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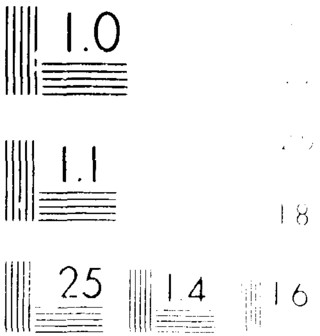
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MAU 79/005

MAURETANIA

FINAL REPORT

Warsaw, 1982

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STUDY ON INDUSTRIALIZATION OF BLACK SANDS

PHASE II, FOLLOW UP GEOLOGICAL INVESTIGATION

Final Report

by

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S U M M A R Y

The results of the second phase of the study on industrialization of black sands of Mauritania/the follow up geological investigations/ are discussed.The aims of the operations were as follows:

1. selection of the promising part of the coast,on the basis of prevoius geological prospection;
2. geophysical survey of the selected area for the location of the depoits;
3. estimation of the reserves by drilling and sampling as well as from geological results;
4. laboratory testing of samples to determine the mineral content,to identify radioactive minerals;
5. reccomendation on the basis of the obtained results for further work.

The Mauritanian coast can be divided into three parts:northern - from Nouadhibou to Râs Timirist, central - from Râs Timirist to Nouakchott and southern -from Nouakchott to Senegal River.The northern part was believed to be negative on a basis of previous French prospection,and out of the two remainder ones.The central one was selected as the most promising because most of black sands occurences concentrate here.Geophysical survey began with methodological investigations which confirmed the applicability of the radiometric method and rather dubious usefulness of the magnetic method.The semi detailed radiometric and magnetic survey over the whole central area enabled to select,two regions with highest radiometric anomalies, for a detailed geophysical prospecting:Jreida and Tânit-Blaouakh.As the magnetic investigations were negative,the detailed survey concluded the radiometric method only.As a result contour maps of the investigated areas were obtained.

They served as a basis for the selection of three areas for drilling: Jreida,Blaouakh and Tânit.The geophysical and drilling data show that in area the black sands form a narrow,less than 100 m wide band locally exceeding 100 m.Very exceptionelly does its thickness exceed 1 m and its mean heavy minerals content is about 3%.

The proven serves of these areas are in consequence low and they total accoordingly : 3 887, 5 242 and 4 020 tons of heavy minerals. The resources of the 60 km long coast total 370 859 tons calculated on the basis of isorad maps, The investigated deposits are of no industrial value, because of their small tonnage.

The laboratory testing of about 1 300 samples has pointed out, that the heavy fraction consists of: rutile /26,5%/, ilmenite /22,5%/, garnets /11,8%/, zircon /10,2%/, epidote /7%/ and other heavy minerals /22%/. The radioactive minerals are: zircon, epidote, monazite and hydrated iron oxides. The coefficient of correlation between field radiometric measurements and heavy minerals content is 0.808.

The analysis of data and conditions of black sands formation suggests that the investigated central part is negative because of a strong erosion of the coast in this area. Conditions more favourable to black sands concentration are to be expected in the southern part.

A tentative programme for geological prospection of the southern part is given. The prospection compaign is planned for 15 months at a cost about 480 000$.

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A. <u>Introduction</u>

After wining the international tender for Project MAU 79/005, entitled "Study on Industrialization of Black Sands", Phase II", POLSERVICE, Foreign Trade Enterprise was entrusted with its execution under contract No 80/147 dated April 2, 1981.

The Project was contracted for by the United Nations Industrial Development Organization, Vienna.

POLSERVICE as the contractor charged the Polish Geological Institute, acting through the intermediary of a specialized agency GEOPOL - Enterprise for Geological Service Abroad, with the direct execution of the Project.

According to the contract stipulations Société Nationale Industrielle et Minière /SNIM/ was to be the Mauritanian conterpart organization of the Polish team, it was however, replaced in August 1981, when the operations were already under way in Mauritania-by the Office Mauritaniae des Recherches Geologiques head quartered in Nouakchott.

B. General Information about the Project

B.1. Background Information

It is a well known fact,that along the West African coast from Mauritania in the North to as far as Nigeria in the South exist concentration of beach black sands containing heavy minerals. These sands in some places form deposits vieble for mining.In some West African countries /as in Senegal/ the black sands were mined. The existence of black sands on the Mauritanian coast has been established by geological prospecting of Dabrovsky Alon,Vogt,Hebrard /see details in paragraph C.2./.The information contained in report from these investigations however was in sufficient to assers the viability of the mining operations.

In 1974 for this purpose an exploratory mission by UNIDO's specialists invited by Mauritanian authorities was completed /Marshall and Szakál 1974,Marshall 1975/.That mission reccomended:

a. systematic prospection with a view to finding out above the location and geometry of the deposits and to estimate the reserves contained in these;

b. systematic sampling to provide sterting material for laboratory testing for the purpose of:

1. assesing the value and saleability of the minerals;
2. devising an ore concentration technology and preparing a conceptual design for a concentraing plant;

c. the preparation of a techno-economic feasibility to serve as a basis for decission making concerning the belting up of a mining and ore concentration operation.

The Mauritanian mining corporation SNIM performed independently preliminary geological and geophysical prospection of the black sands /Zagortchev,Kralev,Katewski ,1978/ and commisioned the British firm WS Atkins and Partners to test the samples taken /Marshall,1978/. UNIDO reckoned that these last-named documents could be regarded as an ending of the preliminary prospecting /Phase I/,but that Phase II or follow-up stage of geological investigations was still needed to procedure all the information required for a viability assesment /Balkay 1978/.

B.2. Aim of the Project

As the result of UNIDO's follow-up mission to Mauritania in order to discuss both the Phase I and the prospective Phase II the following Terms of Reference for the latter one has been agreed upon /see Annex A/:

Long-term aims :

1. to clarify whether the heavy mineral sand of the Mauritanian littoral provide a basis for an economicaly viable mining and ore-dressing /concentration/ operations;
2. in the case of positive geological findings to proceed to the accquisition of information sufficient to determine the technical and economic feasibility of a mining-cum-dressing operation;
3. in the positive case, to increase the export pottential of the country by the working of mineral resources pottential which have not so far been utilized, through the setting up of a mining operation and the construction of an ore dressing plant.

Immediate aims:

1. recovery of samples and documents produced by previous work, as far as feasible;
2. follow-up /definitive/ testing of the geophsical methods of prospecting for heavy beach sand deposite, tentavinely tested during Phase I work;
3. follow-up drilling and sampling in those parts of the Mauritanian littoral that are most promissing of industrial viebility;
4. laboratory testing of the samples taken under 3/;
5. reporting.

The scope of contracting services are presented in detail in the Terms of References /see Appendix A/.

B.3. The Time-table of the Project

The start-up of Project MAU 79/005 was delayed repeatedly due to an additional order by UNIDO for the drill sampling of the copper ore flotation tailings at Akjoujt /under a separate project MAU 80/009/. Following the wish of the Mauritanian party, the latter project was executed first, this entailed changes in organization. Finally the decission was taken to start the operations under Project MAU 79/005 on May1,1981. The Polish team arrived in Nouakchott on April 18,1981, according to schedule, and after installing themselves, set about studying the archival papers on the previous exploration of black sands in the Mauritanian coast. The drilling, geophysical, laboratory and camping equipment shipped from Poland arrived in Nouakchott via Dakar on May 12, 1981. The geophysical copmaign was initiated with no delay, it lasted up to August 1,1981. An interim report on the geophysical prospecting was delivered on August 15,1981 to UNDP Nouakchott, representing UNIDO. The areas envisaged for drilling were singled out on the basis of radioactivity surveys. After the geophysical compaign, the original borehole sitting concept contained in the Terms of Reference was abondoned and a new drilling concept was accepted by dr. Balint Balkay, the UNIDO consultant responsible for the Project during one of his field visits. The drilling compaign was started on September 7,1981 and accomplished on schedule on December 12,1981. Laboratory work on the borehole samplies was taking place at the same time in the Laboratory offered for this purpose by the Office Mauritanien des Réchérches Géologiques. Although the Laboratory was well equiped /with local equipment and equipment brought by the team/ it was impossible to accomplish the abovémentioned work in Nouakchott as the helping staff from OMRG was small in number and the volume of work fairly large. Accordinghly the decission was reached to send the samples to Poland for further tretment. They were sent by plane on December 15,1981 and arrived in Poland as late as February 25,1982. During the debriefing of the team manager of Project MAU 79/005 "April 2,1981/ UNIDO gave its acceptance for sending the samples to Poland and an agreement was reached on the further course of work and a new data was fixed for the delivery of the Final Report.

B.4. The Polish team. Persons co-operating on behalf of UNIDO and Mauritanian conterpart personnel.

The Polish team consisted of the following persons:

Name	Specjalization	Time on Project
Mr.Andrzej Ostromecki, Ph.D.	-Geologist,Head of the Team,	18April-18Dec.81.
Mr.Tadeusz Smakowski,Ing.	-Mineralogist	Apr.18-Dec.12.81
Mr.Ryszard Strzelecki,B.A.	-Geologist	Sept.15-Dec.15.81
Mr.Stanisław Wybraniec,Ph.D.	-Geo-physicist	Apr.29 -Aug.12,81
Mr.Dobrosław Klimczyk,Ph.D.	-drilling Ing.,Head of drill crew,	Sept.9-Dec.12,81.

The division of tasks was the following:

- Mr.Andrzej OSTROMECKI was responsible on behalf of the Contractor for the whole Project,control and efficient progress of operations,he also participated,moreover in the geophysical compaign;
- Mr.Taduesz Smakowski directed the laboratory work and also participated in the geophysical copaign;
- Mr.Ryszard Strzelecki provided geological control of drillings and drill samplings;
- Mr.Stanisław Wybraniec was responsible for the geophysical compaign;
- Mr.Dobrosław Klimczyk supervised the drilling as direct manager of the Mauritanian drill crew.

In the period of implementing Project Mau 79/005 Mr.Edward C.White was Resident Representative of UNDP on behalf of UNIDO,he was assisted by Mr.Michel Gautier and Mr.David Drake,Junior Project Officer who was responsible for the project.The above mentioned gentlemen brought a great contibuted greaths to the efficient performance of the Project.They always approached the problems the Polish team was faced with greatest concern and spared no efforts in order to expedite the operations.Words of deep recognition are due to them from the Project executors.Dr.Balint Balkay,as UNIDO consultant was responsible for

the coincidence of the operations with the assumptions of the Project.He came twice to Mauritania during the period of exploration.His expert advice was of great help to the Polish team.
As it has already been mentioned,Société Nationale Industrielle et Miniére /SNIM/ was the first Mauritanian conterpart organization for the Project:it was later replaced by Office Mauritanien des Récherches Géologiques /OMRG/.The original conterpart person of the Polish team on behalf of SNIM was Mr.Simon Oksengorn.He was later replaced by Mr.Hussein Ould Jiddou.Mr.Sidi Mohammed o'Eleyoud,technical assistent, the drivers,mechanics and drillmen co-operated with the team directly in the field.SNIM brought a great contribution to the work on the Project.Despite the changes in organization and deplacements,SNIM to the best of itspossibilities,provided the off-highway vehicles, workshops,storage and office premises as well as drivers,mechanics, drill-men and labourers.
OMRG became the Mauritanian conterpart organization as of August 1981. Its Director General,Mr.Cheikouna Camara,greatly interested in the works progress used to visit the drilling operations on the spot. Mr.Abdourahmane N'Djaje was responsible for the Project on behalf of OMRG .He gave friendly help throughout as concerned both field operations and laboratory work.The provision of a big,and well-equiped laboratory was an important contribution by OMRG.However itself being in the development phase,OMRG did not have the specialized laboratory staff indispensable for the Project:this is why it became necessary,in the final phase to send the drill samples to Poland for fûrther treatment.

C. Black sands of the Mauritanian littoral- geology,history and plan of the geological investigations.

C.1. Outline of the Quaternary Geology on the Mauritanian Coast

The biggest structural unit in Western Mauritania is the littoral basin adjourning the Atlantic Ocean.It is filled up with Tertiary and Quaternary sediments.The youngest Tertiary /Miocene-Pliocene/ is a continental series known as the Continental Terminal.It reposes on marine sediments,either Eocene and Miocene.It is overlain by Plio- lower Pleistocene sediments /tafaritian/.In places,however, the Tertiary does not appear and the Tafaritian sediments repose directly on a crystalline basement.
The middle and higher Pleistocene is made up of limestones /Ajoujian/ and sandstones /Aguerguerian/.The first are open-sea sediments corresponding to a moderate transgression,the second are littoral.
Above them,the Trarzian corresponds to a dry period with dune formations inserted between the marine and lacustine sediments.The next transgression took place in the Inchirian /some 30 000 BP/.A bay formed in a region of Nouakchott, penetrating 130 km inland.
The youngest Pleistocene is represented by the Ogolian dunes /20 000 15 000 BP/.It includes the big belts of the Amoukrouz,Akchar dunes, and Azefal dunes.
The younger Quaternary /Holocene/ is subdivided into three episodes:

- Tchadian /11 000 - 7 000 years BP/;
- Nouakchottian / 7 000 - 4 000 years BP/;
- Tafolian / 4 000 - 2 000 years BP.

The Tchadian is the period of the last deglaciation.It made the sea level rise gradually.About 11 000 years BP it lay 50 m below the recent one,by the end of the Tchadian / 7 000 years BP/ it had risen by 30 m to 15 m.The littoral topography significantly differed from the present one.The region of today's sebkha subsided somewhat.The ocean level was rising continuously over the Nouakchottian period. The inter-dune strips were gradually indundated, The Saint Jean Bay and the sebkha of Tenioubrar were formed.The biggest bay came to exist in the broad corridor of Inchiri: it spread 90 km inland.

The transgression reached its maximum 5 000 years BP. Towards the end of the Nouakchottian, the shore line was much more complicated than it is today. It was sculptured by two factors: the belts of the Ogolian dunes /NE-SW/ and the transgression which filled up the inter-dune depressions, forming a number of bays. The lagoon N'Dhamcha next to Nouakchott was the biggest of those.

Some 4 200 years BP a littoral current, running North-South arose a sand bar which closed off the Nouakchottian lagoons and bays, separating them from the sea. In this way, the Tafolian sand beach was formed, northward of Cap Timiris. Further north along the coast, the shallow Arguin bank inhibited the accumulative action of the current .

Deposition out of the littoral current coincided with a new transgression on to the Nouakchottian coast.

The recent sandy beach with its deposits of black sands is a relatively young phenomenon. The black sands accumulated in the Tafolian sandy beach which was closing off the Nouakchottian intra-dune bays its narrow belt.

STRATIGRAPHY OF THE QUATERNARY ALONG THE MAURITANIAN COAST

	Horizon	Absolute age	Lithology
HOLOCENE	Tafolian	4 000 - 2 000 BP	on-shore dunes, littoral sand barrier with black sand
	Nouakchottian	7 000 - 4 000 BP	Arca Senilis beaches
	Tchadian	11 000 - 7 000 BP	sands and tropical ferruginous soils
PLEISTOCENE	Ogolian	20 000 - 15 000 BP	dune formations
	Inchirian	30 000 BP	sand and clay with marine molluscs
	Ajoujian	unconfirmed stratigraphy	clayely sand with calcareous concentrations and ferriferous balast layers
PLIO-PLEISTOCENE	Tafaritian		sandy limestone with cross banding older dune systems, gravels and ferruginous sands with quartz pebbles calcareous incrustations

C.2. Previous prospecting of black sands in the Mauritanian Coast

The prospecting of black sands on the Mauritanian coast began in the post-war period. All the explorers pointed out that both beach and dune deposits exist there. However, prospecting was carried out without the systematic application of geophysical methods, and sample taking did not go below the groundwater level.

According to Blanchot /1947/ the deposits of the recent beach are of minor importance because of their small size and changing character.

The dune deposits are of considerably greater interest. Blanchot identified several areas of comparatively well mineralized dunes :

- Legouichichi;
- El Msid;
- El mansour.

A much more detailed investigation was carried out in 1958 by Dabrowsky. He was the first to propose and carry out the concept of prospecting the old beaches. He distinguished several mineralized sectors in the recent beaches , as follows:

- the Coppolani /Jreida/ sector;
- the sector nortward of the wreck of the ship "Montesquieu";
- the Blaouakh-Tânit sector;
- the Tânit sector;
- the sector soutward of Tioulit;
- the Tioulit sector;
- the sector between Tioulit and Zrair /Iraif/.

All the sectors are between Nouakchott and Cap Timiris.

As concerns the dune deposits, Blanchot considered the following to be promising:

- the El Msid dune;
- the Balise Marie dunes;
- the dunes of El Mansour-Ferrat.

According to Blanchot, old beaches of noteworthy mineralization occur in the following regions:

- at Nwanghar /Nouamghar/;
- at Tikattan /El Mhaijrat/;
- nortward of Tioulit;
- at Coppolani /Jreida/.

However, they are major of not practical value.
In 1959 exploration on the Mauritanian coast was continued by Allon. He concentrated on the section northward of Cap Timiris, mainly on the fossil beaches. According to him, those occupy a belt of a 3-5 km width inland from the shoreline. In 1958-1959 a major prospecting compaign was carried out by the Burau Minier de la France d'Outre Mer -AOF. It concentrated on the northern part of the Mauritanian coast mainly on the old beaches. 2789 pits and 134 hand-drillings were made, all of them to the depth of groundwater. The compaign proved 120 000 t of ilmenite, 60 000 t of magnetite and 80 000 t of epidote plus garnet. In the same period, Hebrard investigated the coastal Quaternary as to stratigraphy and paleogeography, without excluding however, the problem of black sands.
In 1975, Blanchot reviewed the problem of ilmenite sand deposit, summing up all the work executed to that date. According to him, the whole Mauritanian coast conatin 5 862 000 m^3 of mineralized sand with an average ilmenite content of 5-6 per cent, which gives 420 000 t of ilmenite.
In 1975 the coast was visited by J.E.F. Marshall working for UNIDO w o took a number of samples between Jreida and the of the "Montesquieu" wreck. Those samples were, in turn, investigated by the company WC Atkins and Partnes. Their work include tests on the feasibility of concentration particular mineral fractions.
The detailed investigations by I.S. Zagortchev, G.K. Kralew and I.G. Katevski /1978/ is the most recent work on the Mauritanian beach sands. According to the above mentioned authors, there are concentrations in recent beaches, old beaches and dunes along the Mauritanian coast. Concentrations in the recent beaches occur above all, in the inter-tidal zone and in the storm beach zone. In the southern coast section /from the Senegalese border up to Cap Timiris/ mineralization is largely northward of Nouakchott. The most important occurances in this section

are as follows:

- El Mansour;
- Jreida;
- the wreck "Montesquieu".

The above mentioned authors give the other occurrences after Blanchot, as follows:

- the Billaouach /Blaouakh/ -Tânit sector;
- the Tânit sector;
- the sector of El Msid;
- the sector of Tioulit.

The authors atate the occurrences in the recent beaches to be of minor importance and put the total /in them at reserves/ 387 000 m^3 of mineralized sand in the section between Nouakchott and Cap Timiris, which corresponds to 50 000 t of ilmenite.

The old beaches occur always at a certain distance from the recent shore line. Mineralization is rather scarce here. It is comparatively most abundant in the sectors:

- Tikattan /El Mhaijrat/;
- Tioulit;
- Jreida.

Its distance is 50-300 m from the recent beach. The resources in the southern section /from the Senegalese bordes up to the Cap Timiris/ amount, together with the resources in the recent beaches, to 30 000 -50 000 t of ilmenite. The northern section /from Cap Timiris up to the Western Sahara/ border/ contains 120 000 t of ilmenite in the old beaches.

The concentrations in dunes are given after the earlier authors as follows:

- the Legouichichi dunes	15 000 t of ilmenite;
- the El Mansour dunes	?
- the Balise Marie dunes	4 000 t of ilmenite;
- the El Msid dunes	178 000 t of ilmenite;
- the Ferrat dunes	?
- the Agneitir and Akchar dunes	?

As concerns minerals quality in the Mauritanian beach sands Zagortchev,Kralev and Katevski empasize,that other minerals in addition to ilmenite should also be taken into consideration.The over supply of ilmenite in the world market would not permit of a profitable exploitation.According to Marshall /1975/ too more attention should be focused on zircon and monazite.

C.3. Selection of the Area for Proscpection

The area for prospection has been selected on site in Mauritania in accord with the Terms of Refernece.As the Terms of Reference strictly limited both the time /as in the case of geophysical survey/ and volume /as for drilling and laboratory measurements/ of the investigations,it was clear that contractor should select such a portion of Mauritanian coast which could be surveyed by geophysical methods in the pre-determined three-months campaign.

The prospection area has been selected on the basis of the results of prevoius prospection done by Vogt,Dabrowsky,Allou,Blanchot Zagortchev et al./see par.C.2/.They revealed thatthere are many heavy minerals occurences along the coast between Cap Blanc and Senegal River in beach black sands as well as in dune black sands.

In the morphological and geological sense the Mauritanian coast can be divided into three parts:

1. northern,between Nouadhibou and Râs Timirist;
2. central,between Râs Timirist and Nouakchott ;
3. southern,between Nouakchott and Senegal River estuary.

The northern part has been investigated rather thoroughly by Allou /see par.C.2/.The results were not encouraging.This region is accessible practically only from Nouadhibou and by sea.The greatest number of the black sands occurences is known from the central part of Mauritanian littoral,especially from that between El Msid and Jreida.In the southern part up till now only the beach and dune black sands concentrations in the region of Leguichichi are known.

In the process of the area selection we have also taken into account suggestions from geologists from SNIM during a field reconnaisance along the Tared coastline between Noaukchott and El Msid. They also believed that this part of the coast is most prospective.

Hebrard/1978/ had other opinion on that part of the coast:

"So between Timiris and Nouakchott only deposits of heavy minerals reworked by sea and wind and of minor importance have been preserved".

So, in the brief, the following factors were decisive in the selection of the central part of the Muaritanian littoral for investigations:

a. time intended for geophysical compaign /3 months/ was too short for survey of whole prospective area /central and southern parts/. it was possible to cover only about 160 km of coastline;

b. the selected central part has the greatest number of known black sands occurences;

c. according to Blanchot/fig.1/ the ilmenite- reserves for the central part /Râs Timirist-Nouakchott/ are 260 600 tons, as compared to 120 000 tons in northern part /Nouadhibou-Râs Timirist/ and only 70.500 tons in southern part /Nouakchott-Senegal River/;

d. the analysis of air photos revealed the existence of several generations of sand barriers in this part/we had not the possibility to see the air photos from the southern part/ as a possible site for the heavy minerals accumulation;

e. the central part is of a rather easy access which was very important considering the drilling compaign foreseen for the 3-months period only;

f. according to geologists from SNIM, the most prospective area was also the central part /especially Jreida-El Msid area/.

The selected part of the coast between Nouakchott and Râs Timirist is not homogenous.It could be divided into two reaches:Nouakchott-Tioulit and Tioulit -Râs Timirist.In the first reach the littoral sand barrier encloses from the West a spacious depression Drhamcha a sea bay turned into a lake and subsequently,into a sebkha.The dune systems of Akchar and Agueitir reach the ocean in the Littoral reach between Tioulit and Râs Timirist.The two dune systems are separated by the sebkha of Teniobrar.

The littoral reach between Nouakchott and Tioulit consists of two parts.The first one up to El Msid is called Tared. The beach formations form a broader zone and aerial photos indicate the existence of several generations of beach sand banks.It was a section of greatest interst because it has the highest concentrations of black sands in both beaches and dunes.The second part situated between El Msid and Tioulit is called Allaqui.Its sand barrier is fairly narrow and the sebkha almost reach the sea.This section is of minor interest.

The section between Tioulit and Râs Timirist is of minor interest too,because the greater part of it is covered by the dunes of Akchar and Aquéitirr.

D. Geophysical Prospection

D.1. Aims of the Geophysical Prospection

According to the terms of reference /see Annex A/ the aim of geophysical work were as follows:

1. definitive testing of geophysical methods i.e. radiometry and magnetometry for heavy beach sand deposits prospecting;
2. performing a detailed radiometry and magnetomotry survey of 4 or 5 promising deposits and by surface sampling to establish a correlation between radiometry readings and mineralization, in positive case of run a geophysical survey of the promising sections of the Mauritanian littoral;
3. to perform experimental runs with a radiometer and /or a magnetometer carried in boat,in order to find out whether offshore concentrations of heavy minerals in shoal water can be identified in this way.

D.2. Programme of Geophysical Prospection

The scope and methodology of geophysical prospecting were lift flexible in the Terms of Reference.Both radiometric and magnetic methods were to be applied.It was difficult to foresee the geophysical conditions in the area under consideration. Information accesible in Poland and the Literature sources gave anly assurance that for investigating the black sands only the radiometric and magnetic methods could be useful.General theoretical considerations implied that the usefulness of the magnetic method can be minor:magnetized bodies elongated N-S in the regions close to the equator give anomalies only at the ends of the bodies,and such anomalies are irrelevant to the distribution of mineralization in the interrior of the bodies.Detailed planning of work was therefore adjurned until more exhaustive data could be had on the spot in Mauritania.At Nouakchott the geological documents on the black sands revealed an almost complete lack of pertinent geophysical data.The only information was found in a document prepared by Bulgarian geologists and geophysists /Zagortchev et al.,1976/ concerning their measurements of the radioactivity of the black sands both in the field and on laboratory samples.They confirmed the distinctive radioactivity of the black sands.They made point measurements only in the field and some measurements on samples.The above mentioned document gave no graphic annexes which could illustrate the results of the geophysical measurements: it contained only numerical information in the text and tables.As far as the magnetic method is concerned,the Bulgarian authors had a negative opinion on its applicability to the prospection of black sands. However,they did not quote concrete data to confirm their statement.

An important information about the applicability of the magnetic method is contained in the document about mineralogy of the black sands /Marshall ,1978/.The mineralogical investigations of samples from the coast between Râs Timirist and Legouichichi revealed,that the content of ferromagntic fraction in in all investigated samples /i.e. the magnetite/ is very low:at the most it does not exceed 4% of the sample with 65% of heavy fraction.As a rule it is under 1% of the whole sample and in many cases/especially from the southern part of the Mauritanian coast/there were only traces of the magnetite.This was a prove that the magnetic susceptiblility of the black sands must be very low.It was an additional factor and as a consequence against the usefulness of magnethic method.Nevertheless the decission was taken that experimental methodology works should be undertaken,in the accord with the terms of reference in order to select the appropriate method of prospection.

After selecting the section of the Mauritanian coast to be investigated /see paragraph 6.3./ a programme of the geophysical compaign has been prepared and accepted both by UNDP and Mauritanian connterpart organization SNIM: three phases of survey has been envisaged:

1. experimental reconnaissance in a beach deposit in order to test both geophysical methods, and to select profile and station spacing;
2. in positive case of work under 1. to run a semidetailed survey of the coast between Nouakchott and Râs Timirist, with the profile spacing of 1 km to find the most prospective sectors;
3. to execute a detailed geophysical investigation in the selected prospective sectors.

D.3. Geophysical Methods and Instruments

D.3.1. Radiometry

The method consists in measurement of the gamma radiation of the ground i.e. the gamma radiation caused by decay of radioactive elements occuring in the ground. There exist many types of this method, including gamma radiometry in the strict sense i.e. the measurement of total gamma radiation, and gamma spectrometry, which in addition to total radiation separately measures the radiation of the most common radioactive elements: uranium, potassium and thorium. These are the most generally used methods.

The field of gamma radiation includes also cosmic radiation. It is almost constant in time: its diurnal variation amplitude usually does not exceed 1.0-1.5%, its seasonal variation does not exceed 5% /Kogan et al. 1976/. For this reason no special measurements for eliminating the cosmic radiation background were made.

The black sands contain zircon and monazite /Marshall, 1978/, both of which include uranium and thorium. Dortman /1976/ states, that monazite from granite contains 30 000 ppm thorium and 1500 ppm uranium, zircon contains 666 ppm thorium and on the average 900 ppm uranium. The U/Th ratio is seen to be different in monazite and in zircon i.e. the relative abundance of the two minerals in the rock can be estimated by means of gamma spedtrometry, if no other source of thorium and uranium is present in the rock. However, as was not included among the Polish team's tasks, the assumption was made in the first approximation that this ration was more or less the same in the whole area and that, in the case of the curvey the total radiation would reflect the aggregate content of those minerals in the black sands.

Later on, the mineralogical study of the black sands, presented in this report revealed that apart from zircon and monazite these are other minerals containing uranium and thorium namely epidote and hydrated iron oxides. Anyway the assumed good correlation between gamma radiation intensity and heavy minerals content has been corroborated by analysis of samples. The correlation coefficient between these two quantitites is 0.808 /see paragraph F.4.4./.

The gamma radiation of potassium is much lower than that of uranium and thorium. The threshold of detection for potassium by gamma spectrometric methos is as high as 1 - 2.5% /Filippow, 1978/. So only rocks containing mainly minerals with a high potassium content /as potassium salts, potasium feldspart etc/ can markedly influence the field of gamma radiation. It is clear then, that in our case the role of radioactive potassium is negligible, because its main source are the sea water containing only 0.035% of potassium /Kogan al., 1976/ and salts in sands /about 1.5%/ contain about 0.15% of potassium. Bot these values are well below the threshould of radiometric detection for potassium.

This fact can be clearly seen on the graphs of radiometric profiles, where the lowest values of gamma radiation are in the westernmost parts of profiles, on the sea edge washed by sea water.

Gamma radiation is damped by the medium that it traverses: so, the depth of penetration of the method is moderate /up to 1 m/. This is the weak spot of the radiometric method as compared with other geophysical methods. but as thickness of the black sands deposits rarely exceeds 1 m and the covering sands are usually less than 0.5 m thick/Smirnov, 1982/, this weak spot of radiometry is negligible for our purpose.

Scintillometers are used nowadays as sensors in the majority of the gamma radiation meters. In them, the gamma quantum passes through a crystal of NaJ doped with gallium:its passage provokes a flash of light.The flashes are amplified and counted over a freely selected period of time.Two instruments of Canadian make /Exploranium Company/ were used:

1. a scintillometer type GR -101 A with dial- and needle readout;
2. a gamma spectrometer type DISA - 300 with diagonal readout.

The second one was borrowed from SNIM and was used only in detailed prospecting.Both were calibrated in counts per second /cps/, but as their crystals are of different size-those units did not coincide.In order to obtain compatible uniform results the following procedure was applied: because only the GR-101 A radiometer was used in both the preliminary and semi-detailed survey,its calibration was accepted as the basic one.In order to reduce the DISA - 300's unit to the unit of the GR - 101 A,on every day of work,one profile was measured with both instruments.Those measurements served as basis for the determination of a conversion coefficient which was used for converting the DISA -800 measurements into GR 101 A units. As the spectrometers are generally not stable the conversion coefficient oscillated from one day to another within certain limits.

D.3.2. Magnetic method

This method makes use of the natural magnetic field of the earth,a vector field which is composed of the Earth's field as that of one big magnet,of fields from local magnetized geological bodies, regarded as smaller magnets and of a variable field created by solar radiation in the ionosphere.The Earth's field is weaker in the equatorail regions and stronger in the circumpolar regions.It amounts to about 34 000 nano Tesla /gamma/ in the region surveyed as compared to 46 000 nano Tesla in Central Europe.

The variable component ajurnal variations is weakest at night,and strongest in the noon hours.Its amplitude in Mauritania is some 30 nanoTesla.In the field operations the influence of this variable component can be eliminated by repeated measurements at the same points when using one magnetometer only,or by recording diurnal variations at a base point by means of one magnetometer,and making field measurements by means of another one.

Geological bodies with an increased magnetic susceptibility /i.e.magnetizability/ magnetize themselves in the magnetic field of the Earth and generate their own magnetic field which is called the anomalous field or simply the anomaly. The anomaly of a body depends of its magnetic susceptibility, its dimensions, its position in space and on the position of the Earth's field vector.

The magnetic susceptibility of a rock depends on the susceptibility of the minerals combained in it. As the highest susceptibility is that of magnetic, amounting to 700 000 - 2 000 000 . 10^{-6} cgs units, the susceptibility of a rock depends mainly on its magnetite content. As mentioned before in the black sands the magnetite content is very low, and another magnetite mineral - ilmenite, the other common in the black sands has the susceptibility well under 100 . 10^{-6} cgs units so overall magnetic susceptibility of the beach sands had been foreseen as quite low and unfavorable to magnetic prospection. Magnetometers measuring the total intensity of the magnetic field /vector modulus/ are most often used in modern surveying. Such a magnetometer was used for the prospecting under consideration too: type PMP - 4 , portable the proton magnetometer /gamma/ accuracy of 1 NanoTesla , a product of the Experimental Works of the Polish Academy of Science. The readings of the instrument are displayed in digital form. The measuring sensor was placed at a fixed above-ground weight of 1.5 m.

D.4. Methodological Research

D.4.1. Aim and Methods of Research

The aim of methodological research was to determine the usefulness of both methods for the evaluation of heavy minerals concentrations in the heavy black sands and to identify the best station and profile spacings. This work was carried out, according to the programme, in the region of Jreida. Because the results of the magnetic survey were negative, additional work was done on a dune in the El Msid region. The area of research in the region of Jreida was at the hydrographic marker /CO -3/ 27 km north of Nouakchott and 5 km nort of Jreida. Both radiometric and magnetic measurements were made on 8 profiles with a station spacing of 5 m and a profile spacing of 50 m.

In the region of El Msid the area of the selected dune was mapped on a 10 x 10 m grid by both the radiometric and the magnetic method. Diurnal magnetic changes were eliminated by repeating measurements at the base points.

D.4.2. Results

In the region of Jreida radiometry measurement revealed the increased gamma radiaton in the recent beach as well as in the storm beach.The profiles traversed the beach formations from the ocean waters edge to the older sand barrier formations.The inter-tidal zone was completely sterile with the radiation at ten or a dozen counts per second /cps/: this is probably the cosmic background only.Inland of the recent beach there is a narrow anomalous zone connected with the storm beach.Radiation amounts here to 80-130 cps.Towards the sebkha,the anomaly gradually decreases: the radiation outside the storm beach is 15-20 cps.The analysis of the measurements showed that a station spacing of 5 m is sufficient for detailed investigation and that the profile spacing can be increased to 100 m. A 25-meter station spacing was found appropriate for the semi-detailed prospecting of the storm beach.

Magnetometry /fig.3/ revealed no anomalies correlating with the radiometric ones.The accuracy of mapping assured the detection of anomalies with an amplitude of 2 nanoTesla.Only a few very low anomalies with an amplitude of 2 nenoTesla were registered.Even these did not correlate from one profile to another.The magnetic method appeared to be inappropriate for the investigation of such concentrations of black sands as occur in the region of Jreida.
In order to find out if the magnetic method is useful in the case of higher concentrations of heavy minerals,the decission was made to perform experimental investigations also on a dune in the region of El Msid.
A dune next to the ocean shore was selected for this investigation. Its grey colour indicated a high concentration of heavy minerals. This fact was confirmed by radiometry which revealed anomalies whose shape matched the dune outline /fig.4/ with radiation values up to 480 cps.

An anomaly connected with the storm beach concentration was discovered in addition. The magnetic results are presented in fig.5. The obtained anomaly was weak, wit positive values in the southern part of the dune and negative values in its northern part. The shape of this anomaly is analogous to that of a sphere under oblique magnetization /Brainer, 1973/. This conformable to expectations, as the shape of the dune can be compared to a sphere in the first approximation. The described anomaly is fairly weak, about 10 nanoTesla at both ends of the dune. On the assumption that the concentration of heavy minerals is uniform in the whole dune values, the magnetic susceptibility of the dune sand can be estimated from the magnitude of the anomaly at $50 \cdot 10^{-6}$ cgs units approximatively, a fairly low value. According to this estimate the magnetite content of the sands should be very low /less than 0.01%/ and the susceptibility of the other minerals, mainly of the ilmenite, should be weak.

D.4.3. Conclusions

Methodological research has revealed the usefulness of the radiometric method in determining the concentrations of heavy minerals in the sands. On the other hand the usefulness of the magnetic method is very doubtful because the magnetic susceptibility of the black sands is very low, about $50 \cdot 10^{-6}$ cgs unite, resulting from a low content of the ferro-magnetic minerals.[x]

The low magnetic susceptibility of dune sands results from a low ilmenite susceptibility and a very low magnetic content. The investigation revealed that the station spacing of 5 m is appropraite in the case of a profile spacing 100 m.

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x/ pure ilmenite is diamagnetic, i.e. its susceptibility is practically zero. However ilmenite forms a series of mix crystals with hematite which, in its turn has a magnetic susceptibility from $10 \cdot 10^{-6}$ to $100 \cdot 10^{-6}$ cgs units.

D.5. Semi - detailed survey between Nouakchott and Râs Timiris

D.5.1. Goals and methods of the survey

The goals of the semi-detailed survey was a geophysical investigation of the coast from Nouakchott up to the Cap of Timiris, with a view to selecting the most hopeful sections for detailed prospection. Profiles of E-W direction were spaced 1 km. The station spacing of the profile was 25 m. Despite the negative magnetic results of the methodological investigations in the region of Jreida and the poorish results obtained on the El Msid dune, the decission was made, to apply magnetometry in addition to radiometry, nevertheless on the assumption that the magnetite content of black sands might be greater in some regions or that the mineralised zone might be thicker.

Siting the profiles in the field was difficult because only the following maps were at our disposal: scale 1: 200 000, Sheet Nouakchott, NE - 28 -XIV -XV and Sheet Nouamghar, NE - 28 -XX -XXI.. Those maps were based on air photos taken in 1954. Ho further had a set, unfortunatelly incomplete, of those same air photos, as well as, for the Nouakchott sheet, a set of 1 : 10 000 scale air photos taken in 1977. A confrontation of the air photos with those of 1977 and with the actual situation in the field revealed that the contours of the shore line had changed mainly as to the shape to the bays. The shore line is very smooth, there are few landmarks which show on the map on the air photos. The air photos were not very useful in profile siting. Instead, the following procedure was applied: profiles were localised every km as measured along the beach by means of the kilometers counters of a Land Rover. The profiles so sited were tied in to characteristc landmarks /villages, bays/ in the scale 1 : 200 000 map.

Of 158 planned profiles 144 were surveyed. Of the 14 remaining areas 11 were situated in an evidently negative region, where the dunes of Agneitir and Akchar reach the Ocean, theother 3 were on Cap Timiris, north of Nonamghar. The magnetic measurement aiming at the elimination of the diurnal fluctuations consisted in a second measurement, at the first point of every profile, after the

end of the profile's measurements. Reducing all the measurements ofall the profiles to one and the same level was not found to be necessary, because it would have given no additional information- concenrning the problem of black sands and it would have greatly complicated and prolonged the measurements.
The profiles were numered in such a way that the profile which included the mas t of the Mauritanian radio station, some 6 km of Nouakchott /was marked as NO and the following as N1, N2 and so on, where the number designates the number of kms to the north of profile NO. The profile marked S 11 was south of the mast of Radio Mauritania. Three profiles in the region of Nouamghar have a separate numering. It increases southward from profile NoSO, which is situated some 300 km south of Noamghar. The profiles in the northern part of the area were surveyed out of a base at Janit which is situated at the altitude of prfile M 55.

D.5.2. Results

The geophysical results are shown in detail in fig.7-14. In the Tared section, the black sands are in the recent beach, in the storm beach and in dunes. The concentrations in the beach are relatively low in its southern part - profiles S1,1 - N 16 with radiation anomalies of 60 cps, there are higher dune concentration in the region of profiles S1 .1, N5, N7, N13, N16 with a radiation anomalies of 70 cps and even 240 cps on N15.
The profile N13 of a lenght 1900 m was surveyed to obtain information on the existence of heavy minerals if any in the old sand barriere more distant from the shore. The results were negative. Similar negative results were obtained on the longer profiles N17, N19 and N21 and also from reconnaissance measurements taken from the vehicle several kilometers to the north of the latter.
A richer beach concentration began on profile N18 /2 km south of Jreida/. This concentration extends over 10 km, up to N29. This concentration extends over 10 km, up to N 29. Its width is 100-150 m /profiles N27 and 28/ but it is fairly narrow in places /profile N 26/. The radiometric anomalies attain 130 cps

/profiles N23 and N25/ and even 200 cps in profile N29.The beach mineralisation tapers off beginning from profiles N30 up to N39 /in the vicinity of the wreck of the "Montesquieu"/.Radiation fluctuates there round 40 cps on the storm beach and up to 80 cps on the recent beach /profile N33/.Beginning with the profile N40 and especially N42,the mineralized zone starts to widen on the storm beach,the concentration of black sands becomes more conspicuous and radioactivity rises to between 60 and 80 cps.The zone begins to pinck out from profile N 52 /the Bay of Tanit/;however concentrations of heavy minerals are fairly high in the recent beach of that region /in profile N56/they give 310 cps/.
Profiles N56-N61 pass through the mineralized dunes of El Msid. Radioactivity is fairly high /130-160 cps/.The region of Allagni /from profile N62 up to profile N86/ is of no particular interest. No major concentrations of black sands occur in the recent beach, excepting profile N62.As has already been mentiond,the storm beach is very narrow here. and the sebkha formations reach almost to the recent beach.
The littoral reach from Tiouilit to Râs Timirist is also divided in two sections.The one between profile N86 and profile N 112 embracing the Akchar dune and the Teniobrar sebhka is not very promising.There are increased concentrations in the recent beach,in profiles N99,N100 and N101 and moderate ones about 40 cps in the storm beach,in profiles N96 and N97.The extremelnorthern section near Nouamghar /profile NoSO to No29/ numbered north to south should also be considered negative.Radiation is very low /some 10 cps and slight concentrations/ of black sands /30-40 cps/ are confined to the profiles No6 and No7 /region of Jraif/.

The literature mentions a deposit concentration in the old beach which,however did not show up in the radiometric survey. Because the ocean waves exert a strong erosive action in certain regions,it might be assumed that the deposit had been destroyed by it /the information on the deposit derives from 1958/.Such an explanation is however not very convincing.We preffer to assume that this deposit was covered by a bed of sterile sand which is shielding the radiation from the deposit.It should be recalled that one - meter of overburden is sufficient to blanket the gamma radiation effectively.Other explanations may be that the bl... sands of the region are characterized by low radioactivity /not very probable/ or that a wide profile spacing the deposit fell between two profiles /fairly probable/.The diagrmas of fig.6-13 show, that magnetom.try gave negative results.Sporadic anomalies of ampliteudes of 2 - 3 nanoTesla gave no correlation with the radiometric anomalies.Profile N13 on the other hand gave distinctive anomalies of several nanoTesla were met.Their shape suggests,however that they were caused by lithological changes in sebkha sediments.A modest anomaly on profile N55 resulted from the fact that this profile passed distance of 30 m from a shed housing the genarator providing current for Mendez Co's house in Tanit.

D.5.3. Accuracy of the field survey

The accuracy of a field survey can be determined on the basis of check measurements.For this purpose,profile N21 was repated on a segment of 27 station.The root-meau square error was calculated to be ± 3.34 cps for radiometry and ± 1.59 nanoTesla for magnetometry.The error is made up tof the measurement error and the error of station location.The magnetic error implies that anomalies of 3 - 4 nanoTesla are already significant.

The error of radiometry ± 3.34 cps is a medium error and it should be borne in mind that this error will decrease in case of low values of radiation and increase in the case of high values. In the neadle-and -dial read-out,according to measured values we use one of several ranges of instrument.The higher the range the bigger is the value of lowest detectable unit i.e. the lower absolute accuracy and vice versa.

D.5.4. Conclusions

The semidetailed survey was carried out according to the pre-set programme.The results confirmed that the magnetic method is not suited for the detection of zones enriched in heavy minerals.

This is due to the low susceptibility of the heavy fraction to the unfavourable orientation of the mineralized zones and probably also to their small thickness.It is probable that those zones give anomalies of one nanoTesla or less.Such anomalies were undetectable with the instrument of our dispozal.For this reason,magnetometry was not deployed in detailed prospecting.The semidetailed survey confirmed also that only youngest sand barrier /of Tafolian age - 4 000 - 2 000 y.BP/ is mineralized .It forms very narrow westernmost stretch of the Tared sand barrier the older sand barrier formations of Nouakchottian age /east of Tafolian one/ are sterile as demonstrated the radiometric measurements on profiles N13,N19,N21 and other earlier mentioned investigations.Most probably the sand barriers visible very clearly on the air photos were submerged during Nouakchottian age forming rather banks than littoral sand barriers in strict sense.

Radiometry allowed the identification of the most prospective stretches of the littoral.These stretches occur in the littoral section called Tared,where the sand barrier that divides the Narhamcha sebkha from the ocean is the widest.They include both beach and dune concentrations. According to the programme,geophysical prospecting focused on the storm beaches because the dune concentrations could be easily spotted without geophysical exploration.Accordingly, the littoral sections bearing dune concentrations /the Nouakchott - Jreida section and El Msid/ were excluded from the detailed geophysical survey.Two littoral sections of a total lenghts of more than 20 km i.e. almost one third of the whole Tared area,were selected for the detailed survey.The first section was given the name "Jreida".It stretches nort ward from Jreida.Its length is 8.6 km.The second section - Tanit - Blaouakh stretches from the "Montesquieu" north to the bay of Tanit.Its lenghts exceeds 12 km.As mentioned above the black sand concentaations in the region of Jraif were not detected by our radiometric measurements,for reason that have not been fully eluicidated.

D.6. Detailed Survey

D.6.1. Goal and methods

The goal of the detailed survey was a more precise examination of the two precisive zones, singled out on the basis of the semi-detailed survey "Jreida" and "Tanit- Blaouakh".
The first section called "Jreida" /fig.17/ beginns by the side of the road that passes through Jreida /between profiles N20 and N21/ and ends 8.6 km farther north at the hydrographic marker /CO - 7/, profile N29.

The section "Tanit" /fig.18/ covers the littoral between the hydrographic markers /R-1/ the wrack of the "Montesqiaeu" between profiles N39 and N40 and R-10 -profile N52. It is over 12 km long. Only radiometry was used in this compaign. The station spacing was 5 m: the between spacing was 100 m filled in to 50 m in the section "Jreida" near the marker CO-4. The profiles ran west to east. Geophysical profiles were tied in to the chain of hydrographic markers existing in the surveyed area. The hydrographic marker is a steel tube 50 cm long and diameter of 5 cm, cemented in the ground. It has its signature marked on the surface of concrete. As the steel tube sticks out, from the ground only 0.5m it is not easy to find it. Of course it is not visible on the air photos both on 1: 50 000 and 1: 10 000 scales.

In the "Jreida" region the hydrographic markers have signatures "CO" probably from Coppolani /Jreida/ and in the "Tânit"-"Blaouakh" region -"R". Apart from that in the latter -region we used also the hydrophic marker "SHELL-3" and in the "Jreida" region two temporary markers: one on the top of a dune near hydrographic marker CO-2, because the latter was badly visible from neighboring markers, and the second on the road in Jreida, the CO-1 marker being near military instalations.
95 profiles were executed in the section "Jreida" and 122 in the section "Tanit" -"Blaouakh". In total, more than 10 000 radiometric measurements were mde in the two soctions.
Theradiometer type GR -101A and the spectrometer type DISA-300 were used /the latter set for recording total radiation/ /counting time

4 seconds/.The readings of the spectrometer were converted into the units of the radiometer.The procedure has been described in paragraph D.3.1.

D.6.2. Results

D.6.2.1. The "Jreida "Region

The profile diagrams are presented in figs.16-33.Figures 55-61 present the contours of total gamma radiation.The whole area falls into three natural units.The first stretches from the south end of the region up to profile CO-3/1.The second covers the area from CO-3/1 up to profile CO-4/8 in the region of an unnamed bay. The third unit is made up of the rest of the ares.In the first unit the mineralized zone is generally narrwo /50-75 m width/.In the vicinity of the marker CO-2,distinctive concentrations of the dune type occur.In addition to the recent beach,the biggest concentrations of heavy minerals are in the region of profiles CO-2/4 to CO-2/6 where radiation exceeds 160 cps.At the end of the unit the zone tapers to 25 m. adiation is moderate here below 80 cps.In the second unit from the south the mineralized zone gradually widens up to 150 m,inthe region of the marker CO-4.Radiation is strongest here,in places it is above 240 cps.The zone narrows suddenly beyond profile CO-4/3 and in the region of CO4/4 CO4/5 the sebkha formations reach the sea.This is the southern arc of the unnamed bay:it seems to have caused the narrowing of the zone of mineralization.
The last unit with the exception of its beginning and end,where the zone is fairly narrow,is relatively wide /some 100 m / with high radiation values /above 160 cps in places/.However,its course is rat irregular.

D.6.2.2. The "Blaouakh" - "Tânit" region

Figures 34-54 present the profile diagrams of gamma radiation intensity,Figs 62-70 the contour maps.The "Tânit" - "Blaouakh" region can be divided into three units.The first one is between wreck

of the "Montesquieu" /hydrographic marker R-1/ and the village of Blaouakh. Its length is 3.5 km. The second unit stretches from the village of Blaouakh up to a bay in the vicinity of marker R - 5. It is 3 km long. The third stretching from the above- mentioned bay to Tânit Bay marker R-10, in a lenght of 5 km.
In the first unit the mineralized zone is narrow and rather poor. The radiation over a long interval does not surpass 60 cps. In its southern part, the unit is richer wish radiation values between 80 and 120 cps. The width of the best-mineralized zone amounts 25-50 m. The dunes in the region of the "Montesquieu" are sterile /see profile R- 2/1.

The second unit is of greater interest. It has a rather richly mineralized zone with radiation exceeding 80 cps almost all along. The width of this zone is 50 to 100 m. It runs parallel to the shore. In addition to this zone, further mineralized zones occurs farther inland /from profile R-4 up to R-4 /10". The agregate width of mineralization reaches 300 m. The other zones of concentration are not so rich as the first one. Their radiation exceeds seldom 80 cps. The mineralized zone tapers strongly in the region of marker R-5 /in the middle of the bay arc/.
The zone widens again in the third unit to as much as 250-300 m and ceeps this width alomost to the marker R-8. Further north, the zone slowly contarsts in the region of profiles R-9/5 and R-9/6 /the centre of the arc of Tânit Bay/ its width is only 50 m.
The mineralization in the recent beach is rather variable. The region of Tânit Bay gave the highest registerd radiations in the whole investigated area-818 cps on profile R-9/6 and 640 cps on R-9/8 in very narrow bands of anomalies. The mineralized zones connected with the storm beach have a rather irregular course.

D.6.3. Accuracy of Measurements

During the detailed survey after measuring a profile, a check reading was invariably taken at the zero point, the one located on the base line. It was on the ground of those check measurements that the measurement error was calculated. It amounts to ± 3.35 cps for the radiometer GR-101A and to ± 2.26 cps for the spectrometer

DISA-300/in the GR-101A's units/. The accuracy of the GR-101A is seen to coincide with what was calculated for the semi-detailed survey /± 3.34 imp/sec./. The accuracy of the DISA-300 was better than expected. The accuracy of the survey can be evaluated on the basis of check measurements on given profiles. Such repeated measurements were made with the other instrument and by another operator /in order to calibrate the DISA-300 apparatus/. Such measurements on profiles R-2/10 and R-3/11 gave the accuracy of the survey operation as ± 3.51 and ± 3.63 cps respectively, i.e. as ± 3.57 cps on the average. This is not significantly worse than the accuracy of the measurements by the GR-101A. As mentioned before it should be remembered that this accuracy in absolute terms is better when the radiation is weack and worse when the radiation is strong.

D.6.4. Conclusions

In the detailed survey two longer shore sections were investigated in detail, in a total length of more than 20 km. This investigation permitted to detect the zone enriched in heavy minerals exist in this area and to discover certain regularities of their occurance. The mineralized zone is mostly very narrow even though the old beach formations are much wider in places. This fact might indicate that the conditions for a concentration of heavy minerals appeared relatively recently and that only the younger beach formations of the old one are prospective. The mineralized zone is wider in those places where beach formation have been deposited relatively recently. The above remarks concern Nouakchott -Tiouilit coast. The condition farther north, in the region of the dune system of Akchar and Agneitir are different. It seems that the copious volum blown away from land to sea inhibited the concentraticns of heavy minerals in this region7/they might also have covered pre-exisitng deposits/.

D.7. Final Conclusions

Geophysical prospecting has permitted to solve several problems connected with the occurances of black sands along the Mauritanian coast between Nouakchott and Ras Timirist.

1. The radiometric investigations of the black sands in the recent beach,storm beach and dunes has revealed increased gamma radiation levels everywhere,as evidence that minerals containing thorium and/or uranium.
2. The magnetic prospecting has revealed the low magnetic susceptibility of the black sands, 50 $\cdot 10^{-6}$ cgs units for a concentration of 400 cps.This fact,together with the small thickness of mineralized zones and with their unfavourable orientation /a N-S elongation/ results in a situation in which most radiometric anomalies give no measurable magnetic anomalies.The low magnetic susceptibility reveals that the share of ferromagnetic minerals in the heavy minerals fraction is low.
3. AA semi-detailed radiometric survey of the whole investigated area permitted to single out the most hopeful regions.
4. A detailed survey in the regions so singled out permitted to identify the structure of mineralized zones and to recognize certain regularities of their occurances on the basis of the gamma radiation maps.
5. The picture of radiation intensity served as a basis for borehole sitting with the aim of an in-depth investigation of the mineralized zone s.This was necessary because the radiometric measurements give in formation on the distribution of heavy minerals only to a depth of 0.5-1 m below the surface;
6. Samples were taken at each station of profile P-8/7,in order to correlate the radiometric results with geological data and to subject them to a mineralogical analyses.The results will be discussed in the chapter on mineralogy:,
7. Gamma spectrometric measurements /measurements of thorium, uranium and potasium radiation should be made in further prospections of the same type.They could give additional information on the distribution of particular minerals and thus on the genesis of the mineralization too.

E. Geological Prospection

E.1. Borehole siting

The goal of the drilling compaign was to find out the character,thickness and concentration of heavy minerals in selected zones of the Mauritanian coast, as well as to obtain an estimate of their reserves.Obtaining information on the Quaternary of the Coast,was a second goal.

In order to examine the Quaternary profile,the decission was taken to drill three boreholes of 20 meter depth.The heavy mineral concentrations were investigated by boreholes of 6-8 m depth. Such a depth was suggested by the fact,that no heavy mineral deposits of greater thickness are known anywhere on the West African coast. Three coast sections of comparatively strong gamma radioactivity were selected for drilling on the basis of a detailed radiometric mapping.Boreholes were purposely sited both zones with different intensity of radiation,both below and above the average.

The Tânit Region /Figs. 2,66/ is connected with the northnern part of Tânit Bay,some 56 km north of Nouakchott.The boreholes were sited on profile lines both parallel and perpendicular to the border.The parallel profile with 200 m spacing between boreholes /T-0, T-1,T-2,T-5,T-10/ was aimed at expolring the anomalies of gamma radiation along the interface between the outer and inner beach/Fig.66/. The perpendicular profiles were spaced 200 m apart and were supposed to explore the character and extent of black sand concentration outside the recent beach,up to the visible border with the sebkha,including the concentration of the dune sands.Borehole spacing on the perpendicular profiles were 50-100 m /Figs.73-76/.A twenty meter deep hole was drilled at the centre of the area under exploration.

The Blaouakh Region is situated some 1.0 - 1.5 km north of the Imragene's fishing village,about 50 km north of Nouakchott

/Figs.2,67/.The plan envisaged execution of four E-W profiles on a 200 m spacing.

The westernmost borehole of each profile /B-1,B-4,B-9,B-13/ was drilled just above the highest tide between the inner and the outer part of the recent beach,thus making up a profile paralle to this coast line/Fig.67/.The remaining boreholes,which served purposes similar to those in Tânit,were situated on the dunes,where the concentration of heavy minerals could be seen by eye.The borehole B-6,20 meters deep,was located at the centre of the drilling area on the sebhka between two dunes.

The Jreida Region is situated some 25 km north of Nouakchott, 1.0-1.5 km north-east of the military base at Jreida/Figs.2,59/. Just as in Tanit and Blaouakh,the project envisaged boreholes in the recent beach along a profile parallel to the shore /J-1,J-3,J-7,J-12, Fig.59/but, in order to explore the rest of the littoral,the sand barrier,dunes and bordering sebkha zone,the profiles perpendicular to the shore were also drilled.The profile spacing was 200 m,the borehole spacing in the profiles was 40-75 m.The twenty-meter deep borehole was located in the middle of the longest profile.

E.2. Methods and Scope of Drilling

The contract stipulated a total of 315 m of drilling,including three boreholes of a depth of 20 m each,to be carried out in three months.

For the above operations, a mobile drill rig on a two-wheeled chassis of Polish make type UWSP-100 was used.A Mercedes-lorry 911L provided by UNDP Nouakchott was used for towage.The crew,supplies,geological samples and small drilling tools were transported by a long Land Rover,also provided by UNDP,Nouakchott.

The hydraulic drill rig UWSP-100 is a adaptable to boring with or without mud circulation,to either churn or rotary drilling using drilling tools of diferent types and diameters:it can drill to a

depth of 100 m.On the basis of the type of geological profile envisaged the decission was taken to use dry rotary with a tool speed of 40-50 rpm and an on-tool weight of 800-1000 kg.
Down to the ground water table,at the depth of 0.9-4.5 m the drilling was done with a spoon drill of 152 mm diameter and 0.5 m lenght,with no casing.Once the water table has been reached,the well had to be cased.Pipe of 6" diameter in length of 1.5 m was used; 2 or 3 lenghts were somotimes twisted together.For beating the casing down a special "hammer"weighting 300 kg was used.The derrick of the rig was used to hoist it.The casing was beaten down to a depth of 6-8 m and a spoon drill or a tube drill was used to take out the sediment that had entered the pipes.After drilling the pipes were pulled by means of the derrick or a hydraulic jack.The casing was beaten down deeper in the "deep" bore holes:to 14.85 m in the T-6 borehole,to 13.35 m in the B-6 borehole, and to 14.2 m in the J-9 borehole.
A total of 315.37 m of hole was drilled in the three above-mentioned areas,61.24 m out of it in the "deep" boreholes.

The conditions of drilling were difficult especially the geological conditions were worse than expected,owing to a relatively shallow ground water table.As a result the sand in the drilled profile had the consistence of quicksand.The fact that it was necessary to use a hydraulic jack with a hoisting capacity of 80 tons for pulling the pipes gives an idea of the pressures acting in the boreholes.It seems that,under such conditions, drilling by the Banka system would e very difficult or probably even impossible.

The transportation conditions were very difficult.Even though an all-wheel-drive off-highway had been provided,the drill rig could be displaced,between the boreholes on pre-laid track only.

E.3. Sampling

The drilled mater taken from the drill tool in lengths of 0.25 m was reduced,on the spot,by coning and quartering.The samples dry at the time of drilling were packed at once into paper bags with identifi

cation written on them,according to the following pattern:borehole... number.......,successive number of the sample in a given borehole.. The wet samples were put after quartering into cloth bags,dried in the sun and then put into the paper bags.
All the samples so taken were sent to the laboratory.For testing in the laboratory in Poland,according to an agreement in April,1982 in Vienna between Mr.Balkay the UNIDO consultant and Mr.Ostromęcki,Head of the Polish team,the quarter-metre samples derivet from more than 2 m depth were lumped together four at a time,so as to give one-metre sample.

E.4. Geological Profiles

E.4.1. Tanit

The recent sand barrier of the littoral is 100-150 m wide in the region of Tânit.It is made up of two-cut zones,the outer beach and the inner beach.

The outer or intertidal beach is some 50 m wide.There are in places accumulations of heavy minerals in the highest parts of the outer beach /the upper boundary of high tide/.In certain parts of the beach,there is at the boundary between the outer and the inner beach a low ridge or a berm,destroyed and redeposited whenever the waves are strong enough.

The inner beach,50-100 m wide is the storm beach,flooded by the waves only duringgales.Organic vestiges including fish remains, carapaces,cuttlefish,sepia as well as gastropod and bivale shells are abundant on this beach.The organic vestiges found inland determine the boundary of the recent beach.The formations of the sand barrier of the littoral laterally pass into the sebkha formations, the formations of a former lagoon /Tafolian/ and the sea bay /Nouakchottian/.The sebkha surface is made up of brown mud with incrustations of gypsum.On the littoral sand barrier and the sebkha,there are dunes occur which make the observation of the boundary between the sebkha and the littoral barrier difficult.There are in place preserved fragments of subrecent beach,connected with earlier stages of sand barrier formation which,at the end of Nouakchottien and in the Tapholien,cut off the ancient bay from the Atlantic Ocean. The boundary between the sand formations of the littoral barrier and those of the lagoon is not clear-cut becaousethat sandy formations also occur in the next to the barrier:lagun zone there laterally pass into the lagoon sediments which are fine clastic or evaporite deposits.The differentiation between the littoralbarrier sands and those of lagoon presupposes an analysis of the whole ensamble of sedimentary structures.however,the drilling system adopted gave samples on which this could not be done.

Two systems of dunes can be distinguished:older dunes,which are partially immobilized and are either yellow or light brown in colour and younger dunes which are mobile and of a light yellow or white colour.The older dunes are 3 meters high,the younger ones do not exceed 1 meter.

The geological profile down to a depth of 20 m was as follows in borehole T-6/Fig.86/.There is a series of sands,fine- or medium-grained,whitish-yellow,yellow and greyish-yellow,between the surface and the depth of 7.9 m.Bivalve shells,both fragments and whole,among others of Arca senilis and Cardium eudale,Cardium costatum,gastropod including Turitella sp.,occur in the sands below the depth of 4.0 m.The next bed, between 7.9 m and 10.1 m depth is whitish-grey:it consists of sands and cemented calcareous debris containing great amounts of crushed and intact oyster shells especially of Ostrea stentina and corals.Below the oyster bed there are once more whitis -grey and grey sands with crushed shells of bivalve and gastropod.A clayey-sandy series of greyish-green colour a pears at a depth of 13-15 m.It is underlain by more fine- and medium-grained sands,brownish,beige and gray in colour,in which beginning at the depth of 19 m ,claystone concretions appear.The sands contain shell fragments.

The stratigraphy of these formations is as follows: to the depth of 7.9 m,Arca senilis abounds,containing it partly to the Nouakchottian,although its top belongs doubtless to the Tafollian.The calcareous-sands oyster bad should be correlated with similar layer descireb by Hebrard/1978/,from the Tikattan Hill and the El Hajder rock situated several tens of km north of Tanit .A similar layer was discovered at Puits d'Aguelil.It is a good horizon marker: according to Hebrard/1978/ it belongs to the Inchirian.The stratigraphic position of sands and claystones below it is not clear as they contain no indicative fauna and comparison with Tikattan Hill and Puits d'Aguelil gives no unequivocal correlation.The assumption can be made that the sediments in question also belong to the Inchirian.

The profiles of the shallow boreholes /Figs.75-76/were similar to the above-described profile of the "deep" borehole, except for the holes T-11 and T-12.
The presauces Arca senilis /T-2 mainly 5.2 m,T-3,T-8,T-9/,Cardium eudale and Cardium papillosum /T-1,T-2,T-5/confirms the Nouakchottian age of those formations.

E.4.2. Blaouakh

The littoral sand barrier is similar here to that described from Tanit,but the outer beach is somewhat narrower/30-40 m/; the inner beach is 100-150 m wide.The accumulations of heavy minerals occur here on the boundary between the two beaches.The thickness of the stratum containing mineralization is up to 0.5 m,as seen in the low periodical berms.They are sand bands poorly mineralized,yellow in colour containg long,black laminae 1.-1.5 m wide composed almost exclusively of heavy minerals.The sebkha surface consists of brown clayey matter containg gypsum inclusions and bands.The sebkha surface is scattere with small shells of bivalve and gastropod.These accumulations are so abundant in certain places as to give the impression of a mass-extinetion of the fauna,connected with the drying up of the sebkha in the Tafolian.
Similarily to the situation at Tanit,two systems of dunes exist: the one consists of dunes of yellow and light brown colour which

occur only in the sebkha area,and the other of light-yellow dunes which occur in the inner beach as well.Some of the white dunes reveal strong mineralization.The composition of the Quaternary profile in borehole B-6 is shown in Fig.86.The first 0.25 m consists of gypsyferous-clayey formations, fine- and medium-grained sands,light-yellow and yellow-with shell fragments of bivalves/Arca senilis/ and gastropod,underlie the first layer to the depth of 6.0 m.The next stratum reaches to the depth of 7.8 m and it consists of fine-grained sands, gray and yellowish-gray and containing detrital shells.In the 7.8-12.9 interval there is a white sandy-calcareous layer containing debris of Ostrea stetino shells.Below this layer there are grey, fine- and medium-grained sands fist without fauna and then with shell debris.A series of clayey-sandy matter with grayish-blue and gray clay and of yellowish-gray sands is found below 12.9 m down to the borehole bottom at 20.86 m.

The profiles of the shallow boreholes /Figs.77,80/ generally coincide with that of the deep borehole.Some of the boreholes started in dune sands under which clyaey-gypsiferous sebkha sediments were discovered.The thickness of the dune sands is up to 2 m /borehole B-12/,that of the gypsiferous-clayey layer up to 0.7 m. Bivalves were found in many boreholes,with abundance of Arca senilis/B-1,B-10,B-14-mainly at 4.2 m/,Cardium eudale /B-4,B-13,B-14/, Dosina isocardia /B-10-mainly at 5.2 m/ and /B-14 -mainly at 1.2.m/.

The stratigraphy is as follows:the clayey-gypsiferous sediments connected with a stage of lagoon sedimentation represent the Tafolian.The sandy formations between the clayey-gypsiferous layer and the top of the oyster bed belongs to the Nouakchottian. The oyster bed together with the clayey-sandy zone below it is placed in the Inchirian.

E.4.3 Jreida

The feature characterizing the littoral in the region of drilling is the presence of a system of big dunes of brown and rusty colour.The dunes take the form of isolated "mounds" 3-4 m high.They are overgrown with vegetation and are immobilized.A large-scale diagonal bedding can be observed in them.In places, those dunes occur in the inner beach area being destroyed by the waves during the high tides.The presence of the dunes makes the width of the beach vary between 20 and 50 m /inner beach/ and between 50 and 150 m /outer beach/.These are also yellow and light yellow-white dunes 2-3 m high with a thickness not exceeding 0.5-0.7 m.

The Quaternary profile in the "deep" borehole J-9 is the following- fine-grained brown sands with fine debris of shelle to the depth of 2.5 m underlie the aeolian sands of light yellowish-white colour,0.65 m thickness.The next layer 1 m thick, is composed of whitish-yellow sands with gypsum nodes and abundant Arca senilis.Below it,to the depth of 10.5 m there occurs a series of fine- and medium-grained sands with crushed bivalve shells.Brown-beige at first, than pass into yellow and greyish-yellow.A series of clayey sands with clay nodes /especially from 15 to 17 m/,gray and grayish-yellow,goes down to the bottom of the borehole/Fig. 86/.
The profiles of the shallow boreholes /Figs. 79-82/ are similar. Worthy of the attentions,however,the predominance of brown colours in them.This implie the presence of sandy material from destroyed Cogolian dunes.Arca senilis has been found in J-4 /mainly at 4.0 m/, J-5 /mainly at 3,7 m/,Dosina isocardia in J-2 /mainly at 3.3 m/ and Cardium eudale in J-4/mainly at 2.2 m/.

The stratigraphy of the main described formation is difficult to etablish,due to the absence of the oysters bed in the Jreida profile,which traces the boundary between the Nouakchottian and the Inchirian in the profiles of Tanit and Blaouakh.Because of this,the depth of 10.5 mthat is,the appearance of claycy sands,was assumed as the boundary.The series of sandy-claycy formations was placed in Inchirian and the sands occuring higher up in the Nouakchottian and Tafolian. The problem of the dunes age will be talked in the next chapter.

E.5. Radiometric Measurements in the boreholes

In the "deep" boreholes T - 6, B - 6, I - 9 the gamma radiation was measured using a Soviet scintillometer type SFP - 68 -02, having an accuracy of 2 cps. A special probe adapted for borehole measurements was used.

The measurements showed that below near-surface zone of 0.5 - 10 m, the gamma radiation was low, not exceeding 20 cps. In the near-surface zone the gamma radiation was about 80 cps in the borehole T - 6 , 45 cps in B - 6 and 60 cps in J - 9. These results are in accord with the laboratory and field radiometric measurements and with heavy mineral content in that zone.

E.6. Remarks on Lithology and Stratigraphy in the Boreholes.

The stratigraphic and lithological outline of the Mauritanian Quaternary was presented by L. Hebrard/1978/. However, the profiles of the Quaternary on the Atlantic Coast between Nouakchott and Râs Timirist are scantily presented in Hebrard's work. The drilling operations enabled us to complete this picture as concerns Nouakchott and Tanit situated 60 km farther north. Recent formations and formations of the Tafolian, Nouakchottian, Inchirian and possibly Ogolian and Tafaritian were confirmed in the drill profiles.The Ogolian and Tafaritian may be represented at the bottom of the profiles of deep boreholes;however for lack of unequivocal proof,the whole series has been placed in the Inchirian claycy-sandy formations.The oyster bed at Blaouakh and Tânit-described by Hebrard /1978/ from small inter-dune sebkhas 50 km north of Tânit,is of interest,as it confirms the existance of a marine bay much farther north in the Inchirian which reached there in the Nouakchottian. The lack of this stratum in the region of Jreida can be explained by the sedimentation conditions in the basin,which-being somewhat deeper and cooler in the region of Jreida did not provide the conditions favourable to the development of oyster reefs.After the Ogolian regression,the desert expanded:the sireable dune belts of Amoukrouz south of Nouakchott and of Akchar and Azefal 170 km north of Nouakchott are the traces thereof.In the drillings at Blaouakh and Tânit ,there was no trace of the Ogolian in the profiles,on the other hand,the brown and rust dunes in the region of Jreida may represent the remnants of the Ogolian dune belt,which took the form of small islands in the shallow marine bay.

After the Nouakchottian transgression and formation of the Ndrhamcha bay,the formation of the northern sand barrier-which in due time cut the bay off the Atlantic and transformed it into a shallow lagoon-probsbly began at once.The formation of the littoral sand barrier should probably be ascribed,in the first place,to the action of a littoral curent,a branch of the Canarian curent flowing from the North southward. This current brought much sandy material from the destroyed dunes of the Ogolian/Azefal and Akchar/ and possibly also from the rivers that flowed into the Atlantic, during the period of humidity.

The submarine canyons marked by Hebrard/1978/ west of Nouakchott and Tikattan-may be the traces of such rivers.The final drying up of the lagoon /N'Drhamcha/- on the surface of which/sebkha/ aedian processes took over occurred in the Tafolian,after the return of a hot desert climate.A system of yellow dunes formed -they are now partially immobilized. Recent aeolian sedimentation is represented by light-yellow and white mobile dunes of the recent littoral sand barrier and on the sebkha. The big dunes of El Msid north of Tanit, the dunes of Ferat soutward of Blaouakh and El Mansour in the vicinity of Nouakchott, belong to the recent system. This system is of greatest interest, as it is generally enriched in heavy minerals: this is proved, in addition to the described profile of El Msid dunes, by the profiles of the boreholes. In all the drilled dunes, both light-yellow and white, enrichments of heavy minerals were noted. According to the profiles from particular regions, the process of formation of the littoral sand barrier is still going on. This sand barrier is subject to destruction in some places of the littoral, for instance north of Tanit, while it is becoming wider in other places. The genesis of the concentrations of heavy minerals is connected with the above-mentioned processes.

F. Laboratory Tests

F.1. Introduction

The tested samples of sands were taken from boreholes drilled in the area of Tânit, Blaouakh and Jreida from radiometric profile R 8/7 near Tânit and from one of the El Msid dunes. In the case of the drill samples the aim was to determine the heavy minerals content of the beach and dune sands in the prospected reaches of the Mauritanian coast. In the case of the samples from radiometric profile R 8/7 and from the El Msid dune, the aim was the qualitative and quantitative determination of heavy minerals with particular consideration of the radioactive ones, special attention was paid to establishing relations, if any, between the results of the field radiometric measurements and the mineral content in the sands.
The laboratory tests were carried out in Mauretania and completed in Poland.

F.2. Scope and Methods of Research

From the initial interpretation of the results of geophysical prospecting and the observations made in the field, the conclusion was made taht are no rich concentrations of heavy minerals in the area under investigation. Due to this fact the blach sands analysis carried out by mineralogical methods instead of the technological methods envisaged in the Terms of Reference and also used by J.E.F. Marshall/1978/.
The preliminary in the laboratory, sieve analyses carried out, pointed out that heavy minerals concentrate mainly in the finest grain classes. This fact suggested to avoid the panning of samples directly after their extraction from boreholes which would have resulted in considerable losses of heavy minerals. Thus the laboratory tests as comprised the raw of bulk/untreated/ samples, obtained as presented in chapter E.3. For the above-mentioned reasons, a two-stage system of laboratory tests was adopted for all the samples, namely:

1.initial tests;
2.detailed tests.

F.2.1. The Initial Tests

The initial tests comprised:washing of samples in hot water and in the case of samples deriving from the radiometric profile and from the dune,an additional washing in a hydrogen peroxide solution in order to eliminate organic matter,drying at a temperature of 120^0, grain size analysis and separation in heavy liquids.
Such initial tests permitted a satisfactory determination of the total heavy minerals content in the sands.
The interval of sampling was 0.25 cm and the weight of a sample for analysis was fixed to 50 g.This weight resulted from the field laboratory equipment in Nouakchott and, short time for laboratory measurements on place in Mauritania.
During the talks in Vienna in April 1982 between UNIDO and Polservice the decission has been taken concerning the laboratory measurements to be continued in Poland.It has been started that for the interval below 2 m four consecutive samples should be mixed together to form one sample of 200 g weight and representing the interval of 1 m.

The samples,after washing and drying,were sieved in a sieve analysis machine type LPzE of Polish make having a set of sievs with apertures of 1.6,0.8,0.63,0.40,0.32,0.20,0.16,0.10 and 0.063mm plus a bottom tray.The sieves of 0.80,0.40,0.20 and 0.063 mm plus the bottom tray were retained for a general characterization of the sands and for determining the grain size of the heavy minerals concentrations.The above-mentioned set of sieves enables a classification of sands similar to the Wentworth scale /Fig.87/ in a following way: very coarse,grained-the +0.80 mm, coarse-the +0.40-0.80 mm,medium-the +0.20-0.40 mm,fine and very fine grained-the+0.063 -0.20 mm as well as the separation of silty and clayey material from the sands.The effective time of a sieve analysis was 15 minutes for a sample weighting about 50.0 gr.

The sand samples so classified were separated in a heavy liquid /in bromoform of specific gravity/ of 2.85 g/cm^3, except for the following classes:+.0.80 mm-composed mainly of shells and their fragments,grains of light minerals with a sporadic content of rock chips,-0.063 mm -silt and clay of no practical importance as concerns recovery of heavy minerals.
Thus, three grain classes from every sample:the +.040-0.80 mm, the +0.20-0.40 mm and the +0.063-0.20 mm were separated in a heavy liquid in separating tunnels of 50 and 100 cm^3 capacity.
The yield of heavy minerals was obtained for each class separately. The sum of those yields gave the true content of heavy minerals in the analysed sample.
The flowsheet for the initial tests on the sand samples/Fig.88/was presented to Dr.B.Balkay at Nouakchott and accepted by him.

F.2.2. Detailed Tests

The second stage of laboratory tests consisted of the analyses of the heavy minerals obtained in the initial operations.It consisted of:-identification of heavy minerals under a binocular magnifying glass;

- -microscopic identification of heavy minerals in powder-preparates in transmitted light and in polished preparates in reflected light;
- -planimetrening of the group of heavy minerals under a microscope in both powdered and polished preparates;
- -X-Ray analysis as a control of the microscopic examination;
- -magnetic,electromagnetic and electrostatic separation;
- -chemical analysis of selected concentrates;
- -X-Ray micro-analysis;
- -laboratory measurements of natural radioactivity.

These methods were deployed depending on the content of heavy minerals in the respective grain classes of the sample,or in the whole sample.The last two methods were used only for testing the samples from radiometric profile F 8/7 and from the dune of El Msid.

F.2.2.1. Microscopic study

The observations under a binocular magnifying glass were carried out mainly in the case of heavy minerals in the +0.06-0.20mm class and, sporadically for the class +0.20-0.40 mm. The identification of heavy minerals was based on such properties as: shape, fracture, cleavage and colour of the grains /Bolewski A., Żabiński W. eds. 1979/.

The microscoping examination comprised the observation of powder preparates in transmitted light and of polished preparates in reflected light. The preparates were made from the heavy fractions of samples. The powder preparates for the examination in transmitted light were made as follow: fraction of the sample was first diluted in a drop of Canada balsam on a microscope slide, than covered with a micro-cover glass. The preparates were made mainly of the heavy fractions of the +0.063-0.20 mm, and +0.20-0.40 mm classes. For a check of the identification of minerals by this method several thin sections were made. They confirmed the suitability of the method. The identification of non-opaque heavy minerals, as well as the determination of their relative abundances were carried out on the preparates so prepared.

The identification properties of the transparent heavy minerals were: grain shape, fracture and cleavage, the angle of extinction relative relief/refraction co-efficient/ and interference colours. In problematic cases, additional observations in convergent light were carried out in order to check whether the mineral was uni- or bi-axial. This was used mainly to distinguish monazite from zircon/Bolewski and Żabiński eds. 1979/.

The quantitative teste were made with an intergrating microscopic stage "Eltinor" /Carl Zeiss Jena-G.D.R./, 250-450 grains were counted, 350 grains on the average. The result of this procedure are given in volume percentages. The analysis error/standard deviation/ amounts to some 10 per cent for the above-mentioned number of countings. The examination of polished preparates in reflected light was aimed at an identification of opaque minerals and the determination of their abundance.

The polished preparates were made in the following way: one part of the sample was fixed to the glass slide by a special glue and polished subsequently.The examination comprised identification of opaque minerals and planimetering for the samples,which were planimetered in transmitted light also.The true abundance of each opaque mineral in the whole heavy fraction was calculated on the basis of total opaques as determined in transmitted light.As concerns samples with less than 0.5% heavy minerals,the identification of minerals was carried out on some samples selected at random.The approximate abundance of minerals was estblished under the binocular magnifying glass for the +0.40-0.80 mm grain classes and the transmitted light microscope for +0.20-0.40 mm and 0.063-0.20 mm classes.Planimetering in both transmitted and reflected light was applied only sporadically. Planimetering of heavy fraction was applied also to the samples containing up to one per cent of heavy minerals and for the samples with more than one per cent of heavy minerals.Above not concern the samples with more than 2.0 gr. of heavy fraction.
A microscopic examination in transmitted and reflected light was, moreover,performed on some of the products separated magnetically and electromagnetically to determine their nature.

F.2.2.2. The X-Ray Analysis

In order to checkthe microscopic identification of the heavy minerals, X-Ray powder analysis were made by means of a diffractometer in filtered CuK radiation.The diffractograms were taken within an angle of 0^o-60^o.

F.2.2.3. Magnetic and electromagnetic separation

Magnetic and electromagnetic separation of the heavy fractions profiting by the differential natural magnetic susceptibility of minerals enables the separation of particular mineral fractions. Such a separation was made by means of a permanent magnet with a stable magnetic field intensity. So as to separate the magnetic fraction the non-magnetic and paramagnetic fractions were separated using an inductive belt high intensity electromagnetic separator, made by ULRICH and having a high-intensity magnetic field of strong in homogeneity. The rougher and cleaner phases of electromagnetic separations differed in the intensity of magnetizing current. With the apparatus of this type, the effectiveness of separation of the heavy fraction was limited by grain mass. As a minimal feed 2.00 gr of heavy minerals was accepted for the complex magnetic and electromagnetic separation. The recovery was generally not below 90% in this process. The following flow sheet for the magnetic and electromagnetic separation of the heavy fraction of investigated samples was adopted /Fig.89/. It enabled the separation two of magnetic concentrates I and II, two III and IV collective para magnetic concentrates, two para magnetic middling products III-a and IV-a and of a collective non-electromagnetic concentrate V. The quality of concentrates and middling products was controlled in both powder and polished preparates under the microscope.

F.2.2.4. Electrostatic separation

Electrostatic separation was applied experimentally to a collective non-electromagnetic concentrate V. Sepaation was made in a drum separator with an ionising electrode, according to Fig.90. It gave a concentrate of non-conductive mineral, i.e. of zircon, plus a mixed concetrate of electrically conductive minerals and a middling product. It was confirmed during the experiments that feeds of so small weight entail considerable losses of non-magnetic fractions. The examination has, moreover, revealed that the non-magnetic fraction contains small amounts of rutile. In view of these short comings as well as of the mineral composition of the non-magnetic fraction, the described method was abandoned.

F.2.2.5. Laboratory Measurements of Natural Radioactivity.

Laboratory measurements of natural radioactivity /total gamma radiation/ were carried out on the samples from radiometric profile R 8/7 and from an El Msid dune on separate grain classes before and after separation in heavy liquid, with the aim of determining then natural radioactivity and its correlation with field measurements. A Harshow scintillation sonde of a high separating capacity /7.9% for line ^{137}Cs, type 12SI3/E, with crystal NaJ /Tl/ of 3X3" size was used for scintillation spectrometry. After amplification, the sonde signal was analysed on a multi-channel pulse-height analyser, type NTA-1024 to obtain the gamma radiation spectrum. The number of countings i.e. of pulses per unit of time obtained from one spectrometric line within the energy range 50KeV - 3 KeV was the result of the measurement. The countings were reduced according to the mass of the sample and - in the case of measurements on a heavy fraction-refered to sample mass before separation in a heavy liquid. Such a normalization is indispansible for a comparison between particular results. Thus, the laboratory measurements of natural radioactivity were expressed in cpm/g. An error was determined for every measurements. When ever its value surpassed 50 per cent of the count in a sample, the sample was considered non radioactive.

F.2.2.6. The X-Ray Microanalysis

The X-Ray microanalysis covered the heavy minerals present in one of the samples from the El Msid dune: it aimed at a reconnaissance of the chemical composition of the sample, in particular its content of radioactive elements, rare elements and rare earth elements. The contents of radioactive elements in the investigated minerals allow to identify those responsible for natural radioactivity in the heavy fraction and, by the same taken, for radiation measured in the field.

The measurements were carried out using a micro-sonde type APL SEMQ 20 KV, sonde current of 150 um and counting time 40 sec. The following spectral lines, synthetic compounds and master chemical were used: MgK, SiK /SiO_2/, PK /InP/, CaK /$CaCO_3$/, TiK, VK, CrK, MnK, FeK /FeS_2/, ZrK, HfK, LEL. Europium and gadolinium were detected by the line LB_1, using a master alloy of rare earth elements ThM /ThO_2/. Elimination of the influence of absorption, fluorescence and difference of atomic numbers to the measured intensity of X-ray radiation was made using method elaborated by Pkilbert J. and Tixier R. /1968/.

F.2.2.7. Indicative chemical Analysis

Indicative chemical analyses were made for the selected concentrates of ilmenite, zircon and for the mixed concentrate of epidote, rutile-ilmenite, monazite, garnets and staurolite.

On the ilmenite concentrates, the following assays were made: TiO_2, FeO, Fe_2O_3, V_2O_5, Cr_2O_3 and MnO. Titanium was assayed by the peroxide method, calorimetrically after previous removal of the ions Fe^{3+} and V^{5+}. The bivalent iron was assayed by $KMnO_4$ titration; total iron, vanadium and chromium, and manganese- by the atomic absorption methode -ASA on the Pay- Unicam apparatus.

As concerns the remaining concentrations, the method of neutron activation analysis was applied. Samples irradiated with thermal neutrons become radioactive. The gamma radiation emitted by them is characteristic of the emitting nucleius. A quantitative and qualitative assay of the sample can be made by recording and analysing the spectrum of the emited radiation.

The samples together with the masters were activated in a neutron flux of density 6×10^{13} n/cm^2 s for 20 minutes. The measurements carried out one week with a semiconductor detector Ge/Li after activation. Every sample and master was measured twice for 10 minutes each. The spectra were registered in the energy range of 0-2 MeV. The reagents Zr, ZrO_2, Ce, Ce_2O_3, La_2O_3, Th /NO_3/ 2 , $6H_2O$, UO_2/NO_3 /4. $5H_2O$. were used as masters. The mass of the

analysed samples was 200 mg.
The content of ZrO_2, HfO_2, ThO_2,U_3O_8 and La_2O_3 was assayed in the concentrates of zircon; ThO_2,U_3O_8 ,Ce_2O_3 and La_2O_3 were assayed quantitatively in the mixed paramagnetic concentrates III.

F.3. Testing of Borehole Samples.

F.3.1. Region of Tânit.

A total of 390 borehole samples from the region of Tânit was subjected to laboratory tests.They were taken from 13 boreholes.After the decission taken in Vienna,the number of samples was reduced to 178.From the first 8 samples from each borehole,to the depth of 2.0 m,on initial weight of about 50.0 g was taken. Beginning with No 9, the weighed portion of eac.h sample is about 200.00 g, from the last sample of very borehole an initial weight within the limits of 100.00-250.00 g was taken.This is the result of lumping together 4 successive samples,each giving a weighted portion of 50.0 g. For instance,sample T 2/9 corresponds to a one-meter interval at the depth of 2.0 - 3.0 m,it is the result of lumping together the four successive samples Nos 9,10,11,12, each of an initial weight of about 50.0 g, taken from four drilling interval of 0.25 m each.

Table No 1 shows the result of inital testing/sieve analyses,separation in a heavy liquid,identification of minerals of heavy fraction /MI/,planimetration of heavy fraction /MIQ/, and magnetic separation /MS/.

F.3.1.1. Granulometry

The sieve analysis represents the result of a classification of samples into 5 grain classes,according to the assumptions adopted by the method.The feed mass of the sieve analysis/item "a" in the table/ is equal to the sample mass after washing in water and drying as well as to the sum of yields of the selected grain classes.

The sieve analysis showed that sands amount to more than 90 per cent of the sample mass, the rest consist of silt and clay /Table 1/.Two grain classes are predominant in the sands:the medium +0.20-0.40 mm class and very fine +0.063-0.20 mm class.For instance in sample T 0/9 the medium-grained sands amount to 70 per cent approximately while in samples T 0/10 and T 0/11 the +0.063 -0.20 mm class i.e.,the fine and very fine class gave a similar percentage. The coarse-grained sands the +0.40 mm-0.80 mm class is between several and tens per cent,the percentage of the +0.80 mm class is below 10.

The results of the sieve analysis have also been presented by cumulative curves /Figs. 91 and 92/.The abundance of heavy minerals in the analysed samples has been marked on the curves.On the basis of the above-mentioned curves and using methods proposed by McManus and Buller in 1972,it is possible to separate the sands of aeolian and beach origin.For this purpose the diameters d_{16},d_{50} and d_{84} mm are read off the cumulative curves for the percentiles 16,50 and 84, on this basis ,the mean diameter GSS the sorting coefficient SA and the skewness SK were calculated . These parameters /cf.Fig.93/ permit to distinguish the aeolian sands from the beach sands.The sands with a sorting coefficient below0.1 and a mean diameter between 0.1 and 0.3 mm can be considered aeolian,while sands with sorting a coefficient above 0.1 and a mean diameter between 0.10 and 0.80 mm are beach sands. For example Fig. 93 shows samples Nos 7,8,9 from borehole T-10 to be aeolian sands,and so are samples 1-4 from borehole T-11. The remaining samples from the borehole T 10,T 11 and T 12 are beach sands.The general aim of such differentiation of sands is the identification of the individual stages of beach formation, including the old beaches.This is, however, a separate and great problem and the merely wishes to suggest the possibility of such a solution.The above-mentioned data can be used for a correlation between the boreholes,for instance,between T 10 and T 11.

F.3.1.2. Heavy Liquid Separation

The grain classes +0.063-0.20 mm,+0.20-0.40 mm and 0.40-0.80 mm were subjected to heavy liquid separation /Table 1 /. No separation was carried out for the +0.80 mm class- which contains only sporadic single grains of heavy minerals- and for the -0.063 mm class, from which,practically no heavy minerals can be recovered. The feed of separation was equal to the yield of each sieve class and the abundance of heavy minerals was refered to the whole heighed-in sample,the yields of heavy minerals in particular grain classes could thus be added up, to give the total yield of the sand fraction.

For every separation in heavy liquid recovery was calculated.A heavy minerals content above 1.00 wt% was confirmed in the following samples from drillings in the region of Tânit:

No of borehole	No of sample	Aggregate Thickness represented by the sample S	Average heavy minerals content,wt%
T 0	1,2	0.5 m	3.35
T 1	1,2,3,4	1.0 m	5.30
T 2	1,2,3	0.75 m	4.11
T 3	1,2	0.50 m	3.42
T 4	1	0.25 m	2.56
T 5	1,2	0.50 m	1.58
T 6	1	0.25 m	6.10
T 7	1,2	0.50 m	4.61
T 8	1	0.25 m	2.42
T 9	1,2,3,4	1.00 m	2.02
T 10	1	0.25 m	4.74
	3	0.25 m	1.90
T 11	1-7	1.75 m	3.84
T 12	1,2,3	0.75 m	2.66

The calculated average heavy minerals content for this group of samples amounts to 3.34 wt%, 73% of which is in the +0.063-0.20 mm grain class,26% in the +0.20-0.40 mm class and only 0.6% in the +0.40-0.80 mm class.Heavy minerals content 0.50-0.99 wt% were confirmed in the following samples:

No of borehole	No of sample	Aggregate thickness represented by the samples	Average heavy minerals content wt%
T 4	2	0.25 m	0.6[illegible]
	10	1.00 m	0.7[illegible]
T 9	6	0.25 m	0.50
T 10	2	0.25 m	0.84
T 11	8	0.25 m	0.66
	10	1.00 m	0.70

In the reference borehole T 6 the content of heavy minerals generally does not exceed 0.25 wt% at depth greater than 2.0 m.

The richest concentrations of heavy minerals occur in the top parts of the borehole profiles:their abundance decreases with increasing depth.A minor enrichment in heavy minerals is observed at the depth of 2.0- 5.0 m in some boreholes for instanee: T 2,T 4,T 7, T 9, T 11 and T 12 but only up to 0.50 wt%.

A grain size analysis of heavy minerals in all the samples from the region of Tânit confirmed that 72% of the heavy fraction is in the +0.063-0.20 mm class, 27% in the +0.20-0. 0 mm class and 1% in the +0.40-0.80 class.The average content of heavy minerals for the +0.063 - 0.20 mm class amounts to 0.55wt% for the +0.20-0.40 mm class to 0.21 wt% and for the class +0.40-0.80 mm to 0.01wt%, which adds up to 0.77 wt% heavy minerals in the sands of that region.

F.3.1.3. Microscopic Study

The identification of heavy minerals under a binocular magnifying glass and under the microscope in transmitted light confirmed, that the heavy fraction contains up to about 5% of light minerals, mainly quartz.The following non-opaque heavy minerals were spotted: garnets,zircon,epidote,disthene, staurolite, sillimanite, tourmaline, pyroxenes, amphiboles, monazite, leucoxene, pure rutile and rarely corundum, chlorites, biotite, spinels, andalusite, apatite, thorite.Opaque minerals appear in the tables as op.m. In the case of a quantitative preponderance of one of those minerals over the others, its approximate content was given.The observations confirm that opaque minerals are considerably more abundant than transparent ones in the +0.063-0.20 mm grain class.For the coarser classes, it is the other way round.

The microscopic study reveals no major differences in mineral composition between the samples deriving from different depths of the same borehole or between the boreholes.The mineral composition of the heavy fraction as well as the grain shape,indicate the nearness of the primary source of the indentified heavy minerals and a short time of their transportation.

Table No 2 shows the result of planimetering in both transmitted and reflected light on 15 samples. The results show a considerable preponderance of opaque minerals over the transparent ones in the +0.063-0.20 mm grain class.The following opaque minerals were identified:ilmenite,sphene,anatase,rutile, hematite,magnetite, goethite and sporadically chromite,cassiterite and brookite. Rutile,ilmenite and hematite predominate.Sample T 11/10 was particularly rich in these minerals.Of the transparent minerals garnets are predominant especially,in the +0.20-0.40 mm grain class zircon, epidote and disthene. The remaining minerals have a share of a few per cent,or below 1 per cent in the case of monazite, sillimanite and tourmaline.

F.3.1.4. Magnetic and Electromagnetic Separation.

A total of 12 samples from this area,representing single or combine grain classes of the heavy fraction of the sample or, at most, of 4 samples with a mass weighting more than 2.00 g were subject to magnetic separation /Table 3/.The magnetic concentrates I and II contain mainly ilmenite.

The para magnetic concentrate III contains mainly epidote /above 70% of it in samples T 12/1-3,T 11/3-4 and T 11/1-2,Ferrous rutile,ilmenite-rutile,leucoxene and small amounts of monazite, staurolite,tourmaline,pyroxenes and amphiboles. The para magnetic concentrate IV is practically made up of two components:garnet and rutile with admixture of pyroxenes,amphiboles,tourmaline and epidote.A garnets content of over 70% was found in the para magnetic concentrate of the samples:T 11/5-8,T 11/3-4,and T 3/1-2. The paramagnetic middlings IIIa and IVa also contain epidote,rutile, ilmenite,garnets,sphene,leucoxene.The non magnetic concentrate V of the samples T 12/1-3,T 11/3-4,T 10/1-3,T 6/1 and T 0/1-2 contains more than 50 per cent zircon as well as pure rutile,quartz, disthene,apatite,tourmaline and monazite.

The results of planimetering and the qualitative evaluation of magnetically separated concentrates show rutile,ilmenite,garnets, zircon-epidote and disthene to be the main minerals in the heavy fraction in the region of Tânit.By a mineralogical classification on the basis of the minerals whose abundance exceeds 1% the deposits of black beach sands are rutile-ilmenite-garnet-zircon sands with epidote and disthene.The average contents of the above-mentioned minerals in the heavy fractions in the region of Tânit are: rutile-27%,ilmenite-23%,garnets-15%,zircon-12%,epidote-7%, and disthene 5%.The remaining 11% consist mainly of hematite,leucoxene, staurolite and pyroxenes and amphiboles.

F.3.2. Region of Blaouakh

In the region of Blaouakh, a total of 478 samples from 15 drillings was taken.The average sampling interval was 0.25 m. After a reduction of the number of samples according to the earlier-described method,a total of 211remained.The initaial sample weights used in the same range as in the region of Tânit.

The results of the initial laboratory tests are shown in a Table 4,and so is information on the identification of minerals of the heavy fraction /symbol MI/,planimetering/MIQ/ and magnetic separation /MS/.

F.3.2.1. Granulometry

As concerns the sieve analysis sands gave more than 95% of the mass of the examined samples.The combined mass of silt and clay amounted to a few per cent/rarely over 10 per cent,for instance in the samples B 1/2,B 11/5,B 11/6.A considerable preponderance of medium grained sands i.e. of the +0.20-0.40 mm class, was noted in some samples,in several samples fine and very-fine grained sand was more abundant/i.e of the +0.063-0.20 mm class/. The coarse-grained sands of the +0.40-0.80 mm class gave on the average more than 10 per cent of the samples under consideration.

The results of the sieve analysis were presented by cumulative curves /Figs. 94 and 95/.On that basis the sands were tentatively divided into beach and aeolian sands.A sample correlation of average diameter and sorting coefficient on a bilogaritmic probability grid is presented for boreholes B 7,B 8 and B 9/Fig. 96/. It can be seen that,in borehole B 8,the samples B 8/1 to B 8/6 are typical aeolian sands,the samples B 8/7 - B 8/8 are beach sands, B 8/10 is aeolian again and,beginning with B 8/11 they are beach sands. In borehole B 9 samples:B 9/5,B 9/6 and B 9/8, B 9/9 were aeolian, the remaining ones were beach sands.Finally in borehole B 7 only samples B 7/1- B 7/3 were aeolian.

F.3.2.2. Heavy Liquid Separation

Separation results are presented in table 4.In the region of Blaouakh heavy minerals contents exceeding 1.00 wt% were found in the following samples:

No of borehole	No of sample	Aggregate thickness represented by the samples	Average heavy mineral content, wt%
B 1	1,2,3,4	1.00 m	3.46
B 3	1,2,3	0.75 m	3.53
B 4	1,2	0.50 m	1.53
B 5	1,2	0.50 m	3.75
B 7	1,2,3	0.75 m	3.79
	8	0.25 m	1.07
B 8	1,2,3,4	1.00 m	3.52
B 9	1,2	0.50 m	4.16
B 10	1,2	0.50 m	3.80
B 11	1,2,3,4,5,6	1.50 m	3.86
	8	0.25 m	1.06
B 12	1-8	2.00 m	3.64
	10	1.00 m	1.20
B 13	1	0.25 m	3.72
B 14	1,2	0.50 m	1.78

The average content of heavy minerals in this group of samples amounts in the region of Blaouakh to 2.92 wt% ,of which 56% is in the +0.063-0.20 mm class,42% in the +0.20-0.40 mm class and only 0.4% in the +0.40-0.80 mm class.These proportions are somewhat different for different boreholes: for instance in boreholes B 1,B 3,B 4,B 10 and B 12- more than 50% of the heavy mineral grains are in the +0.20-0.40 mm class.

Contents of heavy minerals between 0.50 and 0.99 wt% were found in the following samples:

No of borehole	No of sample	Aggregate thickness represented in the samples	Average heavy minerals content, wt%
B 4	4	0.25 m	0.64
B 5	4	0.25 m	0.84
B 6	1	0.25 m	0.72
B 7	5	0.25 m	0.50
	7	0.25 m	0.85
	10	1.00 m	0.50
B 11	10	1.00 m	0.76
B 12	9	1.00 m	0.94

These samples contain, on the average, 0.67 wt% heavy minerals of which 71% in the +0.063-0.20 mm class, 26% in the +0.20-0.40 mm class and 3% in the +0.40-0.80 mm class. Slight heavy mineral concentrations not exceeding 0.5 wt% were observed at the depth 2.00-5.00 m in the boreholes B 1, B 3, B 4, B 5, B 7, B 9, B 11 and B 12. Still, generally speaking the content of heavy minerals decreases with increasing depth, conspicuosly so in the profile of the reference borehole B 6.

The quantitative distribution of heavy minerals regardless of the concentration in the samples of total amount 211 from the region of Blaoukh is as follows: 57% of heavy minerals fall in the +0.063-0.20 mm class which contains on the average 0.48% of those minerals, 42% in the +0.20-0.40 mm class containing 0.36% and 0.9% in the +0.40-0.80 mm class. The sands of the region of Blaoukh contain on the average 0.85% of heavy minerals to a depth 6.0.m.

F.3.2.3. Microscopic Study

The microscopic examination of powder preparates in transmitted light and under a binocular magnifying glass confirmed the presence of the same group of heavy minerals in the region of Tânit. No major differences in vertical and lateral distribution were discovered.

A total of 16 samples from this area were planimeterd in transmitted and reflected light /Table 5/. The abundance of the opaque minerals varies between 35 and 73 per cent and that of the transparent ones between 21 and 63 per cent, relative abundances vary in opposite senses in the +0.063-0.20 mm and +0.20-0.40 mm classes. E.g. of the transparent minerals garnets and epidote are preponderent in the +0.20-0.40 mm class, whereas rutile, ilmenite and in some samples hematite /table 5/ are preponderant in the +0.063-0.20 mm class. The content of zircon exeeds 12 per cent, that of disthene and tourmaline a few per cent each for the latter grain class. The leucoxene content is higher here than in the other regions.

F.3.2.4. Magnetic and Electromagnetic Separation

A total of 15 samples from the region of Blaoukh were subjected to separation,the results are shown in Table 6.The quality of the concentrates was controlled microscopically.A check X-ray analysis was made on sample B 11/3-4.In the case of the paramagnetic concentrate IV draws attention a relatively high yield,as well as the content of garnets amounting in it to 60-80 per cent,mainly in the +0.20-0.40 mm class,among the others in samples:B 4/1-4, B 5/1-4,B 7/1-2 and B 8/1-4 /Table 6/.In this concentrate rutile is accompanied mineral.The total yield for magnetic concentrates I and II,containing mainly ilmenite is at the level of 32 per cent.

The X-ray check analysis for the concentrates and middlings of the sample B 11/3-4 revealed the presence of the following minerals:

- Concentrate I - ilmenite,geikielite,hematite;
- Concentrate II - ilmenite,hematite;
- Concentrate III - epidote,monazite,rutile-ilmenite;
- Concentrate IV - almandine,rutile;
- Middling IIIa - epidote,titanite,ilmenite-rutile; almandine;
- Middling IVa - epidote,almandine,ilmenite-rutile ;
- Concentrate V - zircon,sillimanite,disthene,rutile,quartz.

Planimetering and magnetic separation revealed that in the region of Blaoukh,the samples containing more than 1.00 wt% of heavy minerals represent rutile-ilmenite-garnet-zircon sands with epidote. They contain on the average: 28% rutile,20% ilmenite,20% garnet, 15% zircon and 7% epidote.The remaining 19% is mainly composed of hematite,disthene,tourmaline and other heavy minerals.

F.3.3. Region of Jreida

In the region of Jreida a total 383 samples was taken and were subjected to laboratory tests.After reduction,the number of samples was 171.The initial weighted portions were the same as in the case of Tânit and Blaouakh.The results of the initial laboratory tests covering the sieve analysis and separation in a heavy liquid are shown in Table 7, and so is information on identification of heavy minerals /symbol MI/,planimetering /MIQ/ and magnetic separation /MS/.

F.3.3.1. Granulometry

The sieve analysis of samples from the region of Jreida reveals similar distributions of grain sizes /table 7/ as in Tânit and Blaouakh.The samples contain about 10% of silt and clay were derived from the paleosoic levels,which identified in all samples in the region of Jreida.The medium-grained sands of +0.20-0.40 mm class are predominant generally.Sometimes fine and very-fine grained sands of the +0.063-0.20 mm class was more abundant as, for instance in the samples J 1/9 and J 1/10 /Table 7/.Coarse grained sand of the +0.40-0.80 mm class usually makes up a few to a tens per cent of the sample mass,rarely exceeding 20%.The +0.80 mm class ranges from a few tenths of a per cent to a few per cent,rarely exceeding 10 per cent as, for instance in sample J 3/7.

Cumulative curves have been plotted also for this region /Figs. 97 and 98/ so as to distinguish the aeolian sands from the beach sands by the McManus-Buller method.Figure 99 presents such a correlation in a biologaritmic probability grid for samples from boreholes J 1,J 2 and J 3.For borehole J 1,all the samples are of beach orogin.In boreholes J 2,J 2/1 to J 2/9 the samples are aeolian sands,those from J 2/10 are beach sands.Sample J 2/10 proper represents the transition.For borehole J 3,samples J 3/4 -J 3/6 are of aeolian orogin,the remaining ones especially from J 3/7 down to J 3/12 are of beach origin.

F.3.3.2. Heavy liquid separation

As above separation in a heavy liquid was made for the classes +0.40-0.80 mm,+0.20-0.40 mm and 0.063-0.20 mm.The results are shown in Table 7.

As a general conclussion the region of Jreida is the reachest in heavy minerals of the three prospected regions. Heavy minerals content exceeding 1.00% were found in the following samples:

No of borehole	No of sample	Aggregate Thickness represented by the sample	Average heavy mineral content, wt%
J 1	1,2	0.5 m	3.48
J 2	1,2,3,4	1,0 m	1.90
J 3	1 - 6	1.50 m	7.98
J 4	1 - 8	2.00 m	2.74
J 5	1 - 7	1.75 m	1.74
J 6	1,2	0.50 m	1.56
J 7	1	0.25 m	3.02
J 8	1,2	0.50 m	2.79
J 9	1 - 3	0.75 m	2.69
J 10	1	0.25 m	1.98
J 11	1,2	0.50 m	1.09
J 12	2 - 4	0.75 m	1.63

The above samples have an average heavy mineral content of 2.78%, 52% of it in the +0.063-0.20 mm class, 47% in the +0.20-0.40 class and 1% in the +0.40-0.80 mm class.

Heavy mineral contents between 0.50 and 0.99% were found in the following samples:

No of borehole	No of sample	Aggregate thickness represented by the sample	Average heavy mineral content, wt%
J 1	3,4	0.50 m	0.75
J 3	9	1.00 m	0.65
J 4	11	1.00 m	0.63
J 5	8,9	1.50 m	0.54
J 6	8	0.25 m	0.50
J 7	2	0.25 m	0.73
J 8	3	0.25 m	0.95
J 9	4	0.25 m	0.65
J10	2	0.25 m	0.89
	4	0.25 m	0.58

J 11	1	0.25 m	0.60
	5	0.25 m	0.66
	7	0.25 m	0.64

The average content of heavy minerals is 0.67% in this group of samples, of which 57.0% in the 0.063-0.20 mm class, 41% in the +0.20-0.40 mm class and 2% in the +0.40-0.80 mm class. The quantitative distribution of heavy minerals in all the samples from the region of Jreida regardless of the concentration in the samples is as follows: 56% of heavy minerals fall in the +0.063-0.20 mm class, 42% in the +0.20-0.40 mm class and 2% in the +0.40-0.80 mm class. In the region of Jreida a drop of the content of heavy minerals in the profiles of boreholes is observed, together with growth of depth, as in the other regions.
In the reference borehole J 9, the content of heavy minerals does not exceed 0.40 wt% on depth greater than 1.5 m.

F.3.3.3. Microscopic Study

The mineral composition of the heavy fraction, spotted under the binocular magnifying glass and in the powder preparates under the microscope in transmitted light, is similar to the compositions from Tânit and Blaouakh /Table 8/. Attention is drawn to the preponderance of opaque minerals over the transparent ones in a majority of the samples. No significant differences were observed in the vertical and lateral distribution of the heavy minerals. 17 samples were subjected to planimetering in both transmitted and reflected light. Most samples revealed a predominance of opaque minerals, the exceptions being the +0.20-0.40 mm classes of the samples J 6/1 and J 12/1. There is, overall a considerable preponderance of opaque minerals in the +0.063-0.20 mm class. Rutile and ilmenite are the most abundant among them. Of the transparent minerals zircon and epidote are the main ones in the +0.063-0.20 mm class, and garnets in the +0.20-0.40 mm class, up to 29% of the heavy fraction .The Jreida sands contain about equal amounts/up to several per cent/ of disthene,staurolite,tourmaline and pyroxenes-amphiboles.

F.3.3.4. Magnetic and Electromagnetic Separation

A total of 14 samples was subjected to magnetic and electromagnetic separation.The results are given in table 9.
The quality of the concentrates and middlings was checked microscopically.

Magnetic and electromagnetic separations of heavy fraction from the samples of the region of Jreida shows a relatively high yields of the magnetic concentrates I and II,e.g. samples: J 3/1-2, J 3 /3 in the +0.063-0.20 mm class,J 3/4 in the same class,J 4/5-8, J 7/1-4 an J 8/1-2 which are rich in ilmenite.Major yield. of the paramagnetic concentrate Iv,indicating an abundance up to 70% of garnets,are noted for samples J 1/1-2,J 2/1-4,J 3/1-2,J 3/3-4 in the +0.20-0.40 mm class and J 4 /1-4.

The nonmagnetic concentrate V of the samples J 2/1-4, J 3/3 of the 0.063-0.20 mm class,J 3/4 of the same class,J 7/1-4 and J 9/1-4 are richest in zircon.

The data of magnetic separation and planimetoring imply, that the samds in the region of Jreida are of the rutile-ilmenite-garnet-zircon type with epidote.They contain on the average:27% rutile, 21% ilmenite,10% garnets,7% zircon and 7% epidote.The remaining 28% consists mainly of hematit,disthene,sphene,goethite and other heavy minerals.

F.4. Testing of samples from radiometric profile R 8/7 and the dune of El Msid

F.4.1. Goals and Methods of Testing

The goal of the laboratory tests of samples from profile R 8/7 and of the El Msid dune was to determine the natural radioactivity of the prospected sands,and of its particular minerals and, in consequence,to establish the relation between the field radiometry measurements and the heavy minerals content in the beach and dune sands.

