformed ammonites	1.0

Podmoskovnaya Formation (Middle-Upper Oxfordian)

6	Lean clay; brownish gray; fine horizontal lamination; fine shell detritus; small ammonites in the lower part	0.6
5	Clay; dark gray; fine laminated; small lenses of light gray silt; large ammonites erosional unconformity at the lower contact	2.0

Podosinkovskaya Formation (Upper Callovian-Lower Oxfordian)

4	Clay; greenish gray; compact, shell detritus, small lenses of light gray silt; small ammonites	2.6
3	Clay; light greenish gray; fine lamination; pyrite; rare horizontal trace fossils; erosional unconformity at the base	1.5

Kriushskaya Formation (Middle Callovian)

2	Oolitic clay-marl; rusty brown with light gray mottles; erosional unconformity	0.1

Carboniferous

1	Limestone	0.8

Varavino (M456b)

Well is located in Moscow Province, Sergiev-Posad County, 0.2 km south-east of village Varavino
Altitude 201m, depth 222.3 m.

Unit	Lithology	Thickness (m)

Quaternary

27	Silty clay and silt with pebble and boulders, moraine deposits; erosional unconformity at the base	32.5

Cretaceous

Jakhromskaya Formation (Upper Albian-Lower Cenomanian)

26	Clayey silt; greenish gray; thin clay layers; bioturbation erosional unconformity at the lower contact	8.2

Paramonovskaya Formation (Upper Albian)

25	Clay; black; compact, sometimes silty; thin layers of medium sand;	26.2

rare phosphorite concretions; erosional unconformity at the lower contact

Gavrilkovskaya Formation (Middle Albian)

24	Fine to medium sand; grayish green; glauconitic-quartz, clayey; clayey and sandy-clayey phosphorite concretions of irregular shapes; erosional unconformity at the lower contact	7.6

Volgushinskaya Formation (Upper Aptian)

23	Clayey silt; gray and dark gray; horizontally laminated, micaceous; in the lower part more clayey and abundant plant detritus	3.2

Vorokhobinskaya Formation (Lower Aptian)

22	Fine to silty sand; dark gray; thin coaly layers, very micaceous wavy erosion at the base	8.8

Ikshinskaya Formation (Lower Aptian)

21	Fine to medium quartz sand; dark brown; micaceous,	0.3
20	Fine to silty sand; light brownish gray to white; clayey, micaceous; abundant coaly plant detritus in the lower part	6.5
19	Silty quartz sand; snow white; coaly pellets, erosional surface at the base	4.4

Kotelnikovskaya Formation (Upper Hauterivian)

18	Fine to medium quartz sandstone; grayish brown; clayey ferruginous cement	2.9
17	Clayey-coaly silt; black; small phosphorite nodules and concretions	0.5
16	Clay; grayish brown; fine laminated, micaceous	2.8

Gremyachevskaya Formation (Upper Hauterivian)

15	Fine to medium quartz sand; greenish brown; glauconite; clayey-ferruginous cement; two layers of coaly clay in the upper part	8.2
14	Fine sand; dark gray to black; silty, micaceous; erosional unconformity at the base	1.2

Rostovskaya Formation (Lower Hauterivian)

13	Fine quartz sand; white; micaceous, glauconitic	9.8
12	Fine silty sand; greenish dark gray; clayey, micaceous, rare coaly fragments	1.5
11	Fine sand; brownish gray; small lenses of white sand; numerous phosphorite sandy and clayey nodules; fragments of coalified wood	1.5
10	Fine to medium quartz sand; black; clayey, glauconitic; thin layers of coaly clay; erosional unconformity at the base	7.7

Jurassic

Kostromskaya Formation (Mid Volgian)

9	Quartz glauconitic sandstone; phosphate cement; abundant bivalve shells and ammonites; erosional unconformity at the base	0.8

Gorkinskaya Formation (Upper Kimmeridgian)