For this purpose sampling was made from one of the dunes in the region of El Msid,where a richer concentration of heavy minerals had been macroscopically confirmed,and from the radiometric profile R 8/7 in the region of Tânit.The selection of the profile was made in the presence of Mr.B.Balkay,Dr.

The methods of sampling the El Msid dune and the radiometric profile depended on the technical parameters of radiometers used during the field operations.Their penetration depth amounted to 1m. maximum for the sandy formations.For this reason,the samples were taken using a hand probe from the surface,from the dept of 0.5 m and of 1.0 m in the points of the field radiometry measurements. The samples from the radiometric profile R 8/7 were designated by symbol W or E,depending on the position to the base line "O".The distance between the measurement points was given in meters after a letter symbol,i.e. giving the place and distance of sampling from the above-mentioned base line.For instance:sample W 30/0.5 was extracted in the measurement point at a distance of 30 meters westward of the base line,at the depth of 0.5 m.
From part "W" of the radiometric profile R 8/7 14 samples were made from the surface,14 samples from the depth of 0.5 m and 14 samples from the depth of 1.0 m,i.e. the total of samples was 52.From the part "E" of this profile respectively 12 samples thus,on the total--36 samples.

The samples from the El Msid dune were given the successive numbers with the symbol EM and the presented table shows their localization and the sampling depth.It is also seen in the Figs 4 and 5.

Sample Nº	Place of sampling	Depth in m.
EM 1	E 10/S 0	0.0
EM 2	E 10/S 0	1.0
EM 3	E 30/S 0	0.0
EM 4	E 30/S 0	1.0
EM 5	E 30/S 20	0.0
EM 6	E 30/S 20	1.0
EM 7	E 30/S 40	0.0
EM 8	E 30/S 40	1.0
EM 9	E 40/S 60	0.0
EM 10	E 40/S 60	0.5
EM 11	E 40/S 60	1.0
EM 12	E 50/S 30	0.0
EM 13	E 50/S 30	1.0
EM 14	E 50/S 60	0.0
EM 15	E 50/S 60	0.5
EM 16	E 50/S 60	1.0

F..4.2. Results of Mineralogical Tests

The samples from the radiometric profile R 8/7 and from the dune of El Msid were subjected to the same course of preliminary laboratory tests as the samples from boreholes.They were additionally washed in a hydrogen peroxide solution,in order to eliminate from them the soluble minerals and the organic matter as well.After such a washing and drying the samples were sieved i nto four grain classes,i.e.+0.80 mm,+0.40-0.80 mm,+0.20-0.40 and -0.20 mm.

The +0.80 mm class was not divided to the separation in heavy liquid,because it contains only light minerals or shells or their fragments.

The tables 10,13 and 16 present the result of preliminary tests,separately for: samples from the western part of profile M8/7, the samples from its eastern part and those from the dune of El Msid. The following results have been presented by the above-mentioned tables:sieve analysis,separation in heavy liquid,both laboratory and field measurements of natural radioactivity,identification of heavy minerals under a binocular magnifying glass and microscope,as well as information on further testing.

In order to determine the content of heavy minerals for the thickness of 1.0 m in a each measurement point,were summed up the feeds of samples their yields of heavy and light fractions of the three successive samples,i.e. of the samples taken from the surface,from the depth of 0.5 m and of 1.0 m.The sum of the feeds of such three samples was assumed as 100% and the percentage yields of both heavy and light fractions were calculated in relation to it.

The samples,which contain 0.5 to 1.0 wt% of heavy minerals or above and the mass of their particular grain classes or of their sum had not exceed 2.00 g were planimeterd in both transmitted and reflected light/symbol MIQ in tables 10,13 and 16/. When this mass was more than 2.00 gr. in the samples containing more than 1.00% of heavy minerals,they were directed to magnetic and electromagnetic separation/symbol MS in tables 10,13 and 16/. Fine samples were washed initial in hot water and hydrogen peroxide solution for determining and removing the soluble minerals and organic matter.For the samples from the western section of the radiometric profile M 8/7 the total contents of soluble minerals and of organic matter amounts on the average to 0.5 wt% within the limits of 0.16 - 1.61 %,for the samples from the eastern section of the profile-respectively 0.58 wt% within the limits of 0.13-2.75%, and for the samples from the dune of El Msid of 0.50 wt% -within the limits of 0.17-1.84%.

The results of the sieve analysis of the samples from the western part of profile R 8/7 indicated a domination of the +0.20-0.40 mm grain class,i.e. the medium grained sand,which represents 50-70% of the mass of the samples,excepr the sample W 40/0.0. The -0.20 mm class,i.e. the fine- and very-fine grained sand, representing 15 - 35% of the mass of the tested samples. In a few samples among the others in W 40/0.0,W 45/0.5, W 50/0.0,W 50/0.5,W 55/0.0, W 55/0.0, W 55/1.0, W 60/0.0 the share of this sand is dropping to several percent /Table 10/ and its place is taken by coarse-grained sand i.e. the +0.40-0.80 mm class.As concerns the remaining samples, the amount of the coarse-grained sand does not exceed, as a rule, the several percent.The +0.80 mm class usually does not exceed several per cent.

A several distribution of grain classes was confirmed in the eastern part of profile R 8/7,i.e. a domination of medium-grained sand/the +0.20-0.40 mm/ within the limits of 60-78%,over the remaining grain classes,except the samples E 5/0.0,E 40/0.0 and E 60/0.0 in which there is a considerable share of the +0.40-0.80 mm and 0.80 mm classes.The fine- and very- fine grained sand,i.e. the -0.20 mm class represents 20-25% of the mass of the samples.

The samples from the dune of El Msid reveal a somewhat different classification,except the samples EM 1 and EM 3,taken from the surface at the foot of the dune.The remaining samples,deriving from the central section of the dune,reveal 60-80% in the -0.20 mm class. The +0.40-0.80 mm and -0.80 mm classes represent only about 1% of the mass of the samples.

Separation in heavy liquid of the particular grain classes revealed that samples from the western part of the radiometric profile R 8/7 contain from 1.19 wt%/sample W 20/1.0/ up to 24.02 wt% /sample W 25/0.5/ of heavy minerals /table 10,point "a"/.The above mentioned heavy mineral content are changing for each measurement points in the field /Fig. 100/.

The samples from the eastern part of the radiometric profile R 8/7 contain the heavy minerals within the limits from tenths percentage /samples E 60/1.0, E 60/0.5, E 55/1.0/ up to 11% /samples E 5/0.0, and E 40/1.0/.Similarly as the case of samples from the western part,reveal changeability together with depth /Fig.101/.It can be generally said that a depletion of heave minerals content is taking place in the eastern direction of profile E 8/7.

The samples from the dune of El Msid contain up tp 48.11 wt% of heavy minerals /sample EM 9/,except barren sample EM 4.The remaining samples reveal very high contents of heavy minerals /Table 16/. Beacause a particularly small yields of the +0.40-0.80 mm grain class are noted in the samples:EM 5,EM 6,EM 7,EM 8,EM 9,EM 10,EM 11,EM 14, EM 15 and EM 16,no separation in the heavy liquid was made of them. The content of heavy minerals amounts to some 70% in the -0.20mm grain class,and to about 25%- in the +0.20-0.40 mm class.In the case of samples from the dune of El Msid,they sometimes represent 50% of the -0.20 mm grain class./Table 16/.

Identification of minerals under the binocular magnifying glass for the +0.40-0.80 mm grain class and in the powder preparates in the transmitted light for the +0.20-0.40 mm and -0.20 mm classes of heavy fraction were made mainly for the samples from profile E 8/7 as well as for the samples EM 2 and EM 3 from the dune.

The following transparent minerals were distinguished: garnets,zircon,epidote,tourmaline,staurolite,disthene,sillimanite, leucoxene,monazite,pyroxenes,amphiboles,corundum and andalusite In the same time,it has been confirmed that the heavy fraction contains up 5% of light minerals /not in all the samples/,essentially composed of quartz,more rarely of cordierite and sporaically of beryllium.On the basis of observations in the reflected light,it is known that the opaque minerals are: ilmenite,rutile,ilmenite-rutile,anatase,sphene,geikielite,hematite,goethite, maghemite, magnetite and the hydrated iron oxides. In the case of a distinct domination of one from among the heavy minerals,the percentage content in relation to the whole of the analysed sample was given beside /Table 10,13/.

On the basis of microscopic observations it can be said that the opaque minerals are dominant in the -0.20 mm grain class, the transparent minerals being dominant-mainly garnets-in the coarser classes /table 10,13,16/.The separate grains of cassiterite,brookite, chromite,spinel,chlorite,topaz and thorite were met in particular samples,but they are not indicated in the tables.There were not found special differences in the mineral composition of the heavy fraction of the sample from profile N 8/7 and from the dune of El Msid.

Planimetering in both transmitted and reflected light was carried out for 25 samples from the western part and for 18 samples from the eastern part of the radiometric profile N 8/7. /Table 13 and 14 /.The opaque minerals from the western part of the profile representing 40-72% of the heavy fraction and 26-76% respectively in the eastern part.The transparent minerals represent from 22 to 58% of this fraction for the western part,and 22-73%- for the eastern part. In the group of opaque minerals ilmenite,rutile and also hematite as well are preponderant over the remaining ones,i.e. sphene,anatase, maghemite-magnetite and goethite.The check X-Ray analysis of sample W 25/0.5 was indicated presence of geikielite-$MgTiO_3$ in the -0.20 mm grain class.Geikielite is an isomorph of ilmenite,however,it is very difficult to be distinguished from ilmenite under the microscope.

Among the transparent minerals of the heavy fraction of the samples from profile N 8/7,the dominant are:garnets,zircon and epidote, and additionally leucoxene in the sample from the eastern part of the profile.Garnets are concentrated in major quantities in the +0.20-0.40 mm grain classes zircon being concentrated in the -0.20 mm class.However,major difference aren't noted. in the quantitative distribution of epidote in the separated grain classes.The remaining transparent minerals,i.e.:leucoxene,disthene,staurolite, sillimanite,monacite,tourmaline,pyroxenes and amphiboles amount to some 3-[illegible]% of the heavy fraction.

A magnetic and electromagnetic separation comprised the samples with heavy fractions of grain classes-singular or complex-has a mass of more than 2.00 g.Owing to the separation,the two magnetic concentrates I and II were obtained using a permanent magnet with a stable intensity of magnetic field.Two collective concentrates III and IV of paramagnetic minerals,two middling products IIIa and IVa of those minerals and the nonmagnetic concentrate V were obtained using the inductive belt high intensity separator.To the separation were subjected: 25 samples from the western part of profile E8/7, 11 samples from the eastern section of profile E 8/7 and 25 samples from the dune of El Msid.The result of this separation are presented in tables 12,15 and 17.

The control microscopic examination of the separate concentrates in the reflected or in the transmitted light /tables 12,15 and 17/ revealed that:

- magnetic concentrate I and II is mainly composed of ilmenite, ilmeno-rutile,strongly ferrouginous rutile and hematite.The ilmenite forming 60-90% of concentrate I and II.These minerals are accompanied by small amounts of anatase,sphene and andradite;
- the paramagnetic concentrate III is composed mainly of epidote /up to 80%/,ferrouginous rutile,ilmeno-rutile and small amount of staurolite,monazite,tourmaline,pyroxenes and amphiboles;
- the paramagnetic concentrate IV is practically composed of two components:garnets and rutile.The concent of garnets amounting to 90%,especially in the samples representing the +0.20-0. 0 mm grain class;
- the intermediate products IIIa and IVa heve practically a similar mineral composition:ferrouginous rutile,ilmeno-rutile,ilmenite,sphene,anatase,epidote,garnets,staurolite,leucoxene,monazite,tourmaline,pyroxenes and amphiboles occur in different quantities,while the first minerals being dominant;
- non-magnetic concentrate V contains zircon up to 90% as its main component,which is accompanied by the changing quantities of pure rutile,brookite,tourmaline,monazite and quartz.

On the basis of an analysis of the quantitative distribution of particular heavy minerals in the obtained concentrates and middling products as well as of the results of planimetering it can be stated that the main components are the following minerals:ilmenite-on the average 28% of the heavy fraction ,rutile respectively-24%,garnets-13%,zircon-11% and epidote 7%.The remaining 19% of the heavy fraction are composed of other minerals,occuring in the quantities up to several per cent.

The presence of rutile in almost all concentrates and middling product is a result of changable content of iron in it, and-by, the same- of its different magnetic susceptibility.The pure rutiles without the iron admixtures penetrate into the non-magnetic concentrate.This kind of rutile-the metamorphic rocks,while ferrouginous rutile from magnetic and paramagnetic comes directly from concentrates being the product of ilmenite transformation in the hypergenic conditions.

Detection of radioactive minerals,i.e. "responssible" for natural radioactivity of the prospected sands was one of the essential goals of testing of the samples from the radiometric profile R 8/7 and from the dune of El Msid.The microscopic observations of the series of samples allowed essentially for singling out only one mineral characterized by radioactivity,i.e. monazite.The sporadically inclusions of thorite met in zircon grains can not be taken into consideration. Planimetering of samples from profile R 8/7 showed that the monazite content in the heavy fraction oscillates within the limits 0.5 - 3.0% for the western section and respectively -0.7 - 3.7% for the eastern section.In a few samples monazite was completely absent.Thus,such quantities of monazite can not take the responsability of the intensity of gamma radiation,obtained for the heavy fraction.For this reason, the check X-Ray analysis being carried out for various magnetic fractions of samples: EM 7 of the -0.20 mm class and W 25/0.5 of the same class.The microprobe analysis were made for epidote,zircon,monazite, rutile,ilmenite,hydrated iron oxides and garnets,which came from the concentrates of sample EM 15.

The presence of the radioactive elements mainly of thorium, was confirmed by the microscopic analysis in epidote /Table 22/,zircon /Table 21/,monazite and the hydrated iron oxides /table 23/.

The activation chemical analysis executed for the zircon preconcentrate and for the collective paramagnetic concentrate III /table 26/ confirmed the presence of uranium and thorium on the heavy fraction of the samples.

The epidote from sample EM 15 of the -0,20 mm class reveals the content 0.05 - 0.55% of ThO_2 /table 22/.The activation chemical analysis of the paramagnetic concentrate III, of which epidote is the main component,revealed up to tenths of per cent of ThO_2.The same range of quantities of U_3O_8 were noted especially of the samples EM 9,EM 10 and EM 11 /more than 0.90% of U_3O_8,see table 27/.

The hydrated iron oxides containes- on the basis of microprobe analysis -0.05 - 0.18% ThO_2 /table 23/.

The most radioactive mineral is zircon.The microprobe analysis revealed for it 0.05 - 0.27% of ThO_2 /table 21/ and the activation analysis of its concentrate from the samples EM 15 revealed 0.19 - 0. 7% of ThO_2 and 0.63 - 1.58% of U_3O_8. The presence of these elements in zircon is possible because this mineral forms a continuous isomorphic series with thorite,uranium-thorite and coffinite.

In the case of greater quantities of these elements in zircon, it can contain the inclusions of thorite or uranium-thorite.The presence of the above-mentioned minerals was not confirmed on the X-ray diffraction diagrams for the non magnetic concentrates of samples:EM 7 a and W 25/0.5 which are characteruzed by the higher intensity of the gamma radiation.

The X-ray diffraction diagrams,executed for particular magnetic fractions of sample W 25/0.5 revealed the presence of the following minerals:

- concentrate I - ilmenite,geikielite;
- concentrate II - ilmenite,geikielite;
- concentrate III - epidote,sphene,andratite;
- concentrate IV - almandine,rutile,ilmeno-rutile;
- middling product IIIa - epidote,ilmenite,geikielite;
- middling product IVa - almandine,geikielite,ilmenite;

- concentrate V - zircon,quartz.

For the sample EM 7:

- concentrate I - ilmenite,hematite,psudobrookite,geikielite; and magnetite;
- concentrate II - ilmenite,geikielite,almandine;
- concentrate III - epidote,staurolite,monazite,tourmaline;
- concentrate IV - almandine,ilmeno-rutile,geikielite;
- concentrate V - zircon,sillimanite,disthene,rutile,tourmaline.

The monazite microprobe analysis,showes the presence of ThO_2 in this mineral within the limits 0.15 - 1.50 wt%.

The natural radioactivity of the investigated sands derive from four different minerals: zircon, epidote,monazite and the hydtated iron oxides.The order in which the minerals have been enumerated is not incidental,becuase zircon and epidote have a more abundance then monazite and hydtared iron oxides in the heavy fractions of samples from profile I 8/7 and the dune of El Msid,especially as concerns the -0.20 mm grain class.

F.4.3. Results of Radiometric Testing

The measurements were carried out for the separated grain classes of the samples,before and after a separation in the heavy liquid.The results of those measurements were later normalized to the mass of grain classes.The samples not revealing radioactivity before the separation in the heavy liquid /designated in the tables by symbol "nr"/ were not measured again after separation /symbol "nm" in the tables 10,13,16/.The measurements of natural radioactivity were not made of both heavy and light fraction in these classes of samples which revealed a minimal intensity of gamma radiation before separation in the heavy liquid.

The intensity value of gamma radiation measured in the field was recalculated from cps to cpm being put in the tables 10,13,16 for every mea -

surement point.

The results of laboratory measurements of the natural radioactivity of the grain classes of samples before the separation ini the heavy liquid indicated /tables 10,13 and 16/ that this radioactivity is principally connected with the +0.20 mm grain class and - as concernes samples E 50/1.0 - with the +0.80 mm class, as well.The results of those measurements forthe -0.20 mm grain class of the samples from the surface and from the depth of 0.5 m and 1.0 m as well as of the field-made measurements are presented in the diagrams of profile R 8/7 /Figs. 102 and 103/.

The radioactivity of the heavy fraction,compared with the radioactivity of the sample before separation in heavy liquid /tables 10,13,16/ showed that it is almost completely connected with this fraction /Figs.104 and 105/.Only certain light fractions of the samples reveal a moderate natural radioactivity.The intensity rate of gamma radiation in the heavy fraction is independent of the depth,of sampling and ogf the position of the samples in the profile.For this reason,the correlation of the intensity values of gamma radiation for the grain classes before and after separation in the heavy liquid was carried out only for the -0.20 mm class and for the same depth of sampling /draw.106 and 107/.

It is generally seen that the correlation between the radiation value and the total content of heavy minerals in fairly satisfactory.It goes without saying that there are defections from this directly proportional dependence,among the others,as concerns samples: W 60/0.0, W 60/0.5, W 55/0.0 W 55/0.5 and the othersThis fact can be explained by a lesser or greater contetnt of minerals which are "responsible" for the natural radioactivity in the heavy fraction.

The samples from the eastern part of profile R 8/7 are generally characterized by smaller values of the intensity of gamma radiation, which is connected with a drop of the quantities of heavy minerals,and by the same,of radioactive minerals.
The remarks concerning the samples from profile R 8/7 refer,as well, to the samples from the El Msid dune,being, however, richer in the he-

avy fraction and, due to it, revealing a greater radioactivity.

F.4.4. Correlation between the field radiometry measurements and the heavy minerals content.

The laboratory measurements of the natural radioactivity of samples and determination of the heavy fraction content in them has confirmed a supposition that there exists a good correlation between both quantities. It is clearly seen on the figures 106 and 107 obtained for the -0.20 mm grain class. As the minerals "responsible" for the radioactivity namely: zircon, epidote, monazite and hydrated iron oxides are concentrated mainly in that class which represents some 70% of the heavy fraction, no analogous figure is shown for the +0.20-0.40 mm grain class, though when analysing the data in the tables 10,15,16 similar relations can be observed.

In order to obtain a relation between field radioactivity measurements and heavy mineral content all available pertinent data has been gathered: B8/7 profile data, data from the dune of El Msid and the borehole data /fig.108/. The memeber of data is 71.

The following statistaical parameters has been obtained from these data:

- Mean value of the heavy mineral content - 4.41%
- Mean value of radioactivity - 80.28 cps
- Standard deviation the h.m.' content - 5.77%
- Standard deviation of radioactivity - 68,55 cps
- Correlation coefficient - +0.808
- The 95% confidence interval is 0.7 - 0.85%
- The linear regression equation has a form

$$y = 9.60x + 37.90$$

where:

y - radioactivity in cps

x - percentage of heavy minerals fraction.

The regressian coefficient $a_1 = 9,60$ has the interval of 95% confidence of $\pm$ 1,68

The second linear regression equation is as follows:

$$x = 0.068\, y - 1.05$$

and with an interval of 95% confidence

$$x = /0.068 \pm 0.006/\ y - 1.05$$

The second equation can be used for calculating the heavy minerals content when the field radioactivity is given. For example for 60 cps value the heavy minerals content is in average 3.15%. It can vary within limits of 2.67% and 3.40% with 95% of confidenece.

It must be remembered that the calculated regression equations are valid for the investigated area only.

F.5. Mineral Composition of Heavy Fraction

The microscopic examination, X - Ray microanalysis of the heavy and magnetic fractions of the borehole samples and from the radiometric profile R 8/7 and from the El Msid dune, the following minerals were identified:

- opaque minerals: ilmenite, ilmeno-rutile, sphene, rutile, geikielite, anatase, psudobrookite, hematite, maghemite, magnetite, goethite, chromite, cassiterite;
- transparent minerals: garnets, zircon, epidote, disthene, staurolite, sillimanite, tourmaline, pyroxenes, amphiboles, leucoxene, rutile, monazite, andalusite, biotite, corundum, spinel, cordierite, beryllium.

Of the heavy minerals above-mentioned, the following are present in significant quantities in the heavy fraction: ilmenite, rutile, garnets, zircon, epidote, and more rarely disthene and hematite. Of practical importance are the following: ilmenite and rutile/ as titanium ores/ and also zircon, garnets, disthene and hematite.
The above-mentioned minerals are described below.

Ilmenite

Generally makes up more than 20% of the heavy fraction in the tested samples. It is enriched rather readily in the magnetic concentrates I and II. It is also present in the paramagnetic concentrates III.Three varieties of ilmenite were distinguished microscopically:

1. - homogenous,rounded grain of typical ilmenite;
2. - grains with different degrees of replacement by sphene and anatase;
3. - homogenous grains enriched in TiO_2 and deplated in FeO.

The last type of ilmenite was most abundant in the tested samples.It seems to be a product of transformation towards rutile, a transitional ilmeno-rutile stage.This interpretation is confirmed by its anomalous optical features in reflected light.Its colour is greyish-white with an almost invisible brownish tint.Anisotropy is weak or absent.Internal reflexes of dirtily- tauny colour are visible only at the grain edges. The minerals sometimes reveals a distinct cleavage possibly as a result of oriented pseu brookite-ilmenite intergrowths.

The assaying of microprobe composition of ilmenite /table 18/ shows a surplus of TiO_2 against the formula of this mineral,important admixtures of Mg,Mn and a considerable amount od SiO_2.When a TiO_2 surphus is considerable was observed secretions practically isotropic having the colour of rutile.Such a agregate transforms next to the form of rutile one.

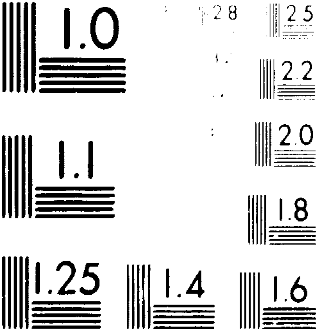
Isomorphous geikielite /$MgTiO_2$/ sometimes shows up with ilmenite in the diffractograms.

Rutile

makes up about 25% of the heavy fraction of tested samples. It is encountered in almost all the magnetic fractions.The rutile is identified in transmitted light and it hasn't contain of iron admixtures and characterizing minor amounts of Ta and Nb /Table 19/. These grains have a red-brownish to almost black columnar habit. Those factors are typically for rutile coms from the metamorphic rocks.The amount of rutile of this type is not great in the tested samples.It passes in to the nonmagntic fraction.

The bulk of rutile finds its way into both the paramagnetic and magnetic concentrates.It is identified in reflected light.More often

83.11.07
AD.85.03


1.0
2.8
2.5
2.2
2.0
1.1
1.8
1.25
1.4
1.6

it occurs as a separate grains revealing typical features and,sometimes, it appears in intergrowths with anatase and sphene or with ilmenite/ilmeno-rutile/.These rutile varieties are characterized by an increasing iron content affecting the magnetic susceptibility,which suggests that the rutile derives from the ilmenite.The described varieties of rutile contain, a considerable amount of Cr_2O_3 also but no Ta and Nb: this is characteristic of the rutiles of this types.There are rutiles high in Ca,they may be related to sphene.

Sphene /titanite/

occurs in small quantities/up to 5%/ in the heavy fraction.It takes the form of separate grains or intergrowths with ilmenite.In the second case,sphene originated as a replacement of ilmenite, the process of its formation was accompanied by segregations of anatase.The chemical assays on titanite reveal a considerable admixture of Al,Fe and often of Cr /table 20/,in addition to the essential components Ca,Ti and Si.Microscopy and chemical analysis suggest that the optically homogenous pure titanite grains contain smaller quantitites of admixtures /tables 20,points B3,K3/.

Magnetite-Maghemite-Hematite

Hematiteis the most abundant in the heavy fraction investigated.It contents to be a 10% or so.Commonly,it forms oriented intergrowths with ilmenite:this form can be considered as primary.Hematite also forms separate grains .They occur more rarely with maghemite. Generally,itrepaces the ilmenite grains.Segregations of anatase also results from this process.Grains of the Fe and Ti oxides are formed by processes of replacement.They are often so fine that the mass is microscopically homogenous and is identified as leucoxene.The products of this process reveal considerable deviations from the chemical composition of typical ilmenite,rutile or titanite.

Magnetite of typical optical properties is a rare component of the heavy fraction.The extant grains of this mineral are being replaced by hematite or maghemite.

Hydrated Iron Oxides

sometimes occur in in the heavy fraction. Their chemical composition is varied, with significant admixtures of Al and Si, probably in the form of clay minerals /table 23/. The P and Th content is also higher in them /table 23/. The hydrated iron oxides contain residues of the non-disegregated ilmenite, sometimes of hematite and, commonly of goethite.

Zircon

occurs in amounts of about 11% in the heavy fraction. It passes in its bulk into the non-magnetic fraction of which it makes up 80-90% of the value. It concentrates mainly in the +0.063-0.20 mm grain class. Zircon is easily identifiable in transmitted light. Four variaties of zircon can be distinguished:

1. - Long, idiomorphic crystals with an elongation of 1:10-12. They are most often transparent with no inclusions of other minerals;
2. - Columnar crystals with rounded ends a distinctive zonal structure and inclusions of opaque minerals of spherical shape. Elongation is 1 : 5-7;
3. - Grains with distinct spalling and an elongation of 1 :1-2. They are transparent, brownish and yellowish-brown with a zonal structure.;
4. - Well- rounded grains of worn surface, transparent with a weak pleochroism.

In reflected light zircon is isotropic and its reflexsity is ca 10%. The zonal structure of zircon is well visible in reflected light, thanks to the different hardness of adjacent zones, and also, to the spalling on the zone edges.

A microprobe analysis in order to interpret the differences in the hardness and mineral composition between the zones. Hafnium is the most valuable admixture in zircon: its content varies between 0.58 qnd 1.23 % HfO_2. Thorium andphosphorus also enter the structure of zircon, their quantities are important but variable. The content of the above-mentioned elements and of Cr progressively increases from the outer zones towards the inner zones.Some zonal zircons reveal strong interzonal differences in the content of Cr and Fe /table 21/.

Garnets

amount to approximate 12% of the heavy fraction in the tested samples.A concentration of about 30% is characteristic of the +0.20-0.400mm grain classes.They find their way into the paramagnetic concentrate lv during electromagnetic separation, to make up 80-90% of that concentrate.Generally,they are a brownish-pink colour intransmitted light, or more rarely,colourless or almost black.The garnet grains are off regular shape, from the elongate to the isomorphic; they have sharp unwar edges with a preserved conchoidae fracture. This indicates that their transport from the source area was not long. They are isotropic in reflected light,having a reflexivity of about 15%. In chemical composition,they resemble almandine most,although important admixtures of Ca,Mn,Mg /table 24/ suggest the presence of an almandite-grossular-spessartite series.X-Ray analysis confirmed that presence of almandine /the main component of the paramagnetic concentrate IV/,of grossular and andradite /admixtures in the magnetic concentrate II/.

Epidote

is encountered rather widespread, averaging some 7-8% in the heavy fractions of the tested sands.It is routed into the paramagnetic concentrate III,in which it is enriched up to 90%,as well as in to the middlings IIIa and IVa.In transmitted light,epidote is seen to form spherical and slightly oval flattened graines of a greenish-yellow colour with weak pleochroism.Sporadically,it contains inclusions of opaque minerals.In reflected light,epidote often reveals a reflexivity of about 10%.A rather high Fe content /table 22/ is typical of this mineral.Epidote contains 0.55% ThO_2,as well as minor amounts of Ti and Cr.

Monazite

is present in modest quantities /up to 3%/ in the heavy fractions of the tested samples.In magnetic separation enters the paramagnetic concentrate III or the middlings IIIa and IVa.It is sometimes encountered in the non-magnetic concentrate V as well.In transmitted light,it takes the form of spherical and transparent grains,colourless,pale-yellow or pale-green,with high coefficients of refraction and oblique extinction.It is biaxial in convergent light.A microprobe analysis of monazite revealed the following chemical composition /in weight per cent/: SiO_2 2.10-4.49, P_2O_5 17.39- 24.50, ThO_2 0.15-1.50, CaO 2.30-3.39, Fe_2O_3 0.08-5.09, Al_2O_3 0.02-0.20, Ce_2O_3 20.50-3[illegible].10,La_2O_3 15.05-24.08,Pr_2O_5 0.08-3.10, Nd_2O_3 3.15-12.60, Sm_2O_3 0.08-1.30.

Tourmaline

is common in minor quantities /up to a few per cent/ in the heavy fraction of the tested samples.It occurs in two varieties:

1. as idiomorphic prismatic crystals withs lightly rounded ends and a distinct cleavage parallel to the prism edge.Those grains have a strong pleochroism depending on the colour and cut of the crystals.It is most often green to brownish-green and more seldom colourless to pinkish;
2. as oval forms,well-rounded of a brownish-yellow shade.Its pleochroism is distinct,but it is sometimes isotropic.The grain shapes imply that tourmaline originates from two different source of unaque distance.

Disthene /cyanite/

occurs in the majority of samples under investigation both in the fine and medium classes. It concentrates in the non-magnetic fraction together with zircon.Noteworthy concentration were found in the region of Tânit /5% on the average/.It most often form elongate and formless grains colourless or yellowish with a weak pleochroizm and oblique extinction.It has high coefficients of diffraction and and paleinterference colours.

Staurolite

is a common mineral /up to several %/, mainly in the paramagnetic fraction, It is characterized by a distinctive brownish- yellow,strong colour,a distinctive pleochroism and high coefficients of diffraction.It shows the characteristic interference colours.The staurolite chip are sometimes intergrown with other minerals,most often opaque ones.

Sillimanite

occurs much more seldom than the others in the heavy fraction.It is elongate,well-rounded,yellowish-green and brownish,with a distinctive cleavage,parallel to the crest of the prism.The grains reveal a visible pleochroism.

Andalusite

is a rare mineral in the form of elongate and shapeless grains with red pleochroism.

The Pyroxenes Group

usually makes up several per cent of the heavy fraction.The most common species is augite.It forms short prisms,slightly rounded and with formless edges.A columnar- step like jointing is visible at the prism end.Augite is pale green,sometimes pleochroic,it tends to occur in the class +0.063-0.20 mm.Its coarser grains are green, always weakly pleochroic.Identified in the majority of preparates it is more rare in the coarser classes.Certain ferrous varieteis. are non-transparent and might be missed.

The Amphiboles Group

is less abundant than the pyroxenes.The amphiboles are distinguished by the habit of their crystals.The optical proporties reveal hornblende to dominate in this group.It has shredded prism ends and a distinctive cleavage. Changes in colour /tarnishing or redness/ occur mainly along the cleavage plane. Hornblende is distinctly more pleochroic than augite and its colour is a more intense brownish-green. It occurs less often in light shades.

Biotite

is rare. It forms yellow flake lying flatways, and the intensity, of its colour depends on the thickness of the flake. Biotite is distinctly pleochroic and sometimes isotropic.

Quartz

is common not abundant in the heavy fractions /up to 5 wt%/. In the light fractions it is the main mineral. Quartz is transparent, sometimes yellowish-brownish by iron oxides. Quartz most often occurs in the form of well-rounded and either oval grains. Sharp-edges quartz fragments were also confirmed, mainly in the finest grain class. Their size however is decidedly smaller than the average diameter of other grains of quartz and of other minerals. Quartz was also observed as a product of leucoxene transformation.

F.6. Chemical Composition of Concentrates

The ilmenite magnetic concentrates I and II, the zircon pre-concentrate V and the paramagnetic concentrate III were subjected to chemical analyses. For the magnetic concentrates I and II, containing mainly ilmenite, the assays covered: TiO_2, V_2O_5, FeO, Fe_2O_3, Cr_2O_3 and MnO /table 25/, the components decisive as to market quality. The concentrates under consideration contains between 42.4 - 51.60% TiO_2. This low content is due to contamination of the concentrates with other heavy minerals in quantities up to 10 per cent. The assays of FeO, Fe_2O_3, Cr_2O_3 and MnO remain within the norm. On the other hand, the content of vanadium is much higher than admissible in an ilmenite concentrate envisaged for the production of titanium white /up to 0.5% V_2O_5/. Such a high content of vanadium can suggest that the ilmenite/which is present in both beach and aeolian sands/ derives largely from basic-ultrabasic rocks or from their metamorphized equivalents present in the Precambrian of Mauritania.Thid hypothesis is confirmed by the presence of ilmenite-hematite and ilmenite-rutile intergrowths,typical of such rocks.

The indicative activation analysis of the zircon preconcentrate V in the nonmagnetic fraction /Table 26/ shows fluctuacting quantitites of ZrO_2. This results from the differences in zircon concentration in the nonmagnetic fraction,/see table 26/. An appropriate cleaning of this pre-concentrate may give an almost monominerals zircon concentrate whose ZrO_2 content will be 64 to66%. The zircons in the prospected beach and aeolian sands are low in hafnium /table 26/ and comparatively high in U and Th,especially in the samples T 1/1-4 and EM 8,

In those samples,the zircon may contain inclusions of uranium,thorite or coffinite.

Zircon is enhanced in value by the increased content of radicactive elements,especially of uranium.The recovery of uranium from zircon is possible by well-tried technologies.This is however,a problem requiring further research work.

Cerium was discovered in samples J 7/1-4,EM 9 and EM 16. This confirmed the microscopic identification of monazite in the nonmagnetic fraction.

A total 15 samples of the paramagnetic concentrate III were,moreover subjected to activation analysis.The assay covered ThO_2,U_3O_8, Ce_2O_3 and La_2O_3.The samples T 1/1-4,B 5/1,4,EM 9 and EM 16 in which modest amounts of monazite were identified microscopically firmed are much higher in cerium and lanthanides than the remaining ones /table 27/.In part of samples The U_3O_8 content exceeds 0.9%.It is bound in epidote.The resluts of this analysis confirm the radioactivity of epidote as revealed by the refractometer.

No other minerals of the paramagnetic concentrate III except epidote and monazite can contain in the radioactive elements in their structure.

F.7. Comparison with Marshalls Report /1978/.

When comparing the results from J.E.F.Marshall's report with t ose in present one the following points should be stressed:

1. sort of samples;
2. aim and methodology of laboratory studies;
3. mineralogical and chemical results;

The samples analysed by Marshall was already pre-concentrated having heavy mineral content about 65-80% as compared ot our "raw" samples containing usually few percent of heavy fraction. The weight of Marshall's samples was usually 500 g, when our samples weighted 50 g /or 200 g from the depth greater then 2 m/.

The aim of the Marshall's analysis was to find methods for minerals separation and to obtain from them concentrates of separate minerals. The main aims of our analysis was to determine heavy minerals content, to identify minerals in heavy fraction, to find minerals with radioactivie mineral content. Different aims resulted in different methods used in this analysis. It can be deduced from the Marshall's report that the mineral identification was made by a binocular glass, when we used in a great extent a microscope.

In spite of those differents the results of mineralogical studies are similar with some exceptions. The content of main minerals is similar in both reports. The differencies are as follows:

1. Apart from the ordinary rutile, the iron rutile was identified as a one of principle minerals;
2. the greater number of heavy minerals was identified;
3. because of the small weight of our samples and low heavy minerals content in them in magnetic separation no ferromagnetic fraction was separated, but the magnetite was identified in samples under a microscope;
4. the high vanadium content was determined in the ilmenite concentrate /up to 0.5% of V/;
5. the monazite content in heavy fraction was established;
6. in the region of Tânit one of principle minerals is disthene.

F.8. Conclusions

The group of methods chosen for laboratory testing enabled a qualitative and quantitative characterization of the group of heavy minerals present in the beach and aeolian sands of the prospected area of the Mauritanian coast.The tests shows that concentrations of heavy minerals of commercial importance,i.e.containing as least 1.00% heavy minerals /the limiting content of the placer deposits of the beach and dune-type,being worked in world practice/ are present only in the surface sand layers, and their thickness rarely exceeds 1 m.No concentrations of this quality were confirmed at the deeper levels,especially in the "deep" boreholes T 6,B 6 and J 9.

The minerals composition of the heavy fraction as well as the grain shapes of the minerals confirm the comparison proximity of the primary source of heavy minerals as well as to the brevily of the period of concentration.The implication is that the old beaches which are now covered by younger sandy formations in the area between Nouakchott and Râs Timiris should contain no heavy minerals concentrations of significant size.The profiles of the executed drillings have confirmed this conclusion.

The heavy minerals from all the areas prospected in detail are concentrated to the tune of about 60% in the fine and very fine grain size classes.The main minerals of the heavy fractions are as follows: rutile - 24-28%,ilmenite - 20-26%,garnets -9-15%,zircon-7-12%, epidote- 7% and distehne only in the region of Tânit - 5%.

By mineralogical classification,the placer deposits of the beach and dune type found in the prospected area, a rutile-ilmenite-garnet-zircon ore.Rutile/a raw material in world demand/ in its most valuable ingredient it is folowed by zircon.Ilmenite and garnets ads to its value less than rutile.

The sands from the prospected regions are easily enriched and according to the results of magnetic and electromagnetic separation on the heavy fractions tested- the pre-concentrates of ilmenite,garnets, and zircon are relatively simply obtained.Rutile is a problem' because,as a phase deriving from ilmenite,it contains iron in vasiable quantities.Its magnetic susceptibility varies accordinghly. As a result it is routed into various concentrates or middlings. For this reason,electrostatic separation should be tried as a means of its enrichment on an industrial scale,after separation of ilmenite from the heavy fraction.

The chemical analyses of the obtained zircon pre-poncentrates reveal considerable admixtures of U and Th which can be recovered from zircon with the technologie available.

The vanadium contents in the concentrates of ilmenite, suggested that this minerals comes from basis or ultrabasic rocks.

The above information can be used as a reserach promise in the prospection of ore deposites of the Fe-Ti-V type in both basic and ultrabasic rocks or in their metamorphic succesors in the Pre-Cambrain. of Mauritania and of deposites of U-Th ores in those formations and areas.

According to the results of the laboratory tests, the natural radioactivity of the aands of Mauritanian coast between Nouakchott and Râs Timirist is connected with their heavy fraction. Zircon, epidote, monazite and hydrated iron oxides are the radioactive minerals. The correlation between the radioactivity measurements in the field and the content of heavy minerals in the surface stratum of 1 m, thickness was confirmed. Thus radiometric mapping permits to outline the richer concentrations of heavy minerals on the beaches and dunes of the coast, only in investigated areas.

G. Geological Results

G.1. Estimation of Reserves and Resources

On the basis of earlier prospecting between Nouakchott and Ras Timirist /Blanchot 1975/ the existence of 260 000 t of ilmenite was confirmed /Fig 1/, but the degree of reliability of this figure was not given. The survey executed by the Polish team allows a calculation of reserves in three categories, thanks to the broad scope of the executed geophysical and drilling prospection. The reserves explored by drilling are placed in the category of proven reserves. Those in the undrilled areas covered by a detiled radiometric survey should be considered probable ones. Finally, the reserves on the whole coast section covered by a semi-detailed geophysical survey should be placed in the category of resouces.

G.1.1. Proved Reserves

They were calculated for three areas prospected by drillings: the region of Jreida, Blaouakh and Tânit. Every where, the outermost positive boreholes /i.e. the boreholes in which a minimum of 1% heavy minerals was found in a thickness minimum of 0.25 m outlined the boundary of the reserve block. In order to calculate the surface area of the shape obtained in this way, it was divided into trapezoids and triangles. The average mineralized thickness and the weighted average content of the heavy minerals were calculated for every block. This permits calculate the volume of mineralized sands for every block. For calculating the tonnage of sands the unit weight of 1.54 t/m^3 was adopted, being calculated from the equation:

$$d = 1.5 + /0.0115 \times \text{heavy minerals content in \%}/.$$

The content of the useful component was calculated in percentages as a weight average over all the samples containing more than 1% of heavy minerals.

The equation for the unit weight of the black sands is given by "Manuel du prospecteur minier", BRGM, Orléans, 1981.

The reserves of heavy minerals were calculated from the sand tonnage and from the average content of the useful component in each block. The results are given as follows:

Region of Tânit:

1.block T I

- surface	44 000 m^3
- volume for thickness 0.69m	30 360 m^3
- tonnage	46 754 t
- average content 3.28%	
- reserves	1 533,5 t

2.block T II

- surface	45 500 m^3
- volume for thickness 0.59m	22 750 m^3
- tonnage	33 035 t
- average content 3.60%	
- reserves	1 261,3 t

3. block T III

- surface	25 250 m^3
- volume for thickness 0.62m	15 781 m^3
- tonnage	24 303 t
- average content 3.83%	
- reserves	930,8 t

4. block T IV

- surface	7 700 m^3
- volume for the thickness0.75m	5 775 m^3
- average content 3.31%	
- reserves	294,4 t

total reserves of Tânit 4 020 t

The total confirmed reserves for the region of Tânit amount, thus to 4 020 t of heavy minerals. The surface area was checked with a planimeter. A result of 121 250 m^2 was obtained. The average thickness of 0.63 m was adopted for the check, the average content of heavy minerals being put at 3.55%. In this way reserves of 4 176 t were obtained.

The distribution of heavy minerals in the sands of the region of Tânit are as follows:

- rutile 27%
- ilmenite 23.0%
- garnets 15.0%
- zircon 12.0%
- epidote 7.0%
- disthene 5.0%
- others 11%

The total reserves in the region of Blaouakh amount to 5242.3 t. A check run by the same method as was used for the region of Tânit, gave reserves of 4913,4 t for a surface of 113 188 m^2, a thickness of 0.81 m and an average content of heavy minerals of 3.48%.

The share of particular heavy minerals in the sands of the region of balouakh is as follows:

- rutile 28.0%
- ilmenite 20.0%
- garnets 9.0%
- zircon 11.0%
- epidote 7%
- remaining 25.0%

Thus, the reserves amount to:

rutile	1 467.8 t
ilmenite	1 048.5 t
garnets	471.8 t
zircon	576.6 t
epidote	367.0 t
remaining	1 310.6 t

Region of Jreida

1. block J I

- surface	20 000 m^2
- volume for thickness 1.21 m	24 200 m^3
- tonnage	37 268 t
- average content 3.44%	
- reserves	1 282 t

2. block J II

- surface	39 000 m^2
- volume for thickness 1.03m	40 170 m^3
- tonnage	61 862 t
- average content 3.2%	
- reserves	1 979.6 t

3. block J III

- surface	25 318 m^2
- volume for thickness 0.71 m	17 976 m^3

- tonnage 27 683 t
- average content 2.26%
- reserves 625.7 t

Totals reserves of Jreida 3 887.3 t

The total reserves in the region of Jreida amount to 3887.3 t. The check-run by the method outlined above gave reserves of 3686.8 t for a surface area of 84 000 m^2, a thickness of 0.95 m and a average content of heavy minerals of 3.0%.

The share of particular minerals in the sands of the region of Jreida is as follows:

- rutile 27.0%
- ilmenite 21.0%
- garnets 10.0%
- zircon 7.0%
- epidote 7.0%
- remaining 28%

Thus, the reserves of particular minerals amount to:

- rutile 1 049.6 t
- ilmenite 816.3 t
- garnets 388.7 t
- zircon 272.1 t
- epidote 272.1 t
- remaining 1 088.5 t

Total proven reserves for the three regions amount to 13 149.6 t or according to the method used for verification 12 776.3 t. The difference is 373.3 t or 2.84% of the higher figure.

G.1.2. <u>Probable reserves</u>

They are calculated for the area of detailed radiometric mapping /the regions of Tânit-Blaouakh and Jreida/. The area outlined by the 60 cps isorad is admitted as the mineralized surface, without taking into consideration the anomalies on the recent beach, in view of the changing character of those reserves. A one-meter thickness was adopted as the average in keeping with the depth of penetration of the radiometric method. After calculation of the volume the sand tonnage is obtained using the unit weight of the proven reserves /1.54 t/m^3/.The average content of heavy minerals is read off the simple correlation diagram /Fig.107/:for 60 cps,it amounts to 3.15%.This value was adopted as the average for the whole area outlined by the isorad 60 cps it is rather conservative.The numbers of sectors correspond to that of the detailed radiometric mapping.

Region of Jreida

Sector 1

- volume	800 093.7 m^3
- sand tonnage	12323 344.3 t
- reserves	3 885.3 t

Sector 2

- volume	72 187.5 m^3
- sand tonnage	111 168.7 t
- reserves	3 501.8 t

Sector 3

- volume	82 500 m^3
- sand tonnage	127 050 t
- reserves	4 002.0 t

Sector 4

- volume	1[illegible] 843 m^3
- sand tonnage	[illegible]39 999.5 t
- reserves	7 559.7 t

Sector 5

- volume	128
- sand tonnage	197 t
- reserves	6 230.2 t

Sector 6

- volume	91 [illegible]37.5 m^3
- sand tonnage	140 813.7 t
- reserves	4 435.0 t

Thus, the total of probable resreves in the region of Jreida amount to 29 614.6 t.

Region of Tânit and Blaouakh

Sector 1

- volume	34 875.0 m^3
- sand tonnage	53 707.5 t
- reserves	1 691.7 t

Sector 3

- volume	15 500.0 m^3
- sand tonnage	23 870.0 t
- reserves	751.0 t

Sector 3

- volume	40 187.5 m^3
- sand tonnage	61 888.7 t
- reserves	1 949.5 t

Sector 4

- volume	171 625.0 m^3
- sand tonnage	264 302.5 t
- reserves	8 325.5 t

Sector 5

- volume	59 437.5 m^3
- tonnage	91 533.7 t
- reserves	2 883.3 t

Sector 6

- volume	81 625.0 m^3
- sand tonnage	125 702.5 t
- reserves	3 959.6 t

Sector 7

- volume	93 250.0 m^3
- sand tonnage	143 605.0 t
- reserves	4 525.6 t

Sector 8

- volume	86 562.5 m^3
- sand tonnage	133 306.2 t
- reserves	4 199.1 t

Thus the total probable reserves in the region of Tânit-Blaouakh amount to 28 284.2 t and in region of Jreida 29 614.8 t. The grand total for the region of Jreida and Tânit -Blaouakh /probable reserves/ amounts to 57 898.8 tons.

The following distibution of heavy minerals in the sands of the area of detailed radiometric mapping /the average of the drilled areas of the correlation profile R 8/7 and of the dune of El Msid/ is as follows:

- rutile	26.5 %
- ilmenite	22.5%
- garnets.	11.8%

- zircon 10.2%
- epidote 7.0%
- others 22.0%

Their probable reserves amount to:

	region of Jreida	region of Tânit Blaouakh	total
- rutile	7 847.9	7 495.3	15 343.2
- ilmenite	6 663.3	6 363.9	13 027.2
- garnets	3 494.5	3 337.5	6 832.0
- zircon	3 020.7	2 885.0	5 905.7
- epidote	2073.0	1 979.4	4 052.9
- remainings	6515.2	6 222.6	12 737.8

G.1.3. Resources

This category is calculated with a high degree of uncertainty. The results of the semi-detailed geophysical mapping with a profile spacing of 1 km were taken as thebasis of claculation. The resources of the recent beach /low and outer/ of the strom beach /inner/ and of the recent dunes are aggregated on the assumption however, based on the drilling, that the fossil beaches are not mineralised. The surface area considered is outside the 60 cps isorad of the semi-detailed survey. It is assumed that the sea-shore is staright in particular sections of the littoral. The eastern boundary is adopted as the sections that link the extreme eastern values of 60 cps. The surface area of the following sections of the littoral was calculated:

from profile N3 to profile N8 - northern part of El Mansour dunes;

from profile N12 to profile N22- the dunes soutward of Jreida ;

from profile N22 to profile N 37-Balise Marie-Ferrat;

from profile N43 to profile N56 -the area south of Tânit Bay ;

from profile N55 to profile N63 - the El Msid dunes .

The volume is obtained on the assumption that the thickness is 1 m. The unit weight of the drilled areas unit weight 1.54 t/m^3. The average content of useful components is determined by correlation, as above . This gave the following results:

- between the profiles N3 to N8
  - volume 1 312 000 m^3
  - sand tonnage 2 020 480 t
  - resources 63 045.1t

- between the profiles N12 to N22
  - volume 1 949 000 m^3
  - sand tonnage 3 001 460 t
  - resources 9 456.0 t

- between the profiles N22 to N37
  - volume 923 000 m^3
  - sand tonnage 1 421 420 t
  - resources 44 774.7 t

- between the profiles N43 to N56
  - volume 1 137 000 m^3
  - sand tonnage 1 750 980 t
  - resources 55 155.9 t

- between the profiles N55 to N56
  - volume 2 324 000 m^3
  - sand tonnage 3 578 960 t
  - resources 112 737.2 t

Thus,the total resources in the prospected section of the coast between Nouakchott and Ras Timiris amount to 370 858.9 t of heavy minerals.

For further calculation it is assumed that the distribution of minerals in the heavy fraction is the same as in the regions of Jreida and Tânit.Thus,their resources amount to:

- rutile 98 277.6 t
- ilmenite 83 443.3 t
- garnets 43 761.5 t
- zircon 37 827.6 t
- epidote 25 960.1 t
- others 81 588.9 t

G.2. Evaluation of the heavy minerals.Occurances on the Investigated area.

The above-presented reserves and resources of the prospected section of the Mauritanian coast seem to indicate the economic viability of exploitation if the balance values 1 m thickness ,1% average of heavy minerals content and 1 milion t of mineralized sands i.e. 10 000 t of heavy minerals for a single deposit are adopted.

However,the Mauritanian coast can not be conceived of in terms of deposit:it is rather a long mineralized zone where the operations coasts and in particular the costs of transportation would preclude the viability of minin.

The smallest Australian producer /NORTHERN RIVERS RUTILE PTY Ltd/ produced 7 000 tons of rutile in 1970.Assuming this value as the minimum of profitable extraction,the probable reserves of the surveyed section of the coast would allow a two-year exploitation. This figure should be adopted as the life-time of the mines.

The above mentioned producer extracted 6 000 t of zircon annually. The resources of the surveyed coastal section would assure the extraction of only 3 000 t approximately of zircon annually during the two-year period.

Ilmenite could be extracted during the two-year period in the quantity of about 6 000 t per year which would assure an annual.

So the probleme reserves as certained by us are too small,because they suffice for two years of mining only then the mining would not be rentable.

Rutile,ilmenite,garnets and zircon are the only minerals in the Mauritanian deposits which can be of market value.

Rutile,an article traded internationally,has usually a guaranted minimum content of 95% of TiO_2, and a maximum content 1% of ZrO_2 as well as 1% Fe_2O_3.Only one of the three analyses on Mauritanian rutile theminumu stipulation of the market.The iron content meets the norms of the raw material that is in market demand.

Ilmenite- the following features determine the market value of this raw material:

- content of $TiO2_2$;
- ratio of trivalent to bivalent iron;
- grain size distribution.

The Mauritanian ilmenites is a poor quality.The marketable ilmenite concentrates usually contain more than 5% TiO_2.Varieties with a high Fe_2O_3:FeO ratio are in demard.In the Mauritanian ilmenite,this ration nowhere exceeds 4 : 1 and is typically 3:1.With its TiO_2 content which does not exceed 50%,Mauritanian ilmenite can not complete with,for instance,the Australian raw materials.

Zircon- three varieteis of zircon -standart,intermediate and premium are available in the market,different as to this contents of ZrO_2 + HfO_2,SiO_2,TiO_2 and Fe_2O_3.The standard quality is the cheapest. It should contain a minimum of 65% ZrO_2 + HfO_2.Even the pure Mauritanian zircon concentrates do not meet this minimum.The remaining components are within the norm.The purity of the concentrate is the next factor of importance for the purchaser.The Australian concentrate contain a guaranteed 99.2% of zircon.The easy recovery of the initalal concentrate from the samples from Mauritanian coast justifies the assumption that a concentrate of the derived purity can be easily obtained in a commercial size concentratot too.
As it results from the above-mentioned comparison,no of the useful components of the heavy minerals from the Mauritanian deposits seems to be marketable.

H. Prospects of discovering industrial black sands deposits

The prospection on the Mauritanian coast between Nouadhibou and Nouakchott have revealed the lack of industrial deposits of the black sands. The northern part has been proved negative by earlier French prospection, and the central part has been investigated rather thoroughly by our team with negative results. The black sands deposits are formed when all four of the following factors occur:

1. strong surf waves helped by ebb wave;
2. distinct sea current near the coast serving as a transport mean for clastic material;
3. accumulation, which ought to be bigger than the coast erosion;
4. source of the heavy minerals.

Hebrard /1978/ believes that in the Quaternary such conditions appeared as late as in the Tafolian /4 000 - 2 000 y.BP/. In that time the breakers got strouger and the Canary sea current appeared creating conditions favourable for forming large black sand concentrations along the West African coast. Varous parts of this coast have specific local conditions which either favour or prevent the formation of big black sand deposits.

The northern part of the Mauritanian coast is separated from the high sea by shallows of the bank of Arquin and this is why the first two factors are less pronounced and the deposits formed are small.

The central part has better conditions: two first factors are well pronounced and so is the fourth, but geological data /Hebrard, 1978/ supported by our field observations, air photos analysis and geophysical data show that the fast erosion of the sea coast in this area destroys and reworks black sands deposits formed previously. Our investigations revealed the absence of bays which, when filled, could be the site of black sand accumulation. The great bay of Tafoli which existed during Nouakchottian age, was in that time separated from the open sea by shallows and at the beginning of Tafolian very fast became a lake closed by a sand barreir. Later it turned to sebkha Drhamcha. Evidently significant black sands deposition could not have occured either on the coasts of this bayor on the sand barrier eroded and moved eastward.

The situation is different in the southern part of the coast Aftout-es-Saheli. On the basis of geological data Hebrard /1978/ states: "/There are/ the concentrations of an order of twenty million tons of heavy minerals: ilmenite, rutile, zircon, in the littoral sand barriers situated between Nouakchott and Dakar, where the heavy minerals content is of an order to 30% in the fossil beach, of 10% in the littoral superposed dunes, and of 5% in the littoral dunes depalced sometimes four kilometers inland, but the tonnage of the latter is greater".

Geological data indicate the existance of the beach sediments both of the Nouakchottian and Tafolian age in the southern sector of this part of the coast. In the area of the Senegal river estaury in the Nouakchottian there was a deep cut bay /Elouard, 1975/, filled during the Tafolian. The Senegal River alluvial cone is an obstacle for the sea current flowing from the north, so northward from the Senegal River the rate of accumulation ought to be greater tahn the rate of erosion, creating conditions for preserving the black sand deposits of greater dimensions.

An open question is the existence of the black sands deposits of Nouakchottian age. Hebrard/1978/ believes, as it was quoted before, that in that time no conditions existed for heavy minerals concentrations in beach sands. However this assumption seems to be worth to checking by geophysical methods.

In concluding it seems, that while the northern and central parts proved negative, the southern part of the Mauritanian coast Aftout-as-Saheli is the most promising for black sands accumulation. So far only beach and dune concentrations of Legonichichi are known to occur in this area.

I. Proposals for further works .

Prospection of the Southern part of the Mauritanian Coast.

For definitive evaluation of the black sands on the Mauritanian coast,and taking into account the geological promises /see par. H/ the geological prospection of the southern part of the coast Aftout - es -Saheli is proposed.
We propose similar methodology of prospection as was used by us in prospection of the central part and which is presented in this report.The project will be divided on several stages and the results of prior stage will have influence on the realization on the next one. The stages will be performed in part in the same time e.g. laboratory testing should start about two weeks after the beginning of the sampling stage etc.

I.Preliminary stage - 1 month

I.1. Analysis of geological materials and air photos;

I.2. Field recconaissance, topographic and preparatory works.

II.Geophysical stage - 6 months

II.1. Semidetailed radiometric survey-made by car -2 months;

II.2. Experimental radiometric invetsigations at sea -0.5 month;

II.3. Detailed radiometric survey of the most promising areas;

III. II.4. Geophysical reporting -0.5 months

III. Drilling and sampling stage - 6 months

III.1. Sampling of semidetailed geophysical and experimental sea profiles- 0.5 month;

III.2. Sampling of detailed geophysical profiles - 1.5 month /during the geophysical stage/;

III.3. Drilling to 6 - 8 m -6 month.

IV.Laboratory testing stage - 6 month

IV.1. Heavy fraction separation ;

IV.2. Mineralogical studies;

IV.3. Special studies.

V.Reporting - 2 months.

In total 15 months duration of the project is planned.

Expatriale personnel

	stages	man-months
1. chief- geologist	I - V	15
2. geophysicist	I,II,V	7
3. geologist-mineralogist	I - V	15
4. mineralogist	III - V	11
5. driller	III,V	7
	total	55

Mauritanian personnel

	stages	man-months
1. driver-technician	I - V	15
2. driver	I - V	15
3. 4. prospectors	I - III	20
5-8. workers	II - III	50
9. cook	I - IV	15
10-13. laboratory assistants	IV	25
	total	140

In total 55 man-months of expatviate personnel is envisaged the total cost would be approximately 480 000 $ .When the positive decission about the above project is taken,the detailed programme has to be prepared.

Subst... e terms of reference for Phase II/ follow-up/ geological investigations

Ref.: UF/MAU/78/292
DP/MAU/79/005

Project title: Study on Industrialization of Black Sands/Phase II - Follow-up geological investigations

A. General Background Information

The existence along the Mauritanian coastline of beach sands containing heavy minerals has been established by previous geological prospecting /Dabrowsky; A. Allon, 1958-59; J. Vogt, 1956; L. Hebrard, 1958/. The information contained in those reports, however, is insufficient to assess the reserves of minerals and the viability of the project.

UNIDO's first contact with the Mauritanian beach sands problem was by an exploratory mission invited by the Mauritanian authorities / Marshall and Szakál, 1974; Marshall, 1975/. That mission recommended

/a/ systematic prospection with a view to finding out about the location and geometry of the deposits and to estimating the reserves contained in those;

/b/ systematic sampling to provide starting material for laboratory testing for the purpose of

/ba/ assessing the value and saleability of the minerals;

/bb/ devising an ore concentration technology and preparing a conceptual design for a concentrating plant;

/c/ the preparation of a techno-economic feasibility study to serve as a basis for decision-making concerning the setting up of a mining and ore concentration operation.

In an effort to promote the industrialization of this resource, the Mauritanian mining corporation SNIM performed on its own a preliminary/scout/geological and geophysical prospection of the deposits /Zagortchev-Kralov-Katevski, 1978/, and commissioned the UK firm WS Atkins and Partners to test the samples taken, a task on which an extensive report was submitted by that firm /Marshall, 1978/.

On the reception of the two last-named documents, UNIDO reckoned that these could be regarded as satisfactorily ending a stage of preliminary /Phase I or scout/ prospecting, but that a Phase II or follow-up stage of geological investigations was still needed to procure all the information required for a viability assessment /Balkay, 1978/. It is this Phase II work that the present Terms of Reference is concerned with.

Late in 1978, UNIDO sent a follow-up mission to Mauritania in order to discuss both the achieved Phase I and the prospective Phase II, and to explore, jointly with the competent Mauritanian organizations, the most appropriate ways and means of proceeding to Phase II /Balkay and Sharipov, 1978/. UNIDO simultaneously expressed its willingness in principle to provide, on request by the Mauritanian Government, technical assistance in promoting a more complete assessment of the said deposits and of their economic potential. The present Terms of Reference are compatible with the agreement reached with the competent Mauritanian organizations and with UNDP/Nouakchott.

B. The Aim of the Project

1. Long-term aims

/i/ to clarify whether the heavy mineral sand deposits of the Mauritanian littoral provide a basis for an economically viable mining and ore-dressing /concentration/ operation.

/ii/ In the case of positive geological findings, to proceed to the acquisition of information sufficient to determine the technical and economic feasibility of a mining-cum-dressing operation.

/iii/ In the positive case, to increase the export potential of the country by the working of mineral resources which have not so far been utilized, through the setting up of a mining operation and the construction of an ore dressing plant.

2. Immediate aims

/i/ Recovery of samples and documents produced by previous work, as far as feasible.

/ii/ Follow-up /definitive/ testing of the geophysical methods of prospecting for heavy beach sand deposits, tentatively tested during Phase I work.

/iii/ Follow-up drilling and sampling in those parts of the Mauritanian littoral that are most promising of industrial viability.

/iv/ Laboratory testing of the samples taken under /iii/.

/v/ Reporting.

C. The Scope of Contracting Services

1. To re-examine and evaluate all available information on previous prospecting and testing, including work performed by the Mauritanian organizations. If it is deemed useful, to visit the French geological services on UNIDO's authority, in order to study any relevant documentation not available in Mauritania. To collect and edit old /unpublished/ documentation concerning sampling, pitting etc., to the extent that such documentation is available and recoverable. To perform any other relevant activity of documentation deemed useful by the Contractor's Project Manager.

2. To identify those minerals which are responsible for radioactivity in the beach sands, preferably using existing concentrates /e.g. those now with WS Atkins and Partners/. To perform a detailed field scintillometer survey of 4 or 5 promising deposits in a density sufficient to permit the tracing of isorad maps. To follow up the survey by surface sampling, in order to establish a correlation between scintillometry readings and mineralization.

3. To run a check geomagnetic survey in the area covered by the scintillometer survey, in the hope of establishing a correlation between the two methods; and to extend the geomagnetic coverage to areas where the mineralized sands are overlain by barren sediment.

4. In possession of the information thus gained, to run a geophysical survey of the promising sections of the Mauritanian littoral.

5. To perform experimental runs with a scintillometer and/or a magnetometer carried in a boat, in order to find out whether offshore concentrations of heavy minerals in shoal water can be identified in this way. To perform check seabottom sampling by some simple means. Provided that this prospecting technique is found to be adequate, to run a geophysical survey and follow-up sampling in some of the shoal waters off the Mauritanian littoral, with a view to identifying offshore heavy mineral deposits in those waters.

6. In some five of the most promising zones of the Mauritanian littoral, to perform a three-month drilling campaign using one suitable light /banka-type/ drill capable of drilling to a depth of about 20 m at a diameter of about 10 cm in loose or little-consolidated sediment; total meterage drilled should be 315 m at the least, but as much as can be achieved within the time span envisaged. For drilling and sampling details see under IV below.

7. To set up a temporary laboratory at Nouakchott for the study of the samples taken under 6, and for the handling of 1200-plus samples of heavy-mineral pre-concentrates prepared by the field team. For details of laboratory work see under IV below.

8. To perform certain laboratory tests /see under IV below/ in Contractor's home laboratory.

9. To write a comprehensive report on the findings of tasks 1. to 8. above, especially as regard their impact on the reserves picture. Over and above the usual subject matter of such reports, the report is to dwell in the greatest possible detail compatible

with the above Terms of Reference and with Contractor's length of stay in Mauritania, on issues of the infrastructure, existing and to be built, required for the industrialization of the heavy mineral sands of the Mauritanian littoral, including especially the availability of washing water for the concentrator.

10. The Report should include a separate chapter on detailed recommendations for further work, which appears most reasonable as an organic continuation of Phase II. These recommendations should be supplemented by a budget estimate.

D. General Time Schedule

The General Time Schedule is as follows: — Time and Duration

(a) Invitation of bids for the preparation of the scout prospecting, selection of a consulting firm, signing of a contract.	May - July 1980
(b) Hiring/procurement of 3 lorries for the Contractor's field work.	August 1980
(c) Tripartite discussions in Nouackchott on the detailed work programme to be implemented.	September 1980
(d) Work schedule for contractor's activities:	September 1980 - August 1981
i) evaluation of all available information on previous prospecting and testing of the black sands;	September 1980
ii) identification of those minerals which are responsible for radioactivity in the beach sands; performance of a detailed field scintillometer survey of 4 to 5 promising deposits in a density sufficient to permit the tracing of isorad maps; follow-up of the survey by surface sampling with a view of establishing a correlation between scintillometry readings and mineralization; implementation of geomagnetic survey in the area covered by the scintillometer survey so as to try to establish a correlation between the two methods;	September 1980 - October 1980

iii) geophysical survey of the promising sections of the Mauritanian littoral; November 1981

iv) performance of experimental runs with a scintillometer and/or a magnetometer carried in a boat in order to find out whether off-shore concentration of heavy minerals in shoal water can be identified by one of those methods; November 1981

v) carrying out, in some five of the most promising zones of the Mauritanian littoral, a three-months drilling campaign using one suitable light (banka-type) drill capable of drilling to a depth of about 20 m at a diameter of about 10 cm in loose or little consolidated sediment (total meterage drilled should be 315 m at the least) November 1980 - January 1981

vi) setting up a temporary laboratory at Nouakchott for the study of the samples taken under para (v) September - October 1980

vii) Contractor's home office work on laboratory testing and preparation of a comprehensive final report containing both the analysis of work under paras (i) to (vii) as regards their impact on the reserves picture and the matters related to the possible industrialization of the black sands as well as detailed recommendations on further work as organic continuation of phase II with a budget estimate. February - April 1981

(e) Discussion in Nouakchott on the draft final report with participation of selected member of a contractor team and UNIDO's team. May 1981

(f) Submission of the Government's and UNIDO's comments on the draft final report to the Contractor. June 1981

(g) Elaboration of the Government's and UNIDO's comments and submission of the final report by the Contractor. July 1981

E. Personnel in the Field

Contractor's team should comprise three expatriate personnel:

- one geologist well versed in micromineralogy, with experience in beach sand prospection, to act as Contractor's Project Manager,
- one geophysist with field survey experience in remote areas, well versed in radiometry, and capable of conducting a magnetometer survey, also borehole sitting and elementary surveying,
- one drilling foreman with experience in Banka-type drilling in remote areas.

The field work is envisaged to take 80 to 90 days. The rest of the work/preparations, wind-up, and report writing and presentation should take two months at the most.

F. Language Requirements

All three persons should speak good French. The geologist and geophysicists should be able to write and edit reports in French.

G. Reports

1. The contractor will prepare a Draft Final Report for comments by UNIDO's Metallurgical Industries Section and take into account those comments in preparing his Final Report. The Draft Final Report is to be submitted to UNIDO in three copies in French and one copy in English.

2. The contractor will prepare and submit his Final Report in ten copies in French and three copies in English.

H. Provision of Services and Equipment

The contractor is to work in close co-operation with the Mauritanian mining company Société Nationale Industrielle et Minière (SNIM), which will act as the Government-designated counterpart organization. The contributions of the two parties will be as follows.

/i/ Expert services. The contractor will provide the experts enumerated in para (E) of the Terms of Reference.

/ii/ SNIM will provide office and lab space, secretarial and copying services, as appropriate, for backstopping the contractor's activities under the Contract.

/iii/ SNIM will provide local personnel.

/iv/ Preparation of bulk and monomineralic samples and of combined monomineralic samples to be performed by the contractor.

/v/ Testing of samples to be performed by contractor.

/vi/ Laboratory equipment to be provided by contractor, except for the microscopes, which are to be furnished by SNIM.

/vii/ Vehicles, to be used also for the local transport of contractor's experts, also fuel and maintenance, to be provided by contractor. Drivers to be provided by SNIM.

/viii/ Petty field mission equipment including camping gear to be provided by SNIM.

/ix/ Prospecting and sampling toools and equipment including the drill rig to be provided by the contractor.

/x/ Geophysical survey instruments to be provided by the contractor.

/xi/ Packaging, local and overseas transport and freight of samples, postal services, etc. to be performed/provided by SNIM.

/xii/ A Zodiac type inflatable rubber raft to be provided by SNIM for one month.

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Tableau 1/1
Table

RESULTATES D'ANALYSE GRANULOMÉTRIQUE ET DE SÉPARATION DANS LES LIQUIDES LOURDS DES SABLES PRELEVES DES SONDAGES DE LA RÉGION DE T Â N I T

RESULTS OF GRAIN SIZE ANALYSIS AND HEAVY LIQUID SEPARATION OF SANDS FROM BOREHOLES IN THE REGION OF T Â N I T

Borehole / Sondage T O

a/ admission / feed
b/ fraction + 0.8mm
c/ fraction + 0.4mm
d/ fraction + 0.2mm
e/ fraction + 0.06mm
f/ total fraction de sable / total sand fraction
g/ fraction de vase et d'argile / silt and clay fraction

Echantillon No / Sample No		Analyse granulométrique / Grain size analysis – rendement / yield		Séparation dans les liquides denses / Heavy liquid separation – Fraction lourde / Heavy fraction – rendement / yield		Fraction légère / Light fraction – rendement / yield		Rendement total / Total yield – rendement / yield		Recouperation / Recovery	Remarks / Remarques
		g	%	g	%	g	%	g	%	%	
1	2	3	4	5	6	7	8	9	10	11	12
T 0/1	a/	49.93	100.00								
	b/	3.76	7.35	ns	-	3.76	7.53	3.76	7.53		
	c/	7.51	15.04	0.02	0.04	7.43	14.88	7.45	14.92	99.20	
	d/	27.57	55.22	0.41	0.82	26.75	53.58	27.16	54.40	98.51	MS[1]/see tab. 3/
	e/	10.44	20.91	1.42	2.84	8.88	17.78	10.30	20.62	98.66	MS[1]/voir tab. 3/
	f/	49.28	98.70	1.85	3.70	46.82	93.77	48.67	97.47		
	g/	0.65	1.30	ns	-	-	-	-	-		
T 0/2	a/	49.90	100.00								
	b/	3.77	7.56	ns	-	3.77	7.56	3.77	7.56		
	c/	6.80	13.63	0.04	0.08	6.68	13.39	6.72	13.47	98.82	MI/il+ga,ep,py,si,mo/
	d/	27.27	54.64	0.21	0.42	26.81	53.73	27.02	54.15	99.08	MS[1]
	e/	10.96	21.96	1.25	2.51	9.61	19.26	10.86	21.77	99.09	MS[1]
	f/	48.80	97.79	1.50	3.01	46.87	93.94	48.37	96.95		
	g/	1.10	2.21	ns	-	-	-	-	-		
T 0/3	a/	49.89	100.00								
	b/	1.97	3.95	ns	-	1.97	3.95	1.97	3.95		
	c/	7.21	14.45	0.00	0.00	7.20	14.43	7.20	14.43	99.86	
	d/	32.18	64.50	0.06	0.12	32.02	64.18	32.08	64.30	99.69	
	e/	7.90	15.83	0.10	0.20	7.47	14.97	7.57	15.17	95.82	MI/[illegible] 60,ep,di,si,[illegible] le,tu,ru,st,py,am/
	f/	49.26	98.73	0.16	0.32	48.66	97.53	48.82	97.85		
	g/	0.63	1.27	ns	-	-	-	-	-		
-		-	-		-		-		-		

1	2	3	4	5	6	7	8	9	10	11	12
T 0/4	a/	49.93	100.00								MI /op.m: 45,ep,le,si,di,st,ga/
	b/	1.47	2.94	ns	–	1.47	2.94	1.47	2.94		
	c/	6.27	12.56	0.00	0.00	6.22	12.46	6.22	12.46	99.20	
	d/	31.94	63.97	0.06	0.12	31.32	62.73	31.38	62.85	98.25	
	e/	9.90	19.83	0.14	0.28	9.22	18.47	9.36	18.75	94.55	
	f/	49.58	99.30	0.20	0.40	48.23	96.60	48.43	97.00		
	g/	0.35	0.70	ns	–	–	–	–	–		
T 0/5	a/	49.93	100.00								
	b/	2.92	5.85	ns	–	2.92	5.85	2.92	5.85		
	c/	10.85	21.73	0.01	0.02	10.75	21.53	10.76	21.55	99.17	
	d/	28.30	56.68	0.01	0.02	28.21	56.50	28.22	56.52	99.72	
	e/	6.34	12.70	0.05	0.10	6.19	12.40	6.24	12.50	98.42	
	f/	48.41	96.96	0.07	0.14	48.07	96.28	48.14	96.42		
	g/	1.52	3.04	ns	–	–	–	–	–		
T 0/6	a/	50.02	100.00								
	b/	4.31	8.62	ns	4.31	8.62		4.31	8.62	–	
	c/	12.31	24.61	0.00	0.00	12.12	24.23	12.12	24.23	98.46	
	d/	27.27	54.52	0.02	0.04	27.00	53.98	27.02	54.02	99.08	
	e/	4.88	9.76	0.02	0.04	4.78	9.56	4.80	9.60	98.36	
	f/	48.77	97.51	0.04	0.08	48.21	96.39	48.25	46.47		
	g/	1.25	2.49	ns	–	–	–	–	–		
T 0/7	a/	49.93	100.00								
	b/	3.28	6.57	ns	–	3.28	6.57	3.28	6.57	–	
	c/	7.34	14.70	0.01	0.02	7.24	14.50	7.25	14.52	98.77	
	d/	29.61	59.30	0.01	0.02	29.19	58.46	29.20	58.48	98.62	
	e/	9.17	18.37	0.02	0.04	8.92	17.87	8.94	17.91	97.49	
	f/	49.40	98.94	0.04	0.08	48.63	97.40	48.67	97.48		
	g/	0.53	1.06	ns	–	–		–	–		
T 0/8	a/	49.93	100.00								
	b/	4.69	9.39	ns	–	4.69	9.39	4.69	9.39		
	c/	8.31	16.64	0.00	0.00	8.10	16.22	8.10	16.22	97.47	
	d/	27.99	56.06	0.04	0.08	27.17	54.42	27.17	54.42	97.21	
	e/	8.31	16.64	0.03	0.06	8.19	16.40	8.22	16.46	98.92	
	f/	49.30	98.73	0.07	0.14	48.15	96.43	48.22	96.57		
	g/	0.63	1.27	ns	–	–	–	–	–		
0/9	a/	199.91	100.00								
	b/	7.59	3.80	ns	–	7.59	3.80	7.59	3.80		
	c/	30.52	15.27	0.02	0.01	30.04	15.03	30.06	15.04	98.49	
	d/	138.58	69.32	0.07	0.03	135.85	67.96	135.92	67.99	98.08	
	e/	21.35	10.68	0.11	0.06	21.01	10.51	21.12	10.56	98.92	
	f/	198.04	99.07	0.20	0.10	194.49	97.30	194.69	97.40		
	g/	1.87	0.93	ns	–	–	–	–	–		
T 0/10	a/	199.84	100.00								MI/ op.m. 45,py,am,ga,le,si,sil,tu,ru/
	b/	2.58	1.29	ns	–	2.58	1.29	2.58	1.29		
	c/	8.51	4.26	0.01	0.01	8.39	4.20	8.40	4.21	98.71	
	d/	46.56	23.30	0.04	0.02	44.59	22.31	44.63	22.33	95.85	
	e/	136.58	68.34	0.35	0.17	134.42	67.26	134.77	67.43	98.67	
	f/	194.23	97.19	0.40	0.20	189.98	95.06	190.38	95.26		
	g/	5.61	2.81	ns	–	–	–	–	–		

1	2	3	4	5	6	7	8	9	10	11	12
T 0/11	a/	199.81	100.00								
	b/	0.35	0.26	ns	-	0.53	0.26	0.53	0.26		
	c/	2.61	1.31	0.01	0.01	2.57	1.29	2.58	1.30	98.85	
	d/	18.11	9.06	0.06	0.03	17.93	8.97	17.99	9.00	99.34	
	e/	172.42	86.29	0.36	0.18	169.69	84.93	170.05	85.11	98.63	MI/.cu.m, 50,py,am ,tu, ru,zi,sil,mo,ga/
	f/	193.67	96.92	0.43	0.22	190.72	95.45	191.15	95.67		
	g/	6.14	3.08	ns	-	-	-	-	-		
T 0/12	a/	99.89	100.00								
	b/	5.54	5.55	ns	-	5.54	5.55	5.54	5.55		
	c/	22.93	22.96	0.01	0.01	21.88	21.90	21.89	21.91	95.46	
	d/	42.99	43.04	0.02	0.02	41.99	42.04	42.01	42.06	97.72	
	e/	25.53	25.56	0.08	0.08	24.86	24.89	24.94	24.97	97.69	
	f/	96.99	97.11	0.11	0.11	94.27	94.38	94.38	94.49		
	g/	2.90	2.89	ns	-	-	-	-	-		

Tableau / Table 1/4

RESULTATES D'ANALYSE GRANULOMETRIQUE ET DE SEPARATION DANS LES LIQUIDES LOURDS DES SABLES PRELEVES DES SONDAGES DE LA REGION DE T Â N I T

RESULTS OF GRAIN SIZE ANALYSIS AND HEAVY LIQUID SEPARATION OF SANDS FROM BOREHOLES IN THE REGION OF T Â N I T

Borehole / Sondage T 1

Echantillon No / Sample No		Analyse granulométrique / Grain size analysis: a/ admission / feed; b/ fraction +0.8mm; c/ fraction +0.4mm; d/ fraction +0.2mm; e/ fraction +0.06mm; f/ total fraction de sable / total sand fraction; g/ fraction de vase et d'argile / silt and clay fraction		Séparation dans les liquides denses / Heavy liquid separation: Fraction lourde / Heavy fraction		Fraction légère / Light fraction		Rendement total / Total yield		Récupération / Recovery	Remarks / Remarques
		rendement / yield		rendement / yield		rendement / yield		rendement / yield			
		g	%	g	%	g	%	g	%	%	
1	2	3	4	5	6	7	8	9	10	11	12
T 1/1	a/	49.99	100.00								
	b/	4.65	9.31	ns	-	4.65	9.31	4.65	9.31		
	c/	9.19	18.38	0.00	0.00	9.16	18.32	9.16	18.32	99.67	
	d/	27.69	55.39	0.02	0.04	27.65	55.31	27.67	55.35	99.93	MS^2/see tab. 3../
	e/	7.83	15.66	1.02	2.04	6.78	13.56	7.80	15.60	99.62	MS^2/voir tab.. 3./
	f/	49.36	98.74	1.04	2.08	48.24	96.50	49.28	98.58		
	g/	0.63	1.26	ns	-	-	-	-	-		
T 1/2	a/	49.93	100.00								
	b/	8.57	17.16	ns	-	8.57	17.16	8.57	17.16		
	c/	5.83	11.68	0.00	0.00	5.79	11.60	5.79	11.60	99.31	
	d/	24.15	48.45	0.15	0.30	23.87	47.81	24.02	48.11	99.30	MS^2 /see tab.3/
	e/	9.75	19.13	0.55	1.10	8.83	17.68	9.38	18.78	96.21	MS^2/ voir tab. 3/
	f/	48.34	96.82	0.70	1.40	47.06	94.25	47.76	95.65		
	g/	1.59	3.18	ns	-	-	-	-	-		
T 1/3	a/	49.96	100.00								
	b/	2.81	5.62	ns	-	2.81	5.62	2.81	5.62		
	c/	6.19	12.39	0.01	0.02	6.15	12.31	6.16	12.33	99.51	
	d/	28.53	57.11	0.29	0.58	27.92	55.88	28.21	56.46	98.88	MS^2
	e/	10.86	21.74	0.88	1.76	9.10	18.21	9.98	19.97	91.90	MS^2
	f/	48.39	96.86	1.18	2.36	45.98	92.02	47.16	94.36		
	g/	1.57	3.14	ns	-	-	-	-	-		
-			-			-		-		-	

Tableau / Table 1/5 Borehole / Sondage T 1

1	2	3	4	5	6	7	8	9	10	11	12
T 1/4	a/	49.98	100.00								
	b/	2.48	4.97	ns	-	2.48	4.97	2.48	4.97		
	c/	5.70	11.40	0.00	0.00	5.68	11.36	5.68	11.36	99.65	
	d/	26.67	57.36	0.19	0.38	28.25	56.52	28.44	56.90	99.20	MQ^2 / see tab.3/
	e/	11.84	23.69	0.69	1.38	10.47	20.95	11.16	22.33	94.26	MQ^2 /voir tab.3/
	f/	48.69	97.42	0.88	1.76	46.88	93.80	47.76	95.56		
	g/	1.29	2.58	ns	-	-	-	-	-		
T 1/5	a/	49.93	100.00								
	b/	2.77	5.55	ns	-	2.77	5.55	2.77	5.55		
	c/	7.01	14.04	0.00	0.00	7.00	14.02	7.00	14.02	99.86	
	d/	28.26	56.60	0.04	0.08	28.16	56.40	28.20	56.48	99.79	
	e/	11.16	22.35	0.12	0.34	10.85	21.73	11.02	22.07	98.74	MI /'op.m. 50,ga,si, ru,tu,di/
	f/	49.20	98.54	0.21	0.42	48.78	97.70	48.99	98.12		
	g/	0.73	1.46	ns	-	-	-	-	-		
T 1/6	a/	49.92	100.00								
	b/	2.37	4.75	ns	-	2.37	4.75	2.37	4.75		
	c/	7.36	14.74	0.00	0.00	7.33	14.68	7.33	14.68	99.59	
	d/	29.54	59.17	0.05	0.10	29.40	58.89	29.45	58.99	99.69	
	e/	10.08	20.19	0.16	0.32	9.76	19.55	9.92	19.87	98.41	MI/ op.m. 50,tu,ga,si, ep,st,py/
	f/	49.35	98.85	0.21	0.42	48.86	97.87	49.07	98.29		
	g/	0.57	1.15	ns	-	-	-	-	-		
T 1/7	a/	50.01	100.00								
	b/	1.96	3.92	ns	-	1.96	3.92	1.96	3.92		
	c/	4.72	9.44	0.00	0.00	4.72	9.44	4.72	9.44	100.00	
	d/	30.48	60.95	0.01	0.02	30.43	60.85	30.44	60.87	99.87	
	e/	11.41	22.82	0.08	0.16	11.24	22.48	11.32	22.64	99.21	
	f/	48.57	97.13	0.09	0.18	48.35	96.69	48.44	96.87		
	g/	1.44	2.87	ns							
T 1/8	a/	50.27	100.00								
	b/	2.61	5.19	ns	-	2.61	5.19	2.61	5.19		
	c/	9.15	18.20	0.00	0.00	9.14	18.18	9.14	18.18	99.89	
	d/	29.42	58.52	0.01	0.02	29.32	58.33	29.33	58.35	99.69	-
	e/	7.57	15.06	0.02	0.04	7.50	14.92	7.52	14.96	99.34	
	f/	48.75	96.97	0.03	0.06	48.57	96.62	48.60	96.68		
	g/	1.52	3.03	ns	-	-	-	-	-		
T 1/9	a/	199.85	100.00								
	b/	10.55	5.28	ns	-	10.55	5.28	10.55	5.28		
	c/	39.41	19.72	0.01	0.01	39.40	19.71	39.41	19.72	100.00	
	d/	110.61	55.35	0.05	0.03	110.44	55.26	110.49	55.29	99.89	
	e/	31.17	15.60	0.26	0.13	30.64	15.33	30.79	15.46	98.78	MI/op.m. 30,tu 20,s: ga,ep,ru,bi,st/
	f/	191.74	95.95	0.32	0.17	191.03	95.58	191.35	95.75		
	g/	8.11	4.05	ns	-	-	-	-	-		
T 1/10	a/	199.76	100.00								
	b/	12.42	6.22	ns		12.42	6.22	12.42	6.22		
	c/	44.76	22.41	0.01	0.01	44.69	22.37	44.70	22.38	99.86	
	d/	104.99	52.56	0.05	0.03	104.75	52.44	104.80	52.47	99.82	
	e/	29.41	14.72	0.15	0.08	28.86	14.46	29.14	14.54	99.08	MI/op.m. 30,tu,ep,s: ru,co,mo/
	f/	191.58	95.51	0.21	0.12	190.74	95.49	190.95	95.61		
	g/	8.18	4.49	ns	-	-	-	-	-		

1	2	3	4	5	6	7	8	9	10	11	12
T 1/11	a/	199.41	100.00								
	b/	13.96	7.00	ns	-	13.96	7.00	13.96	7.00		
	c/	35.88	17.99	0.01	0.01	35.84	17.97	35.85	17.98	99.92	
	d/	87.27	43.76	0.02	0.01	87.21	43.73	87.23	43.74	99.95	
	e/	54.22	27.19	0.23	0.12	53.73	26.94	53.96	27.06	99.52	MI/op.m. 40,tu,si,ep, ga,ru,at,mo/
	f/	191.33	95.94	0.26	0.14	190.74	95.64	191.00	95.78		
	g/	8.08	4.06	ns	-	-	-	-	-		
T 1/12	a/	199.91	100.00								
	b/	19.48	9.74	ns	-	19.48	9.74	19.48	9.74		
	c/	32.06	16.04	0.02	0.01	31.98	16.00	32.00	16.01	99.81	
	d/	71.42	35.73	0.03	0.01	71.31	35.67	71.34	35.68	99.89	
	e/	67.78	33.91	0.25	0.13	67.28	33.66	67.53	33.79	99.63	
	f/	190.74	95.42	0.30	0.15	190.05	95.07	190.35	95.22		
	g/	9.17	4.58	ns	-	-	-	-	-		

Tableau
Table 1/7

RESULTATES D'ANALYSE GRANULOMETRIQUE ET DE SEPARATION DANS LES LIQUIDES LOURDS DES SABLES PRELEVES DES SONDAGES DE LA REGION DE T Â N I T

RESULTS OF GRAIN SIZE ANALYSIS AND HEAVY LIQUID SEPARATION OF SANDS FROM BOREHOLES IN THE REGION OF T Â N I T

Borehole / Sondage T 2

Echantillon No / Sample No	Analyse granulometrique / Grain size analysis: a/ admission / feed; b/ fraction +0.8mm; c/ fraction +0.4mm; d/ fraction +0.2mm; e/ fraction +0.06mm; f/ total fraction de sable / total sand fraction; g/ fraction de vase et d'argile / silt and clay fraction	rendement / yield g	rendement / yield %	Separation dans les liquides denses / Heavy liquid separation: Fraction lourde / Heavy fraction — rendement / yield g	%	Fraction legere / Light fraction — rendement / yield g	%	Rendement total / Total yield — rendement / yield g	%	Recuperation / Recovery %	Remarques / Remarks
1	2	3	4	5	6	7	8	9	10	11	12
T2/1	a/	50.04	100.00								
	b/	3.53	7.05	ns	-	3.53	7.05	3.53	7.05		
	c/	15.40	30.78	0.05	0.10	15.34	30.66	15.39	30.76	99.94	MI /ga 60,il,ep,di,mo,
	d/	26.57	53.10	0.79	1.58	25.34	50.64	26.13	52.22	98.34	MIQ /see tab. .2./
	e/	4.02	8.03	1.07	2.14	2.93	5.86	4.00	8.00	99.50	MS3 /see tab. .3./
	f/	49.55	98.95	1.91	3.82	47.14	94.21	49.05	98.03		/voir tab.2/ /voir tab.3/
	g/	0.49	1.04	ns	-	-	-	-	-		
T 2/2	a/	50.01	100.00								
	b/	0.33	0.66	ns	-	0.33	0.66	0.33	0.66		/voir tab.2/
	c/	3.16	6.32	0.01	0.02	3.14	6.28	3.15	6.30	99.68	
	d/	34.00	67.99	0.52	1.04	33.36	66.71	33.88	67.75	99.65	MIQ /see tab. .2./
	e/	11.44	22.88	1.50	3.00	9.87	19.74	11.37	22.74	99.39	MS3 /
	f/	48.93	97.85	2.03	4.06	46.70	93.39	48.73	97.45		
	g/	1.08	2.15	-	-	-	-	-	-		
T 2/3	a/	50.00	100.00								
	b/	0.30	0.60	ns	-	0.30	0.60	0.30	0.60		/voir tab.2/
	c/	2.98	5.96	0.01	0.02	2.96	5.92	2.97	5.94	99.66	
	d/	34.18	68.36	0.55	1.10	3.40	66.80	33.95	67.90	99.33	MIQ /see tab. 2../
	e/	12.01	24.02	1.67	3.34	10.21	20.42	11.88	23.76	98.92	MS3
	f/	49.47	98.94	2.23	4.46	46.87	93.74	49.10	98.20		
	g/	0.53	1.06	ns	-	-	-	-	-		
-		-		-		-	-		-		

Tableau / Table 1/8 Borehole / Sondage T 2

1	2	3	4	5	6	7	8	9	10	11	12
T 2/4	a/	50.03	100.00								
	b/	0.31	0.62	ns		0.31	0.62	0.31	0.62		
	c/	1.85	3.70	0.00	0.00	1.85	3.70	1.85	3.70	100.00	
	d/	27.15	54.27	0.04	0.08	26.81	53.59	26.85	53.67	98.90	
	e/	19.30	38.58	0.13	0.26	19.01	38.00	19.14	38.26	99.17	MS³
	f/	48.61	97.17	0.17	0.34	47.98	95.91	48.15	96.25		
	g/	1.42	2.83								
T 2/5	a/	50.01	100.00								
	b/	1.12	0.56	ns	-	1.12	0.56	1.12	0.56		
	c/	1.96	3.92	0.00	0.00	1.95	3.90	1.95	3.90	99.49	
	d/	27.27	54.54	0.05	0.10	27.19	54.38	27.24	54.48	99.89	
	e/	18.69	37.38	0.17	0.34	18.43	36.86	18.60	37.20	99.52	
	f/	48.48	96.94	0.22	0.44	48.13	96.26	48.35	96.70		
	g/	1.53	3.96	ns	-	-	-	-	-		
T 2/6	a/	49.97	100.00								
	b/	2.23	4.46	ns		2.23	4.46	2.23	4.46		
	c/	10.97	21.95	0.01	0.02	10.96	21.93	10.97	21.95	100.00	
	d/	28.97	57.97	0.02	0.04	28.58	57.19	28.60	57.23	98.72	
	e/	7.05	14.11	0.04	0.08	7.00	14.01	7.04	14.09	99.93	
	f/	49.22	98.49	0.07	0.14	48.77	97.59	48.84	97.73		
	g/	0.75	1.52	ns	-	-	-	-	-		
T 2/7	a/	49.98	100.00								
	b/	4.34	8.68	ns	-	4.34	8.68	4.34	8.68		
	c/	11.40	22.81	0.00	0.00	11.38	22.77	11.38	22.77	99.82	
	d/	23.91	47.84	0.03	0.06	23.81	47.64	23.84	47.70	99.71	
	e/	8.90	17.81	0.08	0.16	8.77	17.55	8.85	17.71	99.44	
	f/	48.55	97.14	0.11	0.22	48.30	96.64	48.41	96.86		
	g/	1.43	2.86	ns	-	-	-	-	-		
T 2/8	a/	49.96	100.00								
	b/	7.61	15.23	ns	-	7.61	15.23	7.61	15.23		
	c/	12.15	24.32	0.00	0.00	12.13	24.28	12.13	24.28	99.84	
	d/	19.26	38.55	0.05	0.10	19.10	38.23	19.15	38.33	99.43	
	e/	7.47	14.95	0.15	0.30	7.25	14.51	7.40	14.81	99.06	
	f/	46.49	93.05	0.20	0.40	46.09	92.25	46.29	92.65		
	g/	3.47	6.95								
T 2/9	a/	200.03	100.00								
	b/	30.54	15.27	ns	-	30.54	15.27	30.54	15.27		
	c/	80.39	40.19	0.01	0.01	80.09	40.04	80.10	40.05	99.64	
	d/	64.10	32.05	0.05	0.02	63.70	31.85	63.75	31.87	99.45	
	e/	18.87	9.43	0.13	0.06	18.52	9.26	18.65	9.32	98.83	
	f/	193.90	96.94	0.19	0.09	192.85	96.42	193.04	96.51		
	g/	5.06	3.06	-	-	-	-	-	-		
T 2/10	a/	199.93	100.00								
	b/	44.85	28.95	ns	-	22.43	44.85	22.43	44.85		
	c/	57.87	28.95	0.02	0.01	54.48	28.75	57.50	28.76	99.36	
	d/	65.77	32.90	0.10	0.05	65.03	32.54	65.15	32.59	99.06	
	e/	24.42	12.21	0.31	0.16	23.64	11.82	23.95	11.98	98.06	MI/op.m. 60,si,ga,am ap,tu,di,st,ru/
	f/	192.91	96.49	0.43	0.22	191.02	95.54	191.45	95.76		
	g/	3.51	7.02	ns	-	-	-	-	-		

1	2	3	4	5	6	7	8	9	10	11	12
T 2/11	a/	199.82	100.00								
	b/	28.69	14.36	ns	–	28.69	14.36	28.69	14.36		
	c/	62.82	31.44	0.02	0.01	62.28	31.17	62.30	31.18	99.17	
	d/	70.25	35.16	0.08	0.04	69.67	34.87	69.75	34.91	99.29	
	e/	28.79	14.41	0.14	0.07	27.85	13.94	28.15	14.09	97.78	–
	f/	190.55	95.37	0.24	0.12	188.65	94.42	188.89	94.54		
	g/	9.27	4.63	ns	–	–	–	–	–		
T 2/12	a/	199.51	100.00								
	b/	25.75	12.91	ns	–	25.75	12.91	25.75	12.91	–	
	c/	57.42	28.78	0.01	0.01	56.88	28.51	56.89	28.52	99.08	
	d/	82.32	41.26	0.03	0.01	81.62	40.91	81.65	40.93	99.19	
	e/	22.84	11.45	0.06	0.03	22.03	11.04	22.09	11.07	96.72	
	f/	188.33	94.40	0.10	0.05	186.28	93.37	186.38	93.42		
	g/	11.18	5.60	ns	–	–	–	–	–		
T 2/13	a/	149.72	100.00							–	
	b/	18.47	12.34	ns	–	18.47	12.34	18.47	12.34		
	c/	34.86	23.28	0.01	0.01	34.49	23.04	34.50	23.05	99.97	
	d/	78.32	52.31	0.02	0.01	77.13	51.52	77.15	51.23	98.51	
	e/	13.80	9.22	0.05	0.03	13.40	8.95	13.45	8.98	97.46	
	f/	145.45	97.15	0.08	0.05	143.49	95.85	143.57	95.90		
	g/	4.27	2.85	ns	–	–	–	–	–		

Tableau / Table 1/10

RESULTATES D'ANALYSE GRANULOMETRIQUE ET DE SEPARATION DANS LES LIQUIDES LOURDS DES SABLES PRELEVES DES SONDAGES DE LA REGION DE T Â N I T

RESULTS OF GRAIN SIZE ANALYSIS AND HEAVY LIQUID SEPARATION OF SANDS FROM BOREHOLES IN THE REGION OF T Â N I T

Borehole / Sondage T 3

Echantillon No / Sample No	Analyse granulometrique / Grain size analysis: a/ admission / feed; b/ fraction + 0.8mm; c/ fraction + 0.4mm; d/ fraction + 0.2mm; e/ fraction + 0.06mm; f/ total fraction de sable / total sand fraction; g/ fraction de vase et d'argile / silt and clay fraction	rendement / yield		Separation dans les liquides denses / Heavy liquid separation: Fraction lourde / Heavy fraction — rendement / yield		Fraction legère / Light fraction — rendement / yield		Rendement total / Total yield — rendement / yield		Recuperation / Recovery	Remarks / Remarques
		g	%	g	%	g	%	g	%	%	
1	2	3	4	5	6	7	8	9	10	11	12
T 3/1	a/	49.96	100.00								
	b/	0.21	0.42	ns	-	0.21	0.42	0.21	0.42		
	c/	5.96	11.93	0.01	0.02	5.94	11.89	5.95	11.91	99.83	
	d/	35.28	70.62	0.91	1.82	33.88	67.81	24.79	69.93	98.81	MS[4]/see tab. 3../
	e/	7.85	15.71	0.99	1.98	6.76	13.53	7.75	15.51	98.73	MS[4]/voir tab.3/
	f/	49.30	98.68	1.91	3.82	46.79	93.65	48.70	97.47		
	g/	0.66	1.32	ns	-	-	-	-	-		
T 3/2	a/	49.99	100.00								
	b/	0.26	0.52	ns	-	0.26	0.52	0.26	.0.52		
	c/	3.00	6.00	0.00	0.00	3.00	6.00	3.00	6.00	100.00	
	d/	28.98	57.97	0.31	0.62	28.49	56.99	28.80	57.61	99.38	MS[4]
	e/	16.17	32.35	1.20	2.40	14.85	29.81	16.05	32.11	99.26	MS[4]
	f/	48.41	96.84	1.51	3.02	46.60	93.22	48.11	96.24		
	g/	1.58	3.16	ns	-	-	-	-	-		
T 3/3	a/	49.97	100.00								
	b/	2.08	4.16	ns	-	2.08	4.16	2.08	4.16		
	c/	5.20	10.41	0.02	0.00	5.16	10.32	5.16	10.32	99.23	
	d/	25.77	51.57	0.04	0.08	25.71	51.45	25.75	51.53	99.92	
	e/	16.12	32.26	0.14	0.28	15.82	31.66	15.96	31.94	99.01	
	f/	49.17	98.40	0.18	0.36	48.77	97.59	48.95	97.95		
	g/	8.80	1.60	ns	-	-	-	-	-		
-		-		-		-	-		-		

1	2	3	4	5	6	7	8	9	10	11	12
T 3/4	a/	49.98	100.00								
	b/	3.45	6.90	ns	-	3.45	6.90	3.45	6.90		
	c/	6.70	13.41	0.00	0.00	6.70	13.41	6.70	13.41	100.00	
	d/	25.27	50.56	0.05	0.10	25.01	50.04	25.06	50.14	99.17	
	e/	13.88	27.77	0.17	0.34	13.31	26.33	13.48	26.57	97.12	
	f/	49.30	98.64	0.22	0.44	48.39	96.52	48.61	96.96		
	g/	0.68	1.32	-	-	-	-	-	-		
T 3/5	a/	49.98	100.00								
	b/	8.27	16.55	ns	-	8.27	16.55	8.27	16.55		
	c/	9.56	19.12	0.00	0.00	9.55	19.11	9.55	19.11	99.90	
	d/	22.92	45.86	0.04	0.08	22.81	45.64	22.85	45.72	99.69	
	e/	7.85	15.71	0.12	0.24	7.60	15.21	7.72	15.45	98.34	
	f/	48.60	97.25	0.16	0.32	48.23	96.51	48.39	96.83		
	g/	1.38	2.75	ns	-	-	-	-	-		
T 3/6	a/	49.97	100.00								
	b/	5.67	11.35	ns	-	5.67	11.35	5.67	11.35		
	c/	8.50	17.01	0.00	0.00	8.49	16.99	8.49	16.99	99.38	
	d/	25.39	50.81	0.04	0.08	25.31	50.65	25.35	50.73	99.84	
	e/	9.17	18.35	0.12	0.24	9.00	18.01	9.12	18.25	99.45	
	f/	48.73	97.52	0.16	0.32	48.47	97.00	48.63	97.32		
	g/	1.24	2.48	ns	-	-	-	-	-		
T 3/7	a/	49.97	100.00								
	b/	5.17	10.35	ns	-	5.17	10.35	5.17	10.35		
	c/	16.97	33.96	0.00	0.00	16.90	33.82	16.90	33.82	99.59	
	d/	24.07	48.17	0.00	0.00	24.04	48.11	24.04	48.11	99.86	
	e/	2.71	5.42	0.00	0.00	2.70	5.40	2.70	5.40	99.63	
	f/	48.92	97.90	0.00	0.00	48.81	97.68	48.81	97.68		
	g/	1.05	2.10	ns	-	-	-	-	-		
T 3/8	a/	49.94	100.00								
	b/	3.95	7.91	ns	-	3.95	7.91	3.95	7.91		
	c/	9.93	15.88	0.00	0.00	7.90	15.82	7.90	15.82	99.62	
	d/	26.76	53.58	0.03	0.06	26.49	53.04	26.52	53.10	99.10	
	e/	9.81	19.64	0.11	0.22	9.67	19.36	9.78	19.58	99.69	
	f/	48.45	97.01	0.14	0.28	48.01	96.13	48.15	96.41		
	g/	1.49	2.99	ns	-	-	-	-	-		
T 3/9	a/	199.72	100.00								
	b/	18.78	9.40	ns	-	18.78	9.40	18.78	9.40		
	c/	41.68	20.87	0.01	0.01	41.44	20.75	41.45	20.76	99.45	
	d/	92.26	46.19	0.06	0.03	91.39	45.76	91.45	45.79	99.12	
	e/	37.66	18.86	0.18	0.09	36.77	18.41	36.95	18.50	99.11	MI/ op.m. 50,ep,di,ga, le,am ,py,mo,tu/
	f/	190.38	95.32	0.25	0.13	188.38	94.32	188.63	94.45		
	g/	9.34	4.68	ns	-	-	-	-	-		
T 3/10	a/	199.88	100.00								
	b/	21.28	10.65	ns	-	-	-	-	-		
	c/	46.56	23.29	0.01	0.01	46.28	23.15	46.29	23.16	99.42	
	d/	95.65	47.85	0.07	0.03	95.03	47.54	95.10	47.57	99.42	
	e/	28.75	14.38	0.22	0.11	28.23	14.12	28.45	14.23	98.96	
	f/	192.24	96.17	0.30	0.15	190.82	95.46	191.12	95.61		
	g/	7.64	3.83	ns	-		-		-	-	

1	2	3	4	5	6	7	8	9	10	11	12
T 3/11	a/	199.88	100.00								
	b/	23.57	11.79	ns	-	23.57	11.79	23.57	11.79		
	c/	67.19	33.62	0.00	0.00	66.40	33.22	66.40	33.22	98.82	
	d/	84.36	42.21	0.02	0.01	83.62	41.84	83.64	41.85	99.15	
	e/	16.58	8.29	0.12	0.06	16.13	8.07	16.25	8.13	98.01	—
	f/	191.70	95.91	0.14	0.07	189.72	94.92	189.86	94.99		
	g/	8.18	4.09	ns	-	-	-	-	-		
T 3/12	a/	200.02	100.00								
	b/	59.91	29.75	ns	-	59.91	29.75	59.91	29.75		
	c/	93.97	46.98	0.02	0.01	93.36	46.68	93.38	46.69	99.37	
	d/	36.97	18.48	0.05	0.02	36.70	18.35	36.75	18.37	99.40	
	e/	5.49	2.74	0.11	0.06	5.23	2.61	5.34	2.67	97.27	
	f/	195.94	97.95	0.18	0.09	194.80	97.39	194.98	97.48		
	g/	4.08	2.05	ns	-	-	-	-	-		
T 3/13	a/	99.98	100.00								
	b/	29.79	29.79	ns	-	29.79	29.79	29.79	29.79		
	c/	44.48	44.49	0.01	0.01	44.10	44.11	44.11	44.12	99.17	
	d/	20.50	20.50	0.02	0.02	20.14	20.14	20.16	20.16	98.34	
	e/	2.66	2.66	0.02	0.02	2.58	2.58	2.60	2.60	97.74	
	f/	97.43	97.44	0.05	0.05	96.61	96.62	96.66	96.67	-	
	g/	2.55	2.56	ns	-	-	-	-	-	-	

RÉSULTATES D'ANALYSE GRANULOMÉTRIQUE ET DE SÉPARATION DANS LES LIQUIDES LOURDS DES SABLES PRELEVES DES SONDAGES DE LA REGION DE T Â N I T

RESULTS OF GRAIN SIZE ANALYSIS AND HEAVY LIQUID SEPARATION OF SANDS FROM BOREHOLES IN THE REGION OF T Â N I T

Borehole - T 4
Sondage

Echantillon No / Sample No		Analyse granulométrique / Grain size analysis: a/ admission feed; b/ fraction +0.8mm; c/ fraction +0.4mm; d/ fraction +0.2mm; e/ fraction +0.06mm; f/ total fraction de sable / total sand fraction; g/ fraction de vase et d'argile / silt and clay fraction — rendement yield g	%	Séparation dans les liquides denses / Heavy liquid separation — Fraction lourde / Heavy fraction — rendement yield g	%	Fraction legère / Light fraction — rendement yield g	%	Rendement total / Total yield — rendement yield g	%	Recouperation / Recovery %	Remarks / Remarques
1	2	3	4	5	6	7	8	9	10	11	12
T-4/1	a/	50.00	100.00								
	b/	0.50	1.00	ns	-	0.50	1.00	0.50	1.00		
	c/	5.25	10.50	0.01	0.02	5.20	10.40	5.21	10.42	99.23	si,ru/
	d/	31.63	63.26	0.45	0.90	31.00	62.00	31.45	62.90	99.43	MI/ga,op.m.,ep,di,py,s
	e/	10.78	21.56	0.82	1.64	9.61	19.22	10.43	20.86	96.75	MIQ /see tab. 2./
	f/	48.16	96.32	1.28	2.56	46.31	92.62	47.59	95.18		/voir tab.2/
	g/	1.84	3.68	ns	-		-	-	-		
T/4/2	a/	49.76	100.00	--							
	b/	0.94	1.89	ns	-	0.94	1.89	0.49	1.89		
	c/	3.48	6.99	0.00	0.00	3.44	6.91	3.44	6.91	98.85	
	d/	26.45	53.16	0.11	0.22	25.93	52.11	26.04	52.33	98.45	MI/ op.m, ep,ga,py,di/
	e/	17.79	35.75	0.21	0.42	17.11	34.39	17.32	34.81	97.36	MI/ op.m, ga,ep,si,tu, sil,di,py,sp/
	f/	48.66	97.79	0.32	0.64	47.42	95.30	47.74	95.94		
	g/	1.10	2.21	ns	-	-	-	-	-		
T 4/3	a/	49.99	100.00								
	b/	1.14	2.28	ns	-	1,14	2.28	1.14	2.28		
	c/	3.26	6.52	0.06	0.12	3.14	6.28	3.20	6.40	98.16	MI /ga,si/
	d/	26.62	53.25	0.05	0.10	26.09	52.19	26.14	52.29	98.20	
	e/	17.72	35.45	0.03	0.06	17.41	34.83	17.44	34.89	98.42	
	f/	48.74	97.50	0.14	0.28	47.78	95.58	47.92	95.86		
	g/	1.25	2.50	ns	-	-	-	-	-		
--		-	-		-		-	-	-		