8	Silty clay; dark gray; micaceous	0.7
7	Clay; black; well-rounded clayey phosphorite nodules, carbonate detritus wavy erosional surface at the lower contact	2.5
	Ermolinskaya Formation (Upper Oxfordian-Lower Kimmeridgian)	
6	Compact clay; dark gray; horizontally laminated; abundant carbonate detritus; abundant *Zoophycos* and *Nereites* trace fossils in the lower part with marcasite; large bivalve shells, small ammonites and belemnites; erosional unconformity at the base	7.6
	Podmoskovnaya Formation (Mid-Upper Oxfordian)	
5	Compact clay; dark gray to brownish; abundant carbonate detritus and and foraminifera; limonitized in the lower part; erosional surface at the base	5.2
	Podosinkovskaya Formation (Upper Callovian-Lower Oxfordian)	
4	Compact clay; light gray; fine laminated; abundant *Zoophycos* and *Rhizocorallium* trace fossils with silt and marcasite; thin carbonate detritus; erosional surface at the base	0.8
	Velikodvorskaya Formation	
3	Clay; light to bluish gray; fine laminated; abundant carbonate detritus, with fine sand in the lower part	4.0
	Kriushskaya Formation	
2	Clay; brownish gray; horizontally laminated; abundant iron oolites, layer of light gray oolitic marl; erosional unconformity at the base	0.8
	Carboniferous	
1	Dolomite; dark brown	16.1

Savelievo (M163)

Well is located in Vladimir Province, Kirzhach County, 1.2 km south of village Savelievo. Altitude 204 m, Depth 155.8 m

Unit	Lithology	Thickness (m)
	Quaternary	
33	Sandy clay; brownish gray; erosional unconformity at the base	2.5
	Cretaceous	
	Tentikovskaya Formation (Upper Santonian)	
32	Siliceous ooze; light gray; massive, clayey in some places	8.0
31	Compact siliceous ooze; light to brownish gray; with lenses and layers of fine glauconitic quartz sand in the lower part	7.5
30	Fine siltstone with siliceous cement; small lenses of quartz glauconitic sand; small horizontal trace fossils	0.4
	Dmitrovskaya Formation (Upper Santonian)	
29	Fine to very fine quartz sandstone; light to dark gray; glauconitic wavy erosional surface at the base	2.6
	Zagorskaya Formation (Upper Coniacian-Lower Santonian)	

28	Siliceous ooze and clayey siliceous ooze; gray; with *Inoceramus sp*.	6.5
27	Unsorted sandstone; dark gray; predominantly fine; gravel and pebbles in the basal part; erosional unconformity at the base	0.5
	Chernevskaya Formation (Mid-Upper Turonian)	
26	Sandy marl; brownish gray; with gravel	2.7
25	Fine to medium sand; light to purplish gray; clayey, calcareous; small phosphorite concretions in basal part	1.5
24	Poorly sorted, predominantly fine to medium sand; light gray; marly; erosional unconformity at the base	1.2
	Lyaminskaya Formation (Lower Cenomanian)	
23	Fine to very fine sandstone; gray; coarse grains, calcareous in the upper part; erosional unconformity at the lower contact	2.8
	Paramonovskaya Formation (Upper Albian)	
22	Clayey glauconitic siltstone; dark gray to black; pyrite; small phosphorite concretions in the upper part; abundant small horizontal trace fossils in lower part	17.8
21	Silty clay, dark gray to black; horizontal lamination; abundant small horizontal trace fossils; pyrite	11.2
20	Compact rich clay; dark gray to black; very small lenses of silt and very fine sand	5.6
19	Clayey silt; gray; massive	1.7
18	Unsorted quartz glauconitic sand; greenish gray; very fine to coarse with dominating fine grains; abundant well-rounded small (0.5-1 cm) pebbles of clayey phosphorite; erosional unconformity at base	0.3
	Gavrilkovskaya Formation (Mid Albian)	
17	Unsorted quartz glauconitic sand; grayish green; fine to coarse with dominance of medium grains; small (3-5 cm) coarse sandy phosphorite nodules; erosional unconformity at base	9.2
	Kolokshinskaya Formation (Lower Albian)	
16	Fine to very fine quartz sandstone; dark gray; clayey, glauconitic	14.0
15	Clayey glauconitic silt; light to purplish gray; thin layers and lenses of very fine sand in the lower part; erosional unconformity at base	1.4
	Vorokhobinskaya Formation (Lower Aptian)	
14	Very fine sand; brownish gray; silty; wavy erosional surface at lower contact	6.9
	Kotelnikovskaya Formation (Upper Hauterivian)	
13	Clayey silt; dark gray; massive or horizontally laminated	5.4
	Gremyachevskaya Formation (Upper Hauterivian)	
12	Unsorted quartz sand; dark to greenish gray; fine to coarse with dominance of medium grains; clayey; clayey silt in the upper part	4.1