1	2	3	4	5	6	7	8	9	10	11	12
T 4/4	a/	49.98	100.00								
	b/	1.47	2.94	ns	-	1.47	2.94	1.47	2.94		
	c/	3.23	6.46	0.00	0.00	3.20	6.40	3.20	6.40	99.07	
	d/	26.26	52.54	0.02	0.04	26.01	52.04	26.03	52.08	99.12	
	e/	17.66	35.33	0.03	0.06	17.50	35.01	17.53	35.07	99.26	
	f/	48.62	97.27	0.05	0.10	48.18	96.39	48.23	96.49		
	g/	1.36	2.73	ns	-	-	-	-	-		
T 4/5	a/	49.94	100.00								
	b/	2.98	5.97	ns	-	2.98	5.97	2.98	5.97		
	c/	3.43	6.87	0.00	0.00	3.35	6.71	3.35	6.71	97.67	
	d/	23.88	47.82	0.05	0.10	23.50	47.06	23.55	47.16	98.62	
	e/	18.43	36.90	0.03	0.06	18.16	36.36	18.19	36.42	98.70	
	f/	48.72	97.56	0.08	0.16	47.99	96.10	48.07	96.26		
	g/	1.22	2.44	ns	-	-	-	-	-		
T 4/6	a/	49.97	100.00								
	b/	2.55	5.10	ns	-	2.55	5.10	2.55	5.10		
	c/	4.30	8.61	-0.02	0.04	4.22	8.45	4.24	8.49	98.60	
	d/	23.42	96.87	0.03	0.06	23.06	46.15	23.09	46.21	98.59	
	e/	18.19	36.40	0.03	0.06	17.94	35.90	17.97	35.96	98.79	
	f/	48.46	96.98	0.08	0.16	97.77	95.60	97.85	95.76		
	g/	1.51	3.02	ns	-	-	-	-	-		
T 4/7	a/	49.96	100.00								
	b/	1.99	3.98	ns	-	1.99	3.98	1.99	3.98		
	c/	6.74	13.49	0.00	0.00	6.69	13.39	6.69	13.39	99.26	
	d/	27.47	54.98	0.03	0.06	27.31	54.66	27.34	54.72	99.53	
	e/	11.00	22.02	0.03	0.06	10.69	21.40	10.72	21.46	97.45	
	f/	47.20	94.47	0.06	0.12	46.68	93.43	96.74	93.55		
	g/	2.76	5.53	ns	-	-	-	-	-		
T 4/8	a/	49.99	100.00								
	b/	2.71	5.42	ns	-	2.71	5.42	2.71	5.42		
	c/	7.64	15.28	0.01	0.02	7.60	15.20	7.61	15.22	99.61	
	d/	27.94	55.89	0.05	0.10	27.68	55.37	27.73	55.47	99.25	/KI/ op.m. ga,ep/
	e/	8.58	17.16	0.03	0.06	0,33	16.66	8.36	16.72	97.44	
	f/	46.87	93.75	0.09	0.18	46.32	92.65	46.41	92.83		
	g/	3.12	6.25	ns	-	-	-	-	-		
T 4/9	a/	199.84	100.00								
	b/	20.84	10.43	ns	-	20.84	10.43	20.84	10.43		
	c/	49.06	24.55	0.01	0.01	48.52	24.28	48.53	24.29	98.92	
	d/	98.03	49.05	0.03	0.01	97.18	48.64	97.21	48.65	99.16	
	e/	23.32	11.67	0.02	0.01	23.04	11,53	23.06	11.54	98.89	
	f/	191.25	95.70	0.06	0.03	189.58	94.87	189.64	94.91		
	g/	8.59	4.30	ns	-	-	-	-	-		
-		-	-	-	-	-	-	-	-		

1	2	3	4	5	6	7	8	9	10	11	12
T 4/10	a/	199.62	100.00								MIQ /see tab. 2../ /voir tab.2/
	b/	26.20	13.12	ns	-	26.20	13.12	26.20	13.12		
	c/	59.63	29.87	0.02	0.01	59.32	29.72	59.34	29.73	99.51	
	d/	87.74	43.95	1.42	0.71	85.87	43.02	97.29	43.73	99.49	
	e/	17.88	8.96	0.02	0.01	17.48	8.76	17.50	8.77	97.87	
	f/	191.45	95.90	1.46	0.73	188.87	94.62	190.33	95.35		
	g/	8.17	4.10	ns	-	-	-	-	-		
T 4/11	a/	198.72	100.00								
	b/	15.98	8.03	ns	-	15.96	8.05	15.96	8.03		
	c/	57.88	29.13	0.02	0.01	57.15	28.76	57.17	28.77	98.77	
	d/	97.15	48.89	0.02	0.01	96.43	48.53	96.45	48.54	99.28	
	e/	16.99	8.55	0.00	0.00	16.66	8.38	16.66	8.38	98.06	
	f/	187.98	94.60	0.04	0.02	186.20	93.70	189.24	93.72		
	g/	10.74	5.40	ns	-	-	-	-	-		
T 4/12	a/	199.72	100.00								
	b/	13.52	6.77	ns	-	13.52	6.77	13.52	6.77		
	c/	58.34	29.21	-0.02	0.01	58.01	29.05	58.03	29.06	99.47	
	d/	111.18	55.67	0.03	0.02	109.97	55.06	110.00	55.08	98.94	
	e/	12.26	6.14	0.00	0.00	12.09	6.05	12.09	6.05	98.61	
	f/	195.30	97.79	0.05	0.03	193.59	96.93	193.64	96.96		
	g/	4.42	2.21	ns	-	-	-	-	-		
T 4/13	a/	148.81	100.00								
	b/	8.94	6.01	ns	-	8.94	6.01	8.94	6.01		
	c/	37.31	25.07	0.00	0.00	37.14	24.96	37.14	24.96	99.54	
	d/	91.55	61.52	0.02	0.01	91.00	61.15	91.02	61.16	99.42	
	e/	8.50	5.71	0.03	0.02	8.19	5.50	8.22	5.52	96.71	
	f/	146.30	98.31	0.05	0.03	145.27	96.95	145.32	96.98		
	g/	2.51	1.69	ns	-	-	-	-	-		

Tableau / Table 1.10

RÉSULTATES D'ANALYSE GRANULOMÉTRIQUE ET DE SÉPARATION DANS LES LIQUIDES LOURDS DES SABLES PRELEVES DES SONDAGES DE LA RÉGION DE T Â N I T

RESULTS OF GRAIN SIZE ANALYSIS AND HEAVY LIQUID SEPARATION OF SANDS FROM BOREHOLES IN THE REGION OF T Â N I T

Borehole / Sondage T 5

Échantillon No / Sample No		Analyse granulométrique / Grain size analysis — rendement / yield g	%	Séparation dans les liquides denses / Heavy liquid separation — Fraction lourde / Heavy fraction — rendement / yield g	%	Fraction légère / Light fraction — rendement / yield g	%	Rendement total / Total yield — rendement / yield g	%	Récupération / Recovery %	Remarks / Remarques
1	2	3	4	5	6	7	8	9	10	11	12
T 5/1	a/	51.04	100.00								
	b/	3.07	6.02	ns	-	3.[illegible]	6.02	[illegible]	6.[illegible]		
	c/	6.44	12.62	0.02	[illegible].0[illegible]	6.[illegible]	12.48	[illegible]	12.[illegible]	99.22	
	d/	32.21	63.11	0.30	0.59	31.[illegible]	[illegible].40	[illegible]	62.[illegible]	99.81	MI/op.m. 50,ep,ga,di,[illegible] ru,tu/
	e/	9.02	17.67	0.71	1.39	8.14	[illegible].95	[illegible]5	17.34	98.12	MIQ /see tab. 2../
	f/	50.74	99.42	1.08	2.02	49.43	96.85	50.51	98.87		/voir tab.2/
	g/	0.30	0.58	ns	-	-	-	-	-		
T 5/2	a/	50.01	100.00								
	b/	1.05	2.09	ns	-	1.05	2.09	1.05	2.09	-	
	c/	4.89	9.78	0.00	0.00	4.89	9.78	4.89	9.78	100.00	ru,l[illegible]
	d/	33.46	66.91	0.24	0.48	33.01	66.01	33.25	66.49	99.37	MI /op.m. 35,ga,ep,di
	e/	9.80	19.60	0.43	0.86	9.11	18.22	9.54	19.08	97.35	MI /op.m. 70,ga,ep,di st,zi
	f/	49.20	98.38	0.67	1.34	48.06	96.10	48.73	97.64		
	g/	0.81	1.62	ns	-	-	-	-	-		
T 5/3	a/	50.92	100.00								
	b/	0.26	0.52	ns	-	0.26	0.52	0.26	0.52		
	c/	2.30	4.52	0.00	0.00	2.27	4.46	2.27	4.46	98.70	
	d/	31.42	61.70	0.04	0.08	31.28	61.43	31.32	61.51	99.68	
	e/	16.75	32.89	0.08	0.16	16.56	32.52	16.64	32.68	99.34	
	f/	50.73	99.63	0.12	0.24	50.37	98.83	50.49	99.07		
	g/	0.19	0.37	ns	-	-	-	-	-		
-			-		-		-		-		-

Column 2 key:
- a/ admission / feed
- b/ fraction +0.8mm
- c/ fraction +0.4mm
- d/ fraction +0.2mm
- e/ fraction +0.06mm
- f/ total fraction de sable / total sand fraction
- g/ fraction de vase et d'argile / silt and clay fraction

1	2	3	4	5	6	7	8	9	10	11	12
T 5/4	a/	50.02	100.00								
	b/	0.16	0.32	ns	-	0.16	0.32	0.16	0.32		
	c/	2.15	4.30	0.00	0.00	2.15	4.30	2.15	4.30	100.00	
	d/	32.52	65.01	0.02	0.04	32.06	64.09	32.08	64.13	98.65	
	e/	14.74	29.47	0.05	0.10	14.39	28.77	14.44	28.87	97.96	
	f/	49.57	99.10	0.07	0.14	48.76	97.48	48.83	97.62		
	g/	0.45	0.90	ns	-	-	-	-	-		
T 5/5	a/	50.00	100.00								
	b/	0.41	0.82	ns	-	0.41	0.82	0.41	0.82		
	c/	4.15	0.30	0.00	0.00	4.14	8.28	4.14	8.28	99.76	
	d/	35.14	70.28	0.01	0.02	34.62	69.24	34.63	69.26	98.55	
	e/	9.13	18.26	0.02	0.04	9.00	18.00	9.02	18.04	98.80	
	f/	48.83	97.66	0.03	0.06	48.17	96.34	48.20	96.40		
	g/	1.17	2.34	ns	-	-	-	-	-		
T 5/6	a/	49.98	100.00								
	b/	0.18	0.36	ns	-	0.18	0.36	0.18	0.36		
	c/	2.66	5.32	0.00	0.00	2.64	5.28	2.64	5.28	99.25	
	d/	32.20	64.45	0.02	0.04	31.67	63.37	31.69	63.41	98.42	
	e/	13.43	26.87	0.05	0.10	13.21	26.43	13.26	26.53	98.73	
	f/	48.47	96.98	0.07	0.14	47.70	95.44	47.77	95.58		
	g/	1.51	3.02	ns	-	-	-	-	-		
T 5/7	a/	49.97	100.00								
	b/	1.03	2.19	ns	-	1.09	2.19	1.09	2.19		
	c/	3.38	6.76	0.01	0.02	3.37	6.74	3.38	6.76	100.00	
	d/	23.41	46.85	0.01	0.02	23.07	46.17	23.08	46.19	98.59	
	e/	20.37	40.76	0.16	0.32	20.02	40.06	20.18	40.38	99.07	
	f/	48.25	96.56	0.18	0.36	47.55	95.16	47.73	95.52		
	g/	1.72	3.44	ns	-	-	-	-	-		
T 5/8	a/	49.97	100.00								
	b/	1.49	2.99	ns	-	1.49	2.99	1.49	2.99		
	c/	4.13	8.26	0.00	0.00	4.10	8.20	4.10	8.20	99.27	
	d/	24.69	49.41	0.01	0.02	24.43	48.89	24.44	48.91	98.89	
	e/	19.12	38.26	0.09	0.18	18.88	37.78	18.97	37.96	99.22	
	f/	49.93	98.92	0.10	0.20	48.90	97.86	49.00	98.06		
	g/	0.54	1.08	ns	-	-	-	-	-		
T 5/9	a/	199.74	100.00								
	b/	16.59	8.30	ns	-	16.59	8.30	16.59	8.30	-	
	c/	27.06	13.55	0.02	0.01	26.94	13.49	26.96	13.50	99.63	
	d/	93.70	46.91	0.03	0.02	92.86	46.49	92.89	46.51	99.14	
	e/	55.40	27.74	0.14	0.07	55.01	27.54	55.15	27.61	99.55	
	f/	192.75	96.50	0.19	0.10	191.40	95.82	191.59	95.92		
	g/	6.99	3.50	ns	-	-	-	-	-		
T 5/10	a/	199.85	100.00								
	b/	17.33	8.68	ns	-	17.33	8.68	17.33	8.68		
	c/	52.30	26.17	0.03	0.02	52.04	26.04	52.07	26.06	99.56	
	d/	86.48	43.27	0.02	0.01	85.75	42.91	85.77	42.92	99.18	
	e/	35.80	17.91	0.10	0.05	35.27	17.65	35.37	17.70	98.80	
	f/	191.91	96.03	0.15	0.08	190.39	95.28	190.54	95.36		
	g/	7.94	3.97	ns	-	-	-	-	-		

1	2	3	4	5	6	7	8	9	10	11	12
T 5/11	a/	199.56	100.00								
	b/	16.16	8.11	ns	-	16.18	8.11	16.18	8.11		
	c/	49.09	24.60	0.02	0.01	48.13	24.12	48.15	24.13	98.08	
	d/	85.47	42.83	0.02	0.01	84.82	42.50	84.84	42.51	99.26	
	e/	40.08	20.08	0.08	0.04	39.29	19.69	39.37	19.70	98.23	
	f/	190.82	95.62	0.12	0.06	188.42	94.42	188.54	94.08		
	g/	8.74	4.38	ns	-	-	-	-	-		
T 5/12	a/	203.69	100.00								
	b/	20.76	10.19	ns	-	20.76	10.19	20.76	10.19		
	c/	72.46	35.57	0.02	0.01	71.74	35.22	71.76	35.23	99.03	
	d/	81.17	39.85	0.03	0.02	79.98	39.27	80.01	39.29	98.57	
	e/	20.08	9.86	0.06	0.03	19.69	9.67	19.75	9.70	98.36	
	f/	194.47	95.47	0.11	0.06	192.17	94.35	192.28	94.41		
	g/	9.22	4.53	ns	-	-	-	-	-		

Tableau 1/19
Table

RÉSULTATES D'ANALYSE GRANULOMÉTRIQUE ET DE SÉPARATION DANS LES LIQUIDES LOURDS DES SABLES PRÉLEVÉS DES SONDAGES DE LA RÉGION DE T Â N I T

RESULTS OF GRAIN SIZE ANALYSIS AND HEAVY LIQUID SEPARATION OF SANDS FROM BOREHOLES IN THE REGION OF T Â N I T

Borehole
Sondage T 6

Échantillon No Sample No	Analyse granulométrique Grain size analysis a/ admission feed b/ fraction + 0.8mm c/ fraction + 0.4mm d/ fraction + 0.2mm e/ fraction + 0.06mm f/ total fraction de sable total sand fraction g/ fraction de vase et d'argile silt and clay fraction	rendement yield		Separation dans les liquides denses / Heavy liquid separation: Fraction lourde Heavy fraction rendement yield		Fraction legère Light fraction rendement yield		Rendement total Total yield rendement yield		Recouperation Recovery	Remarks Remarques
		g	%	g	%	g	%	g	%	%	
1	2	3	4	5	6	7	8	9	10	11	12
T 6/1	a/	50.50	100.00								
	b/	2.04	4.05	ns		2.04	4.05	2.04	4.05		
	c/	11.53	22.83	0.02	0.04	11.50	22.77	11.52	22.81	99.91	MI/ga,op,m,,mo,ep/
	d/	27.66	54.77	0.97	1.92	26.54	52.55	27.51	54.47	99.46	MS5 /see tab. 3/
	e/	9.01	17.84	2.09	4.14	6.83	13.52	8.92	17.66	99.00	M5 /voir tab.3/
	f/	50.24	99.49	3.08	6.10	65.27	92.89	68.35	98.99		
	g/	0.26	0.51	ns	-	-	-	-	-		
T 6/2	a/	51.67	100.00								
	b/	1.14	2.21	ns		1.14	2.21	1.14	2.21		
	c/	5.63	10.90	0.00	0.00	5.63	10.98	5.63	10.98	100.00	
	d/	26.71	51.69	0.03	0.06	26.54	51.36	26.57	51.42	99.48	
	e/	17.46	32.79	0.08	0.16	17.35	33.58	17.43	33.74	99.83	MI/op,m,(40,ep,ga,tu,p
	f/	50.94	98.59	0.11	0.22	50.66	98.43	50.77	98.35		
	g/	0.73	1.41	ns	-	-	-	-	-		
T 6/3	a/	52.19	100.00								
	b/	0.86	1.64	ns		0.86	1.64	0.86	1.64		
	c/	5.28	10.12	0.00	0.00	5.28	10.12	5.28	10.12	100.00	
	d/	27.64	52.96	0.05	0.09	27.45	52.60	27.50	52.69	99.49	
	e/	18.16	34.80	0.13	0.25	17.73	33.97	17.86	34.22	98.35	MI/bp,m, 50,ep,le,py,g zi,tu,st,sil,di/
	f/	51.94	99.52	0.18	0.34	51.32	98.33	51.50	98.67		
	g/	0.25	0.48								
T 6/4	a/	51.97	100.00								
	b/	1.01	1.95	ns		1.01	1.95	1.01	1.95		
	c/	4.58	8.81	0.00	0.00	4.58	8.81	4.58	8.81	100.00	
	d/	24.27	46.70	0.02	0.04	24.23	46.62	24.25	46.66	99.92	MI/op,m,(60,ep,py,am tu,zi,st,le,di/
	e/	21.75	41.85	0.08	0.15	21.66	41.68	21.74	41.83	99.95	
	f/	51.61	99.31	0.10	0.19	51.48	99.06	51.58	99.25		

Tableau / Table 1/20 — Morehala / Sondage T 6

1	2	3	4	5	6	7	8	9	10	11	12
T 6/5	a/	50.76	100.00								
	b/	0.95	1.87	ns		0.95	1.87	0.95	1.87		
	c/	4.37	8.61	0.00	0.00	4.37	0.61	4.37	8.61	100.00	
	d/	24.56	48.38	0.02	0.04	24.52	48.31	24.54	48.35	99.92	MI/op.m. 30,ga,ep,le,
	e/	19.86	39.13	0.07	0.14	19.73	38.87	19.80	39.01	99.68	MI/op.m. 55,ep,py,le, ga,tu,di,st,ru/
	f/	49.74	97.99	0.09	0.18	49.57	97.66	49.66	97.84		
	g/	1.02	2.01	ns	-	-	-	-	-		
T 6/6	a/	50.29	100.00								
	b/	0.54	1.08	ns		0.54	1.08	0.54	1.08		
	c/	2.42	4.81	0.00	0.00	2.40	4.77	2.40	4.77	99.17	
	d/	19.83	39.43	0.01	0.02	19.80	39.37	19.81	39.39	99.90	
	e/	26.11	51.92	0.05	0.10	26.52	51.74	26.07	51.84	99.85	
	f/	48.90	97.84	0.06	0.12	48.76	99.96	48.82	97.08		
	g/	1.39	2.76								
T 6/7	a/	53.24	100.00								
	b/	1.20	2.25	ns		1.20	2.25	1.20	2.25		
	c/	3.19	5.99	0.00	0.00	3.19	5.99	3.19	5.99	100.00	
	d/	21.29	39.99	0.01	0.02	21.20	39.82	21.21	39.84	99.62	
	e/	25.99	48.82	0.06	0.12	25.93	48.70	25.99	48.82	100.00	
	f/	51.67	97.05	0.07	0.14	51.52	96.76	51.59	96.90		
	g/	1.57	2.95	ns	-	-	-	-	-		
T 6/8	a/	53.01	100.00								
	b/	1.20	2.26	ns		1.20	2.26	1.20	2.26		
	c/	2.47	4.66	0.00	0.00	2.46	4.64	2.46	4.64	99.60	
	d/	18.41	34.73	0.01	0.02	13.39	34.69	18.40	34.72	99.95	
	e/	30.37	57.29	0.08	0.15	29.75	56.12	29.83	56.27	98.22	
	f/	52.45	98.94	0.09	0.17	51.89	97.71	51.89	97.88		
	g/	0.56	1.06	ns	-	-	-	-	-		
T 6/9	a/	211.01	100.00								
	b/	8.36	3.96	ns		8.36	3.96	8.36	3.96		/voir tab.2/
	c/	36.21	17.16	0.03	0.01	35.93	17.03	35.98	17.04	99.36	
	d/	104.08	49.32	0.37	0.18	103.13	48.87	103.50	49.05	99.44	MIQ/see tab. .2./
	e/	57.65	27.32	0.16	0.08	57.46	27.23	57.62	27.31	99,95	MI/op.m. ga,ep,zi,py, ru,st,tu/
	f/	206.30	97.76	0.56	0.27	204.88	97.09	205.44	97.36		
	g/	4.71	2.24	ns	-	-	-	-	-		
T 6/10	a/	227.59	100.00								
	b/	53.76	23.63	ns		53.76	23.63	53.76	23.63		
	c/	95.87	42.12	0.03	0.01	95.37	41.90	95.40	41.91	99.51	
	d/	58.70	25.79	0.05	0.02	58.09	25.52	58.14	25.54	99.04	MI/.op.m. 50,ga,ep,le,
	e/	13.41	5.85	0.11	0.05	13.29	5.84	13.40	5.89	99.93	MI/op.m. 60,ep,le,si, st,di,ga,mo/
	f/	221.74	97.43	0.19	0.08	220.51	96.89	220.70	96.97		
	g/	5.85	2.57	ns	-	-	-	-	-		
T 6/11	a/	232.34	100.00								
	b/	27.87	12.00	ns		27.87	12.00	27.87	12.00		
	c/	61.01	26.26	0.02	0.01	60.93	26.24	60.98	26.25	99.95	
	d/	87.83	37.80	0.06	0.03	87.36	37.60	87.42	37.63	99.53	MI/op.m. 50, le,ga,st;
	e/	47.70	20.53	0.13	0.06	47.51	20.45	47.64	20.51	99.87	MI/op.m. 40,ga,ep,py,tu si,le,st,sil,di,mo/
	f/	224.41	96.59	0.21	0.10	223.70	96.29	223.91	96.39		
	g/	7.93	3.41	ns	-	-	-	-	-		

1	2	3	4	5	6	7	8	9	10	11	12
	a/	226.48	100.00								
	b/	24.51	10.82	ns		24.51	10.81	24.51	10.82		
	c/	43.64	19.27	0.03	0.01	43.31	19.12	43.34	19.13	99.31	MI /op.m.,ep/
T 6/12	d/	87.58	38.67	0.04	0.02	87.22	38.51	87.26	38.53	99.63	
	e/	60.28	26.62	0.13	0.06	60.09	26.53	60.22	26.59	99.90	MI /op.m.,ga,ep,tu,zi,
	f/	216.01	95.38	0.20	0.09	215.13	94.98	215.33	95.07		
	g/	10.47	4.62	ns	-	-	-	-	-		
	a/	223.33	100.00								
	b/	15.56	6.97	ns		15.56	6.97	15.56	6.97		
	c/	20.59	9.22	0.01	0.01	20.53	9.19	20.54	9.20	99.76	
T 6/13	d/	68.39	30.62	0.05	0.02	67.92	30.41	67.97	30.43	99.39	MI/op.m. 50,ep,ga,le,
	e/	106.40	47.64	0.20	0.09	106.03	47.60	106.23	47.69	99.84	MI/op.m. 70,zi,di,le, py,
	f/	210.94	94.45	0.26	0.12	210.04	94.17	210.30	94.29		
	g/	12.39	5.55	ns	-	-	-	-	-		
	a/	214.94	100.00								
	b/	55.92	26.01	ns		55.92	26.01	55.92	26.01		
	c/	23.57	10.97	0.02	0.01	23.47	10.92	23.49	10.93	99.66	
T 6/14	d/	47.43	22.07	0.08	0.04	47.04	21.89	47.12	21.93	99.35	
	e/	74.58	34.70	0.42	0.20	73.64	34.26	74.06	34.46	99.29	MI /op.m.: 60,ep,py,di, tu,ga,le,zi,ru,mo/
	f/	201.50	93.75	0.52	0.25	200.07	93.08	200.59	93.33		
	g/	13.44	6.25								
	a/	235.04	100.00								
	b/	79.59	33.86	ns		79.59	33.86	79.59	33.86		
	c/	20.81	8.85	0.01	0.01	20.75	8.83	20.76	8.84	99.76	di,
T 6/15	d/	45.45	19.34	0.07	0.03	44.92	19.11	44.99	19.14	98.99	MI/.op.m. 55,ga,ep,le,
	e/	75.65	32.19	0.46	0.20	74.73	31.79	75.19	31.89	99.39	MI/.op.m. 60,py,ep,zi, am.,le,tu,st,bi,di/
	f/	221.50	94.24	0.54	0.24	219.99	93.59	220.53	93.83		
	g/	13.54	5.76	ns	-	-	-	-	-		
	a/	225.45	100.00								
	b/	72.49	32.15	ns		72.49	32.15	72.49	32.15		
	c/	26.22	11.63	0.02	0.01	26.19	11.62	26.21	11.63	99.96	
T 6/16	d/	40.89	18.14	0.03	0.01	40.81	18.10	40.84	18.11	99.88	
	e/	73.18	32.46	0.29	0.13	72.66	32.23	72.95	32.36	99.69	
	f/	212.78	94.38	0.34	0.15	212.15	94.10	212.49	94.25		
	g/	12.67	5.62	ns	-	-	-	-	-		
	a/	215.00	100.00								
	b/	37.48	17.44	ns		37.48	17.44	37.48	17.44		
	c/	16.52	7.68	0.01	0.01	16.50	7.67	16.54	7.68	99.94	
T 6/17	d/	33.80	15.72	0.03	0.01	33.75	15.70	33.78	15.71	99.94	
	e/	110.68	51.48	0.35	0.16	109.97	51.15	110.32	51.31	99.67	MI/ op.m. 50,ep,ga,py, di,tu,am ,ru,zi/
	f/	198.48	92.32	0.39	0.18	197.70	91.96	198.09	92.14		
	g/	16.52	7.68	ns	-	-	-	-	-		
	a/	221.05	100.00								
	b/	5.29	2.40	ns		5.29	2.40	5.29	2.40		
	c/	7.81	3.53	0.01	0.01	7.79	3.52	7.80	3.53	99.96	
T 6/18	d/	38.12	17.24	0.03	0.01	38.03	17.20	38.06	17.21	99.84	
	e/	152.90	69.17	0.31	0.14	152.03	68.78	152.34	68.92	99.63	MI /op.m. 50,ga,ep,tu, le,ru/
	f/	204.12	92.34	0.35	0.16	203.14	91.90	203.49	92.06		
	g/	16.93	7.66	ns	-	-	-	-	-		

1	2	3	4	5	6	7	8	9	10	11	12
6/19	a/	204.11	100.00								
	b/	4.06	1.98	ns		4.06	1.98	4.06	1.98		
	c/	7.16	3.51	0.01	0.01	7.06	3.46	7.07	3.47	98.74	/voir tab.2/
	d/	30.33	14.86	0.02	0.01	29.98	14.69	30.00	14.70	98.91	MIC /see tab. 2./
	e/	125.34	61.41	0.32	0.16	123.81	60.66	124.13	60.82	99.03	
	f/	166.89	81.76	0.35	0.18	164.91	80.79	165.26	80.97		
	g/	37.22	18.24	-	-	-	-	-	-		
6/20	a/	199.37	100.00								
	b/	6.69	3.36	ns		6.69	3.36	6.69	3.36	-	
	c/	10.66	5.35	0,01	0.01	10.49	5.26	10.50	5.27	98.50	
	d/	31.98	16.04	0.03	0.02	31.75	15.93	31.78	15.95	99.37	
	e/	96.98	48.64	0.21	0.11	94.91	47.60	95.02	47.71	97.98	MI/op.m. 40,ep,py,zi, ru,di,bi,sil/
	f/	146.31	73.39	0.25	0.14	143.84	72.15	144.09	72.29		
	g/	53.06	26.61	ns	-	-	-	-	-		
6/21	a/	199.54	100,00								
	b/	10.84	5.43	ns		10.84	5.43	10.84	5.43		
	c/	12.47	6.25	0.02	0.01	12.38	6.20	12.40	6.21	99.44	
	d/	32.58	16.33	0.07	0.04	32.26	16.17	32.33	16.21	99.23	
	e/	74.28	37.23	0.08	0.04	73.08	36.62	73.16	36.66	98.49	
	f/	130.17	65.24	0.17	0.09	128.56	64.42	128.73	64.51		
	g/	69.37	34.76	ns	-	-	-	-	-		
6/22	a/	206.92	100.00								
	b/	15.50	7.49	ns		15.50	7.49	15.50	7.49		
	c/	14.07	6.80	0.03	0.01	14.00	6.76	14.03	7.77	99.72	
	d/	48.35	23.37	0.05	0.02	48.24	23.31	48.29	23.33	99.88	
	e/	65.53	31.67	0.14	0.07	65.16	31.49	65.30	31.56	99.65	
	f/	143.45	69.33	0.22	0.10	142.90	69.05	134.12	69.15		
	g/	63.47	30.67	ns	-	-	-	-	-		
6/23	a/	223.66	100.00								
	b/	19.10	8.54	ns		19.10	8.54	19.10	8.54		
	c/	16.46	7.36	0.01	0.01	16.42	7.34	16.43	7.35	99.82	
	d/	66.01	29.51	0.09	0.04	65.83	29.53	65.92	29.47	99.86	
	e/	103.79	46.41	0.39	0.18	103.01	46.05	103.40	46.23	99.62	MI/op.m.45,py,le,zi, tu,st,ru,bi,di/
	f/	205.36	91.82	0.49	0.23	204.36	91.36	204.85	91.58		
	g/	18.30	8.18	ns	-	-	-	-	-		
6/24	a/	221.18	100.00								
	b/	15.20	6.14	ns		15.20	6.14	15.20	6.14		
	c/	20.29	9.17	0.04	0.02	20.18	9.12	20.22	9.14	99.66	MI /op.m,le/
	d/	63.16	28.56	0.07	0.03	63.01	28.50	63.08	28.53	99.87	
	e/	104.46	47.23	0.29	0.13	103.88	46.97	104.17	47.10	99.72	MI /op.m. 35,py,tu,ep, amf,le,zi,di,bi,ga/
	f/	203.11	91.10	0.40	0.18	202.27	90.73	202.67	90.91		
	g/	18.07	8.90	ns	-	-	-	-	-		
6/25	a/	202.67	100.00								
	b/	6.05	2,97	ns		6.05	2,97	6.05	2,97		
	c/	13.65	6.74	0.01	0.01	13.57	6.70	13.58	6.71	99.49	
	d/	53.88	26.59	0.04	0.02	53.38	26.34	53.42	26.36	99.15	
	e/	80.31	39.63	0.37	0.18	79.32	39.14	79.69	39.32	99.23	MI /op.m. 40,ga,di,ep, am ,py,tu,st,mo/
	f/	153.89	75.93	0.42	0.21	152.32	75.15	152.74	75.36		
	g/	48.73	24.07	ns	-	-	-	-	-		

1	2	3	4	5	6	7	8	9	10	11	12
	a/	205.13	100.00								
	b/	10.17	4.96	ns	–	10.17	4.96	10.17	4.96		
	c/	12.12	5.91	0.02	0.01	12.03	5.86	12.05	5.87	99.42	MI / op.m. 90,ga,zi/
T 6/26	d/	47.27	23.04	0.03	0.01	46.76	22.79	46.79	22.80	98.98	
	e/	77.01	37.54	0.29	0.14	76.40	37.24	76.69	37.38	99.58	MI / op.m. 60,py,ep,tu, di,zi,amf,le,st/
	f/	147.57	71.45	0.34	0.16	145.36	70.85	145.70	71.01		
	g/	58.56	28.55	ns	–	–	–	–	–		

RÉSULTATES D'ANALYSE GRANULOMÉTRIQUE ET DE SÉPARATION DANS LES LIQUIDES LOURDS DES SABLES PRÉLEVÉS DES SONDAGES DE LA RÉGION DE T À N I T

RESULTS OF GRAIN SIZE ANALYSIS AND HEAVY LIQUID SEPARATION OF SANDS FROM BOREHOLES IN THE REGION OF T À N I T

Borehole / Sondage T 7

Legend for column 2:
- a/ admission / feed
- b/ fraction +0.8mm
- c/ fraction +0.4mm
- d/ fraction +0.2mm
- e/ fraction +0.06mm
- f/ total fraction de sable / total sand fraction
- g/ fraction de vase et d'argile / silt and clay fraction

Échantillon No / Sample No		Analyse granulométrique / Grain size analysis: rendement / yield		Séparation dans les liquides denses / Heavy liquid separation: Fraction lourde / Heavy fraction, rendement / yield		Fraction légère / Light fraction, rendement / yield		Rendement total / Total yield, rendement / yield		Récupération / Recovery	Remarks / Remarques
		g	%	g	%	g	%	g	%	%	
1	2	3	4	5	6	7	8	9	10	11	12
T 7/1	a/	49.92	100.00								
	b/	0.48	0.96	ns	–	0.48	0.96	0.48	0.96		
	c/	3.44	6.89	0.01	0.02	3.40	6.81	3.41	6.83	99.13	
	d/	34.76	69.63	0.71	1.42	33.74	67.59	34.45	69.01	99.11	MS^6/see tab. 2./
	e/	10.48	20.99	3.30	6.61	6.92	13.86	10.22	20.47	97.52	MS^6 /voir tab.2/
	f/	49.16	98.48	4.02	8.05	44.54	89.22	48.56	97.27		
	g/	0.76	1.52	ns	–	–	–	–	–		
T 7/2	a/	49.98	100.00								
	b/	1.37	2.74	ns	–	1.37	2.74	1.37	2.74	–	
	c/	2.74	5.48	0.00	0.00	2.69	5.38	2.69	5.38	98.18	si,le,di,tu,mo,ch!
	d/	29.82	59.66	0.11	0.22	29.29	58.60	29.40	58.82	98.59	MI/op.m. 60,ep,ga,am
	e/	14.93	29.87	0.48	0.96	14.14	28.29	14.62	29.25	97.92	MIQ /see tab. .2/
	f/	48.86	97.75	0.59	1.18	47.49	95.01	48.18	96.19		/voir tab.2/
	g/	1.12	2.25	ns	–	–	–	–	–		
T 7/3	a/	49.91	100.00								
	b/	0.41	0.82	ns	–	0.41	0.82	0.41	0.82		
	c/	2.22	4.45	0.00	0.00	2.20	4.41	2.20	4.41	99.10	
	d/	28.46	57.02	0.06	0.12	28.09	56.28	28.15	56.40	98.91	
	e/	16.28	32.62	0.13	0.26	15.92	31.90	16.05	32.16	98.59	
	f/	47.37	94.91	0.19	0.38	46.62	93.41	46.81	93.79		
	g/	2.54	5.09	ns	–	–	–	–	–		
T 7/4	a/	49.93	100.00								
	b/	1.14	2.28	ns	–	1.14	2.28	1.14	2.28		
	c/	1.74	3.48	0.00	0.00	1.74	3.48	1.74	3.48	100.00	
	d/	23.94	47.95	0.03	0.06	23.70	47.47	23.73	47.53	99.12	
	e/	21.35	42.76	0.08	0.16	20.95	41.96	21.03	42.12	98.50	
	f/	48.17	96.47	0.11	0.22	47.53	95.19	47.64	95.41		
	g/	1.76	3.53	ns	–	–	–	–	–		

Tableau 1/25
Table

Borehole T 7
Sondage

1	2	3	4	5	6	7	8	9	10	11	12
T 7/5	a/	49.96	100.00								
	b/	0.51	1.02	ns	-	0.51	1.02	0.51	1.02		
	c/	1.42	2.84	0.00	0.00	1.41	2.82	1.41	2.82	99.30	
	d/	20.97	41.97	0.02	0.04	20.90	41.83	20.92	41.87	99.76	
	e/	24.93	49.90	0.04	0.08	24.80	49.64	24.84	49.72	99.64	
	f/	47.83	95.73	0.06	0.12	47.62	95.31	47.68	95.43		
	g/	2.13	4.27	ns	-	-	-	-	-		
T 7/6	a/	49.94	100.00								
	b/	1.21	2.42	ns	-	1.21	2.42	1.21	2.42		
	c/	3.41	6.83	0.00	0.00	3.39	6.79	3.39	6.79	99.41	
	d/	31.54	63.16	0.03	0.06	31.21	62.49	31.24	62.55	99.05	
	e/	13.69	27.41	0.06	0.12	13.32	26.67	13.38	26.79	97.74	
	f/	49.85	99.82	0.09	0.18	49.13	98.37	49.22	98.55		
	g/	0.09	0.18	ns	-	-	-	-	-		
T 7/7	a/	49.97	100.00								
	b/	1.03	2.06	ns	-	1.03	2.06	1.03	2.06	-	
	c/	2.64	5.28	0.00	0.00	2.60	5.20	2.60	5.20	98.48	
	d/	27.74	55.51	0.04	0.08	27.50	55.03	27.54	55.11	99.28	
	e/	18.16	36.34	0.05	0.10	17.96	35.94	18.01	36.04	99.17	
	f/	49.57	9[illegible].19	0.09	0.18	49.09	98.23	49.18	98.41		
	g/	0.40	0.81	ns	-	-	-	-	-	-	
T 7/8	a/	49.98	100.00								
	b/	1.52	3.04	ns	-	1.52	3.04	1.52	3.04	-	
	c/	2.79	5.58	0.02	0.04	2.75	5.50	2.77	5.54	99.28	
	d/	25.98	51.98	0.03	0.06	25.60	51.22	25.63	51.28	98.65	
	e/	18.11	[illegible]	0.15	0.30	17.81	35.63	17.96	35.93	99.17	MI/ op.m. 55,ga,py,am si,tu,ru,st,le/
	f/	48.40	9[illegible].83	0.20	0.40	47.68	95.39	47.88	95.79		
	g/	1.58	3.17	ns	-	-	-	-	-		
T 7/9	a/	200.09	100.00								
	b/	5.42	2.71	ns	-	5.42	2.71	5.42	2.71	-	
	c/	15.66	7.83	0.02	0.01	14.97	7.48	14.99	7.49	95.72	ap,
	d/	104.22	52.09	0.11	0.05	102.85	51.40	102.96	51.45	98.79	MI/ op.m. 30,ep,ga,st,
	e/	70.87	35.42	0.73	0.36	68.99	34.48	69.72	34.84	98.38	MI/ op.m. 60,ga,di,si, tu,py,
	f/	196.17	98.05	0.86	0.42	192.23	96.07	193.09	96.49		
	g/	3.92	1.95	ns	-	-	-	-	-	-	
T 7/10	a/	200.02	100.00								
	b/	3.69	1.84	ns	-	3.69	1.84	3.69	1.84		
	c/	10.99	5.49	0.02	0.01	10.52	5.26	10.54	5.27	95.91	
	d/	102.18	51.08	0.12	0.06	100.26	50.12	100.38	50.18	98.24	MI/ op.m. 30,ga,ep,am.
	e/	75.75	37.87	0.76	0.38	73.83	36.91	74.59	37.29	98.47	MIQ /see tab. .2./
	f/	192.61	96.28	0.90	0.45	188.30	94.13	189.20	94.58		/voir tab.2/
	g/	7.41	3.72	ns	-	-	-	-	-	-	
T 7/11	a/	199.81	100.00								
	b/	2.67	1.34	ns	-	2.67	1.34	2.67	1.34		
	c/	8.95	4.48	0.01	0.01	8.85	4.30	8.86	4.30	98.99	
	d/	90.29	45.19	0.08	0.04	89.01	44.55	89.09	44.59	98.67	
	e/	89.13	44.61	0.04	0.02	88.39	44.24	88.43	44.26	99.21	
	f/	191.04	95.62	0.13	0.07	188.92	94.43	189.05	94.50		
	g/	8.77	4.38	ns	-	-	-	-	-		

1	2	3	4	5	6	7	8	9	10	11	12
T 7/12	a/	199.91	100.00								
	b/	13.78	6.89	ns	–	13.78	6.89	13.78	6.89		
	c/	36.09	18.05	0.00	0.00	35.57	17.79	35.57	17.79	98.56	
	d/	94.20	47.12	0.03	0.02	93.26	46.65	93.29	46.67	99.03	
	e/	43.83	21.92	0.14	0.07	42.22	21.12	42.36	21.19	96.65	MI / op.m. 50,op,ga,an py,zi,ru,di,le/
	f/	187.90	93.98	0.17	0.09	184.83	92.45	185.00	92.54		
	g/	12.01	6.02	ns	–	–	–	–	–		
T 7/13	a/	153.78	100.00								
	b/	14.27	9.28	ns	–	14.27	9.28	14.27	9.28	–	–
	c/	23.75	15.44	0.00	0.00	23.40	15.22	23.40	15.22	98.53	
	d/	68.10	44.28	0.03	0.02	67.65	43.99	67.68	44.01	99.38	
	e/	40.04	26.04	0.13	0.08	38.92	25.31	39.05	25.39	97.53	MI/ op.m. 60,op,py,zi, mo,st,di/
	f/	146.14	95.04	0.16	0.10	144.24	93.80	144.40	93.90		
	g/	7.62	4.96	ns	–	–	–	–	–		

RÉSULTATS D'ANALYSE GRANULOMÉTRIQUE ET DE SÉPARATION DANS LES LIQUIDES LOURDS DES SABLES PRÉLEVÉS DES SONDAGES DE LA RÉGION DE T Â N I T

RESULTS OF GRAIN SIZE ANALYSIS AND HEAVY LIQUID SEPARATION OF SANDS FROM BOREHOLES IN THE REGION OF T Â N I T

Borehole
Sondage T 8

Échantillon No / Sample No		Analyse granulométrique / Grain size analysis: a/ admission / feed; b/ fraction + 0.8mm; c/ fraction + 0.4mm; d/ fraction + 0.2mm; e/ fraction + 0.06mm; f/ total fraction de sable / total sand fraction; g/ fraction de vase et d'argile / silt and clay fraction — rendement / yield g	%	Séparation dans les liquides denses / Heavy liquid separation: Fraction lourde / Heavy fraction — rendement / yield g	%	Fraction légère / Light fraction — rendement / yield g	%	Rendement total / Total yield — rendement / yield g	%	Récupération / Recovery %	Remarks / Remarques
1	2	3	4	5	6	7	8	9	10	11	12
T 8/1	a/	49.98	100.00								
	b/	0.12	0.24	ns	–	0.12	0.24	0.12	0.24		/voir tab.2/
	c/	1.77	3.54	0.00	0.00	1.71	3.42	1.71	3.42	96.61	
	d/	33.12	66.27	0.34	0.68	32.58	65.19	32.92	65.87	99.40	MIQ /see tab. 2./
	e/	13.91	27.83	0.87	1.74	12.88	25.77	13.75	27.51	98.85	MIQ /see tab. 2./ /voir tab.2/
	f/	48.92	97.88	1.21	2.42	47.19	94.62	48.40	97.04		
	g/	1.06	2.12	ns	–	–	–	–	–		
T 8/2	a/	49.92	100.00								
	b/	0.40	0.80	ns		0.40	0.80	0.40	0.80		
	c/	3.23	6.47	0.00	0.00	3.20	6.41	3.20	6.41	99.07	
	d/	26.19	52.46	0.02	0.04	26.02	52.12	26.04	52.16	99.43	
	e/	18.92	37.90	0.14	0.28	18.41	36.88	18.55	37.16	97.88	MI/. op.m-60,ga,ep.di,si, sil,py,ap,ru/
	f/	48.74	97.63	0.16	0.32	48.03	96.21	48.19	96.53	–	
	g/	1.18	2.37	ns	–	–	–	–	–		
T 8/3	a/	49.97	100.00								
	b/	0.64	1.28	ns	–	0.64	1.28	0.64	1.28		
	c/	3.34	6.68	0.00	0.00	3.30	6.60	3.30	6.60	98.80	
	d/	25.52	51.07	0.05	0.10	25.41	50.85	25.46	50.95	99.76	
	e/	18.92	37.86	0.17	0.34	18.55	37.12	18.72	98.38	98.94	
	f/	48.42	96.89	0.22	0.44	47.90	95.85	48.12	96.29		
	g/	1.55	3.11	ns	–	–	–	–	–		
T 8/4	a/	49.96	100.00								
	b/	4.21	8.43	ns	–	4.21	8.43	4.21	8.43		
	c/	3.13	6.27	0.00	0.00	3.12	6.24	3.12	6.24	99.68	
	d/	21.15	42.33	0.00	0.00	20.94	41.91	20.94	41.91	99.01	
	e/	19.13	38.29	0.05	0.10	18.92	37.87	18.97	37.97	99.16	
	f/	47.62	95.32	0.05	0.10	47.19	94.45	47.24	94.55		
	g/	2.34	4.68	ns	–	–	–	–	–		

1	2	3	4	5	6	7	8	9	10	11	12
T 8/5	a/	49.93	100.00								
	b/	4.05	8.11	ns	-	4.05	8.11	4.05	8.11		
	c/	3.48	6.97	0.00	0.00	3.40	6.81	3.40	6.81	97.70	
	d/	20.88	41.82	0.00	0.00	20.67	41.40	20.67	41.40	98.99	
	e/	19.47	38.99	0.04	0.08	19.31	38.67	19.35	38.75	99.38	
	f/	47.88	95.89	0.04	0.08	47.43	94.99	47.47	95.07		
	g/	2.05	4.11	ns	-	-	-	-	-		
T 8/6	a/	50.01	100.00								
	b/	3.56	7.12	ns	-	3.56	7.12	3.56	7.12		
	c/	4.94	9.88	0.00	0.00	4.92	9.84	4.92	9.84	99.59	
	d/	18.73	37.45	0.00	0.00	18.61	37.21	18.61	37.21	99.36	
	e/	20.79	41.57	0.04	0.08	20.63	41.25	20.67	41.33	99.42	
	f/	48.02	96.02	0.04	0.08	47.72	95.42	47.76	95.50		
	g/	1.99	3.98	ns	-	-	-	-	-		
T 8/7	a/	49.95	100.00								
	b/	2.99	5.99	ns		2.99	5.99	2.99	5.99		
	c/	6.88	13.77	0.00	0.00	6.71	13.43	6.71	13.43	97.53	
	d/	21.24	42.55	0.00	0.00	20.72	41.48	20.72	41.48	97.55	
	e/	18.27	36.58	0.03	0.06	17.93	35.89	17.96	35.95	98.30	
	f/	49.3[illegible]	98.86	0.03	0.06	48.35	96.79	48.39	96.85		
	g/	0.57	[illegible].14	ns	-	-	-	-	-		
T 8/8	a/	49.95	100.00								
	b/	5.30	10.61	ns		5.30	10.61	5.30	10.61		
	c/	8.54	17.10	0.00	0.00	8.50	17.02	8.50	17.02	99.53	
	d/	19.50	39.04	0.00	0.00	19.13	38.30	19.13	38.30	98.10	
	e/	15.40	30.83	0.03	0.06	15.24	30.51	15.27	30.57	99.16	
	f/	48.74	97.58	0.03	0.06	48.17	96.44	48.20	96.50		
	g/	1.21	2.42	ns	-	-		-	-		
T 8/9	a/	199.82	100.00								
	b/	10.59	5.30	ns	-	10.59	5.30	10.59	5.30		
	c/	20.42	10.22	0.03	0.01	20.27	10.14	20.30	10.15	99.41	
	d/	95.31	47.70	0.05	0.02	94.52	47.30	94.57	47.32	99.22	/MI/ op.m. 50,ga,ep,di,
	e/	68.46	34.26	0.25	0.13	67.50	33.77	67.75	33.90	98.96	MI/ op.m, 60,et,zi,ga, ti.tu,am ,le/
	f/	194.78	97.48	0.33	0.16	192.88	96.51	193.21	96.67		
	g/	5.04	2.52	ns	-	-	-	-	-		
T 8/10	a/	199.74	100.00								
	b/	9.93	4.97	ns		9.93	4.97	9.93	4.97		
	c/	18.53	9.28	0.06	0.03	18.20	9.11	18.26	9.14	98.54	MI/ op.m. 90,ep,mo,ga,
	d/	98.59	49.36	0.09	0.04	96.67	48.40	96.76	48.44	98.14	MI/ op.m, 60,ga,ep,di,
	e/	69.18	34.64	0.28	0.14	67.98	34.03	68.26	34.17	98.67	MI/ op.m, 30,ga,ep,di am ,zi,st,bi,sil,
	f/	196.23	98.25	0.43	0.21	192.78	97.51	193.21	97.72		
	g/	3.51	1.75	ns	-	-	-	-	-		
T 8/11	a/	199.67	100.00								
	b/	6.80	3.41	ns		6.80	3.41	6.80	3.41		
	c/	15.00	7.51	0.03	0.01	14.88	7.45	14.91	7.46	99.40	
	d/	82.36	41.25	0.06	0.03	82.21	41.17	82.27	41.20	99.89	
	e/	90.60	45.37	0.12	0.06	89.42	44.78	89.54	44.84	98.83	MI/ op.m. 30,ep,di,ga, tu,sil/
	f/	194.76	97.54	0.21	0.10	193.31	96.81	193.21	96.91		
	g/	4.91	2.46	ns	-	-	-	-	-		

1	2	3	4	5	6	7	8	9	10	11	12
T 8/12	a/	199.75	100.00								
	b/	20.96	10.49	ns	-	20.96	10.49	20.96	10.49		
	c/	25.91	12.97	0.02	0.01	25.61	12.82	25.63	12.83	98.92	
	d/	64.53	32.30	0.03	0.01	64.04	32.06	64.07	32.07	99.29	
	e/	77.68	38.89	0.08	0.04	76.73	38.41	76.81	38.45	98.88	
	f/	189.08	94.65	0.13	0.06	187.34	93.78	187.47	93.84		
	g/	10.67	5.35	ns	-	-	-	-	-		
T 8/13	a/	99.92	100.00								
	b/	9.90	9.91	ns	-	9.90	9.91	9.90	9.91		
	c/	13.67	13.68	0.00	0.00	13.61	13.62	13.61	13.62	99.56	
	d/	31.69	31.72	0.01	0.01	31.26	31.28	31.27	31.29	98.67	
	e/	39.31	39.34	0.08	0.08	39.13	39.16	39.21	39.24	99.74	
	f/	94.57	94.65	0.09	0.09	93.90	93.97	93.99	94.06		
	g/	5.35	5.35	ns	-	-	-	-	-		

RÉSULTATES D'ANALYSE GRANULOMÉTRIQUE ET DE SÉPARATION DANS LES LIQUIDES LOURDS DES SABLES PRELEVES DES SONDAGES DE LA RÉGION DE T Ì N I T

RESULTS OF GRAIN SIZE ANALYSIS AND HEAVY LIQUID SEPARATION OF SANDS FROM BOREHOLES IN THE REGION OF T Ì N I T

Borehole
Sondage T 9

Echantillon No / Sample No		Analyse granulométrique / Grain size analysis		Separation dans les liquides denses / Heavy liquid separation							Remarks / Remarques
	a/ admission / feed; b/ fraction +0.8mm; c/ fraction +0.4mm; d/ fraction + 0.2mm; e/ fraction + 0.06mm; f/ total fraction de sable / total sand fraction; g/ fraction de vase et d'argile / silt and clay fraction	rendement / yield		Fraction lourde / Heavy fraction: rendement / yield		Fraction legère / Light fraction: rendement / yield		Rendement total / Total yield: rendement / yield		Recuperation / Recovery	
		g	%	g	%	g	%	g	%	%	
1	2	3	4	5	6	7	8	9	10	11	12
T 9/1	a/	50.05	100.00								
	b/	0.05	0.10	ns	-	0.05	0.10	0.05	0.10		
	c/	1.75	3.52	0.00	0.00	1.74	3.48	1.74	3.48	99.43	
	d/	34.92	69.84	0.35	0.70	34.45	68.83	34.80	69.53	99.66	MS[7]/see tab. 3../
	e/	12.70	25.39	0.87	1.74	11.70	23.38	12.57	25.11	98.98	MS[7] /voir tab.3/
	f/	49.42	98.75	1.22	2.44	47.94	95.78	49.16	98.22		
	g/	0.63	1.25	ns	-	-	-	-	-		
T 9/2	a/	50.02	100.00								
	b/	0.37	0.74	ns	-	0.37	0.74	0.35	0.74		
	c/	4.23	8.44	0.01	0.02	4.20	8.40	4.21	8.42	99.53	
	d/	34.11	68.22	0.34	0.68	33.65	67.27	33.99	67.95	99.65	MS[7]
	e/	10.36	20.72	0.66	1.32	9.68	19.35	10.34	20.67	99.81	MS[7]
	f/	49.07	98.10	1.01	2.02	47.90	95.76	48.91	97.78		
	g/	0.95	1.90	ns	-	-	-	-	-		
T 9/3	a/	50.04	100.00								
	b/	0.21	0.42	ns	-	0.21	0.42	0.21	0.42		
	c/	2.94	5.87	0.00	0.00	2.91	5.82	2.91	5.82	98.98	
	d/	34.67	69.36	0.42	0.84	34.11	68.16	34.53	69.00	99.60	MS[7]
	e/	11.34	22.59	0.87	1.74	10.41	20.80	11.28	22.54	93.74	MS[7]
	f/	49.16	98.24	1.29	2.68	47.64	95.20	48.93	97.88		
	g/	0.88	1.76	ns	-	-	-	-	-		
T 9/4	a/	50.03	100.00								
	b/	1.14	2.28	ns		1.14	2.28	1.14	2.28		
	c/	4.56	0.12	0.01	0.02	4.51	9.01	4.52	0.03	99.12	
	d/	26.64	53.27	0.12	0.24	26.26	52.48	26.38	52.72	99.02	MS[7]
	e/	15.61	31.17	0.38	0.76	15.18	30.34	15.56	31.10	99.68	MS[7]
	f/	47.95	95.84	0.51	1.02	47.09	94.11	47.60	95.13		
	g/	2.08	4.16	ns	-	-	-	-	-		

1	2	3	4	5	6	7	8	9	10	11	12
T 9/5	a/	50.01	100.00								
	b/	0.40	0.80	ns	–	0.40	0.80	0.40	0.80		
	c/	3.38	6.76	0.01	0.02	3.28	6.56	3.29	6.58	97.34	
	d/	23.39	46.76	0.05	0.10	22.85	45.69	22.90	45.79	97.90	MI/ op.m.,ga,ep,st,py,
	e/	21.20	42.40	0.13	0.26	20.62	41.23	20.75	41.49	97.88	MI/ op.m. 50,ga,ep,di, py,am ,tu,le/
	f/	48.37	96.72	0.19	0.38	46.00	92.28	46.34	92.66		
	g/	1.64	3.28	ns	–	–	–	–	–		
T 9/6	a/	50.03	100.00								
	b/	0.45	0.90	ns		0.45	0.90	0.45	0.90		
	c/	2.52	5.04	0.01	0.02	2.50	5.00	2.51	5.02	99.60	
	d/	20.47	42.89	0.08	0.16	20.26	40.50	20.34	40.66	99.36	
	e/	25.25	50.50	0.16	0.32	20.01	49.99	25.17	50.31	99.48	MI/op.m..,py,si,le,ga,
	f/	48.69	87.33	0.25	0.50	48.22	96.39	48.47	96.86		
	g/	1.34	2.67	ns	–	–	–	–	–		
T 9/7	a/	49.99	100.00								
	b/	4.85	9.70	ns		4.85	9.70	4.85	9.70		
	c/	6.25	12.50	0.01	0.02	6.15	12.30	6.16	12.32	98.56	
	d/	21.19	42.39	0.04	0.08	20.97	41.95	21.01	42.03	99.15	
	e/	16.06	32.13	0.14	0.28	15.75	31.51	15.89	31.79	98.94	
	f/	48.35	96.72	0.19	0.38	47.72	95.46	47.91	97.84		
	g/	1.64	3.28	ns	–	–	–	–	–		
T 9/8	a/	50.04	100.00								
	b/	4.56	9.11	ns		4.56	9.11	4.56	9.11		
	c/	6.02	12.03	0.01	0.02	5.97	11.93	5.98	11.95	99.33	
	d/	21.08	42.12	0.04	0.08	20.90	41.77	20.94	41.85	99.34	
	e/	16.86	33.69	0.12	0.24	16.69	33.35	16.81	33.59	99.70	
	f/	48.52	96.96	0.17	0.34	48.12	96.16	48.29	96.50		
	g/	1.52	3.04	ns	–	–	–	–	–		
T 9/9	a/	199.84	100.00								
	b/	16.05	8.03	ns		16.05	8.03	16.05	8.03		
	c/	20.42	10.22	0.01	0.01	20.35	10.18	20.36	10.19	99.71	
	d/	78.87	39.47	0.14	0.07	78.35	39.21	78.49	39.28	99.52	MI/ op.m.,ep,ga,st,di,
	e/	72.86	36.46	0.22	0.11	72.19	35.12	72.41	36.23	99.38	MI/ op.m. 50,py,tu,di, si,am ,bi,le/
	f/	188.20	94.18	0.37	0.19	186.94	93.44	187.31	93.63		
	g/	11.64	5.82	ns	–	–	–	–	–		
T 9/10	a/	199.87	100.00								
	b/	8.77	4.39	ns		8.77	4.39	8.77	4.39		
	c/	19.19	9.60	0.01	0.01	19.15	9.58	19.16	9.59	99.84	
	d/	98.38	49.22	0.22	0.11	97.85	48.96	98.07	49.07	99.68	
	e/	67.73	33.89	0.32	0.16	67.25	33.65	57.57	33.81	99.76	MI/ op.m.,ep,py,tu,ga,
	f/	194.07	97.10	0.55	0.28	193.02	96.58	193.57	96.86		
	g/	5.80	2.90	ns	–	–	–	–	–		
T 9/11	a/	199.92	100.00								
	b/	12.01	6.01	ns		12.01	6.01	12.01	6.01		
	c/	21.18	10.59	0.02	0.01	20.99	10.50	21.01	10.51	99.20	
	d/	92.98	46.51	0.15	0.07	91.79	45.91	91.94	46.06	98.88	/MI/ op.m. 40,ep,ga,le/
	e/	66.27	33.15	0.55	0.28	65.44	32.73	65.99	33.01	99.58	MI/op.m.. 50,ep,ga,py, sil,tu,di,bi,le/
	f/	192.44	96.26	0.72	0.36	190.23	95.15	190.95	95.51		
	g/	7.48	3.74	ns	–	–		–	–		

1	2	3	4	5	6	7	8	9	10	11	12
T 9/12	a/	199.83	100.00								
	b/	2.66	1.33	ns	-	2.66	1.33	2.66	1.33		
	c/	13.61	6.81	0.01	0.01	13.59	6.80	13.61	6.81	100.00	
	d/	100.05	50.07	0.21	0.10	99.18	49.63	99.39	49.73	99.34	
	e/	75.00	37.53	0.40	0.20	74.37	37.22	74.77	37.42	99.69	
	f/	191.32	95.74	0.63	0.31	189.80	94.98	190.43	95.29		-
	g/	8.51	4.26	ns	-	-	-	-	-		
T 9/13	a/	149.95	100.00								
	b/	0.82	0.55	ns		0.82	0.55	0.82	0.55		
	c/	3.22	2.15	0.00	0.00	3.19	2.13	3.19	2.13	99.07	
	d/	51.68	34.46	0.01	0.01	51.27	34.19	51.41	34.28	99.48	
	e/	89.03	59.37	0.29	0.14	88.50	58.08	88.79	59.22	99.73	MI/'op.m.50,ep,ga,zi, am.,py,st,ru,tu/
	f/	144.75	96.53	0.30	0.15	143.91	96.03	144.21	96.18		
	g/	5.20	3.47	ns	-	-	-	-	-		

RÉSULTATES D'ANALYSE GRANULOMÉTRIQUE ET DE SÉPARATION DANS LES LIQUIDES LOURDS DES SABLES PRÉLEVÉS DES SONDAGES DE LA RÉGION DE T Â N I T

RESULTS OF GRAIN SIZE ANALYSIS AND HEAVY LIQUID SEPARATION OF SANDS FROM BOREHOLES IN THE REGION OF T Â N I T

Borehole
Sondage T 10

Échantillon No Sample No		Analyse granulométrique / Grain size analysis: rendement / yield		Séparation dans les liquides denses / Heavy liquid separation: Fraction lourde / Heavy fraction: rendement / yield		Fraction légère / Light fraction: rendement / yield		Rendement total / Total yield: rendement / yield		Récupération / Recovery	Remarks / Remarques
	a/ admission / feed b/ fraction + 0.8mm c/ fraction + 0.4mm d/ fraction + 0.2mm e/ fraction + 0.06mm f/ total fraction de sable / total sand fraction g/ fraction de vase et d'argile / silt and clay fraction	g	%	g	%	g	%	g	%	%	
1	2	3	4	5	6	7	8	9	10	11	12
T 10/1	a/	50.07	100.00								
	b/	4.50	8.99	ns	-	4.50	8.99	4.50	8.99		
	c/	7.48	14.94	0.02	0.04	7.46	14.90	7.48	14.94	100.00	MS[8]/see tab. 3/
	d/	26.45	52.83	0.36	0.72	25.93	51.79	26.29	52.51	99.39	MS[8]/voir tab. 3/
	e/	9.65	19.27	1.99	3.98	7.61	15.20	9.60	19.18	99.48	
	f/	48.08	96.03	2.37	4.74	45.50	90.88	47.87	95.62		
	g/	1.89	3.97	ns	-	-	-	-	-		
T 10/2	a/	49.99	100.00								
	b/	2.69	5.38	ns	-	2.69	5.38	2.69	5.38		
	c/	7.39	14.78	0.01	0.02	7.36	14.72	7.37	14.74	99.73	-
	d/	28.61	57.23	0.08	0.16	28.31	56.63	28.39	56.79	99.23	MS[8]
	e/	9.56	19.12	0.33	0.66	9.02	18.04	9.35	18.70	97.80	MS[8]
	f/	48.25	96.51	0.42	0.84	47.38	94.77	47.80	95.61	-	-
	g/	1.74	3.49	ns	-	-	-	-	-		
T 10/3	a/	49.99	100.00								
	b/	2.98	5.96	ns	-	2.98	5.96	2.98	5.96		
	c/	7.20	14.40	0.01	0.02	7.19	14.38	7.20	14.40	100.00	
	d/	27.53	55.07	0.18	0.36	26.83	53.67	27.01	54.03	98.11	MS[8]
	e/	10.42	20.84	0.76	1.52	9.55	19.10	10.31	20.62	98.94	MS[8]
	f/	48.13	96.27	0.95	1.90	46.55	93.12	47.50	95.02		
	g/	1.86	3.73	ns	-	-	-	-	-		
T 10/4	a/	50.05	100.00								
	b/	5.93	11.85	ns	-	5.93	11.85	5.93	11.85		
	c/	10.85	21.68	0.01	0.02	10.78	21.54	10.79	21.56	99.45	
	d/	22.82	45.59	0.10	0.20	22.60	45.15	22.70	45.35	99.47	
	e/	8.86	17.70	0.04	0.08	8.76	17.50	8.80	17.58	99.32	
	f/	48.46	96.82	0.15	0.30	48.07	96.04	48.22	96.34		
	g/	1.59	3.18	ns	-	-	-	-	-		

Tableau / Tablo 1/34 — Borehole / Sondage T 10

1	2	3	4	5	6	7	8	9	10	11	12
T 10/5	a/	49.94	100.00								
	b/	2.16	4.32	ns	–	2.16	4.32	2.16	4.32		
	c/	5.29	10.59	0.01	0.02	5.26	10.53	5.27	10.55	99.62	
	d/	22.99	46.03	0.01	0.02	22.90	45.86	22.91	45.88	99.65	
	e/	16.16	32.36	0.06	0.12	16.10	32.24	16.16	32.36	100.00	
	f/	46.60	93.30	0.08	0.16	46.42	92.95	46.50	93.11		–
	g/	3.34	6.70	ns	–	–	–	–	–		
T 10/6	a/	49.98	100.00								
	b/	2.79	5.58	ns	–	2.79	5.58	2.79	5.58		
	c/	4.75	9.50	0.00	0.00	4.73	9.46	4.73	9.46	99.58	
	d/	28.03	56.08	0.04	0.08	27.77	55.56	27.81	55.64	99.21	
	e/	13.59	27.20	0.07	0.14	13.32	26.66	13.39	26.80	98.53	
	f/	49.16	98.36	0.11	0.22	48.61	97.26	49.32	97.48		
	g/	0.82	1.64	ns	–	–	–	–	–		
T 10/7	a/	49.98	100.00								
	b/	0.25	0.50	ns	–	0.25	0.50	0.25	0.50		
	c/	2.60	5.20	0.00	0.00	2.59	5.18	2.59	5.18	99.61	
	d/	34.44	68.91	0.09	0.18	33.39	66.81	33.48	66.99	97.21	
	e/	11.70	23.41	0.07	0.14	11.53	23.07	11.60	23.21	99.14	
	f/	48.99	98.02	0.16	0.32	47.76	95.56	47.92	95.88		
	g/	0.99		ns	–	–	–	–	–		
T 10/8	a/	49.59	100.00								
	b/	0.50	1.01	ns	–	0.50	1.01	0.50	1.01		
	c/	2.01	4.05	0.01	0.02	2.00	4.03	2.01	4.05	100.00	
	d/	17.14	34.56	0.01	0.02	16.98	34.24	16.99	34.26	99.12	
	e/	28.98	58.44	0.06	0.12	28.00	56.46	28.06	56.58	96.82	
	f/	48.63	98.06	0.08	0.16	47.48	95.74	47.56	95.90		
	g/	0.99	1.94	ns	–	–	–	–	–		
T 10/9	a/	199.96	100.00								
	b/	1.70	0.85	ns	–	1.70	0.85	1.70	0.85	–	
	c/	5.22	2.61	0.01	0.01	4.99	2.50	5.00	2.51	95.78	
	d/	47.84	23.92	0.06	0.03	46.99	23.50	47.05	23.53	98.35	
	e/	138.41	69.26	0.32	0.16	136.47	68.25	136.79	68.41	98.78	MI/op.m., ep,py,ga,di, tu,
	f/	193.24	96.64	0.39	0.20	190.15	95.10	190.54	95.30		
	g/	7.72	3.36	ns	–	–	–	–	–		
T 10,	a/	200.00	100.00								
	b/	15.59	7.80	ns	–	15.59	7.80	15.59	7.80		
	c/	23.48	11.74	0.02	0.01	23.46	11.73	23.48	11.74	100.00	
	d/	79.98	39.99	0.11	0.06	79.47	39.73	79.58	39.79	99.50	
	e/	70.49	35.24	0.33	0.16	69.57	34.78	69.90	34.94	99.16	MI/ op.m:60,ep,zi,ga,tu, py,am ,st,di,sil,m/
	f/	189.54	94.77	0.46	0.23	188.09	94.04	188.55	94.27		
	g/	10.46	5.23		–	–	–	–	–		
T 10/11	a/	199.90	100.00								
	b/	23.45	11.73	ns	–	23.45	11.73	23.45	11.73		
	c/	51.09	25.53	0.03	0.02	50.98	25.50	51.01	25.52	99.96	
	d/	86.72	43.38	0.09	0.04	85.18	42.61	85.27	42.65	98.33	
	e/	31.17	15.59	0.16	0.08	30.83	15.42	30.99	15.50	99.42	
	f/	192.37	96.23	0.20	0.14	190.44	95.26	190.72	95.40		
	g/	7.53	3.77	ns	–	–	–	–	–		

1	2	3	4	5	6	7	8	9	10	11	12
T10/12	a/	199.89	100.00								
	b/	21.74	10.88	ns	-	21.74	10.88	21.74	10.88		
	c/	66.50	33.27	0.02	0.01	65.13	32.58	65.15	32.59	97.97	
	d/	79.33	39.69	0.08	0.04	78.11	39.08	78.19	39.12	98.56	
	e/	23.38	11.70	0.14	0.07	23.14	11.58	23.28	11.65	99.57	
	f/	190.95	95.53	0.24	0.12	188.12	94.12	188.36	94.24		
	g/	8.94	4.47	ns	-	-	-	-	-		
T11/13	a/	150.92	100.00								
	b/	16.62	10.01	ns	-	16.62	10.01	16.62	10.01		
	c/	51.12	33.87	0.04	0.03	50.93	33.75	50.97	33.78	99.71	MI/ep,di,py,mo,op.m./
	d/	58.83	38.98	0.04	0.03	58.64	38.86	58.68	38.89	98.88	
	e/	17.07	11.31	0.04	0.03	16.78	11.12	16.82	11.15	98.54	MI/op.m.,ep,zi,py,tu,di,ga/
	f/	143.64	95.17	0.12	0.09	142.97	94.74	143.09	94.83		
	g/	6.28	4.83	ns	-	-	-	-	-		

RÉSULTATS D'ANALYSE GRANULOMÉTRIQUE ET DE SÉPARATION DANS LES LIQUIDES LOURDS DES SABLES PRÉLEVÉS DES SONDAGES DE LA RÉGION DE T Â N I T

RESULTS OF GRAIN SIZE ANALYSIS AND HEAVY LIQUID SEPARATION OF SANDS FROM BOREHOLES IN THE REGION OF T Â N I T

Borehole / Sondage T 11

Échantillon No / Sample No	Analyse granulométrique / Grain size analysis: a/ admission / feed; b/ fraction +0.8mm; c/ fraction +0.4mm; d/ fraction +0.2mm; e/ fraction +0.06mm; f/ total fraction de sable / total sand fraction; g/ fraction de vase et d'argile / silt and clay fraction	rendement / yield (g)	rendement / yield (%)	Séparation dans les liquides denses / Heavy liquid separation — Fraction lourde / Heavy fraction: rendement / yield (g)	Fraction lourde / Heavy fraction (%)	Fraction légère / Light fraction: rendement / yield (g)	Fraction légère / Light fraction (%)	Rendement total / Total yield: rendement / yield (g)	Rendement total / Total yield (%)	Récupération / Recovery (%)	Remarks / Remarques
1	2	3	4	5	6	7	8	9	10	11	12
T 11/1	a/	49.99	100.00								
	b/	0.04	0.08	ns	-	0.04	0.08	0.04	0.08		
	c/	4.16	8.32	0.01	0.02	4.02	8.04	4.03	8.06	96.87	
	d/	39.69	79.40	0.49	0.98	38.75	77.52	39.24	78.50	98.87	MS[9]/see tab. 3../
	e/	5.86	11.72	0.93	1.86	4.88	9.76	5.81	11.62	99.15	MS[9]/ voir tab.3 ./
	f/	49.75	99.52	1.43	2.86	47.69	95.40	49.12	98.26		
	g/	0.24	0.48	ns	-	-	-	-	-		
T 11/2	a/	49.97	100.00								
	b/	0.06	0.12	ns		0.06	0.12	0.06	0.12	-	
	c/	2.39	4.78	0.00	0.00	2.36	4.72	2.36	4.72	98.74	
	d/	33.81	67.66	0.55	1.10	33.10	66.24	33.65	67.34	99.53	MS[9]
	e/	13.60	27.22	1.67	3.34	11.62	23.25	13.29	26.59	97.72	MS[9]
	f/	49.86	99.78	2.22	4.44	47.14	94.33	49.36	98.77		
	g/	0.11	0.22	-	-	-	-	-	-		
T 11/3	a/	50.00	100.00								
	b/	0.02	0.04	ns		0.02	0.04	0.02	0.04		
	c/	1.30	2.60	0.01	0.02	1.29	2.58	1.30	2.60	100.00	
	d/	67.18	33.59	0.65	1.30	32.14	64.28	32.79	34.09	97.62	MS[10]/see tab. 3./
	e/	14.76	29.52	2.58	5.16	12.02	24.04	14.60	29.20	98.92	MS[10]/voir tab.3
	f/	49.67	99.34	3.24	6.48	45.47	90.94	48.71	97.42		
	g/	0.33	0.66	ns	-	-	-	-	-		
T 11/4	a/	50.12	100.00								
	b/	0.12	0.24	ns	-	0.12	0.24	0.12	0.24	-	
	c/	7.39	14.74	0.00	0.00	7.30	14.57	7.30	14.57	98.78	
	d/	35.36	70.95	0.59	1.18	34.64	69.11	35.23	70.29	99.63	MS[10]
	e/	7.12	14.21	0.92	1.94	6.04	12.05	7.01	13.99	98.46	MS[10]
	f/	49.99	99.74	1.56	3.12	48.10	95.97	49.66	99.09		
	g/	0.13	0.26	ns	-	-	-	-	-		

1	2	3	4	5	6	7	8	9	10	11	12
T 11/5	a/	49.99	100.00								
	b/	0.40	0.80	ns		0.40	0.80	0.40	0.80		
	c/	11.51	23.02	0.01	0.02	11.47	22.94	11.48	22.96	99.74	
	d/	30.96	61.93	0.71	1.42	29.95	59.91	30.66	61.33	99.03	MS^{11}/see tab. .3./
	e/	6.26	15.52	1.05	2.10	4.97	9.94	6.02	12.04	96.17	MS^{11} /voir tab.3/
	f/	49.13	98.27	1.77	3.54	46.79	93.59	48.56	97.13		
	g/	0.86	1.73	ns	–	–	–	–	–		
T 11/6	a/	49.99	100.00								
	b/	0.37	0.74	ns		0.37	0.74	0.37	0.74		
	c/	11.44	22.28	0.00	0.00	11.10	22.20	11.10	22.20	99.64	
	d/	30.89	61.79	0.70	1.40	29.96	59.93	30.66	61.33	99.26	MS^{11}
	e/	6.84	13.68	1.15	2.30	5.50	11.00	6.65	13.30	97.22	MS^{11}
	f/	49.24	98.49	1.85	3.70	46.93	93.87	48.78	97.57		
	g/	0.75	1.51	ns	–	–	–	–	–		
T 11/7	a/	49.96	100.00								
	b/	0.24	0.48	ns		0.24	0.48	0.24	0.48		
	c/	7.60	15.21	0.00	0.00	7.56	15.13	7.56	15.13	99.47	
	d/	31.70	63.45	0.42	0.84	31.07	62.19	31.49	63.03	99.34	MS^{11}
	e/	8.49	16.99	0.97	1.94	7.18	14.37	8.15	16.31	96.00	MS^{11}
	f/	48.03	96.13	1.39	2.78	46.05	92.17	47.44	94.95		
	g/	1.93	3.87	ns	–	–	–	–	–		
T 11/8	a/	49.93	100.00								
	b/	2.62	5.25	ns		2.62	5.25	2.62	5.25		
	c/	3.93	7.87	0.01	0.02	3.87	7.75	3.88	7.77	98.73	
	d/	17.81	35.67	0.09	0.18	17.23	34.51	17.32	34.69	97.25	MS^{11}/see tab. .3./
	e/	15.52	31.08	0.23	0.46	15.03	30.10	15.26	30.56	98.32	MS^{11} /voir tab.3/
	f/	39.88	79.87	0.33	0.66	38.75	77.61	39.08	78.27		
	g/	10.05	20.13	ns							
T 11/9	a/	201.70	100.00								
	b/	2.83	1.40	ns		2.83	1.40	2.83	1.40		
	c/	6.52	3.23	0.00	0.00	6.48	3.21	6.48	3.21	99.39	le,st/
	d/	50.56	25.07	0.22	0.11	50.10	24.84	50.32	24.95	99.53	MI/ op.m. 40,ep,ga,am
	e/	121.29	60.13	0.75	0.37	120.27	59.63	121.02	60.00	99.78	MIQ/see tab. .../
	f/	181.20	89.83	0.97	0.48	179.68	89.08	180.65	89.56		/voir tab.2/
	g/	20.50	10.17	ns	–	–	–	–	–		
T 11/10	a/	199.91	100.00								
	b/	14.07	7.04	ns	–	14.07	7.04	14.07	7.04		
	c/	22.64	11.33	0.01	0.01	22.22	11.12	22.23	11.13	98.19	
	d/	71.07	35.55	0.32	0.16	70.06	35.04	70.38	35.20	99.03	MI/ op.m. 40,ga,di,si,
	e/	70.24	35.14	1.06	0.53	68.37	34.20	69.43	34.73	98.85	MIQ /see tab. .2./
	f/	178.02	89.06	1.39	0.70	174.72	87.40	176.11	88.20		/voir tab.2/
	g/	21.89	10.94	ns	–	–	–	–	–		
T 11/11	a/	199.90	100.00								
	b/	8.39	4.20	ns	–	8.39	4.20	8.39	4.20	–	
	c/	23.36	11.69	0.02	0.01	23.09	11.55	23.11	11.56	98.93	
	d/	105.31	52.68	0.11	0.06	105.07	52.56	105.18	52.62	99.88	
	e/	52.73	26.38	0.38	0.19	51.46	25.74	51.84	25.93	98.31	/MI/ op.m. 40,ep,di,ga
	f/	189.79	94.94	0.51	0.26	188.01	94.05	188.52	94.31		zi,sil,py/
	g/	10.11	5.05	ns	–	–	–	–	–		

Tableau 1/38
Table

Borehole T 11
Sondage

1	2	3	4	5	6	7	8	9	10	11	12
	a/	249.86	100.00								
	b/	10.19	4.07	ns	-	10.19	4.07	10.19	4.07	-	
	c/	40.55	16.23	0.03	0.01	40.27	16.12	40.30	16.13	99.38	
T 11/12	d/	145.55	58.06	0.14	0.06	144.03	57.64	144.17	57.70	99.38	MI/op.m. 20,ga,ep,st.
	e/	41.02	16.42	0.31	0.12	40.39	16.17	40.70	16.29	99.22	MI/op.m. 55,ep,ga,di, tu,py,le,ap,am /
	f/	236.83	94.78	0.48	0.19	234.88	94.00	135.36	94.19		
	g/	13.03	5.22	ns	-	-	-	-	-		

RÉSULTATES D'ANALYSE GRANULOMÉTRIQUE ET DE SÉPARATION DANS LES LIQUIDES LOURDS DES SABLES PRELEVES DES SONDAGES DE LA RÉGION DE T Â N I T

RESULTS OF GRAIN SIZE ANALYSIS AND HEAVY LIQUID SEPARATION OF SANDS FROM BOREHOLES IN THE REGION OF T Â N I T

Borehole / Sondage T 12

Echantillon No / Sample No	Analyse granulométrique / Grain size analysis			Séparation dans les liquides denses / Heavy liquid separation							Remarks / Remarques
	a/ admission / feed b/ fraction +0.8mm c/ fraction +0.4mm d/ fraction +0.2mm e/ fraction +0.06mm f/ total fraction de sable / total sand fraction g/ fraction de vase et d'argile / silt and clay fraction			Fraction lourde / Heavy fraction		Fraction légère / Light fraction		Rendement total / Total yield		Recuperation / Recovery	
		rendement / yield		rendement / yield		rendement / yield		rendement / yield			
		g	%	g	%	g	%	g	%	%	
1	2	3	4	5	6	7	8	9	10	11	12
T 12/1	a/	49.97	100.00								
	b/	0.05	0.10	ns	-	0.05	0.10	0.05	0.10		
	c/	1.92	3.84	0.00	0.00	1.90	3.80	1.90	3.80	98.96	
	d/	30.58	61.20	0.32	0.64	30.02	60.08	30.34	60.72	99.21	MS[12]/see tab. 3./
	e/	16.51	33.04	1.13	2.26	15.28	30.58	16.41	32.84	99.39	MS[12] /voir tab.3/
	f/	49.06	98.18	1.45	2.90	47.25	94.56	48.70	97.46	99.27	
	g/	0.91	1.82	ns	-	-	-	-	-		
T 12/2	a/	49.88	100.00								
	b/	0.11	0.22	ns	-	0.11	0.22	0.11	0.22		
	c/	3.04	6.10	0.00	0.00	3.00	6.01	3.00	6.01	98.68	
	d/	27.29	54.71	0.35	0.70	26.52	53.17	26.87	53.87	98.46	MS[12]
	e/	14.90	29.87	0.89	1.78	13.65	27.37	14.54	29.15	97.58	MS[12]
	f/	45.34	90.90	1.24	2.48	43.28	86.77	44.52	89.25		
	g/	4.54	9.10	ns	-	-		-	-		
T 12/3	a/	49.94	100.00								
	b/	0.10	0.20	ns	-	0.10	0.20	0.10	0.20		
	c/	3.02	6.05	0.00	0.00	2.98	5.97	2.98	5.97	98.67	
	d/	28.40	56.82	0.34	0.68	27.77	55.61	28.11	56.29	98.98	MS[12]
	e/	16.07	32.18	0.96	1.92	14.85	29.74	15.81	31.66	98.38	MS[12]
	f/	47.59	95.30	1.40	2.60	45.70	91.52	47.10	94.12		
	g/	2.35	4.70	ns	-	-	-	-	-		
-		-		-		-	-	-	-		

1	2	3	4	5	6	7	8	9	10	11	12
	a/	49.95	100.00								
	b/	7.46	14.93	ns	-	7.46	14.93	7.46	14.93		
	c/	2.12	4.24	0.00	0.00	2.12	4.24	2.12	4.24	100.00	
T 12/4	d/	11.18	22.38	0.01	0.02	10.86	21.74	10.87	21.76	97.23	
	e/	14.69	29.41	0.05	0.10	14.49	29.01	14.54	29.11	98.98	MI,/ op.m. 45,ep,py,am zi,ru,tu,ga,di/
	f/	35.45	70.96	0.06	0.12	34.93	69.92	34.99	70.04		
	g/	14.50	29.04	ns	-	-	-	-	-		
	a/	42.54	100.00								
	b/	3.43	8.06	ns	-	3.43	8.06	3.43	8.06		
	c/	0.75	1.76	0.00	0.00	0.75	1.76	0.75	1.76	100.00	
T 12/5	d/	3.48	8.18	0.03	0.06	3.42	8.04	3.45	8.10	99.14	
	e/	3.26	7.66	0.02	0.04	3.18	7.47	3.20	7.51	98.16	
	f/	10.92	25.66	0.05	0.10	10.78	25.33	10.83	25.43		
	g/	31.62	74.34	ns	-	-	-	-	-		
	a/	33.91	100.00								
	b/	1.75	5.16	ns	-	1.75	5.16	1.75	5.16		
	c/	2.27	6.69	0.02	0.06	2.24	6.61	2.26	6.67	99.56	
T 12/6	d/	17.66	52.08	0.02	0.06	17.56	51.78	17.58	51.84	99.55	
	e/	5.30	15.63	0.02	0.06	5.21	15.36	5.23	15.42	98.68	
	f/	26.98	79.56	0.06	0.18	26.76	78.91	26.82	79.09		
	g/	6.93	20.44	ns	-	-	-	-	-		
	a/	49.97	100.00								
	b/	0.89	1.78	ns	-	0.89	1.78	0.89	1.78		
	c/	3.12	6.24	0.00	0.00	3.12	6.24	3.12	6.24	100.00	
T 12/7	d/	19.87	39.76	0.01	0.02	19.83	39.68	19.84	39.70	99.85	
	e/	22.06	44.15	0.07	0.14	21.64	43.30	21.71	43.44	98.41	MI /op.m. 70,py,am , ep,sil,ga,tu/
	f/	45.94	91.93	0.08	0.16	45.48	91.00	45.56	91.16		
	g/	4.03	8.07	ns	-	-	-	-	-		
	a/	49.99	100.00								
	b/	0.78	1.56	ns	-	0.78	1.56	0.78	1.56		
	c/	4.14	8.28	0.01	0.02	4.02	8.04	4.03	8.06	97.34	
T 12/8	d/	21.36	42.73	0.01	0.02	21.25	42.51	21.26	42.53	99.53	
	e/	21.61	43.23	0.05	0.10	21.29	42.59	21.34	42.69	98.75	
	f/	47.89	95.80	0.07	0.14	47.34	94.70	47.41	94.84		
	g/	2.10	4.20	ns	-	-	-	-	-		
	a/	182.99	100.00								
	b/	4.39	2.40	ns	-	4.39	2.40	4.39	2.40		
	c/	17.74	9.69	0.00	0.00	17.61	9.62	17.61	9.62	99.27	
T 12/9	d/	69.51	37.99	0.10	0.05	69.30	37.87	69.40	37.92	99.84	MI/'op.m. 35,ga,ep, di,st,zi,di,mo/
	e/	76.97	42.06	0.26	0.13	76.21	41.65	76.47	41.78	99.35	MI/ op.m. 40,ga,py, zi,ct,di,tu,sil
	f/	168.61	92.14	0.36	0.18	167.51	91.54	167.87	91.72		
	g/	14.38	7.86	ns	-	-	-	-	-		
	a/	199.84	100.00								
	b/	5.64	2.82	ns	-	5.64	2.82	5.64	2.82		
	c/	15.61	7.81	0.02	0.01	15.54	7.78	15.56	7.79	99.68	di,
T 12/10	d/	80.55	40.31	0.17	0.08	79.98	40.02	80.15	40.10	99.50	MI/'op.m.40,ga,op,
	e/	76.87	38.46	0.57	0.28	75.40	37.73	75.97	38.01	98.83	MIQ /see tab. ..2./ /voir tab.2/
	f/	178.67	89.40	0.76	0.37	176.56	88.35	177.32	88.72		
	g/	21.17	10.60	ns	-	-	-	-	-		

1	2	3	4	5	6	7	8	9	10	11	12
T 12/11	a/	197.41	100.00								
	b/	15.38	7.79	ns	-	15.38	7.79	15.38	7.79		
	c/	26.77	13.56	0.02	0.01	26.74	13.54	26.76	13.55	99.96	MI/ga,ep,il,mo/
	d/	94.37	47.80	0.07	0.03	94.14	47.69	94.21	47.72	99.83	MI/op.m.,ga,ep,di,le/
	e/	48.45	24.54	0.26	0.13	47.72	24.17	47.98	24.30	99.03	MI/op.m. 40,ga,ep,zi, am,py,tu,ep,di/
	f/	184.97	93.69	0.35	0.17	183.98	93.19	184.33	93.36		
	g/	12.44	6.31	ns	-	-	-	-	-		
T 12/12	a/	199.94	100.00								
	b/	8.35	4.18	ns	-	8.35	4.18	8.35	4.18		
	c/	19.31	9.66	0.02	0.01	19.19	9.60	19.21	9.61	99.48	
	d/	114.10	57.07	0.03	0.01	113.76	56.90	113.79	56.91	99.73	
	e/	50.24	25.12	0.18	0.09	49.69	24.85	49.87	24.94	99.26	MI /op.m. 30,py,am, di,zi,tu,ga/
	f/	192.00	96.03	0.23	0.11	190.99	95.53	191.22	95.64		
	g/	7.94	3.97	ns	-	-	-	-	-		
T 12/13	a/	199.89	100.00								
	b/	9.59	4.80	ns	-	9.59	4.80	9.59	4.80		
	c/	20.75	10.38	0.02	0.01	20.63	10.32	20.65	10.33	99.52	
	d/	115.49	57.76	0.03	0.02	114.81	57.41	114.84	57.43	99.44	
	e/	46.53	23.27	0.21	0.10	46.18	23.09	46.39	23.19	99.70	MI/op.m. 40,ga,ep, py,zi,le,tu,mo/
	f/	192.36	96.21	0.26	0.13	191.21	95.62	191.47	95.75		
	g/	7.53	3.79	ns	-	-	-	-	-		

Tableau 2
Table

RÉSULTATS DE L'ANALYSE PLANIMÉTRIQUE - LUMIÈRE TRANSMISE ET REFLECTIVE - RÉGION TÂNIT /POURCENTAGE EN VOLUME/

GRAIN COUNTS RESULTS - LIGHT TRANSMITTED AND REFLECTED - REGION TÂNIT /VOL. %/

	MINÉRAUX LOURDS / HEAVY MINERALS																						MINÉRAUX LEGÈRS / LIGHT MINERALS			
	MINÉRAUX OPAQUES / OPAQUE MINERALS									MINÉRAUX TRANSPARENTS / TRANSPARENT MINERALS												Total HM				
Echant. No / Sample No	il	sph	ru	an	he	ma + mag	geo	Autres others	Total OP	le	zi	mo	ga	di	st	sil	tu	ep	py + am.	Autres others	Total MT		qu	cor	Total LM	No
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
T 2/1 + 0.20[x]	8.0	1.9	17.7	2.6	5.5	-	6.7	-	42.4	-	-	-	36.2	5.3	-	-	-	15.1	-	sp 1.0	57.6	100	-	-	-	1
T 2/2 + 0.20	9.5	1.2	15.2	0.8	8.9	-	2.1	-	37.7	-	1.0	-	30.0	6.1	3.2	-	-	21.0	-	-	61.3	99.0	1.0	-	1.0	2
T 2/3 + 0.20	8.6	.1	20.8	0.7	8.2	-	4.7	-	44.1	0.5	1.0	-	30.1	5.3	1.0	-	-	16.0	-	sp 0.5	54.4	98.5	1.5	-	1.5	3
T 4/1 + 0.063[xx]	15.2	0.5	39.2	1.3	8.9	1.3	1.3	-	67.7	0.9	9.1	-	11.4	4.1	0.5	-	-	3.6	1.8	-	31.4	99.1	0.9	-	0.9	4
T 4/10 + 0.20	12.9	0.5	15.5	1.3	16.0	0.4	2.2	-	48.8	-	1.6	-	28.0	3.8	1.1	-	-	10.8	1.1	-	46.4	95.2	4.8	-	4.8	5
T 5/1 + 0.063	16.9	0.8	49.5	2.0	6.1	-	-	-	75.3	1.4	10.7	-	6.5	1.9	-	-	-	3.7	-	-	24.2	99.5	0.5	-	0.5	6
T 6/9 + 0.20	26.2	0.6	6.2	0.6	6.2	-	42.4	-	82.2	2.2	-	-	9.4	1.1	-	-	-	3.1	-	-	15.8	98.0	2.0	-	2.0	7
T 6/19 + 0.063	19.4	0.6	40.9	3.7	4.7	-	-	-	69.3	2.0	3.4	-	4.9	3.8	-	-	-	3.8	6.4	bi 1.3	25.6	94.9	5.1	-	5.1	8
T 7/2 + 0.063	35.1	0.9	22.5	2.8	14.0	-	0.6	-	75.9	0.4	8.3	-	5.0	4.6	0.4	0.4	0.4	1.7	1.7	chl 0.4	23.3	99.2	0.8	-	0.8	9
T 7/10 + 0.063	17.4	-	30.6	-	3.7	-	1.0	-	52.7	2.1	13.2	-	10.4	9.0	1.4	-	-	6.3	2.1	-	44.5	97.2	2.1	0.7	2.8	10
T 8/1 + 0.063	20.2	1.9	36.7	1.3	5.2	0.4	0.6	-	66.3	1.7	10.0	0.4	10.0	3.9	0.4	-	-	2.6	2.6	1.3bi 0.4ca	33.3	99.6	0.4	-	0.4	11
T 8/1 + 0.20	10.3	1.0	16.4	1.3	7.8	0.1	2.3	-	39.2	0.8	3.7	0.2	37.1	4.8	0.4	-	0.3	10.6	1.3	-	59.1	98.3	1.7	-	1.7	12
T 11/10 + 0.063	7.7	-	-	-	43.1	-	12.6	-	63.4	4.9	9.5	-	4.0	5.0	0.5	-	0.9	4.1	5.8	ca 0.5	35.2	98.6	1.4	-	1.4	13
T 11/9 + 0.063	16.9	0.7	32.0	5.4	-	-	5.4	-	60.4	2.4	6.8	0.5	5.4	8.8	1.0	-	1.0	2.9	7.8	bi 0.5	37.1	97.5	1.5	1.0	2.5	14
T 12/10 + 0.063	7.8	1.7	41.7	1.5	2.9	0.4	-	-	55.9	1.8	10.8	-	3.6	7.2	-	0.9	-	6.3	6.3	-	36.9	92.8	7.2	-	7.2	15

[x] c.a.d. + 0.20 - 0.40 mm grain classe de l'échantillon T 2/1
+0.20 - i.e.the + 0.20 - 0.40 mm grain class of the sample T 2/1

[xx] c.a.d. + 0.063 - 0.20 mm grain classe de l'échantillon T 4/1
+ 0.063 - i.e.the + 0.063 - 0.20 mm grain class of the sample T 4/1

RÉSULTATS DE LA SÉPARATION MAGNÉTIQUE ET ÉLECTROMAGNÉTIQUE DE LA FRACTION LOURDE DES ÉCHANTILLONS DES SONDAGES DE LA RÉGION DE TÂNIT.

RESULTS OF MAGNETIC AND ELECTROMAGNETIS SEPARATION OF THE HEAVY FRACTION OF THE SAMPLES FROM BOREHOLES IN THE REGION OF TÂNITś

Tableau 3/1
Table 3/1

MS 1 - Séparation de l'échantillon T 0/1-2
Separation of the sample T 0/1-2

Échantillon Sample		Poids Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate					
T 0/1	+0.20 x	0.4065			
	+0.063 xx	1.4225			
T 0/2	+0.20	0.2067			
	+0.063	1.2482			
admission total T 0/1-2 total feed		3.2839	100.00		
MAGNÉTIQUES MAGNETICS					
Concentré I Concentrate I		0.2337	7.12	il96	MI
Concentré II Concentrate II		0.5272	16.05	il93,he,ga	MI
total magnétiques total magnetics		0.7609	23.17		
PARAMAGNÉTIQUES PARAMAGNETICS					
Concentré III Concentrate III		0.1310	3.99		
Produit intermédiaire IIIa Middling product IIIa		0.1655	5.04	ru30,ep,st,ga	MI
Concentré IV Concentrate IV		1.3175	41.30	ga50,ru50	MI
Produit intermédiaire IVa Middling product IVa		0.2540	7.96	ru45,ga,ep,di,st	MI
total paramagnétiques total paramagnetics		1.8680	58.29		
NON-MAGNÉTIQUES NONMAGNETICS					
Concentré V Concentrate V		0.5615	17.10	zi70,ru	MI
rendement total total yield		3.1904	97.15		

x +0.20 c.a.d. +0.20-0.40 mm grain classe de l'échantillon TO/1-2
i.e. the +0.20-0.40 mm grain class of the sample TO /1-2

xx +0.063 c.a.d. +0.063 -0.20 mm grain classe de l'échantillon TO/1
i.e. the +0.063 -0.20 grain class of the sample TO/1.