11	Fine to very fine quartz sand; light gray;	6.4
Savelievskaya Formation (Upper Hauterivian)		
10	Clayey silt; brownish gray; in the upper part - micaceous, pyrite, coalified plant detritus	8.5
Sobinskaya Formation (Upper Hauterivian)		
9	Clayey silt; dark gray; lenses of unsorted sand; sandy in the lower part sedimentary structures resembling hummocky cross stratification	1.0
8	Unsorted sand; dark to brownish gray; fine to coarse with dominance of fine grains; micaceous; layers and lenses of silty and calcareous clay	2.1
7	Fine to very fine sand; dark to brownish gray; micaceous fragments of fine calcareous sandstone with ammonites *Simbirskites cf. coronatiformis*	2.0
6	Fine sand; dark gray to black; calcareous, clayey, with pyrite erosional unconformity at base	1.4
Rostovskaya Formation (Lower Hauterivian)		
5	Fine to very fine quartz sand; light gray; ?glauconite, clayey in lower part	4.4
4	Very fine sand; smoky gray; micaceous, clayey; calcareous in lower part	6.5
3	Sandy conglomerate; brownish to dark gray; angular to well rounded pebbles of gray to black clayey phosphorite (several generations), small (0.5-1 cm) pebbles dominate, largest can be 4-5 cm; matrix consist of fine calcareous sand; erosional unconformity at base	2.4
Jurassic		
Ermolinskaya Formation (Upper Oxfordian-Lower Kimmeridgian)		
2	Silty clay; brownish gray to black; dark gray phosphorite pebbles in lower part	1.5
1	Silty clay; dark gray; horizontal lamination; abundant fauna of ammonites and bivalves: *Rasenia stephanoides, Amoeboceras sp., Melagrinella subtilis, Loripes kostromensis, Buchia ex. gr. bronni, Astarte cordata, Parallelodon sp., Dicroloma sp.*	5.2

Lasitsy (M121)

Well is located in eastern Ryazan Province, 850 m south of village Lasitsy
Altitude 145.5 m, depth 105 m.

Unit	Lithology	Thickness (m)
Quaternary		
25	Clay, sand, erosional unconformity at the base	25.7
Cretaceous		
Maidanskaya Formation (Lower Aptian, D.weissi zone)		
24	Clayey quartz silt; light gray; micaceous; horizontal lamination	2.7