MS^2 – Séparation de l'échantillon T 1/1-4
Separation of the sample T 1 /1-4

Échantillon / Sample Concentré / Concentrate		Poids / Weight g	%	Minéraux / Minerals	Remarques / Remarks
T 1 /1	+0.20	0.0244			
	+0.063	1.0213			
T 1 /2	+0.20	0.1494			
	+0.063	0.5463			
T 1 /3	+0.20	0.2891			
	+0.063	0.8836			
T 1 / 4	+0.20	0.1892			
	+0.063	0.6890			
Admission total / Total feed	T 1/1-4	3.7923	100.00		
MAGNÉTIQUES / MAGNETICS					
Concentré I / Concentrate I		0.3270	8.62		
Concentré II / Concentrate II		0.3800	10.02		
Total magnétiques / Total magnetics		0.7070	18.64		
PARAMAGNÉTIQUES / PARAMAGNETICS					
Concentré III / Concentrate III		0.4506	11.88		an.chim / ch.a.
Concentré IV / Concentrate IV		1.8317	48.30		
Total paramagnétiques / Total paramagnetics		2.2823	60.18		
NON-MAGNETIQUES / NONMAGNETICS					
Concentré V / Concentrate V		0.6392	16.86		an.chim. / ch.a.
Rendement total / Total yield		3.6285	95.68		

MS[3] - Séparation de l'échantillon T 2/1-4
Separation of the sample T 2/1-4

Échantillon Sample	Poids Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate				
T 1/1 +0.063	1.0652			
T 2/1 +0.063	1.4953			
T 2/3 +0.063	1.6676			
T 2/4 +0.063	0.1250			
Rendement Total	4.3531	100.00		
MAGNÉTIQUES MAGNETICS				
Concentré I Concentrate I	0.6417	14.74		
Concentré II Concentrate II	0.6626	15.22		
Total magnétiques Total magnetics	1.3043	29.96		
PARAMAGNÉTIQUES PARAMAGNETICS				
Concentré III Concentrate III	0.4229	9.71		
Middling prod. IIIa	0.1328	3.06		
Concentré IV Concentrate IV	0.9702	22.29		
Middling prod. IVa	0.2566	5.89		
Total paramagnétiques Total paramagnetics	1.7825	40.95		
NON - MAGNÉTIQUES NONMAGNETICS				
Concentré V Concentrate V	0.4616	10.60		
Rendement total Total yield	3.5484	81.51		

MS4 – Séparation de l'échantillon T 3/1-2
Separation of the sample T 3/1-2

Échantillon Sample Concentré Concentrate	Poids Weight g	%	Minéraux Minerals	Remarques Remarks	
T 3/1 +0.20	0.9100				
T 3/1 +0.063	0.9896				
T 3/2 +0.20	0.3113				
T 3/2 +0.063	1.2038				
Admission total T 3/1-2 Total feed	3.4147	100.00			
MAGNÉTIQUES MAGNETICS					
Concentré I Concentrate I	0.4444	13.01	il 95	an.chem. ch.a.	MIG
Concentré II Concentrate II	0.7594	22.24	il 97	an.chem. ch.a.	MIG
total magnétiques total magnetics	1.2038	35.25			
PARAMAGNÉTIQUES PARAMAGNETICS					
Concentré III Concentrate III	0.5738	16.80			
Concentré IIIa Concentrate IIIa	0.0644	1.88		an.chem. ch.a.	
Concentré IV Concentrate IV	0.8834	25.87	ga 60		MI
Concentré IVa Concentrate IVa	0.1204	3.53			
total paramagnétiques total paramagnetics	1.6420	58.08			
NON-MAGNÉTIQUES NONMAGNETICS					
Concentré V Concentrate V	0.4940	14.47	zi 60	an.chem. ch.a.	MI
Rendement total Total yield	3.3398	97.81			

Tableau 3/5

Table 3/5

MS[5] - Séparation de l'échantillon T 6/1
Separation of the sample T 6/1

Échantillon Sample		Poids Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate					
T 6/1	+0.20 +0.063	0.9713 2.0864			
admission total total feed	T 6/1	3.0595	100.00		
MAGNÉTIQUES MAGNETICS					
Concentré I Concentrate I		0.1892	6.18		
Concentré II Concentrate II		0.4248	13.88		
total magnétiques total magnetics		0.6140	21.06		
PARAMAGNÉTIQUES PARAMAGNETICS					
Concentré III Concentrate III		0.4057	13.26	ru+il40,ga30,ep20	an.chem. ch.a. MIQ
Concentré IV Concentrate IV		1.3528	44.22		
total paramagnétiques total paramagnetics		1.7585	47.46		
NON-MAGNÉTIQUES NONMAGNETICS					
Concentré V Concentrate V		0.5350	17.49	zi60,qu20,ru,mo	an.chem. ch.a. MIQ
Rendement total Total yield		2.9075	95.03		

Tableau 3/6
Table 3/6

MS[6] - Séparation de l'échantillon T7/1
Separation of the sample T7/1

Échantillon Sample Concentré Concentrates	Poids Weight g	%	Minéraux Minerals	Remarques Remarks
T 7/1 +0.20	0.7083			
+0.063	3.2951			
Admission total T 7/1 Total feed	4.0034	100.00		
MAGNÉTIQUES MAGNETICS				
Concentré I Concentrate I	0.2002	5.00		
Concentré II Concentrate II	0.9810	24.50		
total magnétiques total magnetics	1.1812	29.50		
PARAMAGNÉTIQUES PARAMAGNETICS				
Concentré III Concentrate III	0.3271	8.17		
Middling prod.IIIa	0.0807	2.02		
Concentré IV Concentration IV	0.9561	23.88		
Middling prod.IVa	0.2810	7.02		
total paramagnétiques total paramagnetics	1.6449	41.09		
NON-MAGNÉTIQUES NONMAGNETICS				
Concentré V Concentation V	0.5587	13.96	zi80,ru10,qu20	MIQ
Rendement total Total yield	3.3848	84.55		

Tableau 3/7
Table 3/7

MS[7] - Séparation de l'échantillon T 9/1-4
Separation of the sample T / 9 /1-4

Échantillon / Sample		Poids / Weight g	%	Minéraux / Minerals	Remarques / Remarks
Concentré / Concentration					
T 9/1	+0.20	0.3470			
	+0.063	0.8661			
T 9/2	+0.20	0.3358			
	+0.063	0.6593			
T 9/3	+0.20	0.4165			
	+0.063	0.8669			
T 9/4	+0.20	0.1155			
	+0.063	0.3793			
Admission total / Total feed	T 9/ 1-4	3.9864	100.00		
MAGNÉTIQUES / MAGNETICS					
Concentré I / Concentrate I		0.2710	6.80		
Concentré II / Concentrate II		0.3425	8.59		
total magnétiques / total magnetics		0.6135	15.39		
PARAMAGNÉTIQUES / PARAMAGNETICS					
Concentré III / Concentrate III		0.4855	12.18	ep 80	MI
Middling prod,IIIa		0.2125	5.33	ru 60,ga,py,ep,st,lo,di	MI
Concentré IV / Concentrate IV		1.2615	31.65	ga 60	MI
Middling prod.IVa		0.1555	3.90	ru60,ga,ep,py,tu,sil	MI
total paramagnétiques / total paramagnetics		2.1150	53.06		
NON-MAGNÉTIQUES / NONMAGNETICS					
Concentré V / Concentrate V		0.9745	24.45	qu40,zi 55	MI
Rendement total / Total yield		3.7030	92.90		

Tableau 3/8
Table 3/8

MB[8] - Séparation de l'échantillon T 10/1-3
Separation of the sample T 10/1-3

Échantillon / Sample	Poids / Weight g	%	Minéraux / Minerals	Remarques / Remarks
Concentré / Concentrate				
T 10/1 +0.20	0.3588			
T 10/1 +0.063	1.9856			
T 10/2 +0.20	0.0757			
T 10/2 +0.063	0.3249			
T 10/3 +0.20	0.1775			
T 10/3 +0.063	0.7599			
Admission total / Total feed T 10/1-3	3.6824.	100.00		
MAGNÉTIQUES / MAGNETICS				
Concentré I / Concentrate I	0.4661	12.60		an. chem. ch.a.
Concentré II / Concentrate II	0.4280	11.62		an.chem. c.a.
Total magnétiques / Total magnetics	0.8941	34.22		
PARAMAGNÉTIQUES / PARAMAGNETICS				
Concentré III / Concentrate III	0.2878	7.82		
Middling prod.IIIa	0.2118	5.75		
Concentré IV / Concentrate IV	1.0252	27.84	ga50,ru40	MI
Middling prod.IVa	0.3683	10.00		
total paramagnétiques / total paramagnetics	1.8931	61.41		
NON-MAGNÉTIQUES / NONMAGNETICS				
Concentré V / Concentrate V	0.6644	18.04	zi60,qu15,ru,sil	MI
Rendement total / Total yield	3.4496	93.67		

Tableau 3/9
Table 3/9

MS[9] - Séparation de l'échantillon T 11/1-2
Separation of the sample T 11/1-2

Échantillon Sample / Concentré Concentrate		Poids Weight g	%	Minéraux Minerals	Remarques Remarks
T 11/1	+0.20	0.4923			
	+0.063	0.9280			
T 11/2	+0.20	0.5456			
	+0.063	1.6647			
Admission total Total feed	T 11/1-2	3.6306	100.00		
MAGNÉTIQUES MAGNETICS					
Concentré I Concentrate II		0.4770	13.14		
Concentré II Concentrate II		0.3710	10.22		
total magnétiques total magnetics		0.8480	23.36		
PARAMAGNÉTIQUES PARAMAGNETICS					
Concentré III Concentrate III		0.3570	9.83	ep80	MI
Middling prod.IIIa		0.2320	6.39		
Concentré IV Concentrate IV		0.9950	27.41		
Middling prod.IVa		0.4425	12.19		
total paramagnétiques total paramagnetics		2.0265	55.82		
NON-MAGNÉTIQUES NONMAGNETICS					
Concentré V Concentrate V		0.4985	13.73		
Rendement total Total yield		3.3730	92.90		

MS[10] - Séparation de l'échantillon T 11/3-4
Separation of the sample T. 11/3-4

Échantillon Sample Concentré Concentrate		Weight Poids g	%	Minéraux Minerals	Remarques Remarks	
T 11/3	+0.20	0.6533				
	+0.063	2.5793				
T 11/4	+0.20	0.5920				
	+0.063	0.9745				
Admission total Total feed T 11/3-4		4.8991	100.00			
MAGNÉTIQUES MAGNETICS						
Concentré I Concentrate I		0.8570	17.49	il	an.chem. ch.a.	MI
Concentré II Concentrate II		0.0865	1.76			
total magnétiques total magnetics		0.9435	19.25			
PARAMAGNÉTIQUES PARAMAGNETICS						
Concentrate III Concentré III		0.5285	10.79	ep90		MI
Middling prod.IIIa		0.2013	4.11		an.chem. ch.a.	
Concentré IV Concentrate IV		1.2207	24.92	ga 70		
Middling prod.IVa		0.5107	10.42			
total paramagnétiques total paramagnetics		2.4612	50.24			
NON-MAGNÉTIQUES NONMAGNETICS						
Concentré V Concentrate V		1.1130	22.72	zi70	an.chem. ch.a.	MI
Rendement total Total yield		4.5177	92.21			

MS[11] – Séparation de l'échantillon T 11 /5-8
Separation of the sample T 11 /5-8

Échantillon / Sample — Concentré / Concentrate		Poids / Weight g	%	Minéraux / Minerals	Remarques / Remarks
T 11/5	+0.20	0.7114			
	+0.063	1.0455			
T 11/6	+0.20	0.7033			
	+0.063	1.1510			
T 11/7	+0.20	0.4200			
	+0.063	0.9674			
T 11/8	+0.20	0.0914			
	+0.063	0.2311			
Admission total / Total feed T 11/5-8		5.3211	100.00		
MAGNÉTIQUES / MAGNETICS					
Concentré I / Concentrate I		0.8485	15.95	il	
Concentré II / Concentrate II		0.6060	11.39	il	an.chem. ch.a.
total magnétiques / total magnetics		1.4545	27.34		
PARAMAGNÉTIQUES / PARAMAGNETICS					
Concentré III / Concentrate III		0.5440	10.22		
Middling prod.IIIa		0.2200	4.13	ru40,ep,ga,py,st,mo	MI
Concentré IV / Concentrate IV		1.4780	27.78	ga 70	MI
Middling prod.IVa		0.4815	9.05	rz45,ga,ep,py,amf,st,mo	MI
total paramagnétiques / total paramagnetics		2.7235	51.18		
NON-MAGNÉTIQUES / NONMAGNETICS					
Concentré V / Concentrate V		0.8822	16.58		
Rendement total / Total yield		5.0602	95.10		

MS[12] - Séparation de l'échantillon T 12/1-3
Separation of the sample T 12/1-3

Échantillon Sample		Poids Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate					
T 12/1	+0.20	0.3144			
	+0.063	1.1283			
T 12/2	+0.20	0.3530			
	+0.063	0.8877			
T 12/3	+0.20	0.3430			
	+0.063	0.9615			
Admission total T 12/1-3 Total feed		3.9879	100.00		
MAGNÉTIQUES MAGNETICS					
Concentré I Concentrate I		0.4024	10.09		
Concentré II Concentrate II		0.3764	9.44		
total magnétiques total magnetics		0.7788	19.53		
PARAMAGNÉTIQUES PARAMAGNETICS					
Concentré III Concentrate III		0.4195	10.52	ep90	MI
Produit intermédiaire IIIa Middling Product IIIa		0.2775	6.96		
Concentré IV Concentrate IV		1.1535	28.92	ru 50,	MI
Produit intermédiaire IVa Middling Product IVa		0.4070	10.21		
total paramagnétiques total paramagnetics		2.2575	56.61		
NON-MAGNÉTIQUES NONMAGNETICS					
Concentré V Concentrate V		0.5534	13.88	zi 80	MI
Rendement total		3.5897	90.02		

Tableau 4/1
Table

RÉSULTATES D' ANALYSE GRANULOMÉTRIQUE ET DE SÉPARATION DANS LES LIQUIDES LOURDS DES SABLES PRELEVES DES SONDAGES DE LA REGION DE B L A O U A K H

RESULTS OF GRAIN SIZE ANALYSIS AND HEAVY LIQUID SEPARATION OF SANDS FROM BOREHOLES IN THE REGION OF B L A O U A K H

Borehole B 1
Sondage

Echantillon No / Sample No		Analyse granulométrique / Grain size analysis: a/ admission / feed; b/ fraction +0.8mm; c/ fraction +0.4mm; d/ fraction +0.2mm; e/ fraction +0.06mm; f/ total fraction de sable / total sand fraction; g/ fraction de vase et d'argile / silt and clay fraction — rendement / yield		Séparation dans les liquides denses / Heavy liquid separation: Fraction lourde / Heavy fraction — rendement / yield		Fraction légère / Light fraction — rendement / yield		Rendement total / Total yield — rendement / yield		Recouperation / Recovery	Remarks / Remarques
		g	%	g	%	g	%	g	%	%	
1	2	3	4	5	6	7	8	9	10	11	12
B 1/1	a/	49.78	100.00	—							
	b/	6.44	12.94	ns		6.44	12.94	6.44	12.94		
	c/	8.51	17.10	0.01	0.02	8.41	16.89	8.42	16.91	98.94	
	d/	28.89	58.04	1.52	3.05	27.17	54.58	28.69	57.63	99.31	MS[1]/see tab. .6 /
	e/	4.04	8.12	1.06	2.13	2.94	5.91	4.00	8.04	99.01	MS[1]/voir tab. .6 ./
	f/	47.88	96.20	2.59	5.20	44.96	90.32	47.55	95.52		
	g/	1.90	3.80	ns	-	-	-	-	-		
B 1/2	a/	50.38	100.00								
	b/	3.33	6.61	ns		3.33	6.61	3.33	6.61		
	c/	6.11	12.13	0.05	0.10	6.05	12.01	6.10	12.11	99.84	
	d/	32.11	63.74	1.86	3.69	30.09	59.73	31.95	63.42	99.51	MS[1]
	e/	2.37	4.70	0.32	0.64	1.98	3.93	2.30	4.57	97.05	MS[1]
	f/	43.92	88.18	2.23	1.43	41.45	82.28	43.68	86.61		
	g/	6.46	12.82	ns	-	-	-	-	-		
B 1/3	a/	50.20	100.00								
	b/	2.77	5.52	ns		2.77	5.52	2.77	5.52		
	c/	5.41	10.78	0.01	0.02	5.39	10.74	5.40	10.76	99.82	
	d/	37.26	74.22	0.89	1.77	36.11	71.93	37.00	73.70	99.30	MS[1]
	e/	2.41	4.80	0.64	1.27	1.76	3.51	2.40	4.78	99.59	MS[1]
	f/	47.85	95.32	1.54	3.06	46.03	91.70	47.57	94.76		
	g/	2.35	4.68								
B 1/4	a/	46.00	100.00								
	b/	2.36	5.13	ns		2.36	5.13	2.36	5.13		
	c/	6.20	13.48	0.00	0.00	6.19	13.46	6.10	13.46	99.84	
	d/	32.33	70.28	0.32	0.70	31.97	69.50	31.29	70.20	96.28	MS[1]
	e/	4.07	3.89	0.19	0.41	3.81	8.28	4.00	8.69	98.20	MS[1]
	f/	44.96	97.74	0.51	1.11	44.33	96.37	44.84	97.48		
	g/	1.04	2.26	ns	-	-	-	-	-		

Tableau 4/2 Borehole B 1
Tablo Sondage

1	2	3	4	5	6	7	8	9	10	11	12
B 1/5	a/	49.49	100.00								
	b/	2.70	5.46	ns		2.70	5.46	2.70	5.46		
	c/	10.74	21.70	0.01	0.02	10.70	21.62	10.71	21.64	99.72	
	d/	29.19	58.98	0.07	0.14	29.10	58.80	29.17	58.94	99.93	
	e/	6.27	12.67	0.04	0.08	6.16	12.45	6.20	12.53	98.89	
	f/	48.90	98.81	0.12	0.24	48.66	98.33	48.78	98.57		
	g/	0.59	1.19	ns	-	-	-	-	-		
B 1/6	a/	49.51	100.00								
	b/	0.84	1.70	ns		0.84	1.70	0.84	1.70		
	c/	3.75	7.57	0.01	0.02	3.68	7.43	3.69	7.45	98.40	
	d/	30.32	61.24	0.03	0.06	30.16	60.92	30.19	60.98	99.57	
	e/	14.04	28.36	0.08	0.16	13.91	28.10	13.99	28.26	99.64	
	f/	48.95	98.87	0.12	0.24	48.59	98.15	48.71	98.39		
	g/	0.56	1.13	ns	-	-	-	-	-		
B 1/7	a/	49.84	100.00								
	b/	0.58	1.16	ns		0.58	1.16	0.58	1.16		
	c/	2.04	4.09	-0.00	0.00	2.00	4.01	2.00	4.01	98.04	
	d/	21.94	44.02	0.02	0.04	21.67	43.48	21.69	43.52	98.86	
	e/	24.16	48.48	0.10	0.20	23.87	47.89	23.97	48.09	99.21	MI/bp.m. 45,ep,zi,py, sil,di,st,ga/
	f/	48.72	97.75	0.12	0.24	48.12	96.54	48.24	96.78		
	g/	1.12	2.25	ns	-	-	-	-	-		
B 1/8	a/	49.92	100.00								
	b/	2.61	5.23	ns		2.61	5.23	2.61	5.23		
	c/	13.54	27.12	0.00	0.00	13.49	27.02	13.49	27.02	99.63	
	d/	29.62	59.33	0.04	0.08	29.51	59.11	29.55	59.19	99.76	
	e/	3.17	6.35	0.03	0.06	3.07	6.15	3.10	6.21	97.79	
	f/	48.94	98.03	0.07	0.14	48.68	97.51	48.75	97.65		
	g/	0.98	1.97	ns	-	-	-	-	-		
B 1/9	a/	194.74	100.00								
	b/	6.27	3.22	ns		6.27	3.22	6.27	3.22		
	c/	25.27	12.98	0.01	0.01	25.19	12.94	25.20	12.95	99.72	
	d/	136.04	69.86	0.30	0.15	135.40	69.53	135.70	69.68	99.75	MI/bp.m. 45, ga 30,ep, zi,st/
	e/	25.60	13.15	0.30	0.15	25.07	12.87	25.37	13.02	99.10	MI/bp.m. 40,py,ep,ga, zi,tu,di/
	f/	193.18	99.21	0.61	0.31	191.93	98.56	192.54	98.87		
	g/	1.56	0.79	ns	-	-	-	-	-		
B 1/10	a/	194.14	100.00								
	b/	7.32	3.77	ns		7.32	3.77	7.32	3.77		
	c/	27.26	14.04	0.01	0.01	27.19	14.00	27.20	14.01	99.78	
	d/	119.55	61.58	0.13	0.07	119.05	61.32	119.18	61.39	99.69	MI/bp.m.,ep,ga,tu,st,py/
	e/	38.01	19.58	0.34	0.18	37.44	19.29	37.78	19.47	99.39	MI/op.m. 60,ep,zi,ga, sil,di,am,tu/
	f/	192.14	98.97	0.48	0.25	191.00	98.38	191.48	98.64		
	g/	2.00	1.03	ns	-	-	-	-	-		
B 1/11	a/	193.91	100.00								
	b/	7.19	3.71	ns		7.19	3.71	7.19	3.71		
	c/	36.82	18.99	0.01	0.01	36.77	18.96	36.78	18.97	99.89	
	d/	125.04	64.48	0.08	0.04	124.61	64.26	124.69	64.30	99.72	
	e/	20.20	10.42	0.47	0.23	19.53	10.08	20.00	10.31	99.01	
	f/	189.25	97.60	0.56	0.28	188.10	97.01	188.66	97.29		
	g/	4.66	2.40	ns	-	-	-	-	-		

- 2 -

Tableau / Table 4/1

Borehole / Sondage B 1

1	2	3	4	5	6	7	8	9	10	11	12
1/12	a/	198.25	100.00								
	b/	8.28	4.18	ns		8.28	4.18	8.28	4.18		
	c/	45.64	23.02	0.01	0.01	45.50	22.95	45.51	22.96	99.71	
	d/	108.28	54.62	0.02	0.01	108.02	54.49	108.04	54.50	99.78	
	e/	27.61	13.93	0.13	0.07	27.26	13.75	27.39	13.82	99.20	
	f/	189.81	95.75	0.16	0.09	189.06	95.37	189.22	95.46		
	g/	8.44	4.25	ns	-	-	-	-	-		
1/13	a/	193.30	100.00								
	b/	5.65	2.92	ns		5.65	2.92	5.65	2.92		
	c/	35.83	18.53	0.02	0.01	35.66	18.45	35.68	18.46	99.64	
	d/	135.60	70.15	0.04	0.04	135.09	69.89	135.17	69.93	99.68	
	e/	13.67	7.07	0.07	0.04	13.41	6.94	13.48	6.98	98.61	
	f/	190.73	98.67	0.17	0.09	189.81	98.20	189.98	98.29		
	g/	2.57	1.33	ns	-	-	-	-	-		
1/14	a/	95.25	100.00								
	b/	5.22	5.48	ns		5.22	5.48	5.22	5.48		
	c/	13.55	14.23	0.00	0.00	13.48	14.15	13.48	14.15	99.48	
	d/	36.75	38.58	0.02	0.02	36.67	38.50	36.69	38.52	99.84	
	e/	37.47	39.34	0.32	0.34	36.77	38.60	37.09	38.94	98.99	MIQ /see tab. 5 ./ /voir tab. 5.../
	f/	92.99	97.63	0.34	0.36	92.14	96.73	92.48	97.09		
	g/	2.26	2.37	ns	-	-	-	-	-		

Tableau 4/4
Table

RÉSULTATS D' ANALYSE GRANULOMÉTRIQUE ET DE SÉPARATION DANS LES LIQUIDES LOURDS DES SABLES PRELEVES DES SONDAGES DE LA REGION DE B L A O U A K H

RESULTS OF GRAIN SIZE ANALYSIS AND HEAVY LIQUID SEPARATION OF SANDS FROM BOREHOLES IN THE REGION OF B L A O U A K H

Borehole / Sondage B 2

Column 2 key (Analyse granulométrique / Grain size analysis): a/ admission / feed; b/ fraction +0.8mm; c/ fraction +0.4mm; d/ fraction +0.2mm; e/ fraction +0.06mm; f/ total fraction de sable / total sand fraction; g/ fraction de vase et d'argile / silt and clay fraction

Echantillon No / Sample No		Analyse granulométrique / Grain size analysis: rendement / yield g	%	Fraction lourde / Heavy fraction: rendement / yield g	%	Fraction legère / Light fraction: rendement / yield g	%	Rendement total / Total yield: rendement / yield g	%	Recouperation / Recovery %	Remarks / Remarques
1	2	3	4	5	6	7	8	9	10	11	12
B 2/1	a/	45.36	100.00								MI/op.m. 60,en,py,zi, ga,mo,st,di/
	b/	1.46	3.22	ns		1.46	3.22	1.46	3.22		
	c/	1.72	3.79	0.00	0.00	1.69	3.73	1.69	3.73	98.25	
	d/	30.10	66.36	0.05	0.11	30.00	66.14	30.05	66.25	99.83	
	e/	8.84	19.49	0.17	0.37	8.60	18.96	8.77	19.33	99.21	
	f/	42.12	92.86	0.22	0.48	41.75	92.05	41.97	92.53		
	g/	3.24	7.14	ns	-	-	-	-	-		
B 2/2	a/	49.00	100.00								
	b/	0.73	1.49	ns		0.73	1.49	0.73	1.49		
	c/	2.83	5.78	0.00	0.00	2.80	5.71	2.80	5.71	98.94	
	d/	35.30	72.04	0.02	0.04	35.19	71.82	35.21	71.86	99.74	
	e/	9.88	20.16	0.02	0.04	9.84	20.08	9.86	20.12	99.80	
	f/	48.74	99.47	0.04	0.08	48.56	99.10	48.60	99.18		
	g/	0.26	0.53	ns	-	-	-	-	-		
B 2/3	a/	49.00	100.00								
	b/	0.74	1.51	ns		0.74	1.51	0.74	1.51		
	c/	3.65	7.45	0.00	0.00	3.62	7.39	3.62	7.39	99.18	
	d/	33.15	67.65	0.02	0.04	33.07	67.49	33.09	67.53	99.82	
	e/	9.74	19.88	0.03	0.06	9.65	19.69	9.68	19.75	99.38	
	f/	47.28	96.49	0.05	0.10	47.08	96.08	47.13	96.18		
	g/	1.72	3.51	ns	-	-	-	-	-		
B 2/4	a/	49.40	100.00								
	b/	0.89	1.80	ns		0.89	1.80	0.89	1.80		
	c/	2.68	5.42	0.01	0.02	2.62	5.30	2.63	5.32	98.13	
	d/	34.42	69.68	0.01	0.02	34.35	69.53	34.36	69.55	99.82	
	e/	9.85	19.94	0.03	0.06	9.72	19.68	9.75	19.74	98.98	
	f/	47.84	96.84	0.05	0.10	47.58	96.31	47.63	96.41		
	g/	1.56	3.16	ns	-	-	-	-	-		

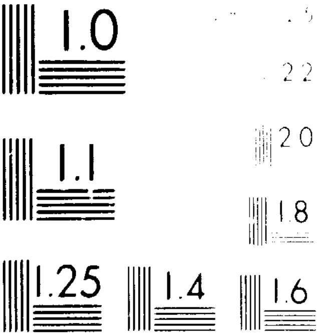
Tableau 4/5 Horohalo 3 R
Tabla Sondage

	2	3	4	5	6	7	8	9	10	11	12
	a/	49.04	100.00								
2/5	b/	1.38	2.81	ns		1.38	2.81	1.38	2.81		
	c/	6.60	13.46	0.00	0.00	6.55	13.36	6.55	13.36	99.24	
	d/	30.88	62.97	0.01	0.02	30.82	62.85	30.83	62.87	99.84	
	e/	8.64	17.62	0.03	0.06	8.55	17.43	8.58	17.49	99.30	
	f/	47.50	96.86	0.04	0.08	47.30	96.45	47.34	96.53		
	g/	1.54	3.14	ns	-	-	-	-	-		
	a/	48.50	100.00								
2/6	b/	0.91	1.88	ns		0.91	1.88	0.91	1.88		
	c/	5.70	11.75	0.00	0.00	5.67	11.69	5.67	11.69	99.47	
	d/	30.32	62.52	0.01	0.02	30.21	62.29	30.22	62.31	99.67	
	e/	9.82	20.25	0.03	0.06	9.76	20.12	9.79	20.18	99.69	
	f/	46.75	96.40	0.04	0.08	46.55	95.98	46.59	96.06		
	g/	1.75	3.60	ns	-	-	-	-	-		
	a/	49.10	100.00								
2/7	b/	0.72	1.47	ns		0.72	1.47	0.72	1.47		
	c/	2.81	5.72	0.00	0.00	2.81	5.72	2.81	5.71	100.00	
	d/	28.88	58.82	0.02	0.04	28.80	58.66	28.82	58.70	99.79	
	e/	15.02	30.59	0.05	0.10	14.95	30.45	15.00	30.55	99.87	
	f/	47.43	96.60	0.07	0.14	47.28	96.30	47.35	96.44		
	g/	1.67	3.40	ns	-	-	-	-	-		
	a/	49.70	100.00								

2/8	b/	0.52	1.05	na		0.52	1.05	0.52	1.05		
	c/	5.55	11.17	0.01	0.02	5.54	11.15	5.55	11.17	100.00	
	d/	34.75	69.92	0.02	0.04	34.65	69.72	34.67	69.76	99.77	
	e/	7.15	14.39	0.03	0.06	7.10	14.29	7.13	14.35	99.72	
	f/	47.97	96.53	0.06	0.12	47.81	96.21	47.87	96.33		
	g/	1.73	3.47	na	-	-	-	-	-		
2/9	a/	199.79	100.00								
	b/	1.84	0.92	na		1.84	0.92	1.84	0.92		
	c/	14.04	7.03	0.02	0.01	13.97	6.99	13.99	7.00	99.64	
	d/	124.38	62.26	0.04	0.02	124.22	62.17	124.26	62.19	99.90	
	e/	54.27	27.16	0.17	0.08	54.00	27.03	54.17	27.11	99.81	MI/op.m. 50,op,gn,zi, di,nm.,tu,py,nv/
	f/	194.53	97.37	0.23	0.11	194.03	97.11	194.26	97.22		
	g/	5.26	2.63	na	-	-	-	-	-		
2/10	a/	197.32	100.00								
	b/	1.86	0.94	na		1.86	0.94	1.86	0.94		
	c/	13.54	6.86	0.03	0.01	13.47	6.83	13.50	6.84	99.70	MI/óp.m. 95,op,mo,gn/
	d/	140.08	70.99	0.03	0.01	139.89	70.89	139.92	70.90	99.88	
	e/	31.21	15.82	0.11	0.06	31.05	15.74	31.16	15.80	99.84	MI/óp.m. 60,zi,op,tu, st,lo,di,ru,nm,nv/
	f/	186.69	94.61	0.17	0.08	186.27	94.40	186.44	94.48		
	g/	10.63	5.39	na	-	-	-	-	-		
2/11	a/	195.80	100.00								
	b/	3.35	1.71	na		3.35	1.71	3.35	1.71		
	c/	10.74	5.49	0.03	0.02	10.65	5.44	10.68	5.46	99.44	
	d/	122.65	62.64	0.05	0.02	122.55	62.59	122.60	62.61	99.96	
	e/	51.62	26.36	0.02	0.01	51.56	26.33	51.58	26.34	99.92	
	f/	188.36	96.20	0.10	0.05	188.11	96.07	188.21	96.12		
	g/	7.44	3.80	na	-	-	-	-	-		

1	2	3	4	5	6	7	8	9	10	11	12
2/12	a/	183.91	100.00								
	b/	7.72	4.20	ns		7.72	4.20	7.72	4.20		
	c/	14.85	8.07	0.01	0.01	14.75	8.02	14.76	8.03	99.39	
	d/	82.82	45.04	0.02	0.01	82.76	45.00	82.78	45.01	99.94	
	e/	70.96	38.58	0.12	0.06	70.72	38.45	70.84	38.51	99.83	MI/op.m. 50,py,ep,zi,st tu,le,di,am.,ga/
	f/	176.36	95.89	0.15	0.08	175.95	95.67	176.10	95.75		
	g/	7.55	4.11	ns	–	–	–	–	–		
2/13	a/	185.95	100.00								
	b/	16.02	8.61	ns		16.02	8.61	16.02	8.61		
	c/	17.20	9.28	0.01	0.01	17.23	9.26	17.24	9.27	99.88	
	d/	58.07	31.23	0.01	0.01	58.00	31.19	58.01	31.20	99.90	
	e/	67.27	26.18	0.18	0.09	67.02	36.04	67.20	36.13	99.89	
	f/	158.62	85.30	0.20	0.11	158.27	85.10	158.47	85.21		
	g/	27.33	14.70	ns	–	–	–	–	–		
2/14	a/	141.33	100.00								
	b/	15.82	11.19	ns		15.82	11.19	15.82	11.19		
	c/	10.44	7.39	0.01	0.01	10.32	7.30	10.33	7.31	98.94	
	d/	33.96	24.03	0.01	0.01	33.82	23.93	33.83	23.94	99.62	
	e/	75.82	53.68	0.26	0.18	75.52	53.50	75.78	53.63	99.88	MI/op.m. 70,py,am,ep, zi,tu,le,ga/
	f/	136.09	96.29	0.28	0.15	135.48	95.92	135.76	96.07		
	g/	5.24	3.71	ns	–	–	–	–	–		

83.II.07
AD.85.03



1.0
2.2
1.1
2.0
1.8
1.25
1.4
1.6

Tableau 4/7
Table

[illegible] D'ANALYSE GRANULOMETRIQUE ET DE SEPARATION DANS LES LIQUIDES [illegible] DES SABLES PRELEVES DES SONDAGES DE LA REGION DE B L A O U A K H

[illegible] OF GRAIN SIZE ANALYSIS AND HEAVY LIQUID SEPARATION OF SANDS FROM [illegible] IN THE REGION OF B L A O U A K H

Borehole B 2
Sondage

Echantillon / Sample		Analyse granulométrique / Grain size analysis		Séparation dans les liquides denses / Heavy liquid separation							Remarks / Remarques
				Fraction lourde / Heavy fraction		Fraction légère / Light fraction		Rendement total / Total yield		Recouperation / Recovery	
	g/	admission / feed									
	g/ g/ g/ g/	fraction + 0.8mm fraction + 0.4mm fraction + 0.2mm fraction + 0.06mm									
	g/	total fraction de sable / total sand fraction									
	g/	fraction de vase et d'argile / silt and clay fraction									
		rendement / yield		rendement / yield		rendement / yield		rendement / yield			
		g	%	g	%	g	%	g	%	%	
1	2	3	4	5	6	7	8	9	10	11	12
[illegible] 3/1	g/	[illegible]	100.00								
	g/ g/ g/ g/	0.73 [illegible] [illegible] [illegible]	1.47 [illegible] 71.48 [illegible]	nn 0.02 1.70 0.98	 0.04 3.40 1.95	0.73 5.42 33.55 3.00	1.47 10.94 67.21 6.05	0.73 5.44 35.20 3.93	1.47 10.93 71.11 8.01	 98.55 99.52 99.60	 MI/gn,zi,ru,ep,tu,an/ MS /non tab. ../ MS² /voir tab. 5/
	g/	45.62	92.10	2.70	5.40	42.70	86.17	45.40	91.57		
	g/	[illegible]	7.90	nn	–	–	–	–	–		
[illegible] 3/2	g/	[illegible]	100.00								
	g/ g/ g/ g/	[illegible] [illegible] [illegible] [illegible]	[illegible] 7.07 50.73 [illegible]	nn 0.00 0.63 0.72	 0.00 [illegible] 1.44	[illegible] [illegible] 20.10 10.31	[illegible] 7.06 [illegible] [illegible]	[illegible] [illegible] 20.82 11.03	8.28 7.0[illegible] 50.17 26.42	 99.66 99.42 99.64	 MS² MS²
	g/	[illegible]	92.90	1.35	2.70	35.83	89.22	38.18	91.92		
	g/	2.93	7.10	nn	–	–	–	–	–		
[illegible] 2/2	g/	44.75	100.00								
	g/ g/ g/ g/	2.15 [illegible] [illegible] 7.50	4.80 [illegible] [illegible] [illegible]	nn 0.00 0.65 0.47	 0.00 1.45 1.05	2.15 2.96 25.71 7.01	4.80 6.61 57.45 15.60	2.15 2.95 26.36 7.48	4.80 6.61 58.90 16.55	 99.66 99.55 98.55	 MS² MS²
	g/	[illegible]	87.57	1.12	2.50	37.83	84.46	38.95	86.96		
	g/	5.56	[illegible]	nn	–	–	–	–	–		
[illegible] 2/4	g/	[illegible]	100.00								
	g/ g/ g/ g/	1.25 [illegible] [illegible] [illegible]	[illegible] [illegible] [illegible] [illegible]	nn 0.00 0.06 [illegible]	 [illegible] [illegible] [illegible]	1.25 3.56 [illegible] [illegible]	2.58 7.32 [illegible] [illegible]	1.25 3.56 32.31 [illegible]	2.58 7.32 66.61 [illegible]	 99.44 99.97 [illegible]	 MS²
	g/	[illegible]	[illegible]	0.12	0.24	46.41	95.67	46.53	[illegible]		
	g/	[illegible]	[illegible]	nn	–	–	–	–	–		

Tableau 4/8
Table

Borehole N 3
Sondage

1	2	3	4	5	6	7	8	9	10	11	12
3/5	a/	49.10	100.00								
	b/	1.75	3.56	ns		1.75	3.56	1.75	3.56		
	c/	4.18	8.51	0.00	0.00	4.17	8.49	4.17	8.49	99.76	
	d/	35.25	71.79	0.00	0.00	35.20	71.69	35.20	71.69	99.86	
	e/	6.73	13.71	0.03	0.06	6.69	13.62	6.72	13.68	99.85	
	f/	47.91	97.57	0.03	0.06	47.81	97.46	47.84	97.42		
	g/	1.19	2.43	ns	–	–	–	–	–		
3/6	a/	48.21	100.00								
	b/	1.49	3.09	ns		1.49	3.09	1.49	3.09		
	c/	2.26	4.69	0.00	0.00	2.25	4.67	2.25	4.67	99.56	
	d/	30.30	62.89	0.03	0.06	30.04	62.31	30.07	62.37	99.17	
	e/	12.29	25.49	0.05	0.10	11.95	24.81	12.01	24.82	97.72	
	f/	46.36	96.16	0.08	0.16	45.74	94.88	45.82	95.04		
	g/	1.85	3.84	ns	–	–	–	–	–		
3/7	a/	49.10	100.00								
	b/	0.54	1.10	ns		0.54	1.10	0.54	1.10		
	c/	3.59	7.31	-0.00	0.00	3.58	7.29	3.58	7.29	99.72	
	d/	33.57	68.37	0.04	0.08	33.25	67.72	33.29	67.80	99.16	
	e/	9.84	20.04	0.05	0.10	9.78	19.92	9.83	20.02	99.90	
	f/	47.54	96.82	0.09	0.18	47.15	96.03	47.24	96.21		
	g/	1.56	3.18	ns	–	–	–	–	–		
	a/	48.40	100.00								

³/8	b/	0.95	1.96	nn		0.95	1.96	0.95	1.96		
	c/	3.61	7.46	0.00	0.00	3.56	7.36	3.56	7.36	98.61	
	d/	32.08	66.28	0.03	0.06	32.00	66.12	32.03	66.18	99.84	
	e/	10.30	21.28	0.04	0.08	10.25	21.18	10.29	21.26	99.90	
	f/	46.94	96.98	0.07	0.14	46.76	96.62	46.83	96.76		
	g/	1.46	3.02	nn	-	-	-	-	-		
	a/	193.23	100.00								
" 3/9	b/	5.05	2.61	nn		5.05	2.61	5.05	2.61		MI/op.m.,ga,ep,di,ru, tu,nn/
	c/	16.43	8.50	0.01	0.01	16.40	8.49	16.41	8.50	99.88	
	d/	95.27	49.30	0.10	0.05	95.07	49.20	95.17	49.25	99.89	
	e/	59.87	30.98	0.50	0.26	59.21	30.64	59.71	30.90	99.73	
	f/	176.62	91.39	0.61	0.32	175.73	90.94	176.34	91.26		
	g/	16.61	8.61	nn	-	-	-	-	-		
	a/	196.95	100.00								
" 3/10	b/	9.44	4.79	nn		9.44	4.79	9.44	4.79		MI/ga, op.m., ep,ru,smf, St,di/
	c/	19.31	9.80	0.02	0.01	19.29	9.79	19.31	9.80	100.00	
	d/	100.12	50.83	0.25	0.13	99.70	50.62	99.95	50.75	99.83	
	e/	62.72	31.84	0.49	0.25	62.15	31.56	62.64	31.81	99.87	MI/ op.m. 70,ga,ep,zi, uil,ru/
	f/	191.59	97.26	0.76	0.39	190.58	96.76	191.34	97.15		
	g/	5.36	2.74	nn	-	-	-	-	-		
	a/	194.08	100.00								
" 3/11	b/	8.82	4.54	nn		8.82	4.54	8.82	4.54		
	c/	25.63	13.20	0.01	0.01	25.60	13.19	25.61	13.20	99.92	
	d/	120.11	61.89	0.10	0.05	119.90	61.78	120.00	61.83	99.91	MI/op.m. 50,ep,ga,tu,an, di, nj/
	e/	30.94	15.94	0.21	0.11	30.65	15.79	30.86	15.90	99.74	MI/ op.m. 70,ga,ep,py,di, uil,mo,zi,tu/
	f/	185.50	95.57	0.32	0.17	184.97	95.30	185.29	95.47		
	g/	8.58	4.43	nn	-	-	-	-	-		

Tableau / Table 4/9 | Borehole / Sondage n 3

1	2	3	4	5	6	7	8	9	10	11	12
n 3/12	a/	190.74	100.00								
	b/	21.20	11.11	na		21.20	11.11	21.20	11.11		
	c/	46.64	24.45	0.01	0.01	46.53	24.42	46.59	24.43	99.89	
	d/	99.57	52.20	0.05	0.03	99.40	52.11	99.45	52.14	99.68	
	e/	20.[illegible]	10.35	0.12	0.06	20.[illegible]	10.72	20.57	10.78	99.56	MI/op.mi 45,op,ga,zi,ru, mo,tu/
	f/	188.07	98.59	0.18	0.10	187.63	98.36	187.81	98.46		
	g/	2.67	1.41								
n 3/13	a/	190.79	100.00								
	b/	23.85	13.41	na		23.85	13.41	23.83	13.41		
	c/	29.71	15.57	0.01	0.01	29.66	15.55	29.67	15.56	99.86	
	d/	109.22	57.25	0.04	0.02	109.11	57.19	109.15	57.21	99.93	
	e/	13.[illegible]	6.90	0.06	0.03	13.02	6.82	13.08	6.85	99.39	MI/op.mu,op,ga,di,py,mo/
	f/	175.92	93.13	0.11	0.06	175.62	92.97	175.73	99.03		
	g/	14.87	6.87	na	-	-	-	-	-		
n 3/14	a/	92.94	100.00								
	b/	19.12	20.57	na		19.12	20.57	19.12	20.57		
	c/	15.30	16.46	-0.01	0.01	15.29	16.45	15.30	16.46	100.00	
	d/	40.66	45.75	0.02	0.02	40.52	43.60	40.54	43.62	99.70	
	e/	12.12	13.04	0.04	0.04	12.04	12.95	12.08	12.99	99.67	
	f/	87.20	93.82	0.07	0.07	86.97	93.57	87.04	93.64		
	g/	5.74	6.18	na	-	-	-	-	-		

Tableau / Table 4/10

RÉSULTATS D'ANALYSE GRANULOMÉTRIQUE ET DE SÉPARATION DANS LES LIQUIDES DENSES DES SABLES PRÉLEVÉS DES SONDAGES DE LA RÉGION DE B L A O U A R

RESULTS OF GRAIN SIZE ANALYSIS AND HEAVY LIQUID SEPARATION OF SANDS FROM BOREHOLES IN THE REGION OF B L A O U A R

Borehole / Sondage B 4

Échantillon n° / Sample n°		Analyse granulométrique / Grain size analysis: rendement / yield (g)	rendement / yield (%)	Séparation dans les liquides denses / Heavy liquid separation — Fraction lourde / Heavy fraction: rendement / yield (g)	(%)	Fraction légère / Light fraction: rendement / yield (g)	(%)	Rendement total / Total yield (g)	(%)	Récupération / Recovery (%)	Remarques / Remarks
1	2	3	4	5	6	7	8	9	10	11	12
B 4/1	a/	50.10	100.00								
	b/	2.75	5.49	nn		2.75	5.49	2.27	5.49		
	c/	13.05	26.05	0.02	0.05	12.94	25.91	13.00	25.96	99.62	
	d/	31.95	63.77	0.72	1.43	31.23	62.34	31.95	63.77	100.00	MS[3] /see tab. 5 ./
	e/	2.10	4.19	1.02	2.04	1.07	2.13	2.09	4.17	99.52	MS[3] /voir tab. 5../
	f/	49.85	99.50	1.76	3.52	48.03	95.87	49.79	99.39		
	g/	0.25	0.50	nn	–	–	–	–	–		
B 4/2	a/	47.40	100.00								
	b/	6.00	12.68	nn		6.00	12.68	6.00	12.68		
	c/	3.99	8.33	0.00	0.00	3.99	8.33	3.99	8.33	99.75	
	d/	22.09	46.61	0.17	0.36	21.82	46.13	22.04	46.59	99.95	MS[3]
	e/	13.50	28.54	0.51	1.07	12.96	27.40	13.47	28.47	99.78	MS[3]
	f/	45.50	96.19	0.68	1.43	44.77	94.64	45.45	96.07		
	g/	1.90	[illegible]	nn	–	–	–	–	–		
B 4/3	a/	47.70	100.00								
	b/	1.15	2.41	nn		1.15	2.41	1.15	2.41		
	c/	1.40	2.93	0.00	0.00	1.38	2.90	1.38	2.90	98.57	
	d/	12.85	26.94	0.03	0.06	12.82	26.88	12.85	26.94	100.00	MS[3]
	e/	30.70	64.36	0.14	0.30	30.53	64.00	30.67	64.30	99.90	MS[3]
	f/	46.10	96.64	0.17	0.36	45.88	96.19	46.05	96.55		
	g/	1.60	3.36	nn	– –	–	–	–	–		
B 4/4	a/	47.40	100.00								
	b/	2.15	4.54	nn		2.15	4.54	2.15	4.54		
	c/	2.55	5.38	0.00	0.00	2.54	5.36	2.54	5.36	99.61	
	d/	20.20	42.62	0.06	0.12	20.13	42.47	20.19	42.59	99.95	MS[3]
	e/	21.45	45.25	0.25	0.52	21.19	44.70	21.44	45.22	99.95	MS[3]
	f/	46.35	97.79	0.31	0.64	46.01	97.07	46.32	97.71		
	g/	1.05	2.21	nn	–	–	–	–	–		

Key to column 2:
- a/ admission / feed
- b/ fraction + 0.8mm
- c/ fraction + 0.4mm
- d/ fraction + 0.2mm
- e/ fraction + 0.06mm
- f/ total fraction de sable / total sand fraction
- g/ fraction de vase et d'argile / silt and clay fraction

1	2	3	4	5	6	7	8	9	10	11	12
4/5	a/	49.35	100.00								
	b/	1.50	3.04	ns		1.50	3.04	1.50	3.04		
	c/	4.50	9.13	0.00	0.00	4.48	9.09	4.48	9.09	99.56	MI/op.m.,ga,ep,zi,st,di.nv,le/
	d/	29.35	59.13	0.04	0.08	29.10	59.03	29.14	59.11	99.96	
	e/	13.35	27.04	0.12	0.25	13.21	26.79	13.33	27.04	99.85	MI/.op.m.40,ep,zi,tu,ga,py,di,bi,st/
	f/	48.50	98.38	0.16	0.33	48.29	97.95	48.45	98.28		
	g/	0.80	1.62	ns	–	–	–	–	–		
4/6	a/	48.90	100.00								
	b/	1.15	2.35	ns		1.15	2.35	1.15	2.35		
	c/	4.15	8.49	0.00	0.00	4.14	8.47	4.14	8.47	99.76	
	d/	33.00	67.48	0.02	0.05	32.95	67.33	32.97	67.43	99.91	MI/op.m. 70,ga,ep,zi,st,tu,di,sp,py/
	e/	10.20	20.86	0.10	0.21	10.06	20.57	10.16	20.78	99.61	
	f/	48.50	99.18	0.12	0.26	48.30	98.77	48.42	99.03		
	g/	0.40	0.82	ns	–	–	–	–	–		
4/7	a/	40.30	100.00								
	b/	0.90	2.23	ns		0.90	2.23	0.90	2.23		
	c/	2.95	7.32	0.00	0.00	2.95	7.31	2.95	7.31	100.00	
	d/	29.05	72.08	0.01	0.03	29.04	72.05	29.05	72.08	100.00	
	e/	7.10	17.62	0.03	0.07	7.06	17.52	7.09	17.59	99.86	
	f/	40.00	99.25	0.04	0.10	39.95	99.11	39.99	99.21		
	g/	0.30	0.75	ns	–	–	–	–	–		
	a/	48.00	100.00								

4/8	b/	1.10	2.25	ns		1.10	2.25	1.10	2.25		
	c/	3.75	7.67	0.00	0.00	3.74	7.66	3.74	7.66	99.73	
	d/	35.10	73.82	0.02	0.04	36.08	73.78	36.10	73.82	100.00	
	e/	7.29	14.83	0.08	0.17	7.16	14.64	7.24	14.81	99.86	
	f/	48.20	98.57	0.10	0.21	48.08	98.33	48.18	98.54		
	g/	0.7[illegible]	1.43	ns	-	-	-	-	-		
	a/	195.5[illegible]	100.00								
4/9	b/	3.6[illegible]	1.86	ns		3.65	1.86	3.65	1.86		
	c/	9.8[illegible]	5.02	0.00	0.00	9.84	5.01	9.84	5.01	99.90	MI/ op.m.40,ga,ep,zi, tu,di,le,nt,py/
	d/	116.0[illegible]	59.03	0.11	0.05	115.86	58.96	115.97	59.01	99.97	
	e/	65.0[illegible]	33.10	0.32	0.16	64.71	32.93	65.03	33.09	99.97	MI/op.m. 65,gn,zi,tu, ep,nt,py,mo/
	f/	[illegible]	99.01	0.43	0.21	194.06	98.76	194.49	98.97		
	g/	1.95	0.99	ns	-	-	-	-	-		
	a/	195.70	100.00								
4/10	b/	6.75	3.45	ns		6.75	3.45	6.75	3.45		
	c/	13.20	6.74	0.01	0.01	13.18	6.73	13.19	6.74	99.92	
	d/	132.90	67.91	0.13	0.07	132.75	67.83	132.88	67.90	99.98	
	e/	41.15	21.03	0.40	0.21	40.75	20.82	41.15	21.03	100.00	
	f/	194.00	99.13	0.54	0.29	193.43	98.83	193.97	99.12		
	g/	1.70	0.87	ns	-	-	-	-	-		
	a/	192.40	100.00								
4/11	b/	6.25	3.25	ns		6.25	3.25	6.25	3.25		
	c/	16.60	8.63	0.00	0.00	16.59	8.62	16.59	8.62	99.94	
	d/	138.25	71.86	0.07	0.04	138.17	71.81	138.24	71.85	99.99	
	e/	27.25	14.16	0.18	0.09	27.07	14.07	27.25	14.16	100.00	MI/op.m.,tu,zi,ga,ep, nt,di,sil,py/
	f/	188.35	97.90	0.25	0.13	188.08	97.75	188.33	97.88		
	g/	4.05	2.10	ns	-	-	-	-	-		

Tableau / Table 4/12   Borehole / Sondage B 4

1	2	3	4	5	6	7	8	9	10	11	12
	a/	190.80	100.00								
[illegible] 4/12	b/ c/ d/ e/	18.40 34.65 117.85 18.55	9.64 18.16 61.77 9.72	ns 0.01 0.05 0.11	0.01 0.03 0.06	18.40 34.57 117.80 18.43	9.64 18.12 61.74 9.66	18.40 34.58 117.85 18.54	9.64 18.13 61.77 9.72	99.78 100.00 99.95	
	f/	189.45	99.29	0.17	0.10	189.20	99.16	189.37	99.26		
	g/	1.35	0.71	ns	–	–	–	–	–		
	a/	189.20	100.00								
[illegible] 4/13	b/ c/ d/ e/	22.20 34.45 106.50 23.90	11.73 18.21 56.29 12.63	ns 0.00 0.05 0.15	0.00 0.03 0.08	22.20 34.40 105.45 23.72	11.73 18.18 56.26 12.54	22.20 34.40 106.50 23.87	11.73 18.18 56.29 12.62	99.85 100.00 99.87	MI/op.m.,zi,ep,ga,tu, py,am ,di,le/
	f/	187.05	98.86	0.20	0.11	186.77	98.71	186.97	98.82		
	g/	2.15	1.14	ns	–	–	–	–	–		

Tableau
Table 4/13

RÉSULTATES D'ANALYSE GRANULOMÉTRIQUE ET DE SÉPARATION DANS LES LIQUIDES LOURDS DES SABLES PRELEVES DES SONDAGES DE LA RÉGION DE B L A O U A N E

RESULTS OF GRAIN SIZE ANALYSIS AND HEAVY LIQUID SEPARATION OF SANDS FROM BOREHOLES IN THE REGION OF B L A O U A N E

Borehole
Sondage B 5

Echantillon No	Analyse granulométrique / Grain size analysis		Séparation dans les liquides denses / Heavy liquid separation: Fraction lourde / Heavy fraction		Fraction legère / Light fraction		Rendement total / Total yield		Recuperation / Recovery	Remarks / Remarques
	a/ admission / feed b/ fraction + 0.6mm c/ fraction + 0.3mm d/ fraction + 0.2mm e/ fraction + 0.06mm f/ total fraction de sable / total sand fraction g/ fraction de vase et d'argile / silt and clay fraction									
	rendement / yield		rendement / yield		rendement / yield		rendement / yield			
	g	%	g	%	g	%	g	%	%	
1	2	3	4	5	6	7	8	9	10	11	12

	a/	48.00	100.00								
[illegible] 5/1	b/ c/ d/	0.88 5.20 37.01	1.83 11.04 77.10	ns 0.01 0.67	 0.01 1.40	0.88 5.29 36.33	1.83 11.03 75.69	0.88 5.30 37.00	1.83 11.04 77.09	 100.00 99.97	MS[4] /see tab. [illegible].../
	e/	3.02	8.47	1.24	2.58	2.66	5.55	3.00	[illegible].13	99.40	MS[4]/voir tab. [illegible].../
	f/	47.11	98.14	1.92	3.99	45.16	94.10	47.08	98.09		
	g/	0.91	1.86	ns	-	-	-	-	-		
	a/	48.86	100.00								
[illegible] 5/2	b/ c/ d/ e/	1.51 2.85 [illegible] 11.70	3.08 5.85 64.86 23.95	ns 0.01 0.59 1.12	 0.01 1.21 2.30	1.54 2.84 32.06 10.57	3.08 5.82 65.63 21.65	1.51 2.85 32.65 11.69	3.08 5.85 64.84 21.95	 100.00 100.00 99.91	MS[4] MS[4]
	f/	48.71	99.76	1.72	3.52	46.98	96.18	48.70	99.70		
	g/	0.14	0.29	ns	-	-	-	-	-		
	a/	49.40	100.00								
[illegible] 5/3	b/ c/ d/ e/	1.05 2.45 22.90 22.80	2.13 4.96 46.35 46.15	ns 0.00 0.01 0.14	 0.00 0.01 0.28	1.05 2.45 22.89 22.65	2.13 4.96 46.34 45.85	1.05 2.45 22.90 22.79	2.13 4.96 46.35 46.13	 100.00 100.00 99.96	MS[4] MS[4]
	f/	49.20	99.59	0.15	0.29	49.04	99.28	49.19	99.57		
	g/	0.20	0.41	ns	-	-	-	-	-		
	a/	49.20	100.00								
[illegible] 5/[illegible]	b/ c/ d/ e/	0.65 2.70 25.05 [illegible]	1.32 5.48 52.05 [illegible]	ns 0.00 0.12 0.29	 0.00 0.25 [illegible]	0.65 2.69 25.92 [illegible]	1.32 5.47 52.69 [illegible]	0.65 2.69 26.04 [illegible]	1.32 5.47 52.94 [illegible]	 99.63 99.96 [illegible]	MS[4] MS[4]
	f/	48.95	99.49	0.41	0.84	48.51	98.61	48.92	99.45		
	g/	0.25	0.51	ns	-	-	-	-	-		

1	2	3	4	5	6	7	8	9	10	11	12
~ 5/5	a/	49.30	100.00								
	b/	0.50	1.01	ns		0.50	1.01	0.50	1.01		
	c/	3.14	6.39	0.00	0.00	3.14	6.37	3.14	6.37	99.68	
	d/	30.6[illegible]	62.17	0.01	0.02	30.64	62.15	30.65	62.17	100.00	
	e/	14.80	30.02	0.02	0.03	14.78	29.99	14.80	30.02	100.00	
	f/	49.10	99.59	0.03	0.05	49.06	99.52	49.09	99.57		
	g/	0.20	0.41	ns	-	-	-	-	-		
~ 5/6	a/	48.75	100.00								
	b/	0.35	0.72	ns		0.35	0.72	0.35	0.72		
	c/	2.44	5.03	0.00	0.00	2.44	5.01	2.44	5.01	99.59	
	d/	29.65	60.82	0.02	0.04	29.63	60.78	29.65	60.82	100.00	
	e/	15.55	31.90	0.08	0.17	15.46	31.72	15.54	31.89	99.93	
	f/	48.09	98.47	0.10	0.21	47.88	98.23	47.98	98.44		
	g/	0.75	1.53	ns	-	-	-	-	-		
~ 5/7	a/	49.10	100.00								
	b/	0.65	1.32	ns		0.65	1.32	9.65	1.32		
	c/	4.80	9.78	-0.01	0.01	4.79	9.77	4.80	9.78	100.00	
	d/	32.35	65.88	0.02	0.04	32.33	65.84	32.35	65.88	100.00	
	e/	10.95	22.30	0.02	0.04	10.91	22.22	10.93	22.26	99.82	
	f/	48.75	99.28	0.05	0.09	48.68	99.15	48.73	99.24		
	g/	0.35	0.72	ns	-	-	-	-	-		
~ 5/8	a/	49.40	100.00								
	b/	0.50	1.01	ns		0.50	1.01	0.50	1.01		
	c/	3.92	7.93	0.00	0.00	3.89	7.93	3.89	7.93	99.23	
	d/	33.45	67.78	0.05	0.10	33.40	67.61	33.45	67.71	99.91	
	e/	11.25	22.77	0.10	0.20	11.15	22.47	11.21	22.72	100.00	MI/op.m. 50,ga,py,zi, am ,tu,st,ep,di,m?/
	f/	49.15	99.49	0.15	0.30	48.94	99.12	49.09	99.42		
	g/	0.25	0.51	ns	-	-	-	-	-		
~ 5/9	a/	195.45	100.00								
	b/	3.75	1.91	ns		3.75	1.91	3.75	1.91		
	c/	18.15	9.24	0.00	0.00	18.14	9.23	18.14	9.23	99.94	
	d/	130.30	66.32	0.22	0.11	130.06	66.20	130.28	66.31	99.98	MI/op.m. 40,~~ga~~ 30,ep, zi,di/
	e/	43.00	21.[illegible]	0.58	0.29	42.40	21.58	42.98	21.87	99.95	MIQ /see tab. 5 ./ /voir tab. 5../
	f/	195.20	99.36	0.80	0.40	194.35	98.92	195.15	99.32		
	g/	1.25	0.64	ns	-	-	-	-	-		
~ 5/10	a/	195.90	100.00								
	b/	6.25	3.19	ns		6.25	3.19	6.25	3.19		
	c/	25.95	13.25	0.02	0.01	25.92	13.24	25.94	13.25	99.96	MI/op.m. 90,ga,ep/
	d/	130.20	66.50	0.22	0.11	129.97	66.38	130.19	66.49	99.99	MI/op.m. 20,ga,zi,py, ep,st,lo,am ,di/
	e/	32.30	16.50	0.54	0.17	31.96	16.32	32.30	16.49	100.00	MIQ /see tab. 5../ /voir tab. 5../
	f/	194.70	99.44	0.58	0.29	194.10	99.13	194.68	99.42		
	g/	1.10	0.56	ns	-	-	-	-	-		
~ 5/11	a/	193.50	100.00								
	b/	9.25	4.78	ns		9.25	4.78	9.25	4.78		
	c/	22.65	11.71	0.01	0.01	22.64	11.70	22.65	11.71	100.00	
	d/	126.10	65.17	0.09	0.05	126.00	65.11	126.09	65.16	99.99	MI/op.m. 30,ga,zi,py, tu,ep,di,am ,lo/
	e/	33.75	17.44	0.09	0.05	33.65	17.39	33.74	17.44	99.97	MI/op.m.40,zi,ga,py, tu,am ,ep,ru,st,di, sil/
	f/	191.75	99.10	0.19	0.11	191.54	98.98	191.73	99.09		
	g/	1.75	0.90	ns	-	-	-	-	-		

Tableau 4/15 Borehole B 5
Table Sondage

1	2	3	4	5	6	7	8	9	10	11	12
B 5/12	a/	191.00	100.00								
	b/	15.65	8.17	ns		15.65	8.17	15.65	8.17		MI/ga,cp,zi.il,mo/
	c/	51.72	26.99	0.03	0.01	51.69	26.97	51.70	26.98	99.96	
	d/	101.0[illegible]	52.72	0.04	0.02	100.95	52.69	100.99	52.71	99.98	MI/op.m., 30,ga,py,zi, tu,op,ru,di,[illegible]/
	e/	21.16	11.04	0.09	0.04	21.07	10.99	21.15	11.03	99.95	
	f/	189.94	98.92	0.15	0.07	189.34	98.82	189.40	98.80		
	g/	2.06	1.08	ns	–	–	–	–	–		
B 5/13	a/	236.75	100.00								
	b/	26.60	11.24	ns		26.60	11.24	26.60	11.24		
	c/	40.89	17.29	0.01	0.01	40.83	17.24	40.34	17.29	99.97	
	d/	95.59	40.73	0.04	0.02	95.50	40.76	95.54	40.78	99.99	
	e/	69.59	29.42	0.17	0.07	69.43	29.32	69.60	29.39	99.93	MI/op.m, 45,py,tu,[illegible], ga,zi,di,[illegible],op,le/
	f/	233.65	98.69	0.22	0.10	233.36	98.56	233.58	98.66		
	g/	3.10	1.31	ns	–	–	–	–	–		

Tableau 4/16
Table

RÉSULTATES D'ANALYSE GRANULOMÉTRIQUE ET DE SÉPARATION DANS LES LIQUIDES LOURDS DES SABLES PRÉLEVÉS DES SONDAGES DE LA RÉGION DE B L A O U A K H

RESULTS OF GRAIN SIZE ANALYSIS AND HEAVY LIQUID SEPARATION OF SANDS FROM BOREHOLES IN THE REGION OF B L A O U A K H

Borehole / Sondage : B 6

Echantillon No / Sample No		Analyse granulométrique / Grain size analysis: a/ admission / feed; b/ fraction +0,8mm; c/ fraction +0,4mm; d/ fraction +0,2mm; e/ fraction +0,06mm; f/ total fraction de sable / total sand fraction; g/ fraction de vase et d'argile / silt and clay fraction		Séparation dans les liquides denses / Heavy liquid separation: Fraction lourde / Heavy fraction		Fraction légère / Light fraction		Rendement total / Total yield		Récupération / Recovery	Remarks / Remarques
		rendement / yield		rendement / yield		rendement / yield		rendement / yield			
		g	%	g	%	g	%	g	%	%	
1	2	3	4	5	6	7	8	9	10	11	12
B 6/1	a/	49.73	100.00								MI/op.m. 50,ga,ep,le, st,tu,zi/ MIQ /see tab. 5../ /voir tab. 5../
	b/	9.04	18.08	ns		9.04	18.08	9.04	18.08		
	c/	4.22	8.49	0.00	0.00	4.12	8.28	4.12	8.28	97.63	
	d/	17.74	35.67	0.05	0.10	17.64	35.47	17.69	35.57	99.72	
	e/	11.71	23.55	0.31	0.62	11.31	22.80	11.65	23.42	99.49	
	f/	42.71	85.89	0.36	0.72	42.44	84.83	42.50	85.35		
	g/	7.02	14.11	ns	-	-	-	-	-		
B 6/2	a/	50.09	100.00								
	b/	6.36	12.70	ns		6.36	12.70	6.36	12.70		
	c/	2.87	5.73	0.00	0.00	2.81	5.61	2.81	6.61	97.91	
	d/	20.20	40.33	0.02	0.04	20.12	40.17	20.14	40.21	99.70	
	e/	14.31	28.57	0.08	0.16	14.11	28.17	14.19	28.33	99.16	
	f/	43.74	87.33	0.10	0.20	43.40	86.65	43.50	86.85		
	g/	6.35	12.67	ns	-	-	-	-	-		
B 6/3	a/	49.39	100.00								
	b/	1.97	3.89	ns		1.97	3.89	1.97	3.89		
	c/	2.93	5.93	0.00	0.00	2.83	5.73	2.83	5.73	96.59	
	d/	27.14	54.95	0.01	0.02	27.05	54.77	27.06	54.79	99.70	
	e/	13.31	26.95	0.06	0.12	13.21	26.75	13.27	26.87	99.70	
	f/	45.35	91.72	0.07	0.14	45.06	91.14	45.13	91.28		
	g/	4.04	8.18	ns	-	-	-	-	-		
B 6/4	a/	46.03	100.00								
	b/	1.81	3.93	ns		1.81	3.93	1.81	3.93		
	c/	1.82	3.95	0.00	0.00	1.73	3.76	1.73	3.76	95.05	
	d/	21.58	46.87	0.02	0.04	21.56	46.85	21.58	46.89	100.00	
	e/	16.80	36.51	0.05	0.10	16.71	36.31	16.76	36.41	99.76	
	f/	42.01	91.26	0.07	0.14	41.81	90.85	41.88	90.99		
	g/	4.02	8.74	ns	-	-	-	-	-		

1	2	3	4	5	6	7	8	9	10	11	12
B 6/5	a/	49.90	100.00								
	b/	2.41	4.83	ns		2.41	4.83	2.41	4.83		
	c/	5.55	11.12	0.00	0.00	5.25	10.52	5.25	10.52	94.59	
	d/	18.07	36.21	0.00	0.00	17.91	35.89	17.91	35.89	99.11	
	e/	22.02	44.13	0.05	0.10	21.93	43.95	21.98	44.05	99.82	
	f/	48.05	96.29	0.05	0.10	47.50	95.19	47.55	85.29		
	g/	1.85	3.71	ns	-	-	-	-	-		
B 6/6	a/	50.24	100.00								
	b/	0.31	0.62	ns		0.31	0.62	0.31	0.62		
	c/	2.56	5.10	0.00	0.00	2.24	4.46	2.24	4.46	87.50	
	d/	36.62	72.89	0.04	0.04	36.48	72.61	36.50	72.65	99.67	
	e/	9.31	18.53	0.01	0.02	9.23	18.37	9.24	18.39	99.25	
	f/	48.80	97.14	0.05	0.06	48.26	96.06	48.29	96.12		
	g/	1.44	2.86	ns	-	-	-	-	-		
B 6/7	a/	49.62	100.00								
	b/	0.26	0.52	ns		0.26	0.52	0.26	0.52		
	c/	2.83	5.70	0.00	0.00	2.28	4.59	2.28	4.59	80.56	
	d/	42.21	85.07	0.01	0.02	42.14	84.93	42.15	84.95	99.86	
	e/	3.71	7.48	0.01	0.02	3.63	7.32	3.64	7.34	98.11	
	f/	49.01	98.77	0.02	0.04	48.31	97.36	48.33	97.40		
	g/	0.61	1.23	ns	-	-	-	-	-		
B 6/8	a/	46.06	100.00								
	b/	0.31	0.67	ns		0.31	0.67	0.31	0.67		
	c/	2.03	4.41	0.00	0.00	1.68	3.66	1.68	3.66	82.76	
	d/	39.15	85.00	0.01	0.02	38.75	84.13	38.76	84.15	98.98	
	e/	3.86	8.38	0.01	0.02	3.82	8.29	3.83	8.31	99.22	
	f/	45.37	98.46	0.02	0.04	44.56	96.75	44.58	96.79		
	g/	0.71	1.54	ns	-	-	-	-	-		
B 6/9	a/	199.31	100.00								
	b/	3.92	1.97	ns		3.92	1.97	3.92	1.97		
	c/	10.85	5.44	0.02	0.01	9.55	4.79	9.57	4.80	88.20	
	d/	134.71	67.59	0.06	0.03	132.71	66.58	132.77	66.61	98.56	MI/'op,m,60,py,zi,ga,le,ep,am,st,ru/
	e/	43.80	21.98	0.16	0.08	43.07	21.61	43.23	21.69	98.70	
	f/	199.31	96.98	0.24	0.12	189.25	94.95	189.49	95.07		
	g/	6.03	3.02	ns	-	-	-	-	-		
B 6/10	a/	196.00	100.00								
	b/	3.00	1.53	ns		3.00	1.53	3.00	1.53		
	c/	10.68	5.45	0.02	0.01	9.22	4.70	9.24	4.71	86.52	
	d/	143.62	73.28	0.06	0.03	141.21	72.05	141.27	72.08	98.36	
	e/	33.83	17.26	0.12	0.06	33.09	16.89	33.21	16.95	98.17	
	f/	191.13	97.52	0.20	0.10	186.52	95.17	186.72	95.27		
	g/	4.87	2.48	ns	-	-	-	-	-		
B 6/11	a/	199.92	100.00								
	b/	5.46	2.73	ns		5.46	2.73	5.46	2.73		
	c/	14.11	7.06	0.01	0.01	12.81	6.41	12.82	6.42	90.86	
	d/	147.88	73.97	0.06	0.03	145.92	72.99	145.98	73.02	98.71	
	e/	27.22	13.61	0.09	0.04	26.20	13.22	26.29	13.26	96.58	
	f/	194.67	97.37	0.16	0.08	190.39	95.25	190.55	95.33		
	g/	5.25	2.63	ns	-	-	-	-	-		

Tableau / Table 4/18 Borehole / Bundage B 6

1	2	3	4	5	6	7	8	9	10	11	12
B 6/12	a/	196.06	100.00								—
	b/	12.60	6.43	ns		12.60	6.43	12.60	6.43		MI/op.m. 60,ga,ep,le,zi,py,ru,sil/
	c/	33.55	17.11	0.01	0.01	30.42	15.52	30.43	15.53	90.70	
	d/	106.87	54.51	0.05	0.02	104.17	53.13	104.22	53.15	97.52	
	e/	33.83	17.25	0.16	0.08	32.24	16.45	32.40	16.53	95.77	
	f/	186.85	95.30	0.22	0.11	179.45	91.53	179.65	91.64		
	g/	9.21	4.70	ns	-	-	-	-	-		
B 6/13	a/	199.88	100.00								
	b/	19.84	9.93	ns		19.84	9.93	19.84	9.93		
	c/	52.53	26.28	0.01	0.01	48.14	24.08	48.15	24.09	91.66	
	d/	97.86	48.96	0.02	0.01	94.89	47.47	94.91	47.48	96.98	
	e/	19.74	9.88	0.06	0.03	18.59	9.30	18.65	9.33	94.48	
	f/	189.97	95.05	0.09	0.05	181.46	90.78	181.55	90.83		
	g/	9.91	4.95	ns	-	-	-	-	-		
B 6/14	a/	198.61	100.00								
	b/	45.72	23.02	ns		45.72	23.02	45.72	23.02		
	c/	48.85	24.60	0.01	0.01	44.80	22.56	44.81	22.57	91.73	
	d/	66.63	33.55	0.03	0.01	64.42	32.44	64.45	32.45	96.73	
	e/	22.87	11.52	0.06	0.03	22.29	11.22	22.35	11.25	97.73	
	f/	184.07	92.69	0.10	0.05	177.23	89.24	177.33	89.29		
	g/	14.54	7.31	ns	-	-	-	-	-		
B 6/15	a/	200.00	100.00								
	b/	73.33	36.66	ns		73.33	36.66	73.33	36.66		
	c/	26.62	13.31	0.01	0.01	26.02	13.01	26.03	13.02	97.78	
	d/	39.62	19.81	0.02	0.01	39.41	19.71	39.43	19.72	99.51	
	e/	38.23	19.12	0.08	0.04	37.93	18.97	38.01	19.01	99.42	
	f/	177.80	88.90	0.11	0.06	176.69	88.35	176.80	88.41		
	g/	22.20	11.10	ns	-	-	-	-	-		
B 6/16	a/	200.43	100.00								
	b/	58.41	29.14	ns		58.41	29.14	58.41	29.14		
	c/	8.87	4.43	0.01	0.01	8.72	4.35	8.73	4.36	98.42	
	d/	41.22	20.57	0.02	0.01	40.92	20.42	40.94	20.43	99.32	
	e/	73.08	36.46	0.09	0.04	72.68	36.27	72.77	36.31	99.58	
	f/	181.58	90.60	0.12	0.06	180.73	90.18	180.85	90.24		
	g/	18.85	9.40	ns	-	-	-	-	-		
B 6/17	a/	200.64	100.00								
	b/	29.72	14.81	ns		29.72	14.81	29.72	14.81		
	c/	34.53	17.21	0.01	0.01	33.52	16.71	33.53	16.72	97.10	
	d/	66.35	33.07	0.03	0.01	65.71	32.75	65.74	32.76	99.08	
	e/	47.81	23.83	0.06	0.03	47.62	23.74	47.68	23.77	99.73	
	f/	178.41	88.92	0.10	0.05	176.57	88.01	176.67	88.06		
	g/	22.23	11.08	ns	-	-	-	-	-		
B 6/18	a/	200.17	100.00								
	b/	28.87	14.42	ns		28.87	14.42	28.87	14.42		
	c/	24.74	12.36	0.01	0.01	24.24	12.11	24.25	12.12	99.57	
	d/	42.14	21.04	0.02	0.01	41.92	20.94	41.94	20.95	99.57	
	e/	69.23	34.59	0.02	0.01	69.13	34.54	69.15	34.55	99.88	
	f/	164.96	82.41	0.05	0.03	164.16	82.01	164.21	82.04		
	g/	35.21	17.59	ns	-	-	-	-	-		

1	2	3	4	5	6	7	8	9	10	11	12
B 6/19	a/	199.86	100.00								
	b/	28.06	14.04	ns		28.06	14.04	28.06	14.04		
	c/	31.82	15.93	0.01	0.01	31.81	15.92	31.82	15.93	100.00	
	d/	46.77	23.40	0.02	0.01	46.67	23.35	46.69	23.36	99.83	
	e/	71.41	35.73	0.09	0.05	71.31	35.67	71.40	35.72	99.99	
	f/	178.06	89.10	0.12	0.07	177.85	88.98	177.97	89.05		
	g/	21.80	10.91	ns	-	-	-	-	-		
B 6/20	a/	201.02	100.00								
	b/	21.35	10.62	ns		21.35	10.62	21.35	10.62		
	c/	15.03	7.48	0.01	0.01	15.02	7.47	15.03	7.48	100.00	
	d/	28.70	14.28	0.01	0.01	28.62	14.23	28.63	14.24	99.76	
	e/	40.41	20.10	0.01	0.01	40.31	20.05	40.32	20.06	99.78	
	f/	105.49	52.48	0.03	0.03	105.30	52.37	105.33	52.40		
	g/	95.53	47.54	ns	-	-	-	-	-		
B 6/21	a/	200.04	100.00								
	b/	15.63	7.81	ns		15.63	7.81	15.63	7.81		
	c/	21.50	10.75	0.02	0.01	21.40	10.70	21.42	10.71	99.63	
	d/	46.42	23.21	0.03	0.02	46.32	23.16	46.35	23.18	99.85	
	e/	49.82	24.91	0.11	0.06	49.61	24.80	49.72	24.86	99.80	
	f/	133.37	66.68	0.16	0.09	132.96	66.47	133.12	66.56		
	g/	66.67	33.32	ns	-	-	-	-	-		
B 6/22	a/	200.01	100.00								
	b/	9.61	4.80	ns		9.61	4.80	9.61	4.80		
	c/	17.62	8.81	0.01	0.01	17.56	8.77	17.57	8.78	99.72	
	d/	56.35	28.17	0.03	0.02	56.28	28.14	56.31	28.16	99.93	
	e/	58.42	29.21	0.09	0.04	58.30	29.15	58.39	29.19	99.95	MI/op.m. 60,ga,zi,di,
	f/	142.00	70.99	0.13	0.07	141.75	70.86	141.88	70.93		ep,py,am ,tu,le/
	g/	58.01	29.01	ns	-	-	-	-	-		
B 6/23	a/	200.80	100.00								
	b/	13.12	6.53	ns		13.12	6.53	13.12	6.53		
	c/	10.88	5.42	0.02	0.01	10.80	5.38	10.82	5.39	99.45	
	d/	40.97	20.35	0.05	0.03	40.81	20.32	40.86	20.35	99.73	
	e/	75.05	37.38	0.12	0.06	74.86	37.28	74.98	37.34	99.91	MI/op.m. 60,di,ep,zi,
	f/	140.02	69.68	0.19	0.10	139.59	69.51	139.78	69.61		py,ga,sil,tu,ru/
	g/	60.88	30.32	ns	-	-	-	-	-		
B 6/24	a/	200.59	100.00								
	b/	10.20	5.09	ns		10.20	5.09	10.20	5.09		
	c/	19.87	9.91	0.03	0.01	19.81	9.88	19.84	9.89	99.85	MI/op.m. 90,le,mo/
	d/	57.88	28.85	0.09	0.05	57.78	28.80	57.87	28.85	99.98	
	e/	50.44	25.14	0.18	0.09	50.18	25.01	50.36	25.10	99.84	MI/op.m. 50,ep,di, ga,zi,tu,py,am ,st/
	f/	138.39	68.99	0.30	0.15	137.97	68.78	138.27	68.93		
	g/	62.20	31.01	ns	-	-	-	-	-		
B 6/25	a/	200.78	100.00								
	b/	7.31	3.64	ns		7.31	3.64	7.31	3.64		
	c/	17.22	8.58	0.03	0.01	17.12	8.53	17.15	8.54	99.59	
	d/	64.12	31.94	0.08	0.04	63.94	31.85	64.02	31.89	99.84	
	e/	55.43	27.61	0.13	0.07	55.28	27.53	55.41	27.60	99.96	MI/op.m. 60,di,py,ep,
	f/	144.08	71.77	0.24	0.12	143.65	71.55	143.89	71.67		ga,zi,le,tu/
	g/	56.70	28.23	ns	-	-	-	-	-		

1	2	3	4	5	6	7	8	9	10	11	12
B 6/26	a/	200.61	100.00	.							
	b/	7.01	3.49	ns		7.01	3.49	7.01	3.09		
	c/	12.63	6.30	0.03	0.01	12.52	6.24	12.55	6.25	99.37	MI/op.m. 95,le/
	d/	52.71	26.27	0.06	0.03	52.61	26.25	52.67	26.26	99.92	MI/op.m. 60,ep,ga,di, tu,st,le,zi/ 5
	e/	72.81	36.29	0.50	0.25	72.25	36.02	72.75	36.27	99.92	MIQ /see tab. ..../ /voir tab. 5/
	f/	145.16	72.35	0.59	0.29	144.39	71.98	144.98	72.27		
	g/	55.45	27.65	ns	–	–	–	–	–		
B 6/27	a/	150.33	100.00						—		
	b/	3.80	2.53	ns		3.80	2.53	3.80	2.53		
	c/	8.02	5.33	0.02	0.02	7.92	5.27	7.94	5.29	99.00	
	d/	42.83	28.49	0.05	0.04	42.74	28.43	42.79	28.47	99.91	
	e/	61.55	40.94	0.06	0.06	61.48	40.69	61.51	40.74	99.93	MI/op.m. 60,ga.ep,di, le.tu/ ..../
	f/	116.20	77.29	0.13	0.11	115.94	77.12	116.07	77.23		
	g/	34.13	22.71	ns	–	–	–	–	–		

Tableau / Table 4/21

RÉSULTATES D'ANALYSE GRANULOMÉTRIQUE ET DE SÉPARATION DANS LES LIQUIDES LOURDS DES SABLES PRELEVÉS DES SONDAGES DE LA RÉGION DE B L A O U A K H

RESULTS OF GRAIN SIZE ANALYSIS AND HEAVY LIQUID SEPARATION OF SANDS FROM BOREHOLES IN THE REGION OF B L A O U A K H

Borehole / Sondage B 7

Échantillon No / Sample No		Analyse granulométrique / Grain size analysis: rendement / yield g	%	Séparation dans les liquides denses / Heavy liquid separation: Fraction lourde / Heavy fraction: rendement / yield g	%	Fraction légère / Light fraction: rendement / yield g	%	Rendement total / Total yield: rendement / yield g	%	Récupération / Recovery %	Remarks / Remarques
	a/ admission / feed; b/ fraction + 0.8mm; c/ fraction + 0.4mm; d/ fraction + 0.2mm; e/ fraction + 0.06mm; f/ total fraction de sable / total sand fraction; g/ fraction de vase et d'argile / silt and clay fraction										
1	2	3	4	5	6	7	8	9	10	11	12
B 7/1	a/	49.60	100.00								
	b/	0.35	0.70	ns	.	0.35	0.70	0.35	0.70		
	c/	[illegible]	8.71	0.01	0.02	4.29	8.65	4.30	8.67	99.54	
	d/	38.15	76.88	1.46	2.94	36.53	73.65	37.99	76.59	99.63	MS[5]/see tab. 8.../
	e/	6.68	13.47	1.68	3.39	4.87	9.82	6.55	13.21	98.05	MS[5]/voir tab. 9.../
	f/	49.48	99.76	3.15	6.35	46.04	92.82	49.19	99.17		
	g/	0.12	0.24	ns	-	-	-	-	-		
B 7/2	a/	49.22	100.00								
	b/	0.27	0.54	ns		0.27	0.54	0.27	0.54		
	c/	1.84	3.70	0.01	0.02	1.79	3.60	1.80	3.62	97.83	
	d/	34.49	69.30	0.37	0.74	34.03	68.37	34.40	69.11	99.74	MS[5]
	e/	12.00	24.11	1.28	2.57	10.55	21.20	11.83	23.77	98.58	MS[5]
	f/	48.60	97.65	1.66	3.33	46.64	93.71	48.30	97.04		
	g/	1.17	2.35	ns	-	-	-	-	-		
B 7/3	a/	43.31	100.00								
	b/	1.84	4.25	ns	.	1.84	4.25	1.84	4.25		
	c/	1.33	3.07	0.01	0.02	1.31	3.02	1.32	3.04	99.25	
	d/	26.86	62.02	0.29	0.67	26.47	61.12	26.76	61.79	99.63	MI/ op.m, 30,ga,op,di, le,st/
	e/	11.66	26.92	0.60	1.39	11.00	25.40	11.60	26.79	99.49	MIQ /see tab. 5../ /voir tab. 5.../
	f/	41.69	96.26	0.90	2.08	40.62	93.79	41.52	94.87		
	g/	1.62	3.75	ns	-	-	-	-	-		
B 7/4	a/	45.66	100.00								
	b/	13.91	30.46	ns		13.91	30.46	13.91	30.46		
	c/	2.12	4.64	0.00	0.00	2.10	4.60	2.10	4.60	99.06	
	d/	17.84	39.07	0.10	0.20	17.69	38.74	17.79	38.96	99.72	
	e/	10.02	21.94	0.12	0.26	9.79	21.44	9.91	21.70	98.90	
	f/	43.89	97.93	0.22	0.48	43.49	95.28	43.71	95.76		
	g/	1.77	2.07	ns	-	-	-	-	-		

Tableau 4/22
Tablo

Borehole B 7
Sondage

1	2	3	4	5	6	7	8	9	10	11	12
B 7/5	a/	45.08	100.00								
	b/	9.73	21.58	ns		9.73	21.58	9.73	21.58		
	c/	2.73	6.06	0.03	0.06	2.70	5.99	2.73	6.05	100.00	
	d/	17.55	38.93	0.04	0.09	17.44	38.69	17.48	38.78	99.60	
	e/	11.44	25.38	0.16	0.35	11.20	[illegible]	[illegible]	25.19	99.30	
	f/	41.45	91.95	0.23	0.50	41.07	[illegible]	41.30	91.60		
	g/	3.63	8.05	ns	–	–	–	–	–		
B 7/6	a/	46.80	100.00								
	b/	15.74	33.63	ns		15.74	33.63	15.74	33.63		
	c/	2.33	4.99	0.00	.0.00	2.30	4.91	2.30	4.91	98.71	
	d/	15.44	32.99	0.05	0.11	15.32	32.74	15.37	32.85	99.55	
	e/	13.11	28.01	0.12	0.26	12.89	27.54	13.01	27.80	99.24	
	f/	46.62	99.62	0.17	0.37	46.25	98.82	46.42	99.19		
	g/	0.18	0.38	ns	–	–	–	–	–		
B 7/7	a/	47.47	100.00								
	b/	8.78	18.50	ns		8.78	18.50	8.78	18.50		
	c/	2.52	5.31	0.00	0.00	2.50	5.27	2.50	5.27	99.21	
	d/	24.66	51.95	0.05	0.11	24.47	51.55	24.52	51.66	99.43	
	e/	11.25	23.70	0.35	0.74	10.88	22.92	11.23	23.66	99.82	MI/op.m. 60,ga,ep,di, am,zi,tu,sil/
	f/	47.21	99.46	0.40	0.85	46.63	98.24	47.03	99.29		
	g/	0.26	0.54	ns	–	–	–	–	–		
B 7/8	a/	45.92	100.00								
	b/	3.13	6.82	ns		3.13	6.82	3.13	6 82		
	c/	2.55	5.55	0.00	0.00	2.52	5.49	2.52	5.49	98.82	
	d/	25.81	56.21	0.11	0.24	25.64	55.84	25.75	56.08	99.77	MI,op.m. 45,ga,ep,di, st,tu,le/
	e/	14.17	30.86	0.38	0.83	13.76	29.97	[illegible]	30.80	99.79	MIQ /see tab. 5../ /voir tab. 5../
	f/	45.66	99.44	0.49	1.07	45.05	98.12	45.54	99.19		
	g/	0.26	0.56	ns	–	–	–	–	–		
B 7/9	a/	193.83	100.00								
	b/	6.07	3.13	ns		6.07	3.13	6.07	3.13		
	c/	20.54	10.60	0.02	0.01	20.47	10.56	20.49	10.57	99.76	
	d/	109.38	56.43	0.12	0.06	109.00	56.23	109.12	56.29	99.76	
	e/	53.38	27.54	0.26	0.13	52.91	27.30	53.17	27.43	99.61	
	f/	189.37	97.70	0.40	0.20	188.45	97.22	188.85	97.42		
	g/	4.46	2.30	ns	–	–	–	–	–		
B 7/10	a/	190.69	100.00								
	b/	8.65	4.54	ns		[illegible].65	4.54	8.65	4.54		
	c/	29.45	15.44	0.09	0.05	29.32	15.38	29.41	15.43	99.86	MI/op.m.80,ga,zi,ep,mo
	d/	101.63	53.30	0.33	0.17	100.98	52.96	101.31	53.13	99.69	MI/op.m. 50,ep,ga,le, st,zi,py,di/
	e/	43.87	23.00	0.54	0.28	43.08	22.59	43.62	22.87	99.43	MIQ /see tab. .3./ /voir tab. .3../
	f/	183.60	96.28	0.96	0.50	182.03	95.47	182.99	95.97		
	g/	7.09	3.72	ns	–	–	–	–	–		
B 7/11	a/	192.84	100.00								
	b/	13.22	6.86	ns		13.22	6.86	13.22	6.86		
	c/	41.91	21.73	0.04	0.02	41.79	21.67	41.83	21.69	99.81	
	d/	103.47	53.66	0.28	0.15	102.88	53.35	103.16	53.50	99.77	
	e/	30.22	15.67	0.41	0.21	20.66	15.38	30.07	15.59	99.50	MI/op.m.50,ep,ga,zi, py,tu,di/
	f/	188.82	97.92	0.73	0.38	187.55	97.26	188.28	97.64		
	g/	4.02	2.08	ns	–	–	–	–	–		

Tableau / Table 4/23 Borehole / Sondage #

1	2	3	4	5	6	7	8	9	10	11	12
B 7/12	a/	194.23	100.00								MI/op.m., 80,ep,ga,zi/
	b/	21.24	10.94	ns		21.24	10.94	21.24	10.94		
	c/	55.38	28.51	0.03	0.02	55.27	28.46	55.30	28.48	99.86	
	d/	92.90	47.83	0.14	0.07	92.51	47.63	92.65	47.70	99.73	
	e/	19.17	9.87	0.19	0.10	18.82	9.69	19.01	9.79	99.17	
	f/	188.69	97.15	0.36	0.19	187.84	96.72	188.20	96.91		
	g/	3.54	2.85	ns	-	-	-	-	-		
B 7/13	a/	239.11	100.00								MI/op.m..,le,ga,ep,di/ MI/op.m..,ga,di,ep,tu, am.,py,sil,zi,mo/
	b/	23.71	9.92	ns		23.71	9.92	23.71	9.92		
	c/	54.96	22.99	0.02	0.00	54.91	22.96	54.93	22.96	99.95	
	d/	124.52	52.08	0.17	0.07	123.69	51.73	123.86	51.80	99.47	
	e/	30.17	12.62	0.17	0.07	29.58	12.37	29.75	12.44	98.61	
	f/	233.36	97.61	0.36	0.14	231.89	96.98	232.25	97.12		
	g/	5.75	2.39	ns	-	-	-	-	-		

Tableau 4/24
Table

RÉSULTATS D'ANALYSE GRANULOMÉTRIQUE ET DE SÉPARATION DANS LES LIQUIDES LOURDS DES SABLES PRÉLEVÉS DES SONDAGES DE LA RÉGION DE B L A O U A K H

RESULTS OF GRAIN SIZE ANALYSIS AND HEAVY LIQUID SEPARATION OF SANDS FROM BOREHOLES IN THE REGION OF B L A O U A K H

Borehole / Sondage B 8

Échantillon No / Sample No		Analyse granulométrique / Grain size analysis: a/ admission / feed; b/ fraction +0.8mm; c/ fraction +0.4mm; d/ fraction +0.2mm; e/ fraction +0.06mm; f/ total fraction de sable / total sand fraction; g/ fraction de vase et d'argile / silt and clay fraction — rendement / yield g	rendement / yield %	Séparation dans les liquides denses / Heavy liquid separation — Fraction lourde / Heavy fraction — rendement / yield g	%	Fraction légère / Light fraction — rendement / yield g	%	Rendement total / Total yield — rendement / yield g	%	Récupération / Recovery %	Remarks / Remarques
1	2	3	4	5	6	7	8	9	10	11	12
B 8/1	a/	49.75	100.00								
	b/	0.20	0.40	nn		0.20	0.40	0.20	0.40		
	c/	1.15	2.31	0.00	0.00	1.13	2.27	1.13	2.27	98.26	
	d/	41.95	84.32	1.03	2.08	40.89	82.19	41.92	84.27	99.93	MS[6] /see tab. .6../
	e/	5.75	11.56	1.09	2.20	4.66	9.36	5.75	11.56	100.00	MS[7] /voir tab. 6.../
	f/	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	49.00	98.50		
	g/	0.70	1.41	nn	-	-	-	-	-		
B 8/2	a/	49.55	100.00								
	b/	0.10	0.20	nn		0.10	0.20	0.10	0.20		
	c/	1.45	2.93	0.00	0.00	1.44	2.90	1.44	2.90	99.31	
	d/	42.25	85.27	0.93	1.88	41.30	83.35	42.23	85.23	99.95	MS[6]
	e/	5.25	10.59	1.20	2.42	4.04	8.16	5.24	10.58	99.81	MS[7]
	f/	49.05	98.99	2.13	4.30	46.88	94.61	49.01	98.91		
	g/	0.50	1.01	nn	-	-	-	-	-		
B 8/3	a/	50.40	100.00								
	b/	0.15	0.30	nn		0.15	0.30	0.15	0.30		
	c/	0.95	1.88	0.00	0.00	0.94	1.87	0.94	1.87	98.95	
	d/	45.05	89.39	0.90	1.79	44.13	87.56	45.03	89.35	99.95	MS[6]
	e/	3.95	7.84	0.61	1.22	3.32	6.59	3.93	7.81	99.49	MS[7]
	f/	50.10	99.41	1.51	3.01	48.54	96.32	50.05	99.33		
	g/	0.30	0.59	nn	-	-	-	-	-		
B 8/4	a/	49.25	100.00								
	b/	0.10	0.20	nn		0.10	0.20	0.10	0.20		
	c/	1.50	3.05	0.00	0.00	1.48	3.00	1.48	3.00	98.67	
	d/	39.85	80.91	0.42	0.85	39.43	80.06	39.85	80.91	100.00	MS[6]
	e/	7.25	14.72	0.81	1.63	6.40	12.99	7.21	14.62	99.45	MS[7]
	f/	48.70	98.88	1.23	2.48	47.41	96.25	48.64	98.73		
	g/	0.55	1.12	nn	-	-	-	-	-		

1	2	3	4	5	6	7	8	9	10	11	12
B 8/5	a/	44.10	100.00								
	b/	0.45	1.02	ns		0.45	1.02	0.45	1.02		
	c/	1.45	3.29	0.00	0.00	1.45	3.28	1.45	3.28	100.00	
	d/	21.10	47.85	0.03	0.06	21.07	47.78	21.10	47.84	100.00	
	e/	19.45	44.10	0.18	0.36	19.27	43.74	19.45	44.10	100.00	MI/ op.m. 50,tu,ep,ga, sph,ru,py,am ,st/
	f/	42.45	96.26	0.21	0.42	42.24	95.82	42.45	96.24		
	g/	1.65	3.74	ns	-	-	-	-	-		
B 8/6	a/	49.60	100.00								
	b/	0.40	0.81	ns		0.40	0.81	0.40	0.81		
	c/	2.25	4.54	0.00	0.00	2.24	4.51	2.24	4.51	99.55	
	d/	25.45	51.30	0.01	0.01	25.44	51.29	25.45	51.30	100.00	
	e/	20.35	41.03	0.03	0.06	20.31	40.95	20.34	41.01	99.95	
	f/	48.45	97.68	0.04	0.07	48.39	97.56	48.43	97.63		
	g/	1.15	2.32	ns	-	-	-	-	-		
B 8/7	a/	48.90	100.00								
	b/	2.00	4.09	ns		2.00	4.09	2.00	4.09		
	c/	5.45	11.15	0.00	0.00	5.44	11.12	5.44	11.12	99.81	
	d/	28.55	58.38	0.01	0.03	28.53	58.34	28.54	58.37	99.96	
	e/	12.05	24.64	0.04	0.08	12.01	24.56	12.05	24.64	100.00	
	f/	48.05	[illegible].26	0.05	0.11	47.98	98.11	48.03	98.22		
	g/	0.85	1.74	ns	-	-	-	-	-		
B 8/8	a/	47.85	100.00								
	b/	3.15	6.58	ns		3.15	6.58	3.15	6.58		
	c/	7.50	15.67	0.00	0.00	7.50	15.67	7.50	15.67	100.00	
	d/	27.45	57.37	0.01	0.02	27.42	57.30	27.43	57.32	99.93	
	e/	8.55	17.67	0.02	0.04	8.50	17.77	8.52	17.81	99.65	
	f/	46.65	97.49	0.03	0.06	46.57	97.32	46.60	97.38		
	g/	[illegible]	[illegible]	ns	-	-	-	-	-		
B 8/9	a/	189.65	100.00								
	b/	4.65	2.45	ns		4.65	2.45	4.65	2.45		
	c/	9.60	5.06	0.01	0.01	9.56	5.04	9.57	5.05	99.69	
	d/	89.75	47.33	0.28	0.15	89.46	47.17	89.74	47.32	99.99	MI/ op.m. 50,ga,ep,tu, ru,zi,st,le/
	e/	80.95	42.68	0.38	0.20	80.56	42.48	80.94	42.68	99.99	MI/op.m. 50,ep,zi,tu, ga,py,am ,di/
	f/	184.95	97.52	0.67	0.36	184.23	97.14	184.90	97.50		
	g/	4.70	2.48	ns	-	-	-	-	-		
B 8/10	a/	189.65	100.00								
	b/	6.60	3.48	ns		6.60	3.48	6.60	3.48		
	c/	9.35	4.93	0.01	0.01	9.34	4.92	9.35	4.93	100.00	
	d/	111.45	58.77	0.26	0.14	111.18	58.62	111.44	58.76	99.99	MI/ op.m. 30,ep,zi,ga, tu,am ,py,ru/
	e/	60.35	31.82	0.30	0.16	59.95	31.61	60.25	31.77	99,83	MI/op.m. 45,ep,tu,zi, ga,ru,am ,py/
	f/	185.75	99.00	0.57	0.31	187.07	98.63	187.64	98.94		
	g/	1.90	1.00	ns	-	-	-	-	-		
B 8/11	a/	189.85	100.00								
	b/	4.00	2.11	ns		4.00	2.11	4.00	2.11		
	c/	11.35	5.98	0.00	0.00	11.35	5.98	11.35	5.98	100.00	
	d/	87.05	45.85	0.11	0.07	86.94	45.85	87.05	45.92	100.00	MI/ op.m. 40,ga,ep,tu, zi,py,amf,ru,di/
	e/	86.80	45.72	0.17	0.09	86.61	45.63	86.78	45.72	99.98	MI/ op.m. 50,ga,ep,zi, py,am ,ru,di/
	f/	189.20	99.66	0.28	0.16	188.90	99.57	189.18	99.73		
	g/	0.65	0.34	ns	-	-	-	-	-		

Tableau 4/26 Borehole B 8
Table Sondage

1	2	3	4	5	6	7	8	9	10	11	12
B 8/12	a/	190.80	100.00								
	b/	22.25	11.66	ns		22.25	11.66	22.25	11.66		
	c/	35.35	18.53	0.00	0.00	35.30	18.50	35.30	18.50	99.86	
	d/	105.50	55.29	0.04	0.02	105.39	55.24	105.43	55.26	99.93	
	e/	23.65	12.40	0.06	0.03	23.58	12.36	23.64	12.39	99.96	
	f/	186.75	97.88	0.10	0.05	186.52	97.76	186.62	97.81		
	g/	4.05	2.12	ns	-	-	-	-	-		
B 8/13	a/	145.30	100.00								MI/op.m.,ep,tu,zi,ga, py,le,nt/
	b/	16.50	11.36	ns		16.50	11.36	16.50	11.36		
	c/	33.05	22.75	0.01	0.01	32.95	22.68	32.96	22.69	99.73	
	d/	75.50	51.96	0.04	0.03	75.42	51.91	75.46	51.94	99.95	
	e/	12.65	8.70	0.36	0.25	12.29	8.45	12.65	8.70	100.00	
	f/	137.70	94.77	0.41	0.29	137.16	94.40	137.57	94.69		
	g/	7.60	5.23	ns	-	-	-	-	-		

RÉSULTATES D'ANALYSE GRANULOMÉTRIQUE ET DE SÉPARATION DANS LES LIQUIDES LOURDS DES SABLES PRELEVES DES SONDAGES DE LA RÉGION DE B L A O U A K H

RESULTS OF GRAIN SIZE ANALYSIS AND HEAVY LIQUID SEPARATION OF SANDS FROM BOREHOLES IN THE REGION OF B L A O U A K H

Borehole B 9
Sondage

Échantillon No / Sample No		Analyse granulométrique / Grain size analysis: rendement / yield g	%	Séparation dans les liquides denses / Heavy liquid separation — Fraction lourde / Heavy fraction: rendement / yield g	%	Fraction légère / Light fraction: rendement / yield g	%	Rendement total / Total yield: rendement / yield g	%	Récupération / Recovery %	Remarques / Remarks
1	2	3	4	5	6	7	8	9	10	11	12
B 9/1	a/	49.91	100.00							-	-
	b/	6.72	13.46	ns		6.72	13.46	6.72	13.46		
	c/	6.76	13.55	0.01	0.02	6.72	13.46	6.73	13.48	99.56	
	d/	25.74	51.57	0.87	1.74	24.83	49.75	25.70	51.49	99.84	MS[8] /see tab. 6.6./
	e/	8.80	17.63	2.64	5.29	6.12	12.26	8.76	17.55	99.54	MS[8] /voir tab. 6.6./
	f/	48.02	96.21	3.52	7.05	44.39	88.93	47.91	95.98		
	g/	1.89	3.79	ns	-	-	-	-	-		
B 9/2	a/	50.24	100.00								
	b/	4.44	8.84	ns		4.44	8.84	4.44	8.84		
	c/	4.21	8.38	0.00	0.00	4.19	8.34	4.19	8.34	99.52	
	d/	22.57	44.92	0.12	0.24	22.38	44.55	22.50	44.79	99.69	MS[8]
	e/	10.36	20.62	0.52	1.03	9.68	19.27	10.20	20.30	98.46	MS[8]
	f/	41.58	82.76	0.64	1.27	40.69	81.00	41.33	82.27		
	g/	8.66	17.24	ns	-	-	-	-	-		
B 9/3	a/	44.63	100.00								
	b/	1.77	3.97	ns		1.77	3.97	1.77	3.97		
	c/	3.51	7.86	0.01	0.02	3.49	7.82	3.50	7.84	99.71	
	d/	23.42	52.48	0.06	0.13	23.14	51.85	23.20	51.98	99.06	
	e/	10.70	23.97	0.15	0.34	10.53	23.59	10.68	23.93	99.81	MI /op.m. 50,gn,zi,am., di,ep,tu,sil,ru/
	f/	39.40	88.28	0.22	0.49	38.93	87.23	39.15	87.72		
	g/	5.23	1.72	ns	-	-	-	-	-		
B 9/4	a/	49.21	100.00								
	b/	0.74	1.50	ns		0.74	1.50	0.74	1.50		
	c/	5.05	10.26	0.00	0.00	5.00	10.16	5.00	10.16	99.07	
	d/	30.92	62.83	0.02	0.04	30.68	62.35	30.70	62.39	99.29	
	e/	10.28	20.89	0.07	0.14	10.02	20.36	10.09	20.50	98.15	
	f/	46.99	95.48	0.09	0.18	46.44	94.37	46.53	94.55		
	g/	2.22	4.52	ns	-	-	-	-	-		

Column 2 key:
a/ admission / feed
b/ fraction +0.8mm
c/ fraction +0.4mm
d/ fraction +0.2mm
e/ fraction +0.06mm
f/ total fraction de sable / total sand fraction
g/ fraction de vase et d'argile / silt and clay fraction

1	2	3	4	5	6	7	8	9	10	11	12
B 9/5	a/	39.51	100.00								
	b/	0.76	1.92	ns		0.76	1.92	0.76	1.92		
	c/	2.09	5.29	0.00	0.00	2.04	5.16	2.04	5.16	97.61	
	d/	22.77	57.63	0.06	0.15	22.63	57.28	22.69	57.43	99.65	
	e/	12.23	30.95	0.07	0.18	12.12	30.68	12.19	30.66	99.67	
	f/	37.85	95.79	0.13	0.33	37.55	95.04	37.68	95.37		
	g/	1.66	4.21	ns	-	-	-	-	-		
B 9/6	a/	47.06	100.00								
	b/	1.25	2.66	ns		1.25	2.66	1.25	2.66		
	c/	1.52	3.23	0.01	0.02	1.48	3.14	1.49	3.16	98.03	
	d/	28.16	59.84	0.03	0.06	28.06	59.63	28.09	59.69	99.75	
	e/	14.45	30.71	0.06	0.13	14.30	30.39	14.36	30.52	99.38	
	f/	45.38	96.44	0.10	0.21	45.09	95.09	45.19	96.03		
	g/	1.68	3.56	ns	-	-	-	-	-		
B 9/7	a/	44.98	100.00								
	b/	1.54	3.42	ns		1.54	3.42	1.54	3.42		
	c/	3.20	7.11	0.00	0.00	3.19	7.09	3.19	7.09	99.69	
	d/	29.41	65.39	0.02	0.04	29.27	65.07	29.29	65.11	99.59	
	e/	9.04	20.10	0.78	1.73	8.04	17.87	8.82	19.60	97.57	
	f/	43.19	96.02	0.80	1.77	42.04	93.45	42.84	95.22		
	g/	1.79	3.98	ns	-	-	-	-	-		
B 9/8	a/	49.53	100.00								
	b/	1.43	2.89	ns		1.43	2.89	1.43	2.89		
	c/	4.13	8.34	0.01	0.02	4.09	8.26	4.10	8.28	99.27	
	d/	36.02	72.72	0.08	0.16	35.82	72.32	35.90	72.48	99.67	
	e/	5.48	11.06	0.37	0.75	5.03	10.16	5.40	10.91	98.54	
	f/	47.06	95.01	0.46	0.93	46.37	93.63	46.83	94.56		
	g/	2.47	4.99	ns	-	-	-	-	-		
B 9/9	a/	194.20	100.00								
	b/	6.06	3.12	ns		6.06	3.12	6.06	3.12		
	c/	20.31	10.46	0.03	0.02	20.20	10.40	20.23	10.42	99.61	
	d/	143.21	73.74	0.21	0.11	142.68	73.68	142.89	73.47	99.78	MI/op.m.,ga,ep/
	e/	20.05	10.32	0.41	0.21	19.39	9.98	19.80	10.19	98.75	
	f/	189.63	97.64	0.65	0.34	188.33	96.97	188.98	97.31		
	g/	4.57	2.36	ns	-	-	-	-	-		
B 9/10	a/	196.18	100.00								
	b/	9.88	5.04	ns		9.88	5.04	9.88	5.04		
	c/	38.16	19.45	0.02	0.01	38.08	19.41	38.10	19.42	99.84	
	d/	145.20	74.01	0.23	0.12	144.87	73.84	145.10	73.96	99.93	MI/op.m.,ep,ga,zi,py,le,di,tu,ru/
	e/	1.32	0.67	0.04	0.02	1.26	0.64	1.30	0.66	98.48	
	f/	194.56	99.17	0.29	0.15	194.09	98.93	194.37	99.08		
	g/	1.62	0.83	ns	-	-	-	-	-		
B 9/11	a/	200.56	100.00								
	b/	15.29	7.62	ns		15.29	7.62	15.29	7.62		
	c/	49.24	24.55	0.01	0.01	49.19	24.53	49.20	24.54	99.92	
	d/	114.01	56.85	0.10	0.05	113.70	56.69	113.80	56.74	99.82	
	e/	8.36	4.17	0.05	0.02	8.24	4.11	8.29	4.13	99.16	
	f/	186.90	93.19	0.16	0.08	186.42	92.95	186.58	93.03		
	g/	13.66	6.81	ns	-	-	-	-	-		

Tableau / Table 4/29 — Borehole / Sondage B 9

1	2	3	4	5	6	7	8	9	10	11	12
B 9/12	a/	196.20	100.00								
	b/	11.74	5.98	ns		11.74	5.98	11.74	5.98		
	c/	39.01	19.88	0.01	0.01	38.89	19.82	38.90	19.83	99.72	
	d/	111.26	56.71	0.05	0.02	111.00	56.57	111.05	56.59	99.81	
	e/	23.19	11.82	0.09	0.05	22.94	11.69	23.03	11.74	99.31	
	f/	185.20	94.39	0.15	0.08	184.57	94.06	174.72	94.14		
	g/	11.00	5.61	ns	–	–	–	–	–		
B 9/13	a/	197.26	100.00								
	b/	12.02	6.09	ns		12.02	6.09	12.02	6.09		
	c/	35.74	18.12	0.01	0.01	35.69	18.09	35.70	18.10	99.88	
	d/	104.04	52.74	0.03	0.01	103.86	52.65	103.89	52.66	99.86	
	e/	31.77	16.11	0.15	0.08	31.42	15.93	31.57	16.01	99.37	
	f/	183.57	93.06	0.19	0.10	181.99	92.25	182.18	92.35		
	g/	13.69	6.94	ns	–	–	–	–	–		

RÉSULTATES D'ANALYSE GRANULOMÉTRIQUE ET DE SÉPARATION DANS LES LIQUIDES LOURDS DES SABLES PRÉLEVÉS DES SONDAGES DE LA RÉGION DE B L A O U A K H

RESULTS OF GRAIN SIZE ANALYSIS AND HEAVY LIQUID SEPARATION OF SANDS FROM BOREHOLES IN THE REGION OF B L A O U A K H

Borehole
Sondage B 10

Échantillon No / Sample No		Analyse granulométrique / Grain size analysis — rendement / yield (g)	(%)	Séparation dans les liquides denses / Heavy liquid separation — Fraction lourde / Heavy fraction — rendement / yield (g)	(%)	Fraction légère / Light fraction — rendement / yield (g)	(%)	Rendement total / Total yield — rendement / yield (g)	(%)	Récupération / Recovery (%)	Remarques / Remarques
1	2	3	4	5	6	7	8	9	10	11	12
B 10/1	a/	50.01	100.00								
	b/	0.25	0.50	ns		.0.25	0.50	0.25	0.50		
	c/	6.15	12.30	0.01	0.02	6.12	12.24	6.13	12.26	99.67	
	d/	39.54	79.06	1.23	2.46	38.07	76.12	39.30	78.58	99.39	MS[9] /see tab. 6. /
	e/	1.91	3.82	0.60	1.20	1.30	2.60	1.90	3.80	99.42	MS[9] /voir tab. .6../
	f/	47.85	95.68	1.84	3.68	45.74	91.46	47.58	95.14		
	g/	2.16	4.32	ns	-	-	-	-	-		
B 10/2	a/	49.18	100.00								
	b/	0.15	0.30	ns		0.15	0.30	0.15	0.30		
	c/	3.10	6.30	0.00	0.00	3.08	6.26	3.08	6.26	99.35	
	d/	34.36	69.87	0.82	1.67	33.04	67.18	33.86	68.85	98.54	MS[9]
	e/	7.28	14.80	1.11	2.26	6.01	12.12	7.12	14.48	97.80	MS[9]
	f/	44.89	91.27	1.93	3.93	42.28	85.96	44.21	89.89		
	g/	4.29	8.73	ns	-	-	-	-	-		
B 10/3	a/	49.43	100.00								
	b/	1.11	2.25	ns		1.11	2.25	1.11	2.25		
	c/	4.61	9.33	0.00	0.00	4.58	9.27	4.58	9.27	99.34	
	d/	36.80	74.45	0.04	0.08	36.17	73.17	36.21	73.25	98.39	
	e/	5.82	11.77	0.06	0.12	5.71	11.55	5.77	11.67	99.14	
	f/	48.34	97.80	0.10	0.20	47.57	96.24	47.67	96.44		
	g/	1.09	2.20	ns	-	-	-	-	-		
B 10/4	a/	46.60	100.00								
	b/	1.08	2.32	ns		1.08	2.32	1.08	2.32		
	c/	4.71	10.11	0.00	0.00	4.67	10.02	4.67	10.02	99.15	
	d/	32.96	70.73	0.03	0.06	32.33	69.38	32.36	69.44	98.18	
	e/	6.58	14.12	0.07	0.15	6.40	13.7[illegible]	6.47	13.88	98.32	
	f/	45.33	97.28	0.10	0.21	44.48	95.4[illegible]	44.58	95.46		
	g/	1.27	2.72	ns	-	-	-	-	-		

Column 2 legend: a/ admission / feed; b/ fraction +0.8mm; c/ fraction +0.4mm; d/ fraction +0.2mm; e/ fraction +0.06mm; f/ total fraction de sable / total sand fraction; g/ fraction de vase et d'argile / silt and clay fraction.

1	2	3	4	5	6	7	8	9	10	11	12
B 10/5	a/	48.84	100.00								
	b/	1.21	2.48	ns		1.21	2.48	1.21	2.48		
	c/	5.07	10.38	0.01	0.02	5.00	10.24	5.02	10.26	99.01	
	d/	34.65	70.95	0.04	0.08	34.50	70.64	34.54	70.72	99.68	
	e/	4.95	10.13	0.06	0.12	4.81	9.85	4.87	9.97	98.38	
	f/	45.88	93.94	0.11	0.22	45.52	93.21	45.64	93.43		
	g/	2.96	6.06	ns	-	-	-	-	-		
B 10/6	a/	50.26	100.00								
	b/	1.49	2.96	ns		1.49	2.96	1.49	2.96		
	c/	6.23	12.40	0.00	0.00	6.20	12.34	6.20	12.34	99.52	
	d/	35.35	70.33	0.02	0.04	35.12	69.88	35.14	69.92	99.40	
	e/	5.36	10.66	0.07	0.14	5.19	10.33	5.26	10.47	98.13	
	f/	48.43	96.35	0.09	0.18	48.00	95.51	48.09	95.69		
	g/	1.83	3.65	ns	-	-	-	-	-		
B 10/7	a/	48.82	100.00								
	b/	1.61	3.30	ns		1.61	3.30	1.61	3.30		
	c/	8.11	16.61	0.00	0.00	8.08	16.55	8.08	16.55	99.63	
	d/	31.21	63.93	0.02	0.04	31.00	63.50	31.02	63.54	99.39	
	e/	4.32	8.85	0.04	0.08	4.20	8.60	4.24	8.68	98.15	
	f/	45.25	92.69	0.06	0.12	44.89	91.95	44.95	91.17		
	g/	3.57	7.31	ns	-	-	-	-	-		
B 10/8	a/	50.32	100.00								
	b/	1.25	2.48	ns		1.25	2.48	1.25	2.48		
	c/	8.95	17.79	0.00	0.00	8.90	17.69	8.90	17.69	99.44	
	d/	29.58	58.78	0.02	0.04	29.39	58.41	29.41	58.45	99.42	
	e/	5.32	10.57	0.06	0.12	5.25	10.43	5.31	10.55	99.81	
	f/	45.10	89.63	0.08	0.16	44.79	89.01	44.87	89.17		
	g/	5.22	10.37	ns	-	-	-	-	-		
B 10/9	a/	199.94	100.00								
	b/	9.48	4.74	ns		9.48	4.74	9.48	4.74		
	c/	32.94	16.48	0.03	0.02	32.80	16.40	32.83	16.42	99.67	
	d/	123.45	61.74	0.09	0.05	122.91	61.47	123.00	61.52	99.63	
	e/	26.24	13.12	0.16	0.08	25.89	12.95	26.05	13.03	99.24	MI/'op.m.60,ep,zi,ga, di,sph/
	f/	192.11	96.08	0.28	0.15	191.08	95.56	191.36	97.71		
	g/	7.83	3.92	ns	-	-	-	-	-		
B 10/10	a/	192.62	100.00								
	b/	14.14	7.23	ns		14.14	7.23	14.14	7.23		
	c/	34.67	17.72	0.04	0.02	34.51	17.64	34.55	17.66	99.65	MI/op.m.,mo,ga,op/
	d/	119.02	60.84	0.11	0.06	118.33	60.49	118.44	60.55	99.51	MI/op.m.,ga,op,au,tu, di,mo/
	e/	20.22	10.34	0.15	0.08	20.00	10.22	20.15	10.30	99.65	MI/op.m. 70,ep,py,st, zi,ga,di/
	f/	188.05	96.13	0.30	0.16	186.98	95.58	187.28	95.64		
	g/	7.57	3.87	ns	-	-	-	-	-		
B 10/11	a/	200.05	100.00								
	b/	20.32	10.16	ns		20.32	10.16	20.32	10.16		
	c/	45.18	22.58	0.01	0.01	45.05	22.52	45.06	22.53	99.73	
	d/	104.86	52.42	0.04	0.02	104.27	52.12	104.31	52.14	99.47	
	e/	12.99	6.49	0.08	0.04	12.82	6.41	12.90	6.45	99.30	
	f/	183.35	91.65	0.13	0.07	182.46	91.21	182.59	21.28		
	g/	16.70	8.35	ns	-	-	-	-	-		

Tableau / Table 4/32 Borehole / Sondage B 10

1	2	3	4	5	6	7	8	9	10	11	12
B 10/12	a/	196.17	100.00								
	b/	16.95	8.64	ns		16.95	8.64	16.95	8.64		
	c/	38.29	19.50	0.01	0.01	38.10	19.42	38.11	19.43	99.63	
	d/	111.30	56.77	0.05	0.03	110.49	56.32	110.54	56.35	99.27	
	e/	17.64	8.99	0.07	0.04	17.46	8.90	17.53	8.94	99.38	
	f/	184.20	93.90	0.13	0.08	183.00	93.28	183.13	93.36		
	g/	11.97	6.10	ns	-	-	-	-	-		
B 10/13	a/	144.90	100.00								
	b/	12.52	8.64	ns		12.52	8.64	12.52	8.64		
	c/	28.19	19.43	0.01	0.01	28.01	19.33	28.02	19.34	99.54	
	d/	82.48	56.92	0.03	0.02	82.03	56.61	82.06	56.63	99.49	
	e/	13.51	9.32	0.05	0.03	13.40	9.25	13.45	9.28	99.55	
	f/	136.66	94.31	0.09	0.06	135.96	92.83	136.05	93.89		
	g/	8.34	5.69	ns	-	-	-	-	-		

1	2	3	4	5	6	7	8	9	10	11	12
11/5	a/	50.20	100.00								MS[12]/see tab. 6/ MS[12]/voir tab.6/
	b/	3.58	7.13	ns		3.58	7.13	3.58	7.13		
	c/	3.15	6.35	0.00	0.00	3.15	6.27	3.15	6.27	98.75	
	d/	28.04	55.86	0.44	0.88	27.53	54.84	27.97	55.72	99.75	
	e/	8.20	16.33	0.78	1.55	7.20	14.34	7.98	15.89	97.32	
	f/	43.01	85.67	1.22	2.43	41.46	82.58	42.68	85.01		
	g/	7.19	14.33	ns	–	–	–	–	–		
11/6	a/	50.10	100.00								MS[12] MS[12]
	b/	3.88	7.74	ns		3.88	7.74	3.88	7.74		
	c/	2.43	4.85	0.01	0.02	2.40	4.79	2.41	4.81	99.18	
	d/	25.70	51.30	0.39	0.78	25.02	49.94	25.41	50.72	98.87	
	e/	11.78	23.51	0.66	1.32	11.07	22.10	11.73	23.42	99.58	
	f/	43.79	87.40	1.06	2.12	42.37	84.47	43.43	86.69		
	g/	6.31	12.60	ns	–	–	–	–	–		
11/7	a/	50.00	100.00								MS[12] MS[12]
	b/	1.78	3.56	ns		1.78	3.56	1.78	3.56		
	c/	5.62	11.24	0.00	0.00	5.59	11.18	5.59	11.18	99.47	
	d/	31.15	62.30	0.06	0.12	29.96	59.92	30.02	60.04	96.37	
	e/	9.38	18.76	0.06	0.12	9.12	18.24	9.18	18.36	97.87	
	f/	47.93	95.86	0.12	0.24	46.45	92.90	46.57	93.14		
	g/	2.07	4.14	ns	–	–	–	–	–		
11/8	a/	49.90	100.00								MS[12]/see tab. 6 / MS[12]/voir tab. 6../
	b/	0.68	1.36	ns		0.68	1.36	0.68	1.36		
	c/	3.83	7.66	0.01	0.02	3.77	7.56	3.78	7.58	98.95	
	d/	24.80	49.70	0.15	0.30	24.45	49.00	24.60	49.30	99.19	
	e/	17.45	34.97	0.37	0.74	17.02	34.11	17.39	34.85	99.66	
	f/	46.75	93.69	0.53	1.06	45.92	92.03	46.45	93.09		
	g/	3.15	6.31	ns	–	–	–	–	–		
11/9	a/	[illegible]0.19	100.00								
	b/	[illegible].34	3.17			6.34	3.17	6.34	3.17		
	c/	[illegible].27	14.12		0.00	28.17	14.07	28.17	14.07	99.64	
	d/	[illegible].70	64.29		0.04	128.21	64.04	128.30	64.08	99.69	
	e/	[illegible].40	12.69		0.11	25.02	12.53	25.24	12.64	99.27	
	f/	188.71	94.27		0.15	187.74	93.81	188.05	93.96		
	g/	11.48	5.73		–	–	–	–	–		
11/10	a/	193.94	100.00								MI/ op.m, 40,ga,ep,zi,au, tu,di,ru/ MIQ /see tab. 5./ /voir tab. 5../
	b/	10.11	5.21	ns		10.11	5.21	10.11	5.21		
	c/	22.09	11.39	0.0[illegible]	0.01	22.03	11.36	22.04	11.37	99.77	
	d/	115.74	59.68	0.51	0.26	115.06	59.33	115.57	59.59	99.85	
	e/	31.13	16.05	0.93	0.49	29.92	15.42	30.85	15.91	99.10	
	f/	197.07	92.33	1.[illegible]5	0.76	177.42	91.72	178.57	92.08		
	g/	14.87	7.67	ns	–	–	–	–	–		
11/11	a/	194.71	100.00								MI/ga, op.m.,op,di,ru,m… MIQ /see tab. ..5./ /voir tab. ..5../
	b/	11.44	5.88	ns		11.44	5.88	11.44	5.88		
	c/	25.67	13.18	0.01	0.01	25.49	13.09	25.50	13.10	99.34	
	d/	118.50	60.86	0.38	0.19	117.56	60.43	118.04	60.62	99.61	
	e/	25.11	12.90	0.48	0.25	24.62	12.59	25.00	12.84	99.56	
	f/	180.72	92.82	0.87	0.45	[illegible].41	91.89	179.98	92.44		
	g/	13.99	7.18	ns	–	–	–	–	–		

Tableau / Table 4/35 Borehole / Sondage B 11

1	2	3	4	5	6	7	8	9	10	11	12
11/12	a/	198.26	100.00								MI/bp.m. 60,ep,zi,ga, ru,tu,sil/
	b/ c/ d/ e/	15.76 33.09 116.54 18.54	7.95 16.66 58.78 9.35	ns 0.01 0.13 0.22	 0.01 0.07 0.11	15.76 32.90 116.03 18.22	7.95 16.59 58.52 9.19	15.76 32.91 116.16 18.44	7.95 16.60 58.59 9.30	 99.64 99.67 99.46	
	f/	183.87	92.74	0.36	0.19	182.91	92.25	183.25	92.44		
	g/	14.39	6.26	ns	-	-	-	-	-		
B 11/13	a/	192.99	100.00								
	b/ c/ d/ e/	11.52 31.28 114.07 17.36	5.97 16.21 59.09 9.00	ns 0.01 0.04 0.11	 0.01 0.02 0.06	11.52 31.09 113.80 17.04	5.97 16.11 58.98 8.83	11.52 31.10 113.84 17.15	5.97 16.12 59.00 8.89	 99.42 99.84 98.79	
	f/	174.14	90.27	0.16	0.09	173.45	89.89	173.61	89.98		
	g/	18.44	9.73	ns	-	-	-	-	-		

Tableau
Table 4/36

RÉSULTATES D'ANALYSE GRANULOMÉTRIQUE ET DE SÉPARATION DANS LES LIQUIDES LOURDS DES SABLES PRELEVÉS DES SONDAGES DE LA RÉGION DE B L A O U A K H

RESULTS OF GRAIN SIZE ANALYSIS AND HEAVY LIQUID SEPARATION OF SANDS FROM BOREHOLES IN THE REGION OF B L A O U Á K H

Borehole
Sondage B 12

Échantillon No / Sample No		Analyse granulométrique / Grain size analysis: a/ admission / feed; b/ fraction + 0.8mm; c/ fraction + 0.4mm; d/ fraction + 0.2mm; e/ fraction + 0.06mm; f/ total fraction de sable / total sand fraction; g/ fraction de vase et d'argile / silt and clay fraction		Séparation dans les liquides denses / Heavy liquid separation: Fraction lourde / Heavy fraction		Fraction légère / Light fraction		Rendement total / Total yield		Recupération / Recovery	Remarques / Remarks
		rendement / yield		rendement / yield		rendement / yield		rendement / yield			
		g	%	g	%	g	%	g	%	%	
1	2	3	4	5	6	7	8	9	10	11	12
B 12/1	a/	50.40	100.00								
	b/	0.35	0.69	ns		0.35	0.69	0.35	0.69		
	c/	3.50	6.94	0.01	0.01	3.47	6.90	3.48	6.91	99.43	
	d/	42.25	83.83	1.36	2.71	40.88	81.11	42.24	83.82	99.98	MS12 /see tab. 6../
	e/	3.15	6.25	0.82	1.62	2.33	4.62	3.15	6.24	100.00	MS13 /voir tab. 6../ /see tab. 4../ /voir tab. 4../
	f/	49.25	97.71	2.19	4.13	47.03	93.32	49.22	97.45		
	g/	1.15	2.29	ns	-	-	-	-	-		
B 12/2	a/	51.05	100.00								
	b/	0.25	0.49	ns		0.25	0.49	0.25	0.49		
	c/	3.50	6.86	0.00	0.00	3.49	6.84	3.49	6.84	99.71	
	d/	41.45	81.19	1.02	1.99	40.42	79.18	41.44	81.17	99.98	MS12
	e/	5.75	11.26	1.08	2.12	4.60	9.00	5.68	11.12	98.78	MS13
	f/	50.95	99.80	2.10	4.11	48.76	95.51	50.86	99.62		
	g/	0.10	0.20	ns	-	-	-	-	-		
B 12/3	a/	51.30	100.00								
	b/	0.10	0.19	ns		0.10	0.19	0.10	0.19		
	c/	3.25	6.34	0.00	0.00	3.24	6.32	3.24	6.32	99.69	
	d/	42.55	82.94	0.94	1.83	41.60	81.09	42.54	82.92	99.98	MS12
	e/	3.70	7.21	0.66	1.29	3.04	5.93	3.70	7.22	100.00	MS13
	f/	49.60	96.68	1.60	3.12	47.98	93.53	49.58	96.55		
	g/	1.70	3.32	ns	-	-	-	-	-		
B 12/4	a/	50.30	100.00								
	b/	0.10	0.20	ns		0.10	0.20	0.10	0.20		
	c/	2.65	5.27	0.00	0.00	2.64	5.25	2.64	5.25	99.62	
	d/	40.75	81.01	0.84	1.67	39.56	78.65	40.40	80.32	99.14	MS12
	e/	5.65	11.23	0.97	1.93	4.67	9.28	5.64	11.21	99.82	MS13
	f/	49.15	97.71	1.81	3.60	46.97	93.38	48.78	96.98		
	g/	1.15	2.29	ns	-	-	-	-	-		

	2	3	4	5	6	7	8	9	10	11	12
	a/	50.30	100.00								
	b/	0.30	0.60	ns		0.30	0.60	0.30	0.60		
12/5	c/	3.30	6.56	0.00	0.00	3.19	6.34	3.19	6.34	99.69	
	d/	41.75	83.00	1.06	2.11	40.67	80.85	41.73	82.96	99.95	
	e/	4.25	8.45	0.77	1.52	3.43	6.84	4.20	8.35	98.82	
	f/	49.50	98.41	1.83	3.63	47.59	94.62	49.42	98.25		
	g/	0.80	1.59	ns	–	–	–	–	–		
	a/	50.20	100.00								
	b/	2.35	4.68	ns		2.35	4.68	2.35	4.68		
12/6	c/	2.15	4.28	0.00	0.00	2.14	4.26	2.14	4.26	99.53	
	d/	40.90	81.47	0.96	1.92	39.91	79.50	40.87	81.42	99.93	
	e/	4.50	8.97	1.17	2.32	3.32	6.62	4.49	8.94	99.78	
	f/	49.90	99.40	2.13	4.24	47.72	95.06	49.85	95.30		
	g/	0.30	0.60	ns	–	–	–	–	–		
	a/	50.25	100.00								
	b/	0.25	0.50	ns		0.25	0.50	0.25	0.50		
12/7	c/	2.30	4.58	–0.00	0.00	2.26	4.49	2.26	4.49	98.26	
	d/	42.85	85.27	1.07	2.13	41.75	83.08	42.82	85.21	99.93	
	e/	4.15	8.26	0.82	1.63	3.33	6.63	4.15	8.26	100.00	
	f/	49.55	98.61	1.89	3.76	47.59	94.70	49.48	98.46		
	g/	0.70	1.39	ns	–	–	–	–	–		
	a/	46.30	100.00								
	b/	1.30	2.80	ns		1.30	2.80	1.30	2.80		
12/8	c/	3.50	7.56	0.00	0.00	3.49	7.54	3.49	7.54	99.71	
	d/	28.75	62.10	0.43	0.93	28.30	61.12	28.73	62.05	99.93	
	e/	7.75	16.74	0.65	1.39	7.10	15.34	7.75	16.73	100.00	/
	f/	41.30	89.20	1.08	2.32	40.19	86.80	41.27	89.12		
	g/	5.00	10.80	ns	–	–	–	–	–		
	a/	198.90	100.00								
	b/	10.50	5.28	ns		10.50	5.28	10.50	5.28		
12/9	c/	22.65	11.39	0.01	0.01	22.59	11.36	22.60	11.37	99.78	
	d/	120.25	60.49	0.81	0.41	119.35	60.04	120.16	60.45	99.92	MI/'op.m. 40,ga,zi,ep, tu,nt,di/
	e/	[illegible]	17.73	1.03	0.52	[illegible]	17.21	35.24	17.73	99.92	MIQ /see tab. .5../ /voir tab. .5../
	f/	188.65	94.89	1.85	0.94	186.65	93.89	188.50	94.83		
	g/	10.15	5.11	ns	–	–	–	–	–		
	a/	191.35	100.00								
	b/	11.15	5.83	ns		11.15	5.83	11.15	5.89		
12/10	c/	25.75	13.46	0.03	0.01	25.72	13.44	25.75	13.45	100.00	MI/.op.m.ga,ep,zi,py/
	d/	130.95	68.43	1.01	0.53	129.88	67.88	130.89	68.41	99.95	MIQ /see tab. .5../ /voir tab. 5.../
	e/	20.45	10.69	1.26	0.66	19.17	10.02	20.43	10.68	99.90	MIQ /see tab. .5 ./ /voir tab. 5 .../
	f/	188.30	98.41	2.30	1.20	185.95	97.17	188.25	98.37		
	g/	3.05	1.59	ns	–	–	–	–	–		
	a/	198.50	100.00								
	b/	10.00	5.04	ns		10.00	5.04	10.00	5.04		
12/11	c/	32.05	16.15	0.01	0.01	32.04	16.14	32.05	16.15	100.00	
	d/	137.55	69.29	0.23	0.12	137.32	69.18	137.55	69.30	100.00	MI/op.m.. 40,ga 30,op,zi, ru,tu,py,di,st/
	e/	14.75	7.43	0.10	0.05	14.64	7.38	14.74	7.43	99.93	MI/op.m.. 60,ep,zi,tu,ru, ga,bi,le,di,sil/
	f/	194.35	97.91	0.34	0.18	194.00	97.74	194.34	97.92		
	g/	4.15	2.09	ns	–	–	–	–	–		

Tableau 4/38 Table

Sondage B 12 Borehole

1	2	3	4	5	6	7	8	9	10	11	12
12/12	a/	197.25	100.00								
	b/	16.20	8.22	ns		16.20	8.22	16.20	8.22		
	c/	35.75	18.12	0.01	0.01	35.65	18.07	35.66	18.08	99.75	MI/op.m 40,ga,zi,ep,tu,ru,le,st,py/
	d/	115.75	58.68	0.07	0.04	115.66	58.64	115.73	58.68	99.98	MI/op.m. 60,ga,zi,tu,ep,st,le,di/
	e/	24.30	12.32	0.07	0.04	24.21	12.27	24.28	12.31	99.92	
	f/	192.00	97.34	0.15	0.09	191.72	97.20	191.87	97.29		
	g/	5.25	2.66	ns	-	-	-	-	-		
12/13	a/	198.05	100.00								
	b/	13.30	6.72	ns		13.30	6.72	13.30	6.72		
	c/	32.85	16.58	0.00	0.00	32.82	16.57	32.82	16.57	99.91	
	d/	108.05	54.56	0.05	0.03	107.92	54.49	107.97	54.52	99.93	
	e/	33.65	16.99	0.08	0.04	33.54	16.94	33.62	16.98	99.91	
	f/	187.85	94.85	0.13	0.07	187.58	94.72	187.71	94.79		
	g/	10.20	5.15	ns	-	-	-	-	-		

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Tableau
Table 4/39

RÉSULTATS D'ANALYSE GRANULOMÉTRIQUE ET DE SÉPARATION DANS LES LIQUIDES LOURDS DES SABLES PRELEVES DES SONDAGES DE LA RÉGION DE B L A O U A K H

RESULTS OF GRAIN SIZE ANALYSIS AND HEAVY LIQUID SEPARATION OF SANDS FROM BOREHOLES IN THE REGION OF B L A O U A K H

Borehole
Sondage B 13

Echantillon No / Sample No		Analyse granulométrique / Grain size analysis: a/ admission / feed; b/ fraction +0.8mm; c/ fraction +0.4mm; d/ fraction +0.2mm; e/ fraction +0.06mm; f/ total fraction de sable / total sand fraction; g/ fraction de vase et d'argile / silt and clay fraction		Séparation dans les liquides denses / Heavy liquid separation: Fraction lourde / Heavy fraction		Fraction légère / Light fraction		Rendement total / Total yield		Récupération / Recovery	Remarks / Remarques
		rendement / yield		rendement / yield		rendement / yield		rendement / yield			
		g	%	g	%	g	%	g	%	%	
1	2	3	4	5	6	7	8	9	10	11	12
B 13/1	a/	50.06	100.00								
	b/	16.82	33.60	ns		16.82	33.60	16.82	33.60		
	c/	4.39	8.77	0.00	0.00	4.23	8.45	4.23	8.45	96.35	
	d/	20.45	40.87	0.60	1.20	19.64	39.23	20.24	40.43	98.92	MIQ /see tab. .5../ /voir tab. 5.../
	e/	7.07	14.12	1.26	2.52	5.55	11.29	6.81	13.81	96.32	MIQ /see tab. .5../ /voir tab. 5.../
	f/	48.74	97.36	1.86	3.72	46.34	92.57	48.20	96.29		
	g/	1.32	2.64	ns	–	–	–	–	–		
B 13/2	a/	50.33	100.00								
	b/	6.06	12.04	ns		6.06	12.04	6.06	12.04		
	c/	4.05	8.05	0.00	0.00	3.82	7.59	3.82	7.59	94.32	
	d/	30.38	60.36	0.09	0.18	29.93	59.47	30.02	59.65	98.81	
	e/	7.12	14.15	0.12	0.24	6.72	13.35	6.84	13.59	96.07	MI/ op.m.60,le,zi,py, ep,ga,tu,am ,st,ru, di/
	f/	47.61	94.60	0.21	0.42	46.53	92.45	46.74	92.87		
	g/	2.72	5.40	ns	–	–	–	–	–		
B 13/3	a/	50.14	100.00								
	b/	1.32	2.63	ns		1.32	2.63	1.32	2.63		
	c/	4.59	9.15	0.00	0.00	4.20	8.38	4.20	8.38	91.50	
	d/	33.65	67.11	0.02	0.04	33.27	66.35	33.29	66.39	98;93	
	e/	10.11	20.16	0.04	0.08	9.72	19.38	9.76	19.46	96,54	
	f/	49.67	99.05	0.06	0.12	48.51	96.74	48.57	96.86		
	g/	0.47	0.95	ns	–	–	–	–	–		
B 13/4	a/	50.07	100.00								
	b/	1.83	3.65	ns		1.83	3.65	1.83	3.65		
	c/	3.74	7.47	0.00	0.00	3.63	7.25	3.63	7.25	97.06	
	d/	29.40	58.72	0.03	0.06	29.11	58.14	29.14	58.20	99.12	
	e/	14.47	28.90	0.09	0.18	14.28	28.44	14.33	28.62	99.03	MI/'op.m.60,ga,zi,ep,le, tu,py,mo,ru,di/
	f/	49.44	98.74	0.12	0.24	48.81	97.48	48.93	97.72		
	g/	[illegible]	1.26	ns	–	–	–	–	–		

Tableau 4/40 Borehole B 13
Table Sondage

1	2	3	4	5	6	7	8	9	10	11	12
B 13/5	a/	50.13	100.00								
	b/ c/ d/ e/	1.75 4.90 35.01 7.63	3.51 9.77 69.84 15.22	ns 0.00 0.02 0.04	 0.00 0.04 0.08	1.76 4.85 34.35 7.53	3.51 9.67 68.52 15.02	1.76 4.85 34.37 7.57	3.51 9.67 68.56 15.10	 98.98 98.17 99.21	
	f/	49.30	98.34	0.06	0.12	48.49	96.72	48.55	96.84		
	g/	0.83	1.66	ns	–	–	–	–	–		
B 13/6	a/	50.02	100.00								
	b/ c/ d/ e/	1.31 4.00 35.09 8.78	2.62 8.00 70.15 17.55	ns 0.00 0.01 0.05	 0.00 0.02 0.10	1.31 4.00 35.06 8.64	2.62 8.00 70.09 17.27	1.31 4.00 35.07 8.69	2.62 8.00 70.11 17.37	 100.00 99.94 98.97	
	f/	49.18	98.32	0.06	0.12	49.01	97.98	49.07	98.10		
	g/	0.84	1.68	ns	–	–	–	–	–		
B 13/7	a/	50.04	100.00								
	b/ c/ d/ e/	1.52 4.40 30.26 12.91	3.04 8.79 60.47 25.80	ns 0.00 0.01 0.04	 0.00 0.02 0.08	1.52 4.32 30.13 12.75	3.04 8.63 60.21 25.48	1.52 4.32 30.14 12.79	3.04 8.63 60.23 25.56	 98.18 99.60 99.07	
	f/	49.09	98.10	0.05	0.10	48.72	97.36	48.77	97.46		
	g/	0.95	1.90	ns	–	–	–	–	–		
B 13/8	a/	50.01	100.00								
	b/ c/ d/ e/	[illegible] [illegible] [illegible] 13.17	2.54 7.60 61.07 26.33	ns 0.00 0.01 0.04	 0.00 0.02 0.08	1.27 3.76 29.31 12.90	2.54 7.52 58.61 25.79	1.27 3.76 29.32 12.94	2.54 7.52 58.63 25.87	 98.94 96.00 98.25	
	f/	48.78	97.54	0.05	0.10	47.24	94.46	47.29	94.56		
	g/	1.23	2.46	ns	–	–	–	–	–		
B 13/9	a/	197.38	100.00								
	b/ c/ d/ e/	6.94 [illegible] [illegible] 48.85	3.52 11.41 59.11 24.75	ns 0.01 0.05 0.24	 0.01 0.02 0.12	6.94 22.42 116.40 48.61	3.52 11.36 58.97 24.63	6.94 22.43 116.45 48.85	3.52 11.37 58.99 24.75	 99.56 99.81 100.00	MI /op.m. 55,16,tu, op,py,ga,zi,st,di,amt./
	f/	[illegible]	98.79	[illegible]	0.15	194.37	98.48	194.66	98.63		
	g/	[illegible]	1.21	ns	–	–	–	–	–		
B 13/10	a/	200.08	100.00								
	b/ c/ d/ e/	8.51 30.30 117.19 40.44	4.25 15.10 58.57 20.21	ns 0.01 0.05 0.17	 0.01 0.02 0.08	8.51 30.19 117.09 40.22	4.25 15.09 58.52 20.10	8.51 30.20 117.14 40.39	4.25 15.10 58.54 20.18	 100.00 99.96 99.88	MI /op.m. 50,le,py,zi, op,st,ga,am ,tu,di,ru/
	f/	196.34	98.13	0.23	0.11	196.01	97.96	196.24	98.07		
	g/	3.74	1.87	ns	–	–	–	–	–		
B 13/11	a/	200.34	100.00								
	b/ c/ d/ e/	13.77 47.80 109.12 22.11	6.87 23.86 54.47 11.04	ns 0.01 0.03 0.07	 0.01 0.01 0.03	13.77 47.66 108.93 21.92	6.87 23.79 54.37 10.94	13.77 47.67 108.96 21.99	6.87 23.80 54.38 10.97	 99.73 99.85 99.46	
	f/	192.80	96.24	0.11	0.05	192.28	95.97	192.39	96.02		
	g/	7.54	3.76	ns	–	–	–	–	–		

Tableau 4/41 Borehole B 13
Table Sondage

1	2	3	4	5	6	7	8	9	10	11	12
	a/	249.39	100.00								
B 13/12	b/	19.57	7.85	ns		19.57	7.85	19.57	7.85		
	c/	56.82	22.78	0.01	0.01	56.80	22.77	56.81	22.78	99.98	
	d/	132.79	53.25	0.04	0.02	132.73	53.22	132.77	53.24	99.92	
	e/	27.48	11.02	0.10	0.04	27.38	10.98	27.48	11.02	100.00	MI/pp.m. 50,le,ep,ga, zi,py.tu,ut,di/
	f/	236.66	94.60	0.15	0.07	236.48	94.82	236.63	94.89		
	g/	12.73	5.10	ns	–	–	–	–	–		–

RÉSULTATES D'ANALYSE GRANULOMÉTRIQUE ET DE SÉPARATION DANS LES LIQUIDES LOURDS DES SABLES PRELEVÉS DES SONDAGES DE LA RÉGION DE B L A O U A K H

RESULTS OF GRAIN SIZE ANALYSIS AND HEAVY LIQUID SEPARATION OF SANDS FROM BOREHOLES IN THE REGION OF B L A O U A K H

Borehole
Sondage B 14.

Échantillon No / Sample No		Analyse granulométrique / Grain size analysis: rendement / yield (g)	(%)	Séparation dans les liquides denses / Heavy liquid separation — Fraction lourde / Heavy fraction: rendement / yield (g)	(%)	Fraction légère / Light fraction: rendement / yield (g)	(%)	Rendement total / Total yield: rendement / yield (g)	(%)	Récupération / Recovery (%)	Remarques / Remarks
1	2	3	4	5	6	7	8	9	10	11	12
14/1	a/	50.51	100.00								
	b/	4.02	7.96	ns		4.02	7.96	4.02	7.96		
	c/	4.13	8.18	0.00	0.00	4.13	8.18	4.13	8.18	100.00	
	d/	27.44	54.33	0.25	0.49	27.12	53.69	27.37	54.18	99.74	MIQ /see tab. ..5./ /voir tab. .5../
	e/	12.48	24.71	0.89	1.76	11.52	22.81	12.41	24.57	99.44	MIQ /see tab. ..5./ /voir tab. .5../
	f/	48.07	95.18	1.14	2.25	46.79	92.64	47.93	94.89		
	g/	2.44	4.82	ns	–	–	–	–	–		
14/2	a/	50.27	100.00								
	b/	1.12	2.23	ns		1.12	2.23	1.12	2.23		
	c/	2.26	4.50	0.00	0.00	2.26	4.50	2.26	4.50	100.00	
	d/	22.99	45.73	0.11	0.22	22.85	45.45	22.86	45.67	99.43	MI/op.m. 35,ga,ep,le, st,ru,mo/
	e/	21.58	42.93	0.55	1.09	20.95	41.67	21.50	42.76	99.63	MIQ /see tab. ..5../ /voir tab. .5../
	f/	47.95	95.39	0.66	1.31	47.18	93.85	47.84	95.16		
	g/	2.32	4.61	ns	–	–	–	–	–		
14/3	a/	50.03	100.00								
	b/	0.92	1.84	ns		0.92	1.84	0.92	1.84		
	c/	3.37	6.74	0.00	0.00	3.37	6.74	3.37	6.74	100.00	
	d/	31.11	62.18	0.03	0.06	31.07	62.10	31.10	62.16	99.97	
	e/	13.82	27.62	0.12	0.24	13.69	27.36	13.81	27.60	99.93	MI/op.m. 50,ep,ga,py,le, zi,tu,st,di,ru/
	f/	49.22	98.38	0.15	0.30	49.05	98.04	49.20	98.34		
	g/	0.81	1.62	ns	–	–	–	–	–		
14/4	a/	50.14	100.00								
	b/	0.60	1.20	ns		0.60	1.20	0.60	1.20		
	c/	3.62	7.22	0.00	0.00	3.62	7.22	3.62	7.22	100.00	
	d/	32.35	64.52	0.03	0.06	32.29	64.40	32.32	64.46	99.91	
	e/	12.65	25.23	0.09	0.18	12.56	25.05	12.65	25.23	100.00	MI/op.m. 35,ep,le,ga,tu, py,zi,st,ru,di/
	f/	49.22	98.17	0.12	0.24	49.07	97.87	49.19	98.11		
	g/	0.92	1.83	ns	–	–	–	–	–		

Key to column 2:
a/ admission / feed
b/ fraction + 0.8mm
c/ fraction + 0.4mm
d/ fraction + 0.2mm
e/ fraction + 0.06mm
f/ total fraction de sable / total sand fraction
g/ fraction de vase et d'argile / silt and clay fraction

1	2	3	4	5	6	7	8	9	10	11	12
14/5	a/	50.42	100.00								MI /le,ep,sil,di,ga/
	b/	5.17	10.25	ns		5.17	10.25	5.17	10.25		
	c/	6.99	13.86	0.00	0.00	6.99	13.86	6.99	13.86	100.00	
	d/	30.60	60.69	0.09	0.18	30.35	60.19	30.44	60.37	99.45	
	e/	7.08	14.04	0.03	0.06	7.02	13.92	7.05	13.98	99.58	
	f/	49.84	98.84	0.12	0.24	49.53	98.22	49.65	98.46		
	g/	0.58	1.16	ns	-	-	-	-	-		
14/6	a/	50.55	100.00								
	b/	3.57	7.06	ns		3.57	7.06	3.57	7.06		
	c/	6.05	11.97	0.00	0.00	6.05	11.97	6.05	11.97	100.00	
	d/	29.80	58.95	0.09	0.18	29.71	58.77	29.80	58.95	100.00	
	e/	7.22	14.28	0.04	0.08	7.10	14.04	7.14	14.12	98.89	
	f/	46.64	92.26	0.13	0.26	46.43	91.84	46.56	92.10		
	g/	3.91	7.74	ns	-	-	-	-	-		
14/7	a/	50.19	100.00								
	b/	2.89	5.76	ns		2.89	5.76	2.89	5.76		
	c/	7.57	15.08	0.00	0.00	7.57	15.08	7.57	15.08	100.00	
	d/	32.36	64.47	0.01	0.02	32.33	64.41	32.34	64.43	99.94	
	e/	6.02	11.99	0.02	0.04	5.99	11.93	6.01	11.97		
	f/	48.84	97.30	0.03	0.06	48.78	97.18	48.81	97.24		
	g/	1.35	2.70	ns	-	-	-	-	-		
14/8	a/	50.50	100.00								
	b/	2.92	5.78	ns		2.92	5.78	2.92	5.78		
	c/	6.50	12.87	0.00	0.00	6.39	12.65	6.39	12.65	98.31	
	d/	33.21	65.76	0.02	0.04	32.93	65.21	32.95	62.25	99.22	
	e/	6.64	13.15	0.03	0.06	6.45	12.77	6.48	12.83	97.59	
	f/	49.27	97.56	0.05	0.10	48.69	96.41	48.74	96.51		
	g/	1.23	2.44								
14/9	a/	200.47	100.00								
	b/	11.55	5.76	ns		11.55	5.76	11.55	5.76		
	c/	25.92	12.94	0.02	0.01	25.82	12.88	25.84	12.89	99.69	MI/ op.m,ep,mo,ga/
	d/	134.83	67.26	0.06	0.03	134.71	67.20	134.77	67.23	99.95	MI/op.m. 50,ga,py,ep, zi,tu,am,le/
	e/	26.07	13.00	0.12	0.06	25.84	12.89	25.96	12.95	99.58	MI/op.m. 70,ga,ep,zi, py,ut,ru,di,sil/
	f/	198.37	98.96	0.20	0.10	197.92	98.73	198.12	98.84		
	g/	2.10	1.04	ns	-	-	-	-	-		
14/10	a/	200.82	100.00								
	b/	12.37	6.16	ns		12.37	6.16	12.37	6.16		
	c/	34.92	17.41	0.02	0.01	34.94	17.40	34.96	17.40	100.00	
	d/	126.89	63.17	0.04	0.02	126.67	63.08	126.71	63.10	99.89	
	e/	23.62	11.76	0.09	0.05	23.44	11.67	23.53	11.72	99.62	
	f/	197.80	98.50	0.15	0.08	197.42	98.31	197.57	98.39		
	g/	3.02	1.50	ns	-	-	-	-	-		
14/11	a/	200.87	100.00								
	b/	15.23	7.58	ns		15.23	7.58	15.23	7.58		
	c/	41.60	20.71	0.01	0.01	41.47	20.64	41.49	20.65	99.71	
	d/	121.36	60.42	0.04	0.02	120.88	60.18	120.82	60.20	99.64	
	e/	18.72	9.32	0.05	0.02	18.52	9.22	18.57	9.24	99.20	
	f/	196.91	98.03	0.10	0.05	196.10	97.62	196.20	97.67		
	g/	3.96	1.97	ns	-	-	-	-	-		

1	2	3	4	5	6	7	8	9	10	11	12
B 14/12	a/	200.33	100.00								
	b/	11.09	5.54	ns		11.09	5.54	11.09	5.54		
	c/	33.81	16.88	0.01	0.01	33.80	16.87	33.81	16.85	100.00	
	d/	105.89	52.86	0.02	0.01	105.84	52.84	105.86	52.[illegible]	99.97	
	e/	43.40	21.66	0.06	0.03	43.30	21.61	43.36	21.64	99.91	
	f/	194.19	96.94	0.09	0.05	194.03	96.85	194.12	96.90		
	g/	6.14	3.06	ns	–	–	–	–	–		
B 14/13	a/	150.27	100.00								
	b/	10.0[illegible]	6.67	ns		10.02	6.67	10.02	6.67		
	c/	23.10	15.37	0.01	0.01	23.04	15.33	23.05	15.34	99.78	
	d/	71.07	47.29	0.04	0.03	70.96	47.22	71.00	47.25	99.90	
	e/	30.18	20.08	0.08	0.05	30.07	20.01	30.15	20.06	99.90	
	f/	134.37	89.41	0.13	0.09	134.09	89.23	134.22	89.32		
	g/	15.90	10.59	ns	–	–	–	–	–		

Tableau / Table 4/45

RESULTATS D'ANALYSE GRANULOMETRIQUE ET DE SEPARATION DANS LES LIQUIDES LOURDS DES SABLES PRELEVES DES SONDAGES DE LA REGION DE B L A O U A K H

RESULTS OF GRAIN SIZE ANALYSIS AND HEAVY LIQUID SEPARATION OF SANDS FROM BOREHOLES IN THE REGION OF B L A O U A K H

Borehole / Sondage B 15

Echantillon No / Sample No		Analyse granulometrique / Grain size analysis: rendement / yield g	%	Separation dans les liquides denses / Heavy liquid separation — Fraction lourde / heavy fraction: rendement / yield g	%	Fraction légère / Light fraction: rendement / yield g	%	Rendement total / Total yield: rendement / yield g	%	Recuperation / Recovery %	Remarks / Remarques
1	2	3	4	5	6	7	8	9	10	11	12
B 15/1	a/	50.04	100.00								XI/op.m., 60,ep,di,zi,ga. am,st,sp/
	b/	5.79	11.57	ns		5.79	11.57	5.79	11.57		
	c/	5.41	10.81	0.01	0.02	5.39	10.77	5.40	10.79	99.81	
	d/	22.73	45.42	0.04	0.08	22.61	45.18	22.65	45.26	99.65	
	e/	10.90	21.78	0.16	0.32	10.70	21.38	10.86	21.70	99.63	
	f/	44.83	89.58	0.21	0.42	44.49	88.90	44.70	89.32		
	g/	5.21	10.42	ns	-	-	-	-	-		
B 15/2	a/	50.27	100.00								
	b/	14.44	28.72	ns		14.44	28.72	14.44	28.72		
	c/	3.82	7.60	0.01	0.02	3.79	7.54	3.80	7.56	99.48	
	d/	16.50	32.82	0.01	0.02	16.44	32.70	16.45	32.72	99.70	
	e/	8.71	17.33	0.02	0.04	8.66	17.23	8.68	17.27	99.65	
	f/	43.47	86.47	0.04	0.08	43.33	86.19	43.37	86.27		
	g/	6.80	13.53	ns	-	-	-	-	-		
B 15/3	a/	50.14	100.00								
	b/	0.63	1.26	ns		0.63	1.26	0.63	1.26		
	c/	2.42	4.83	0.00	0.00	2.40	4.79	2.40	4.79	99.17	
	d/	29.48	58.80	0.02	0.04	29.37	58.58	29.39	58.62	99.69	
	e/	13.95	27.82	0.03	0.06	13.86	27.64	13.89	27.70	99.57	
	f/	46.48	92.71	0.05	0.10	46.26	92.26	46.31	92.36		
	g/	3.66	7.29	ns	-	-	-	-	-		
B 15/4	a/	47.81	100.00								
	b/	1.33	2.78	ns		1.33	2.78	1.33	2.78		
	c/	1.94	4.06	0.01	0.02	1.93	4.04	1.94	4.06	100.00	
	d/	23.17	48.46	0.02	0.04	23.07	48.25	23.09	48.29	99.65	
	e/	15.22	31.83	0.03	0.06	15.13	31.65	15.16	31.71	99.60	
	f/	41.66	87.13	0.06	0.12	41.46	86.72	41.52	86.84		
	g/	6.15	12.87	ns	-	-	-	-	-		

Key to column 2: a/ admission / feed; b/ fraction +0.8mm; c/ fraction +0.4mm; d/ fraction +0.2mm; e/ fraction +0.06mm; f/ total fraction de sable / total sand fraction; g/ fraction de vase et d'argile / silt and clay fraction

1	2	3	4	5	6	7	8	9	10	11	12
B 15/5	a/	50.07	100.00								
	b/	0.62	1.24	ns		0.62	1.24	0.62	1.24		
	c/	2.89	5.77	0.00	0.00	2.88	5.75	2.88	5.75	99.65	
	d/	23.00	45.93	0.02	0.04	22.91	45.76	22.93	45.80	99.69	
	e/	16.04	32.03	0.02	0.04	15.98	31.91	16.00	31.95	99.75	
	f/	42.55	84.97	0.04	0.08	42.39	84.66	42.43	84.74		
	g/	7.52	15.03	ns	-	-	-	-	-		
B 15/6	a/	50.17	100.00								
	b/	1.01	2.01	ns		1.01	2.01	1.01	2.01		
	c/	3.12	6.22	0.00	0.00	3.10	6.18	3.10	6.18	99.36	
	d/	27.62	55.05	0.01	0.02	27.50	54.81	27.51	54.83	99.60	
	e/	13.63	27.17	0.03	0.06	13.49	26.89	13.52	26.95	99.19	
	f/	45.38	90.45	0.04	0.08	45.10	89.89	45.14	89.97		
	g/	4.79	9.55	ns	-	-	-	-	-		
B 15/7	a/	50.05	100.00								
	b/	1.52	3.04	ns		1.52	3.04	1.52	3.04		
	c/	3.19	6.37	0.00	0.00	3.19	6.37	3.19	6.37	100.00	
	d/	29.50	58.94	0.01	0.02	29.43	58.80	29.44	58.82	99.80	
	e/	13.70	27.37	0.02	0.04	13.59	27.15	13.61	27.19	99.34	
	f/	47.91	95.72	0.03	0.06	47.73	95.36	47.76	95.42		
	g/	2.14	4.28	ns	-	-	-	-	-		
B 15/8	a/	50.21	100.00								
	b/	1.11	2.21	ns		1.11	2.21	1.11	2.21		
	c/	3.50	6.97	0.00	0.00	3.48	6.93	3.48	6.93	99.43	
	d/	33.44	66.60	0.01	0.02	33.29	66.30	33.30	66.32	66.32	
	e/	9.69	19.30	0.03	0.06	9.58	19.08	9.61	19.14	99.17	
	f/	47.74	95.08	0.04	0.08	47.46	94.52	47.50	94.60		
	g/	2.47	4.92	ns	-	-	-	-	-		
B 15/9	a/	199.98	100.00								
	b/	5.32	2.66	ns		5.32	2.66	5.32	2.66		
	c/	11.78	5.89	0.01	0.01	11.70	5.85	11.71	5.86	99.40	
	d/	138.95	69.48	0.05	0.02	138.05	69.03	138.10	69.05	99.39	MI/ op.m,ga,op,di,lo/
	e/	39.60	19.80	0.10	0.05	39.46	19.73	39.56	19.78	99.90	
	f/	195.65	97.83	0.16	0.08	194.53	97.27	194.69	97.35		
	g/	4.33	2.17	ns	-	-	-	-	-		
B 15/10	a/	200.03	100.00								
	b/	3.40	1.70	ns		3.40	1.70	3.40	1.70		
	c/	9.77	4.88	0.02	0.01	9.70	4.85	9.72	4.86	99.49	
	d/	146.34	73.16	0.05	0.02	145.76	72.87	145.81	72.89	99.64	
	e/	36.08	18.04	0.13	0.06	35.77	17.88	35.90	17.94	99.50	
	f/	195.59	97.78	0.20	0.09	194.63	97.30	194.83	97.39		
	g/	4.44	2.22	ns	-	-	-	-	-		
B 15/11	a/	200.43	100.00								
	b/	2.91	1.45	ns		2.91	1.45	2.91	1.45		
	c/	10.14	5.06	0.01	0.01	10.10	5.04	10.11	5.05	99.70	
	d/	143.70	71.70	0.06	0.03	143.26	71.48	143.32	71.51	99.73	
	e/	38.56	19.24	0.13	0.06	38.38	19.15	38.51	19.21	99.87	MI/op.m, 55,op,di,go, oil,tu,st,zi,om./
	f/	195.31	97.45	0.20	0.10	194.65	97.12	194.85	97.22		
	g/	5.12	2.55	ns	-	-	-	-	-		

1	2	3	4	5	6	7	8	9	10	11	12
B 15/12	a/	200.43	100.00								
	b/	7.09	3.54	na		7.09	3.54	7.09	3.54		
	c/	33.01	16.47	0.01	0.01	32.90	16.41	32.91	16.42	99.70	
	d/	117.33	58.54	0.03	0.01	116.97	58.36	117.00	58.37	99.72	
	e/	28.32	14.13	0.09	0.04	28.02	13.98	28.11	14.02	99.26	
	f/	185.75	92.68	0.13	0.06	184.98	92.29	185.11	92.35		
	g/	14.68	7.32	na	–	–	–	–	–		
B 15/13	a/	200.10	100.00								
	b/	12.84	6.42	na		12.84	6.42	12.84	6.42		
	c/	40.40	20.19	0.01	0.01	40.51	20.14	40.52	20.15	99.80	
	d/	105.28	52.61	0.08	0.04	104.81	52.38	104.89	52.42	99.63	
	e/	20.68	10.33	0.09	0.04	20.42	10.20	20.51	10.24		
	f/	179.20	89.55	0.18	0.09	178.38	89.14	178.66	89.23		
	g/	20.90	10.45	na	–	–	–	–	–		

RÉSULTATES DE L'ANALYSE PLANIMÉTRIQUE - LUMIÈRE TRANSMISE ET RÉFLECTIVE - RÉGION BLAOUOAKH /POURCENTAGE EN VOLUME/
GRAIN COUNTS RESULTS - LIGHT TRANSMITTED AND REFLECTED - REGION BLAOUOAKH / VOL. %/

Tableau
Table 5

	MINÉRAUX LOURDS HEAVY MINERALS																						MINÉRAUX LEGÉRS LIGHT MINERALS			
	MINÉRAUX OPAQUES OPAQUE MINERALS									MINÉRAUX TRANSPARENTS TRANSPARENT MINERALS																
Échant. No Sample No	il	sph	ru	an	he	ma mag	geo	Autres Others	Total OM	le	zi	mo	ga	di	st	sil	tu	ep	py amf	Autres Others	Total NT	Total HM	qu	cor	Total LM	N
1	2	3	4	5	6	7	8	9	10	11	12	13	.14	15	16	17	18	19	20	21	22	23	24	25	26	[illegible]
B 5/9 + 0.063[x]	28.4	0.5	12.1	1.6	10.6	0.5	0.8	-	54.5	5.0	13.7	0.5	9.2	1.7	1.7	-	3.3	2.2	1.7	and 0.5	39.5	94.0	6.0	-	6.0	[illegible]
B 5/10 + 0.063	18.8	-	18.3	-	20.6	-	0.5	-	58.2	6.2	8.9	-	5.0	5.5	1.2	-	3.0	5.0	1.2	and 0.8	36.8	95.0	5.0	-	5.0	[illegible]
B 6/1 + 0.063	17.7	0.6	24.2	2.4	19.7	0.7	1.3	-	66.6	3.8	13.3	0.8	2.4	2.3	-	-	2.5	2.3	2.9	-	30.3	96.9	3.1	-	3.1	3
B 7/3 + 0.063	21.1	-	35.9	-	15.5	-	1.2	-	73.7	0.8	6.2	-	3.0	5.4	0.8	-	-	3.8	1.5	-	21.5	95.2	4.8	-	4.8	4
B 7/8 + 0.063	8.5	0.3	39.8	0.5	3.5	-	-	-	52.6	0.7	3.7	-	13.4	6.9	-	-	-	12.5	2.8	sp 0.5	40.5	93.1	6.9	-	6.9	5
B7/10 + 0.063	12.6	0.5	31.6	0.5	15.8	0.5	0.6	-	62.1	0.8	10.0	-	4.1	4.5	-	-	1.7	6.5	3.8	-	31.4	93.5	6.5	-	6.5	6
B 11/10 + 0.063	16.6	-	22.3	0.4	23.5	1.2	1.2	-	65.2	2.4	10.7	-	5.6	3.5	-	0.6	0.8	3.7	0.8	-	28.1	93.3	6.7	-	6.7	7
B 11/11 + 0.063	16.6	0.9	27.6	2.3	4.1	0.5	0.5	-	52.5	0.8	9.8	-	14.0	5.0	0.8	-	-	5.9	2.4	-	38.7	91.2	8.8	-	8.8	8
B 12/9 + 0.063	16.1	1.0	33.3	2.5	1.0	-	1.0	-	54.9	-	16.5	-	4.0	2.1	0.9	-	2.5	14.0	1.1	-	41.1	96.0	4.0	-	4.0	9
B 12/10 + 0.20[xx]	7.1	-	23.4	1.4	2.0	-	1.1	-	35.0	5.0	16.0	-	22.5	-	-	-	1.0	18.0	1.0	-	63.5	98.5	1.5	-	1.5	10
B 12/10 + 0.063	18.0	0.5	39.2	2.1	1.6	0.6	-	-	62.0	-	11.0	-	7.0	0.5	0.5	-	4.0	8.5	2.5	-	34.0	96.0	4.0	-	4.0	11
B 13/1 + 0.20	12.6	0.2	31.1	0.8	3.0	1.3	0.2	-	49.2	5.5	5.1	-	20.9	2.8	0.4	-	0.4	10.2	1.2	-	46.5	95.7	4.3	-	4.3	12
B 13/1 + 0.063	21.1	0.6	36.1	1.2	1.2	4.8	0.6	-	65.6	1.2	18.3	-	3.9	1.2	1.6	-	0.4	2.3	1.2	-	30.1	95.3	4.3	0.4	4.7	13
B 14/1 + 0.20	11.5	1.2	16.4	1.2	13.4	0.7	-	-	44.4	8.2	1.7	0.9	25.9	1.3	0.4	-	0.4	11.6	-	-	50.4	94.8	5.2	-	5.2	14
B 14/1 + 0.063	23.9	-	27.5	0.4	6.6	0.9	0.4	-	59.7	2.7	14.6	-	6.7	1.5	0.8	-	0.7	2.6	2.0	-	31.6	91.3	8.7	-	8.7	15
B 14/2 + 0.063	20.0	0.6	36.8	1.3	4.4	0.6	-	-	63.7	2.8	13.6	-	3.2	1.8	-	-	2.8	5.1	1.4	be 0.5	31.2	94.9	5.1	-	5.1	16

[x] + 0.063 c.a.d. + 0.063 - 0.20 mm grain classe de l'échantillon B 5/9
i.e. the + 0.063 - 0.20 mm grain class of the sample B 5/9

[xx] + 0.20 c.a.d. + 0.063 - 0.20 mm grain classe de l'échantillon B 12/[illegible]
i.e. the + 0.063 - 0.20 mm grain class of the sample B 12/[illegible]

Tableau 6/1
Table 6/1

RÉSULTATS DE LA SÉPARATION MAGNÉTIQUE ET ÉLECTROMAGNÉTIQUE DE LA FRACTION LOURDE DES ÉCHANTILLONS DES SONDAGES DE LA RÉGION DE BLAOUAKH.

RESULTS OF MAGNETIC AND ELECTROMAGNETIC SEPARATION OF THE HEAVY FRACTION THE SAMPLES FROM BOREHOLES IN THE REGION OF BLAOUAKH.

MS[1] – Séparation de l'échantillon B 1/1-4
Separation of the sample B 1/1-4

Échantillon Sample / Concentré Concentrate		Poids Weight g	%	Minéraux Minerals	Remarques Remarks
B 1/1	+0.20	1.5202			
	+0.063	1.0545			
B 1/2	+0.20	1.8585			
	+0.063	0.5150			
B 1/3	+0.20	0.8853			
	+0.063	0.6569			
B 1/4	+0.20	0.5152			
	+0.063	0.1920			
Admission total / Total feed B 1 /1-4		6.7776	100.00		
MAGNÉTIQUES / MAGNETICS					
Concentré I / Concentrate I		0.6356	9.38		
Concentré II / Concentrate II		0.5641	8.32		
total magnétiques / total magnetics		1.1997	17.70		
PARAMAGNÉTIQUES / PARAMAGNETICS					
Concentré III / Concentrate III		0.2744	4.05	ep 80	MI
Produit intermédiaire IIIa / Middling product IIIa		0.7160	10.56		
Concentré IV / Concentrate IV		1.3025	19.22	ga 70	MI
Produit intermédiaire IVa / Middling product IVa		0.2494	3.68		
total paramagnétiques / total paramagnetics		2.5423	37.51		
NON-MAGNÉTIQUES / NONMAGNETICS					
Concentré V / Concentrate V		2.5314	37.35	zi 40, qu 40	MI
Rendement total / Total yield		6.2734	92.56		

Tableau 6/2
Table 6/2

MS[2] - Séparation de l'échantillon B 3/1-4
Separation of the sample B 3/1-4

Échantillon / Sample — Concentré / Concentrate		Poids / Weight g	%	Minéraux / Minerals	Remarques / Remarks
B 3/1	+0.20	1.7000			
	+0.063	0.9806			
B 3/2	+0.20	0.6273			
	+0.063	0.7231			
B 3/3	+0.20	0.6530			
	+0.063	0.4737			
B 3/4	+0.20	0.0626			
	+0.063	0.0582			
Admission total / Total feed		5.2785	100.00		
MAGNÉTIQUES / MAGNETICS					
Concentré I / Concentrate I		0.2470	4.68	il	MI
Concentré II / Concentrate II		0.2807	5.32	il	MI
total magnetiques / total magnetics		0.5277	10.00		
PARAMAGNÉTIQUES / PARAMAGNETICS					
Concentré III / Concentrate III		0.5010	9.49	ep 60	MI
Produit intermédiaire IIIa / Middling product IIIa		0.1795	3.40	ru75,ep,ga,py mo,tu	MI
Concentré IV / Concentrate IV		2.3500	44.52	ga 60	MI
Produit intermédiaire IVa / Middling productIVa		0.6130	11.61	ru 60,ga10,ep10, py,amf,sf	MIQ
total paramagnétiques / total paramagnetics		3.6435	69.02		
NON-MAGNÉTIQUES / NONMAGNETICS					
Concentré V / Concentrate V		0.7800	14.78	zi65,qu30	MIQ
Rendement total / Total yield		4.9512	93.80		

MS^3 = Séparation de l'échantillon B 4/1-4
= Separation of the sample B 4/1-4

Échantillon Sample		Poids Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate					
B 4/1	+0.20	0.7166			
	+0.063	1.0222			
B 4/2	+0.20	0.1723			
	+0.063	0.5086			
B 4/3	+0.20	0.0309			
	+0.063	0.1448			
B 4/4	+0.20	0.0588			
	+0.063	0.2463			
Admission total Total feed		2.9005	100.00		
MAGNÉTIQUES MAGNETICS					
Concentré I Concentrate I		0.2255	7.77		
Concentré II Concentrate II		0.4676	16.12		
total magnétiques total magnetics		0.6931	23.89		
PARAMAGNÉTIQUES PARAMAGNETICS					
Concentré III Concentrate III		0.3345	11.53	ep35,ru35,tu5,st,py,le	MIQ
Produit intermédiaire IIIa Middling product IIIa		0.0885	3.05	ru40,ep30,ga,st,ga80	MI
Concentré IV Concentrate IV		0.4068	14.03	ga 80	MI
Produit intermédiaire IVa Middling product IVa		0.1322	4.56	ru40,ga30,py10,amf	MIQ
total paramagnétiques total paramagnetics		0.9820	33.17		
NON-MAGNÉTIQUES NONMAGNETICS					
Concentré V Concentrate V		1.0568	36.44	zi	
Rendement total Total yield		2.7119	93.50		

Tableau 6/4
Table 6/4

MS[4] - Séparation de l'échantillon B 5/1-4

Separation of the sample B 5/1-4

Échantillon Sample / Concentré Concentrate		Poids Weight g	%	Minéraux Minerals	Remarques Remarks
B 5/1	+0.20	0.6673			
	+0.063	1.2374			
B 5/2	+0.20	0.5895			
	+0.063	1.1242			
B 5/3	+0.20	0.0079			
	+0.063	0.1406			
B 5/4	+0.20	0.1247			
	+0.063	0.2942			
Admission total Total feed	B 5/1-4	4.1858	100.00		
MAGNÉTIQUES MAGNETICS					
Concentré I Concentrate I		0.5564	13.29	il	an.chem. ch.a.
Concentré II Concentrate II		0.5444	13.01	il	an.chem. ch.a.
total magnétiques total magnetics		1.1008	26.30		
PARAMAGNÉTIQUES PARAMAGNETICS					
Concentré III Concentrate III		0.4211	10.06		an.chem. ch.a.
Produit intermédiaire IIIa Middling product		0.1171	2.80		
Concentré IV Concentrate IV		1.2420	29.67	ga 60	MI
Produit intermédiaire IVa Middling product IVa		0.2509	5.99		
total paramagnétiques total paramagnetics		2.0311	48.52		
NON-MAGNÉTIQUES NONMAGNETICS					
Concentré V Concentrate V		0.6584	15.73		
Rendement total Total yield		3.7903	90.55		

Tableau 6/5
Table 6/5

Séparation de l'échantillon B 7/1-2

MS[5] - Separation of the sample B 7/1-2

Échantillon Sample	Poids Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate				
B 7/1 +0.20	1.4625			
B 7/1 +0.063	1.6832			
B 7/2 +0.20	0.3658			
B 7/2 +0.063	1.2837			
Admission total B 7/1-2 Total feed	4.7952	100.00		
MAGNETIQUES MAGNETICS				
Concentré I Concentrate I	0.3291	6.86	il 90	MI
Concentré II Concentrate II	0.4652	9.70	il 90	MI
total magnétiques total magnetics	0.7943	16.56		
PARAMAGNETIQUES PARAMAGNETICS				
Concentré III Concentrate III	0.3488	7.27	ep70,ru+il	MI
Produit intermédiire IIIa Middling product IIIa	0.4435	9.25	ep,ga,ru+il,py	MI
Concentré IV Concentrate IV	1.8774	39.15	ga 80	MI
Produit intermédiaire IVa Middling product IVa	0.3138	6.54	ga,ru+il	MI
total paramagnétiques total paramagnetics	2.9835	62.21		
NON-MAGNETIQUES NONMAGNETICS				
Concentré V Concentrate V	0.6896	14.38	zi 60	
Rendement total Total yield	4.4674	93.15		

Tableau 6/6
Table 6/6

MS[6] - Séparation de l'échantillon B 8/1-4
Separation of the sample B 8/1-4

Échantillon Sample	Poids Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate				
B 8/1 +0.063	1.0936			
B 8/2 +0.063	1.2001			
B 8/3 +0.063	0.6157			
B 8/4 +0.063	0.8054			
Admission total Total feed B 8/1-4	3.7148	100.00		
MAGNÉTIQUES MAGNETICS				
Concentré I Concentrate I	0.6331	17.04	il	an.chem. ch.a.
Concentre II Concentrate II	0.8975	24.16	il	
total magnétiques total magnetics	1.5306	41.20		
PARAMAGNÉTIQUES PARAMAGNETICS				
Concentré III Concentrate III	0.5869	15.80	ep	an.chem. ch.a.
Produit intermédiaire IIIa Middling product IIIa	0.3363	9.05		
Concentré IV Concentrate IV	0.1530	4.12		
Produit intermédiaire IVa Middling product IVa	0.2860	7.70		
total paramagnétiques total paramagnetics	1.3622	36.67		
NON-MAGNÉTIQUES NONMAGNETICS				
Concentré V Concentrate V	0.4812	12.95	zi	an.chem. ch.a.
Rendement total Total yield	3.3740	90.82		

Tableau 6/7
Table 6/7

MS 7 - Séparation de l'échantillon B 8/1-4

Separation of the sample B 8/1-4

Échantillon Sample	Poids Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate				
B 8/1 +0.2	1.0331			
B 8/2 +0.2	0.9314			
B 8/3 +0.2	0.9020			
B 8/4 +0.2	0.4177			
Admission total Total feed B 8/1-4	3.2842	100.00		
MAGNÉTIQUES MAGNETICS				
Concentré I Concentrate I	0.2027	6.17	il 94	MI
Concentré II Concentrate II	0.2671	7.97	il 94	MI
total magnétiques total magnetics	0.4698	14.14		
PARAMAGNÉTIQUES PARAMAGNETICS				
Concentré III Concentrate III	0.6588	20.06		
Produit intermédiaire IIIa Middling product IIIa	0.1778	5.41		
Concentré IV Concentrate IV	1.0490	31.94	ga 60	MI
Produit intermédiaire IVa Middling product IVa	0.3140	9.56		
Produit inermédiaire IVb Middling product IVb	0.1110	3.38		
total paramagnétiques total paramagnetics	2.3106	70.35		
NON-MAGNÉTIQUES NONMAGNETICS				
Concentré V Concentrate V	0.4133	12.58		
Rendement total Total yield	3.1937	97.24		

Tableau 6/8
Table 6/8

MS[8] - Séparation de l'échantillon B 9/1-2
Separation of the sample B 9/1-2

Echantillon Sample	Poids Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate				
B 9/1 +0.20	0.8688			
B 9/1 +0.063	2.6422			
B 9/2 +0.20	0.1187			
B 9/2 +0.063	0.5174			
Admission total B 9/1-2 Total feed	4.1471	100.00		
MAGNÉTIQUES MAGNETICS				
Concentré I Concentrate I	0.4528	10.92		
Concentré II Concentrate II	0.3410	8.22		
total magnétiques total magnetics	0.7938	19.14		
PARAMAGNÉTIQUES PARAMAGNETICS				
Concentré III Concentrate III	0.2583	6.23		
Produit intermédiaire IIIa Middling product IIIa	0.2238	5.40	ru+il 60,ep15,st5,di,tu,mo, ga	MIQ
Concentré IV Concentrate IV	1.4470	34.89	ga50,il17,ru28,he2,sph2,an2	MIQ
Produit intermédiaire IVa Middling product IVa	0.3585	8.64	ru30,il20,he5,an2,sph2, ga10,py,amf,st	MIQ
total paramagnétiques total paramagnetics	2.2876	55.16		
NON-MAGNÉTIQUES NONMAGNETICS				
Concentré V Concentrate V	0.8140	19.63	zi50,qu30,ru,di,st	MI
Rendement total Total yield	3.8954	93.93		

Tableau 6/9
Table 6/9

MS 9 - Séparation de l'échantillt B 10/1-2
Separation of the sample B 10/1-2

Échantillon Sample	Poids Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate				
B 10/1 +0.20	1.2193			
B 10/1 +0.063	0.6026			
B 10/2 +0.20	0.8244			
B 10/2 +0.063	1.1147			
Admission total Total feed B 10/1-2	3.7610	100.00		
MAGNÉTIQUES MAGNETICS				
Concentré I Concentrate I	0.2228	5.92		
Concentré II Concentrate II	0.3642	9.68		
total magnétiques total magnetics	0.5870	15.60		
PARAMAGNÉTIQUES PARAMAGNETICS				
Concentré III Concentrate III	0.4283	11.39		
Produit intermédiaire IIIa Middling product IIIa	0.1870	4.97	ru40,ep20,st,ga,sil,mo	MI
Concentré IV Concentrate IV	1.4650	38.95		
Produit intermédiaire IVa Middling product IVa	0.5015	13.33	ru50,ep30,ga,letu,py	MI
total paramagnétiques total paramagnetics	2.5818	68.64		
NON-MAGNÉTIQUES NONMAGNETICS				
Concentré V Concentrate V	0.5115	13.60	zi60,m,di,qu20	MI
Rendement total Total yield	3.6803	97.84		

Tableau 6/10
Table 6/10

MS[10] - Séparation de l'échantillon B 11/1-2
Separation of the sample B 11/1-4

Échantillon Sample		Poids Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate					
B 11/1	+0.20	1.6764			
	+0.063	1.0053			
B 11/2	+0.20	1.0116			
	+0.063	1.2658			
Admission total B 11/1-2 Total feed		4.9591	100.00		
MAGNETICS MAGNÉTIQUES					
Concentré I Concentrate I		0.7430	14.98	il	an.chem. ch.a.
Concentré II Concentrate II		0.4215	8.50		
total magnétiques total magnetics		1.1645	23.48		
PARAMAGNÉTIQUES PARAMAGNETICS					
Concentré III Concentrate III		0.5678	11.45		
Produit intermédiaire IIIa Middling product IIIa		0.1890	3.81		
Concentré IV Concentrate IV		1.3159	26.54		
Produit intermédiaire IVa Middling product IVa		0.8100	16.33		
total paramagnétiques total paramagnetics		2.8827	58.13		
NON-MAGNÉTIQUES NONMAGNETICS					
Concentré V Concentration V		0.7315	14.75		
Rendement total Total yield		4.7787	96.36		

MS[11] - Séparation de l'échantillon B 11/3-4

Separation of the sample B 11/3-4

Échantillon Sample		Poids Weight g	%	Minéraux Minerals	Remarques Remarks	
Concentré Concentrate						
B 11/3	+0.20	0.8174				
	+0.063	1.0585				
B 11/4	+0.20	0.7235				
	+0.063	1.3597				
Admission total Total feed B 11/3-4		3.9591	100.00			
MAGNÉTIQUES MAGNETICS						
Concentré I Concentrate I		0.4256	10.75	il 98	an. r-X X-ray	MI
Concentré II Concentrate II		0.7233	18.27	il 97	an. r-X X-ray	MI
total magnétiques total magnetics		1.1489	29.02			
PARAMAGNETICS PARAMAGNÉTIQUES						
Concentré III Concentrate III		0.1317	3.33		an. r-X X-ray	
Produit intermédiaire IIIa Middling product IIIa		0.3190	8.06		an. r-X X-ray	
Produit intermédiaire IIIb Middling product IIIb		0.3214	8.12		an. r-X X-ray	
Concentré IV Concentrate IV		1.1970	30.23		an. r-X X-ray	
Produit intermédiaire IVa Middling product IVa		0.0334	0.84			
total paramagnétiques total paramagnetics		2.0025	50.58			
NON-MAGNÉTIQUES NONMAGNETICS						
Concentré V Concentrate V		0.5963	15.06	zi	an. r-X X-ray	
Rendement total Total yield		3.7477	94.66			

Tableau 6/12
Table 6/12

MS[12] - Séparation de l'échàntillon B 11/5-8

Separation of the sample B 11/5-8

Échantillon Sample		Poids Weight g	%	Minéraux Minerals	Remarques Remarks	
Concentré Concentrate						
B 11/5	+0.20	0.4430				
	+0.063	0.7840				
B 11/6	+0.20	0.3895				
	+0.063	0.6626				
B 11/7	+0.20	0.0624				
	+0.063	0.0587				
B 11/8	+0.20	0.1496				
	+0.063	0.3717				
Admission total Total feed B 11/5-8		2.9215	100.00			
MAGNETIQUES MAGNETICS						
Concentré I Concentrate I		0.4249	14.54	il 90	MI	
Concentré II Concentrate II		0.5184	17.74	il 90	MI	
total magnétiques total magnetics		0.9433	32.28			
PARAMAGNETIQUES PARAMAGNETICS						
Concentré III Concentrate III		0.3581	12.26	ep	an.chem. ch.a.	MI
Concentré IV Concentrate IV		0.9266	31.72			
total paramagnétiques total paramagnetics		1.2847	43.98			
NON-MAGNETIQUES NONMAGNETICS						
Concentré V Concentrate V		0.4327	14.81	zi	an.chem. ch.a.	
Rendement total Total yield		2.7120	91.07			

Tableau 6/13
Table 6/13

MS 13 – Séparation de l'échantillon B 12/1-4
Separation of the sample B 12/1-4

Échantillon Sample Concentré Concentrate	Poids Weight g	%	Minéraux Minerals	Remarques Remarks
B 12/1 +0.20	1.3642			
B 12/2 +0.20	1.0163			
B 12/3 +0.20	0.9405			
B 12/4 +0.20	0.8404			
Admission total Total feed	4.1614	100.00		
MAGNETIQUES MAGNETICS				
Concentré I Concentrate I	0.2806	6.74		
Concentré II Concentrate II	0.0287	0.69		
total magnétiques total magnetics	0.3093	7.43		
PARAMAGNÉTIQUES PARAMAGNETICS				
Concentré III Concentrate III	1.1195	26.90		
Produit intermédiaire IIIa Middling product III a	0.0788	1.89		
Concentré IV Concentrate IV	0.6644	15.96		
Produit intermédiaire IVa Middling product IVa	0.1373	3.30		
total paramagnétiques total paramagnetics	2.0000	48.05		
NON-MAGNÉTIQUES NONMAGNETICS				
Concentré V Concentrate V	0.3568	8.57	zi	an.chem. ch.a.
Rendement total Total yield	2.6661	64.07		

Tableau 7/1
Table

RÉSULTATES D'ANALYSE GRANULOMÉTRIQUE ET DE SÉPARATION DANS LES LIQUIDES LOURDS DES SABLES PRELEVES DES SONDAGES DE LA RÉGION DE J R E I D A

RESULTS OF GRAIN SIZE ANALYSIS AND HEAVY LIQUID SEPARATION OF SANDS FROM BOREHOLES IN THE REGION OF J R E I D A

Borehole / Sondage J 1

Echantillon No / Sample No		Analyse granulométrique / Grain size analysis: a/ admission / feed; b/ fraction + 0.8mm; c/ fraction + 0.4mm; d/ fraction + 0.2mm; e/ fraction + 0.06mm; f/ total fraction de sable / total sand fraction; g/ fraction de vase et d'argile / silt and clay fraction		Séparation dans les liquides denses / Heavy liquid separation: Fraction lourde / Heavy fraction		Fraction légère / Light fraction		Rendement total / Total yield		Récupération / Recovery	Remarks / Remarques
		rendement / yield		rendement / yield		rendement / yield		rendement / yield			
		g	%	g	%	g	%	g	%	%	
1	2	3	4	5	6	7	8	9	10	11	12
J 1/1	a/	50.23	100.00								
	b/	0.22	0.44	ns		0.22	0.44	0.22	0.44		
	c/	5.64	11.23	0.02	0.04	5.55	11.05	5.57	11.09	98.7[illegible]	MI1/ga 70,il,le,mo,zi
	d/	33.85	67.39	0.75	1.49	32.92	65.54	33.67	67.03	99.47	MS1/see tab...?./
	e/	4.04	8.04	1.01	2.01	3.00	5.97	4.01	7.98	99.26	MS1/voir tab.?../
	f/	43.75	87.10	1.78	3.54	41.69	83.00	43.47	86.54		
	g/	6.48	2.90	ns	-	-	-	-	-		
J 1/2	a/	48.83	100.00								
	b/	0.91	1.86	ns		0.91	1.86	0.91	1.86		
	c/	6.52	13.35	0.02	0.04	6.45	13.21	6.47	13.25	99.23	
	d/	35.52	72.74	0.93	1.90	34.55	70.76	35.48	72.66	99.89	MS1
	e/	4.12	8.44	0.72	1.47	3.33	6.82	4.05	8.29	98.30	MS1
	f/	47.07	96.39	1.67	3.41	45.24	92.65	46.91	96.06		
	g/	1.06	3.61	ns	-	-	-	-	-		
J 1/3	a/	49.02	100.00								
	b/	0.92	1.88	ns		0.92	1.88	0.92	1.88		
	c/	5.17	10.55	0.00	0.00	5.17	10.55	5.17	10.55	100.00	
	d/	27.24	55.57	0.18	0.37	27.00	55.08	27.18	55.45	98.78	MI/ op.m,ga,op,zi,py,[illegible]
	e/	10.44	21.30	0.27	0.55	10.15	20.71	10.42	21.26	99.81	MI/op.m. 50,op,zi,ga,[illegible] di,tu,co,sil,py,bi/
	f/	34.77	89.30	0.45	0.92	43.24	88.22	43.69	89.14		
	g/	5.25	10.70	ns	-	-	-	-	-		
J 1/4	a/	50.34	100.00								
	b/	1.32	2.62	ns		1.32	2.62	1.32	2.62		
	c/	5.27	10.47	0.00	0.00	5.24	10.41	5.24	10.41	99.43	
	d/	28.71	57.03	0.12	0.24	28.54	56.69	28.66	56.93	99.82	MI/ op.m,ga,op,zi,le,[illegible]
	e/	10.14	20.14	0.12	[illegible]	9.02	[illegible]	[illegible]	[illegible]	[illegible]	MI/ op.m.50,ga,op,zi,[illegible] di,sp,tu/
	f/	45.44	90.26	0.29	0.58	45.02	89.43	45.31	90.01		
	g/	4.90	9.74	ns	-	-	-	-	-		

1	2	3	4	5	6	7	8	9	10	11	12
J 1/5	a/	49.95	100.00								
	b/	1.13	2.28	ns		1.13	2.28	1.13	2.28		
	c/	3.24	6.55	0.00	0.00	3.23	6.55	3.23	6.55	99.69	
	d/	29.18	59.01	0.13	0.26	29.01	58.66	29.14	58.92	99.86	
	e/	11.95	24.17	0.00	0.00	11.83	23.92	11.83	23.92	98.99	
	f/	45.50	92.01	0.13	0.26	45.20	91.39	45.33	91.65		
	g/	3.95	7.99	ns	-	-	-	-	-		
J 1/6	a/	49.97	100.00								
	b/	1.32	2.64	ns		1.32	2.64	1.32	2.64		
	c/	4.40	8.81	0.00	0.00	4.40	8.81	4.40	8.81	100.00	
	d/	31.66	63.36	0.08	0.16	31.50	63.04	31.58	63.20	99.75	
	e/	10.36	20.73	0.06	0.12	10.17	20.35	10.23	20.47	98.75	
	f/	47.74	95.54	0.14	0.28	47.39	94.84	47.53	95.12		
	g/	2.23	4.46	ns	-	-	-	-	-		
J 1/7	a/	50.27	100.00								
	b/	3.24	6.44	ns		3.24	6.44	3.24	6.44		
	c/	6.71	13.35	0.00	0.00	6.67	13.27	6.67	13.27	99.40	
	d/	27.15	54.01	0.06	0.12	27.02	53.75	27.08	53.87	99.74	
	e/	11.75	23.37	0.002	0.00	11.65	23.17	11.65	23.17	99.15	
	f/	48.85	97.17	0.06	0.12	48.58	96.63	48.64	96.75		
	g/	1.42	2.83	ns	-	-	-	-	-		
J 1/8	a/	50.23	100.00								
	b/	4.34	8.64	ns		4.34	8.64	4.34	8.64		
	c/	7.75	15.43	0.00	0.00	7.72	15.37	7.72	15.37	99.61	MI/op.m. 50,op,ga,tu,
	d/	25.30	50.37	0.07	0.14	25.02	49.81	25.09	49.95	99.17	MI/op.m.,zi,tupil,py,
	e/	10.54	20.98	0.16	0.32	10.31	20.52	10.47	20.84	99.33	ep,bi/
	f/	47.93	95.42	0.23	0.46	47.39	94.34	47.62	94.80		
	g/	2.30	4.58	ns	-	-	-	-	-		
J 1/9	a/	197.40	100.00								
	b/	2.54	1.29	ns		2.54	1.29	2.54	1.29		
	c/	6.57	3.33	0.00	0.00	6.53	3.31	6.53	3.31	99.39	
	d/	69.30	35.11	0.22	0.11	68.94	34.92	69.16	35.03	99.80	MI/op.m.45,ga,op,di,.
	e/	105.70	53.55	0.16	0.08	105.37	53.38	105.53	53.46	99.84	MI/op.m.70,zi,py,le,. ep,di,am ,mo,sp/
	f/	184.11	93.28	0.38	0.19	183.38	92.90	183.76	93.09		
	g/	13.29	6.72	ns	-	-	-	-	-		
J 1/10	a/	199.80	100.00								
	b/	5.70	2.85	ns		5.70	2.85	5.70	2.85		
	c/	10.77	5.39	0.00	0.00	10.70	5.35	10.70	5.35	99.35	
	d/	71.92	36.00	0.36	0.18	71.51	35.79	71.87	35.97	99.93	MI/op.m.50,ga,op,di,.
	e/	90.07	45.08	0.36	0.18	89.58	44.83	89.94	45.01	99.86	MI/op.m.60,ga,ep,tu, py,di,zi,am /
	f/	178.46	89.32	0.72	0.36	177.49	88.82	178.21	89.18		
	g/	21.34	10.68	ns	-	-	-	-	-		
J 1/11	a/	193.13	100.00								
	b/	10.22	5.29	ns		10.22	5.29	10.22	5.29		
	c/	14.92	7.72	0.01	0.01	14.86	7.68	14.87	7.69	99.66	
	d/	119.56	61.91	0.04	0.02	119.30	61.77	119.34	61.80	99.82	
	e/	28.63	14.82	0.08	0.04	28.47	14.74	28.55	14.78	99.72	MI/op.m.,ep,py,tu,zi, amf,st,bi/
	f/	173.33	89.74	0.13	0.07	172.85	89.49	172.98	89.56		
	g/	19.80	10.26	ns	-	-	-	-	-		

1	2	3	4	5	6	7	8	9	10	11	12
J 1/12	a/	200.32	100.00								
	b/ c/ d/ e/	19.13 19.13 105.35 42.94	7.55 9.55 52.59 21.44	ns 0.00 0.02 0.05	0.00 0.01 0.02	19.13 19.10 105.06 42.85	7.55 9.53 52.45 21.39	19.13 19.10 105.08 42.90	7.55 9.53 52.46 21.41	99.84 99.74 99.91	
	f/	182.55	91,13	0.07	0.03	182.14	90.92	182.21	90.95		
	g/	17.77	8.87	ns	–	–	–	–	–		
J 1/13	a/	100.26	100.00								
	b/ c/ d/ e/	5.73 8.39 51.34 28.99	5.71 8.37 51.21 28.91	ns 0.01 0.01 0.17	0.01 0.01 0.17	5.73 8.29 51.25 28.62	5.71 8.27 51.12 28.55	5.73 8.30 51.26 28.79	5.71 8.28 51.13 28.72	98.93 99.84 99.31	
	f/	94.45	94.20	0.19	0.19	93.89	93.65	94.08	93.84		
	g/	5.81	5.80	ns	–	–	–	–	–		

Tableau 7/4
Table

RÉSULTATS D'ANALYSE GRANULOMÉTRIQUE ET DE SÉPARATION DANS LES LIQUIDES LOURDS DES SABLES PRÉLEVÉS DES SONDAGES DE LA RÉGION DE J R E I D A

RESULTS OF GRAIN SIZE ANALYSIS AND HEAVY LIQUID SEPARATION OF SANDS FROM BOREHOLES IN THE REGION OF J R E I D A

Borehole / Sondage J 2

Key to column 2: a/ admission / feed; b/ fraction + 0.8mm; c/ fraction + 0.4mm; d/ fraction + 0.2mm; e/ fraction + 0.06mm; f/ total fraction de sable / total sand fraction; g/ fraction de vase et d'argile / silt and clay fraction

Échantillon No / Sample No		Analyse granulométrique / Grain size analysis – rendement / yield K	rendement / yield %	Fraction lourde / Heavy fraction – rendement / yield K	%	Fraction légère / Light fraction – rendement / yield K	%	Rendement total / Total yield – K	%	Récupération / Recovery %	Remarks / Remarques
1	2	3	4	5	6	7	8	9	10	11	12
	a/	50.48	100.00								
J 2/1	b/	0.05	0.10	ns		0.05	0.10	0.05	0.10		
	c/	2.43	4.81	0.00	0.00	2.43	4.81	2.43	4.81	100.00	
	d/	44.33	87.82	0.70	1.39	43.56	86.29	44.26	87.68	99.8[illegible]	MS_2^2/see tab.9/ /
	e/	2.52	4.99	0.21	0.42	2.25	4.46	2.46	4.88	97.62	MS^2/voir tab.9/
	f/	49.33	97.72	0.91	1.81	48.29	95.66	49.20	97.47		
	g/	1.15	2.28	ns	-	-	-	-	-		
	a/	50.29	100.00								
J 2/2	b/	0.09	0.18	ns		0.09	0.18	0.09	0.18		
	c/	2.38	4.73	0.00	0.00	2.32	4.61	2.32	4.61	97.48	
	d/	40.62	80.77	0.83	1.65	39.72	78.98	40.55	80.63	99.83	MS^2
	e/	3.55	7.06	0.66	1.31	2.86	5.69	3.52	7.00	99.15	MS^2
	f/	46.64	92.71	1.49	2.96	44.99	89.46	46.48	92.42		
	g/	3.65	7.26	ns	-	-	-	-	-		
	a/	49.03	100.00								
J 2/3	b/	0.12	0.24	ns		0.12	0.24	0.12	0.24		
	c/	5.07	10.34	0.00	0.00	5.05	10.30	5.05	10.30	99.60	
	d/	39.44	80.44	0.50	1.02	38.82	79.18	39.32	80.20	99.70	MS^2
	e/	1.74	3.55	0.04	0.08	1.59	3.24	1.63	3.32	93.68	MS^2
	f/	46.37	94.57	0.54	1.10	45.58	92.96	46.12	94.06		
	g/	2.66	5.43	ns	-	-	-	-	-		
	a/	50.26	100.00								
J 2/4	b/	0.27	0.54	ns		0.27	0.54	0.27	0.54		
	c/	7.50	14.92	0.03	0.06	7.45	14.82	7.48	14.88	99.73	MI_2/il,ga,ep,zi,di,mo
	d/	38.61	76.82	0.51	1.01	37.97	75.55	38.48	76.56	99.66	MS^2
	e/	2.48	4.93	0.34	0.68	2.07	4.12	2.41	4.80	97.18	MS^2
	f/	48.86	97.21	0.88	1.75	47.76	95.03	48.64	96.78		
	g/	1.40	2.79	ns	-	-	-	-	-		

1	2	3	4	5	6	7	8	9	10	11	12
J 2/5	a/	50.64	100.00								
	b/	0.66	1.28	ns		0.66	1.28	0.66	1.28		
	c/	6.32	12.24	0.01	0.02	6.30	12.20	6.31	12.22	99.84	MI /op.m.40,op,ga,st, sp,di,zi,mo/.
	d/	40.08	77.61	0.18	0.35	39.80	77.07	39.98	77.42	99.75	
	e/	2.27	4.40	0.03	0.06	2.13	4.12	2.16	4.18	95.15	
	f/	49.33	95.53	0.22	0.43	48.89	94.67	49.11	95.10		
	g/	1.31	4.47	ns	-	-	-	-	-		
J 2/6	a/	50.22	100.00								
	b/	1.65	3.28	ns		1.65	3.28	1.65	3.28		
	c/	4.75	9.46	0.00	0.00	4.72	9.40	4.72	9.40	99.37	MI /op.m.30,op,ga,st, le,zi/
	d/	37.82	75.31	0.18	0.36	37.57	74.81	37.75	75.17	99.81	
	e/	2.40	4.78	0.02	0.04	2.32	4.62	2.34	4.66	97.50	
	f/	46.62	92.83	0.20	0.40	46.26	92.11	46.46	92.51		
	g/	3.60	7.17	ns	-	-	-	-	-		
J 2/7	a/	50.62	100.00								
	b/	1.27	2.51	ns		1.27	2.51	1.27	2.51		
	c/	5.96	11.78	-0.00	0.00	5.91	11.67	5.91	11.67	99.16	
	d/	37.06	73.21	0.07	0.14	36.88	72.86	36.95	73.00	99.70	
	e/	3.94	7.78	0.00	0.00	3.90	7.70	3.90	7.70	98.98	
	f/	48.23	95.28	0.07	0.14	47.96	94.74	48.03	94.88		
	g/	2.39	4.72	ns	-	-	-	-	-		
J 2/8	a/	48.98	100.00								
	b/	0.87	1.78	ns		0.87	1.78	0.87	1.78		
	c/	4.32	8.82	0.00	0.00	4.26	8.70	4.26	8.70	98.61	
	d/	39.01	79.64	0.07	0.14	38.84	79.30	38.91	79.44	99.74	
	e/	3.42	6.98	0.02	0.04	3.39	6.92	3.41	6.96	99.71	
	f/	47.62	97.22	0.09	0.18	47.36	96.70	47.45	96.88		
	g/	1.36	2.78	ns	-	-	-	-	-		
J 2/9	a/	198.97	100.00								
	b/	4.52	2.27	ns		4.52	2.27	4.52	2.27		
	c/	25.12	12.63	0.00	0.00	25.03	12.58	25.03	12.58	99.64	MI /op.m. ,ga,op,tu,ie, zi,st,sil,sp/
	d/	155.20	78.00	0.08	0.04	154.69	77.74	154.77	77.78	99.72	
	e/	9.07	4.56	0.02	0.01	8.88	4.46	8.90	4.47	98.13	
	f/	193.91	94.46	0.10	0.05	193.12	97.05	193.22	97.10		
	g/	5.06	2.54	ns	-	-	-	-	-		
J 2/10	a/	200.61	100.00								
	b/	8.00	3.99	ns		8.00	3.99	8.00	3.99		
	c/	22.04	10.99	0.01	0.01	21.64	10.78	21.65	10.79	98.23	MI /op.m.,op,zi,ga,py, di/
	d/	139.48	60.53	0.14	0.07	138.80	69.19	138.94	69.26	99.61	
	e/	21.44	10.69	0.02	0.01	21.29	10.61	21.31	10.62	99.39	
	f/	190.96	95.20	0.17	0.09	189.73	94.57	189.90	94.66		
	g/	9.65	4.80	ns	-	-	-	-	-		
J 2/11	a/	200.38	100.00								
	b/	14.01	6.99	ns		14.01	6.99	14.01	6.99		
	c/	17.91	8.94	0.01	0.01	17.90	8.93	17.91	8.94	100.00	MI /op.m50,py,op,tu, st,zi,ga/
	d/	77.26	38.56	0.05	0.02	77.07	38.46	77.12	38.48	99.82	
	e/	75.66	37.76	0.12	0.06	75.26	37.55	75.38	37.61	97.06	
	f/	184.84	92.25	0.16	0.09	184.24	91.93	184.42	92.02		
	g/	15.54	7.75	ns	-	-	-	-	-		

1	2	3	4	5	6	7	8	9	10	11	12
J 2/12	a/	200.38	100.00								
	b/	24.19	13.07	ns		24.19	13.07	24.19	13.07		
	c/	22.77	11.36	0.00	0.00	22.64	11.30	22.64	11.30	99.43	
	d/	80.40	40.12	0.06	0.03	80.02	39.95	80.08	39.98	99.60	
	e/	55.62	27.76	0.08	0.04	55.31	27.60	55.39	27.64	99.59	
	f/	182.98	92.31	0.14	0.07	182.16	91.90	182.30	91.97		
	g/	17.40	8.69	ns	-	-	-	-	-		
J 2/13	a/	200.44	100.00								
	b/	31.11	15.52	ns		31.11	15.52	31.11	15.52		
	c/	24.60	12.27	0.00	0.00	24.51	12.22	24.51	12.22	99.63	
	d/	67.07	33.46	0.02	0.01	65.87	33.36	66.69	33.37	99.73	
	e/	63.05	31.46	0.00	0.00	62.87	31.37	62.87	31.37	99.71	
	f/	185.83	92.71	0.02	0.01	185.36	92.47	185.38	92.48		
	g/	14.61	7.29	ns	-	-	-	-	-		
J 2/14	a'	101.47	100.00								
	b/	11.74	11.57	ns		11.74	11.57	11.74	11.57		
	c/	10.43	10.28	0.00	0.00	10.39	10.24	10.39	10.24	99.62	
	d/	38.24	37.69	0.03	0.03	38.11	37.56	38.14	37.59	99.74	
	e/	33.86	33.37	0.00	0.00	33.72	33.23	33.72	33.23	99.59	
	f/	94.27	92.90	0.03	0.03	93.96	92.60	93.99	92.63		
	g/	7.20	7.10	ns	-	-	-	-	-		

RÉSULTATES D'ANALYSE GRANULOMÉTRIQUE ET DE SÉPARATION DANS LES LIQUIDES LOURDS DES SABLES PRÉLEVÉS DES SONDAGES DE LA RÉGION DE J R E I D A

RESULTS OF GRAIN SIZE ANALYSIS AND HEAVY LIQUID SEPARATION OF SANDS FROM BOREHOLES IN THE REGION OF J R E I D A

Borehole / Sondage J 3

Legend (Analyse granulométrique / Grain size analysis):
- a/ admission / feed
- b/ fraction + 0.8mm
- c/ fraction + 0.4mm
- d/ fraction + 0.2mm
- e/ fraction + 0.06mm
- f/ total fraction de sable / total sand fraction
- g/ fraction de vase et d'argile / silt and clay fraction

Echantillon No / Sample No		Analyse granulométrique / Grain size analysis: rendement / yield g	%	Séparation dans les liquides denses / Heavy liquid separation — Fraction lourde / Heavy fraction: rendement / yield g	%	Fraction légère / Light fraction: rendement / yield g	%	Rendement total / Total yield: rendement / yield g	%	Récupération / Recovery %	Remarks / Remarques
1	2	3	4	5	6	7	8	9	10	11	12
J 3/1	a/	49.48	100.00								
	b/	1.27	2.57	ns		1.27	2.57	1.27	2.57		
	c/	10.12	20.45	0.05	0.10	9.88	19.97	9.93	10.07	98.12	MI/ga 70, op.m., zi, mo,
	d/	33.45	67.61	2.82	5.69	30.53	61.70	33.35	67.39	99.70	MS³ /see tab. 9./ an
	e/	4.46	9.01	2.02	4.08	2.44	4.93	4.46	9.01	100.00	MS³ /voir tab. 9../
	f/	49.30	99.64	4.89	9.87	44.12	89.17	49.01	99.04		
	g/	0.18	0.36	ns	-	-	-	-	-		
J 3/2	a/	50.43	100.00								
	b/	1.79	3.55	ns		1.79	3.55	1.79	3.55		
	c/	8.31	16.47	0.01	0.02	8.29	16.45	8.30	16.47	99.88	
	d/	33.82	67.06	1.11	2.22	32.70	64.84	33.81	67.06	99.97	MS³
	e/	5.61	11.13	1.52	3.02	4.08	8.10	5.60	11.12	99.82	MS³
	f/	49.53	98.21	2.64	5.26	46.86	92.94	49.50	98.20		
	g/	0.90	1.79	ns	-	-	-	-	-		
J 3/3	a/	50.17	100.00								
	b/	0.70	1.40	ns		0.70	1.40	0.70	1.40		
	c/	4.81	9.59	0.03	0.06	4.77	9.51	4.80	9.57	99.79	
	d/	35.65	71.06	2.82	5.62	32.73	65.24	35.55	70.86	99.72	MS⁴ /see tab. 9./
	e/	8.61	17.16	4.16	8.29	4.35	8.67	8.51	16.96	98.84	MS⁵ /voir tab. 9../
	f/	49.77	99.21	7.01	13.97	42.55	84.82	49.56	98.79		
	g/	0.40	0.79	ns	-	-	-	-	-		
J 3/4	a/	50.32	100.00								
	b/	0.39	0.78	ns		0.39	0.78	0.39	0.78		
	c/	3.91	7.77	0.03	0.06	3.78	7.51	3.81	7.57	97.44	MI/ga 60, zi, op.m., mo,
	d/	35.32	70.19	2.49	4.95	32.62	64.82	35.11	69.77	99.40	MS⁴
	e/	10.21	20.29	5.23	10.39	4.86	9.66	10.09	20.05	98.82	MS⁶ /see tab. ..9./
	f/	49.83	99.03	7.75	15.40	41.65	82.77	49.40	98.17		/voir tab. .9./
	g/	0.49	0.97	ns	-	-	-	-	-		

1	2	3	4	5	6	7	8	9	10	11	12
J 3/5	a/	50.05	100.00								
	b/	0.31	0.62.	ns		0.31	0.62	0.31	0.62		
	c/	2.70	5.39	0.01	0.02	2.67	5.33	2.68	5.35	99.26	
	d/	37.43	74.79	0.32	0.64	37.02	73.97	37.34	74.61	99.76	MI /op.m.. 40,ep,ga,st,
	e/	9.21	18.40	0.53	1.06	8.53	17.04	9.06	18.10	98.37	MIQ /see tab. ..8./
	f/	49.65	99.20	0.86	1.72	48.53	96.96	49.39	98.68		/voir tab. .8../
	g/	0.40	0.80	ns	-	-	-	-	-		
J 3/6	a/	43.92	100.00								
	b/	0.43	0.98	ns		0.43	0.98	0.43	0.98		
	c/	1.59	3.62	0.00	0.00	1.59	3.62	1.59	3.62	100.00	
	d/	31.49	71.70	0.26	0.59	31.07	70.74	31.33	71.33	99.49	MI /op.m. 35,ep,30,ga zi,le/
	e/	9.72	22.13	0.47	1.07	9.20	20.95	9.67	22.02	99.49	MIQ /see tab.8../
	f/	43.23	98.43	0.73	1.66	42.29	96.29	43.02	97.95		/voir tab.8../
	g/	0.69	1.57	ns	-	-	-	-	-		
J 3/7	a/	50.46	100.00								
	b/	16.02	31.75	ns		16.02	31.75	16.02	31.75		
	c/	7.01	13.89	0.00	0.00	6.98	13.83	6.98	13.83	99.57	
	d/	15.02	29.77	0.05	0.10	14.75	29.23	14.80	29.33	98.54	
	e/	10.51	20.83	0.13	0.26	10.30	20.41	10.43	20.67	99.24	MI /op.m. 60,ep,zi,le,
	f/	48.56	96.24	0.18	0.36	48.05	95.22	47.23	95.58		ga,tu,di,py/
	g/	1.90	3.76	ns	-	-	-	-	-		
J 3/8	a/	50.27	100.00								
	b/	20.19	40.16	ns		20.19	40.16	20.19	40.16		
	c/	.49	16.89	0.00	0.00	8.43	16.77	8.43	16.77	99.29	
	d/	4.49	28.82	0.05	0.10	14.40	28.65	14.45	28.75	99.72	
	e/	5.81	11.56	0.13	0.26	5.63	11.20	5.76	11.46	99.14	
	f/	48.98	97.43	0.18	0.36	48.65	96.78	48.83	97.14		
	g/	1.29	2.57	ns	-	-	-	-	-		
J 3/9	a/	199.78	100.00								
	b/	27.35	13.69	ns		27.35	13.69	27.35	13.69		
	c/	29.33	14.68	0.01	0.01	29.28	14.66	29.29	14.67	99.87	MIQ /see tab. .8./
	d/	94.15	47.13	0.69	0.35	93.35	46.73	94.04	47.08	99.88	/voir tab. 8.../
	e/	36.74	18.39	0.59	0.29	36.02	18.03	36.61	18.32	99.65	MI / op.m.60,zi 20,ep,
	f/	187.57	93.89	1.29	0.65	186.00	93.11	187.29	93.76		py,am ,tu/
	g/	12.21	6.11	ns	-	-	-	-	-		
J 3/10	a/	199.55	100.00								
	b/	32.54	16.31	ns		32.54	16.31	32.54	16.31		
	c/	39.17	19.63	0.02	0.01	39.03	19.56	39.05	19.57	99.69	
	d/	86.07	43.13	0.24	0.12	85.63	42.91	85.87	43.03	99.77	MI /op.m. 50,ep,ga,le py,sil,zi,tu/
	e/	32.67	16.37	0.22	0.11	32.35	16.21	32.57	16.32	99.70	MI /op.m. 50,ga,zi,py
	f/	190.45	95.44	0.48	0.24	189.55	94.99	190.03	95.23		tu,st,ru,di/
	g/	9.10	4.56	ns	-	-	-	-	-		
J 3/11	a/	200.15	100.00								
	b/	23.00	11.49	ns		23.00	11.49	23.00	11.49		
	c/	31.94	15.96	0.02	0.01	31.78	15.88	31.80	15.89	99.56	
	d/	89.89	44.91	0.43	0.22	89.17	44.55	89.60	44.77	99.68	MI /op.m. 35,ga,op,as tu,zi,di/
	e/	44.87	22.40	0.80	0.40	43.91	21.94	44.71	22.34	99.73	MIQ /see tab. ..8./
	f/	189.66	94.76	1.25	0.63	187.86	93.86	189.11	94.49		/voir tab. .8../
	g/	10.49	5.24	ns	-	-	-	-	-		

Tableau / Table 7/9 Borehole / Sondage J 3

1	2	3	4	5	6	7	8	9	10	11	12
J 3/12	a/	250.08	100.00								
	b/	14.00	5.60	ns	0.00	14.00	5.60	14.00	5.60		
	c/	22.51	9.00	0.00	0.00	22.42	8.97	22.42	8.97	99.60	
	d/	142.47	56.97	0.05	0.02	142.19	56.85	142.24	56.87	99.84	MI /op.m.,cp,ga,di,mo/
	e/	58.29	23.31	0.11	0.04	58.01	23.20	58.12	23.24	99.71	MI /op.m. 50,cp,ga,lo, am ,tu,op,py/
	f/	237.27	94.88	0.16	0.06	236.62	94.62	236.78	94.68		
	g/	12.81	5.12	ns	–	–	–	–	–		

RÉSULTATES D'ANALYSE GRANULOMÉTRIQUE ET DE SÉPARATION DANS LES LIQUIDES LOURDS DES SABLES PRÉLEVÉS DES SONDAGES DE LA RÉGION DE J R E I D A

RESULTS OF GRAIN SIZE ANALYSIS AND HEAVY LIQUID SEPARATION OF SANDS FROM BOREHOLES IN THE REGION OF J R E I D A

Borehole
Sondage J 4

Échantillon No / Sample No	Analyse granulométrique / Grain size analysis			Séparation dans les liquides denses / Heavy liquid separation							Remarks / Remarques
	a/ admission / feed; b/ fraction +0.8mm; c/ fraction +0.4mm; d/ fraction +0.2mm; e/ fraction +0.06mm; f/ total fraction de sable / total sand fraction; g/ fraction de vase et d'argile / silt and clay fraction	rendement / yield		Fraction lourde / Heavy fraction (rendement / yield)		Fraction legère / Light fraction (rendement / yield)		Rendement total / Total yield (rendement / yield)		Recuperation / Recovery	
		g	%	g	%	g	%	g	%	%	
1	2	3	4	5	6	7	8	9	10	11	12
J 4/1	a/	50.12	100.00								
	b/	0.80	1.60	ns		0.80	1.60	0.80	1.60		
	c/	10.00	19.96	0.04	0.08	9.95	19.85	9.99	19.93	99.90	MI7/ga,mo,il,di,ep/
	d/	35.12	70.06	1.36	2.72	33.64	67.12	35.00	69.84	99.66	MS7 /see tab. 9../
	e/	4.00	7.98	1.22	2.44	2.78	5.54	4.00	7.98	100.00	MS7 /voir tab. 9../
	f/	49.92	99.60	2.62	5.24	47.17	94.11	49.79	99.35		
	g/	0.20	0.40	ns	-	-	-	-	-		
J 4/2	a/	50.26	100.00								
	b/	0.40	0.80	ns		0.40	0.80	0.40	0.80		
	c/	5.91	11.76	0.01	0.02	5.80	11.54	5.81	11.56	98.31	
	d/	39.94	79.47	0.76	1.52	38.97	77.54	39.73	79.06	99.47	MS7
	e/	3.91	7.78	0.75	1.49	3.03	6.03	3.78	7.52	96.68	MS7
	f/	50.16	99.81	1.52	3.03	48.20	95.91	49.72	98.94		
	g/	0.10	0.19	ns	-	-	-	-	-		
J 4/3	a/	50.28	100.00								
	b/	0.10	0.20	ns		0.10	0.20	0.10	0.20		
	c/	3.40	6.76	0.00	0.00	3.38	6.72	3.38	6.72	99.41	
	d/	40.78	81.11	0.78	1.59	39.85	79.26	40.63	80.81	99.63	MS7
	e/	5.70	11.33	1.05	2.09	4.58	9.11	5.63	11.20	98.77	MS7
	f/	49.98	99.40	1.83	3.64	47.91	95.29	49.74	98.93		
	g/	0.30	0.60	ns	-	-	-	-	-		
J 4/4	a/	50.33	100.00								
	b/	0.11	0.22	ns		0.11	0.22	0.11	0.22		
	c/	4.10	8.15	0.01	0.02	3.95	7.85	3.96	7.87	96.59	
	d/	41.31	82.08	0.64	1.27	40.58	80.63	41.12	81.90	99.54	MS7
	e/	4.61	9.16	0.82	1.63	3.69	7.33	4.51	8.96	97.83	MS7
	f/	50.13	99.61	1.47	2.92	48.33	96.03	49.80	98.95		
	g/	0.20	0.39	ns	-	-	-	-	-		

1	2	3	4	5	6	7	8	9	10	11	12
J 4/5	a/	50.18	100.00								
	b/	0.13	0.26	ns		0.13	0.26	0.13	0.26		
	c/	4.07	8.11	0.00	0.00	3.98	7.93	3.98	7.93	97.79	
	d/	41.28	82.26	0.37	0.74	40.76	81.23	41.13	81.96	99.63	MS^8 / see tab. 9/
	e/	4.50	8.97	0.50	0.99	3.85	7.67	4.35	8.66	96.67	MS^8 / voir tab. 9/
	f/	49.98	99.60	0.87	1.73	48.72	97.09	49.59	98.81		
	g/	0.20	0.40	ns	-	-	-	-	-		
J 4/6	a/	50.26	100.00								
	b/	0.21	0.42	ns		0.21	0.42	0.21	0.42		
	c/	3.29	6.55	0.01	0.02	3.28	6.53	3.29	6.55	100.00	
	d/	41.37	82.31	0.39	0.78	40.88	81.34	41.27	82.11	99.76	MS^8
	e/	4.69	9.33	0.55	1.09	4.14	8.24	4.69	9.33	100.00	MS^8
	f/	49.56	98.61	0.95	1.89	48.51	96.53	49.96	98.41		
	g/	0.70	1.39	ns	-	-	-	-	-		
J 4/7	a/	50.13	100.00								
	b/	0.28	0.56	ns		0.28	0.56	0.28	0.56		
	c/	3.91	7.80	-0.00	0.00	3.86	7.70	3.86	7.70	98.72	
	d/	39.72	79.36	0.36	0.71	39.25	78.30	39.61	79.01	99.72	MS^8
	e/	5.31	10.59	0.58	1.15	4.63	9.24	5.21	10.39	98.12	MS^8
	f/	49.22	98.18	0.94	1.86	48.02	95.80	48.96	97.66		
	g/	0.91	1.82	ns	-	-	-	-	-		
J 4/8	a/	50.16	100.00								
	b/	2.03	4.05	ns		2.03	4.05	2.03	4.05		
	c/	5.12	10.21	0.01	0.02	5.09	10.15	5.10	10.17	99.60	
	d/	32.69	65.17	0.26	0.52	32.34	64.47	32.60	64.99	99.72	MS^8 /see tab. .9./
	e/	8.64	17.22	0.52	1.04	8.07	16.09	8.59	17.12	99.42	MS^8 /voir tab. 9../
	f/	48.48	96.65	0.79	1.58	47.53	94.76	48.32	96.33		
	g/	1.68	3.35	ns	-	-	-	-	-		
J 4/9	a/	188.56	100.00								
	b/	27.49	14.58	ns		27.49	14.58	27.49	14.58		
	c/	33.66	17.85	0.01	0.01	33.54	17.79	33.55	17.80	99.67	
	d/	91.62	48.59	0.32	0.17	91.09	48.31	91.41	48.48	99.77	MI/op.m. 50,ga,ep,le/
	e/	23.21	12.31	0.51	0.27	22.63	12.00	23.14	12.27	99.70	MI/op.m. 60,ep,py,ga, zi,ru,mo/
	f/	175.98	93.33	0.84	0.45	174.75	92.68	175.59	93.13		
	g/	12.58	6.67	ns	-	-	-	-	-		
J 4/10	a/	199.63	100.00								
	b/	35.87	17.97	ns		35.87	17.97	35.87	17.97		
	c/	27.40	13.72	0.01	0.01	27.37	13.71	27.38	13.72	99.93	
	d/	83.78	41.97	0.31	0.16	83.26	41.71	83.57	41.87	99.75	
	e/	38.19	19.13	0.35	0.18	37.72	18.89	38.07	19.97	99.69	
	f/	185.24	92.79	0.67	0.35	184.22	92.28	184.89	92.63		
	g/	14.39	7.21	ns	-	-	-	-	-		
J 4/11	a/	200.48	100.00								
	b/	29.11	14.52	ns		29.11	14.52	29.11	14.52		
	c/	23.44	11.69	0.02	0.01	23.26	11.60	23.28	11.61	99.32	
	d/	89.92	44.85	0.41	0.20	89.06	44.42	89.47	44.63	99.50	MI/op.m. 50,ep,ga,ru,
	e/	45.50	22.70	0.32	0.16	44.87	22.38	45.19	22.54	99.32	MI/op.m. 60,ga,ep,zi, di,sil,tu,ot/
	f/	187.97	93.76	0.75	0.37	186.30	92.92	187.05	93.30		
	g/	12.51	6.24	ns	-	-	-	-	-		

1	2	3	4	5	6	7	8	9	10	11	12
J 4/12	a/	200.08	100.00								
	b/	16.32	8.16	ns		16.32	8.16	16.32	8.16		
	c/	23.01	11.50	0.01	0.01	22.81	11.40	22.82	11.41	99.18	
	d/	108.74	54.35	0.19	0.09	108.32	54.14	108.51	54.23	99.79	MI/'op.m,ga,ep,py,di,st zi.ru/
	e/	41.11	20.55	0.32	0.16	40.52	20.25	40.84	20.41	99.34	MI/ ? 60,op,ga,py,di zi,st,sp,sil,mo/
	f/	189.18	94.56	0.52	0.26	187.97	93.95	188.49	94.21		
	g/	10.90	5.44	ns	-	-	-	-	-		
J 4/13	a/	200.18	100.00								
	b/	12.88	6.43	ns		12.88	6.43	12.88	6.43		
	c/	20.99	10.49	0.01	0.01	20.86	10.42	20.87	10.43	99.43	
	d/	87.19	43.56	0.04	0.02	86.91	43.42	86.95	43.44	99.72	
	e/	69.18	34.56	0.19	0.09	68.28	34.11	68.47	34.30	98.97	MI/'op.m,ep,py,ga,di,st zi,ru,mo/
	f/	190.24	95.04	0.24	0.12	188.93	94.38	189.17	94.50		
	g/	9.94	4.96	ns	-	-	-	-	-		
J 4/14	a/	149.89	100.00								
	b/	6.84	4.56	ns		6.84	4.56	6.84	4.56		
	c/	9.27	6.18	0.01	0.01	9.20	6.14	9.21	6.14	99.35	
	d/	55.21	36.83	0.03	0.02	54.95	36.66	54.98	36.68	99.58	
	e/	70.19	46.83	0.14	0.09	69.66	46.47	69.80	46.57	99.30	MI /op.m,ep,di,ga,zi/
	f/	141.51	94.40	0.18	0.12	140.65	93.83	140.83	93.95		
	g/	8.38	5.60	ns	-	-	-	-	-		

RÉSULTATES D'ANALYSE GRANULOMÉTRIQUE ET DE SÉPARATION DANS LES LIQUIDES LOURDS DES SABLES PRÉLEVÉS DES SONDAGES DE LA RÉGION DE J R E I D A

RESULTS OF GRAIN SIZE ANALYSIS AND HEAVY LIQUID SEPARATION OF SANDS FROM BOREHOLES IN THE REGION OF J R E I D A

Borehole / Sondage J 5

Echantillon No / Sample No		Analyse granulométrique / Grain size analysis: a/ admission / feed; b/ fraction +0.8mm; c/ fraction +0.4mm; d/ fraction +0.2mm; e/ fraction +0.06mm; f/ total fraction de sable / total sand fraction; g/ fraction de vase et d'argile / silt and clay fraction — rendement / yield		Séparation dans les liquides denses / Heavy liquid separation — Fraction lourde / Heavy fraction — rendement / yield		Fraction légère / Light fraction — rendement / yield		Rendement total / Total yield — rendement / yield		Récupération / Recovery	Remarks / Remarques
		kg	%	kg	%	kg	%	kg	%	%	
1	2	3	4	5	6	7	8	9	10	11	12
J 5/1	a/	51.23	100.00								
	b/	0.16	0.31	ns		0.16	0.31	0.16	0.31		
	c/	3.94	7.69	0.01	0.02	3.93	7.67	3.94	7.69	100.00	
	d/	35.37	69.04	0.30	0.60	34.92	68.16	35.22	68.76	99.[illegible]	MS^9 /see tab. ..[illegible]../
	e/	7.67	14.97	0.35	0.70	7.30	14.25	7.65	14.95	99.74	MS^9 /voir tab. ..[illegible]../
	f/	47.14	92.01	0.66	1.32	46.31	90.39	46.97	91.71		
	g/	4.09	7.99	ns	-	-	-	-	-		
J 5/2	a/	51.52	10[illegible]								
	b/	0.19	0.37	ns		0.19	0.37	0.19	0.37		
	c/	3.19	6.19	0.13	0.26	3.04	5.90	3.17	6.16	99.37	
	d/	39.07	75.84	0.42	0.84	38.42	74.57	38.84	75.41	99.41	MS^9
	e/	3.68	7.14	0.33	0.66	3.30	6.40	3.63	7.06	98.64	MS^9
	f/	46.13	89.54	0.88	1.76	44.95	87.24	45.83	89.00		
	g/	5.39	10.46	ns	-	-	-	-	-		
J 5/3	a/	51.96	100.00								
	b/	0.17	0.33	ns		0.17	0.33	0.17	0.33		
	c/	4.29	8.26	0.03	0.06	4.26	8.20	4.29	8.26	100.00	
	d/	38.51	74.11	0.43	0.86	38.00	73.13	38.43	73.99	99.79	MS^9
	e/	5.59	10.76	0.38	0.76	5.07	9.76	5.45	10.52	97.50	MS^9
	f/	48.56	93.46	0.84	1.68	47.50	91.42	48.34	93.10		
	g/	3.40	6.54	ns	-	-	-	-	-		
J 5/4	a/	52.33	100.00								
	b/	0.05	0.10	ns		0.05	0.10	0.05	0.10		
	c/	4.24	8.10	0.01	0.02	4.23	8.08	4.24	8.10	100.00	
	d/	39.95	76.34	0.41	0.82	39.40	75.29	39.81	76.11	99.65	MS^9
	e/	4.00	7.64	0.49	0.98	3.27	6.25	3.86	7.23	96.50	MS^9
	f/	48.24	92.18	0.91	1.82	46.95	89.72	47.86	91.54		
	g/	4.09	7.82	ns	-	-	-	-	-		

1	2	3	4	5	6	7	8	9	10	11	12
J 5/5	a/	50.29	100.00								
	b/	0.14	0.28	ns		0.14	0.28	0.14	0.28		
	c/	2.99	5.94	0.01	0.02	2.97	5.90	2.98	5.92	99.66	
	d/	35.29	70.14	0.28	0.56	34.79	69.18	35.07	69.74	99.38	MS[10] /see tab. 9/
	e/	9.71	19.31	0.41	0.82	9.17	18.23	9.58	19.05	98.66	MS[10] /voir tab. 9/
	f/	48.13	95.70	0.70	1.40	47.07	93.59	47.77	94.99		
	g/	2.16	4.30	ns	–	–	–	–	–		
J 5/6	a/	52.05	100.00								
	b/	0.13	0.25	ns		0.13	0.25	0.13	0.25		
	c/	3.07	5.90	0.01	0.02	3.05	5.86	3.06	5.88	99.67	MS[10]
	d/	41.59	79.90	0.46	0.92	40.82	78.42	41.28	79.34	99.25	MS[10]
	e/	3.82	7.34	0.50	1.80	3.15	6.05	3.65	7.05	95.55	
	f/	48.61	93.39	0.91	1.94	47.15	90.58	48.12	92.52		
	g/	3.44	6.61	ns	–	–	–	–	–		
J 5/7	a/	50.01	100.00								
	b/	0.24	0.48	ns		0.24	0.48	0.24	0.48		
	c/	5.12	10.24	0.03	0.06	5.08	10.16	5.11	10.22	99.80	MS[10]
	d/	36.04	72.06	0.25	0.50	35.63	71.25	35.88	71.75	99.56	MS[10]
	e/	5.77	11.54	0.42	0.84	5.28	10.56	5.70	11.40	98.79	
	f/	47.17	94.32	0.70	1.40	46.23	92.45	46.93	93.85		
	g/	2.84	5.68	ns	–	–	–	–	–		
J 5/8	a/	51.91	100.00								
	b/	1.91	3.68	ns		1.91	3.68	1.91	3.68		
	c/	5.42	10.44	0.00	0.00	5.40	10.40	5.40	10.40	99.63	MS[10] /see tab. 9/
	d/	29.42	56.67	0.07	0.14	29.21	56.27	29.28	56.41	99.52	MS[10] /voir tab. 9/
	e/	9.69	18.67	0.21	0.42	9.33	17.97	9.54	18.39	98.45	
	f/	46.44	89.46	0.28	0.56	45.85	88.32	46.13	88.88		
	g/	5.47	10.54	ns	–	–	–	–	–		
J 5/9	a/	200.01	100.00								
	b/	18.07	9.03	ns		18.07	9.03	18.07	9.03		
	c/	26.38	13.19	0.04	0.02	26.07	13.03	16.11	13.05	98.98	
	d/	114.36	57.18	0.32	0.16	113.57	56.78	113.89	56.94	99.59	MI/ op.m. 30,ep,ga,le, sil,st,mo/
	e/	29.17	14.58	0.66	0.33	28.09	14.04	28.75	14.37	98.56	MI/op.m. 65,di,op,ga, tu,st,zi,ru/
	f/	187.98	93.98	1.02	0.51	185.80	92.88	186.82	93.39		
	g/	12.03	6.02	ns	–	–	–	–	–		
J 5/10	a/	199.93	100.00								
	b/	53.18	26.60	ns		53.18	26.60	53.18	26.60		
	c/	40.57	20.29	0.04	0.02	40.06	20.04	40;10	20.06	98;84	
	d/	76.07	38.05	0.03	0.01	74.69	37.36	74;72	37.37	98.22	
	e/	17.22	8.61	0.08	0.04	16.93	8.47	17.01	8.51	98.78	
	f/	187.04	93.55	0.15	0.07	184.86	92.46	185.01	92.53		
	g/	12.89	6.45	ns	–	–	–	–	–		
J 5/11	a/	239.40	100.00								
	b/	39.16	16.36	ns		39.16	16.36	39.16	16.36		
	c/	39.33	16.43	0.07	0.04	39.17	16.35	39.24	16.39	99.77	MI /óp.m./
	d/	74.55	31.14	0.03	0.01	74.10	30.96	74.13	30.97	99.44	
	e/	33.34	13.93	0.25	0.13	32.97	13.75	33.22	13.88	99.64	MI /óp.m. 30,ga,ep,di, am,zi,st,py/
	f/	186.38	77.86	0.35	0.18	185.40	77.42	185.25	77.60		
	g/	53.02	22.14	ns	–	–	–	–	–		