23	Silty and clay; brownish green gray; fragments of coalified wood; sandy siderite concretions in the upper portion; with fine to medium sand	1.8
22	Clayey silt; light to smoky gray; micaceous; thin layers of dark brown clay horizontal lamination; plant detritus	5.7
21	Clayey silt and fine quartz sand; light gray; micaceous	2.8
22	Silt and fine sand; light gray; clayey, micaceous; massive; small plant detritus	4.6
21	Lean clay; gray; numerous small lenses of fine quartz sand; erosional surface at the lower contact	0.7
Lasitskaya Formation (Lower Aptian, M.ridzewskyi zone)		
20	Fine top medium quartz sand; yellowish gray; grains are well rounded	3.0
19	Fine quartz sand; brownish gray to dark gray; silty and clayey	2.6
18	Fine quartz sand; dark gray to black; clayey, micaceous; abundant pyrite nodules (0.5-4 cm); erosional unconformity at base	2.4
Okshovskaya Formation (Upper Hauterivian)		
17	Silty clay; dark gray to black; micaceous; abundant quartz grains and chamosite oolites in middle part	4.2
16	Silty clay; light gray to rusty brown; abundant iron (chamosite) oolites; erosional unconformity at base	2.2
Izhevskaya Formation (Lower Hauterivian)		
15	Phosphorite; brown gray; well rounded quartz sand and gravel; abundant iron oolites and oncoids; phosphate cement; abundant bivalves: *Buchia sublaevis*; erosional unconformity at base	1.2
Jurassic		
Elatminskaya Formation (Lower Callovian)		
14	Fine silt; light gray to gray; clayey, micaceous; horizontal lamination; large bivalve shells and belemnite fragments	7.6
13	Clayey silt; light to smoky gray; fine horizontal lamination; small horizontal trace fossils; small poorly preserved ammonites	3.6
12	Clayey silt; dark gray; micaceous; wavy lamination, abundant horizontal trace fossils; coalified wood fragments; well preserved lower Callovian ammonites	3.2
11	Silty clay; gray; micaceous; fragments of coalified wood; bioturbated; small horizontal trace fossils	2.8
10	Silty clay; brownish gray; micaceous; plant detritus; coalified and pyritized fragments of wood and belemnite fragments in the basal part; well preserved ammonites in middle part; erosional unconformity at base	7.6

Mokshinskaya Formation (Mid-Late Bathonian)

9	Clay; light gray; silty in the lower part; horizontal lamination	5.2
8	Coarse silt; light gray; micaceous, quartz-glauconitic; massive	1.2
7	Clay; gray; fine horizontal lamination; thin layers of silt	3.3
6	Silty clay; brownish to light gray; sandy in upper and lower parts; horizontal lamination	1.9
5	Clay; light gray; horizontal lamination	1.5
4	Silty clay; gray; abundant plant remnants and detritus; horizontal lamination	1.5

Vyazhnevskaya Formation (Upper Bajocian-Lower Bathonian)

3	Clay; brownish to dark gray; coalified plant remnants; shell detritus	2.5
2	Oolitic marl; brownish to dark gray; shell detritus; abundant iron oolites erosional unconformity at the base	1.0

Carboniferous

1	Limestone	1.5

Boyarka River section (Valanginian-Hauterivian part)

Section is located in southern Taimyr Peninsula at 97.5 E, 70.7 N and is exposed in several outcrops along Boyarka River.

Unit	Lithology	Thickness (m)
Lower Hauterivian		
zone Homolsomites bojarkensis		
28	Sandy silt; bluish-gray; fine sand in the upper part; *Arctichnus* trace fossils	3.5
27	Silt clayey; dark gray	2.5
26	Silty clay; bluish gray, massive; lenses of greenish gray sand in upper part	18.0
25	Clayey silt; gray; sandy in some parts; rare carbonate concretions; lower contact - wavy erosional surface	7.0
24	Silt, fine sand; dark to yellow gray; abundant *Arctichnus* trace fossils	6.8
23	Silt; gray; lenses of jarosite	4.2
22	Sandy silt/clay; gray; lenses of silty sand with brown limonite mottles; wavy erosion at the lower contact	4.1
21	sandy silt - sand; greenish gray; small jarosite lenses	9.9

20	Silty clay; dark gray; rare carbonate concretions Fauna: *Homolsomites sp. ind.*	2.4
19	Sandy silt; light gray; *Arctichnus* trace fossils	7.1
18	Fine sand; gray; abundant *Arctichnus* trace fossils	2.9
17	Silt; gray; micaceous, sandy in the lower part Ammonites: *Homolsomites bojarkensis*	2.0
16	Silt sandy and clayey; dark gray; erosional unconformity at the lower contact; Fauna: *Neocraspedites kotschetkovi, Polyptychites cf. bidichotomoides, Homolsomites sp.,*	6.7