1	2	3	4	5	6	7	8	9	10	11	12
J 5/12	a/	201.20	100.00								
	b/	13.24	6.58	ns		13.24	6.58	13.24	6.58		
	c/	28.71	14.27	0.01	0.01	28.53	14.18	28.54	14.19	99.41	
	d/	77.62	38.58	0.00	0.00	77.17	38.35	77.17	38.35	99.45	
	e/	66.20	32.90	0.17	0.08	65.72	32.71	65.89	32.75	99.53	
	f/	185.77	92.33	0.18	0.09	184.68	91.79	184.86	91.88		
	g/	15.43	7.67	ns	-	-	-	-	-		
J 5/13	a/	200.00	100.00								
	b/	17.32	9.66	ns		17.32	9.66	17.32	9.66		
	c/	24.81	12.41	0.01	0.01	24.70	12.35	24.71	12.36	99.60	
	d/	86.28	43.14	0.04	0.02	85.86	42.93	85.90	42.95	99.56	
	e/	54.21	27.10	0.12	0.06	53.80	26.90	53.92	26.96	99.46	MI /op.m..,am ,py,zi,st di.ep,le,mo/
	f/	182.62	91.31	0.17	0.08	181.68	90.85	181.85	90.93		
	g/	17.38	8.69	ns	-	-	-	-	-		
J 5/14	a/	99.96	100.00								
	b/	5.31	5.31	ns		5.31	5.31	5.31	5.31		
	c/	10.39	10.39	0.03	0.03	10.13	10.13	10.16	10.16	97.78	
	d/	44.60	44.62	0.00	0.00	44.07	44.09	44.07	44.09	98.81	
	e/	31.94	31.95	0.13	0.13	31.22	31.23	31.35	31.36	98.15	
	f/	92.24	92.27	0.16	0.16	90.73	90.76	90.89	90.92		
	g/	7.72	7.73	ns	-	-	-	-	-		

Tablica 7/10
Table

RESULTATES D'ANALYSE GRANULOMETRIQUE ET DE SEPARATION DANS LES LIQUIDES-LOURDS DES SABLES PRELEVES DES SONDAGES DE LA REGION DE J R E I D A

RESULTS OF GRAIN SIZE ANALYSIS AND HEAVY LIQUID SEPARATION OF SANDS FROM BOREHOLES IN THE REGION OF J R E I D A

Borehole
Sondage J 6

Echantillon No / Sample No		Analyse granulometrique / Grain size analysis: a/ admission feed; b/ fraction +0.8mm; c/ fraction +0.4mm; d/ fraction +0.2mm; e/ fraction +0.06mm; f/ total fraction de sable / total sand fraction; g/ fraction de vase et d'argile / silt and clay fraction		Separation dans les liquides denses / Heavy liquid separation: Fraction lourde / Heavy fraction		Fraction legere / Light fraction		Rendement total / Total yield		Recuperation / Recovery	Remarks / Remarques
		rendement yield		rendement yield		rendement yield		rendement yield			
		g	%	g	%	g	%	g	%	%	
1	2	3	4	5	6	7	8	9	10	11	12
J 6/1	a/	50.30	100.00								
	b/	0.11	0.22	ns		0.11	0.22	0.11	0.22		
	c/	3.63	7.22	0.22	0.04	3.61	7.18	3.63	7.22	100.00	MI /ga, op.m./
	d/	41.50	82.50	0.38	0.76	41.01	81.53	41.39	82.29	99.75	MIQ /see tab. 8../ /voir tab. 8.../
	e/	3.62	7.20	0.45	0.90	3.08	6.12	3.53	7.02	97.51	MIQ /see tab. 8../ /voir tab. .8../
	f/	48.86	97.14	0.85	1.70	47.81	95.05	48.66	96.75		
	g/	1.44	2.86	ns	-	-	-	-	-		
J 6/2	a/	50.38	100.00								
	b/	0.32	0.64	ns		0.32	0.64	0.32	0.64		
	c/	2.70	5.36	0.00	0.00	2.69	5.34	2.69	5.34	99.63	
	d/	35.81	71.08	0.18	0.36	35.44	70.35	35.62	70.71	99.47	MI/ga 30, op 30, op.m. 20, di, tu, zi, ru, py, mo, s
	e/	8.55	16,97	0.53	1.06	7.77	15.42	8.30	16.48	97.08	MIQ /see tab. 8../ /voir tab. .8../
	f/	47.38	94.05	0.71	1.42	46.22	91.75	46.93	93.17		
	g/	3.00	5.95	ns	-	-	-	-	-		
J 6/3	a/	50.39	100.00								
	b/	0.63	1.25	ns		0.63	1.25	0.63	1.25		
	c/	3.27	6.50	0.01	0.02	3.22	6.39	3.23	6.41	98.78	
	d/	33.91	67.29	0.04	0.08	33.80	47.08	33.84	67.16	99.79	
	e/	10.16	20.16	0.16	0.32	9.69	19.23	9.85	19.55	96.95	MI/ op.m.60, op, ga, di, tu, zi, sil/
	f/	48.07	95.40	0.21	0.42	47.34	93.95	47.55	94.37		
	g/	2.32	4.60	ns	-	-	-	-	-		
J 6/4	a/	49.84	100.00								
	b/	0.81	1.62	ns		0.81	1.62	0.81	1.62		
	c/	3.68	7.38	0.02	0.04	3.63	7.28	3.65	7.32	99.18	
	d/	32.10	64.31	0.04	0.08	31.86	93.92	31.90	64.00	99.38	
	e/	11.16	22.39	0.15	0.30	10.92	21.91	11.07	22.21	99.19	MI/op.m., zi, op, ga, di tu, py, ru, sp, mo/
	f/	47.75	95.80	0.21	0.42	47.22	94.73	47.43	95.15		
	g/	2.09	4.20	ns	-	-	-	-	-		

1	2	3	4	5	6	7	8	9	10	11	12
J 6/5	a/	50.11	100.00								
	b/	0.72	1.44	ns		0.72	1.44	0.72	1.44		
	c/	3.50	6.98	0.01	0.02	3.44	6.86	3.45	6.88	98.57	
	d/	34.58	69.01	0.02	0.04	34.16	68.17	34.18	68.21	98.84	
	e/	9.47	18.90	0.07	0.14	9.20	18.36	9.27	18.50	97.89	
	f/	48.27	96.33	0.10	0.20	47.52	94.83	47.62	95.03		
	g/	1.84	3.67	ns	–	–	–	–	–		
J 6/6	a/	50.10	100.00								
	b/	1.11	2.21	ns		1.11	2.21	1.11	2.21		
	c/	5.49	10.96	0.02	0.04	5.43	10.84	5.45	10.88	99.27	
	d/	35.57	71.00	0.03	0.06	35.11	70.08	35.14	70.14	98.79	
	e/	7.81	15.59	0.09	0.18	7.56	15.09	7.65	15.27	97.95	
	f/	49.98	99.76	0.14	0.28	49.21	98.23	49.35	98.51		
	g/	0.12	0.24	ns	–	–	–	–	–		
J 6/7	a/	48.85	100.00								
	b/	8.33	17.05	ns		8.33	17.05	8.33	17.05		
	c/	9.84	20.14	0.01	0.02	9.79	20.04	9.80	20.06	99.59	
	d/	20.35	41.66	0.10	0.20	20.05	41.04	20.15	41.24	99.02	
	e/	9.99	20.45	0.03	0.06	9.87	20.20	9.90	20.26	99.10	
	f/	48.15	99.30	0.14	0.28	48.04	98.33	48.18	98.61		
	g/	0.34	0.70	ns	–	–	–	–	–		
J 6/8	a/	50.05	100.00								MI /ga,di,mo,zi/
	b/	10.81	21.60	ns		10.81	21.60	10.81	21.60		MI /op.m. 70,ga,ep,di,tu,sp/
	c/	13.13	26.23	0.03	0.06	13.06	26.09	13.09	26.15	99.69	
	d/	16.69	33.35	0.08	0.16	16.57	33.11	16.65	33.27	99.76	
	e/	8.60	17.18	0.14	0.28	8.32	16.62	8.46	16.90	98.37	
	f/	49.23	98.36	0.25	0.50	48.76	97.42	49.01	97.92		
	g/	0.82	1.64	ns	–	–	–	–	–		
J 6/9	a/	200.00	100.00								MI /op.m.,py,tu,ga,ep,zi,sil/
	b/	11.01	5.50	ns		11.01	5.50	11.01	5.50		
	c/	16.62	8.31	0.00	0.00	16.52	8.26	16.52	8.26	99.40	
	d/	84.36	42.18	0.01	0.01	84.00	42.00	84.01	42.01	99.58	
	e/	78.71	39.36	0.25	0.12	78.35	39.18	78.60	39.30	99.86	
	f/	190.70	95.35	0.26	0.13	189.88	94.94	190.14	95.07		
	g/	9.30	4.65	ns	–	–	–	–	–		
J 6/10	a/	200.08	100.00								MI/ga,di,zi,st/
	b/	8.83	4.41	ns		8.83	4.41	8.83	4.41		MI/op.m.,ep,ga,di,zi,
	c/	15.61	7.80	0.31	0.15	15.11	7.55	15.42	7.70	98.78	MI/op.m.,ep,py,tu,st,
	d/	109.74	54.85	0.24	0.12	109.12	54.54	109.36	54.66	99.65	
	e/	54.42	27.20	0.18	0.09	53.49	26.73	53.67	26.82	98.62	
	f/	188.60	94.26	0.73	0.36	186.55	93.24	187.28	93.60		
	g/	11.48	5.74	ns	–	–	–	–	–		
J 6/11	a/	201.16	100.00								MI/'op.m,ep,ga,au,tu,di,zi,ru/
	b/	15.91	7.91	ns		15.91	7.91	15.91	7.91		
	c/	18.99	9.44	0.01	0.01	18.90	9.39	18.91	9.40	99.58	
	d/	95.50	47.47	0.07	0.03	95.06	47.26	95.13	47.29	99.61	
	e/	56.36	28.02	0.41	0.20	55.55	27.61	55.96	27.81	99.29	
	f/	186.76	92.84	0.49	0.24	185.42	92.17	185.91	92.41		
	g/	14.40	7.16	ns	–	–	–	–	–		

1	2	3	4	5	6	7	8	9	10	11	12
J 6/12	a/	200.84	100.00								MI/ op.m. 50,ep,ga,tu, zi,mo/
	b/	5.31	2.64	ns		5.31	2.64	5.31	2.64		
	c/	12.01	5.98	0.02	0.01	11.92	5.94	11.94	5.95	99.42	
	d/	149.28	74.29	0.24	0.12	148.21	73.80	148.45	73.92	99.50	
	e/	22.79	11.35	0.10	0.05	22.22	11.06	22.32	11.11	97.94	
	f/	189.31	94.26	0.36	0.18	187.66	93.44	188.02	93.62		
	g/	11.53	5.74	ns	–	–	–	–	–		
J 6/13	a/	152.85	100.00								MI/ op.m.,ga,ep,tu,py, tu,di/
	b/	4.83	3.16	ns		4.83	3.16	4.83	3.16		
	c/	3.21	2.10	0.01	0.01	3.15	2.06	3.16	2.07	98.44	
	d/	30.04	19.65	0.04	0.03	29.88	19.55	29.92	19.58	99.60	
	e/	106.38	69.60	0.61	0.40	104.80	68.56	105.41	68.96	99.09	
	f/	144.46	94.51	0.66	0.44	142.66	93.33	143.32	93.77		
	g/	7.39	5.49	ns	–	–	–	–	–		

RÉSULTATS D'ANALYSE GRANULOMÉTRIQUE ET DE SÉPARATION DANS LES LIQUIDES LOURDS DES SABLES PRÉLEVÉS DES SONDAGES DE LA RÉGION DE J R E I D A

RESULTS OF GRAIN SIZE ANALYSIS AND HEAVY LIQUID SEPARATION OF SANDS FROM BOREHOLES IN THE REGION OF J R E I D A

Borehole J 7
Sondage

Echantillon No / Sample No		Analyse granulométrique / Grain size analysis: a/ admission / feed; b/ fraction + 0.8mm; c/ fraction + 0.4mm; d/ fraction + 0.2mm; e/ fraction + 0.06mm; f/ total fraction de sable / total sand fraction; g/ fraction de vase et d'argile / silt and clay fraction		Séparation dans les liquides denses / Heavy liquid separation: Fraction lourde / Heavy fraction		Fraction légère / Light fraction		Rendement total / Total yield		Récupération / Recovery	Remarks / Remarques
		rendement / yield		rendement / yield		rendement / yield		rendement / yield			
		g	%	g	%	g	%	g	%	%	
1	2	3	4	5	6	7	8	9	10	11	12
J 7/1	a/	50.19	100.00								
	b/	0.82	1.63	ns		0.82	1.63	0.82	1.63		
	c/	7.14	14.23	0.05	0.10	7.07	14.09	7.12	14.19	99.72	MI₁₁/ga,op.m.,st/
	d/	38.26	76.23	0.73	1.45	37.26	74.24	37.99	75.69	99.29	MS¹¹ /see tab. .9./
	e/	3.13	6.24	0.74	1.47	2.35	4.68	3.09	6.15	98.72	MS¹¹ /voir tab. .9./
	f/	49.35	98.33	1.52	3.02	47.50	98.64	49.02	97.66		
	g/	0.84	1.67	ns	-	-	-	-	-		
J 7/2	a/	50.71	100.00								
	b/	0.84	1.66	ns		0.84	1.66	0.84	1.66		
	c/	7.72	15.22	0.01	0.02	7.69	15.16	7.70	15.18	99.74	
	d/	39.65	78.19	0.19	0.37	19.30	77.50	39.49	77.87	99.60	MS¹¹
	e/	1.13	2.23	0.17	0.34	0.96	1.89	1.13	2.23	100.00	MS¹¹
	f/	49.34	97.30	0.37	0.73	48.79	96.21	49.16	96.94		
	g/	1.37	2.70	ns	-	-	-	-	-		
J 7/3	a/	50.18	100.00								
	b/	0.88	1.75	ns		0.88	1.75	0.88	1.75		
	c/	9.64	19.21	0.04	0.08	9.56	19.05	9.60	19.13	99.58	MS¹¹
	d/	37.44	74.61	0.83	1.65	36.35	72.44	37.18	74.09	99.31	MS¹¹
	e/	1.62	3.23	0.75	1.49	0.87	1.74	1.62	3.23	100.00	
	f/	49.58	98.80	1.62	3.22	47.67	94.98	49.29	97.20		
	g/	0.60	1.20	ns	-	-	-	-	-		
J 7/4	a/	50.41	100.00								
	b/	0.65	1.29	ns		0.65	1.29	0.65	1.29		
	c/	6.50	12.89	0.04	0.08	6.40	12.70	6.44	12.78	99.08	MI₁₁/ga,op.m.,ep,st/
	d/	38.58	76.53	1.50	2.98	36.82	73.04	38.32	76.02	99.33	MS¹¹
	e/	3.66	7.26	1.83	3.63	1.80	3.57	3.63	7.20	99.18	MS¹¹
	f/	49.39	97.97	3.37	6.69	45.67	90.60	49.04	97.29		
	g/	1.02	2.03	ns	-	-	-	-	-		

1	2	3	4	5	6	7	8	9	10	11	12
J 7/5	a/	50.35	100.00								
	b/	2.77	5.50	ns		2.77	5.50	2.77	5.50		
	c/	14.06	27.92	0.01	0.02	14.01	27.83	14.02	27.85	99.72	
	d/	30.06	59.70	0.08	0.16	29.88	59.34	29.96	59.50	99.67	
	e/	1.62	3.22	0.03	0.06	1.58	3.14	1.61	3.20	99.38	
	f/	48.51	96.34	0.012	0.24	48.24	95.81	48.35	96.05		
	g/	1.84	3.66	ns	-	-	-	-	-		
J 7/6	a/	52.00	100.00								
	b/	2.72	5.23	ns		2.72	5.23	2.72	5.23		
	c/	15.66	30.12	0.01	0.02	15.60	30.00	15.61	30.02	99.68	
	d/	30.47	58.60	0.02	0.04	30.26	58.19	30.28	58.23	99.38	
	e/	1.40	2.69	0.01	0.02	1.38	2.65	1.39	2.67	99.29	
	f/	50.25	96.64	0.04	0.08	49.96	96.07	50.00	96.15		
	g/	1.75	3.36	ns	-	-	-	-	-		
J 7/7	a/	51.46	100.00								
	b/	3.02	5.87	ns		3.02	5.87	3.02	5.87		
	c/	8.80	17.10	0.01	0.02	8.77	17.04	8.78	17.06	99.77	
	d/	32.26	62.69	0.01	0.02	32.04	62.26	32.05	62.28	99.35	
	e/	5.42	10.53	0.01	0.02	5.38	10.45	5.39	10.47	99.45	
	f/	49.50	96.19	0.03	0.06	49.21	95.62	49.24	95.68		
	g/	1.96	5.81	ns	-	-	-	-	-		
J 7/8	a/	49.84	100.00								
	b/	4.56	9.15	ns		4.56	9.15	4.56	9.15		
	c/	7.05	14.15	0.00	0.00	7.03	14.11	7.03	14.11	99.72	
	d/	25.61	51.38	0.03	0.06	25.51	51.18	25.54	51.24	99.72	
	e/	10.53	21.13	0.03	0.06	10.47	21.01	10.50	21.07	99.72	
	f/	47.75	95.81	0.06	0.12	47.57	95.45	47.63	95.57		
	g/	2.09	4.19	ns	-	-	-	-	-		
J 7/9	a/	202.13	100.00								
	b/	13.16	6.51	ns		13.16	6.51	13.16	6.51		
	c/	25.84	12.78	0.00	0.00	25.80	12.76	25.80	12.76	99.85	
	d/	101.73	50.33	0.00	0.00	101.29	50.11	101.29	50.11	99.57	
	e/	48.19	23.84	0.17	0.08	47.86	23.68	48.03	23.76	99.67	MI/op.m. 70,ep 10,ga 10 zi,sil,di,st,tu,mo/
	f/	188.92	93.46	0.17	0.08	188.11	93.06	188.28	93.14		
	g/	13.21	6.54	ns	-	-	-	-	-		
J 7/10	a/	200.95	100.00								
	b/	10.36	5.16	ns		10.36	5.16	10.36	5.16		
	c/	21.87	10.88	0.02	0.01	21.79	10.84	21.81	10.85	99.73	
	d/	90.04	44.81	0.06	0.03	89.88	44.73	89.94	44.76	99.89	
	e/	62.74	31.22	0.02	0.01	62.60	31.15	62.62	31.16	99.81	
	f/	185.01	92.07	0.10	0.05	184.63	91.88	184.73	91.93		
	g/	15.94	7.93	ns	-	-	-	-	-		
J 7/11	a/	200.96	100.00								
	b/	14.52	7.23	ns		14.52	7.23	14.52	7.23		
	c/	18.92	9.41	0.01	0.01	18.88	9.39	18.89	9.40	99.84	
	d/	102.55	51.03	0.00	0.00	102.86	50.79	102.06	50.79	99.52	
	e/	50.47	25.11	0.00	0.00	50.29	25.02	50.29	25.02	99.64	
	f/	186.46	92.78	0.01	0.01	185.75	92.43	185.76	92.44		
	g/	14.50	7.22	ns	-	-	-	-	-		

1	2	3	4	5	6	7	8	9	10	11	12
7/12	a/	149.55	100.00								
	b/	10.80	7.22	ns		10.80	7.22	10.80	7.22		
	c/	18.44	12.33	0.02	0.01	18.19	12.16	18.21	12.17	98.75	
	d/	82.07	54.88	0.04	0.03	81.80	54.70	81.84	54.73	99.72	
	e/	29.89	19.96	0.04	0.03	29.61	19.80	29.65	19.83	99.39	
	f/	141.16	94.39	0.10	0.07	140.40	93.88	140.50	93.95		
	g/	8.39	5.61	ns	–	–	–	–	–		

RÉSULTATS D'ANALYSE GRANULOMÉTRIQUE ET DE SÉPARATION DANS LES LIQUIDES LOURDS DES SABLES PRÉLEVÉS DES SONDAGES DE LA RÉGION DE J R E I D A .

RESULTS OF GRAIN SIZE ANALYSIS AND HEAVY LIQUID SEPARATION OF SANDS FROM BOREHOLES IN THE REGION OF J R E I D A .

Borehole / Sondage J 8

Echantillon No / Sample No		Analyse granulométrique / Grain size analysis: a/ admission / feed; b/ fraction + 0.8mm; c/ fraction + 0.4mm; d/ fraction + 0.2mm; e/ fraction + 0.06mm; f/ total fraction de sable / total sand fraction; g/ fraction de vase et d'argile / silt and clay fraction — rendement / yield g	%	Séparation dans les liquides denses / Heavy liquid separation — Fraction lourde / Heavy fraction — rendement / yield g	%	Fraction légère / Light fraction — rendement / yield g	%	Rendement total / Total yield — rendement / yield g	%	Récupération / Recovery %	Remarks / Remarques
1	2	3	4	5	6	7	8	9	10	11	12
J 8/1	a/	50.89	100.00								
	b/	7.70	15.13	ns		7.70	15.13	7.70	15.13		
	c/	12.04	24.05	0.06	0.12	12.11	23.79	12.17	23.91	99.43	MI/ga 70,op.m.,ep,py,mo
	d/	25.55	50.21	0.36	0.71	25.10	49.32	25.46	50.03	99.65	MS12/see tab. 9./zi/
	e/	2.21	4.34	0.79	1.55	1.40	2.75	2.19	4.30	99.01	MS12 /voir tab. ..9.
	f/	47.70	93.73	1.21	2.37	46.31	91.00	47.52	93.37		
	g/	3.19	6.27	ns	-	-	-	-	-		
J 8/2	a/	52.92	100.00								
	b/	5.67	10.71	ns		5.67	10.71	5.67	10.71		
	c/	12.93	24.43	0.04	0.08	12.81	24.21	12.85	24.28	99.38	MI/ga 60,il,zi,ep,di,p mo,st/
	d/	27.82	52.57	0.58	1.09	27.07	51.15	27.65	52.25	99.39	MS12
	e/	3.62	6.84	1.08	2.04	2.42	4.57	3.50	6.61	96.68	MS12
	f/	50.04	94.55	1.60	3.21	47.97	90.64	49.67	93.85		
	g/	2.88	5.45	ns	-	-	-	-	-		
J 8/3	a/	51.82	100.00								
	b/	2.66	5.13	ns		2.66	5.13	2.66	5.13		
	c/	18.41	35.53	0.02	0.04	18.30	35.31	18.32	35.35	99.52	
	d/	27.13	52.35	0.27	0.52	26.80	51.72	27.07	52.24	99.78	MI/op.m. 60,ga,ep,le, di/
	e/	1.07	2.06	0.20	0.39	0.87	1.68	1.07	2.07	100.00	MI/op.m. 60,ep,ga,zi,d py,and,ru,st/
	f/	49.27	95.07	0.49	0.95	48.63	93.84	49.12	94.79		
	g/	2.55	4.93	ns	-	-	-	-	-		
J 8/4	a/	49.98	100.00								
	b/	1.31	2.62	ns		1.31	2.62	1.31	2.62		
	c/	14.65	29.31	0.00	0.00	14.60	29.21	14.60	29.21	99.66	
	d/	31.22	62.46	0.08	0.16	30.85	61.72	30.93	61.88	99.67	
	e/	1.84	3.64	0.06	0.12	1.76	3.52	1.72	3.44	93.48	
	f/	49.02	98.07	0.14	0.28	48.52	97.07	48.66	97.35		
	g/	0.96	1.93	ns	-	-	-	-	-		

1	2	3	4	5	6	7	8	9	10	11	12
8/5	a/	49.11	100.00								
	b/	0.53	1.08	ns		0.53	1.08	0.53	1.08		
	c/	2.93	5.97	0.00	0.00	2.91	5.92	2.91	5.92	99.31	
	d/	29.50	60.07	0.03	0.06	29.39	59.84	29.42	59.90	99.73	
	e/	15.07	30.68	0.07	0.14	14.96	30.46	15.03	30.60	99.74	
	f/	48.03	97.80	0.10	0.20	47.79	97.30	45.89	97.50		
	g/	1.08	2.20	ns	-	-	-	-	-		
8/6	a/	51.34	100.00								
	b/	0.94	1.83	ns		0.94	1.83	0.94	1.83		
	c/	3.44	6.70	0.01	0.02	3.40	6.62	3.41	6.64	99.12	
	d/	32.30	62.91	0.05	0.10	32.07	62.46	32.12	62.56	99.44	
	e/	13.29	25.88	0.02	0.04	13.19	25.69	13.21	25.75	99.40	
	f/	49.97	97.32	0.08	0.16	49.60	96.60	49.68	97.78		
	g/	1.37	2.68	ns	-	-	-	-	-		
8/7	a/	50.41	100.00								
	b/	3.50	6.94	ns		3.50	6.94	3.50	6.94		
	c/	8.73	17.31	0.01	0.02	8.69	17.23	8.70	17.25	99.67	
	d/	27.41	53.37	0.03	0.05	27.29	54.14	27.32	54.19	99.67	
	e/	7.89	15.65	0.03	0.05	7.80	15.47	7.83	15.53	99.24	
	f/	47.53	94.27	0.07	0.12	47.28	93.78	47.35	93.91		
	g/	2.88	5.73	ns	-	-	-	-	-		
8/8	a/	50.52	100.00								
	b/	2.46	4.87	ns		2.46	4.87	2.46	4.87		
	c/	10.03	19.85	0.01	0.02	10.00	19.79	10.01	19.80	99.80	
	d/	31.67	62.57	0.03	0.06	31.44	62.23	31.47	62.29	99.37	
	e/	4.72	9.34	0.02	0.04	4.67	9.24	4.69	9.28	99.36	
	f/	48.82	96.63	0.06	0.12	48.57	96.13	48.63	96.24		
	g/	1.70	3.37	ns	-	-	-	-	-		
8/9	a/	201.92	100.00								
	b/	12.55	6.21	ns		12.55	6.21	12.55	6.21		
	c/	25.38	12.57	0.02	0.01	25.18	12.47	25.20	12.48	99.30	
	d/	114.40	56.66	0.30	0.15	113.89	56.40	114.19	56.55	99.81	MI/op.m. 60,ep,le,ga,di, sil,st,py,ru/
	e/	38.52	19.08	0.27	0.13	38.17	18.90	38.44	19.04	99.29	MI/op.m. 50,ep,py,um ,zi le,di,st,sil,tu/
	f/	190.85	94.52	0.59	0.29	189.79	93.98	190.38	94.28		
	g/	11.07	5.48	ns	-	-	-	-	-		
8/10	a/	201.66	100.00								
	b/	11.27	5.59	ns		11.27	5.59	11.27	5.59		
	c/	20.33	10.08	0.03	0.01	20.27	10.05	20.30	10.06	99.85	
	d/	86.04	42.68	0.14	0.07	85.71	42.50	85.85	42.57	99.76	MI/op.m. 40,ep,ga,le,sil zi,tu/
	e/	66.75	33.10	0.13	0.06	66.42	32.93	66.55	32.99	99.70	MI/op.m. 30,ep,di,py,le tu,ga,zi/
	f/	184.37	91.45	0.30	0.14	183.67	91.07	183.97	91.21		
	g/	17.29	8.55	ns	-	-	-	-	-		
8/11	a/	201.75	100.00								
	b/	10.92	5.41	ns		10.92	5.41	10.92	5.41		
	c/	23.54	11.67	0.01	0.01	23.43	11.61	23.44	11.62	99.58	
	d/	100.23	49.68	0.05	0.02	100.02	49.68	100.07	49.59	99.58	
	e/	51.70	25.62	0.02	0.01	51.49	25.52	51.51	25.53	99.63	
	f/	186.39	92.38	0.08	0.04	185.86	92.12	185.94	92.15		
	g/	15.37	7.62	ns	-	-	-	-	-		

1	2	3	4	5	6	7	8	9	10	11	12
8/12	a/	201.85	100.00								
	b/	15.53	7.69	ns		15.53	7.69	15.53	7.69		
	c/	22.83	11.31	0.02	0.01	22.71	11.25	22.73	11.26	99.56	
	d/	100.37	49.72	0.06	0.03	100.06	49.57	100.12	49.60	99.75	
	e/	48.91	24.23	0.06	0.03	48.61	24.08	48.67	24.11	99.51	
	f/	187.64	92.95	0.14	0.07	186.91	92.59	187.05	92.66		
	g/	14.21	7.05	ns	-	-	-	-	-		
8/13	a/	151.24	100.00								
	b/	11.92	7.68	ns		11.92	7.68	11.92	7.68		
	c/	23.82	15.75	0.02	0.01	23.72	15.68	23.74	15.69	99.66	
	d/	69.41	45.89	0.02	0.01	69.21	45.76	69.23	45.77	99.74	
	e/	35.40	23.41	0.00	0.00	35.33	23.36	35.33	23.36	99.80	
	f/	140.55	92.93	0.04	0.02	140.18	92.66	140.22	92.70		
	g/	10.69	7.07	ns	-	-	-	-	-		

RÉSULTATS D'ANALYSE GRANULOMÉTRIQUE ET DE SÉPARATION DANS LES LIQUIDES LOURDS DES SABLES PRÉLEVÉS DES SONDAGES DE LA RÉGION DE J R E I D A

RESULTS OF GRAIN SIZE ANALYSES AND HEAVY LIQUID SEPARATION OF SANDS FROM BOREHOLES IN THE REGION OF J R S I D A

Borehole / Sondage J 9

Echantillon No / Sample No		Analyse granulométrique / Grain size analysis		Séparation dans les liquides denses / Heavy liquid separation							Remarks / Remarques
	a/ admission / feed; b/ fraction +0.8mm; c/ fraction +0.4mm; d/ fraction +0.2mm; e/ fraction +0.06mm; f/ total fraction de sable / total sand fraction; g/ fraction de vase et d'argile / silt and clay fraction	rendement / yield		Fraction lourde / Heavy fraction: rendement / yield		Fraction légère / Light fraction: rendement / yield		Rendement total / Total yield: rendement / yield		Recouperation / Recovery	
		g	%	g	%	g	%	g	%	%	
1	2	3	4	5	6	7	8	9	10	11	12
J 9/1	a/	50.04	100.00								
	b/	0.11	0.22	ns		0.11	0.22	0.11	0.22		
	c/	1.92	3.84	0.01	0.02	1.91	3.82	1.92	3.84	100.00	
	d/	41.46	82.85	0.91	1.82	40.47	80.88	41.38	82.70	99.80	MS[13] /see tab. 9../
	e/	6.27	12.53	1.14	2.28	5.12	10.24	6.26	12.52	99.80	MS[13] /voir tab. 9../
	f/	49.76	99.44	2.06	4.12	47.61	95.16	49.67	99.28		
	g/	0.28	0.56	ns	-	-	-	-	-		
J 9/2	a/	50.15	100.00								
	b/	0.21	0.42	ns		0.21	0.42	0.21	0.42		
	c/	4.07	8.11	0.01	0.02	3.97	7.92	3.98	7.94	97.78	
	d/	40.86	81.48	0.58	1.16	40.18	80.12	40.76	81.28	99.75	MS[13]
	e/	3.42	6.82	0.46	0.92	2.92	5.82	3.38	6.74	98.83	MS[13]
	f/	48.56	96.83	1.05	2.10	47.28	94.28	48.33	96.38		
	g/	1.59	3.17	ns	-	-	-	-	-		
J 9/3	a/	49.30	100.00								
	b/	0.30	0.61	ns		0.30	0.61	0.30	0.61		
	c/	3.55	7.20	0.00	0.00	3.55	7.20	3.55	7.20	100.00	
	d/	36.20	73.43	0.29	0.59	35.91	72.84	36.20	73.43	100.00	MS[13]
	e/	7.15	14.50	0.63	0.18	6.50	13.18	7.13	14.46	99.72	MS[13]
	f/	47.20	95.74	0.92	1.86	46.26	92.24	47.18	94.10		
	g/	2.10	4.26	ns	-	-	-	-	-		
J 9/4	a/	48.86	100.00								
	b/	1.05	2.15	ns-		1.05	2.15	1.05	2.15		
	c/	4.42	9.06	0.00	0.00	4.39	9.00	4.39	9.00	99.32	
	d/	31.45	64.45	0.09	0.18	31.30	64.06	31.39	64.24	99.81	MS[13]
	e/	6.71	13.73	0.23	0.47	6.32	12.93	6.55	13.40	97.61	MS[13]
	f/	43.63	89.29	0.32	0.65	43.06	88.14	43.38	88.79		
	g/	5.23	10.71	ns	-	-	-	-	-		

1	2	3	4	5	6	7	8	9	10	11	12
J 9/5	a/	49.45	100.00								
	b/	0.24	0.48	ns		0.24	0.48	0.24	0.48		
	c/	2.53	5.11	0.00	0.00	2.50	5.05	2.50	5.06	98.81	
	d/	37.13	75.08	0.10	0.20	36.95	74.72	37.05	74.92	99.78	
	e/	7.45	15.07	0.77	1.56	6.47	13.08	7.24	14.64	97.18	MIQ /see tab. .8../ /voir tab. 8.../
	f/	47.35	95.74	0.87	1.76	46.16	93.34	47.03	95.10		
	g/	2.10	4.26	ns	–	–	–	–	–		
J 9/6	a/	47.39	100.00								
	b/	0.36	0.76	ns		0.36	0.76	0.36	0.76		
	c/	4.82	10.17	0.00	0.00	4.80	10.13	4.80	10.13	99.58	
	d/	33.15	69.95	0.06	0.13	33.06	69.76	33.12	69.89	99.90	
	e/	6.00	12.66	0.09	0.19	5.82	12.28	5.91	12.47	98.50	
	f/	44.33	93.54	0.15	0.32	44.04	92.93	44.19	93.25		
	g/	3.06	4.46	ns	–	–	–	–	–		
J 9/7	a/	48.37	100.00								
	b/	1.82	3.76	ns		1.82	3.76	1.82	3.76		
	c/	6.74	13.93	0.00	0.00	6.71	13.87	6.71	13.87	99.55	
	d/	31.70	65.54	0.05	0.10	31.47	65.06	31.52	65.16	99.43	
	e/	5.08	10.50	0.05	0.10	5.00	10.34	5.05	10.44	99.40	
	f/	45.34	93.73	0.10	0.20	45.00	93.03	45.10	93.23		
	g/	3.03	6.27	ns	–	–	–	–	–		
J 9/8	a/	49.64	100.00								
	b/	1.77	3.57	ns		1.77	3.57	1.77	3.57		
	c/	6.29	12.67	0.00	0.00	6.25	12.59	6.25	12.59	99.36	
	d/	32.27	65.01	0.06	0.12	32.12	64.70	32.18	64.82	99.72	
	e/	3.40	6.85	0.08	0.16	3.27	6.59	3.35	6.75	98.53	
	f/	43.73	88.10	0.14	0.28	43.41	87.45	43.55	87.73		
	g/	5.91	11.90	ns	–	–	–	–	–		
J 9/9	a/	200.57	100.00								
	b/	22.10	11.02	ns		22.10	11.02	22.10	11.02		
	c/	34.15	17.03	0.02	0.01	34.10	17.00	34.12	17.01	99.91	
	d/	100.10	49.91	0.08	0.04	99.93	49.82	100.01	49.86	99.91	
	e/	24.75	12.34	0.19	0.09	24.25	12.10	24.44	12.19	98.95	MI/op.m. 45,ga,ep,tu, zi,py,st,sil/
	f/	181.10	90.30	0.29	0.14	180.38	89.94	180.62	90.08		
	g/	19.47	9.70	ns	–	–	–	–	–		
J 9/10	a/	200.52	100.00								
	b/	29.00	14.46	ns		29.00	14.46	29.00	14.46		
	c/	28.65	14.29	0.01	0.01	28.60	14.26	28.61	14.27	99.86	
	d/	84.33	42.06	0.14	0.07	84.02	41.90	84.16	41.97	99.80	
	e/	35.55	17.73	0.26	0.13	35.11	17.51	35.37	17.64	99.49	
	f/	177.53	88.54	0.41	0.21	176.73	88.13	177.14	88.34		
	g/	22.99	11.46	ns	–	–	–	–	–		
J 9/11	a/	200.65	100.00								
	b/	22.58	11.25	ns		22.58	11.25	22.58	11.25		
	c/	24.98	12.45	0.02	0.01	24.94	12.43	24.96	12.44	99.92	MI/op.m,zi,ep/
	d/	72.63	36.20	0.06	0.03	72.52	36.15	72.58	36.18	99.93	MI/op.m.,ga,ep,ru,le,
	e/	53.00	26.41	0.18	0.09	52.74	26.28	52.92	26.37	98.84	MI/op.m. 40,ep,le,zi, am.,tu,st,py,ru,mo/
	f/	173.14	86.31	0.26	0.13	172.78	86.11	173.04	86.24		
	g/	27.45	13.69	ns	–	–	–	–	–		

1	2	3	4	5	6	7	8	9	10	11	12
J 9/12	a/	200.24	100.00								—
	b/	11.08	5.93	ns		11.08	5.93	11.08	5.93		
	c/	18.9[illegible]	9.46	0.02	0.01	18.92	9.45	18.94	9.46	99.95	
	d/	78.63	39.27	0.07	0.03	78.42	39.56	78.49	39.19	99.82	
	e/	77.78	38.85	0.15	0.07	77.61	38.76	77.76	38.83	99.97	MI/op.m. 50,ep,zi,ga, lo,tu,di,ru/
	f/	186.44	93.11	0.24	0.11	186.03	92.90	186.27	93.01		
	g/	13.80	6.89	ns	–	–	–	–	–		
J 9/13	a/	199.93	100.00								
	b/	6.70	3.38	ns		6.76	3.38	6.76	3.38		
	c/	9.91	4.96	0.02	0.01	9.88	4.94	9.90	4.95	99.90	
	d/	63.32	31.67	0.02	0.01	63.29	31.65	63.31	31.66	99.98	
	e/	108.66	54.35	0.14	0.07	108.49	54.27	108,63	54.34	99,77	MI/op.m.,py,am.,ep,di, zi,st/
	f/	188.65	94.36	0.18	0.09	188.42	94.24	188.60	94.33		
	g/	11.28	5.64	ns	–	–	–	–	–		
J 9/14	a/	197.67	100.00								
	b/	4.60	2.33	ns		4.60	2.33	4.60	2.33		
	c/	6.66	3.37	0.01	0.01	6.63	3.35	6.64	3.36	99.70	
	d/	51.78	26.19	0.02	0.01	51.69	26.15	51.71	26.16	99.86	
	e/	120.14	60.78	0.14	0.07	119.88	60.65	120.02	60.72	99.90	MI/op.m.,py,am ,ep,zi, le,ga,st,di,tu/
	f/	183.18	92.67	0.17	0.09	182.80	92.48	182.97	92.57		
	g/	14.49	7.33	ns	–	–	–	–	–		
J 9/15	a/	195.15	100.00								
	b/	1.92	0.98	ns		1.92	0.98	1.92	0.98		
	c/	3.18	1.63	0.01	0.01	3.17	1.62	3.18	1.63	100.00	
	d/	34.68	17.77	0.18	0.09	34.36	17.61	34.54	17.70	99.60	
	e/	142.22	72.88	0.54	0.27	141.55	72.53	142.09	72.80	99.91	MI/. op.m.40,ep,zi,py, am ,ga,st,ru,le,di, tu/
	f/	182.00	93.26	0.73	0.37	181.00	92.74	181.73	93.11		
	g/	13.15	6.74	ns	–	–	–	–	–		
J 9/16	a/	196.68	100.00								
	b/	1.88	0.96	ns		1.88	0.96	1.88	0.96		
	c/	3.62	1.84	0.01	0.01	3.61	1.83	3.62	1.84	100.00	
	d/	43.87	22.30	0.07	0.04	43.60	22.17	43.67	22.21	99.54	MI/op.m, 40,ga,ep,le,
	e/	108.35	55.09	0.31	0.16	107.00	54.40	107.31	54.36	99.04	MI/op.m, 60,zi,di,ga,ru/ ep,tu,am /
	f/	157.72	80.19	0.39	0.21	156.09	79.36	156.48	79.57		
	g/	38.96	19.81	ns	–	–	–	–	–		
J 9/17	a/	198.00	100.00								
	b/	2.83	1.43	ns		2.83	1.43	2.83	1.43		
	c/	3.77	1.90	0.01	0.01	3.70	1.87	3.71	1.88	98.40	
	d/	37.67	19.02	0.02	0.01	37.34	18.86	37.36	18.87	99.18	
	e/	117.01	59.10	0.34	0.17	116.36	58.77	116.70	58.94	99.74	MI/op.m. 40,py,ep,am tu,zi,di,mo/
	f/	161.28	81.45	0.37	0.19	160.23	80.93	160.60	81.12		
	g/	36.72	18.55	ns	–	–	–	–	–		
J 9/18	a/	196.01	100.00								
	b/	5.01	2.56	ns		5.01	2.56	5.01	2.56		
	c/	11.26	5.74	0.00	0.00	11.19	5.71	11.19	5.71	99.38	
	d/	94.71	48.32	0.02	0.01	94.58	48.25	94.60	48.26	99.88	
	e/	32.56	16.61	0.12	0.06	32.32	16.49	32.44	16.55	99.63	MI/op.m, 45,py,ga,am , zi,ep,tu,st,le,di/
	f/	143.54	73.23	0.14	0.07	143.10	73.01	143.40	73.08		
	g/	52.47	26.77	ns	–	–	–	–	–		

1	2	3	4	5	6	7	8	9	10	11	12
J 9/19	a/	199.02	100.00								
	b/	3.75	1.88	ns		3.75	1.88	3.75	1.88		
	c/	5.43	2.72	0.01	0.01	5.40	2.71	5.41	2.72	100.00	
	d/	45.70	22.99	0.06	0.03	45.64	22.93	45.70	22.96	99.87	
	e/	121.35	60.98	0.26	0.13	119.80	60.20	120.06	60.33	98.93	MI/op.m.,am ,py,tu,di, le,zi/
	f/	176.22	88.57	0.33	0.17	174.59	87.72	174.92	87.89		
	g/	22.75	11.43	ns	-	-	-	-	-		
J 9/20	a/	198.34	100.00								
	b/	16.29	8.21	ns		16.29	8.21	16.29	8.21		
	c/	8.47	4.27	0.00	0.00	8.45	4.26	8.45	4.26	99.76	
	d/	32.13	16.20	0.02	0.01	32.04	16.15	32.06	16.16	99.78	
	e/	115.32	58.14	0.26	0.13	115.03	58.00	115.29	58.13	99.97	MI/op.m., 40,py,am ,zi, ep,le,di,tu,ga,st/
	f/	172.21	86.82	0.28	0.14	171.81	86.62	172.09	86.76		
	g/	26.13	13.18	ns	-	-	-	-	-		
J 9/21	a/	203.80	100.00								
	b/	44.11	21.64	ns		44.11	21.64	44.11	21.64		
	c/	20.56	10.09	0.02	0.01	20.30	9.96	20.32	9.97	98.83	
	d/	39.73	19.49	0.06	0.03	38.66	18.97	38.72	19.00	97.45	
	e/	46.07	22.61	0.07	0.03	44.99	22.08	45.06	22.11	97.81	
	f/	150.47	73.83	0.15	0.07	148.06	72.65	148.21	72.72		
	g/	53.33	26.17	ns	-	-	-	-	-		
J 9/22	a/	198.39	100.00								
	b/	43.85	22.10	ns		43.85	22.10	43.85	22.10		
	c/	17.93	9.04	0.01	0.01	17.32	8.73	17.33	8.74	96.65	
	d/	44.68	22.52	0.04	0.02	43.63	21.99	43.67	22.01	97.74	
	e/	43.71	22.03	0.05	0.03	42.62	21.48	42.71	21.51	97.71	MI/op.m.,di,ga,ep,py,zi, le,tu/
	f/	150.17	75.69	0.10	0.06	147.42	74.30	147.52	74.36		
	g/	48.22	24.31	ns	-	-	-	-	-		
J 9/23	a/	192.80	100.00								
	b/	46.30	24.01	ns		46.30	24.01	46.30	24.01		
	c/	13.97	7.24	0.01	0.01	13.94	7.23	13.95	7.24	99.86	
	d/	32.66	16.93	0.02	0.01	32.62	16.91	32.64	16.92	99.94	
	e/	50.86	26.39	0.09	0.05	50.76	26.32	50.85	36.37	99.92	
	f/	143.86	74.57	0.13	0.07	143.62	74.47	143.74	74.54		
	g/	49.04	25.43	ns	-	-	-	-	-		
J 9/24	a/	195.40	100.00								
	b/	16.75	8.57	ns		16.75	8.57	16.75	8.57		
	c/	14.36	7.35	0.00	0.00	14.30	7.32	14.30	7.32	99.58	
	d/	34.77	17.79	0.02	0.01	34.56	17.69	34.58	17.70	99.45	
	e/	113.80	58.24	0.00	0.00	113.14	57.90	113.14	57.90	99.42	
	f/	179.68	91.95	0.02	0.01	178.75	91.48	178.77	91.49		
	g/	15.82	8.05	ns	-	-	-	-	-		
J 9/25	a/	192.40	100.00								
	b/	23.52	12.22	ns		23.52	12.22	23.52	12.22		
	c/	12.33	6.41	0.00	0.00	12.30	6.39	12.30	6.39	99.76	
	d/	29.33	15.23	0.04	0.02	29.06	15.10	29.10	15.12	99.32	
	e/	52.99	27.54	0.10	0.05	52.33	27.20	52.43	27.25	98.94	MI/op.m., 40,py,ep,le, zi,tu,di,gu/
	f/	118.14	61.40	0.14	0.07	117.21	60.91	117.35	60.98		
	g/	74.26	38.60	ns	-	-	-	-	-		

Tableau / Taula 7/29 Borehole / Sondage J 9

1	2	3	4	5	6	7	8	9	10	11	12
9/26	a/	245.67	100.00								MI/ op.m., ga, ep, zi, ru, py, tu/
	b/	17.78	7.24	ns		17.78	7.24	17.78	7.24		
	c/	36.10	14.69	0.02	0.01	36.05	14.67	36.07	14.68	99.91	
	d/	61.15	24.89	0.06	0.02	60.84	24.76	60.90	24.78	99.59	
	e/	51.47	20.95	0.17	0.07	50.79	20.67	50.95	20.74	99.01	
	f/	166.50	67.77	0.25	0.10	165.46	67.34	165.71	67.44		
	g/	79.17	32.23	ns	-	-	-	-	-		

RÉSULTATS D'ANALYSE GRANULOMÉTRIQUE ET DE SÉPARATION DANS LES LIQUIDES LOURDS DES SABLES PRÉLEVÉS DES SONDAGES DE LA RÉGION DE J R E I D A

RESULTS OF GRAIN SIZE ANALYSIS AND HEAVY LIQUID SEPARATION OF SANDS FROM BOREHOLES IN THE REGION OF J R E I D A

Borehole
Sondage J 10

Column 2 key (Analyse granulométrique / Grain size analysis):
- a/ admission / feed
- b/ fraction + 0.8mm
- c/ fraction + 0.4mm
- d/ fraction + 0.2mm
- e/ fraction + 0.06mm
- f/ total fraction de sable / total sand fraction
- g/ fraction de vase et d'argile / silt and clay fraction

Échantillon No / Sample No		Analyse granulométrique / Grain size analysis – rendement / yield (g)	(%)	Séparation dans les liquides denses / Heavy liquid separation – Fraction lourde / Heavy fraction – rendement / yield (g)	(%)	Fraction légère / Light fraction – rendement / yield (g)	(%)	Rendement total / Total yield – rendement / yield (g)	(%)	Récupération / Recovery (%)	Remarks / Remarques
1	2	3	4	5	6	7	8	9	10	11	12
J 10/1	a/	51.00	100.00								
	b/	0.77	1.51	ns		0.77	1.51	0.77	1.51		
	c/	3.52	6.90	0.00	0.00	3.70	6.86	3.50	6.86	99.43	
	d/	42.94	84.20	0.73	1.43	42.13	82.61	42.86	84.04	99.81	MIQ /see tab. 8../ /voir tab. 8../
	e/	2.42	4.75	0.28	0.55	2.06	4.04	2.34	4.59	96.69	MI /op.m. 55,ep,zi,ga, tu,di,py/
	f/	49.65	97.36	1.01	1.98	48.46	95.02	49.47	97.00		
	g/	1.35	2.64	ns	–	–	–	–	–		
J 10/2	a/	49.38	100.00								
	b/	1.42	2.88	ns		1.42	2.88	1.42	2.88		
	c/	3.90	7.90	0.00	0.00	3.90	7.90	3.90	7.90	99.49	
	d/	34.34	69.54	0.12	0.24	34.19	69.24	34.31	69.48	99.91	MI /op.m.,ep,ga,zi,tu st,di,mo/
	e/	6.07	12.29	0.32	0.65	5.64	11.42	5.96	12.07	98.19	MI /op.m. 60,py,ep,zi ga,tu,di/
	f/	45.75	92.65	0.44	0.89	45.15	91.44	45.59	92.33		
	g/	3.63	7.35	ns	–	–	–	–	–		
J 10/3	a/	48.66	100.00								
	b/	1.07	2.20	ns		1.07	2.20	1.07	2.20		
	c/	3.81	7.83	0.01	0.02	3.79	7.79	3.80	7.81	99.73	
	d/	38.09	78.28	0.11	0.23	37.84	77.76	37.95	77.99	99.63	MI /op.m. 40,zi 25,ga tu,ru,st,nm,ep/
	e/	4.26	8.75	0.11	0.23	4.05	8.32	4.16	8.55	97.65	MI /op.m. 30,zi 30,ga tu,ep,st,py,mo/
	f/	47.23	97.06	0.23	0.48	46.75	96.07	46.98	96.55		
	g/	1.43	2.94	ns	–	–	–	–	–		
J 10/4	a/	48.48	100.00								
	b/	0.41	0.85	ns		0.41	0.85	0.41	0.85		
	c/	4.11	8.48	0.01	0.02	4.09	8.44	4.10	8.46	99.76	
	d/	38.88	80.12	0.15	0.31	38.61	79.64	38.76	79.95	99.79	MI /op.m. 25,zi,ga,ep py,st,ru,tu,mo/
	e/	2.63	5.42	0.12	0.25	2.49	5.14	2.61	5.39	99.24	
	f/	45.99	94.87	0.28	0.58	45.60	94.07	45.88	94.65		
	g/	2.49	5.13	ns	–	–	–	–	–		

Tabulka / Table 7/31 Borehole / Sondage J 10

1	2	3	4	5	6	7	8	9	10	11	12
J 10/5	a/	50.61	100.00								
	b/	2.08	4.11	ns		2.08	4.11	2.08	4.11		
	c/	7.20	14.23	0.00	0.00	7.20	14.28	7.20	14.28	100.00	
	d/	36.55	72.22	0.04	0.08	36.42	71.96	36.46	72.04	99.75	
	e/	2.99	5.91	0.06	0.12	2.90	5.73	2.96	5.85	99.00	
	f/	48.82	96.47	0.10	0.20	48.60	96.03	48.70	96.23		
	g/	1.79	3.53	ns	-	-	-	-	-		
J 10/6	a/	55.40	100.00								
	b/	1.06	2.10	ns		1.06	2.10	1.06	2.10		
	c/	7.62	15.11	0.01	0.02	7.60	15.07	7.61	15.09	99.87	
	d/	36.11	71.59	0.01	0.02	36.00	71.37	36.01	71.39	99.72	
	e/	4.25	8.51	0.01	0.02	4.23	8.39	4.24	8.41	98.83	
	f/	49.08	97.31	0.03	0.06	48.89	96.93	48.92	96.99		
	g/	1.36	2.69	ns	-	-	-	-	-		
J 10/7	a/	50.62	100.00								
	b/	9.12	18.02	ns		9.12	18.02	9.12	18.02		
	c/	9.24	18.25	-0.00	0.00	9.24	18.25	9.24	18.25	100.00	
	d/	24.06	47.53	0.01	0.02	24.00	47.41	24.01	47.34	99.79	
	e/	5.35	10.57	0.03	0.06	5.26	10.39	5.29	10.45	98.88	
	f/	47.77	94.37	0.04	0.08	47.62	94.07	47.66	94.15		
	g/	2.85	5.63	ns	-	-	-	-	-		
J 10/8	a/	50.63	100.00								
	b/	4.72	9.32	ns		4.72	9.32	4.72	9.32		
	c/	8.17	16.14	0.00	0.00	8.15	16.10	8.15	16.10	99.76	
	d/	22.35	44.14	0.02	0.04	22.29	44.03	22.31	44.07	99.82	
	e/	11.80	23.31	0.00	0.00	11.67	23.05	11.67	25.05	98.90	
	f/	47.04	92.91	0.02	0.04	46.83	92.50	46.85	92.54		
	g/	3.59	7.09	ns	-	-	-	-	-		
J 10/9	a/	203.03	100.00								
	b/	27.02	13.31	ns		27.02	13.31	27.02	13.31		
	c/	34.59	17.04	0.01	0.01	34.56	17.02	34.56	17.03	99.94	
	d/	97.88	48.21	0.07	0.03	97.73	48.14	97.80	48.17	99.92	
	e/	23.54	11.59	0.03	0.02	23.42	11.54	23.45	11.56	99.62	
	f/	183.03	90.15	0.11	0.06	182.73	90.01	182.84	90.07		
	g/	20.00	9.85	ns	-	-	-	-	-		
J 10/10	a/	201.83	100.00								
	b/	16.47	8.16	ns		16.47	8.16	16.47	8.16		
	c/	32.29	16.05	0.01	0.01	32.30	16.00	32.31	16.01	99.75	MI/op.m. 30,ga,zi,py,t ep,st/
	d/	98.90	49.00	0.06	0.03	98.71	48.91	98.77	48.94	99.87	MI/op.m. 40,zi,tu,ga,p ep,st,di,mo/
	e/	31.05	15.38	0.09	0.04	30.64	15.18	30.73	15.22	98.97	
	f/	178.81	88.59	0.16	0.08	178.12	88.34	178.28	88.42		
	g/	23.02	11.41	ns	-	-	-	-	-		
J 10/11	a/	202.40	100.00								
	b/	10.13	5.00	ns		10.13	5.00	10.13	5.00		
	c/	29.36	14.51	0.01	0.01	29.33	14.49	29.34	14.50	99.93	
	d/	104.04	51.40	0.03	0.02	103.87	51.32	103.90	51.34	99.87	
	e/	38.69	19.08	0.07	0.03	37.22	18.39	37.29	18.42	96.58	
	f/	182.14	89.99	0.11	0.06	180.55	89.20	180.66	89.26		
	g/	20.26	10.01	ns	-	-	-	-	-		

Tableau / Tabela 7/12 Borehole / Sondage J 10

1	2	3	4	5	6	7	8	9	10	11	12
J 10/12	a/	203.42	100.00								
	b/	11.33	5.57	ns		11.33	5.57	11.33	5.57		
	c/	14.96	7.35	0.01	0.01	14.91	7.33	14.92	7.34	99.73	
	d/	115.37	56.72	0.04	0.02	115.12	56.59	115.16	56.61	99.82	
	e/	41.72	20.51	0.11	0.06	41.29	20.30	41.40	20.35	99.23	
	f/	183.38	90.15	0.16	0.08	182.65	89.79	182.81	89.87		
	g/	20.04	9.85	ns	-	-	-	-	-		
J 10/13	a/	203.06	100.00								
	b/	14.12	6.95	ns		14.12	6.95	14.12	6.95		
	c/	14.77	7.27	0.01	0.01	14.72	7.25	14.73	7.26	99.73	
	d/	68.54	33.75	0.06	0.03	68.38	33.67	68.44	33.70	99.85	
	e/	85.53	42.12	0.13	0.06	85.05	41.90	85.22	41.96	99.64	MI/op.m.,py,am ,tu,zi, at,di/
	f/	182.96	90.09	0.20	0.10	182.31	89.77	182.51	89.87		
	g/	20.10	9.91	ns	-	-	-	-	-		
J 10/14	a/	99.67	100.00								
	b/	6.92	6.94	-ns		6.92	6.94	6.92	6.94		
	c/	6.77	6.79	0.01	0.01	6.72	6.74	6.73	6.75	99.70	
	d/	35.75	35.87	0.01	0.01	35.68	35.80	35.69	35.81	99.83	
	e/	40.56	40.69	0.05	0.05	40.36	40.49	40.41	40.54	99.63	
	f/	90.00	90.29	0.07	0.07	89.68	89.97	89.75	90.04		
	g/	9.67	9.71	ns	-	-	-	-	-		

RÉSULTATES D'ANALYSE GRANULOMÉTRIQUE ET DE SÉPARATION DANS LES LIQUIDES LOURDS DES SABLES PRELEVES DES SONDAGES DE LA RÉGION DE J R E I D A

RESULTS OF GRAIN SIZE ANALYSIS AND HEAVY LIQUID SEPARATION OF SANDS FROM BOREHOLES IN THE REGION OF J R E I D A

Borehole J 11
Sondage

Column 2 key (Analyse granulométrique / Grain size analysis):
a/ admission / feed
b/ fraction +0.8mm
c/ fraction +0.4mm
d/ fraction +0.2mm
e/ fraction +0.06mm
f/ total fraction de sable / total sand fraction
g/ fraction de vase et d'argile / silt and clay fractions

Échantillon No / Sample No		Analyse granulométrique / Grain size analysis: rendement / yield		Fraction lourde / Heavy fraction: rendement / yield		Fraction légère / Light fraction: rendement / yield		Rendement total / Total yield: rendement / yield		Récupération / Recovery	Remarks / Remarques
		g	%	g	%	g	%	g	%	%	
1	2	3	4	5	6	7	8	9	10	11	12
	a/	50.52	100.00								
	b/	0.06	0.12	ns		0.06	0.12	0.06	0.12		
	c/	1.07	2.13	0.00	0.00	1.07	2.13	1.07	2.13	100.00	
J 11/1	d/	46.22	91.85	0.53	1.05	45.51	90.44	46.04	91.49	99.61	MIQ /see tab. 8.../ /voir tab. 8.../
	e/	1.55	3.08	0.16	0.32	1.32	2.62	1.48	2.94	95.48	
	f/	48.90	97.18	0.69	1.37	47.96	95.31	48.65	96.68		
	g/	1.42	2.82	ns	–	–	–	–	–		
	a/	49.66	100.00								
	b/	0.16	0.32	ns		0.16	0.32	0.16	0.32		
	c/	1.67	3.36	0.00	0.00	1.66	3.34	1.16	3.34	99.40	
J 11/2	d/	38.70	77.93	0.31	0.62	38.32	76.96	38.63	77.58	99.82	MI/op.m.,zi,ga,ep,tu, py,st,ru,mo/
	e/	6.72	13.53	0.32	0.64	6.29	12.62	6.61	13.31	98.36	MI/op.m. 40,zi,ga,py, ep,st,di ru/
	f/	47.25	95.14	0.63	1.26	46.43	93.29	47.06	94.55		
	g/	2.41	4.86	ns	–	–	–	–	–		
	a/	50.43	100.00								
	b/	0.29	0.58	ns		0.29	0.58	0.29	0.58		
	c/	1.41	2.80	0.00	0.00	1.41	2.80	1.41	2.80	100.00	
J 11/3	d/	36.93	73.23	0.17	0.34	36.73	72.83	36.90	73.17	99.92	MI/op.m.,ga,zi,ep,tu, py,am ,st,bi/
	e/	8.10	16.06	0.07	0.14	8.00	15.86	8.07	16.00	99.63	
	f/	46.73	92.67	0.24	0.48	46.43	92.07	46.67	92.55		
	g/	3.70	7.33	ns	–	–	–	–	–		
	a/	49.47	100.00								
	b/	0.12	0.24	ns		0.12	0.24	0.12	0.24		
	c/	1.66	3.36	0.01	0.02	1.64	3.31	1.65	3.33	99.40	
J 11/4	d/	34.24	69.21	0.16	0.32	34.02	68.77	34.18	69.09	99.82	MI/ga,il,ep,zi,py,di,
	e/	9.21	18.62	0.37	0.75	8.64	17.47	9.01	18.22	[illegible]	MIQ/see tab. 8/tu,st,mo/ /voir tab. 8..../
	f/	45.23	91.43	0.54	1.09	44.42	89.79	44.96	90.88		
	g/	4.24	8.57	ns	–	–	–	–	–		

1	2	3	4	5	6	7	8	9	10	11	12
11/5	a/	50.84	100.00								MI/ôp.m: 20,ga,zi,op, tu,py,st,di,bi,mo/
	b/	0.00	0.00	ns		0.00	0.00	0.00	0.00		
	c/	2.06	4.05	0.00	0.00	2.06	4.05	2.06	4.05	100.00	
	d/	31.38	61.64	0.09	0.18	[illegible]	61.39	31.30	61.57	99.89	
	e/	11.87	23.35	0.12	0.24	11.69	22.93	11.81	23.17	99.23	
	f/	45.27	89.04	0.21	0.42	44.96	88.37	45.17	88.79		
	g/	5.57	10.96	ns	-	-	-	-	-		
11/6	a/	50.32	100.00								MI/op.m. 20,ga,zi,op,py st, di,tu,mo/
	b/	0.74	1.47	ns		0.74	1.47	0.74	1.47		
	c/	3.16	6.28	0.00	.0.00	3.15	6.26	3.15	6.26	99.68	
	d/	31.92	63.43	0.10	0.20	31.74	63.08	31.84	63.28	99.75	
	e/	9.95	19.77	0.01	0.02	9.90	19.67	9.91	19.69	99.60	
	f/	45.77	90.95	0.11	0.22	45.53	90.48	45.64	90.70		
	g/	4.55	9.05	ns	-	-	-	-	-		
11/7	a/	50.06	100.00								
	b/	0.39	0.78	ns		0.39	0.78	0.39	0.78		
	c/	2.40	4.79	0.00	0.00	2.38	4.75	2.38	4.75	99.17	
	d/	32.71	65.34	0.02	0.04	32.60	65.12	32.62	65.16	99.72	
	e/	11.87	23.71	0.02	0.04	11.79	23.55	11.81	23.59	99.49	
	f/	47.37	94.62	0.04	0.08	47.16	94.20	47.20	94.28		
	g/	2.69	5.38	ns	-	-	-	-	-		
11/8	a/	47.89	100.00								
	b/	0.34	0.71	ns		0.34	0.71	0.34	0.71		
	c/	2.95	6.16	0.01	0.02	2.94	6.14	2.95	6.16	100.00	
	d/	32.94	68.78	0.02	0.04	32.87	68.64	32.89	68.68	99.85	
	e/	9.11	19.02	0.00	0.00	9.05	18.90	9.05	18.90	99.34	
	f/	45.34	94.67	0.03	0.06	45.20	94.39	45.23	94.45		
	g/	2.55	5.33	ns	-	-	-	-	-		
11/9	a/	203.43	100.00								
	b/	[illegible]	0.89	ns		1.82	0.89	1.82	0.89		
	c/	9.06	4.42	0.01	0.01	8.96	4,40	8.97	4.41	99.67	
	d/	163.03	80.14	0.26	0.13	162.57	79.91	162.83	80.04	99.88	
	e/	19.17	9.42	0.26	0.13	18.66	9.17	18.92	9.30	98.70	
	f/	193.02	94.87	0.53	0.27	192.01	94.37	192.54	94.64		
	g/	10.41	5.13	ns	-	-	-	-	-		
11/10	a/	199.74	100.00								MI/op.m: 30,zi,ga,op,py di,tu,sil,st,ru,mo/
	b/	10.32	5.17	ns		10.32	5.17	10.32	5.17		
	c/	14.66	7.34	0.00	0.00	14.64	7.33	14.64	7.33	99.86	
	d/	77.93	39.04	0.01	0.01	77.76	38.93	77.77	38.94	99.73	
	e/	85.86	42.99	0.19	0.10	85.34	42.73	85.53	42.83	99.62	
	f/	188.82	94.54	0.20	0.11	188.06	94.16	188.26	94.27		
	g/	10.92	5.46	ns	-	-	-	-	-		
11/11	a/	202.2?	100.00								MI/bp.m. 30,zi,ga,op,tu py,st,ru,di,sil,mo/
	b/	10.77	5.33	ns		10.77	5.33	10.77	5.33		
	c/	14.10	6.97	0.01	0.01	14.07	6.95	14.08	6.96	99.86	
	d/	86.12	42.59	0.24	0.12	85.68	42.37	85.92	42.49	99.76	
	e/	75.17	37.15	0.05	0.02	74.90	37.04	74.95	37.06	99.77	
	f/	186.12	92.04	0.30	0.15	185.60	91.69	185.90	91.84		
	g/	16.10	7.96	ns	-	-	-	-	-		

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Tableau / Tabla 7/33 Borehole / Sondage 11

1	2	3	4	5	6	7	8	9	10	11	12
11/12	a/	202.36	100.00								
	b/ c/ d/ e/	17.33 22.41 81.01 63.98	8.56 11.07 40.03 31.62	ns 0.01 0.06 0.16	0.01 0.03 0.03	17.33 22.39 80.[illegible] 63.69	8.56 11.06 39.95 31.47	17.33 22.40 80.91 63.85	8.56 11.07 39.98 31.85	99.98 99.88 99.80	
	Σ/	184.73	91.28	0.23	0.12	184.26	91.04	184.49	91.16		MI/σβ-m- 30,pytu,am, zi,st,bi,di,mo/
	σ/	17.63	8.72	ns	-	-	-	-	-		
11/13	a/	203.04	100.00								
	b/ c/ d/ e/	25.11 25.55 97.29 36.54	12.37 12.58 47.92 18.00	ns 0.00 0.03 0.03	0.00 0.02 0.02	25.11 25.53 97.09 36.41	12.37 12.57 47.82 17.93	25.11 25.53 97.12 36.44	12.37 12.57 47.84 17.95	99.92 99.83 99.73	
	Σ/	184.49	90.87	0.06	0.04	184.14	90.69	184.20	90.23		
	σ/	18.55	9.13	ns	-	-	-	-	-		
11/14	a/	152.31	100.00								
	b/ c/ d/ e/	10.82 9.37 83.67 35.94	7.10 6.15 54.94 23.60	ns 0.00 0.04 0.04	0.00 0.03 0.03	10.82 9.35 83.59 35.80	7.10 6.14 54.88 23.50	10.82 9.35 83.63 35.84	7.10 6.14 54.91 23.53	99.79 99.95 99.72	
	Σ/	139.80	91.79	0.08	0.06	139.56	91.62	139.64	91.68		
	σ/	12.51	8.21	ns	-	-	-	-	-		

Tableau 7/38
Table

RÉSULTATS D'ANALYSE GRANULOMÉTRIQUE ET DE SÉPARATION DANS LES LIQUIDES LOURDS DES SABLES PRÉLEVÉS DES SONDAGES DE LA RÉGION DE J R E I D A

RESULTS OF GRAIN SIZE ANALYSIS AND HEAVY LIQUID SEPARATION OF SANDS FROM BOREHOLES IN THE REGION OF J R E I D A

Borehole / Sondage J 12

Column 2 key — Analyse granulométrique / Grain size analysis:
- a/ admission / feed
- b/ fraction +0.8mm
- c/ fraction +0.4mm
- d/ fraction +0.2mm
- e/ fraction +0.06mm
- f/ total fraction de sable / total sand fraction
- g/ fraction de vase et d'argile / silt and clay fraction

Séparation dans les liquides denses / Heavy liquid separation

Echantillon / Sample No		Analyse granulométrique / Grain size analysis: rendement / yield g	%	Fraction lourde / Heavy fraction: rendement / yield g	%	Fraction légère / Light fraction: rendement / yield g	%	Rendement total / Total yield: rendement / yield g	%	Récupération / Recovery %	Remarks / Remarques
1	2	3	4	5	6	7	8	9	10	11	12
J 12/1	a/	50.12	100.00								
	b/	4.52	9.01	ns		4.52	9.01	4.52	9.01		
	c/	10.07	20.07	0.02	0.04	9.99	19.91	10.01	19.95	99.40	MI /ga 90,op,st/
	d/	30.52	60.83	0.15	0.30	30.35	60.49	30.50	60.79	99.93	MI /ga 40, 30,op,st,le,zi/
	e/	3.40	6.78	0.13	0.26	3.27	6.52	3.40	6.78	100.00	MI /op.m. 50,op,ga,st,zi,di/
	f/	48.51	96.69	0.30	0.60	48.13	95.93	48.43	96.53		
	g/	1.66	3.31	ns	-	-	-	-	-		
J 12/2	a/	50.05	100.00								
	b/	[illegible]	5.87	ns		2.94	5.87	2.94	5.87		
	c/	[illegible]	[illegible]	0.01	0.02	6.50	[illegible]	6.51	13.01	99.85	MIQ /see tab. 8./ /voir tab. 8./
	d/	34.10	68.13	[illegible]	0.44	33.88	67.69	34.10	68.13	100.00	
	e/	4.77	9.53	0.30	0.60	4.40	8.79	4.70	9.39	98.53	MIQ /see tab. 8./ /voir tab. 8./
	f/	48.33	96.56	0.53	1.06	47.72	95.34	48.25	96.40		
	g/	1.72	3.44	ns	-	-	-	-	-		
J 12/3	a/	50.07	100.00								
	b/	2.50	4.99	ns		2.50	4.99	2.50	4.99		
	c/	10.44	20.85	0.02	0.04	10.38	20.73	10.40	20.77	99.62	MIQ /see tab. 8./ /voir tab. 8./
	d/	30.74	61.39	0.33	0.66	30.32	60.55	30.65	61.21	99.71	
	e/	4.32	8.63	0.54	1.08	3.62	7.23	4.16	8.31	96.30	MIQ /see tab. 8./ /voir tab. 8./
	f/	48.00	95.86	0.89	1.78	46.82	93.50	47.71	95.28		
	g/	2.07	4.14	ns	-	-	-	-	-		
J 12/4	a/	50.31	100.00								
	b/	1.66	3.30	ns		1.66	3.30	1.66	3.30		
	c/	7.62	15.15	0.01	0.02	7.59	15.09	7.60	15.11	99.74	MIQ /see tab. 8./ /voir tab. 8./
	d/	[illegible]	64.94	0.40	0.80	32.02	63.64	32.42	64.44	99.23	
	e/	5.81	11.55	0.62	1.24	5.04	10.02	5.66	11.26	97.42	MIQ /see tab. 8./ /voir tab. 8./
	f/	47.76	94.94	1.03	2.06	46.31	95.05	47.34	94.11		
	g/	2.55	5.06	ns	-	-	-	-	-		

1	2	3	4	5	6	7	8	9	10	11	12
J 12/5	a/	50.03	100.00								MI/op.m..,ga,st,zi/ MI/op.m.. 60,ep,ga,st, zi,sil,am ,an/
	b/	2.22	4.44	ns		2.22	4.44	2.22	4.44		
	c/	7.77	15.53	0.01	0.02	7.74	15.47	7.75	15.49	99.74	
	d/	33.00	65.96	0.13	0.26	32.17	64.30	32.30	64.56	97.88	
	e/	5.16	10.31	0.19	0.38	4.91	9.81	5.10	10.19	98.84	
	f/	48.15	96.24	0.33	0.66	47.04	94.02	47.37	47.37		
	g/	1.88	3.76	ns	-	-	-	-	-		
J 12/6	a/	50.12	100.00								MI/op.m.60,ga,ep,di,le, MI/op.m.160,ep,ga,sil/
	b/	2.45	4.89	ns		2.45	4.89	2.45	4.89		
	c/	7.32	14.65	0.00	·0.00	7.30	14.56	7.30	14.56	99.73	
	d/	32.22	64.28	0.09	0.18	32.16	64.05	32.19	64.23	99.91	
	e/	6.14	12.25	0.08	0.16	5.93	11.83	6.01	11.99	97.88	
	f/	48.13	96.02	0.17	0.34	47.63	93.33	47.95	99.67		
	g/	1.99	3.98	ns	-	-	-	-	-		
J 12/7	a/	50.24	100.00								MI/op.m.. 60,ga,ep,le/ MI/op.m.. 60,ga,ep,py, am ,zi,ru,sp,tu/
	b/	3.34	6.65	ns		3.34	6.65	3.34	6.65		
	c/	7.61	15.15	-0.01	0.02	7.60	15.13	7.61	15.15	100.00	
	d/	29.21	58.14	0.10	0.20	28.84	57.40	28.94	57.60	99.08	
	e/	7.96	15.84	0.21	0.42	7.62	15.17	7.83	15.59	98.37	
	f/	48.12	95.78	0.32	0.64	47.40	94.35	47.72	94.99		
	g/	2.12	4.22	ns	-	-	-	-	-		
J 12/8	a/	50.21	100.00								
	b/	4.27	8.50	ns		4.27	8.50	4.27	8.50		
	c/	7.23	14.40	0.01	0.02	7.19	14.32	7.20	14.34	99.58	
	d/	20.53	40.89	0.05	0.10	20.35	40.53	20.40	40.63	99.37	
	e/	8.27	16.47	0.08	0.16	8.02	15.97	8.10	16.13	97.94	
	f/	40.30	80.26	0.14	0.28	39.83	79.32	39.97	79.60		
	g/	9.91	19.74	ns	-	-	-	-	-		
J 12/9	a/	200.57	100.00								
	b/	22.54	11.24	ns		22.54	11.24	22.54	11.24		
	c/	18.10	9.02	0.02	0.01	18.08	9.01	18.10	9.02	100.00	
	d/	105.61	52.65	0.24	0.12	105.21	51.46	105.45	52.58	99.85	
	e/	49.07	24.47	0.43	0.21	48.36	24.11	48.79	24.32	99.43	
	f/	195.47	97.38	0.69	0.34	194.19	96.82	194.88	97.16		
	g/	5.75	2.62	ns	-	-	-	-	-		
J 12/10	a/	200.44	100.00								MI/op.m.. 50,ep,py,am , zi,st,tu,le,sil/
	b/	10.86	5.42	ns		10.86	5.42	10.86	5.42		
	c/	22.00	10.98	0.01	0.01	21.89	10.92	21.90	10.93	99.54	
	d/	89.04	44.42	0.03	0.02	88.90	44.35	88.93	44.37	99.88	
	e/	67.98	33.91	0.19	0.09	67.66	33.76	67.85	33.85	99.81	
	f/	189.88	94.73	0.23	0.12	199.31	99.45	199.54	99.57		
	g/	10.56	5.27	ns	-	-	-	-	-		
J 12/11	a/	199.09	100.00								MI/op.m.. 50,ep,py,ga, am ,tu,zi,di/
	b/	8.06	4.05	ns		8.06	4.05	8.06	4.05		
	c/	12.46	6.26	0.01	0.01	12.45	6.25	12.46	6.26	100.00	
	d/	68.94	34.65	0.02	0.01	68.92	34.62	68.94	34.63	99.93	
	e/	96.86	48.67	0.29	0.14	96.57	48.51	96.86	48.65	99.96	
	f/	186.41	93.63	0.32	0.16	186.00	93.43	186.32	93.59		
	g/	12.68	6.37	ns	-	-	-	-	-		

1	2	3	4	5	6	7	8	9	10	11	12
12/12	a/	100.61	100.00								MI/ op.m.45,py,am ,ep, bi,tu,ga,zi/
	b/	6.47	6.43	ns		6.47	6.43	6.47	6.43		
	c/	4.54	4.51	0.01	0.01	4.53	4.50	4.54	4.51	100.00	
	d/	32.40	32.20	0.02	0.02	32.[illegible]	32.02	32.24	32.04	99.51	
	e/	53.81	53.48	0.20	0.20	53.50	53.18	53.70	53.38	99.79	
	f/	97.22	96.62	0.23	0.23	96.72	96.13	96.95	96.36		
	g/	3.39	3.38	ns	–	–	–	–	–		

LES RÉSULTATS DE L'ANALYSE PLANIMÉTRIQUE - LUMIÈRE TRANSMISE ET RÉFLECTIVE - RÉGION JEDIDA / POURCENTAGE EN VOLUME/ Tableau 8

GRAIN COUNTS RESULTS - LIGHT TRANSMITTED AND REFLECTED - REGION JEDIDA / VOL.%/ Table 8

Echant. No Sample No	MINÉRAUX LOURDS HEAVY MINERALS: MINÉRAUX OPAQUES OPAQUE MINERALS									MINÉRAUX TRANSPARENTS TRANSPARENT MINERALS													MINÉRAUX LÉGERS LIGHT MINERALS			No
	il	sph	ru	an	he	ma + mg	geo	Autres Others	Total OM	le	zi	mo	ga	di	st	sil	tu	ep	py + am	Autres Others	Total MT	Total HM	qu	cor	Total LM	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
J 3/5 x + 0.063	21.1	4.[illegible]	22.8	4.6	14.2	-	8.0	-	74.7	1.7	6.8	0.9	4.3	4.3	0.2	-	0.4	4.7	0.4	-	23.7	98.4	0.8	0.8	1.6	1
J 3/6 + 0.063	17.6	3.4	40.0	4.7	1.3	-	0.8	-	67.8	0.5	7.3	0.5	7.8	7.3	-	-	0.5	6.0	0.9	-	30.8	98.6	1.4	-	1.4	2
J 3/9 xx + 0.20	33.6	1.3	20.7	1.9	3.8	1.3	0.7	-	63.3	1.4	5.6	-	8.3	7.4	1.4	-	-	9.3	0.5	-	33.9	97.2	2.3	0.5	2.8	3
J 3/11 + 0.063	27.9	-	37.7	-	7.7	-	0.7	-	74.1	1.5	7.3	0.4	2.3	5.7	1.5	-	1.1	2.3	2.3	-	24.4	98.5	1.5	-	1.5	4
J 6/1 + 0.20	9.2	-	13.1	0.5	3.5	-	0.4	-	26.7	1.2	-	-	29.6	3.0	2.4	-	-	25.4	1.2	-	62.8	96.5	3.5	-	3.5	5
J 6/1 + 0.063	17.4	1.3	43.7	0.6	3.9	-	-	-	66.9	0.9	5.8	-	10.7	6.7	0.5	-	0.9	4.5	1.8	-	31.8	98.7	1.3	-	1.3	6
J 6/2 + 0.063	14.6	1.0	31.5	3.8	8.9	0.4	-	-	60.2	2.7	8.2	-	7.7	10.9	-	-	2.7	7.1	-	-	39.3	99.5	0.5	-	0.5	7
J 9/5 + 0.063	18.7	0.5	31.6	1.8	8.2	-	2.1	-	62.9	1.7	8.6	-	0.8	9.6	0.8	-	3.4	6.0	4.3	-	35.2	98.1	1.9	-	1.9	8
J 10/1 + 0.20	13.0	0.9	31.9	1.5	2.9	-	2.4	-	52.6	-	20.2	-	11.4	2.2	2.2	-	2.6	1.8	7.0	-	47.4	100.0	-	-	-	9
J 11/1 + 0.20	10.8	2.1	11.7	2.3	7.3	-	4.1	-	38.3	-	23.0	-	16.4	2.3	2.3	-	1.7	3.0	9.3	-	59.0	97.3	2.7	-	2.7	10
J 11/4 + 0.063	26.3	1.3	35.2	2.3	1.9	-	-	-	67.0	-	10.5	-	7.0	1.5	0.5	-	4.5	4.5	-	-	28.5	95.5	4.5	-	4.5	11
J 12/2 + 0.20	17.3	0.1	22.1	0.4	9.8	-	0.7	-	50.4	1.9	1.6	0.6	20.0	3.1	3.1	-	-	13.1	-	-	43.4	93.8	6.2	-	6.2	12
J 12/2 + 0.063	16.5	0.6	28.3	0.7	11.6	-	5.9	-	65.6	1.0	5.7	-	6.8	3.1	0.8	1.4	-	9.3	1.3	-	29.4	93.0	7.0	-	7.0	13
J 12/3 + 0.20	30.1	2.4	22.9	-	13.5	1.6	4.7	-	75.2	1.0	6.2	-	7.8	1.5	0.6	-	-	6.2	-	-	23.3	98.5	1.5	-	1.5	14
J 12/3 + 0.063	40.1	0.7	25.5	1.2	8.5	-	0.6	-	76.6	-	5.0	-	3.7	3.0	0.6	-	-	4.4	-	-	16.7	93.3	6.7	-	6.7	15
J 12/4 + 0.20	16.2	1.0	15.4	1.6	3.5	-	2.3	-	40.0	0.6	0.6	-	28.8	1.9	0.6	-	0.6	19.9	-	-	53.0	93.0	6.4	0.6	7.0	16
J 12/4 + 0.063	29.1	1.5	38.9	2.6	2.1	-	-	-	74.2	-	4.2	0.5	7.5	3.7	0.5	-	0.5	3.3	1.0	-	21.2	95.4	3.7	0.9	4.6	17

x + 0.063 c.a.d. + 0.063 - 0.20 mm grain classe de l'échantillon J 3/5
i.e. the + 0.063 - 0.20 mm grain class of the sample J 3/5

xx + 0.20 c.a.d. + 0.20 - 0.40 mm grain classe de l'échantillon J 3/9
i.e. + 0.20 - 0.40 mm grain class of the sample J 3/9

RÉSULTATS DE LA SÉPARATION MAGNÉTIQUE ET ELECTROMAGNÉTIQUE DE LA FRACTION LOURDE DES ÉCHANTILLONS DES SONDAGES DE LA RÉGION DE JREIDA

RESULTS OF THE MAGNETIC AND ELECTROMAGNETIC SEPARATION OF THE HEAVY FRACTION THE SAMPLES FROM BOREHOLES IN THE REGION OF JREIDA

Tableau 9/1
Table 9/1

MS[1] - Séparation de l'échantillon J 1/1-2
Separation of the sample J 1/1-2

Échantillon Sample	Poids Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate				
J 1/1 +0.20[x]	0.7512			
J 1/1 +0.063[xx]	1.0122			
J 1/2 +0.20	0.9347			
J 1/2 +0.063	0.7165			
Admission total Total feed J 1/1-2	3.4146	100.00		
MAGNÉTIQUES MAGNETICS				
Concentré I Concentrate I	0.1235	3.62	il	MI
total magnetiques total magnetics	0.5548	16.25		
PARAMAGNÉTIQUES PARAMAGNETICS				
Concentré III Concentrate III	0.2446	7.16		
Produit intermédiaire IIIa Middling product IIIa	0.2855	8.36	ep40,ep.m.30,py,ga,st	MI
Concentré IV Concentrate IV	1.2510	36.64	ga 60	MI
Produit intermédiaire IVa Middling product IVa	0.4340	12.71	ep.m,ga,mo,ep	MI
total paramagnétiques total paramagnetics	1.2151	64.87		
NON-MAGNÉTIQUES NONMAGNETICS				
Concentré V Concentrate V	0.3995	11.70	zi 40,qu40,di,tu	MI
rendement total total yield	3.1694	92.82		

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[x] +0.20 c.a.d. +0.20 -40 mm grain classe de l'échantillon J 1/1
i.e. the +0.20-40 mm grain class of the sample J 1/1

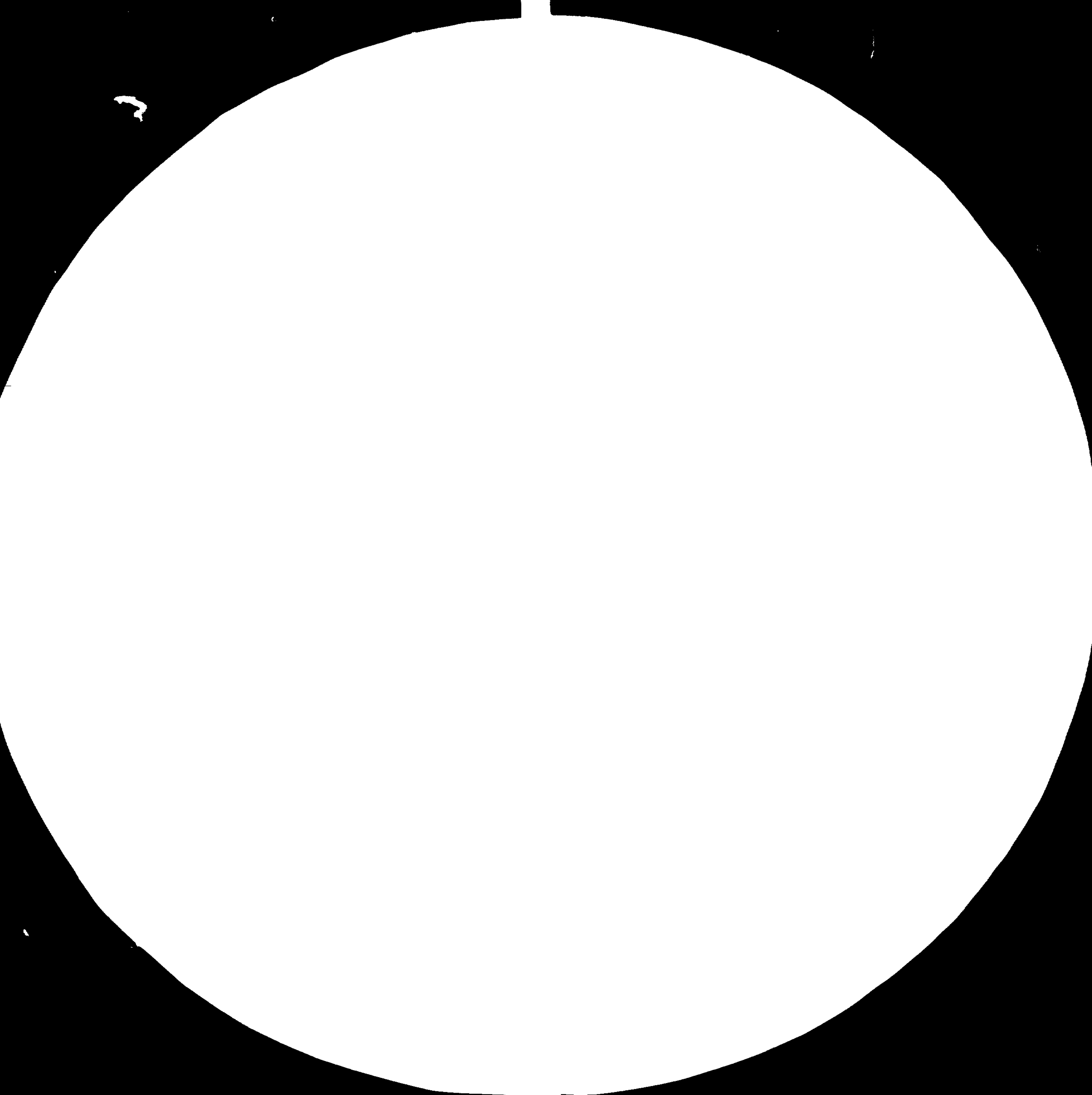
[xx] +0.063 c.a.d. +0.063-0.20 mm grain classe de l'échantillon J 1/1
i.e. the +0.063-0.20 mm grain class of the sample J 1/1

Tableau 9/2
Table 9/2

MS^2 - Séparation de l'échantillon J 2/1-4
Separation of the sample J 2/1-4

Échantillon Sample Concentré Concentrate	Poids Weight g	%	Minéraux Minerals	Remarques Remarks
J 2/1 +0.20	0.7022			
J 2/1 +0.063	0.2146			
J 2/2 +0.20	0.8321			
J 2/2 +0.063	0.6649			
J 2/3 +0.20	0.5003			
J 2/3 +0.063	0.0367			
J 2/4 +0.20	0.5066			
J 2/4 +0.063	0.3390			
Admission total Total feed J 2/1-4	3.7964	100.00		
MAGNÉTIQUES MAGNETICS				
Concentré I Concentrate I	0.0990	2.61	il	
Concentré II Concentrate II	0.3700	9.75	il	
total magnétiques total magnetics	0.4690	12.36		
PARAMAGNÉTIQUES PARAMAGNETICS				
Concentré III Concentrate III	0.4420	11.64	ep	MI
Produit intermédiaire IIIa Middling product IIIa	0.8115	21.38	ru+il,ep,ga	MI
Concentré IV Concentrate IV	0.9270	24.42	ga,ru+il	MI
Produit intermédiaire IVa Middling product IVa	0.1124	2.96		
total paramagnétiques total paramagnetics	2.2929	60.40		
NON-MAGNÉTIQUES NONMAGNETICS				
Concentré V Concentrate V	0.6845	18.03	qu50	MI
Rendement total Total yield	3.4464	99.79		

83.11.30
AD.85.03



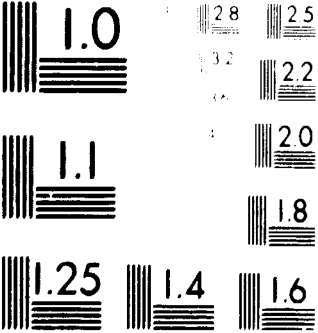

1.0
2.8
2.5
2.2
2.0
1.1
1.8
1.25
1.4
1.6

Tableau 9/3
Table 9/3

MS[3] - Séparation de l'échantillon J 3/1-2
Separation of the sample J 3/1-2

Échantillon Sample Concentré Concentrate	Poids Weight g	%	Minéraux Minerals	Remarques Remarks
J 3/1 +0.20	2.8169			
J 3/1 +0.063	2.0212			
J 3/2 +0.20	1.1130			
J 3/2 +0.063	1.5224			
Admission total J 3/1-2 Total feed	7.4735	100.00		
MAGNÉTIQUES MAGNETICS				
Concentré I Concentrate I	1.1908	15.93		an.chem. ch.a.
Concentré II Concentrate II	1.0389	13.90		
total magnétiques total magnetics	2.2297	29.83		
PARAMAGNÉTIQUES PARAMAGNETICS				
Concentré III Concentrate III	0.3065	4.10	ep50,ru+il,sph,mo	MI
Produit intermédiaire IIIa Middling product IIIa	0.6185	8.28		
Concentré IV Concentrate IV	2.3585	31.56	ga 50,ru+il50	
Produit intermédiaire IVa Middling product IVa	0.7735	10.35		
Total paramagnétiques Total paramagnetics	4.0570	54.29		
NON-MAGNÉTIQUES NONMAGNETICS				
Concentré V Concentrate V	1.1365	15.21	zi50,qu40,ru,di	MI
Rendement total Total yield	7.4232	99.33		

Tableau 9/4
Table 9/4

MS[4] - Séparation de l'échantillon J 3/3-4
Separation of the sample J 3/3-4

Échantillon Sample	Poids Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate				
J 3/3 +0.20	2.8160			
J 3/4 +0.20	2.4917			
Admission total Total feed	5.3077	100.00		
MAGNÉTIQUES MAGNETICS				
Concentré I Concentrate I	0.5038	9.49		
Concentré II Concentrate II	0.1920	3.62		
total magnétiques total magnetics	0.6958	13.11		
PARAMAGNÉTIQUES PARAMAGNETICS				
Concentré III Concentrate III	0.3055	5.76		
Produit intermédiaire IIIa Middling product IIIa	0.7950	15.98		
Concentré IV Concentrate IV	1.9625	36.97		
Produit intermédiaire IVa Middling product IVa	0.3005	5.66		
total paramagnétiques total paramagnetics	3.3635	64.37		
NON-MAGNÉTIQUES NONMAGNETICS				
Concentré V Concentrate V	0.9170	17.28	qu50,zi40	MI
Rendement total Total yield	4.9763	93.76		

Tableau 9/5
Table 9/5

MS[5] - Séparation de l'échantillon J 3/3

Separation of the sample J 3/3

Échantillon Sample	Poids Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate				
J 3/3 +0.063	4.1631			
Admission total J 3/3 Total feed	4.1631	100.00		
MAGNÉTIQUES MAGNETICS				
Concentré I Concentrate I	0.7060	16.96		
Concentré II Concentrate II	0.7801	18.74		
total magnétiques total magnetics	1.4861	35.70		
PARAMAGNÉTIQUES PARAMAGNETICS				
Concentré III Concentraté III	0.0398	0.96		
Produit intermédiaire IIIa Middling product IIIa	0.3309	7.95		
Concentré IV Concentrate IV	0.5080	12.20	il20,ru66,he18,an2,aph2	MIQ opm
Produit intermédiaire IVa Middling product IVa	0.9757	23.43		
NON-MAGNÉTIQUES NONMAGNETICS				
Concentré V Concentrate V	0.6037	14.50	zi70,qu20,tu,sil	MI
Rendement total Total yield	3.0655	73.63		

MS[6] – Séparation de l'échantillon J 3/4
Separation of the sample J 3/4

Échantillon Sample	Poids Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate				
J 3/4 +0.063	5.2335	100.00		
Admission total J 3/4 Total feed	5.2335	100.00		
MAGNETIQUES MAGNETICS				
Concentré I Concentrate I	1.0807	20.65	il 90	an.chem. ch.a.
Concentré II Concentrate II	1.0453	19.97	il 90	an.chem. ch.a.
admission total total feed	2.1260	40.62		
PARAMAGNETIQUES PARAMAGNETICS				
Concentré III Concentrate III	0.1575	3.01	ep50,ru20,st10,mo,py	HIQ
Produit intermédiaire IIIa Middling product	0.2492	4.76	ep30,ga30,ru+il30,mo,st	MI
Concentré IV Concentrate IV	1.3049	24.93	ga 70,ru+il30	MI
Produit intermédiaire IVa Middling product IVa	0.3657	6.99	ep30,ga30,st,ru+il30	MI
NON-MAGNETIQUES NONMAGNETICS				
Concentré V Concentrate V	0.8472	16.19		
Rendement total Total yield	5.0505	96.50		

Tableau 9/7
Table 9/7

MS[7] - Séparation de l'échantillon J 4/1-4

Separation of the sample J.4/1-4

Échantillon Sample — Concentré Concentrate		Poids Weight g	%	Minéraux Minerals	Remarques Remarks
J 4/1	+0.20	1.3620			
	+0.063	1.2155			
J 4/2	+0.20	0.7582			
	+0.063	0.7478			
J 4/3	+0.20	0.7768			
	+0.063	1.0457			
J 4/4	+0.20	0.6409			
	+0.063	0.8151			
Admission total Total feed		7.3620	100.00		
MAGNÉTIQUES MAGNETICS					
Concentré I Concentrate I		0.5277	7.17		
Concentré II Concentrate II		0.5791	7.87		
total magnétiques total magnetics		1.1068	15.04		
PARAMAGNÉTIQUES PARAMAGNETICS					
Concentré III Concentrate III		0.9135	12.41	ep 90	MI
Produit intermédiaire IIIa Middling product IIIa		0.8907	12.10	ep45,ru+il20,st,tu,sil	MI
Concentré IV Concentrate IV		2.4888	33.81	ga70,ru,il	MI
Produit intermédiaire IVa Middling product IVa		0.6394	8.68	ru40,ga,ep,st,mo,tu,py	MI
total paramagnétiques total paramagnetics		4.9324	67.00		
NON-MAGNÉTIQUES NONMAGNETICS					
Concentré V Concentrate V		1.0628	14.44	zi50,qu40,tu,di,ru	MI
Rendement total Total yield		7.1020	96.48		

Tableau 9/8
Table 9/8

MS[8] - Séparation de l'échantillon J 4/5-8
Separation of the sample J 4/5-8

Échantillon Sample		Poids Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate					
J 4/5	+0.20	0.3731			
	+0.063	0.4960			
J 4/6	+0.20	0.3864			
	+0.063	0.5461			
J 4/7	+0.20	0.3591			
	+0.063	0.5797			
J 4/8	+0.20	0.2596			
	+0.063	0.5232			
Admission total Total feed	J 4/5-8	3.5232	100.00		
MAGNÉTIQUES MAGNETICS					
Concentré I Concentrate I		0.3096	8.79	i161,ru28,he8,an2	MIQ
Concentré II Concentrate II		0.5278	14.98	i158,ru18,he22,an5	MIQ
total magnétiques total magnetics		0.8374	23.77		
PARAMAGNETIQUES PARAMAGNETICS					
Concentré III Concentrate III		0.5110	14,50		
Produit intermédiaire IIIa Middling product IIIa		0.3745	10.63	ep40,ru+i120,ga10,le,st	MI
Concentré IV Concentrate IV		0.7151	20.30		
Produit intermédiaire IVa Middling product IVa		0.5068	14.38		
total paramagnétiques total paramagnetics		2.1074	59.81		
NON-MAGNÉTIQUES NONMAGNETICS					
Concentré V Concentrate V		0.4627	13.13	zi55,qu40,ru,tu	MI
Rendement total Total yield		3.4075	96.71		

Tableau 9/9
Table 9/9

MS[9] – Séparation de l'échantillon J 5/1-4
Separation of the sample J 5/1-4

Échantillon Sample		Poids Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate					
J 5/1	+020	0.2984			
	+0.063	0.3450			
J 5/2	+0.20	0.4210			
	+0.063	0.3316			
J 5/3	+0.20	0.4253			
	+0.063	0.3810			
J 5/4	+0.20	0.4067			
	+0.063	0.4922			
Admission total Total feed J 5/1 – 4		3.1012	100.00		
MAGNÉTIQUES MAGNETICS					
Concentré I Concentrate I		0.0810	2.61		
Concentré II Concentrate II		0.3894	12.56		
total magnétiques total magnetics		0.4704	15.17		
PARAMAGNÉTIQUES PARAMAGNETICS					
Concentré III Concentrate III		0.9217	29.72		
Concentré IV Concentrate IV		1.1372	36.67		
total paramagnétiques total paramagnetics		2.0589	66.39		
NON-MAGNÉTIQUES NONMAGNETICS					
Concentré V Concentrate V		0.4193	13.52		
Rendement total Total yield		2.9486	95.08		

Tableau 9/10
Table 9/10

MS[10] – Séparation de l'échantillon J 5/5-8
Separation of the sample J 5/5-8

Échantillon Sample		Poids Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate					
J 5/5	+0.20	0.2806			
	+0.063	0.4077			
J 5/6	+0.20	0.3626			
	+0.063	0.5017			
	+0.20	0.2537			
J 5/7	+0.063	0.4147			
J 5/8	+0.20	0.0736			
	+0.063	0.2121			
Admission total Total feed	J 5/5-8	2.6067	100.00		
MAGNÉTIQUES MAGNETICS					
Concentré I Concentrate I		0.0933	3.58		
Concentré II Concentrate II		0.2766	10.61		
total magnétiques total magnetics		0.3699	14.19		
PARAMAGNÉTIQUES PARAMAGNETICS					
Concentré III Concentrate III		0.5480	21.02		
Produit intermédiaire IIIa Middling product IIIa		0.2187	8.39	ga + ep	MI
Concentré IV Concentrate IV		0.7326	28.10	ga	MI
total paramagnétiques total paramagnetics		1.4993	57.51		
NON-MAGNÉTIQUES NONMAGNETICS					
Concentré V Concentrate V		0.3132	12.02		
Rendement total Total yield		2.1824	83.72		

MS[11] - Séparation de l'échantillon J 7/1-4

Separation of the sample: J 7/1-4

Échantillon Sample		Poids Weight		Minéraux Minerals	Remarques Remarks
Concentré Concentrate		g	%		
J 7/1	+0.20	0.7268			
	+0.063	0.7412			
J 7/2	+0.20	0.1699			
	+0.063	0.1672			
J 7/3	+0.20	0.8254			
	+0.063	0.7543			
J 7/4	+0.20	1. 951			
	+0.063	1.8262			
Admission total J/7 1-4 Total feed		6.7061	100.00		
MAGNÉTIQUES MAGNETICS					
Concentré I Concentrate II		0.5492	8.19	il	
Concentré II Concentrate II		1.4600	21.77	il	
total magnétiques total magnetics		2.0092	29.96		
PARAMAGNETICS PARAMAGNÉTIQUES					
Concentré III Concentrate III		0.1536	2.29	ep	
Produit intermédiaire IIIa Middling product IIIa		0.4388	6.54		
Concentré IV Concentrate IV		2.7511	41.02	ga 50, mu+il 50	MI
Produit intermédiaire IVa Middling product IVa		0.3648	5.44		
total paramagnétiques total paramagnetics		3.7083	55.29		
NON-MAGNÉTIQUES NONMAGNETICS					
Concentré V Concentrate V		0.7930	11.83	zi	
rendement total total yield		6.5105	97,08		

MS[12] - Séparation de l'échantillon J 8/1-2
Separation of the sample J 8/1-2

Échantillon Sample		Poids Weight g	%	Minéraux Minarals	Remarques Remarks
Concentre Concentrate					
J 8/1	+0.20	0.3624			
	+0.063	0.7888			
J 8/2	+.20	0.5771			
	+0.063	1.0793			
Admission total J 8/1-2 Total feed J 8/1-2		2.8076	100.00		
MAGNÉTIQUES MAGNETICS					
Concentré I Concentrate I		0.2780	9.90	il 90,ru,he,goe	MI
Concentré II Concentrate II		0.4900	17.45	il 90,ru,he,goe	MI
Total magnétiques Total magnetics		0.7680	27.35		
PARAMAGNÉTIQUES PARAMAGNETICS					
Concentré III Concentrate III		0.1000	3.56	ep 50,di, me	MI
Middling prod.IIIa		0.1430	5.09		
Concentre IV Concentrate IV		0.8235	29.33	ga 50,ru	MI
Middling prod.IVa		0.0870	3.10		
Total paramagnétiques Total paramagnetics		1.1435	41.08		
NONMAGNÉTIQUES NONMAGNETICS					
Concentré V Concentaate V		0.2880	10.26	zi 50	MI
Rendement Total Total yield		2.2095	78.69		

MS[13] - Séparation de l'échantillon J 9/1-4
Separation of the sample J 9/1-4

Échantillon / Sample		Poids / Weight g	%	Minéraux / Minerals	Remarques / Remarks
Concentré / Concentrate					
J 9/1	+0.20	0.9087			
	+0.063	1.1405			
J 9/2	+0.20	0.5750			
	+0.063	0.4591			
J 9/3	+0.20	0.2372			
	+0.063	0.6316			
J 9/4	+0.20	0.0908			
	+0.063	0.2320			
admission total / total feed J 9/1-4		4.3249	100 .00		
MAGNÉTIQUES / MAGNETICS					
Concentré I / Concentrate I		0.2611	6.04		
Concentré II / Concentrate II		0.4885	11.30		
total magnétiques / total magnetics		0.7496	17.34		
PARAMAGNÉTIQUES / PARAMAGNETICS					
Concentré III / Concentrate III		0.7287	16.85		
Produit intermédiaire IIIa / Middling product IIIa		0.1921	4.44	ep,m,30,ep 30,qu20,py,st	MI(?)
Concentré IV / Concentrate IV		1.1843	27.38		
Produit intermédiaire IVa / Middling product IVa		0.5380	12.44	ga 50,ep.m.40,py	MI
total paramagnétiques / total paramagnetics		2.6431	61.11		
NON-MAGNÉTIQUES / NONMAGNETICS					
Concentré V / Concentrate V		0.6818	15,76	zi50,qu30,ru	MI

Tableau 10/1
Table

RÉSULTATS D'ANALYSE GRANULOMÉTRIQUES, DE SÉPARATION EN LIQUIDE LOURDE ET DES MESURES RADIOMÉTRIQUES DES ÉCHANTILLONS DE LA PARTIE OUEST DU PROFIL RADIOMÉTRIQUE R 8/7

RESULTS OF GRAIN SIZE ANALYSIS, HEAVY LIQUID SEPARATION AND RADIOMETRIC MEASUREMENTS OF SAND SAMPLES FROM THE WESTERN PART OF RADIOMETRIC PROFILE R 8/7

Échantillon No / Sample No	Granulométrie / Granulometry: a/ admission, feed; b/ fraction +0,8mm; c/ fraction +0,4mm; d/ fraction +0,2mm; e/ fraction −0,2mm	Granulométrie / Granulometry: rendement / yield		Séparation dans le liquide lourde / Separation in heavy liquid: Fraction lourde / Heavy fraction, rendement / yield		Fraction legère / Light fraction, rendement / yield		Rendement total / Total yield		Récupération / Recovery	Radioactivité naturelle / Natural radioactivity: Mesures / Measurements, Laboratoire / Laboratory: avant séparation dans l.l. / before separation in h.l.	fraction lourde / heavy fraction	fraction legère / light fraction	Terrain / Field	Remarques / Remarks
		g	%	g	%	g	%	g	%	%	cpm/g	cpm/g	cpm/g	cpm	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	a/	49.6565	100.00	3.7441	7.54	45.5060	91.64	49.2501	99.18						
	b/	1.5272	3.08	ns	-	1.5272	3.08	1.5272	3.08	-	nr[x]	nm[xx]	nm		
W0/0.0	c/	7.3236	14.75	0.0233	0.05	7.2996	14.68	7.3129	14.73	99.85	nr	nm	nm		MI /op.m.,tu,ga,ep,ze,sil/
	d/	26.9802	54.33	1.2398	2.50	25.4200	51.19	26.6598	53.69	98.81	0.74±0.21	1.23±0.06	nr		MIQ /see tab. 11/
	e/	13.8255	27.84	2.4810	5.00	11.2692	22.69	13.7502	27.69	99.46	21.50±0.50	22.57±0.55	0.41±0.06		MS[1] /voir tab. 11/ /voir tab. 12/
	a/	49.8405	100.00	0.9946	2.00	48.2697	96.93	49.2643	98.93						
	b/	0.6521	1.31	ns	-	0.6521	1.31	0.6521	1.31	-	nr	nm	nm		
W0/0.5	c/	4.5294	9.09	0.0123	0.02	4.4925	0.02	4.5049	9.04	99.46	nr	nm	nm		
	d/	32.7887	65.79	0.2705	0.54	32.1189	64.50	32.3892	65.04	98.78	0.20±0.17	nm	nm		MI /op.m., 40,op,ga,sil, le,zr/
	e/	11.5703	23.81	0.7120	1.43	11.0061	22.10	11.7181	23.53	98.72	4.04±0.19	3.82± 0.19	nr		MIQ /see tab. 11/ /voir tab. 11/
	a/	49.8209	100.00	3.2330	6.59	45.8937	92.15	49.1767	98.74						
	b/	0.4870	0.98	ns	-	0.4870	0.98	0.4870	0.98	-	nr	nm	nm		
W0/1.0	c/	2.7363	5.49	0.0665	0.13	2.6500	5.32	[illegible].7165	5.45	99.23	nr	nm	nm		
	d/	29.9214	60.06	1.0015	2.01	28.5560	57.33	29.5575	59.34	98.78	nr	nm	nm		MS[2] /see tab. 12/
	e/	16.6762	33.47	2.2150	4.45	14.2007	28.51	16.4157	32.96	98.44	15.40±0.70	16.54±0.44	nr		MS[2] /voir tab. 12/
W0		149.3179	100.00	8.0217	5.37	139.[illegible]	93.54	147.6911	98.91					5040	

x nr – manque de radioactivité
  nr – nonradioactive

xx nm – non mesuré
  nm – not measured

Tableau
Table 10/2

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	a/	49.5771	100.00	6.2056	12.52	43.3310	86.90	49.2866	99.42						
	b/	0.9296	1.83	ns	-	0.9296	1.88	0.9296	1.83		nr	nm	nm		
5/0.0	c/	6.4611	13.03	0.0593	0.13	6.4002	12.91	6.4595	13.03	99.98	nr	nm	nm		MI/op.m.,ga,ep,ep,
	d/	25.1814	50.79	1.6973	3.42	23.3905	47.18	25.0378	50.60	99.63	0.71±0.22	2.04±0.07	nr		
	e/	17.0050	34.30	4.4490	8.97	12.3607	24.93	16.8097	33.90	98.85	14.90±0.20	20.94±0.46	nr		MS[3] /see tab. 12/ /voir tab.12/
	a/	49.7858	100.00	3.4458	6.92	46.0798	92.66	49.5236	99.58						
	b/	1.3570	2.73	ns	-	1.3570	2.73	1.3570	2.73		nr	nm	nm		
5/0.5	c/	6.5062	13.07	0.0175	0.03	6.4797	13.03	6.4972	13.07	99.86	nr	nm	nm		MI /ga, op.m.,zi,ep,
	d/	30.8234	61.91	1.1563	2.33	29.5422	59.40	30.6955	61.73	99.59	1.36±0.07	1.12±0.05	0.18±0.06		MS[4] /see tab. 12/
	e/	11.0992	22.29	2.2700	4.56	8.7009	17.50	10.9709	22.06	98.84	31.50±0.70	27.10±0.70	0.90±0.19		MS[4] /voir tab.12/
	a/	49.8193	100.00	2.4144	4.85	47.2510	94.87	49.6754	99.72						
	b/	0.4812	0.97	ns	-	0.4812	0.97	0.4812	0.97		nr	nm	nm		
5/1.0	c/	3.6439	7.31	0.0139	0.03	3.5394	7.20	3.6033	7.23	98.89	nr	nm	nm		
	d/	33.5295	67.30	0.5315	1.07	32.9548	66.17	33.4963	67.24	99.90	nr	nm	nm		MS[5] /see tab. 12/
	e/	12.1646	24.42	1.8690	3.75	10.2256	20.53	12.0946	24.28	99.42	18.60±0.60	19.00±0.60	nr		MS[5] /voir tab.12/
W 5		149.1822	100.00	12.0638	8.09	136.4218	91.45	148.4856	99.54					6000	
	a/	49.6191	100.00	2.8828	5.81	46.1592	93.03	49.0420	98.84						
	b/	1.0712	2.16	ns	-	1.0712	2.16	1.0712	2.16		nr	nm	nm		
W10/0.0	c/	7.8450	15.81	0.0474	0.09	7.7461	15.62	7.7955	15.71	99.37	nr	nm	nm		MI/ga, op.m., ep,mo, st,zi/
	d/	26.0289	52.46	1.1204	2.26	24.4656	49.31	25.5860	51.57	98.30	0.90±0.08	1.36±0.07	nr		MS[6] /see tab. 12/
	e/	14.6740	29.57	1.7150	3.46	12.8793	25.95	14.5943	29.41	99.46	16.20±0.50	15.60±0.40	nr		MS[6] /voir tab.12/
	a/	49.8036	100.00	2.7890	5.60	46.3048	92.97	49.0938	98.57						
	b/	1.7062	3.43	ns	-	1.7062	3.43	1.7062	3.43		nr	nm	nm		
W10/0.5	c/	6.7942	13.64	0.0165	0.03	6.6502	13.41	6.6967	13.44	98.56	nr	nm	nm		
	d/	30.4081	61.06	0.7350	1.48	29.4581	59.15	30.1931	60.63	99.29	0.27±0.18	0.55±0.06	nm		MS[7] /see tab. 12/
	e/	10.8951	21.87	2.0375	4.09	8.4603	16.99	10.4978	21.08	96.35	17.70±0.60	21.60±0.60	nr		MS[7] /voir tab.12/
	a/	49.8644	100.00	1.6302	3.28	47.8538	95.97	49.4840	99.24						
	b/	3.0030	6.02	ns	-	3.0030	6.02	3.0030	6.02		nr	nm	nm		
W10/1.0	c/	7.4770	14.99	0.0285	0.06	7.3692	14.78	7.3977	14.84	98.94	nr	nm	nm		MI/ga, op.m.,zi,le, mo/
	d/	30.4213	61.01	0.5070	1.02	29.6812	59.52	30.1882	60.54	99.23	nr	nm	nm		MIQ /see tab. 11/ /voir tab.11/
	e/	8.9631	17.98	1.0947	2.20	7.6004	15.64	8.8951	17.84	99.24	10.70±0.50	12.30±0.70	nr		MIQ /see tab. 11/ /voir tab.11/
W10		149.2871	100.00	7.3020	4.89	140.3178	93.99	147.6198	98.88					5820	