Upper Valanginian
zone Dichotomites bidichotomus

15	Fine sand and sandy silt; light gray; coarse-grained light-greenish sand with mineralized wood and rare carbonate concretions in the lower part; *Arctichnus* trace fossils in lower and upper (sandier) parts Fauna: *Polyptychites (Dichotomites) aff. bidichotomus*	5.8
14	Clayey silt; dark gray; shell accumulation of "shell pavement" type at the base; *Arctichnus* trace fossils Fauna: *Polyptychites polyptichus, Polyptychites bidichotomus, Polyptychites bidichotomoides*	2.9
13	Sandy silt; greenish gray; carbonate concretions; abundant *Arctichnus* trace fossils; wavy erosion at the lower contact Fauna: *Polyptychites polyptychus, P. triplodiptychus, P. bidichotomus, P. bidichotomoides*	8.2

Lower Valanginian
zone Polyptychites polyptychus

12	Sandy silt; greenish gray Fauna: *Temnoptychites mediatus, Polyptychites polyptychus, P. triplodiptichus, P. beani, P.bidichotomus*	2.0
11	Sand; greenish gray; ferruginous, silty in the lower part, rare carbonate concretions; abundant *Arctichnus* trace fossils Fauna: *Siberites rectangulatus, Temnoptychites mediatus, P. beani, Polyptychites polyptychus,*	4.3
10	Clay and clayey silt; dark gray; rounded shape carbonate concretions,	5.1

sandy in the lower part

9	Sand and silty sand; greenish gray to bluish gray; rare scattered carbonate concretions, ferrous in some parts; abundant *Arctichnus* in the lower part; mineralized wood patterns in the middle part and horizon of carbonate concretions in the lower part; shell accumulation of "shingled" type in the middle part; wavy erosion at the lower contact Fauna: *Siberites rectangulatus, S.ramulicostata*	14.7

zone Temnoptychites syzranicus

8	Fine sand and sandy silt; yellowish to greenish gray; rare nodules of lime sandstone; abundant *Arctichnus* trace fossils; abundant mineralized wood in the upper part; trough cross-bedding in the lower part; Fauna: *Neocraspedites menjaiteformis, Siberites rectangulatus, S.ramulicostata, Temnoptychites sp. ind.*	14.4
7	Sandy silt; gray; rare carbonate nodules; *Arctichnus* trace fossils and small trough cross-bedding in the upper part	7.8
6	Clay; dark to greenish gray	5.0
5	Fine sand and silty sand; greenish gray; ferruginous, high content of leptochlorite; tabular/trough crossbeds and concretions of limy sandstone in the lower part; wavy erosion at the lower contact; *Arctichnus* trace fossils and shell accumulations of "shingled" type in the lower part; Fauna: *Neotollia maimetschensis*	10.3
4	Sand; greenish gray; leptochlorites; abundant trough and tabular cross-beds; sandy carbonate concretions; Rhizocorallium and *Zoophycos* trace fossils; "regularly distributed" accumulations of shells; Fauna: *Neotollia klimovskiensis*	17.0
3	Sand; greenish gray; plant detritus; trough cross-beds flasers of clay in the lower part; abundant *Arctichnus*, and *Rhizocorallium* only in the lower part; shell accumulations of "shell pavement" type; Fauna: *Tollia sp. ind., Temnoptychites sp. ind.*	8.6
2	Fine sand; greenish gray; limonite mottles around some mineralized wood patterns; trough cross-beds and clay flasers; abundant *Arctichnus* and *Rhizocorallium* trace fossils;	14.5

Berriasian
zone Bojarkia mesezhnikovi

1	Silty clay; dark gray; massive	20.0

Yangoda River section

Section is located in southern Taimyr peninsula at 88 E, 70.7 N and is exposed in several outcrops along the Yangoda River.

Unit	Lithology	Thickness (m)
Lower Coniacian		
layers with Inoceramus schulginae - I. jangodaensis		
20	Fine sand; greenish gray; massive, sandy concretions in the lower part climbing ripples, vertical trace fossils (*Arctichnus*)	5.0
19	Fine sand; greenish gray; massive, well sorted; numerous phosphorite and siderite nodules in the basal part; lower contact is an erosional unconformity Fossils: shark teeth, fragments of vertebras of Pliosauroids	2.5
18	Fine quartz sand; light gray; climbing ripples	7.5
17	Intercalation of fine- medium sand with clay layers; abundant siderite concretions of different shapes; abundant trace fossils including *Arctichnus*, *Rhizocorallium* Fossils: *Inoceramus jangodaensis, I. schulginae*	3.0
16	Fine sand; greenish gray; small trough cross-bedding in the upper part; rare phosphorite and siderite concretions; *Ophiomorpha* burrows; wavy erosional surface at the lower contact; Fossils: *Inoceramus jangodaensis, I. schulginae*	3.0
15	Fine sand, same lithology as unit 11 Fossils: *Inoceramus schulginae, I. jangodaensis, I. lamarcki, I.websteri, I. aff. monopterus, I. sp.*	3.0
zone Volviceramus subinvolutus		
14	Fine sand; light gray; large trough cross-bedding, abundant siderite concretions; abundant fragments of wood; Fossils: *Cremnoceramus incostans, Volviceramus subinvolutus, Inoceramus lamarcki, I. jangodaensis, I.websteri, I. aff. monopterus, I. sp., Arctica sp., Euspira sp.*	6.0
13	Unsorted sand; dark green; small lenses of clay and silt; sandy phosphorite concretions in the lower part; abundant *Arctichnus* and *Rhizocorallium* trace fossils; wavy erosion at the lower contact Fossils: *Inoceramus schulginae, I. jangodaensis, I. lamarcki, I. cf. websteri, I. sp., I. aff. monopterus, Protocardia sp., Nuculoma (?) sp., Euspira sp., Serrifusus sp., shark teeth, Elasmosauridae* vertebrae	3.0

12	Fine sand and silty sand; dark gray; thin layers of silt; plant detritus and small fragments of wood; rare vertical trace fossils in the upper part Fossils: *Cremnoceramus incostans, Volviceramus subinvolutus, I. sp., Inoceramus schulginae*	10.5
11	Silty sand; light gray; thin layers of clay and silt; plant detritus, abundant mineralized wood in the upper part Fossils: *Inoceramus schulginae, I. jangodaensis, I. cf. pseudocancellatus, Cremnoceramus incostans*	5.7
10	Fine sand; light to dark green; numerous layers of silty clay, lenses of unsorted siderite sand, sandy phosphorite concretions, small trough crossbedding, abundant *Arctichnus* trace fossils; erosional wavy surface at the lower contact Fossils: *Inoceramus inaequivalvis, I. lamarcki, Cremnoceramus incostans, Volviceramus subinvolutus, I. cf. pseudocancellatus*	2.6

Upper Turonian
zone Inoceramus inaequivalvis

9	Clay and silty clay; bluish gray to dark brown; lenses and thin layers of fine cross-bedded and bioturbated sand; abundant jarosite in the lower part; rare *Rhizocorallium* trace fossils	5.0
8	Clayey silt and silty clay, micaceous; dark gray to black; small sandy siderite concretions in the lower part; small pyrite nodules	7.4
7	Fine sand; dark gray to brown; concretions of sandy siderite, rare fragments of wood; abundant *Rhizocorallium* and rare *Arctichnus* trace fossils; wavy erosion at the lower contact Fossils: *Inoceramus pseudocancellatus, I. inaequivalvis, I. shulginae*	3.0
6	Fine sand; light gray; thin layers of clay and plant detritus in the lower part, well sorted with trough cross-beds in the upper part; rare fragments of mineralized wood	21.0
5	Black clay; small pyrite nodules, layer of carbonate concretions in the lower part	3.0
4	Clayey silt; dark gray; phosphorite and sandy siderite concretions in the lower part, and accumulations of shell fragments, erosional unconformity at the lower contact Fossils: fragments of Inoceramus pseudocancellatus	2.0
3	Clayey silt; greenish gray; abundant sandy phosphorite concretions in the lower part, abundant *Arctichnus* trace fossils and coprolites	1.7