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	a/	49.4416	100.00	2.7592	5.54	46.2335	93.61	49.0227	99.15						
W15/0.0	b/	0.3983	0.81	ns	-	0.3983	0.81	0.3983	0.81	-	nr	nm	nm		
	c/	4.9165	9.94	0.0192	0.04	4.8755	9.86	4.8948	9.90	99.56	nr	nm	nm		
	d/	29.4271	59.52	0.7700	1.56	28.5150	57.67	29.2850	59.23	99.52	0.80±0.19	0.79±0.05	nr		MS[8] /see tab. 12./
	e/	14.6997	29.73	1.9500	3.94	12.4946	25.27	14.4446	29.21	98.27	13.80±0.50	15.70±0.50	nr		MS[8] /voir tab.12/
	a/	49.8560	100.00	4.5557	9.20	44.7547	89.79	49.3504	98.99						
W15/0.5	b/	0.7527	1.51	ns	-	0.7527	1.51	0.7527	1.51	-	nr	nm	nm		
	c/	3.1156	6.25	0.243	0.05	3.0813	6.18	3.1056	6.23	99.68	nr	nm	nm		
	d/	34.1298	68.46	1.1051	2.22	32.7905	65.77	33.8956	67.99	99.31	0.62±0.06	0.60±0.05	nr		MS[9] /see tab. 12./
	e/	11.8579	23.78	3.4563	6.93	8.1402	16.33	11.5965	23.26	97.80	32.60±0.70	34.10±0.70	nr		MS[9]/voir tab.12/
	a/	49.7648	100.00	2.4695	4.96	46.7809	94.00	49.2504	98.97						
W15/1.0	b/	7.4091	14.89	ns	-	7.4091	14.89	7.4091	14.89	-	nr	nm	nm		
	c/	6.1616	12.38	0.0115	0.02	6.1434	12.34	6.1549	12.36	99.89	nr	nm	nm		
	d/	24.1742	48.58	0.4784	0.96	23.5132	47.25	23.9916	48.21	99.24	nr	nm	nm		MS[10]/see tab. 12/
	e/	12.0199	24.15	1.9795	3.98	9.7152	19.52	11.6948	23.50	97.30	18.04±0.37	17.60±0.60	nr		MS[10]/voir tab.12/
W15		149.0624	100.00	9.7944	6.57	137.8291	92.46	147.6235	99.03					5400	
	a/	49.6040	100.00	2.2144	4.46	46.8511	94.45	49.0655	98.91						
W20/0.0	b/	0.0740	0.15	ns	-	0.0740	0.15	0.0740	0.15	-	nr	nm	nm		
	c/	3.4245	6.90	0.0187	0.04	3.3773	6.81	3.3965	6.85	99.18	nr	nm	nm		
	d/	32.5204	65.56	0.7590	1.53	31.5382	63.58	32.2972	65.11	99.31	nr	nm	nm		MIQ /see tab. 11/
	e/	13.5851	27.39	1.4367	2.90	11.8611	23.91	13.2978	26.81	97.89	10.00±0.50	0.70±0.50	nr		MIQ /voir tab.11/
	a/	49.7576	100.00	0.8058	1.62	48.8057	98.08	49.6145	99.71						
W20/0.5	b/	0.9042	1.82	ns	-	0.9042	1.82	0.9042	1.82	-	nr	nm	nm		
	c/	5.1753	10.40	0.0013	0.01	5.1569	10.36	5.1572	10.37	99.65	nr	nm	nm		
	d/	32.5213	65.36	0.2302	0.46	32.2440	64.80	32.4742	65.26	99.86	0.47±0.17	0.40±0.11	nr		MI/ op.m.40,ga,ep, st,sil,le,di,py/ /see tab.11/
	e/	11.1568	22.42	0.5773	1.16	10.5006	21.10	11.0779	22.26	99.29	2.63±0.20	3.74±0.16	nr		MIQ /voir tab.11/
	a/	49.8150	100.00	0.5928	1.19	48.9520	98.32	49.5748	99.52						
W20/1.0	b/	1.0270	2.06	ns	-	1.0270	2.06	1.0270	2.06	-	nr	nm	nm		
	c/	3.0625	6.15	0.0013	0.01	3.0496	6.12	3.0509	6.13	99.62	nr	nm	nm		
	d/	31.1460	62.52	0.1198	0.24	30.9026	62.03	31.0224	62.27	99.60	nr	nm	nm		/see tab.11/
	e/	14.5795	29.27	0.4717	0.95	14.0028	28.11	14.4745	29.06	99.28	2.16±0.15	2.50±0.10	nr		MIQ /voir tab.11/
W20		149.1765	100.00	3.6160	2.42	144.6383	96.96	148.2548	99.38					5400	

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	a/	49.7159	100.00	3.3893	6.82	45.9592	92.50	49.3750	99.32						
W25/0.0	b/	0.2013	0.41	ns	-	0.2018	0.41	0.2013	0.41	-	93.00±38.0	nm	nm		
	c/	9.3335	18.77	0,0355	0.07	9.2557	18.34	9.3022	18.71	99.66	nr	nm	nm		MI/ga,ep,op.m.,zi,m py/
	d/	29.0814	58.49	1.5446	3.11	27.3995	55.11	28.9442	58.22	99.53	1.31±0.08	1.33±0.06	nr		MS[11]/see tab. 12/
	e/	11.1022	22.33	1.8097	3.64	9.1211	18.55	10.9303	21.99	98.4[illegible]	17.10±0.60	18.95±0.61	nr		MS[11]/voir tab.12/
	a/	49.8218	100.00	11.9669	24.02	37.4668	75.19	49.4357	99.22						
W25/0.5	b/	2.3339	4.68	ns	-	2.3339	4.68	2.3339	4.68	-	nr	nm	nm		
	c/	7.6559	15.37	0.0686	0.13	7.4800	15.01	7.5686	15.19	98.86	nr	nm	nm		MI/ga,ep,op.m.,zi/
	d/	28.2064	56.61	4.5630	9.17	23.3907	46.95	25.9587	56.12	99.12	4.23±0.23	4.20±0.12	nr		MS[12]/see tab. 12/ voir tab.12/
	e/	11.6256	23.34	7.3103	14.67	4.2522	8.55	11.5725	23.23	99.54	77.50±0.90	69.00±0.90	5.00±0.08		MS[13]/see tab. 12/
	a/	49.6996	100.00	0.8544	1.72	48.3726	97.33	49.2270	99.05						
W25/1.0	b/	4.0923	8.23	ns	-	4.0923	8.23	4.0923	0.23	-	nr	nm	nm		
	c/	8.3405	16.78	0.0022	0.01	8.3103	16.73	8.3123	16.74	99.67	nr	nm	nm		
	d/	25.5557	51.42	0.3017	0.61	25.0707	50.44	25.3724	51.05	99.28	nr	nm	nm		MI/op.m. 30,ga,ep, st,mo/
	e/	11.7111	23.57	0.5505	1.11	10.8990	21.93	11.4495	23.04	97.77	3.54±0.20	4.58±0.15	nr		MIQ /see tab. 11/ voir tab. 11/
W 25		149.2403	100.00	16.2111	10.86	131.5286	88.33	148.0397	99.19					5100	
	a/	49.6860	100.00	3.8381	7.73	45.2328	91.04	49.0709	98.77						
W30/0.0	b/	0.2227	0.45	ns	-	0.2227	0.45	0.2227	0.45	-	nr	nm	nm		
	c/	3.9103	7.87	0.0043	0.01	3.9007	7.85	3.9050	7.86	99.85	nr	nm	nm		
	d/	31.3074	63.01	1.0534	2.12	30.0002	60.38	31.0536	62.50	99.19	0.81±0.18	0.83±0.05	nr		MS[14]/see tab. 12/
	e/	14.2456	28.67	2.7804	5.60	11.1092	22.36	13.8896	27.96	97.50	18.50±0.50	19.40±0.50	nr		MS[14]/voir tab.12/
	a/	49.8327	100.00	4.0112	8.05	45.4822	91.27	49.4934	99.32						
W30/0.5	b/	0.4068	0.82	ns	-	0.4058	0.82	0.4068	0.82	-	nr	nm	nm		
	c/	2.6650	5.35	0.0092	0.02	2.6517	5.32	2.6609	5.34	99.85	nr	nm	nm		
	d/	29.0168	58.23	1.0010	2.01	27.8004	55.79	28.8014	57.80	99.26	0.94±0.08	0.89±0.04	nr		MS[15]/see tab. 12/
	e/	17.7441	35.60	3.0010	6.02	14.6233	29.34	17.6243	35.36	99.32	18.30±0.20	18.47±0.17	nr		MS[15]/voir tab.12/
	a/	49.7864	100.00	6.1695	12.39	43.4803	87.33	49.6498	99.72						
W30/1.0	b/	0.5827	1.17	ns	-	0.5827	1.17	0.5827	1.17	-	nr	nr	nm		
	c/	2.6819	5.39	0.0855	0.17	2.5418	5.11	2.6273	5.28	97.96	nr	nm	nm		MI /ga,ep,op.m.,mo zi/
	d/	34.2541	68.80	2.4078	4.84	31.8100	63.89	34.2178	68.73	99.89	1.07±0.06	1.02±0.56	nr		MS[16]/see tab.12/
	e/	12.2677	24.64	3.6762	7.38	8.5458	17.16	12.2220	24.54	99.63	20.60±0.60	19.34±0.56	nr		MS[16] /voir tab.12/
W30		149.3051	100.00	14.0188	9.39	134.1953	89.88	148.2141	99.27					4740	

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	a/	49.4045	100.00	3.9793	8.05	45.3617	91.80	49.3415	99.85						
	b/	0.8424	1.70	ns	-	0.8424	1.70	0.8424	1.70	-	nr	nm	nm		
[illegible]/0.0	c/	5.6674	11.47	0.0330	0.07	5.6240	11.38	5.6570	11.45	99.82	nr	nm	nm		
	d/	29.7551	60.22	1.1980	2.42	28.5253	57.73	27.7233	60.15	99.90	0.61±0.16	0.63±0.05	nr		MS17/see tab. 12/
	e/	13.1463	26.61	2.7438	5.56	10.3700	20.99	13.1183	26.55	99.[illegible]	17.90±0.40	18.40±0.50	nr		MS17, voir tab.12/
	a/	49.4507	100.00	1.2513	2.53	47.6035	96.26	48.8538	98.79						
	b/	0.6955	1.41	ns	-	0.6955	1.41	0.6955	1.41	-	nr	nm	nm		
W35/0.5	c/	3.4575	6.99	0.0090	0.02	3.4425	6.96	3.4515	6.98	99.82	nr	nm	nm		
	d/	31.7556	64.18	0.3182	0.64	30.8594	62.40	31.1776	63.04	98.24	nr	nm	nm		MI/op.m. 30,ca,ep,st/
	e/	13.5620	27.42	0.9341	1.87	12.6051	25.49	13.5292	27.36	99.76	5.22±0.17	4.95±0.41	nm		MIQ /see tab. 11/ voir tab.11/
	a/	49.6613	100.00	1.2539	2.52	48.3594	97.37	49.6033	99.89						
	b/	1.1564	2.33	ns	-	1.1564	2.33	1.1564	2.33	-	nr	nm	nm		
W35/1.0	c/	5.6975	11.47	0.0093	0.02	5.6782	11.44	5.6880	11.46	99.83	nr	nm	nm		
	d/	28.1723	56.73	0.3231	0.65	27.8280	56.04	28.1511	56.69	99.92	0.43±0.20	0.36±0.10	nr		MI/op.m. 40,ca,st sil,zi,co/
	e/	14.6355	29.47	0.9210	1.85	13.6868	27.56	14.6078	29.41	99.81	2.62±0.08	5.49±0.39	nr		MIQ /see tab. 11/ voir tab.11/
Σ 35		148.5220	100.00	6.4850	4.37	141.3236	95.13	147.5066	99.50					4860	
	a/	49.6465	100.00	4.0245	8.10	45.6015	91.86	49.6260	99.97						
	b/	9.4988	19.14	ns	-	9.4988	19.14	9.4988	19.14	-	nr	nm	nm		
W40/0.0	c/	10.9076	21.97	0.0255	0.05	10.8731	21.92	10.9036	21.97	99.73	nr	nm	nm		
	d/	19.1457	38.57	1.1323	2.28	18.0096	36.28	19.1419	38.56	99.96	1.12±0.29	1.15±0.09	nr		MS18/see tab. 12/
	e/	10.0355	20.32	2.8667	5.77	7.2150	14.53	10.0317	20.30	99.96	29.50±0.80	33.40±0.90	nr		MS18/voir tab. 12/
	a/	49.6553	100.00	1.0616	2.14	48.7009	97.68	49.7625	99.82						
	b/	0.1404	0.28	ns	-	0.1404	0.28	0.1404	0.28	-	nr	nm	nm		
W40/0.5	c/	1.1144	2.24	0.0028	0.01	1.1078	2.22	1.1106	2.23	99.66	nr	nm	nm		
	d/	30.3709	60.92	0.2673	0.54	30.0585	60.29	30.3263	60.83	99.85	nr	nm	nm		MI/op.m. 30,ra,le, ep,st,py,tu/
	e/	18.2236	36.56	0.7910	1.59	17.3942	[illegible]	18.1852	36.48	99.76	2.17±0.13	2.00±0.10	nr		MIQ /see tab.11/ voir tab.11/
	a/	49.1923	100.00	0.7633	1.56	48.3551	[illegible]	49.1184	99.85						
	b/	0.2563	0.52	ns	-	0.2563	0.[illegible]	0.2563	0.52	-	nr	nm	nm		
W40/1.0	c/	2.2236	4.53	0.0090	0.02	2.2206	4.51	2.2296	4.53	100.00	nr	nm	nm		
	d/	34.5602	70.26	0.2657	0.54	34.2518	69.63	34.5155	70.17	99.87	nr	nm	nm		MI/op.m. 30,ca,ep, di,st,zo/
	e/	12.1462	24.69	0.4906	1.00	11.6264	23.63	12.1170	24.63	99.76	1.56±0.46	2.06±0.14	nr		MIQ /see tab. 11/ voir tab.11/
Σ 40		148.6582	100.00	5.6494	3.93	142.6575	95.94	148.5069	99.87					4200	

Tableau 10/6
Table

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	a/	49.5483	100.00	1.6430	3.32	47.3658	95.60	49.0133	98.92						
	b/	4.9021	9.89	ns	-	4.9021	9.89	4.9021	9.89	-	nr	nm	nm		
W45/0.3	c/	15.8068	31.90	0.0130	0.02	15.7600	31.81	15.7730	31.83	99.79	nr	nm	nm		MI /op.m..,ep,tu,ga,
	d/	22.9585	46.34	0.5005	1.01	22.9567	44.52	22.5572	45.53	98.25	nr	nm	nm		MIQ /see tab. 11/
	e/	5.8809	11.87	1.1345	2.29	4.6470	9.38	5.7815	11.67	98.31	18.00±0.80	16.17±0.36	nr		MIQ /voir tab.11/
	a/	49.8529	100.00	0.6615	1.33	48.5240	97.33	49.1855	98.66						
	b/	0.2711	0.54	ns	-	0.2711	0.54	0.2711	0.54	-	nr	nm	nm		
W45/0.5	c/	1.9760	3.76	0.0080	0.02	1.8461	3.70	1.8541	3.72	98.83	nr	nm	nm		
	d/	29.7504	59.68	0.1510	0.30	29.2666	58.71	29.4176	59.01	98.58	nr	nm	nm		MI op.m. 30,ga,py,e[illegible] di,st,tu/
	e/	17.9554	36.02	0.5025	1.01	17.1402	34.38	17.6427	35.39	98.26	2.16±0.13	1.75±0.11	0.45±0.11		MIQ /voir tab.11 /see tab. .../
	a/	48.8035	100.00	0.0824	0.17	48.0332	98.42	48.1156	98.59						
	b/	0.2273	0.47	ns	-	0.2273	0.47	0.2273	0.47	-	nr	nm	nm		
W45/1.0	c/	1.2262	2.51	0.0082	0.02	1.2004	2.46	1.2086	2.45	98.56	nr	nm	nm		
	d/	31.7556	65.07	0.0185	0.04	31.2349	64.00	31.2534	64.04	98.42	nr	nm	nm		MI/op.m. 10,ga,ep, sp,le,mo/
	e/	15.5944	31.95	0.0557	0.11	15.3706	31.49	15.4263	31.60	98.92	nr	nr	nr		MI/ op.m. 60,ep,py, ga,an,mo/
W 45		148.2047	100.00	2.3919	1.61	143.9230	97.11	146.3149	98.72					4920	
	a/	49.8287	100.00	1.0879	2.19	48.1135	96.56	49.2014	98.75						
	b/	4.4726	8.98	ns	-	4.4726	8.98	4.4726	8.98	-	nr	nm	nm		
W50/0.0	c/	14.4960	29.09	0.0085	0.02	14.4500	29.00	14.4585	29.02	99.74	nr	nm	nm		MI/op.m.,[illegible],ep,[illegible], py/
	d/	25.7267	51.63	0.3670	0.74	24.8892	49.95	25.2562	50.69	98.17	nr	nm	nm		MIQ /see tab. 11/
	e/	5.1314	10.30	0.7124	1.43	4.3017	8.63	5.0141	10.06	97.71	10.90±0.40	9.39±0.35	0.32±0.02		MIQ /voir tab.11/
	a/	49.9074	100.00	1.8600	3.73	47.4639	95.11	49.3239	98.84						
	b/	7.2596	14.55	ns	-	7.2596	14.55	7.2596	14.55	-	nr	nm	nm		
W50/0.5	c/	12.5241	25.09	0.0205	0.04	12.4906	25.03	12.5111	25.07	99.90	nr	nm	nm		MI/op.m.,[illegible],le,ep, mo/ /voir tab.11/
	d/	26.7752	53.65	0.6867	1.38	25.7229	51.54	26.4096	52.92	98.63	0.67±0.21	0.51±0.04	nr		MIQ /see tab. 11/ /voir tab.11
	e/	3.3485	6.71	1.1528	2.31	1.9908	3.99	3.1436	6.30	95.93	21.30±0.70	21.40±0.60	nr		MIQ /see tab. 11/
	a/	49.7380	100.00	2.1325	4.29	45.9533	94.40	49.0858	98.69						
	b/	1.3640	2.74	ns	-	1.3640	2.74	1.3640	2.74	-	nr	nm	nm		
W50/1.0	c/	6.3107	12.69	0.0156	0.03	6.2973	12.66	6.3129	12.69	100.00	nr	nm	nm		MI/ op.m.,[illegible],ep,[illegible]/
	d/	31.7230	63.78	0.6310	1.27	30.6947	61.71	31.3257	62.98	98.75	nr	nm	nm		MS19 /see tab.12/
	e/	10.3404	20.79	1.4859	2.99	8.5975	17.29	10.0832	20.27	97.51	9.93±0.23	6.63±0.17	2.14±0.21		MS19 /voir tab.12/
W 50		149.4721	100.00	5.0804	3.40	142.5307	95.36	147.6111	98.76					4200	

Tableau 10/7
Table

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	a/	49.8793	100.00	2.0129	4.05	47.4353	95.35	49.4367	99.41						
[illegible]/0.0	b/	3.4352	6.91	ns	-	3.4352	6.91	3.4352	6.91	-	nr	nm	nm		
	c/	13.8293	27.54	0.0137	0.03	13.8006	27.73	13.8143	21.81	99.89	nr	nm	nm		/voir tab.11/
	d/	27.4785	55.31	0.5065	1.02	26.4839	53.32	26.9984	54.34	98.25	0.59±0.20	0.42±0.10	nr		MIQ /see tab. 11/ /voir tab.11
	e/	4.9363	9.94	1.0484	2.11	3.7001	7.45	4.7485	9.56	96.20	27.50±0.70	25.01±1.24	nr		MIQ /see tab. 11/
	a/	49.8467	100.00	6.7896	13.62	42.6304	85.53	49.4200	99.14						
[illegible]5/05	b/	0.4217	0.85	ns	-	0.4217	0.85	0.4217	0.86	-	nr	nm	nm		MI/op.m.,sa,ep,zo, zi,chr/ /voir tab
	c/	5.7571	11.55	0.0177	0.04	5.7229	11.48	5.7336	11.51	99.68	nr	nm	nm		
	d/	29.3067	58.79	1.7251	3.46	27.4111	54.99	29.1362	58.45	99.42	0.5±0.08	0.81±0.02	nr		MIQ /see tab. 11/
	e/	14.3612	28.80	5.0468	10.12	9.0737	18.21	14.1235	28.33	95.13	22.60±0.60	19.90±0.50	1.35±0.20		MS20 /voir tab.12 /see tab.12
	a/	49.7826	100.00	1.1010	2.21	48.4863	97.20	49.5873	99.41						
[illegible]5/1.0	b/	6.4361	12.90	ns	-	6.4361	12.90	6.4361	12.90	-	nr	nm	nm		
	c/	12.6163	25.29	0.0017	0.01	12.6100	25.28	12.6117	25.29	99.95	nr	nm	nm		/voir tab.11/
	d/	27.4099	54.95	0.3635	0.73	26.8704	53.87	27.2339	54.60	99.36	0.62±0.20	0.54±0.11	nr		MIQ /see tab. 11/ voir tab.11
	e/	3.4183	6.86	0.7353	1.48	2.5698	5.15	3.3056	6.63	96.70	12.00±0.70	14.20±0.50	nr		MIQ /see tab. 11/
[illegible] 55		149.4036	100.00	9.9035	6.63	138.5425	92.73	148.4480	99.36					3000	
	a/	49.9020	100.00	3.2020	6.42	45.9451	92.07	49.1471	98.49						
[illegible]60/0.0	b/	1.6376	3.23	ns	-	1.6376	3.28	1.6376	3.28	-	nr	nm	nm		
	c/	7.4275	14.88	0.0227	0.05	7.3964	14.82	7.4191	14.87	99.89	nr	nm	nm		MI/sa,ep,op.m.,chr/
	d/	33.4707	67.07	1.2073	2.42	31.7867	63.70	32.9940	66.12	98.56	0.49±0.07	0.52±0.06	nr		MS21 /see tab. 12/
	e/	7.3662	14.77	1.9720	3.95	5.1344	10.27	7.0964	14.22	96.34	22.00±0.90	21.00±0.90	nr		MS21 /voir tab.12/
	a/	49.9110	100.00	2.1203	4.25	47.4704	95.11	49.5912	99.36						
[illegible]60/0.5	b/	3.7134	7.44	ns	-	3.7134	7.44	3.7134	7.44	-	nr	nm	nm		
	c/	16.3408	32.74	0.0381	0.08	16.2387	32.64	16.3268	32.71	99.91	nr	nm	nm		/voir tab.11/
	d/	27.7040	55.51	1.0672	2.14	26.4646	53.02	27.5318	55.16	99.38	0.70±0.20	0.78±0.16	nr		MIQ /see tab. 11/ /voir tab.11
	e/	2.1528	4.31	1.0155	2.03	1.0037	2.01	2.0192	4.05	93.79	29.30±1.30	35.12±0.88	2.01±0.32		MIQ /see tab. 11/
	a/	49.8256	100.00	2.6424	5.30	46.5850	93.49	49.2274	98.79						
[illegible]60/1.0	b/	0.6851	1.37	ns	-	0.6851	1.37	0.6851	1.32	-	nr	nm	nm		MI/op.m.,sa,ep,zi, chr,le/
	c/	3.8922	7.81	0.0537	0.11	3.8200	7.67	3.8737	7.78	99.52	nr	nm	nm		
	d/	37.2534	74.78	0.7938	1.59	36.0317	72.41	36.8755	74.00	98.96	nr	nm	nm		MS22/see tab. 12/
	e/	7.9539	16.04	1.7949	3.60	6.0002	12.04	7.7951	15.64	97.56	18.10±0.80	14.69±0.30	0.79±0.20		MS22 /voir tab.12/
[illegible]60		149.6416	100.00	7.9652	5.32	140.0005	93.56	147.9657	98.88					2340	

Table 1.5

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	a/	49.4152	100.00	1.2735	2.58	47.8482	96.42	48.9217	99.00						
	b/	0.5596	1.13	ns	-	0.5596	1.13	0.5596	1.13	-	nr	nm	nm		
[illegible]/0.0	c/	2.8005	5.67	0.0016	0.01	2.7855	5.64	2.7902	5.65	99.63	nr	nm	nm		
	d/	27.1957	55.03	0.2066	0.42	26.7900	54.21	26.9966	54.63	99.27	nr	nm	nm		MIQ /voir tab.11/
	e/	18.8593	38.17	1.0653	2.16	17.5108	35.44	18.5761	37.59	98.50	8.28±0.35	8.10±0.33	nr		MIQ /see tab.11/
	a/	49.6230	100.00	2.0214	4.08	47.1365	94.99	49.1579	99.07						
	b/	0.5236	1.06	ns	-	0.5236	1.06	0.5236	1.06	-	nr	nm	nm		le,ga/
[illegible]/0.5	c/	1.8344	3.70	0.0097	0.02	1.8126	3.65	1.8223	3.67	99.34	nr	nm	nm		MI/op.m.,ep,gce,chr
	d/	28.0719	56.57	0.4938	1.00	27.4207	55.26	27.9145	56.25	99.44	nr	nm	nm		MS^{23}/see tab. 12 .../
	e/	19.1931	38.67	1.5179	3.06	17.3796	35.02	18.8975	38.08	98.46	4.65±0.23	5.43±0.10	nr		MS^{23}/voir tab.12/
	a/	49.3779	100.00	3.2955	6.67	45.3572	91.85	48.6527	98.52						
	b/	0.6032	1.22	ns	-	0.6032	1.22	0.6032	1.22	-	nr	nm	nm		
[illegible]/1.0	c/	2.1432	4.35	0.0092	0.02	2.1193	4.29	2.1285	4.31	99.08	nr	nm	nm		MI /op.m.,ga,no/
	d/	30.9044	62.59	0.3110	1.64	29.7940	60.34	30.6050	61.98	99.03	nr	nm	nm		MS^{24} /see tab. 12 .../
	e/	15.7221	31.84	2.4753	5.01	12.8407	26.00	15.3160	31.01	97.42	12.80±0.40	12.53±0.43	nr		MS^{24}/voir tab.12/
365		148.4161	100.00	6.5904	4.44	140.1419	94.42	146.7323	98.86					2220	

RÉSULTATS DE L'ANALYSE PLANIMÉTRIQUE - LUMIÈRE TRANSMISE ET RÉFLECTIVE - PROFIL RADIOMÉTRIQUE R 8/7 / PARTIE OUEST/

GRAIN COUNTS RESULTS - LIGHT TRANSMITTED AND REFLECTED - RADIOMETRIC PROFILE R 8/7 /PART WEST/

Tableau / Table 11

Échant.No / Sample No	MINÉRAUX LOURDS / HEAVY MINERALS — MINÉRAUX OPAQUES / OPAQUE MINERALS									MINÉRAUX TRANSPARENTS / TRANSPARENT MINERALS														MINÉRAUX LÉGERS / LIGHT MINERALS			
	il	sph	ru	an	he	ma mag	geo	Autres Others	Total OM	le	zi	mo	ga	di	st	sil	tu	ep	py am	Autres Others	Total MT	Total HM	qu	cor	Total LM	No
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
W 0/0.5 - 0.2 x	21.4	-	30.3	4.2	4.2	1.7	3.0	-	64.8	3.3	6.6	1.6	4.9	-	0.5	-	-	9.3	2.7	-	28.9	93.7	6.3	-	6.3	1
W 10/1.0 + 0.2 xx	21.6	2.1	26.7	7.2	5.1	1.0	3.1	-	65.8	1.0	15.6	-	3.0	-	1.5	0.5	-	3.0	1.5	-	26,1	92.9	7.1	-	7.1	2
W 10/1.0 - 0.2	33.5	-	23.9	5.1	3.2	0.6	1.9	-	68.3	2.1	7.5	-	3.7	2.1	1.1	0.5	0.5	4.3	1.1	-	22.9	91.2	8.8	-	8.8	3
W 20/0.0 + 0.2	13.0	-	13.8	2.2	4.3	1.5	5.8	-	40.6	3.8	2.8	-	27.4	0.9	2.8	-	-	8.5	6.6	-	52.8	93.4	6.6	-	6.6	4
W 20/0.0 - 0.2	12.9	-	32.4	3.9	10.6	0.6	2.2	-	62.6	0.9	14.7	0.5	6.2	-	2.4	-	-	2.4	2.4	-	29.5	92.1	7.9	-	7.9	5
W 20/0.5 - 0.2	39.4	-	23.8	3.0	3.0	0.7	1.4	-	71.3	1.0	8.4	3.0	4.0	0.5	1.5	-	-	3.5	3.5	-	25.4	96.7	3.3	-	3.3	6
W 20/1.0 - 0.2	15.2	-	27.2	4.3	5.4	2.2	3.3	-	57.6	4.5	7.6	2.3	15.2	0.8	2.3	-	0.8	6.1	-	-	39.6	97.2	2.8	-	2.8	7
W 25/1.0 - 0.2	19.9	-	32.8	3.9	8.4	0.6	2.6	-	68,2	0.6	16.7	1.3	4.5	0.6	1.3	-	1.3	3.2	0.6	-	30.1	98.3	1.7	-	1.7	8
W 35/0.5 - 0.2	31.2	-	31.2	2.0	5.3	-	1.3	-	71.0	0.6	17.5	-	1.3	-	0.6	0.6	-	2.6	-	-	23.2	94.2	5.8	-	5.8	9
W 35/1.0 - 0.2	31.6	-	22.8	2.7	6.7	1.3	3.4	-	68.5	-	15.4	-	2.5	-	1.2	-	-	3.1	1.9	-	24.1	92.6	7.4	-	7.4	10
W 40/0.5 - 0.2	25.2	-	30.8	0.5	5.7	1.0	1.6	-	64.8	1.1	11.2	0.6	1.8	1.1	3.3	-	0.6	3.9	3.4	-	27.0	91.8	8.2	-	8.2	11
W 40/1.0 - 0.2	26.0	0.6	26.0	4.5	2.8	-	0.6	-	60.5	-	8.9	0.6	10.0	-	0.6	0.6	1.1	5.0	4.4	-	31.2	91.7	8.3	-	8.3	12
W 45/0.0 + 0.2	9.7	-	15.3	4.8	10.4	-	3.5	-	43.7	2.5	5.0	1.7	26.1	0.8	0.8	-	-	10.9	2.5	and 0.8	51.1	94.8	5.2	-	5.2	13
W 45/0.0 - 0.2	25.7	-	29.0	0.7	14.5	0.7	1.3	-	71.9	-	10.1	-	8.7	0.7	0.7	-	0.7	0.7	0.7	-	22.3	94.2	5.8	-	5.8	14
W 45/0.5 - 0.2	15.4	-	33.7	3.5	11.2	-	-	-	63.8	-	12.6	1.7	5.9	3.4	1.7	-	2.5	4.2	1.7	-	33.7	97.5	2.5	-	2.5	15
W 50/0.0 + 0.2	12.5	0.8	15.8	0.8	5.0	-	9.1	-	44.0	-	2.9	2.9	26.0	4.8	1.0	-	-	13.5	2.9	-	54.0	100.0	-	-	-	16
W 50/0.0 - 0.2	11.6	-	37.2	3.5	2.0	0.5	-	-	54.8	-	13.1	0.7	17.6	1.3	-	2.0	-	7.8	0.7	-	43.2	98.0	2.0	-	2.0	17
W 50/0.5 + 0.2	18.6	-	22.0	2.5	4.2	-	-	-	47.3	-	1.9	-	22.6	0.9	-	-	-	23.6	0.9	-	49.9	97.2	2.8	-	2.8	18
W 50/0.5 - 0.2	17.6	-	26.1	2.7	6.4	2.1	2.1	-	57.1	-	35.1	1.8	2.4	0.6	0.6	-	-	1.8	-	-	42.3	99.4	0.6	-	0.6	19
W 55/0.0 + 0.2	12.1	-	20.2	0.7	5.4	0.7	1.3	-	40.3	-	2.8	0.9	35.5	0.9	-	-	-	16.8	0.9	-	57.8	98.1	1.9	-	1.9	20
W 55/0.0 - 0.2	28.6	-	18.8	4.0	-	1.5	0.5	-	56.3	-	33.0	1.7	2.3	0.6	0.6	-	-	3.4	-	-	41.6	97.9	2.1	-	2.1	21
W 55/0.5 + 0.2	29.0	-	11.0	1.0	6.0	-	6.0	-	53.0	1.7	2.6	0.8	24.8	-	1.7	-	-	11.1	1.7	-	44.4	97.4	2.6	-	2.6	22
W 55/1.0 + 0.2	18.8	0.9	6.8	0.9	20.5	1.7	2.5	-	52.1	0.9	0.9	-	24.3	0.9	-	-	-	18.3	1.7	-	47.0	99.1	0.9	-	0.9	23
W 55/1.0 - 0.2	26.3	-	22.2	2.3	2.9	0.6	0.6	-	54.9	1.3	15.5	1.3	11.6	1.9	-	-	0.6	11.0	1.3	-	44.5	99.4	0.6	-	0.6	24
W 65/0.0 - 0.2	28.0	2.2	9.5	1.1	19.8	0.5	0.5	-	61.6	2.0	19.1	2.0	4.4	-	1.5	0.5	-	5.9	0.5	cd 0.5	36.4	98.0	2.0	-	2.0	25

x c.a.d. - 0.20 mm grain classe de l'échantillon W0/0.5
i.e. the - 0.20 mm grain class of the sample W 0/0.5

xx c.a.d. + 0.20 - 0.40 mm grain classe de l'échantillon W 10/1.0
i.e the + 20 - 0.40 mm grain class of the sample W 10/0.0

RÉSULTATS DE LA SÉPARATION MAGNÉTIQUE ET ÉLECTROMAGNÉTIQUE DE LA FRACTION LOURDE DES ÉCHANTILLONS DE LA PARTIE OUEST DU PROFIL RADIOMÉTRIQUE R 8/7.

RESULTS OF MAGNETIC AND ELECTROMAGNETIC SEPARATION OF THE HEAVY FRACTION OF THE SAMPLES FROM THE WESTERN PART OF RADIOMETRIC PROFILE R 8/7.

Tableau 12/1
Table 12/1

MS[1] – Séparation de l'échantillon W 0/0.0
Separation of the sample W 0/0.0

Échantillon / Sample / Concentré / Concentration	Poids / Weight g	%	Minéraux / Minerals	Remarques / Remarks
W 0/0.0 +0.20 x	1.2398			
-0.20 xx	2.4810			
admission total / total feed	3.7208	100.00		
MAGNÉTIQUES / MAGNETICS				
Concentré I / Concentrate I	0.3080	8.28	il	MI
Concentré II / Concentrate II	1.0420	28.00	il	MI
total magnétiques / total magnetics	1.3500	36.28		
PARAMAGNÉTIQUES / PARAMAGNETICS				
Concentré III / Concentrate III	0.1120	3.01		
Produit intermédiaire IIIa / Middling product IIIa	0.2767	7.44		
Concentré IV / Concentrate IV	1.0615	28.53	ga 50	MI
Produit intermédiaire IVa / Middling product IVa	0.1587	4.27	ru50,ep20,ga20,le mo,st,py	MIQ
total paramagnétiques / total paramagnetics	1.6089	43.25		
NON-MAGNÉTIQUES / NONMAGNETICS				
Concentre V / Concentrate V	0.5550	14.92	zi90,ru,tu,qu2	MI
rendement total / total yield	3.5139	94.45		

x +0.20 c.a.d. +0.20-0.40 mm grain classe de l'échantillon W 0/0.0
i.e. the +0.20-0.40 mm grain class of the sample W0/0.0

xx -0.20 c.a.d. -0.20 grain classe de l'échantillon W0/0.0
i.e. the -0,20 grain class of the sample W0/0.0

Tableau 12/2
Table 12/2

MS[2] - Séparation de l'échantillon WO/1.0
Separation of the sample WO/1.0

Échantillon Sample		Poids Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate					
WO/1	+0.20	1.0015			
	-0.20	2.2150			
admission total total feed		3.2165	100.00		
MAGNÉTIQUES MAGNETICS					
Concentré I Concentrate I		0.7146	22.22		
Concentré II Concentrate II		0.9150	28.45		
total magnétiques total magnetics		1.6296	50.67		
PARAMAGNÉTIQUES PARAMAGNETICS					
Concentré III Concentrate III		0.2948	9.17		
Concentré IV Concentrate IV		0.6882	21.40		
total paramagnétiques total paramagnetics		0.9830	30.57		
NON-MAGNÉTIQUES NONMAGNETICS					
Concentré V Concentrate V		0.4896	15.22	zi90,ru,st,di	MI
rendement total total yield		3.1022	96.46		

MS3 - Séparation de l'échantillon W5/0.0
Separation of the sample W5/0.0

Échantillon Sample	Poids weight g	%	Minéraux	Remarques Remarks
Concentré Concentrate				
W 5/0.0 +0.20	1.6973			
W 5/0.0 -0.20	1.4490			
admission total total feed	6.0463	100.00		
MAGNÉTIQUES MAGNETICS				
Concentré I Concentrate I	0.9740	16.11		
Concentré II Concentrate II	0.3468	5.74		
total magnétiques total magnetics	1.3208	21.85		
PARAMAGNÉTIQUES PARAMAGNETICS				
Concentré III Concentrate III	0.2810	4.65		
Produit intermédiaire IIIa Middling product IIIa	0.4412	7.30		
Concentré IV Concentrate IV	1.3267	21.94		
Produit intermédiaire.IVa Middling product IVa	0.2652	4.39		
total paramagnétiques total paramagnetiks	2.3141	38.38		
NON-MAGNÉTIQUES NONMAGNETICS				
Concentré V Concentrate V	2.0858	34.50	qu50,zi40,le,di	MI
rendement total total yield	5.7207	9 .63		

MS[4] – Séparation de l'échantillon W 5/05
Separation of the sample W 5/05

Échantillon Sample		Poids Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate					
W 5/0.5	+0.20	1.1563			
	-0.20	2.2700			
admission total total feed		3.4363	100.00		
MAGNÉTIQUES MAGNETICS					
Concentré I Concentrate I		0.2580	7.51		
Concentré II Concentrate II		1.0520	30.61		
total magnétiques total magnetics		1.3100	38.12		
PARAMAGNÉTIQUES PARAMAGNETICS					
Concentré III Concentrate III		0.1490	4.34		
Produit intermédiaire IIIa Middling product IIIa		0.1842	5.36		
Concentré IV Concentrate IV		0.9525	27.72	ga 50	MI
Produit intermédiaire IVa Middling product IVa		0.1370	3.99		
total paramagnétiques total paramagnetics		1.4227	41.41		
NON-MAGNÉTIQUES NONMAGNETICS					
Concentré V Concentrate V		0.5193	15.11	zi90,qu5,ru,tu,	MI
rendement total total yield		3.2520	94.64		

Tableau 12/5
Table 12/5

MS[5] Séparation de l'échantillon W5/1.0
S Separation of the sample W5/1.0

Échantillon Sample		Poids Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate					
W 5/1.0	+0.20	0.5315			
	-0.20	1.8690			
admission total total feed	W5/1.0	2.4005	100.00		
MAGNÉTIQUES MAGNETICS					
Concentré I Concentrate I		0.2228	9.28		
Concentré II Concentrate II		0.2412	8.80		
total magnétiques total magnetics		0.4340	18.08		
PARAMAGNÉTIQUES PARAMAGNETICS					
Concentré III Concentrate III		0.0480	2.00		
Proudit intermédiaire IIIa Middling product IIIa		0.2981	12.42		
Concentré IV Concentrate IV		0.8880	36.99		
Produit intermédiaire IVa Middling product IVa		0.0846	3.52		
total paramagnétiques total paramagnetics		1.3187	54.93		
NON-MAGNÉTIQUES NONMAGNETICS					
Concentré V Concentrate V		0.4708	19.61	zi70,qu10,ru,di,st,co,aa	MI
rendement total total yield		2.2235	92.62		

MS[6] – Séparation de l'échantillon W 10/0.0
Separation of the sample W 10/0.0

Échantillon Sample / Concentré Concentrate		Poids Weight g	%	Mineraux Minerals	Remarques, Remarks
W 10/0.0	+0.20	1.1204			
	-0.20	1.7150			
Admission. total total yield		2.8354	100.00		
MAGNÉTIQUES MAGNETICS					
Concentré I ConcentrateI		0.1325	4.67		
Concentré II Concentrate II		0.2636	9.30		
total magnétiques total magnetics		0.3961	13.97		
PARAMAGNÉTIQUES PARAMAGNETICS					
Concentré III Concentrate III		0.0845	2.98		
Produit intermédiaire IIIa Middling product IIIa		0.3457	12.19		
Concentré IV Concentrate IV		1.2674	44.70	ga50,ru+il45	MI
Produit intermédiaire IVa Middling product IVa		0.1450	5.11		
total paramagnétiques total paramagnetics		1.8426	64.98		
NON-MAGNÉTIQUES NONMAGNETICS					
Concentré V Concentrate V		0.4454	15.71	zi80,qu10,di,ru	MI
rendement total total yield		2.6841	94.66		

Tableau 12/7
Table 12/7

MS[7] - Séparation de l'échantillon W 10/0.5
Separation of the sample W 10/0.5

Échantillon Sample Concentré Concentrate	Poids Weight g	%	Minéraux Minerals	Remarques Remarks
W 10/0.5 +0.20	0.7350			
W 10/0.5 -0.20	2.0375			
admission total total feed	2.7725	100.00		
MAGNÉTIQUES MAGNETICS				
Concentré I Concentrate I	0.6255	22.56		
Concentré II Concentrate II	0.4165	15.02		
total magnétiques total magnetics	1.0420	37.58		
PARAMAGNÉTIQUES PARAMAGNETICS				
Concentré III Concentrate III	0.1792	6.46	ep80,ru10,st,mo,le,tu	MI
Produit intermédiaire IIIa Middling product IIIa	0.1455	5.25	ep30,ga30,ru+il30,st,mo	MI
Concentré IV Concentrate IV	0.5289	19.08		
Concentré IVa Concentrate IVa	0.0875	3.16		
total paramagnétiques total paramagnetics	0.9411	33.95		
NON-MAGNÉTIQUES NONMAGNETICS				
Concentré V Concentrate V	0.5817	20.98	zi50,qu40,di,ru,br,tu	MI
rendement total total yield	2.5648	92.51		

Tableau 12/8
Tabla 12/8

MS[8] – Séparation de l'échantillon W 15/0.0
Separation of the sample W 15/0.0

Échantillon Sample		Poids Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate					
W 15/0.0	+0.20	0.7700			
	-0.20	1.9500			
admission total total feed	W 15/0.0	2.7200	100.00		
MAGNÉTIQUES MAGNETICS					
Concentré I Concentrate I		0.3740	13.75		
Concentré II Concentrate II		0.5350	19.67		
total magnétiques total magnetics		0.9090	33.42		
PARAMAGNÉTIQUES PARAMAGNETICS					
Concentré III Concentrate III		0.0798	2.93		
Produit intermédiaire IIIa Middling product IIIa		0.2518	9.26		
Concentré IV Concentrate IV		0.7836	28.81		
Produit intermédiaire IVa Middling product IVa		0.0825	3.03		
total paramagnétiques total paramagnetics		1.1977	44.03		
NON-MAGNÉTIQUES NONMAGNETICS					
Concentré V Concentrate V		0.4390	16.14	zi60,qu20	MI
rendement total total yield		2.5457	93.59		

Tableau 12/9
Table 12/9

MS[9] - Séparation de l'échantillon W 15/0.5
Separation of the sample W 15/0.5

Échantillon / Sample Concentré / Concentrate		Poids / Weight g	%	Minéraux / Minerals	Remarques / Remarks
W 15/0.5	+0.20	1.1051			
	-0.20	3.4563			
admission total / total feed	W 15/0.5	4.5614	100.00		
MAGNÉTIQUES / MAGNETICS					
Concentré I / Concentrate I		0.7897	17.31		
Concentré II / Concentrate II		1.3260	29.07		
total magnétiques / total magnetics		2.1157	46.38		
PARAMAGNÉTIQUES / PARAMAGNETICS					
Concentré III / Concentrate III		0.0795	1.74		
Produit intermédiaire IIIa / Middling product IIIa		0.3305	7.25		
Concentré IV / Concentrate IV		0.8690	19.05	ga80,ru+il15,ep	MI
Produit intermédiaire IVa / Middling product IVa		0.0936	2.05		
total paramagnétiques / total paramagnetics		1.3726	30.09		
NON-MAGNÉTIQUES / NONMAGNETICS					
Concentré V / Concentrate V		0.8905	19.52	zi80,qu5,st	MI
rendement total / total yield		4.3788	95.99		

Tableau 12/10
Table 12/10

10 MS

Séparation de l'échantillon W 15/1.0
Separation of the sample W 15/1.0

Échantillon Sample		Poids Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate					
W 15/1.0	+0.20	0.4784			
	-0.20	1.9796			
Admission total W 15/1.0 Total feed		2.4580	100.00		
MAGNÉTIQUES MAGNETICS					
Concentré I Concentrate I		0.3670	14.93		
Concentré II Concentrate II		0.6550	26.65		
total magnétiques total magnetics		1.0220	41.58		
PARAMAGNÉTIQUES PARAMAGNETICS					
Concentré III Concentrate III		0.0618	2.51	ep40,ru+il30,le,ga mo,tu	MI
Produit intermédiaire IIIa Middling product IIIa		0.2317	9.43		
Concentré IV Concentrate IV		0.4770	19.41		
Produit intermédiaire IVa Middling product IVa		0.0851	3.46		
total paramagnétiques total paramagnetics		0.8556	34.81		
NON-MAGNÉTIQUES NONMAGNETICS					
Concentré V Concentrate V		0.4009	16.31	zi80,qu5,di,st,sil	MI
rendement total total yield		2.2785	92.70		

Tableau 12/11
Table 12/11

MS[11] - Séparation de l'échantilon W 25/0.0
Separation of the sample W 25/0.0

Échantillon Sample	Poids Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate				
W 25/0,0 +0.20	1.5446			
W 25/0,0 -0.20	1.8097			
admission total W 25/0.0 total feed	3.3543	100.00		
MAGNÉTIQUES MAGNETICS				
Concentré I Concentrate I	0.3931	11.72		
Concentré II Concentrate II	0.7662	22.84		
total magnétiques total magnetics	1.1593	34.56		
PARAMAGNÉTIQUES PARAMAGNETICS				
Concentré III Concentrate III	0.1033	3.08		
Produit intermédiaire IIIa Middling product IIIa	0.1913	5.70		
Concentré IV Concentrate IV	0.9917	29.57		
Produit intermédiaire IVa Middling product IVa	0.2419	7.21		
total paramagnétiques total paramagnetics	1.5282	45.56		
NON-MAGNÉTIQUES NONMAGNETICS				
Concentré V Concentrate V	0.4370	13.03	zi80,di,sil,le,qu	MI
rendement total total yield	3.1245	93.15		

KS[12] - Séparation de l'échantillon W 25/0.5
Separation of the sample W 25/0.5

Échantillon Sample / Concentré Concentrate	Poids Weight g	%	Mineraux Minerals	Remarques Remarks
W 25/0.5 +0.2	4.5680			
admission total / total feed	4.5680	100.00		
MAGNÉTIQUES / MAGNETICS				
Concentré I / Concentrate I	0.2290	5.01		
Concentré II / Concentrate II	0.2894	6.34		
total magnétiques / total magnetics	0.5184	11.35		
PARAMAGNÉTIQUES / PARAMAGNETICS				
Concentré III / Concentrate III	0.0368	0.81		
Produit intermédiaire IIIa / Middling product IIIa	0.2090	4.58		
Concentré IV / Concentrate IV	2.9289	64.12	ga 90,ru+il10,	
Produit intermédiaire IVa / Middling product IVa	0.1850	4.05	ru+il50,ga40,py,ep,tu,amf	
total paramagnétiques / total paramagnetics	3.3598	73.56		
NON-MAGNÉTIQUES / NONMAGNETICS				
Concentré V / Concentrate V	0.3735	8.18	zi40,ru,st,qu5	
rendement total / total yield	4.2517	93.09		

MS[13] - Séparation de l'échantillon W 25/0.5

Separation of the sample W 25/0.5

Échantillon Sample	Poids Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate				
W 25/05 -0.20	7.3103	100.00		
Admission total Total feed	7.3103	100.00		
MAGNÉTIQUES MAGNETICS				
Concentré I Concentrate I	0.7574	10.36	il,ge	X-Ray an.
Concentré II Concentrate II	0.4917	6.73	il90,ge	X-Ray an.
total magnétiques total magnetics	1.2491	17.09		
PARAMAGNÉTIQUES PARAMAGNETICS				
Concentré III Concentrate III	0.0470	0.64	ep,sph,ge,and,an	X-Ray an.
Produit intermédiaire IIIa Middling product IIIa	0.3904	5.34	ep,and,ii,ge	X-Ray an.
Concentré IV Concentrate IV	3.3667	46.05	il40,ru30,al30	X-Ray an.
Produit intermédiaire IVa Middling product IVa	0.2533	3.46	ql,ge,il	X-Ray an.
total paramagnétiques total paramagnetics	4.0574	55.49		
NON-MAGNÉTIQUES NONMAGNETICS				
Concentré V Concentrate V	1.3738	18.79	zi90,qu2,di,st	X-Ray an. MI
rendement total total yield	6.6803	91.37		

MS[14] - Séparation de l'échantillon W 30/0.0
Separation of the sample W 30/0.0

Échantillon Sample	g	Poids Weight %	Minéraux Minerals	Remarques Remarks
Concentré Concentrate				
+0.20	1.0534			
W 30/0.0 -0.20	2.7804			
admission total total feed	3.8338	100.00		
MAGNÉTIQUES MAGNETICS				
Concentré I ConcentrateI	0.4365	11.39		
Concentré II Concentrate II	0.9660	25.20		
total magnétiques total magnetics	1.4025	36.59		
PARAMAGNÉTIQUES PARAMAGNETICS				
Concentré III Concentrate III	0.1683	4.39		
Produit intermédiaire IIIa Middling product IIIa	0.2879	7.51		
Concentré IV Concentrate IV	1.0425	27.19	ga70,ru,ep,st	MI
Produit intermédiaire IVa Middling product IVa	0.1923	5.02		
total paramagnétiques total paramagnetics	1.6910	24.11		
NON-MAGNÉTIQUES NONMAGNETICS				
Concentré V Concentrate V	0.5683	14.82	zi90,st,mo,tu	MI
rendement total total yield	3.6618	95.52		

MS[15] - Séparation de l'óechantillon W 30/0.5
Separation of the sample W 30/0.5

Échantillon Sample	Poids Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate				
W 30/0.5 +0.20	1.0010			
W 30/0.5 -0.20	3.0010			
admission total / total feed	4.0020	100.00		
MAGNETIQUES MAGNETICS :				
Concentré I / Concentrate I	0.7010	17.52	il76,he14,ru6,ma4,	MIQ
Concentré II / Concentrate II	0.9305	23.25	il62,ru32,he6	MIQ
total magnétiques / total magnetics	1.6315	40.77		
PARAMAGNETIQUES PARAMAGNETICS				
Concentré III / Concentrate III	0.1110	2.77		
Produit intermé - diaire IIIa / Middling product IIIa	0.2630	6.57		
Concentré IV / Concentrate IV	0.9723	24.30	ru+il50,ga45,py,mo	MI
Produit intermé- diaire IVa / Middling product IVa	0.1903	4.76		
total paramagnétiques / total paramagnetics	1.5366	38.40		
NON-MAGNETIQUES NONMAGNETICS				
Concentré V / Concentrate V	0.6685	16.70	zi90,di,st,mo	MI
rendement total / total yield	3.8366	95.87		

MS[16] - Séparation de l'échantillon W 30/1.0
Separation of the sample W 30/1.0

Échantillon / Sample	Poids / Weight g	%	Minéraux / Minerals	Remarques / Remarks
Concentré / Concentrate				
W 30/1.0 +0.20	2.4078			
W 30/1.0 -0.20	3.6762			
admission total / total feed	6.0840	100.00		
MAGNÉTIQUES / MAGNETICS				
Concentré I / Concentrate I	0.6137	10.09		
Concentré II / Concentrate II	1.0115	16.63		
total magnétiques / total magnetics	1.6252	26.72		
PARAMAGNÉTIQUES / PARAMAGNETICS				
Concentré III / Concentrate III	0.1606	2.64		
Produit intermédiaire IIIa / Middling product IIIa	0.4575	7.52		
Concentré IV / Concentrate IV	1.8036	29.64	ga70	MI
Produit intermédiaire IVa / Middling product IVa	0.3089	5.08		
total paramagnétiques / total paramagnetic	2.7306	44.88		
NON-MAGNÉTIQUES / NONMAGNETICS				
Concentré V / Concentrate V	1.4700	24.16	zi50,qu40,st,ru,di	MI
rendement total / total yield	5.8258	95.76		

Tableau 12/17
Table 12/17

MS[17] - Séparation de l'échantillon W 35/0.0
Separation of the sample W 35/0.0

Échantillon Sample	Poids Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate				
W 35/0.0 +0.20	1.1980			
W 35/0.0 -0.20	2.7488			
admission total total feed	3.9468	100.00		
MAGNÉTIQUES MAGNETICS				
Concentré I Concentrate I	0.4087	10.36		
Concentré II Concentrate II	1.0208	25.86		
admission total total magnetics	1.4295	36.22		
PARAMAGNÉTIQUES PARAMAGNETICS				
Concentré III Concentrate III	0.1445	3.66		
Produit intermédiaire IIIa Middling product IIIa	0.3190	8.08		
Concentré IV Concentrate IV	1.0143	25.70	ga 50,ru+il40,ep,st,py,amp	MI
Produit intermédiaire IVa Middling product IVa	0.1308	3.31	ru40,ep30,ga20 st,py,amp	MIQ
total paramagnetiques total paramagnetics	1.6086	40.75		
NON-MAGNÉTIQUES NONMAGNETICS				
Concentré V Concentrate V	0.7165	18.15	zi70,qu20,ru,di,st	MI
rendement total total yield	3.7546	95.12		

MS 18 - Séparation de l'échantillon W 40/0.0
Separation of the sample W 40/0.0

Échantillon Sample	Poids Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate				
+0.20	1.1323			
W 40/0.0 -0.20	2.8667			
admission total / total feed	3.9990	100.00		
MAGNÉTIQUES / MAGNETICS				
Concentré I / Concentrate I	0.2371	5.93		
Concentré II / Concentrate II	0.3703	9.26		
total magnétiques / total magnetics	0.6074	15.19		
PARAMAGNÉTIQUES / PARAMAGNETICS				
Concentré III / Concentrate III	0.9760	1.90		
Produit intermédiaire IIIa / Middling product IIIa	0.3322	8.31		
Concentré IV / Concentrate IV	1.6903	42.27		
Produit intermédiaire IVa / Middling product IVa	0.2905	7.26		
total paramagnétiques / total paramagnetics	2.3890	59.74		
NON-MAGNÉTIQUES / NONMAGNETICS				
Concentré V / Concentrate V	0.7520	18.80	zi70,qu10,ru,st,di	MI
rendement total / total yield	3.7484	93.73		

MS19 – Séparation de l'échantillon W 50/1.0
Separation of the sample W 50/1.0

Échantillon Sample	Poids / Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate				
W 50/1.0 +0.20	0.6310			
W 50/1.0 -0.20	1.4859			
admission total total feed	2.1169	100.00		
MAGNÉTIQUES MAGNETICS				
Concentré I Concentrate I	0.1383	6.53		
Concentré II Concentrate II	0.4078	19.26		
total magnétiques total magnetics	0.5461	25.79		
PARAMAGNÉTIQUES PARAMAGNETICS				
Concentré III Concentrate III	0.1880	8.88	ep40,ru+il 20,ga10,le,st,mo	MIQ
Produit intermédiaire IIIa Middling product IIIa	0.2094	9.89		
Concentré IV Concentrate IV	0.4996	23.60		
Produit intermédiaire IVa Middling product IVa	0.2865	13.53		
total paramagnétiques total paramagnetics	1.1835	55.90		
NON-MAGNÉTIQUES NONMAGNETICS				
Concentré V Concentrate V	0.2931	13.85	zi60,ru,tu,di,me,qu20	MI
rendement total total yield	2.0227	95.54		

Tableau 12/20
Table 12/20

MS[20] - Séparation de l'échantillon W 55/0.5
Separation of the sample W 55/0.5

Échantillon Sample	Poids Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate				
W 55/0.5 - 0.20	5.0468	100.00		
admission total total feed	5.0468	100.00		
MAGNÉTIQUES MAGNETICS				
Concentré I Concentrate I	0.8080	16.01		
Concentré II Concentrate II	0.6890	13.65		
total magnétiques total magnetics	1.4970	29.66		
PARAMAGNÉTIQUES PARAMAGNETICS				
Concentré III Concentrate III	0.1925	3.81		
Produit intermédiaire IIIa Middling product IIIa	0.0219	0.43		
Concentré IV Concentrate IV	1.4113	27.96		
Produit intermédiaire IVa Middling product IVa	0.7452	14.77		
total paramagnétiques total paramagnetics	2.3709	46.97		
NON-MAGNÉTIQUES NONMAGNETICS				
Concentré V Concentrate V	0.9806	19.43	zi80,di,sil,ru	MI
rendement total total yield	4.8485	96.06		

Tableau 12/21
Table 12/21

MS[21] Séparation de l'échantillon W 60/0.0
Separation of the sample W 60/0.0

Échantillon Sample	Poids / Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate				
W 60/0.0 +0.20	1.2073			
W 60/0.0 -0.20	1.9720			
admission total total feed	3.1793	100.00		
MAGNÉTIQUES MAGNETICS				
Concentré I Concentrate I	0.7115	22.38		
Concentré II Concentrate II	0.2732	8.59		
total magnétiques total magnetics	0.9847	30.97		
PARAMAGNÉTIQUES PARAMAGNETICS				
Concentré III Concentrate III	0.0810	2.55	ep30,ru20,le20,tu,mo,st	MIQ
Produit intermédiaire IIIa Middling product IIIa	0.2159	6.79		
Concentré IV Concentrate IV	1.2015	37.79		
Produit intermédiaire IVa Middling product IVa	0.1265	3.98		
total paramagnétiques total paramagnetics	1.6249	51.11		
NON-MAGNÉTIQUES NONMAGNETICS				
Concentré V Concentrate V	0.3400	10.69	zi70,st,di,sil	MI
rendement total total yield	2.9496	92.77		

MS22 - Séparation de l'échantillon W 60/0.5
Separation of the sample W 60/0.5

Échantillon Sample Concentré Concentrate	Poids Weight g	%	Minéraux Minerals	Remarques Remarks
W 60/05 +0.20	1.0672			
-0.20	1.0155			
admission total total feed	2.0827	100.00		
MAGNÉTIQUES MAGNETICS				
Concentré I Concentrate I	0.1893	9.09		
Concentré II Concentrate II	0.3535	16.97		
total magnétiques total magnetics	0.5428	26.06		
PARAMAGNÉTIQUES PARAMAGNETICS				
Concentré III Concentrate III	0.0629	3.02		
Produit intermédiaire IIIa Middling product IIIa	0.2338	11.23		
Concentré IV Concentrate IV	0.7240	34.76	ga80,ru+il,20	MI
Produit intermédiaire IVa Middling product IVa	0.1434	6.89		
total paramagnétiques total paramagnetics	1.1641	55.90		
NON-MAGNÉTIQUES NONMAGNETICS				
Concentré V Concentrate V	0.2385	11.45	zi60,qu5,di,ru,tu,le	MI
rendement total total yield	1.9454	93.41		

23 _ Séparation de l'échantillon W 60/1.0
MS
Separation of the sample W 60/1.0

Échantillon Sample	Poids Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate				
W 60/1.0 +0.20	0.7938			
W 60/1.0 -0.20	1.7949			
admission total / total feed	2.5887	100.00		
MAGNÉTIQUES / MAGNETICS				
Concentré I / Concentrate I	0.4269	16.49		
Concentré II / Concentrate II	0.0888	3.43		
total magnétiques / total magnetics	0.5157	19.92		
PARAMAGNÉTIQUES / PARAMAGNETICS				
Concentré III / Concentrate III	0.2374	9.17		
Produit intermédiaire IIIa / Middling product IIIa	0.1456	5.62		
Concentré IV / Concentrate IV	0.7828	30.24		
Produit intermédiaire IVa / Middling product IVa	0.3133	12.10	ru+il65,ep15,ga15,st,tu	MIQ
total paramagnétiques / total paramagnetics	1.4791	57.13		
NON-MAGNÉTIQUES / NONMAGNETICS				
Concentré V / Concentrate V	0.3583	13.84	zi90,ru,di,sil,tu	MI
rendement total / total yield	2.3530	90.89		

MS[24] - Séparation de l'échantillon W 65/0.5
Separation of the sample W 65/0.5

Échantillon / Sample	Poids / Weight g	%	Minéraux / Minerals	Remarques / Remarks
Concentré / Concentrate				
W 65/0.5 +0.20	0.4938			
W 65/0.5 -0.20	1.5179			
admission total / total feed	2.0117	100.00		
MAGNÉTIQUES / MAGNETICS				
Concentré I / Concentrate I	0.1440	7.16		
Concentré II / Concentrate II	0.2310	11.48		
total magnétiques / total magnetics	0.3750	18.64		
PARAMAGNÉTIQUES / PARAMAGNETICS				
Concentré III / Concentrate III	0.1487	7.39		
Produit intermédiaire IIIa / Middling product IIIn	0.2785	13.84	ru+il50,ep30,ga10,st,le, py,tu	MIQ
Concentré IV / Concentrate IV	0.6180	30.72		
Produit intormó-diaire IVa / Middling product I^{V}a	0.2835	14.09		
total paramagnétiques / total paramagnetics	1.3287	66.04		
NON-MAGNÉTIQUES / NONMAGNETICS				
Concentró V / Concentrate V	0.2963	14.73	zi90,ru,di,qu1	MI
rendement total / total yield	2.0000	99.41		

MS[25] – Séparation de l'échantillon W 65/1.0
Separation of the sample W 65/1.0

Échantillon Sample	Poids Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate				
W 65/1.0 +0.20	0.8110			
W 65/1.0 -0.20	2.4753			
admission total total feed	3.2863	100.00		
MAGNÉTIQUES MAGNETICS				
Concentré I Concentrate I	0.4017	12.22		
Concentré II Concentrate II	0.2880	8.76		
total magnétiques total magnetics	0.6897	20.98		
PARAMAGNÉTIQUES PARAMAGNETICS				
Concentré III Concentrate III	0.4781	14.55		
Produit intermédiaire IIIa Middling product IIIa	0.1481	4.51	ru50,ep30,ga10,st,le,tu, py,amp	MI
Concentré IV Concentrate IV	0.7649	23.27		
Produit intermédiaire IVa Middling product IVa	0.4121	12.54		
total paramagnétiques total paramagnetics	1.8032	54.87		
NON-MAGNÉTIQUES NONMAGNETICS				
Concentré V Concentrate V	0.5030	15.31	zi80,tu,ru,le,di	MI
rendement total total yield	2.9959	91.16		

RÉSULTATS D'ANALYSE GRANULOMÉTRIQUES, DE SÉPARATION EN LIQUIDE LOURDE ET DES MESURES RADIOMÉTRIQUES DES ÉCHANTILLONS DE LA PARTIE ORIENTALE DU PROFIL RADIOMÉTRIQUE R 8/7

RESULTS OF GRAIN SIZE ANALYSIS, HEAVY LIQUID SEPARATION AND RADIOMETRIC MEASUREMENTS OF SAND SAMPLES FROM THE EASTERN PART OF RADIOMETRIC PROFILE R 8/7

Échantillon No / Sample No	a/ admission, feed; b/ fraction +0,8mm; c/ fraction +0,4mm; d/ fraction +0,2mm; e/ fraction -0,2mm	Granulométrie / Granulometry: rendement / yield		Séparation dans le liquide lourd / Separation in heavy liquid: Fraction lourde / Heavy fraction, rendement / yield		Fraction légère / Light fraction, rendement / yield		Rendement total / Total yield		Récupération / Recovery	Radioactivité naturelle / Natural radioactivity, Mesures / Measurements, Laboratoire / Laboratory: Avant séparation dans l.l. / before separation in h.l.	Fraction lourde / heavy fraction	Fraction légère / light fraction	Terrain / Field	Remarques / Remarks
		g	%	g	%	g	%	g	%	%	cpm/g	cpm/g	cpm/g	cpm	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	a/	49.6150	100.00	5.6092	11.31	43.6022	87.88	49.2[illegible]	99.19						
E5/0.0	b/	1.8159	3.66	ns	-	1.8159	3.66	1.8[illegible]	3.66	-	nr[x]	nm[xx]	nm		
	c/	6.9328	13.97	0.0126	0.03	6.9104	13.93	6.[illegible]	13.96	99.86	nr	nm	nm		
	d/	23.9439	48.26	1.4770	2.93	22.2965	44.94	23.7[illegible]	47.92	99.29	1.39±0.12	1.66±0.08	nr		MS[1] /see tab. 15/
	e/	16.9224	34.11	4.1196	8.30	12.5794	25.35	16.[illegible]	33.65	98.68	24.28±1.10	25.90±0.18	nr		MS[1] /voir tab. 15/
	a/	49.8369	100.00	1.5182	3.05	48.2415	96.80	49.7[illegible]	99.85						
E5/0.5	b/	2.5199	5.06	ns	-	2.5199	5.06	2.5[illegible]	5.06	-	nr	nm	nm		
	c/	6.8701	13.78	0.0102	0.02	6.8525	13.75	6.8[illegible]	13.77	99.89	nr	nm	nm		
	d/	28.9053	58.00	0.3814	0.77	28.5047	57.19	28.8[illegible]	57.96	99.93	0.41±0.19	0.34±0.06	nr		MI /op.m. 30,gn,ep,sil st/
	e/	11.5416	23.16	1.1256	2.26	10.3644	20.80	11.4[illegible]	23.06	99.56	8.41±0.71	9.33±0.18	nr		MIQ /see tab. 14/ /voir tab. 14/
	a/	49.8464	100.00	0.3798	0.76	49.3326	98.97	49.7[illegible]	99.73						
E5/1.0	b/	0.3715	0.74	ns	-	0.3715	0.74	0.3715	0.74	-	nr	nm	nm		
	c/	1.3677	2.74	0.0021	0.01	1.3600	2.73	1.3621	2.73	99.59	nr	nm	nm		
	d/	30.0994	60.38	0.0000	0.00	30.0212	60.23	30.0212	60.23	99.74	nr	nm	nm		
	e/	18.0078	26.14	0.3777	0.76	17.5799	35.27	17.9[illegible]	36.03	99.72	1.25±0.16	0.99±0.08	nm	-	MI /op.m. 60,ep,zi,gr py,mo/
E 5		149.2983	100.00	7.5072	5.03	141.1763	94.56	148.6[illegible]	99.59					5040	

[x] nr - manque de radioactivité
nr - nonradioactive

[xx] nm - non mesuré
nm - not measured

Tableau
Table 13/2

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
E10/0.0	a/	49.8217	100.00	2.5105	5.04	47.1515	94.64	49.[illegible]	99.63						
	b/	3.4331	6.89	ns	-	3.4331	6.89	3.[illegible]	6.89	-	4.46±1.69	nm	nm		
	c/	14.5182	29.14	0.0662	0.13	14.4220	28.95	14.[illegible]	29.03	99.79	0.89±0.40	0.72±0.31	nr		MI /op.m.., goe, ep, ma, st/
	d/	26.2967	52.78	1.3117	2.63	24.8998	49.98	26.[illegible]	52.61	99.68	0.82±0.22	1.10±0.06	nr		MS^2 /see tab.15./
	e/	5.5737	11.19	1.1326	2.27	4.3967	10.83	5.[illegible]	13.10	99.20	16.67±0.75	16.29±0.29	nr		MS^2 /voir tab.15/
E10/0.5	a/	49.8166	100.00	0.4004	0.81	49.2298	98.82	49.[illegible]	99.63						
	b/	0.5038	1.01	ns	-	0.5038	1.01	0.[illegible]	1.01	-	nr	nm	nm		
	c/	1.6370	3.29	0.0033	0.01	1.6224	3.26	1.[illegible]	3.27	99.31	nr	nm	nm		
	d/	30.6719	61.57	0.0887	0.18	30.5027	61.23	30.[illegible]	61.41	99.74	nr	nm	nm		
	e/	17.0039	34.13	0.3084	0.62	16.6009	33.32	16.[illegible]	33.94	99.44	1.68±0.16	0.71±0.11	0.62±0.23		MI /óp.m. 80%, ga ep, zi, st, d[illegible], mo/
E10/1.0	a/	49.9191	100.00	1.8940	3.80	47.7377	95.68	49.[illegible]	99.48						
	b/	1.9869	3.98	ns	-	1.9869	3.98	1.[illegible]	3.98	-	nr	nm	nm		
	c/	6.3873	12.80	0.0101	0.02	6.3699	12.77	6.[illegible]	12.79	99.89	nr	nm	nm		/voir tab.14/
	d/	32.3593	64.86	0.5367	1.08	31.6907	63.52	32.[illegible]	64.60	99.59	3.05±0.91	0.25±0.05	2.01±0.12		MIQ /see tab. 14/
	e/	9.1544	18.36	1.3472	2.70	7.6902	15.41	9.[illegible]	18.11	98.72	7.80±0.26	7.12±0.22	nr		MIQ /see tab.14/ /voir tab.14/
E 10		149.5574	100.00	4.8049	3.21	144.1190	96.36	148.[illegible]	99.57					5340	
E15/0.0	a/	49.4923	100.00	2.8905	5.84	46.5550	94.02	49.[illegible]	99.56						
	b/	6.5364	13.21	ns	-	6.5364	13.21	6.[illegible]	13.21	-	nr	nm	nm		
	c/	9.7314	19.66	0.0195	0.04	9.7055	19.61	9.[illegible]	19.65	99.93	nr	nm	nm		
	d/	23.3875	47.25	1.0487	2.12	22.2923	45.04	23.[illegible]	47.16	99.80	1.04±0.10	1.27±0.06	nr		MS^3 /see tab. 15/
	e/	9.8670	19.88	1.8223	3.68	8.0008	16.17	9.[illegible]	19.85	99.56	17.18±0.73	22.[illegible]±0.17	nr		MS^3 /voir tab.15/
E15/0.5	a/	49.8658	100.00	3.2051	6.43	46.3454	92.94	49.[illegible]	99.37						
	b/	1.7149	3.44	ns	-	1.7149	3.44	1.[illegible]	3.44	-	nr	nm	nm		
	c/	4.5479	9.12	0.0085	0.02	4.5195	0.06	4.[illegible]	9.08	99.56	nr	nm	nm		
	d/	32.2157	64.61	0.9040	1.81	31.1102	62.39	32.[illegible]	64.20	99.37	0.69±0.18	0.54±0.11	nr		MS^4 /see tab. 15./
	e/	11.3843	22.83	2.2926	4.60	9.0007	18.05	11.[illegible]	22.65	99.20	12.31±0.57	9.32±0.52	1.14±0.16		MS^4 /voir tab.15/
E15/1.0	a/	49.570	100.00	4.0625	8.15	45.4336	91.13	49.[illegible]	99.38						
	b/	0.4754	0.95	ns	-	0.4754	0.95	0.[illegible]	0.95	-	nr	nm	nm		
	c/	1.8074	3.63	0.0211	0.04	1.7499	3.51	1.[illegible]	3.55	97.99	nr	nm	nm		MI /op.m., ga, le, m[illegible]/
	d/	34.5694	69.34	1.3153	2.64	33.1092	66.41	34.[illegible]	69.05	99.58	0.55±0.17	0.42±0.15	nm		MS^5 /see tab. 15./
	e/	13.0048	26.08	2.7261	5.47	10.0991	20.26	12.[illegible]	25.75	98.62	12.92±0.23	9.46±0.50	1.89±0.63		MS^5 /voir tab.15/
E 15		149.2151	100.00	10.1531	6.81	138.3140	92.69	148.[illegible]	99.50					6120	

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
E20/0.0	a/	49.7931	100.00	2.4268	4.87	46.9705	94.33	49.3973	99.20						
	b/	0.3742	0.75	ns	-	0.3747	0.75	0.3747	0.75	-	nr	nm	nm		
	c/	5.5498	11.14	0.0241	0.05	5.5041	11.05	5.5282	11.10	99.61	nr	nm	nm		MI /op.m. ,ga,ep,le/
	d/	33.1575	66.59	1.0366	2.08	31.9704	64.21	33.0070	66.29	99.55	0.69±0.18	0.56±0.05	nr		MS[6] /see tab. 15/
	e/	10.7111	21.52	1.3661	2.74	9.1213	18.32	10.4574	21.06	99.55	11.43±0.63	9.41±0.60	nr		MS[6] /voir tab.15
E20/0.5	a/	49.9198	100.00	0.6080	1.22	49.0261	98.21	49.6341	99.43						
	b/	0.3210	0.64	ns	-	0.3210	0.64	0.3210	0.64	-	nr	nm	nm		
	c/	2.4994	5.01	0.0000	0.00	2.4901	4.99	2.4901	4.99	99.63	nr	nm	nm		
	d/	36.5741	73.27	0.2945	0.59	36.1247	72.37	36.4192	72.96	99.58	nr	nm	nm		MI /op.m. 40,ga,py, am ,di,ep,tu/
	e/	10.5253	21.08	0.3135	0.63	10.0903	20.21	10.4038	20.84	98.85	nr	nm	nm		MI /op.m. 50, ga,py, am ,di,ep,tu/
E20/1.0	a/	49.8858	100.00	0.6690	1.34	48.6840	97.59	49.3530	98.93						
	b/	0.3192	0.64	ns	-	0.3192	0.64	0.3192	0.64	-	nr	nm	nm		
	c/	2.1882	4.39	0.0038	0.01	2.1764	4.36	2.1802	4.37	99.63	nr	nm	nm		
	d/	36.8982	73.97	0.2151	0.43	36.2279	72.62	36.4430	73.05	98.77	nr	nm	nm		MI /op.m. 40,ga,ep, mo,py,le/
	e/	10.4802	21.00	0.4501	0.90	9.9605	19.97	10.4106	20.87	99.34	1.93±0.30	1.88±0.25	nm		MIQ /see tab. 14/ /voir tab. 14/
E20		149.5987	100.00	3.7038	2.48	144.6806	96.71	148.3844	99.19					5400	
E25/0.0	a/	49.7807	100.00	1.9739	3.96	47.3617	95.14	49.3556	99.10						
	b/	1.0920	2.19	ns	-	1.0920	2.19	1.0920	2.19	-	nr	nm	nm		
	c/	8.0130	16.10	0.0269	0.05	7.9700	16.01	7.9969	16.06	99.50	nr	nm	nm		
	d/	30.2673	60.80	0.2992	0.60	29.7795	59.82	30.0788	60.42	99.38	nr	nm	nm		/voir tab.14
	e/	10.4084	20.91	1.6478	3.31	8.5201	17.12	10.1679	20.43	97.69	15.35±0.62	15.10±0.61	nr		MIQ /see tab. 14/
E25/0.5	a/	49.8579	100.00	0.7051	1.41	48.8101	97.90	49.5152	99.31						
	b/	2.1268	4.27	ns	-	2.1268	4.27	2.1268	4.27	-	nr	nm	nm		
	c/	7.1508	14.34	0.0173	0.03	7.1269	14.29	7.1442	14.34	99.91	nr	nm	nm		
	d/	33.2029	66.60	0.2613	0.52	32.7655	65.72	33.0268	66.24	99.47	nr	nm	nm		MI /op.m. 40,ep,[illegible], py,am ,le,[illegible]/
	e/	7.3774	14.79	0.4265	0.86	6.7909	13.62	7.2174	14.48	97.83	2.48±0.53	2.33±0.23	nr		MIQ /see tab. 14/ /voir tab.14/
E25/1.0	a/	49.8582	100.00	0.9757	1.96	48.6342	97.54	49.6099	99.50						
	b/	0.1353	0.27	ns	-	0.1353	0.27	0.1353	0.27	-	nr	nm	nm		
	c/	1.0630	2.13	0.0076	0.02	1.0440	2.09	1.0516	2.11	98.93	nr	nm	nm		MI /op.m.,ep,le,[illegible], mo/
	d/	32.3215	64.83	0.2566	0.51	31.8423	63.87	32.0890	64.38	99.31	1.22±0.19	1.37±0.05	nr		MI/op.m. 30,[illegible], ep.py,le,[illegible]/
	e/	16.3334	32.77	0.7115	1.43	15.6121	31.31	16.3283	32.74	99.91	1.04±0.35	2.17±0.12	nr		MIQ /see tab. 14/ /voir tab.14/
E25		149.4968	100.00	3.6547	2.44	144.8000	96.83	148.4607	99.30					5880	

Tableau 13/4
Table

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
B30/0.0	a/	49.4791	100.00	2.3649	5.80	46.5080	93.99	49.3729	99.79						
	b/	5.3037	1.07	ns	-	5.3037	1.07	5.3037	1.07	-	nr	nm	nm		
	c/	5.8077	11.74	0.0182	0.04	5.7893	11.70	5.8075	11.74	99.99	nr	nm	nm		
	d/	26.9223	54.41	0.6225	1.26	26.2828	53.12	26.9053	54.38	99.94	nr	nm	nm		MS[7] /see tab. 15/
	e/	11.4454	23.13	2.2242	4.50	9.1322	18.45	11.3564	22.95	99.22	20.70±0.60	21.52±0.21	nr		MS[7] /voir tab.15/
B30/0.5	a/	49.8850	100.00	4.0072	8.03	45.3404	90.89	49.3476	98.92						
	b/	0.5130	1.03	ns	-	0.5130	1.03	0.5130	1.03	-	nr	nm	nm		
	c/	2.0104	4.03	0.0094	0.02	2.0006	4.01	2.0100	4.03	99.98	nr	nm	nm		
	d/	36.3278	72.92	1.2536	2.51	34.6752	69.51	35.9288	72.02	98.77	0.35±0.12	0.29±0.05	nr		MS[8] /see tab. 15./
	e/	10.9838	22.02	2.7442	5.50	8.1516	16.34	10.8958	21.84	99.20	8.87±0.40	7.04±0.18	0.88±0.12		MS[8] /voir tab. 15/
B30/1.0	a/	49.7794	100.00	1.3611	2.73	48.2362	96.90	49.5973	99.63						
	b/	0.8279	1.66	ns	-	0.8279	1.66	0.8279	1.66	-	nr	nm	nm		
	c/	2.2597	4.54	0.0103	0.02	2.2466	4.51	2.2574	4.53	99.90	nr	nm	nm		
	d/	35.3057	70.92	0.4422	0.89	34.7486	69.81	35.1908	70.70	99.67	nr	nm	nm		MIQ /see tab. 14/
	e/	11.3861	22.88	0.9031	1.82	10.4131	20.92	11.3212	22.74	99.43	3.39±0.21	3.40±0.17	nr		MIQ /voir tab.14/
E 30		149.1435	100.00	8.2332	5.52	140.0646	93.93	148.3178	99.45					6000	
B35/0.0	a/	49.4564	100.00	2.1947	4.43	46.9650	94.97	49.1597	99.40						
	b/	2.5548	5.17	ns	-	2.5548	5.17	2.5548	5.17	-	nr	nm	nm		
	c/	2.9542	5.98	0.0070	0.01	2.9459	5.96	2.9529	5.97	99.96	nr	nm	nm		
	d/	31.6225	63.94	0.4751	0.96	31.0393	62.76	31.5149	63.72	99.66	nr	nm	nm		/voir tab.14/
	e/	12.3249	24.91	1.7126	3.46	10.4245	21.08	12.1371	24.54	98.48	11.20±0.41	12.21±0.13	nr		MIQ /see tab. 14/
B35/0.5	a/	49.8773	100.00	0.9583	1.93	48.5616	97.37	49.5193	99.30						
	b/	0.4425	0.89	ns	-	0.4425	0.89	0.4425	0.89	-	nr	nm	nm		
	c/	1.6005	3.21	0.0000	0.00	1.5390	3.09	1.5390	3.09	96.16	nr	nm	nm		
	d/	37.6993	75.58	0.3423	0.69	37.2714	74.73	37.6137	75.42	99.77	nr	nm	nm		MI /ep,ma,di,zi,st, le,py,mo/
	e/	10.1350	20.32	0.6160	1.24	9.3057	18.66	9.9247	19.90	97.93	0.95±0.54	1.14±0.13	nr		MIQ /see tab. 14/ /voir tab.14/
B35/1.0	a/	49.8709	100.00	0.7723	1.55	48.9004	98.06	49.6727	99.61						
	b/	0.1797	0.36	ns	-	0.1797	0.36	0.1797	0.36	-	nr	nm	nm		
	c/	1.7050	3.42	0.0068	0.01	1.6805	3.37	1.6873	3.38	98.96	nr	nm	nm		
	d/	38.9527	78.11	0.2533	0.53	38.5373	77.27	38.7976	77.80	99.60	nr	nm	nm		MI /ep,m, 30,ep,[illegible], mo,[illegible],si,[illegible]/
	e/	9.0335	18.11	0.5022	1.01	8.5059	17.06	9.0381	18.07	99.72	1.23±0.62	0.55±0.20	nr		/voir tab.14/ MIQ /see tab. 14./
E 35		149.2051	100.00	3.9253	2.63	144.4270	96.80	148.3523	99.43					3600	

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	a/	49.4055	100.00	3.7384	7.57	45.5097	92.12	49.2481	99.69						
	b/	10.8481	21.96	ns	-	10.8431	21.96	10.8431	21.96	-	nr	nm	nm		
E40/0.0	c/	5.5459	11.23	0.0341	0.07	5.4659	11.06	5.5000	11.13	99.17	nr	nm	nm		MI /op.m.,ga,le,er,zi,tu/
	d/	20.1749	40.84	0.8165	1.66	19.2317	39.03	20.1002	40.69	99.63	nr	nm	nm		MS^9 /see tab. 15/
	e/	12.8346	25.97	2.8858	5.84	9.9140	20.07	12.7988	25.91	99.73	17.97±0.57	18.90±0.20	nr		MS^9 /voir tab.15/
	a/	49.9261	100.00	0.6665	1.33	48.9935	98.14	49.6598	99.47						
	b/	0.1602	0.32	ns	-	0.1602	0.32	0.1602	0.32	-	nr	nm	nm		
E40/0.5	c/	3.2465	6.50	0.0274	0.05	3.1728	6.36	3.2002	6.41	98.57	nr	nm	nm		MI /op.m.,ga,mo,le,ep/
	d/	39.7158	79.55	0.3361	0.67	39.2653	78.64	39.5994	79.32	99.71	0.25±0.14	0.18±0.04	nr		MI /op.m. 40,ga,zi,ep,sil,st,py,mo,.../
	e/	6.8065	13.63	0.3030	0.61	6.5970	12.81	6.7000	13.42	98.43	2.69±0.82	3.06±0.25	nr		
[illegible]	a/	49.8464	100.00	5.5150	11.07	44.1280	88.53	49.6430	99.60						
	b/	0.2433	0.49	ns	-	0.2433	0.49	0.2433	0.49	-	nr	nm	nm		
E40/1.0	c/	3.2448	6.51	0.0337	0.07	3.1661	6.35	0.1998	6.42	98.61	nr	nm	nm		MI /op.m.,ga,ep,le,mo,nos/
	d/	34.6627	69.54	1.7782	3.57	32.8217	65.85	34.5999	69.42	99.82	1.19±0.07	1.44±0.05	nr		MS^{10}/see tab. 15/
	e/	11.6956	23.46	3.7031	7.43	7.8969	15.84	11.6000	23.27	99.18	28.90±0.70	27.21±0.54	nr		MS^{10} /voir tab.15/
F40		149.1760	100.00	9.9199	6.65	138.6310	92.93	148.5509	99.58					3600	
	a/	49.7348	100.00	1.3299	2.68	48.0445	96.59	49.3744	99.27						
	b/	1.0742	2.16	ns	-	1.0742	2.16	1.0742	2.16	-	nr	nm	nm		
E45/0.0	c/	3.5548	7.15	0.0149	0.03	3.4853	7.00	3.5002	7.03	98.46	nr	nm	nm		MI /op.m.,ga,ep,mo/
	d/	28.9185	58.15	0.5155	1.04	28.1844	56.67	28.6999	57.71	99.24	nr	nm	nm		MIQ /see tab. 14/
	e/	16.1873	32.54	0.7995	1.61	15.3006	30.76	16.1001	32.37	99.46	2.86±0.12	2.87±0.11	nr		MIQ /voir tab. 14/
	a/	49.9099	100.00	0.7669	1.54	48.4622	97.09	49.2291	98.63						
	b/	0.4285	0.86	ns	-	0.4285	0.86	0.4285	0.86	-	nr	nm	nm		
E45/0.5	c/	4.3941	8.80	0.0258	0.05	4.2744	8.57	4.3002	8.62	97.86	nr	nm	nm		MI /op.m.,ga,tu/
	d/	34.2835	68.69	0.3337	0.67	33.5667	67.25	33.9004	67.92	98.88	nr	nm	nm		MI /op.m. 80,ga,er,zi,st,tu/
	e/	10.8033	21.65	0.4074	0.82	10.1926	20.42	10.6000	21.24	98.11	2.51± 0.20	2.52±0.16	nr		MIQ /see tab. 14/ /voir tab.14/
	a/	49.8969	100.00	0.5811	1.17	43.6669	97.53	49.2479	98.70						
	b/	0.3475	0.70	ns	-	0.3475	0.70	0.3475	0.70	-	nr	nm	nm		
E45/1.0	c/	1.3837	2.77	0.0137	0.03	1.2863	2.57	1.3000	2.60	93.95	nr	nm	nm		
	d/	37.1395	74.43	0.3989	0.80	36.4016	72.95	36.8005	73.75	99.09	nr	nm	nm		MI /op.m.,ga,ep,zi,mo/
	e/	11.0362	22.10	0.1835	0.34	10.6314	21.31	10.7499	21.65	97.95	0.93±0.41	0.75±0.15	nr		MI /op.m. 80,ga,er,mo,..,zi,st/
[illegible]		149.5416	100.00	2.6773	1.79	145.1733	97.03	147.8515	98.87					4800	

Tableau
Table 13/6

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	a/	49.6800	100.00	1.7225	3.47	47.3882	95.38	49.1107	98.85						
	b/	3.6108	7.27	ns	–	3.6108	7.27	3.6108	7.27	–	nr	nm	nm		
350/0.0	c/	8.9119	17.94	0.0582	0.08	7.7619	17.63	8.8001	17.71	98.75	nr	nm	nm		MI/op.m.,ga,le,zi,mo, ep/
	d/	28.3991	57.16	0.8071	1.62	27.2929	54.94	28.1000	56.56	98.95	0.57±0.20	0.72±0.18	nr		MIQ /see tab.14../
	e/	8.7662	17.63	0.8772	1.77	7.7226	15.54	8.5998	17.31	98.10	5.06±0.27	7.36±0.21	nr		MIQ /see tab. ..14/ /voir tab.14/
	a/	49.8800	100.00	1.7423	3.49	47.7392	95.71	49.4815	99.20						
	b/	0.3917	0.79	ns	–	0.3917	0.79	0.3917	0.79	–	nr	nm	nm		
350/0.5	c/	1.6926	3.39	0.0009	0.00	1.6598	3.39	1.6907	3.39	99.89	nr	nm	nm		
	d/	30.0317	60.21	0.5204	1.04	29.2607	58.66	29.7811	59.71	99.18	0.66±0.19	0.73±0.06	nr		MIQ /see tab. ..14/
	e/	17.7640	35.61	1.2210	2.45	16.3970	32.87	17.6180	35.32	99.18	17.32±0.16	13.14±0.12	2.92±0.09		MIQ /see tab. ..14/ /voir tab.14/
	a/	49.3566	100.00	0.1819	0.36	48.6660	98.61	48.8479	98.97						
	b/	1.5679	3.18	ns	–	1.5679	3.18	1.5679	3.18	–	10.20±3.60	nm	nm		
350/1.0	c/	4.5523	9.22	0.0052	0.01	4.5006	0.12	4.5058	9.13	98.98	nr	nm	nm		
	d/	26.2766	53.24	0.0614	0.12	25.9009	52.48	25.9623	52.60	98.80	nr	nm	nm		MI/op.m.,45,ga,ep, st,le,py,sil/
	e/	16.9598	34.36	0.1153	0.25	16.6966	33.83	16.8119	34.06	99.13	0.89±0.33	0.57±0.10	nr		MIQ /see tab. ..14/ /voir tab.14/
350		148.9166	100.00	3.6467	2.45	143.7934	96.56	147.4401	99.91					3600	
	a/	51.6135	100.00	0.3807	0.74	50.6406	98.11	51.0213	98.95						
	b/	9.2508	17.92	ns	–	9.2508	17.92	9.2508	17.92	–	nr	nm	nm		
355/0.0	c/	8.8434	17.13	0.0303	0.06	8.7911	17.03	8.8214	17.09	99.75	nr	nm	nm		MI/ga,ep,op.m.,le,py/
	d/	22.7816	44.14	0.3492	0.68	21.9609	42.55	22.3101	43.23	97.23	nr	nm	nm		MIQ /see tab. ..14/
	e/	10.7377	20.81	0.0012	0.00	10.6378	20.61	10.6390	20.61	99.08	nr	nm	nm		MI /op.m. 50,ga,ep, st,di,sil,mo/
	a/	48.5552	100.00	0.2713	0.55	47.8256	98.29	48.0969	98.84						
	b/	5.7025	11.72	ns	–	5.7025	11.72	5.7025	11.72	–	nr	nm	nm		
355/0.5	c/	7.4521	15.32	0.0255	0.05	7.3520	15.11	7.3775	15.16	99.00	nr	nm	nm		MI/op.m.,ga,ep,py, di,zi,le/
	d/	25.6499	52.72	0.0747	0.15	25.3691	52.14	25.4438	52.29	99.20	nr	nm	nm		MI/op.m. 40,ga,ep,py di,zi,le/
	e/	9.8507	20.24	0.1711	0.35	9.4020	19.32	9.5731	19.67	97.18	2.57±0.23	1.81±0.17	nr		MI/op.m. 55,zi,ga,ep di,mo/
	a/	48.3232	100.00	0.0649	0.13	47.7515	98.82	47.8164	98.95						
	b/	0.7728	1.60	ns	–	0.7728	1.60	0.7728	1.60	–	nr	nm	[illegible]		
355/1.0	c/	2.5864	5.35	0.0010	0.00	2.5804	5.34	2.5814	5.34	99.81	nr	nm	nm		
	d/	30.6101	63.34	0.0256	0.05	30.2977	62.70	30.3233	62.75	99.05	nr	nm	nm		MI/op.m. 30,ga,ep, le,py,sil,mo/
	e/	14.3539	29.71	0.0383	0.08	14.1006	29.18	14.1389	29.26	98.50	nr	nm	nm		MI /op.m. 60,ep,st, ti,ga,zi,di,py/
355		143.5919	100.00	0.7169	0.48	145.2177	98.40	145.9346	98.88					3240	

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	a/	49.[illegible]257	100.00	1.3775	2.76	48.[illegible]	96.52	48.3077	99.28						
	b/	6.3755	12.63	ns	–	6.3755	12.63	6.3755	12.63	–	nr	nm	nm		
[illegible]0.0	c/	9.8301	19.77	0.0017	0.00	9.[illegible]	19.71	9.8017	19.71	99.71	nr	nm	nm		MI/op.m.,st,ga,ep,le/
	d/	23.1453	45.55	0.2754	0.55	22.[illegible]	45.72	22.9975	46.25	99.35	0.64±0.[illegible]	0.69±0.07	nr		MI /see tab. 14 /,
	e/	10.3655	20.55	1.1002	2.21	9.[illegible]	18.23	10.1890	20.49	98.[illegible]	12.10±[illegible]	3.82±0.17	6.04±0.12		MIQ /see tab.14/
	a/	49.0176	100.00	0.0852	0.17	48.[illegible]	98.38	48.3092	98.55						
	b/	7.2569	14.80	ns	–	7.2569	14.80	7.2569	14.80	–	nr	nm	nm		
[illegible]0/0,5	c/	8.4170	17.17	0.0013	0.00	8.[illegible]	17.14	8.4017	17.14	99.82	nr	nm	nm		
	d/	22.9997	46.92	0.0217	0.04	22.[illegible]57	45.90	22.5184	45.94	97.91	nr	nm	nm		MI/op.m. 50,ga,ep, zi,st.le,co/
	e/	10.3440	21.11	0.0622	0.13	10.[illegible]	20.54	10.1322	20.67	97.95	nr	nm	nm		MI /zi,ep,tu,ga,py, mo,cs/
	a/	49.0955	100.00	0.0521	0.16	48.[illegible]55	99.44	48.8976	99.60						
	b/	1.7748	3.62	ns	–	1.77[illegible]	3.62	1.7748	3.62	–	nr	nm	nm		
[illegible]0/1.0	c/	4.2078	8.57	0.0014	0.00	4.[illegible]63	8.55	4.1977	8.55	99.76	nr	nm	nm		
	d/	31.0798	63.31	0.0307	0.06	30.[illegible]	63.02	30.9707	63.06	99.65	nr	nm	nm		MI/op.m. 40,ga,ep, zi,le,mo,py/
	e/	12.0309	24.50	0.0500	0.10	11.[illegible]	24.25	11.9544	24.35	99.36	1.18±0.47	1.41±0.22	nr		MI /op.m. 60,zi,py, ga,ep,mo,sil,st/
250		147.8546	100.00	1.5446	1.04	145.0299	98.10	146.5745	99.14					3000	

[illegible]

Point No / Sample No	MINÉRAUX LOURDS / HEAVY MINERALS: MINÉRAUX OPAQUES / OPAQUE MINERALS: il	sph	ma	an	he	ma + mag	go	Autres Others	Total OM	MINÉRAUX TRANSPARENTS / TRANSPARENT MINERALS: le	zi	mo	ga	di	st	sil	tu	ep	py + am	Autres Others	Total TM	Total HM	MINÉRAUX LÉGERS / LIGHT MINERALS: qu	cor	Total LM	No
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	
B 5/0.5 - 0.20x	15.4	-	44.1	3.2	8.2	-	-	-	71.9	0.8	14.9	-	2.9	-	-	0.4	1.2	3.7	2.1	-	26.0	97.9	2.1	-	2.1	1
B 10/1.0 + 0.20xx	14.9	-	18.8	1.3	1.9	-	2.6	-	39.6	10.1	0.8	-	27.7	-	0.8	1.7	-	15.1	2.5	-	58.7	98.3	1.7	-	1.7	2
B 10/1.0 - 0.20	33.7	-	31.8	0.6	3.7	0.6	-	-	70.4	0.8	10.4	1.2	4.8	0.8	2.4	-	0.4	6.4	0.4	-	27.6	98.0	2.0	-	2.0	3
B 20/1.0 + 0.20	32.2	0.4	29.2	1.3	6.0	0.4	3.4	-	72.9	1.3	6.0	0.9	9.9	-	2.6	0.4	0.4	3.4	0.9	-	25.8	98.7	1.3	-	1.3	4
B 25/0.0 - 0.20	24.5	-	30.2	3.0	3.9	-	5.2	-	66.8	1.3	16.8	1.3	2.6	0.4	0.9	-	1.7	5.2	-	-	30.2	97.0	3.0	-	3.0	5
B 25/0.5 - 0.20	14.1	-	28.8	3.1	10.5	2.1	-	-	58.6	5.8	4.7	2.1	14.7	1.6	2.1	1.0	-	5.8	2.6	-	40.4	99.0	1.0	-	1.0	6
B 25/1.0 - 0.20	18.4	-	21.1	-	3.1	0.8	2.0	-	45.4	6.5	10.2	2.8	9.3	1.9	-	-	2.8	8.3	0.9	-	42.7	88.1	1.9	-	1.9	7
B 30/1.0 + 0.20	5.5	1.5	9.6	3.5	5.0	-	1.5	-	26.6	11.9	0.9	3.7	33.0	0.9	2.8	-	0.9	18.4	0.9	-	73.4	100.0	-	-	-	8
B 30/1.0 - 0.20	17.3	-	38.3	1.2	6.2	-	2.5	-	65.4	4.7	7.4	-	9.5	1.4	3.4	-	2.7	3.4	1.4	-	33.9	99.3	0.7	-	0.7	9
B 35/0.5 - 0.20	16.2	-	28.5	1.1	10.0	1.1	1.1	chr 0.6	58.6	5.5	3.4	1.4	11.7	1.4	2.8	-	2.8	6.9	1.4	-	37.3	95.9	4.1	-	4.1	10
B 35/1.0 - 0.20	19.2	1.1	28.7	1.6	3.2	-	1.6	chr 0.5	55.9	5.6	4.9	0.7	9.1	2.1	-	-	-	19.6	1.4	-	43.4	99.3	0.7	-	0.7	11
B 45/0.0 + 0.20	24.5	0.8	20.6	-	2.4	-	1.6	-	49.9	1.4	2.9	-	28.6	2.9	1.4	-	-	4.3	-	-	41.5	91.4	0.6	-	0.6	12
B 45/0.0 - 0.20	20.1	-	30.8	3.4	5.0	0.6	1.1	-	61.0	1.2	7.3	-	9.8	2.4	1.2	-	1.2	9.8	3.7	-	36.6	97.6	2.4	-	2.4	13
B 45/0.5 - 0.20	30.8	0.6	29.7	1.6	5.5	-	-	-	68.2	1.9	4.8	-	8.7	1.0	1.0	-	1.0	3.8	1.9	-	24.1	92.3	7.7	-	7.7	14
B 50/0.0 + 0.20	12.4	0.9	10.6	1.4	5.0	0.5	1.8	-	32.6	4.9	3.0	-	29.7	2.0	1.0	-	-	14.9	7.9	-	63.4	96.0	4.0	-	4.0	15
B 50/0.0 - 0.20	24.7	-	30.8	3.0	3.6	-	1.8	-	63.9	-	10.3	-	10.3	-	1.2	0.6	2.4	1.8	0.6	bi 1.2	28.4	92.3	7.7	-	7.7	16
B 50/0.5 + 0.20	30.4	-	32.5	3.2	2.2	-	1.1	-	69.4	1.8	-	1.8	12.6	-	1.8	-	-	7.2	0.9	-	26.1	95.5	4.5	-	4.5	17
B 50/0.5 - 0.20	20.4	-	32.5	1.6	7.3	-	-	-	61.8	1.2	22.0	1.7	3.5	1.2	1.7	-	-	3.5	1.7	-	36.5	98.3	1.7	-	1.7	18
B 60/0.0 - 0.20	37.5	-	30.9	2.6	5.3	-	-	-	75.3	0.5	12.6	-	3.7	1.0	0.5	-	0.5	6.8	2.1	-	21.7	99.0	1.0	-	1.0	19

x c.a.d - 0.20 mm grain classe de l'échantillon B 5/0.5
i.e. the - 0.20 mm grain class of the sample B 5/0.5

xx c.a.d + 0.20 - 0.40 mm grain classe d'échantillon B 10/1.0
i.e. the + 20 - 0.40 mm grain class of the sample B 10/1.0

RÉSULTATS DE LA SÉPARATION MAGNÉTIQUE ET ÉLECTROMAGNÉTIQUE DE LA FRACTION LOURDE DES ÉCHANTILLONS DE LA PARTIE ORIENTALE DU PROFIL RADIOMÉTRIQUE R8/7.