Fossils: *Scaphites spp., Baculites sp., Inoceramus pseudocancellatus, inaequivalvis, I. shulgi*nae, *I. lamarcki, Lopatinia jenisseae, Nuculana sp., Nucula sp., Astarte sp., Arctica sp., Malletia nitens, Saturnia sp., Tankredia sp, Goniomya sp., Modiolus sp., Euspira sp., Drepanocheilus sotnikovi, Graphidula sp., Serrifusus sp.*

2 Fine or medium sand; grayish green; bioturbated; phosphorite concretions; abundant siderite and glauconite; Abundant *Rhizocorallium* and *Arctichnus* trace fossils; wavy erosion at the lower contact — 5.7
Fossils: *Inoceramus pseudocancellatus, I. inaequivalvis, Lopatinia jenisseae, Falcimytilus lanceolatus, Arctica sp., Pleuromya sp., Modiolus sp., Lucina sp., Protocardia sp., Euspira sp., Cylichna sp.*

1 Fine sand; light gray to greenish gray; ferrous in the middle part; thin clay layers, phosphorite concretions; *Arctichnus* trace fossils,pellets and coprolites; climbing ripples — 10.2
Fossils: *Inoceramus sp. ind., Lopatinia jenisseae, Falcimytilus lanceolatus,* gastropods, teeth of marine lizards

Agapa River

The section is located in southern Taimyr peninsula at 86 N, 70 E and is exposed in several outcrops along Agapa River.

Unit — Lithology — Thickness (m)

Lower Turonian, Inoceramus labiatus zone

11 Fine sand; light gray; massive; large concretions of sandstone in the upper part; *Inoceramus labiatus* — 8.5

10 Clayey silt; greenish dark gray; extensively bioturbated; small (3-4 cm) phosphorite concretions; soiderite concretions in the upper part (8-10 cm); abundant shell detritus and accumulations; — 11.0
Fossils: *Proplacenticeras sp., Borissiakoceras sp., Inoceramus labiatus , Nuculana sp., Malletia sp., Lopatinia jenissiae, Eusprira sp., Falcimytilus lanceolatus , Pyropsis sp.*

9 Leptochlorite silt; greenish gray; extensively bioturbated; accumulation of accumulation of shell detritus in the lower part; numerous siderite concretions in the middle part; — 1.5
Fossils: *Proplacenticeras sp., Aporrhais sp., Fasciolaria sp., Cylichna sp., Pyropsis sp.*

8 Silty clay; bluish dark gray; massive or fine horizontal lamination; bioturbated in the uppermost part; rare*Inoceramus labiatus* — 12.0

Upper Cenomanian, Inoceramus pictus zone

7 Leptochloritic silt; green gray; abundant phosphate nodules and fossil accumulations (bivalves, ammonites, gastropods, etc.), including — 3.5

Inoceramus pictus Sow.

6	Silt and silty clay; gray; bioturbated; limonite mottles; accumulations of small shells (bivalves and gastropods)	6.8
5	Fine sand; greennish gray and green; two layers of calcareous sand in the upper part and siderite concretiuons with abundant fauna including *Inoceramus pictus*	5.5

Not observed (~30 m)

4	Clayey silt; gray; horizon of siderite concretions with inoceramids in the lower part; scattered shells and accumulations of *Lopatinea*, ctenodontids; gastropods and belemnite rostra	12.5
3	Intercalation of sand, silt, and clay; light to dark gray; horizontal lamination chained horizons of siderite concretions; clayey breccias; plant detritus	9.2
2	Quartz fine and medium sand; light gray; lens-like accumulations of lignitic wood; and associated amber resins (retinites); large trough and tabular cross--bedding;	25.0