RESULTS OF MAGNETIC AND ELECTROMAGNETIC SEPARATION OF THE HEAVY FRACTION OF THE SAMPLES FROM THE EASTERN PART OF RADIOMETRIC PROFILE R8/7

Tableau 15/1
Table 15/1

MS[1] – Séparation de l'échantillon E 5/0.0
Separation of the sample E 5/0.0

Échantillon / Sample	Poids / Weight g	%	Minéraux / Minerals	Remarques / Remarks
Concentré / Concentrate				
E 5/0.0 +0.20 x	1.4770			
E 5/0.0 -0.20 xx	4.1196			
admission total / total feed	5.5966	100.00		
MAGNÉTIQUES / MAGNETICS				
Concentré I / Concentrate I	0.6715	12.00		
Concentré II / Concentrate II	0.6765	12.09		
total magnétiques / total magnetics	1.3480	24.09		
PARAMAGNÉTIQUES / PARAMAGNETICS				
Concentré III / Concentrate III	0.1647	2.94		
Produit intermédiaire IIIa / Middling product IIIa	0.3500	6.25		
Concentré IV / Concentrate IV	1.2864	22.98		
Produit intermédiaire IVa / Middling product IVa	0.4905	8.76	ru+il70,ga20,ep5,st,py	MI
total paramagnétiques / total paramagnetics	2.2916	40.93		
NON-MAGNÉTIQUES / NONMAGNETICS				
Concentré V / Concentrate V	1.4575	26.04	zi50,qu40,ru,tu	MI
rendement total / total yield	5.0971	91.06		

x +0.20 c.a.d. +0.20-0.40 mm grain classe de l'échantillon E 5/0.0
i.e. the +0.20-0.40 mm grain class of the sample E 5/0.0

xx -0.20 c.a.d. +0.20-grain classe de l'échantillon E 5/0.0
i.e. -0.20 mm grain class of the sample E 5/0.0

Tableau 15/2
Table 15/2

MS^2 - Séparation de l'échantillon E 10/0.0

Separation of the sample E 10/0.0

Échantillon Sample		Poids Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate					
E 10/0.0	+0.20	1.3117			
	- 0.20	1.1326			
Admission total total feed		2.4443	100.00		
MAGNÉTIQUES MAGNETICS					
Concentré I Concentrate I		0.1420	5.81		
Concentré II Concentrate II		0.6092	24.92		
total magnetiques total magnetics		0.7512	30.73		
PARAMAGNÉTIQUES PARAMAGNETICS					
Concentré III Concentrate III		0.0807	3.30		
Produit intermédiaire IIIa Middling product IIIa		0.1895	7.75		
Concentré IV Concentrate IV		0.8295	33.94	ga 80	MI
Produit intermédiaire IVa Middling product IVa		0.2049	8.38		
total paramagnétiques total paramagnetics		1.3046	53.37		
NON-MAGNÉTIQUES NONMAGNETICS					
Concentré V Concentrate V		0.2781	11.38		
rendement total total yield		2.3339	95.48		

Tableau 15/3
Table 15/3

MS[3] Séparation de l'échantillon E 15/0.0
Separation of the sample E 15/0.0

Échantillon Sample		Poids Weight		Minéraux Minerals	Remarques Remarks
Concentré Concentrate		g	%		
E 15/0.0	+0.20	1.0487			
	-0.20	1.8223			
admission total / total feed		2.8710	100.00		
MAGNÉTIQUES / MAGNETICS					
Concentré I / Concentrate I		0.6720	23.41		
Concentré II / Concentrate II		0.2906	10.12	il67,ru25,an3,he2,sph2	MIQ
total magnétiques / total magnetics		0.9626	33.53		
PARAMAGNÉTIQUES / PARA MAGNETICS					
Concentré III / Concentrate III		0.0860	3.00		
Produit intermédiaire IIIa / Middling product IIIa		0.2816	9.81	ep40,ga30,ru20,st,mo,py,amp, tu	MIQ
Concentré IV / Concentrate IV		0.6150	21.42		
Produit intermédiaire IVa / Middling product IVa		0.1386	4.83		
total paramagnétiques / total paramagnetics		1.1212	39.06		
NON-MAGNÉTIQUES / NONMAGNETICS					
Concentré V / Concentrate V		0.4339	15.11	zi60,qu5,di,tu,le,mo,ru	MI
rendement total / total yield		2.5177	87.70		

Tableau 15/4
Table 15/4

MS[4] - Séparation de l'échantillon E 15/0.5

Separation of the sample E 15/0.5

Échantillon Sample Concentré Concentrate		Poids Weight g	%	Minéraux Minerals	Remarques Remarks
E 15/0.5	+0.2	0.9040			
	-0.2	2.2926			
admission total total feed		3.1966	100.00		
MAGNÉTIQUES MAGNETICS					
Concentré I Concentrate I		0.6479	18.75		
Concentré II Concentrate II		0.8502	24.60		
total magnétiques total magnetics		1.4981	43.35		
PARAMAGNÉTIQUES PARAMAGNETICS					
Concentré III Concentrate III		0.1609	4.66		
Produit intermédiaire IIIa Middling product IIIa		0.0710	2.05		
Concentré IV Concentrate IV		0.8310	24.04		
Produit intermédiaire IVa Middling product IVa		0.1493	4.32		
total paramagnétiques total paramagnetics		1.2122	35.07		
NON-MAGNÉTIQUES NONMAGNETICS					
Concentré V Concentrate V		0.4326	12.52		
rendement total total yield		3.1429	90.94		

Tableau 15/5
Table 15/5

MS[5] - Séparation de l'échantillon E 15/1.0

Separation of the sample E 15/1.0

Échantillon Sample		Poids Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate					
	+0.20	1.3153			
E 15/1.0	-0.20	2.7261			
admission total total feed		4.0414	100.00		
MAGNÉTIQUES MAGNETICS					
Concentré I Concentrate I		0.7700	19.05		
Concentré II Concentrate II		0.8505	21.04		
total magnétiques total magnetics		1.6205	40.09		
PARAMAGNÉTIQUES PARAMAGNETICS					
Concentré III Concentrate III		0.1640	4.06	ep70,il+ru20,me	MI
Produit intermédiaire IIIa Middling product IIIa		0.1845	4.57		
Concentré IV Concentrate IV		1.1663	28.86	ga50,ru+il40 ep,st,mo,py	MI
Produit intermédiaire IVa Middling product IVa		0.2400	5,94		
paramagnétiques total total paramagnetics		1.7548	43.43		
NON-MAGNÉTIQUES NONMAGNETICS					
Concentré V Concentrate V		0.5348	13.23	zi60,qu10,ru,di,tu	M[1]
rendement total total yield		3.9101	96.75		

Tableau 15/6
Table 15/6

MS[6] Séparation de l'échantillon E 20/0.0
Separation of the sample E 20/0.0

Échantillon Sample	Poids Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate				
E 20/0.0 +0.20	1.0366			
E 20/0.0 -0.20	1.3661			
admission total total feed	2.4027	100.00		
MAGNÉTIQUES MAGNETICS				
Concentré I Concentrate I	0.0500	2.08		
Concentré II Concentrate II	0.2984	12.42		
total magnétiques total magnetics	0.3484	14.50		
PARAMAGNÉTIQUES PARAMAGNETICS				
Concentré III Concentrate III	0.2398	9.98		
Produit intermédiaire IIIa Middling product IIIa	0.1306	5.43		
Concentré IV Concentrate IV	0.8493	35.35		
Produit intermédiaire IVa Middling product IVa	0.2986	12.43		
total paramagnétiques total paramagnetics	1.5183	53.19		
NON-MAGNÉTIQUES NONMAGNETICS				
Concentré V Concentrate V	0.3261	13.57		
rendement total total yield	2.1928	91.26		

Tableau 15/7
Table 15/7

MS[7] - Séparation de l'échantillon E 30/0.0
Separation of the sample E 30/0.0

Échantillon Sample		Poids Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate					
E 30/0.0	+0.20	0.6225			
	-0.20	2.2242			
admission total total feed		2.8467	100.00		
MAGNÉTIQUES MAGNETICS					
Concentré I Concentrate I		0.5498	19.31		
Concentré II Concentrate II		0.6690	23.50		
total magnétiques total magnetics		1.2188	42.81		
PARAMAGNÉTIQUES PARAMAGNETICS					
Concentré III Concentrate III		0.3617	12.71		
Concentré IV Concentrate IV		0.6342	22.28	ep30,ga30,ru30,st,le,mo	MI
total paramagnétiques total paramagnetics		0.9960	34.99		
NON-MAGNÉTIQUES NONMAGNETICS					
Concentré V Concentrate V		0.4468	15.70	zi90,ru,st,di	MI
rendement total total yield		2.6616	93.50		

Tableau 15/8
Table 15/8

MS[8] – Séparation de l'échantillon E 30/0.5
Separation of the sample E 30/0.5

Échantillon Sample / Concentré Concentrate	Poids Weight g	%	Minéraux Minerals	Remarques Remarks
E 30/0.5 +0.20	1.2536			
E 30/0.5 -0.20	2.7442			
admission total / total feed	3.9978	100.00		
MAGNÉTIQUES / MAGNETICS				
Concentré I / Concentrate I	0.3310	8.28		
Concentré II / Concentrate II	0.4363	10.91		
total magnétiques / total magnetics	0.7673	19.19		
PARAMAGNÉTIQUES / PARAMAGNETICS				
Concentré III / Concentrate III	0.6080	15.21		
Produit intermédiaire IIIa / Middling product IIIa	0.3418	8.55		
Concentré IV / Concentrate IV	1.2644	31.63	ga50,ru+il45,ep,st,mo	MI
Produit intermédiaire IVa / Middling product IVa	0.2734	6.84		
total paramagnétiques / total paramagnetics	2.8476	62.23		
NON-MAGNÉTIQUES / NONMAGNETICS				
Concentré V / Concentrate V	0.4896	12.25	zi70,di10,ru,tu,st	MI
rendement total / total yield	3.7445	93.67		

MS9 - Séparation de l'échantillon E 35/0.0
Separation of the sample E 35/0.0

Échantillon / Sample		Poids / Weight g	%	Minéraux / Minerals	Remarques / Remarks
Concentré / Concentrate					
E 35/0.0	+0.2	0.4751			
	-0.2	1.7126			
admission total / total feed		2.1877	100.00		
MAGNÉTIQUES / MAGNETICS					
Concentré I / Concentrate I		0.1515	6.93		
Concentré II / Concentrate II		0.4675	21.37		
total magnétiques / total magnetics		0.6190	28.30		
PARAMAGNÉTIQUES / PARAMAGNETICS					
Concentré III / Concentrate III		0.1391	6.36		
Produit intermédiaire IIIa / Middling product IIIa		0.2201	10.86		
Concentré IV / Concentrate IV		0.4393	20.08		
Produit intermédiaire IVa / Middling product IVa		0.0870	3.98		
total paramagnétiques / total paramagnetics		0.8855	40.48		
NON-MAGNÉTIQUES / NONMAGNETICS					
Concentré V / Concentrate V		0.3495	15.98	zi60,di,ru,qu20	MI
rendement total / total yield		1.8540	84.76		

Tableau 15/10
Table 15/10

MS 10 – Séparation de l'échantillon E 40/0.0
Separation of the sample E 40/0.0

Échantillon Sample		Poids Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate					
E 40/0.0	+0.20	0.8185			
	-0.20	2.8858			
admission total total feed		3.7043	100.00		
MAGNÉTIQUES MAGNETICS					
Concentré I Concentrate I		0.4367	11.79		
Concentré II Concentrate II		0.7255	19.95		
total magnétiques total magnetics		1.1622	31.38		
PARAMAGNÉTIQUES PARAMAGNETICS					
Concentré III Concentrate III		0.0988	2.67		
Produit intermédiaire IIIa Middling product IIIa		0.4603	12.43		
Concentré IV Concentrate IV		0.5432	14.66		
Produit intermédiaire IVa Middling product IVa		0.1310	3.54		
total paramagnétiques total paramagnetics		1.2333	33.30		
NON-MAGNÉTICS NONMAGNETICS					
Concentré V Concentrate V		0.9223	24.90	zi50,qu40	MI
rendement total total yield		3.3178	89.58		

Tableau 15/11
Table 15/11

MS[11] – Séparation de l'échantillon E 40/1.0
Separation of the sample E 40/1.0

Échantillon Sample Concentré Concentrate	Poids Weight g	%	Minéraux Minerals	Remarques Remarks
E 40/0.0 -0.20	3.7031			
admission total / total feed	3.7031	100.00		
MAGNÉTIQUES / MAGNETICS				
Concentré I / Concentrate I	0.2151	5.81		
Concentré II / Concentrate II	0.3619	9.77		
total magnétiques / total magnetics	0.5770	15.58		
PARAMAGNÉTIQUES / PARAMAGNETICS				
Concentré III / Concentrate III	0.0800	2.16	ep30,ru20,le,mo,tu,st	
Produit intermédiaire IIIa / Middling product IIIa	0.3299	8.91	ru40,ep30,ga20,le,st,mo,py	
Concentré IV / Concentrate IV	1.4906	40.25	ga50,ru+il50	
Produit intermédiaire IVa / Middling product IVa	0.1840	4.97		
total paramagnétiques / total paramagnetics	2.0845	56.29		
NON-MAGNÉTIQUES / NONMAGNETICS				
Concentré V / Concentrate V	0.9123	24.64	zi40,qu40,ru,st,mi	
rendement total / total yield	3.5738	96.31		

Tableau
Table 16/1

RÉSULTATS D'ANALYSE GRANULOMÉTRIQUES, DE SÉPARATION EN LIQUIDE LOURDE ET DES MESURES RADIOMÉTRIQUES DES ÉCHANTILLONS DE LA DUNE D'EL MSID

RESULTS OF GRAIN SIZE ANALYSIS, HEAVY LIQUID SEPARATION AND RADIOMETRIC MEASUREMENTS OF SAND SAMPLES FROM THE DUNE OF EL MSID

Échantillon No / Sample No	a/ admission, feed; b/ fraction+ 0,5mm; c/ fraction+ 0,4mm; d/ fraction+ 0,2mm; e/ fraction- 0,2mm	Granulométrie / Granulometry – rendement / yield		Séparation dans le liquide lourds / Separation in heavy liquid – Fraction lourde / Heavy fraction – rendement / yield		Fraction legère / Light fraction – rendement / yield		Rendement total / Total yield		Récupération / Recovery	Radioactivité naturelle / Natural radioactivity – Mesures / Measurements – Laboratoire / Laboratory – avant separation dans l.l. / before separation in h.l.	fraction lourde / heavy fraction	fraction legère / light fraction	Terrain / Field	Remarques / Remarks
		g	%	g	%	g	%	g	%	%	cpm/g	cpm/g	cpm/g	cpm	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
EM 1	a/	49.6841	100.00	3.3544	6.75	45.9694	92.52	49.3238	99.27						
	b/	3.4111	6.86	ns	-	3.4111	6.86	3.4111	6.86	-	nr[x]	nm	nm[xx]		
	c/	3.1569	6.35	0.0084	0.02	3.1480	6.32	3.1564	6.34	99.98	nr	nm	nm		
	d/	35.7770	72.00	2.4247	4.88	33.0546	66.59	35.5093	71.47	99.25	1.04 ± 0.05	1.39 ±0.05	nr		MS[1] /see tab. 17/
	e/	7.3421	14.79	0.9213	1.85	6.3257	12.73	7.2470	14.58	98.70	8.12 ± 0.27	7.26 ±0.20	1.43 ±0.23		MS[1] /voir tab.17/
EM 2	a/	49.9146	100.00	0.0566	0.13	49.3506	98.93	49.4472	99.06						
	b/	0.2675	0.54	ns	-	0.2675	0.54	0.2675	0.54	-	nr	nm	nm		
	c/	3.0007	6.01	0.0067	0.01	2.9907	5.99	2.9974	6.00	99.89	nr	nm	nm		
	d/	39.1958	78.53	0.0244	0.05	38.7267	77.59	38.7511	77.64	98.87	nr	nm	nm		MI/ep,ga,tu,le,di,mo/
	e/	7.4506	14.92	0.0355	0.07	7.3957	14.82	7.4312	14.89	99.74	nr	nm	nm		MI/op.m. 70,ep,di,amf, py,st,sil,ga,mo/
EM1,2		99.5957	100.00	3.4210	3.43	95.3500	95.73	98.7710	99.16					5400	
EM 3	a/	49.8479	100.00	0.6700	1.34	48.8157	97.93	49.4867	99.27						
	b/	0.2204	0.44	ns	-	0.2204	0.44	0.2204	0.44	-	nr	nm	nm		
	c/	2.7111	5.44	0.0350	0.01	2.7052	5.43	2.7102	5.44	99.97	nr	nm	nm		le,st,and,mo
	d/	42.6009	85.46	0.2844	0.57	42.0211	84.30	42.3055	84.87	99.31	nr	nm	nm		MI/op.m. 30,ga 30,ep,py,
	e/	4.3155	8.66	0.3806	0.76	3.8700	7.76	4.2506	8.53	98.50	1.90±1,30	1.53±0.32	nr		MI/op.m. 70,ga,ep,di,st, py,mo,le/

x nr - manque de radioactivité
nr - nonradioactive

xx nm - non mesuré
nm - not measured

Tableau 16/2
Table

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
EM 4	a/	47.3316	100.00	0.0000	0.00	47.2497	99.82	47.2497	99.82						
	b/	0.8658	1.83	ns	-	0.8658	1.83	0.8658	1.83	-	nr	nm	nm		
	c/	1.0342	2.19	0.0000	0.00	1.0275	2.17	1.0275	2.17	99.35	nr	nm	nm		
	d/	6.9956	14.78	0.0000	0.00	6.9694	14.72	6.9694	14.72	99.63	nr	nm	nm		
	e/	38.4360	81.20	0.0000	0.00	38.3870	81.10	38.3870	81.10	99.87	nr	nm	nm		
EM3,4		97.1795	100.00	0.6700	0.69	96.0654	98.85	96.7364	99.54					3600	
EM 5	a/	49.8814	100.00	4.0115	8.04	45.7903	91.79	49.8018	99.84						
	b/	0.0221	0.04	ns	-	0.0221	0.04	0.0221	0.04	-	nr	nm	nm		
	c/	0.1255	0.25	ns	-	0.1255	0.25	0.1255	0.25	- -	nr	nm	nm		
	d/	45.4074	91.01	2.6482	5.31	42.7030	85.61	45.3512	90.92	99.88	0.31±0.12	0.52±0.04	nr		MS²/see tab. 17./
	e/	4.3364	8.70	1.3633	2.73	2.9397	5.89	4.3030	8.63	99.23	0.02±0.04	7.56±0.44	nr		MS² /voir tab.17/
EM 6	a/	49.8903	100.00	2.9730	5.96	46.7308	93.73	49.7038	99.69						
	b/	0.0047	0.01	ns	-	0.0047	0.01	0.0047	0.01	-	nr	nm	nm		
	c/	0.1945	0.39	ns	-	0.1945	0.39	0.1945	0.39	-	nr	nm	nm		
	d/	42.7667	85.72	1.4026	2.81	41.2272	82.64	42.6298	85.45	99.68	0.49±0.13	0,41± 0.04	nr		MS³ /see tab. 17./
	e/	6.9244	13.88	1.5704	3.15	5.3044	10.63	6.8748	13.78	99.28	7.32±0.33	6,76± 0.27	nr		MS³ /see tab.17/ /voir tab.17/
EM5,6		99.7717	100.00	6.9845	7.00	92.2211	92.43	99.2056	99.43					5880	
EM 7	a/	50.0948	100.00	9.9807	19.92	39.9420	79.44	49.9227	99.66						
	b/	0.0079	0.02	ns	-	0.0079	0.02	0.0079	0.02	-	nr	nm	nm		
	c/	0.0600	0.12	ns	-	0.0600	0.12	0.0600	0.02	-	nr	nm	nm		
	d/	30.1622	60.21	2.5196	5.03	27.5501	55.00	30.0697	60.03	99.69	1.07±0.07	0.95±0.06	nr		MS⁴ /see tab. 17./
	e/	19.8647	39.65	7.4611	14.89	12.3240	24.60	19.7851	39.49	99.60	19.90±0.40	21.69±0.42	nr		MS⁵ /see tab. 17/ /voir tab.17/
EM 8	a/	50.3721	100.00	9.5839	19.03	40.0322	79.47	49.6161	98.50						
	b/	0.0000	0.00	ns	-	0.0000	0.00	0.0000	0.00	-	nr	nm	nm		
	c/	0.1858	0.37	ns	-	0.1858	0.37	0.1858	0.32	-	nr	nm	nm		
	d/	34.5800	68.65	2.5213	5.01	31.9230	63.37	34.4443	68.38	99.61	1.33±0.70	1.69±0.05	nr		MS⁶ /see tab. 17./
	e/	15.6063	30.98	7.0626	14.02	7.9234	15.73	14.9860	29.75	96.03	27.90±0.60	26.10±0.20	nr		MS⁷ /see tab. 17./ /voir tab.17/
EM7,8		100.4669	100.00	19.5646	19.47	79.9742	79.60	99.5388	99.07					15000	

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	a/	51.1555	100.00	24.5400	45.14	25.3357	51.45	50.9787	99.59						
	b/	0.0244	0.05	ns	-	0.0244	0.05	0.0244	0.05	-	nr	nm	nm		
EN 9	c/	0.0325	0.06	ns	-	0.0325	0.06	0.0325	0.06	-	nr	nm	nm		/voir tab.17/
	d/	27.0486	52.84	7.2776	14.22	19.6156	38.32	26.8932	52.54	99.42	5.32±0.24	5.43±0.23	nr		MS[8] /see tab. 17/
	e/	24.0803	47.05	17.3624	33.92	6.6662	13.02	12.0286	46.94	99.73	62.82±0.56	72.61±0.19	nr		MS[9] /see tab. 17/ /voir tab.17/
	a/	49.8306	100.00	14.3357	28.77	35.3328	70.90	49.6585	99.67						
	b/	0.0015	0.00	ns	-	0.0015	0.00	0.0015	0.00	-	nr	nm	nm		
EN 10	c/	0.0296	0.06	ns	-	0.0296	0.06	0.0296	0.06	-	nr	nm	nm		/voir tab.17
	d/	26.9215	54.03	2.7544	5.55	24.1200	48.40	26.8844	53.95	99.86	1.07±0.08	1.40±0.07	nr		MS[10]/see tab. 17
	e/	22.8750	45.91	11.5713	23.22	11.1517	22.44	22.7530	45.66	99.45	34.70±0.50	37.73±0.15	nr		MS[11]/see tab. 17 /voir tab.17
	a/	49.3692	100.00	16.5528	34.15	32.3304	65.53	49.2132	99.68						
	b/	0.0176	0.04	ns	-	0.0176	0.04	0.0176	0.04	-	nr	nm	nm		
EN 11	c/	0.0451	0.09	ns	-	0.0451	0.09	0.451	0.09	-	nr	nm	nm		/voir tab.17
	d/	30.9833	62.76	5.6101	11.36	25.2594	51.22	30.8995	62.58	99.73	3.10±0.10	3.59±0.06	nr		MS[12]/see tab. 17
	e/	18.3232	37.11	11.2527	22.79	6.9953	14.18	18.2510	36.97	99.61	42.70±0.60	46.18±0.19	nr		MS[13]/see tab. 17 /voir tab.17
EN 9,10,11		150.3556	100.00	55.8335	37.13	94.0219	62.52	149.8604	99.65					28800	
	a/	51.1151	100.00	7.6541	14.97	43.2138	84.55	50.8679	99.52						
	b/	0.1981	0.39	ns	-	0.1981	0.39	0.1981	0.39	-	nr	nm	nm		
EN 12	c/	1.1269	2.20	0.1240	0.24	0.9956	1.95	1.1196	2.19	99.35	nr	nm	nm		/voir tab.17/
	d/	40.5829	79.40	3.8701	7.57	36.5121	71.43	40.3822	79.00	99.50	1.60±0.20	1.87±0.05	nr		MS[14]/see tab. 17/
	e/	9.2072	18.01	3.6600	7.16	5.5030	10.78	9.1680	17.94	99.57	24.80±0.80	26.70±0.80	nr		MS[15]/see tab. 17/ /voir tab.17/
	a/	49.5725	100.00	7.9203	15.97	40.5037	81.71	48.4290	97.68						
	b/	0.0057	0.01	ns	-	0.0057	0.01	0.0057	0.01	-	nr	nm	nm		
EN 13	c/	0.1267	0.26	0.0052	0.01	0.1120	0.23	0.1172	0.24	92.50	nr	nm	nm		/voir tab.17/
	d/	32.4065	65.37	2.5303	5.10	29.1708	58.84	31.7011	63.94	97.82	1.08±0.07	1.25±0.06	nr		MS[16]/see tab. 17/
	e/	17.0336	34.36	5.3848	10.86	11.2202	26.63	16.6050	33.49	97.48	15.20±0.40	19.40±0.20	nr		MS[17]/see tab. 17/
EN 12,13		100.6876	100.00	15.5744	15.47	85.7225	83.15	99.2969	98.62					7200	/voir tab.17/

Tableau
Table 16/4

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	a/	20.2246	100.00	15.5106	30.88	34.1222	67.94	49.6328	98.92						
	b/	0.0102	0.02	ns	-	0.0102	0.02	0.0102	0.02	-	nr	nm	nm		
EM 14	c/	0.0702	0.14	ns	-	0.0702	0.14	0.0702	0.14	-	nr	nm	nm		-/voir tab.17/
	d/	33.4990	66.70	5.7102	11.37	27.2918	54.34	33.0020	65.71	98.52	2.31±0.09	2.61±0.06	nm		MS[18]/see tab. 17/
	e/	16.6452	33.14	9.8004	19.51	6.7500	13.44	16.5504	32.95	99.43	42.00±2.00	33.40±0.20	3.72±0.12		MS[19]/see tab. 17/ /voir tab.17/
	a/	50.2615	100.00	12.9591	25.78	36.8748	73.36	49.8339	99.14						
	b/	0.0353	0.07	ns	-	0.0353	0.07	0.0353	0.07	-	nr	nm	nm		
EM 15	c/	0.0854	0.17	ns	-	0.0854	0.17	0.0854	0.17	-	nr	nm	nm		/voir tab.17/
	d/	35.7253	71.08	4.2033	8.36	31.2079	62.09	35.4112	70.45	99.12	1.74±0.07	2.07±0.05	0.27±0,05		MS[20] /see tab. 17/
	e/	14.4155	28.68	8.7558	17.42	5.5462	11.03	14.3020	28.45	99.21	34.50±1.40	33.02±0.21	1.27±0.17		MS[21] /see tab. 17/ /voir tab.17/
	a/	51.0194	100.00	9.6405	18.89	40.6450	79.67	50.2855	98.56						
	b/	0.0240	0.05	ns	-	0.0240	0.05	0.0240	0.05	-	nr	nm	nm		
EM 16	c/	0.1232	0.24	ns	-	0.1232	0.24	0.1232	0.24	-	nr	nm	nm		/voir tab.17/
	d/	37.7399	73.97	3.1753	6.22	34.4007	67.43	37.5760	73.65	99.57	1.12±0.06	1.31±0.05	0.35±0.002		MS[22] /see tab. 17/
	e/	13.1323	25.74	6.4652	12.67	6.0971	11.95	12.5623	24.62	95.66	30.00±1.00	32.50±1.20	nr		MS[23] /see tab. 17/ /voir tab.17/
EM 14, 15, 16		151.5055	100.00	38.1102	25.15	111.6420	73.69	149.7522	98.84					19800	

RÉSULTAT DE LA SÉPARATION MAGNÉTIQUE ET ELECTROMAGNÉTIQUE DE LA FRACTION LOURDE DES ÉCHANTILLONS DE LA DUNE D'EL MSID.

RESULTS OF MAGNETIC AND ELECTROMAGNETIC SEPARATION OF THE HEAVY FRACTION OF THE SAMPLES FROM THE DUNE OF EL MSID.

Tableau 17/1
Table 17/1

MS[1] - Séparation de l'échantillon EM 1
Separation of the sample EM 1

Échantillon Sample / Concentré Concentrate	Poids Weight g	%	Minéraux Minerals	Remarques Remarks
EM 1 +0.20[x]	2.4247			
EM 1 -0.20[xx]	0.9213			
Admission total / Total feed	3.3460	100.00		
MAGNÉTIQUES / MAGNETICS				
Concentré I / Concentrate I	0.3922	11.72		
Concentré II / Concentrate II	0.4325	12.93		
total magnétiques / total magnetics	0.8247	24.65		
PARAMAGNÉTIQUES / PARAMAGNETICS				
Concentré III / Concentrate III	0.3170	9.47		
Produit intermédiaire IIIa / Middling product IIIa	0.1667	4.98		
Concentré IV / Concentrate IV	1.0508	31.40		
Produit intermédiaire IVa / Middling product IVa	0.4037	12.07		
total paramagnétiques / total paramagnetics	1.9382	57.92		
NONMAGNÉTIQUE / NONMAGNETICS				
Concentré V / Concentrate V	0.2882	6.81	zi70,qu5,tu,ru,mo, le	MI
rendement total / total yield	3.0511	91.18		

x +0.20 c.a.d. +0.20-0.40 mm grain classe de l'échantillons EM 1
i.e. the +0.20-0.40 mm grain class of the sample EM 1

xx -0.20 c.a.d. -0.20 grain classe de l'échantillon EM 1
i.e. the -0.20 mm grain classe of the sample EM 1.

MS[2] - Séparation de l'échantillon EM 5
Separation of the sample EM 5

Échantillon Sample	Poids Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate				
EM 5 +0.20	2.6482			
-0.20	1.3633			
admission total total feed	4.0115	100.00		
MAGNÉTIQUES MAGNETICS				
Concentré I Concentrate I	0.1970	4.91		
Concentré II Concentrate II	0.1772	4.42		
total magnétiques total magnetics	0.3742	9.33		
PARAMAGNÉTIQUES PARAMAGNETICS				
Concentré III Concentrate III	0.2758	6.88		
Concentré IIIa Concentrate IIIa	0.4120	10.71		
Concentré IV Concentrate IV	1.0130	25.25	ga 40, ru40	MI
Concentré IVa Concentrate IVa	0.2170	5.41		
total paramagnétiques total paramagnetics	1.9178	48.25		
NON-MAGNÉTIQUES NONMAGNETICS				
Concentré V Concentrate V	1.4550	36.27		
rendement total total yield	3.7470	93.41		

MS[3] - Séparation de l'échantillon EM 6
Separation of the sample EM 6

Échantillon Sample	Poids Weight g	% 	Minéraux Minerals	Remarques Remarks
Concentré Concentrate				
EM 6 +0.20	1.4026			
EM 6 -0.20	1.5704			
admission total total feed	2.9730	100.00		
MAGNÉTIQUES MAGNETICS				
Concentré I Concentrate I	0.2510	8.44		
Concentré II Concentrate II	0.1577	5.30		
total magnétiques total magnetics	0.4087	13.74		
PARAMAGNÉTIQUES PARAMAGNETICS				
Concentré III Concentrate III	0.3717	12.50	ep80	MI
Produit intermédiaire IIIa Middling product IIIa	0.2925	9.83		
Concentré IV Concentrate IV	0.8901	29.94	ga 70	MI
Produit intermédiaire IVa Middling product IVa	0.3640	12.24		
total paramagnétiques total paramagnetics	1.9183	64.51		
NON-MAGNÉTIQUES NONMAGNETICS				
Concentré V Concentrate V	0.4845	16.30	zi40,qu40,ru,di,tu,mo,sil	MI
rendement total total yield	2.8115	94.45		

MS[4] - Séparation de l'échantillon EM 7
Separation of the sample EM 7

Échantillon Sample Concentré Concentrate	Poids Weight g	%	Minéraux Minerals	Remarques Remarks
EM 7 +0.20	2.5196	100.00		
admission total total feed	2.5196	100.00		
MAGNÉTIQUES MAGNETICS				
Concentré I Concentrate I	0.0377	1.50		
Concentré II Concentrate II	0.2373	9.42		
total magnétiques total magnetics	0.2750	10.92		
PARAMAGNÉTIQUES PARAMAGNETICS				
Concentré III Concentrate III	0.6093	24.18		
Produit intermédiaire IIIa Middling product IIIa	0.0325	1.29		
Concentré IV Concentrate IV	1.1713	46.49	ga 90	MI
Produit intermédiare IVa Middling product IVa	0.1287	5.11		
total paramagnétiques total paramagnetics	1.9418	77.07		
NON-MAGNÉTIQUES NONMAGNETICS				
Concentré V Concentrate V	0.1687	6.70	zi 30, ru, di, tu, le, qu 5	MI
rendement total total yield	2.3855	94.69		

MS[5] – Séparation de l'échantillon EM 7

Separation of the sample EM 7

Échantillon Sample / Concentré Concentrate	Poids Weight g	%	Minéraux Minerals	Remarques Remarks
EM 7 -0.20	7.4611	100.00		
admission total / total feed	7.4611	100.00		
MAGNÉTIQUES / MAGNETICS				
Concentré I / Concentrate I	1.4234	19.08		an.rX / X-ray an.
Concentré II / Concentrate II.	1.7560	23.54		an.rX / X-Ray an.
total magnétiques / total magnetics	3.1794	42.62		
PARAMAGNÉTIQUES / PARAMAGNETICS				
Concentré III / Concentrate III	0.7358	9.86		an.rX / X-ray an.
Concentré IV / Concentrate IV	2.0892	28.00		an.rX / X-ray an.
total paramagnétiques / total paramagnetics	2.8250	37.86		
NON-MAGNÉTIQUES / NONMAGNETICS				
Concentré V / Concentrate V	1.2252	16.42		an.rX / X-ray an.
rendement total / total yield	7.2296	96.90		

MS6 – Séparation de l'échantillon EM 8
Separation of the sample EM 8

Échantillon Sample	Poids Weight g	 % 	Minéraux Minerals	Remarques Remarks
Concentré Concentrate				
EM 8 +0.2	2.5213			
admission total total feed	2.5213	100.00		
MAGNÉTIQUES MAGNETICS				
Concentré I Concentrate I	0.0808	3.20	il,he	MI
Concentrate II Concentré II	0.2639	10.47	il	MI
total magnétiques total magnetics	0.3447	13.67		
PARAMAGNÉTIQUES PARAMAGNETICS				
Concentré III Concentrate III	0.4820	19.12	ep30,ga30,ru30, ga 50	MI
Produit intermédiaire IIIa Middling product IIIa	0.1798	7.13		
Concentré IV Concentrate IV	1.1485	45.55	ga50	MI
Produit intermédiaire IVa Middling product IVa	0.2705	10.72	ru,ga	MI
total paramagnétiques total paramagnetics	2.0808	82.52		
NON-MAGNÉTIQUES NONMAGNETICS				
Concentré V Concentrate V	0.0758	3.01	zi70	MI
rendement total total yield	2.5013	99.20		

MS7 - Séparation de l'échantillon EM 8
- Separation of the sample EM 8

Échantillon Sample	Poids Weight g	 %	Minéraux Minerals	Remarques Remarks	
Concentré Concentrate					
EM 8 -0.20	7.0628	100.00			
admission total total feed	7.0628	100.00			
MAGNÉTIQUES MAGNETICS					
Concentré I Concentrate I	1.1226	15.89	il	an.chem. ch.a.	MI
Concentré II Concentrate II	1.9875	28.14	il	an.chem. ch.a.	MI
total magnétiques total magnetics	3.1101	44.03			
PARAMAGNÉTIQUES PARAMAGNETICS					
Concentré III Concentrate III	0.7515	10.64	ep30,ru40,tu10,	an.chem. ch.a.	MI
Concentré IV Concentrate IV	1.7303	24.50	ep,ru50,ga40,tu	an.chem. ch.a.	MI
total paramagnétiques total paramagnetics	2.4818	35.14			
NON-MAGNÉTIQUES NONMAGNETICS					
Concentré V Concentrate V	1.3728	19.44	zi50,qu20,ru10	an.chem. ch.a. an.chem. ch.a.	
rendement total total yield	6.9647	98.61			

Tableau 17/8
Table 17/8

MS8 – Séparation de l'échantillon EM 9
Separation of the sample EM 9

Échantillon Sample	Poids Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate				
EM 9 +0.20	7.2776	100.00		
admission total total feed	7.2776	100.00		
MAGNÉTIQUES MAGNETICS				
Concentré I Concentrate I	0.5630	7.74	il54,ru24,he15 an4.sph2	MIQ
Concentré II Concentrate II	0.6342	8.71	il48,ru 35,he 13,an2, sph 2	MIQ
total magnétiques total magnetics	1.1972	16.45		
PARAMAGNÉTIQUES PARAMAGNETICS				
Concentré III Concentrate III	0.4840	6.65		
Produit intermédiaire IIIa Middling product IIIa	0.4260	5.85	ru+il90	MI
Concentré IV Concentrate IV	3.4536	47.46	ga40,ru+il40,ep20,	MI
Produit intermédiaire IVa Middling product IVa	0.9816	13.49	ru+il80,ga,py,am,mo	MI
total paramagnétiques total paramagnetics	5.3452	73.45		
NON-MAGNÉTIQUES NONMAGNETICS				
Concentré V Concentrate V	0.4830	6.64		
rendement total total yield	7.0254	96.54		

MS[9] - Séparation de l'échantillon EM 10
Separation of the sample EM 10

Échantillon Sample	Poids Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate				
EM 9 -0.20	17.3624	100.00		
admission total total feed	17.3624	100.00		
MAGNÉTIQUES MAGNETICS				
Concentré I Concentrate I	1.6704	9.62		an.chem. ch.a.
Concentré II Concentrate II	2.5020	14.41		an.chem. ch.a.
total magnétiques total magnetics	4.1724	24.03		
PARAMAGNÉTIQUES PARAMAGNETICS				
Concentré III Concentrate III	0.3504	2.02		an.chem. ch.a.
Produit intermédiaire IIIa Middling product IIIa	0.1257	0.72		
Concentré IV Concentrate IV	6.9060	39.78	ru40,ga30,ep20	MI
Produit intermédiaire IVa Middling product IVa	2.0243	11.66		
total paramagnétiques total paramagnetics	9.4054	54.18		
NON-MAGNÉTIQUES NONMAGNETICS				
Concentré V Concentrate V	3.3610	19.38	zi90	an.chem. ch.a.
rendement total total yield	16.9398	97.59		

Tableau 17/10
Table 17/10

MS[10] – Séparation de l'échantillon EM 10
Separation of the sample EM 10

Échantillon Sample Concentré Concentrate	Poids Weight g	%	Minéraux Minerals	Remarques Remarks
EM 10/ +0.20	2.7644	100.00		
admission total total feed	2.7644	100.00		
MAGNÉTIQUES MAGNETICS				
Concentré I Concentrate I	0.1110	4.02		
Concentré II Concentrate II	0.0515	1.86		
total magnétiques total magnetics	0.1625	5.88		
PARAMAGNÉTIQUES PARAMAGNETICS				
Concentré III Concentrate III	0.5420	19.61	ep60,ru20,le,ga,mo,st	MI
Produit intermédiaire IIIa Middling product IIIa	0.0485	1.75		
Concentré IV Concentrate IV	1.2380	44.78	ga 70	MI
Produit intermédiare IVa Middling product IVa	0.2681	9.70	ep40,ga40,ru10,st,le	MI
total paramagnétiques total paramagnetics	2.0966	75.84		
NON-MAGNÉTIQUES NONMAGNETICS				
Concentré V Concentrate V	0.2137	7.73	zi40,di,ru,le,tu	MI
rendement total total yield	2.4728	89.45		

MS[11] – Séparation de l'échantillon EM 10.
Separation of the sample EM 10

Échantillon Sample	Poids Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate				
EM 10 -0.20	11.5713	100.00		
admission total total feed	11.5713	100.00		
MAGNÉTIQUES MAGNETICS				
Concentré I Concentrate I	3.2730	28.28		
Concentré II Concentrate II	0.9635	8.33		
total magnétiques total magnetics	4.2365	36.61		
PARAMAGNÉTIQUES PARAMAGNETICS				
Concentré III Concentrate III	0.4489	3.88		
Produit intermédiaire IIIa Middling product IIIa	0.5580	4.82	ru80,ep10,st,le,ga,mo	MI
Concentré IV Concentrate IV	2.6070	22.53		
Produit intermédiaire IVa Middling product IVa	1.1071	9.57		
total paramagnétiques total paramagnetics	4.7210	40.80		
NON-MAGNÉTIQUES NONMAGNETICS				
Concentré V Concentrate V	2.1140	18.27	zi80,ru10	an.chem. ch.a. MI
rendement total total yield	11.0715	95.68		

MS[12] – Séparation de l'échantillon EM 11
Separation of the sample EM 11

Échantillon Sample Concentré Concentrate	Poids Weight g	%	Minéraux Minerals	Remarques Remarks
EM 11 +0.20	5.6101	100.00		
admission total total feed	5.6101	100.00		
MAGNÉTIQUES MAGNETICS				
Concentré I Concentrate I	0.4647	8.28		
Concentré II Concentrate II	0.5699	10.16		
total magnétiques total magnetics	1.0346	18.44		
PARAMAGNÉTIQUES PARAMAGNETICS				
Concentré III Concentrate III	0.4662	8.31		
Produit intermédiaire IIIa Middling product IIIa	0.4485	7.99		
Concentré IV Concentrate IV	2.3292	41.52		
Produit intermédiaire IVa Middling product IVa	0.6063	10.81	ru45,ga45,ep10	MI
total paramagnétiques total paramagnetics	3.8501	68.63		
NON-MAGNÉTIQUES NONMAGNETICS				
Concentré V Concentrate V	0.3452	6.15	zi50,st,ru,di,mo,tu	MI
rendement total total yield	5.2300	93.22		

Tableau 17/13
Table 17/13

MS[13] - Séparation de l'échantillon EM 11
Separation of the sample EM 11

Échantillon Sample ------ Concentré Concentrate	Poids Weight g	 %	Minéraux Minerals	Remarques Remarks
EM 11 -0.20	11.2557	100.00		
admission total total feed	11.2557	100.00		
MAGNÉTIQUES MAGNETICS				
Concentré I Concentrate I	1.3240	11.77		an.chem. ch.a.
Concentré II Concentrate II	1.7750	15.77		
total magnétiques total magnetic	3.0990	27.54		
PARAMAGNÉTIQUES PARAMAGNETICS				
Concentré III Concentrate III	0.5850	5.20		
Produit intermédiaire IIIa Middling product IIIa	0.4158	3.69		
Concentré IV Concentrate IV	3.6354	32.61		
Produit intermédiaire IVa Middling product IV a	1.2220	10.86	ru+il70,ga15,ep15	MI
total paramagnétiques total paramagnetics	5.8582	52.36		
NON-MAGNÉTIQUES NONMAGNETICS				
Concentré V Concentrate V	1.8686	16.61	zi90,ru,tu	MI
rendement total total yield	10.8258	96.51		

Tableau 17/4
Table 17/4

MS 14 - Séparation de l'échantillon EM 12
Separation of the sample EM 12

Échantillon / Sample	Poids / Weight g	%	Minéraux / Minerals	Remarques / Remarks
Concentré / Concentrate				
EM 12 +0.20	3.8701			
admission total / total feed	3.8701	100.00		
MAGNÉTIQUES / MAGNETICS				
Concentré I / Concentrate I	0.0670	1.73	il,ma	MI
Concentré II / Concentrate II	0.4390	11.34	il	MI
total magnétiques / total magnetics	0.5060	13.07		
PARAMAGNÉTIQUES / PARAMAGNETICS				
Concentré III / Concentrate III	0.2270	5.87	ep70,st20,tu,ga,mo	MI
Produit intermédiaire IIIa / Middling product IIIa	0.4421	11.42		
Concentré IV / Concentrate IV	2.0228	52.27	ga50,ru+il50	MI
Produit intermediaire IVa / Middling product IVa	0.3482	9.00		
total paramagnétiques / total paramagnetics	3.0401	78.56		
NON-MAGNÉTIQUES / NONMAGNETICS				
Concentré V / Concentrate V	0.2593	6.70	zi50,ru20,qu5	MI
rendement total / total yield	3.8054	98.33		

Tableau 17/15
Table 17/15

MS 15 – Séparation de l'échantillon EM 12
Separation of the sample EM 12

Échantillon Sample / Concentré Concentrate	Poids Weight g	%	Minéraux Minerals	Remarques Remarks
EM 12 -0.20	3.6600	100.00		
admission total / total feed	3.6600	100.00		
MAGNÉTIQUES / MAGNETICS				
Concentré I / Concentrate I	0.5770	15.77		
Concentré II / Concentrate II	1.1830	5.00		
total magnétiques / total magnetics	0.7600	20.77		
PARAMAGNÉTIQUES / PARAMAGNETICS				
Concentré III / Concentrate III	0.1010	2.76		
Produit intermédiaire IIIa / Middling product IIIa	0.3100	8.47		
Concentré IV / Concentrate IV	1.2640	34.54		
Produit intermédiaire IVa / Middling product IVa	0.2916	7.96		
total paramagnétiques / total paramagnetics	1.9666	53.73		
NON-MAGNÉTIQUES / NONMAGNETICS				
Concentré V / Concentrate V	0.5600	15.30	zi90,qu5,ru,tu	MI
rendement total / total yield	3.2866	89.90		

Tableau 17/16
Table 17/16

MS[16] – Séparation de l'échantillon EM 13

Separation of the sample EM 13

Échantillon Sample Concentré Concentrate	Poids Weight g	% 	Minéraux Minerals	Remarques Remarks
EM 13 +0.20	2.5303			
admission total total feed	2.5303	100.00		
MAGNÉTIQUES MAGNETICS				
Concentré I Concentrate I	0.0436	1.72		
Concentré II Concentrate II	0.0722	2.85		
total magnétiques total magnetics	0.1158	4.57		
PARAMAGNÉTIQUES PARAMAGNETICS				
Concentré III Concentrate III	0.2560	10.12		
Produit intermédiaire IIIa Middling product IIIa	0.2884	11.40		
Concentré IV Concentrate IV	1.2802	50.59	ga80,ru+il 20	MI
Produit intermédiaire IVa Middling product IVa	0.3880	15.33		
total paramagnétiques total paramagnetics	2.2126	87.44		
NON-MAGNÉTIQUES NONMAGNETICS				
Concentré V Concentrate V	0.1486	5.87	zi60,ru,st,di,mo	MI
rendement total total yield	2.4770	97.88		

MS[17] – Séparation de l'échantillon EM 13
Separation of the sample EM 13

Échantillon / Sample	Poids / Weight g	%	Minéraux / Minerals	Remarques / Remarks
Concentré / Concentrate				
EM 13 -0.20	5.3848			
admission total / total feed	5.3848	100.00		
MAGNÉTIQUES / MAGNETICS				
Concentré I / Concentrate I	0.3998	7.42		
Concentré II / Concentrate II	1.0528	19.55		
total magnétiques / total magnetics	1.4526	26.97		
PARAMAGNÉTIQUES / PARAMAGNETICS				
Concentré III / Concentrate III	0.1032	1.92	ep50,ru+il10,tu,mo,py,st	MI
Produit intermédiaire IIIa / Middling product IIIa	0.6181	11.48		
Concentré IV / Concentrate IV	2.0542	38.15		
Produit intermédiaire IVa / Middling product IVa	0.3078	5.72		
total paramagnétiques / total paramagnetics	3.0833	57.27		
NON-MAGNÉTIQUES / NONMAGNETICS				
Concentré V / Concentrate V	0.7320	13.59	zi80,st,ru,di,tu,mo	MI
rendement total / total yield	5.2679	97.83		

MS 18 – Séparation de l'échantillon EM 14
Separation of the sample EM 14

Échantillon Sample / Concentré Concentrate	Poids Weight g	%	Minéraux Minerals	Remarques Remarks
EM 14 +0.20	5.7102	100.00		
admission total total feed	5.7102	100.00		
MAGNÉTIQUES MAGNETICS				
Concentré I Concentrate I	0.2735	4.79		
Concentré II Concentrate II	0.3728	6.53		
total magnétiques total magnetics	0.6463	11.32		
PARAMAGNÉTIQUES PARAMAGNETICS				
Concentré III Concentrate III	0.5500	9.63		
Produit intermédiaire IIIa Middling product IIIa	0.1242	2.17	ru+il50,ep40,ga,st,le py,am	MI
Concentré IV Concentrate IV	2.5350	44.39	ga 80	MI
Produit intermédiaire IVa Middling product IVa	1.1650	20.40	ru+il50,ga20,ep20,tu,py am	MI
total paramagnétiques total paramagnetics	4.3742	76.59		
NON-MAGNÉTIQUES NONMAGNETICS				
Concentré V Concentrate V	0.4142	7.25	zi30,di10,ru,le,st,tu	MI
rendement total total yield	5.4347	95.16		

MS[19] - Séparation de l'échantillon EM 14
Separation of the sample EM 14

Échantillon Sample / Concentré Concentrate	Poids Weight g	%	Minéraux Minerals	Remarques Remarks
EM 14 -0.20	9.8004			
admission total / total feed	9.8004	100.00		
MAGNÉTIQUES / MAGNETICS				
Concentré I / Concentrate I	0.7160	7.31	il	MI
Concentré II / Concentrate II	1.1618	11.85	il	MI
total magnétiques / total magnetics	1.8778	19.16		
PARAMAGNÉTIQUES / PARAMAGNETICS				
Concentré III / Concentrate III	0.1571	1.60		
Produit intermédiaire IIIa / Middling product IIIa	0.7480	7.63		
Concentré IV / Concentrate IV	4.0611	41.44	ga30,ru40,il20 he4,goe3,an3	MI
Produit intermédiaire IVa / Middling product IVa	0.6690	6.83		
total paramagnétiques / total paramagnetics	5.6352	57.50		
NON-MAGNÉTIQUES / NONMAGNETICS				
Concentré V / Concentrate V	1.6403	16.74	zi70,ru5,di	MI
rendement total / total yield	9.1533	93.40		

Tableau 17/20
Table 17/20

MS[20] - Séparation de l'échantillon EM 15

Separation of the sample EM 15

Échantillon Sample	Poids Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate				
EM 15 +0.20	4.2033	100.00		
admission total total feed	4.2033	100.00		
MAGNÉTIQUES MAGNETICS				
Concentré I Concentrate I	0.1305	3.10		
Concentré II Concentrate II	0.2143	5.10		
total magnétiques total magnetics	0.3448	8.20		
PARAMAGNÉTIQUES PARAMAGNETICS				
Concentré III Concentrate III	0.3870	9.21		
Produit intermédiaire IIIa Middling product IIIa	0.5908	14.06		
Concentré IV Concentrate IV	1.7696	42.10	ga 60	MI
Produit intermédiaire IVa Middling product IVa	0.4828	11.49		
total paramagnétiques total paramagnetics	3.2302	76.86		
NON-MAGNÉTIQUES NONMAGNETICS				
Concentré V Concentrate V	0.3548	8.44	zi40,di,st,ru,mo	MI
rendement total total yield	3.9298	93.50		

Tableau 17/21
Table 17/21

MS[21] - Séparation de l'échantillon EM 15
Separation of the sample EM 15

Échantillon Sample	Poids Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate				
EM 15 -0.20	8.7558	100.00		
admission total / total feed	8.7558	100.00		
MAGNÉTIQUES / MAGNETICS				
Concentré I / Concentrate I	0.3482	3.98		
Concentré II / Concentrate II	0.9470	10.82		
total magnétiques / total magnetics	1.2952	14.80		
PARAMAGNÈTIQUES / PARAMAGNETICS				
Concentré III / Concentrate III	0.7343	8.38	ep	MI
Produit intermédiaire IIIa / Middling product IIIa	1.0157	11.60	ep+ga	MI
Concentré IV / Concentrate IV	2.1834	24.94	ga	MI
total paramagnétiques / total paramagnetics	3.9334	44.92		
NON-MAGNÉTIQUES / NONMAGNETICS				
Concentré V / Concentrate V	2.3756	27.13		
rendement total / total yield	7.6042	86.85		

Tableau 17/22
Table 17/22

MS[21] – Séparation de l'échantillon EM 16
Separation of the sample EM 16

Échantillon Sample	Poids Weight g	%	Minéraux Minerals	Remarques Remarks
Concentré Concentrate				
EM 16 +0.20	3.1753	100.00		
admission total total feed	3.1753	100.00		
MAGNÉTIQUES MAGNETICS				
Concentré I Concentrate I	0.1355	4.27		
Concentré II Concentrate II	0.1565	4.93		
total magnétiques total magnetics	0.2920	9.20		
PARAMAGNÉTIQUES PARAMAGNETICS				
Concentré III Concentrate III	0.3640	11.46		
Produit intermédiaire IIIa Middling product IIIa	0.3230	10.17		
Concentré IV Concentrate IV	1.3771	43.37	ga70,ru30	MI
Produit intermédiaire IVa Middling product IVa	0.4201	13.23	ep50,ga30,ru10,st,le	MI
total paramagnétiques total paramagnetics	2.4842	78.23		
NON-MAGNÉTIQUES NONMAGNETICS				
Concentré V Concentrate V	0.2316	7.29	zi30,ru,mo,di,st,le	MI
rendement total total yield	3.0078	94.72		

MS[23] Séparation de l'échantillon EM 16
Separation of the sample EM 16

Échantillon Sample	Poids Weight g	%	Minéraux Minerals	Remarques Remarques
Concentré Concentrate				
EM 16 -0.20	6.4652	100.00		
admission total total feed	6.4652	100.00		
MAGNÉTIQUES MAGNETICS				
Concentré I Concentrate I	0.8955	13.85	il	an.chem. ch.a.
Concentré II Concentrate II	1.2655	19.57	il	an.chem. ch.a.
total magnétiques total magnetics	2.1610	33.42		
PARAMAGNÉTIQUES PARAMAGNETICS				
Concentré III Concentrate III	0.2735	4.23		
Produit intermédiaire IIIa Middling product IIIa	0.3968	6.14		an.chem. ch.a.
Concentré IV Concentrate IV	1.9315	29.88	ru+il70,ga20,ep, py,	MI
Produit intermédiaire IVa Middling product IVa	0.3880	6.00	ru40,ep30,ga20, py	MI
total paramagnétiques total paramagnetics	2.9898	46.25		
NON-MAGNÉTIQUES NONMAGNETICS				
Concentré V Concentrate V	1.1125	17.21	zi70	an.chem. ch.a.
rendement total total yield	6.2633	96.88		

MICROANALYSE DE L'ILMÉNITE - POURCENTAGE PONDERAL - ÉCHANT. No, EM 15 - 0.20

MICROPROBE COMPOSITION OF ILMENITE IN WT. % FROM THE SAMPLES EM 15 - 0.20

Tableau
Table 18

Échant. No	MgO	Al_2O_3	SiO_2	P_2O_5	CaO	TiO_2	V_2O_5	MnO	FeO	Σ
I1	1.50	1.00	0.37	≤0.02	0.80	61.46	0.30	0.50	32.55	98.48
B1	0.80	≤0.02	0.35	"	≤0.05	51.20	≤0.12	0.30	47.00	99.65
C1	1.70	"	0.26	"	"	63.67	1.38	0.40	31.58	98.99
D6	1.81	"	0.63	"	0.60	62.69	0.50	0.20	33.38	99.81

Tableau 19

Table 19

Microanalyse de TiO_2 - pourcentage pondéval - échant. n° EM 15 -0.20

Microprobe composition of TiO_2 in wt% from the sample EM 15 -0.20

Échant. n° Probe number	Al_2O_3	SiO_2	CaO	TiO_2	Cr_2O_3	FeO	Nb_2O_5	Ta_2O_5	Σ
F 1	0.10	0.17	5.60	91.76	1.17	0.40	0.10	$\leqslant$ 0.08	99.30
H 2	0.51	0.33	9.19	86.86	2.21	0.76	$\leqslant$ 0.04	"	99.86
L 2	$\leqslant$ 0.03	$\leqslant$ 0.02	0.50	98.50	0.24	0.07	0.15	0.18	99.58

$\leqslant$ - limite de detection au microsonde

limit of microprobe detection

Tableau 20

Table 20

Microanalyse de titanite - pourcentage pondéral - échant. n° EM 15 - 0.20

Microprobe composition of titanite in wt.% from sample EM 15 - 0.20

Échant. n° Probe number	Al_2O_3	SiO_2	CaO	TiO_2	Cr_2O_3	FeO	Σ
B 3	1.47	29.99	35.40	29.10	0.05	1.15	97.16
F 5	9.60	29.68	16.35	27.38	1.80	0.79	85.06
H 1	10.11	24.77	26.90	29.72	2.50	0.25	94.25
I 4	7.11	30.25	29.00	28.51	0.50	0.25	95.62
K 2	6.05	30.01	28.75	30.15	0.30	0.86	96.12
K 3	1.25	29.30	20.34	29.26	0.65	0.84	81.64

Tableau 21
Table 21

Microanalyse de zircon -pourcentage pondéral - échantillon n° EM 15 -0.20

Microprobe composition of zircon in wt% from sample EM 15 -0.20

Échant. n° Probe number	MgO	Al_2O_3	SiO_2	P_2O_5	CaO	TiO_2	Cr_2O_3	MnO	FeO	ZrO_2	HfO_2	ThO_2	Σ
B 1	≤0.01	0.12	33.43	0.24	≤0.02	0.05	0.05	≤ 0.02	≤0.03	63.84	0.99	0.27	98.99
B 2	"	0.10	36.63	0.16	"	0.04	0.05	"	0.04	63.15	0.86	0.19	101.22
D 3	0.06	0.39	35.09	0.36	0.76	0.06	1.09	"	1.63	57.67	0.87	0.15	98.13
D 4	0.04	0.28	36.24	0.60	0.84	0.06	0.08	0.04	0.51	59.21	0.88	0.21	98.99
E 1	0.08	0.45	34.35	0.48	0.66	0.06	3.30	≤0.02	0.84	55.55	1.15	0.09	97,01
E 2	≤0.01	0.61	34.25	0.16	0.93	0.06	5.96	"	0.30	56.79	1.04	0.15	100.25
E 3	0.06	0.51	32.41	0.32	0.71	0.05	2.17	"	0.85	56.78	1.11	0.14	95.11
E 4	0.04	0.41	34.97	≤0.02	0.47	0.06	1.29	"	0.05	63.16	1.23	0.09	1101.78
F 2	≤0.01	0.10	34.84	"	0.11	0.05	0.89	"	0.04	[illegible].73	0.92	0.09	101,78
G 1	"	0.12	32.24	"	0.31	0.06	1.55	"	0.31	62.27	0.97	≤ 0.05	97.83
G 2	"	0.19	32.46	"	0.29	0.05	1.55	"	0.30	61.79	0.83	0.16	97.62
G 3	"	0.24	33.18	"	0.37	0.05	2.24	0.05	0.27	61.99	0.85	0.15	99.39
G 4	"	0.24	34.10	"	0.37	0.03	2.16	0.04	0.06	63.65	0.90	0.18	101.73
G 5	"	0.22	32.98	"	0.39	0.04	1.72	≤0.02	0.25	60.13	0.58	0.19	96.50
I 2	0.17	0.25	35.33	"	0.30	0.08	2.00	0.05	0.26	62.42	0.82	0.25	101.93

≤ - limite de detection au microsonde
limit of microprobe detection

83.11.07
AD.85.03

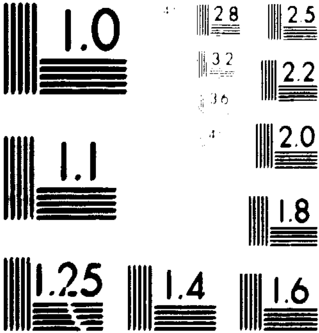

1.0
2.8
2.5
3.2
2.2
3.6
2.0
1.1
1.8
1.25
1.4
1.6

Tableau 22

Table 22

Microanalyse des Fe oxides - pourcentage ponderal .Échant. n° EM 15 - 0.20

Microprobe composition of Fe oxides in wt% from the sample EM 15 - 0.20

Échant. n° Probe number	Al_2O_3	SiO_2	CaO	TiO_2	Cr_2O_3	P_2O_5	ThO_2	Fe_2O_3	Σ
D 5	6.35	5.56	0.20	0.02	0.16	0.61	0.18	64.93	77.99
E 1	12.58	11.77	0.10	0.30	0.10	0.08	0.12	61.56	86.61
E 2	16.44	13.58	0.12	0.20	0.14	0.12	0.05	59.95	90.55
E 3	18.42	20.96	0.18	0.20	0.16	0.10	0.18	54.08	94.28

$\leq$ - limite de detection microsonde

limit of microprobe detection

Tableau 23
Table 23

Microanalyse des garnets - pourcentage ponderal - échant. n° EM 15 - 0.20

Microprobe composition of garnets in wt% from the sample EM 15 -0.20

Échant. n° Probe number	Al_2O_3	SiO_2	CaO	TiO_2	Cr_2O_3	Fe_2O_3	MgO	MnO	NaO	Σ
B 3	21.50	37.71	5.07	0.08	0.12	27.36	2.50	4.00	$\leqslant$ 0.09	98.34
B 4	22.38	38.47	0.99	0.08	0.09	26.39	1.11	8.60	"	98.20
B 5	22.15	37.25	2.80	0.02	0.12	26.54	3.50	6.53	"	98.89
C 2	12.11	43.31	13.14	0.91	$\leqslant$ 0.02	17.68	2.01	8.20	1.82	99.18
D 3	22.15	36.82	1.33	0.08	0.12	23.89	0.80	10.13	$\leqslant$ 0.09	95.32
D 4	20.91	41.05	2.74	$\leqslant$ 0.02	0.05	27.15	1.22	5.10	"	98.22

$\leqslant$ - limite de detectino au microsonde
limit of microprobe detection

Tableau 24
Table 24

Microanalyse de l'epidote - poucentage pondeval - échant. n° 15 EM -0.20

Microprobe composition of epidote in wt.% from the sample EM 15 -0.20

Échant. n° Probe number	Al_2O_3	SiO_2	P_2O_5	CaO	TiO_2	Cr_2O_3	FeO	ThO_2	OH calc.	Σ
C 4	27.78	36.55	⩽0.01	24.08	0.02	0.60	5.13	0.55	5.31	100.00
D 2	22.67	40.20	⩽0.02	21.81	0.10	0.02	8.06	0.35	6.81	"
K 1	21.54	36.47	"	23.20	0.14	0.18	6.46	0.16	11.85	"
D 1	24.33	38.08	"	23.37	0.08	⩽0.02	8.87	0.20	5.07	"
A 1	29.31	36.63	"	24.08	⩽0.02	0.10	6.06	0.05	3.82	"
B 2	27.36	39.03	0.16	23.89	"	⩽0.02	6.58	"	2.98	""

⩽ - limite de detection au microsonde
limit of microprobe detection

RÉSULTATS DE L'ANALYSE CHIMIQUE DE L'ILMENITE, POURCENTAGE PONDÉRAL

RESULTS OF CHEMICAL ANALYSIS OF ILMENITE IN WT. %

No.	Échant. No Sample No	TiO_2	V_2O_5	Fe_2O_3	FeO	Cr_2O_3	MnO
	Region Tânit						
1.	[x] I T 3/1-2	50.53	0.66	35.30	13.30	0.07	1.60
2.	II T 3/1-2	44.10	0.54	32.70	13.20	0.06	1.80
3.	I T 10/1-3	48.70	0.53	35.15	11.70	0.05	1.25
4.	II T 10/1-3	48.22	0.64	30.20	15.70	0.05	1.70
5.	I T 11/3-4	48.90	0.07	31.60	13.20	0.07	1.30
6.	II T 11/5-8	45.20	0.23	31.20	13.55	0.55	1.52
	Région Blaeuoakh						
7.	I B 1/1-4	47.94	0.80	37.20	10.55	0.05	1.35
8.	II B 1/1-4	46.85	0.85	30.35	15.65	0.05	1.55
9.	I B 5/1-4	49.98	0.99	34.50	11.95	0.05	1.32
10.	II B 5/1-4	46.05	0.76	32.60	11.85	0.04	2.05
11.	II B 8/1-4	46.75	0.78	32.00	11.80	0.10	1.56
12.	I B 11/1-2	48.90	1.18	33.55	14.50	0.02	1.65
13.	II B 12/5-8	49.65	0.64	36.10	11.90	0.06	1.90
	Région Jreida						
14.	I J 3/1-2	48.90	0.99	33.50	11.80	0.06	1.55
15.	II J 3/1-2	43.75	0.69	29.30	14.45	0.06	1.05
16.	I J 3/4	43.80	0.82	33.80	10.65	0.04	0.97
17.	II J 3/4	44.48	0.83	31.45	14.50	0.05	1.45
18.	I J 4/1-4	42.40	1.00	30.55	13.35	0.05	1.25
19.	II J 4/1-4	46.63	0.90	34.10	13.20	0.05	1.60
	Region El Msid						
20.	II EM 6	46.25	0.74	34.30	13.20	0.07	1.65
21.	I EM 8 + 0.2	44.60	0.50	32.60	13.25	0.06	0.75
22.	II EM 8 - 0.2	46.86	0.93	28.50	14.85	0.05	1.85
23.	I EM 9 + 0.2	42.50	0.75	35.15	14.20	0.02	1.05
[illegible]	II EM 9 0.2	51.60	0.52	33.45	11.95	0.05	1.65
25.	[illegible] EM 11 - 0.2	42.25	0.64	36.90	14.05	0.10	1.25
26.	II EM 15 0.2	49.63	0.49	35.15	11.75	0.04	1.35
27.	I EM 16 0.2	46.75	0.82	34.50	13.15	0.03	1.35
28.	I W 55/0.5	48.68	0.77	34.10	12.50	0.04	1.50
29.	II W 55/0.5	49.10	0.63	33.75	11.85	0.10	1.55

x = *number of ilmenite concentrate*
numero de l'ilmenite concentré

QUELQUES COMPOSANTS CHIMIQUES DU CONCENTR...

SOME CHEMICAL COMPONENTS OF ZIRCON CONCEN...

	Echant.No Sample No	Qualité du concentré Quality of concentrate	ZrO_2
1	T 1/1-4	zi 75, qu 5, op.m. 20,	39.71
2	T 3/1-4	zi 70, qu 10, op.m.,di,	34.85
3	T 6/1	zi 60, qu 15, op.m. 10, di	37.82
4	T 11/3-4	zi 60, qu 10, op.m. 20, di	35.28
5	B 4/1-4	zi 80, qu 5, Op.m.10, di	50.52
6	B 8/1-4	zi 50, op.m. 30, qu 10, di,tu,	31.89
7	B 11/5-8	zi 80, qu 10, op.m. 10,	47.12
8	B 12/1-4	zi 50, op.m. 20, qu 15, di,	29.46
9	J 5/1-4	zi 60, Op.m. 20, qu 10, ru, di,	31.72
10	J 5/5-8	zi 60, qu 15, op.m. 10, ru,st,di	31.18
11	J 7/1-4	zi 60, qu 10, op.m. 10, mo	36.20
12	EM 8 - 0.20	zi 70, qu 15, op.m. 5, di,mo,	37.15
13	EM 9 - 0.20	zi 80, op.m. 15, me,di,qu,	44.85
14.	EM 10 - 0.20	zi 70, op.m. 10, qu 5,di,sil,	34.88
15	EM 16 - 0.20	zi 70, Op.m. 10, qu10,di,mo,	37.98

[illegible] ZIRCON, [illegible] [illegible]

[illegible]

$[illegible]O_2$	ThO_2	$[illegible]_3O_8$	$[illegible]_2O_3$	Autres Others
0.48	0.19	2.08	0.06	
0.44	0.15	0.33	0.20	
0.46	0.23	0.92	0.14	
0.47	0.10	0.35	0.07	
0.14	0.03	0.22	0.01	
0.34	0.09	0.59	0.06	
0.42	0.14	0.57	0.16	
0.26	0.09	0.42	0.06	
0.34	0.11	0.52	0.10	
0.36	0.14	0.49	0.18	
0.45	0.23	0.73	0.14	Ce_2O_3 -0.37
0.49	0.23	1.58	0.28	
0.60	0.47	0.67	0.79	Ce_2O_3 -1.76
0.47	0.21	0.66	0.31	
0.51	0.19	0.64	0.22	Ce_2O_3 -0.47

QUELQUES COMPOSANTS CHIMIQUES DU CONCENTRÉ D'ÉPIDOTE, MONAZITE, RUTILE, ILMÉNITE, GRENATE ET STAUROLITE

SOME CHEMICAL COMPONENTS OF CONCENTRATE OF EPIDOTE, MONAZITE, RUTILE, ILMENITE, GARNETS AND STAUROLITE

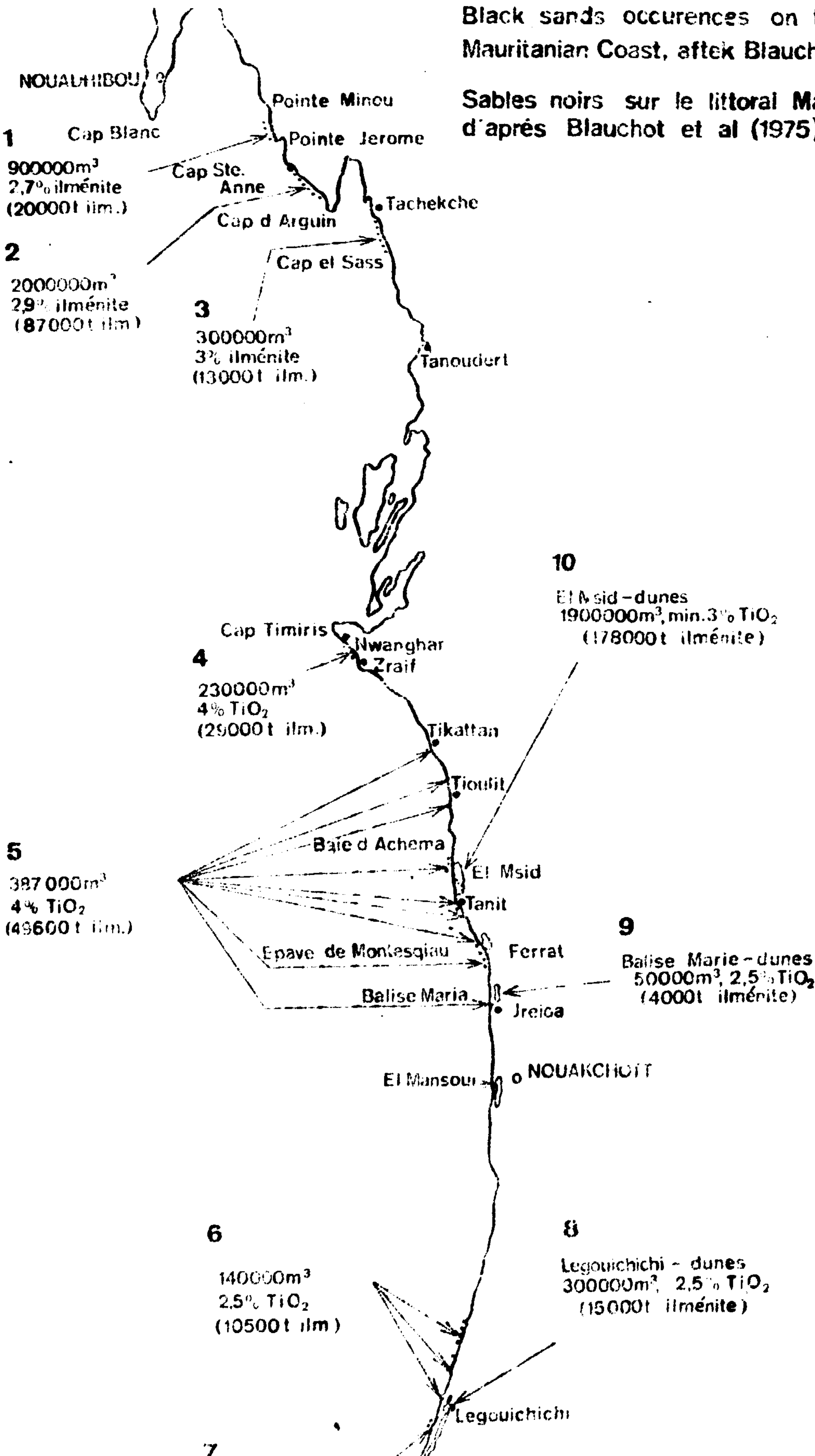
Tableau 27
Table

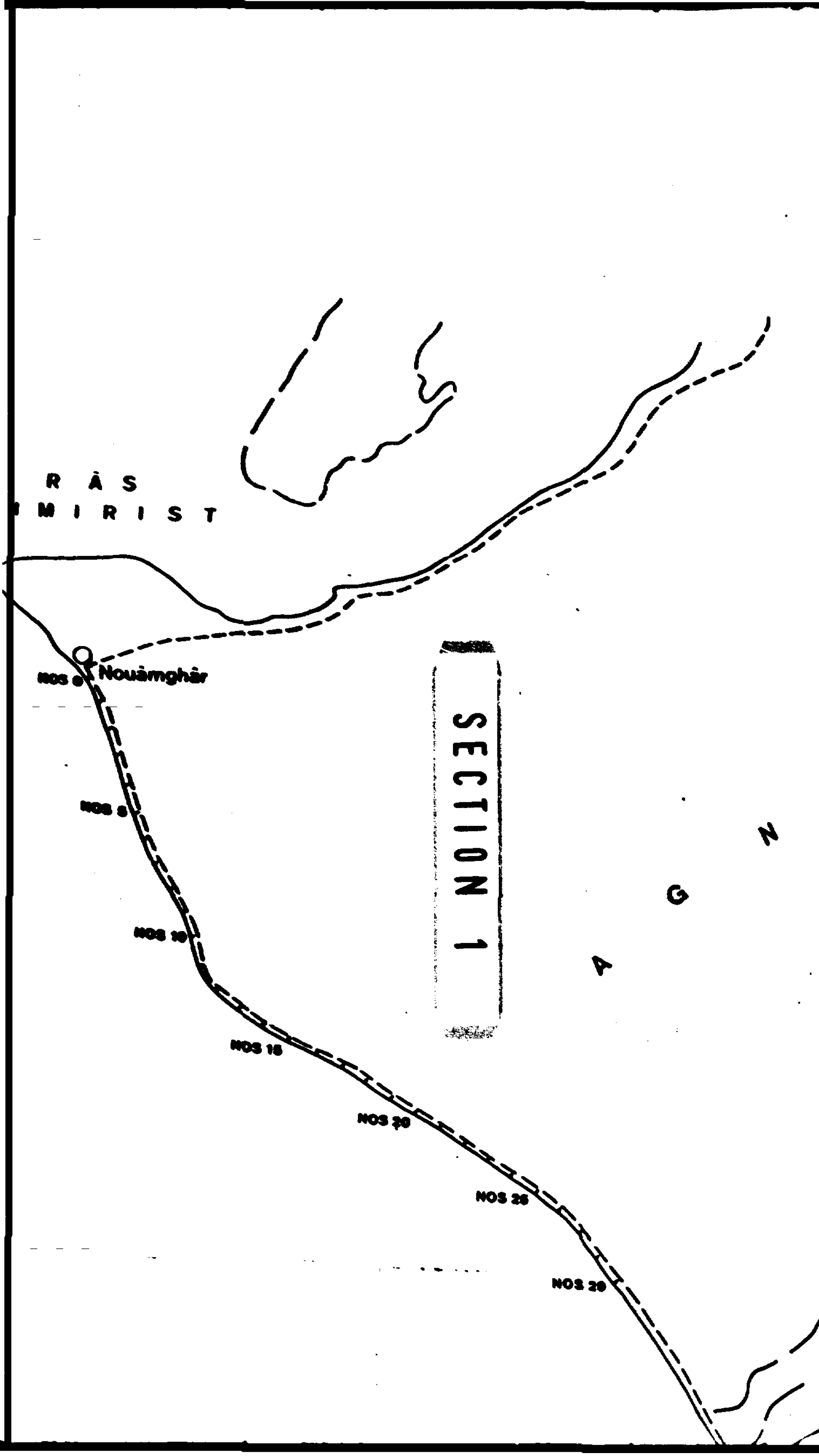
No	Echant. No Sample No	Qualité du concentré Quality of concentrate	ThO_2	U_3O_8	La_2O_3	Ce_2O_3	Autres Others
1	T 1/1-4	ep 60, ep.m. 20,me,st,tu,zi	0.24	0.06	0.53	1.99	ZrO_2 - 7.29
2	T 3/1-4	ep 50, ep.m. 20,st.ga,tu,amf,	0.02	0.02	0.03	-	
3	T 6/1	ep.m. 40, ep,ga,. le	-	0.03	0.47	-	[illegible],Cr,Fe
4	T 11/3-4	ep.m. 40, ep,ga,tu,st,	-	-	0.02	0.05	
5	B 5/1-4	ep.m. 30, ep 40, ga,me,	0.07	0.91	0.08	0.52	
6	B 8/1-4	ep.m. 50, ep 30,ga 20,zi,	-	0.12	0.01	-	ZrO_2 - 1.01
7	B 11/5-8	ep 50, Op.m. 10, ga,st,me,	0.03	0.92	0.07	0.20	
8	B 12/5-8	ep.m. 70, ep 20, ga 10	-	0.02	-	-	
9	J 5/1-4	ep 60, ep.m. 10,st,ga,am ,	0.01	0.02	0.03	-	
10	J 5/5-8	ep 50, ep.m. 15,tu,st,	-	0.05	0.03	-	
11	J 7/1-4	ep 40, Op.m. 30,st,me,ga,	0.05	0.92	0.07	0.29	
12	EM 8 - 0.20	ep 40, ep.m. 30, ga,tu,	0.01	0.02	0.03	-	
13	EM 9 - 0.20	ep 40, ep.m. 30,me,st,le,	0.73	0.94	1.58	6,44	
14	EM 11 -0.20	ep 40, ep.m. 40,ga,le,py,	-	0.93	0.02	-	
15	EM 16 -0.20	ep 60, ep.m. 20,me,st,tu,	0.36	0.92	6.90	2.93	

Fig.1

Black sands occurences on the Mauritanian Coast, aftek Blauchot et al (1975)

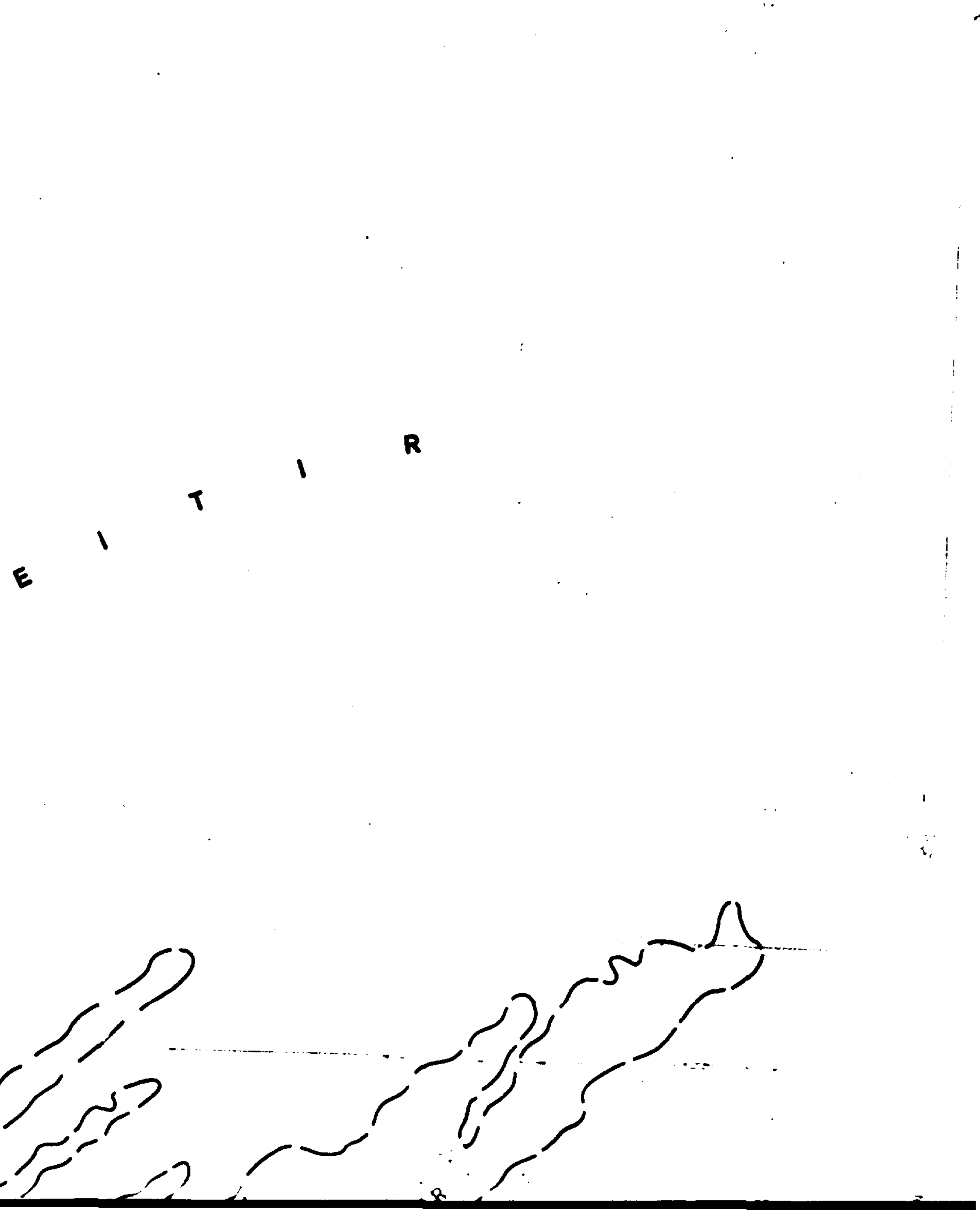
Sables noirs sur le littoral Mauritanien d'aprés Blauchot et al (1975)

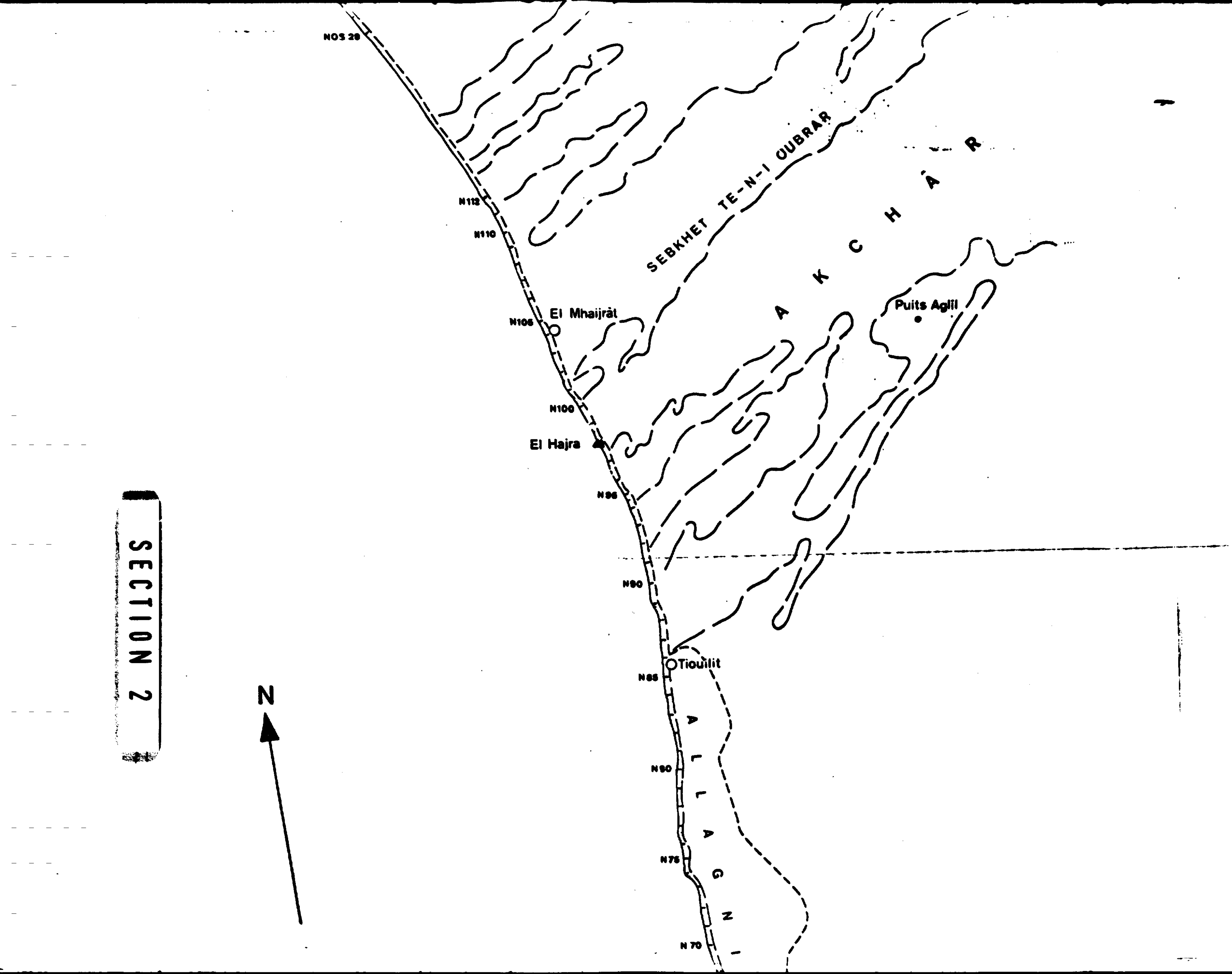


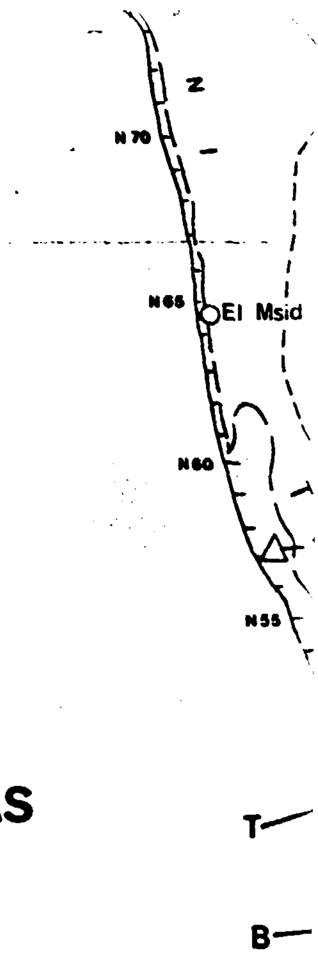


R Â S
M I R I S T
Nouâmghâr
NOS 5
NOS 10
NOS 15
NOS 20
NOS 25
SECTION 1

Fig. 2




SECTION 2
N
NOS 28
N112
N110
N105
N100
N95
N90
N85
N80
N75
N70
El Mhaijrât
El Hajra
Tiouilit
Puits Aglil
SEBKHET TE-N-I OUBRAR
A K C H Â R
A L L A G N I



LITTORAL MAURITANIEN ENTRE NOUAKCHOTT ET RÂS TIMIRIST – SITUATION DES TRAVAUX
MAURITANIAN COAST BETWEEN NOUAKCHOTT AND RÂS TIMIRIST – SITUATION OF WORKS

ECHELLE – SCALE 1 : 200 000

rivage
coast line

limites des régions géographiques
limits of topographical regions

ville
town

village
locality

SECTION 3

route
road

piste
track

AKCHAR nom d'un région géographique
name of topographical region

réchérches géophysiques semidétaillés
semidetail géophysical survey

travaux géophysiques expérimentaux
experimental geophysical survey
1-El Msid 2–Jreida

régions des rechèrches géophysiques détaillés
detail geophysical survey regions
I-Tánit II – Jreida

région des forages
borehole group
T- Tánit B-Blaouakh J - Jreida

ITRE NOUAKCHOTT ET
DES TRAVAUX
EEN NOUAKCHOTT AND RÂS
F WORKS

: 200 000

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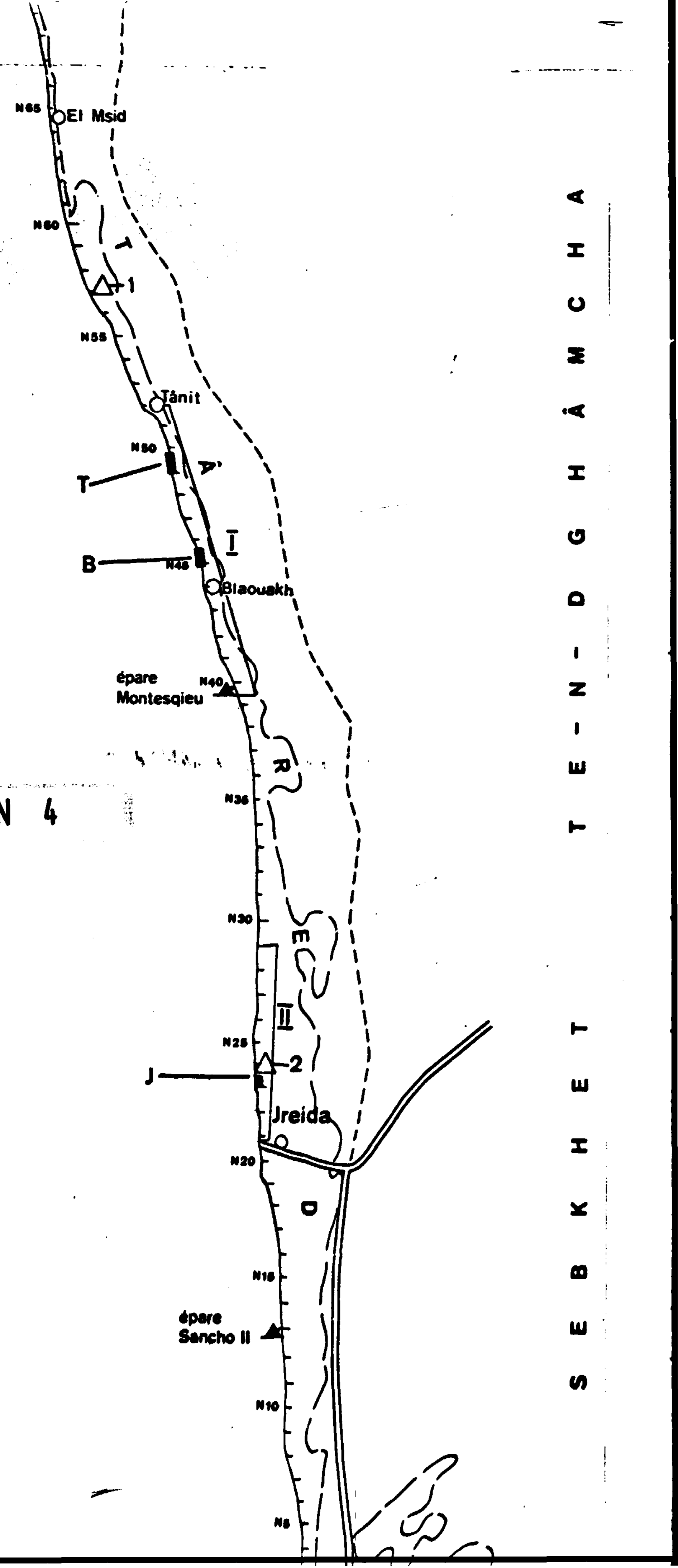
SECTION 4



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- Jreida

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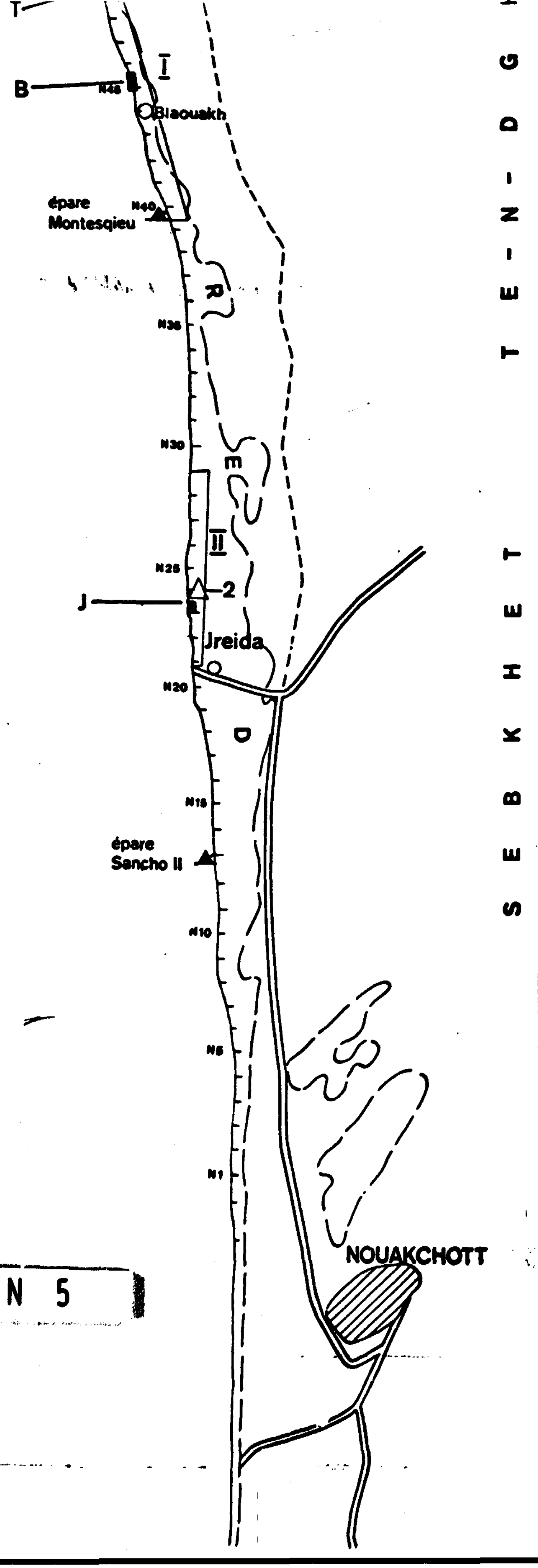
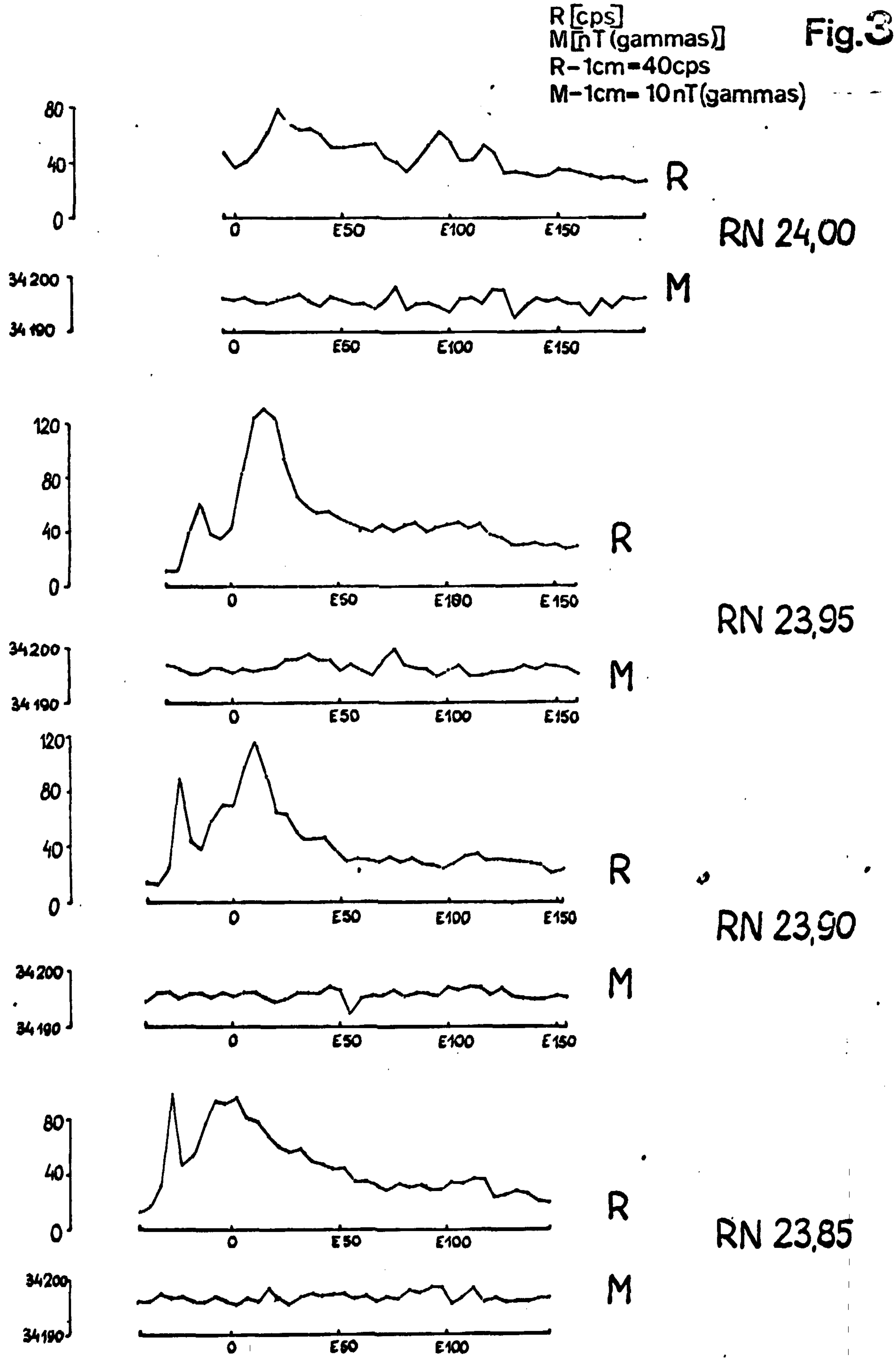
Jreida

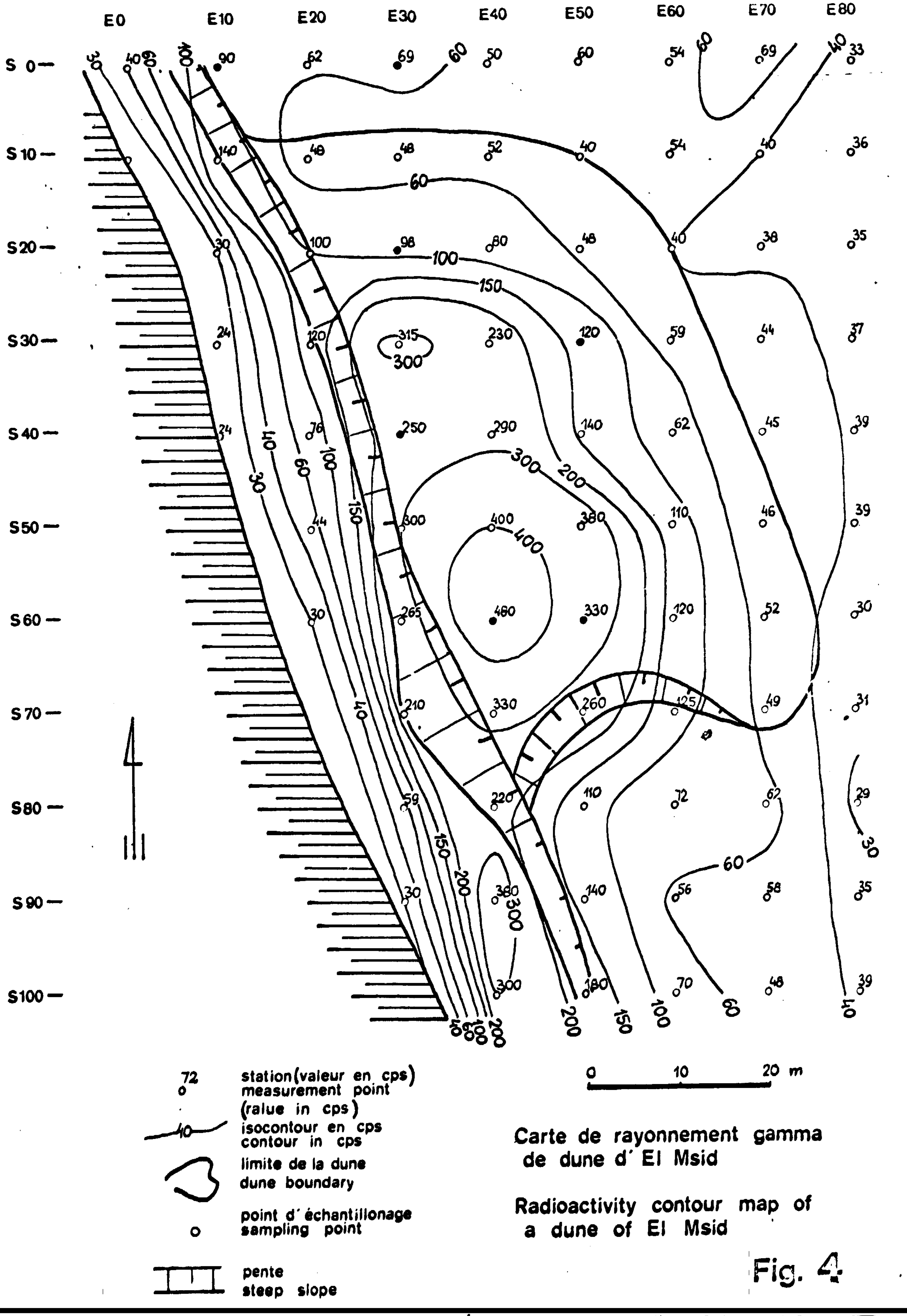


SECTION 5



Profils radiométriques (R) et magnétiques (M)
Travaux methodologiques á Jreida

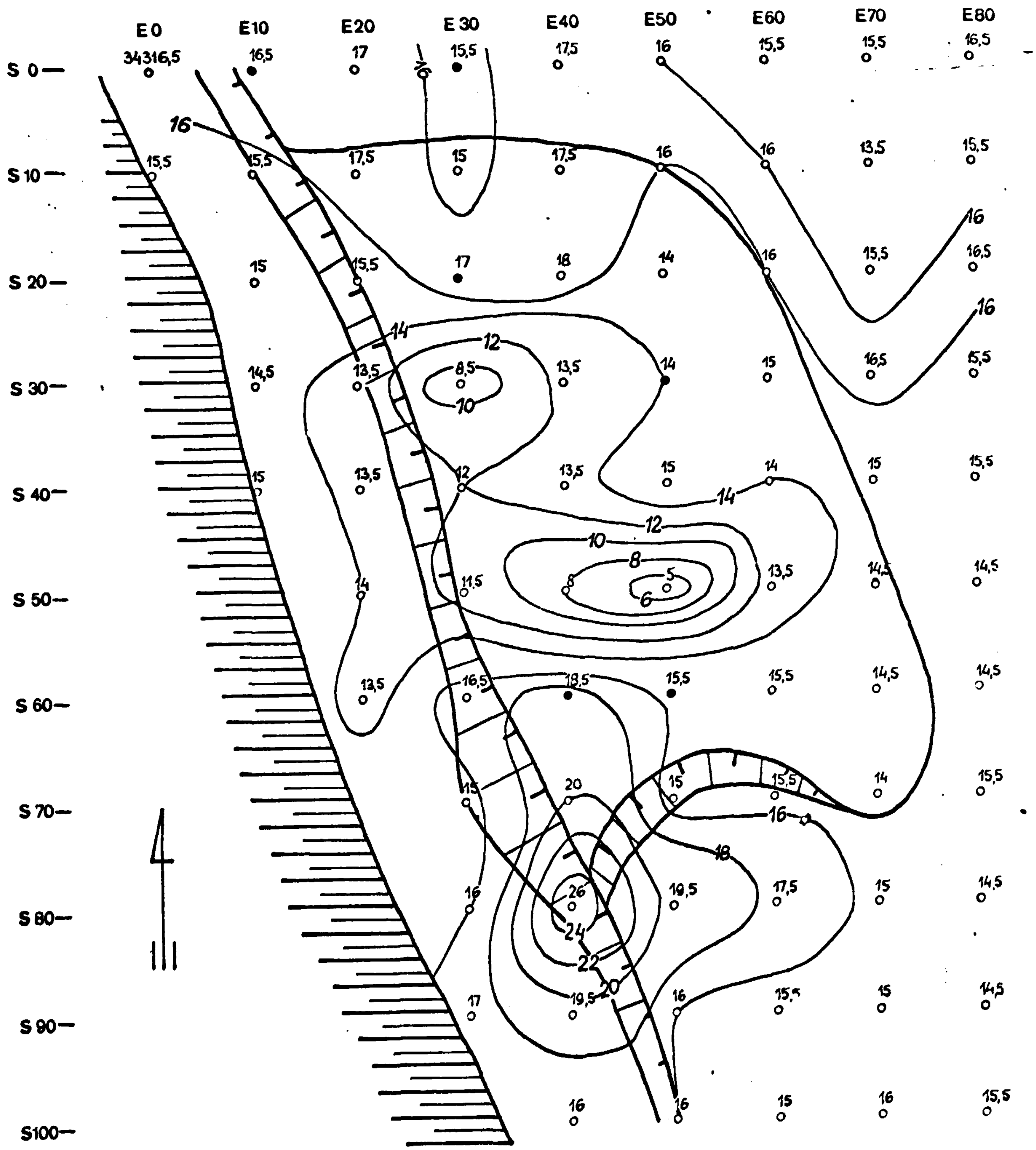
Radiometric (R) and magnetic (M) profiles
Methodology reconnaissance at Jreida



Carte de rayonnement gamma de dune d'El Msid

Radioactivity contour map of a dune of El Msid

Fig. 4



station (raleur en nanoteslas)
measuremeyt point (ralue in nanoteslas)

isocontour en nanoteslas
contour in nanoteslas

limite de la dune
dune boundary

point échantillonné
sampling point

pente
steep slope

0 10 20 m

Carte magnétique de dune d'El Msid

Magnetic map of a dune of El Msid

Fig. 5

Fig. 6

Explications pour figures 7 – 14
Explonations for figures

TRAVAUX SEMIDÉTAILLÉS
SEMIDETAILED SURVEY

Profils radiométrique (R) et magnétiques (M)

Radiometric (R) and magnetic (M) profiles

Échelle horizontale }
Horizontal scale } 1 : 25 000

Fig. 7

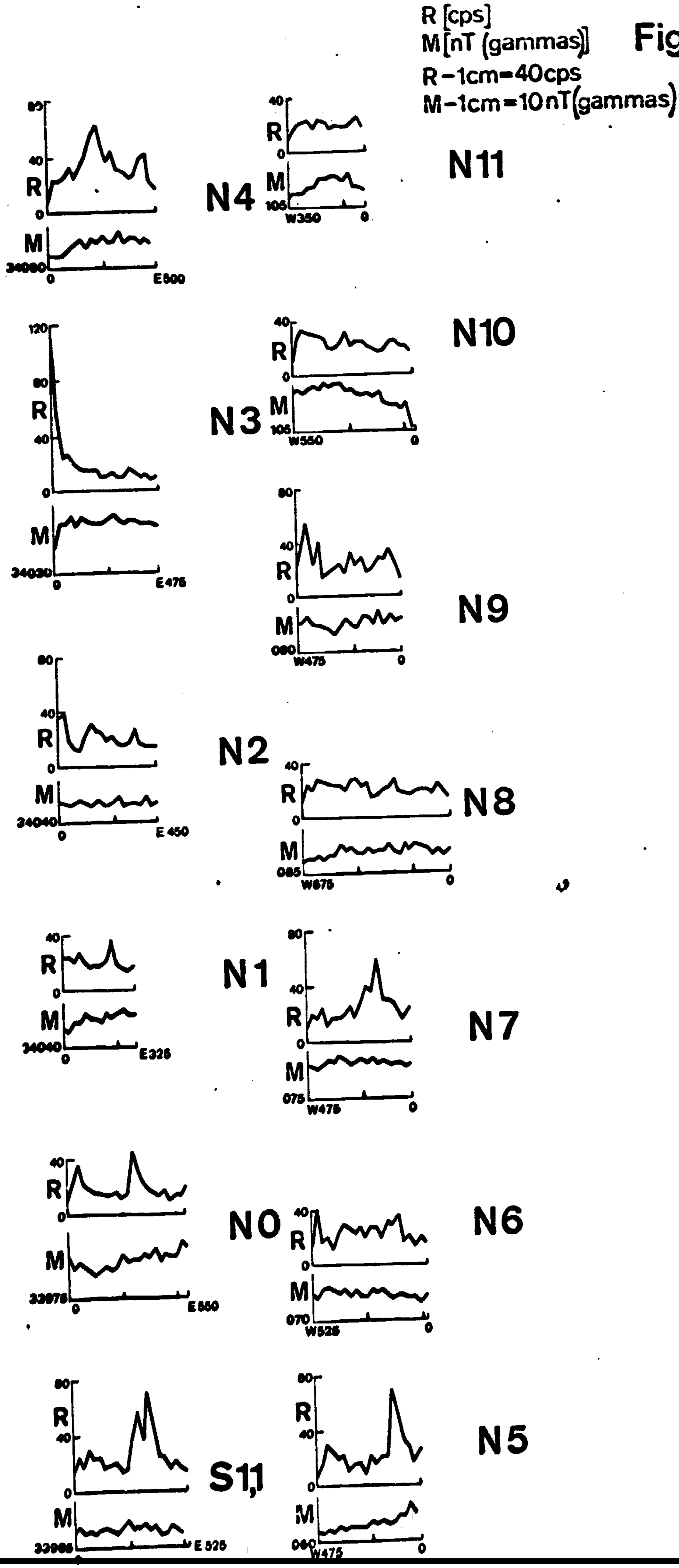
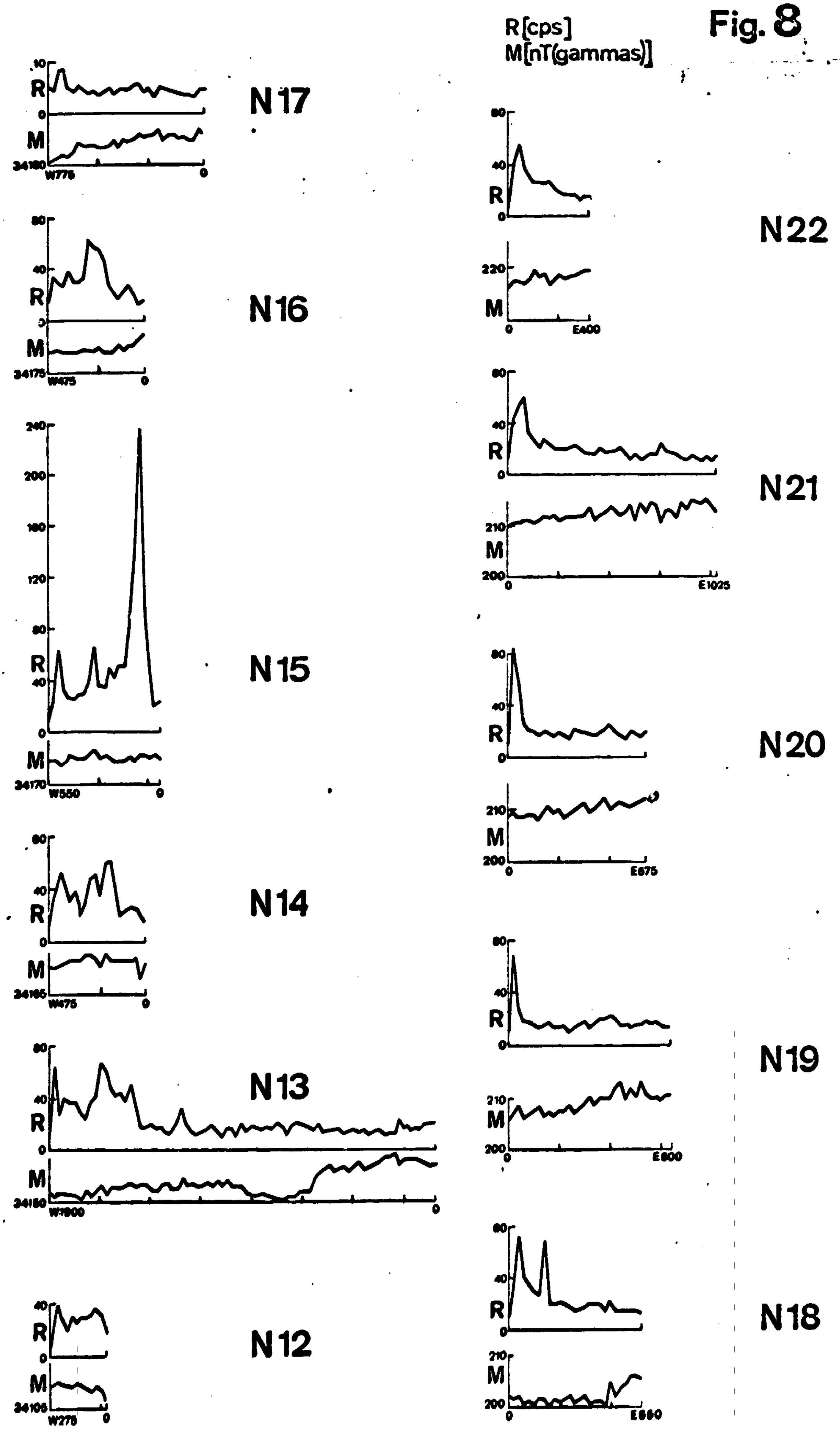

R [cps]
M [nT (gammas)]
R - 1cm = 40cps
M - 1cm = 10 nT (gammas)
N4
N11
N3
N10
N9
N2
N8
N1
N7
N0
N6
S1,1
N5

Fig. 8



R[cps]
M[nT(gammas)]
N17
N16
N15
N14
N13
N12
N22
N21
N20
N19
N18
R
M
34180
W775
34175
W475
34170
W550
34165
W475
34150
W1900
34105
W275
E400
E1025
E675
E800
E650

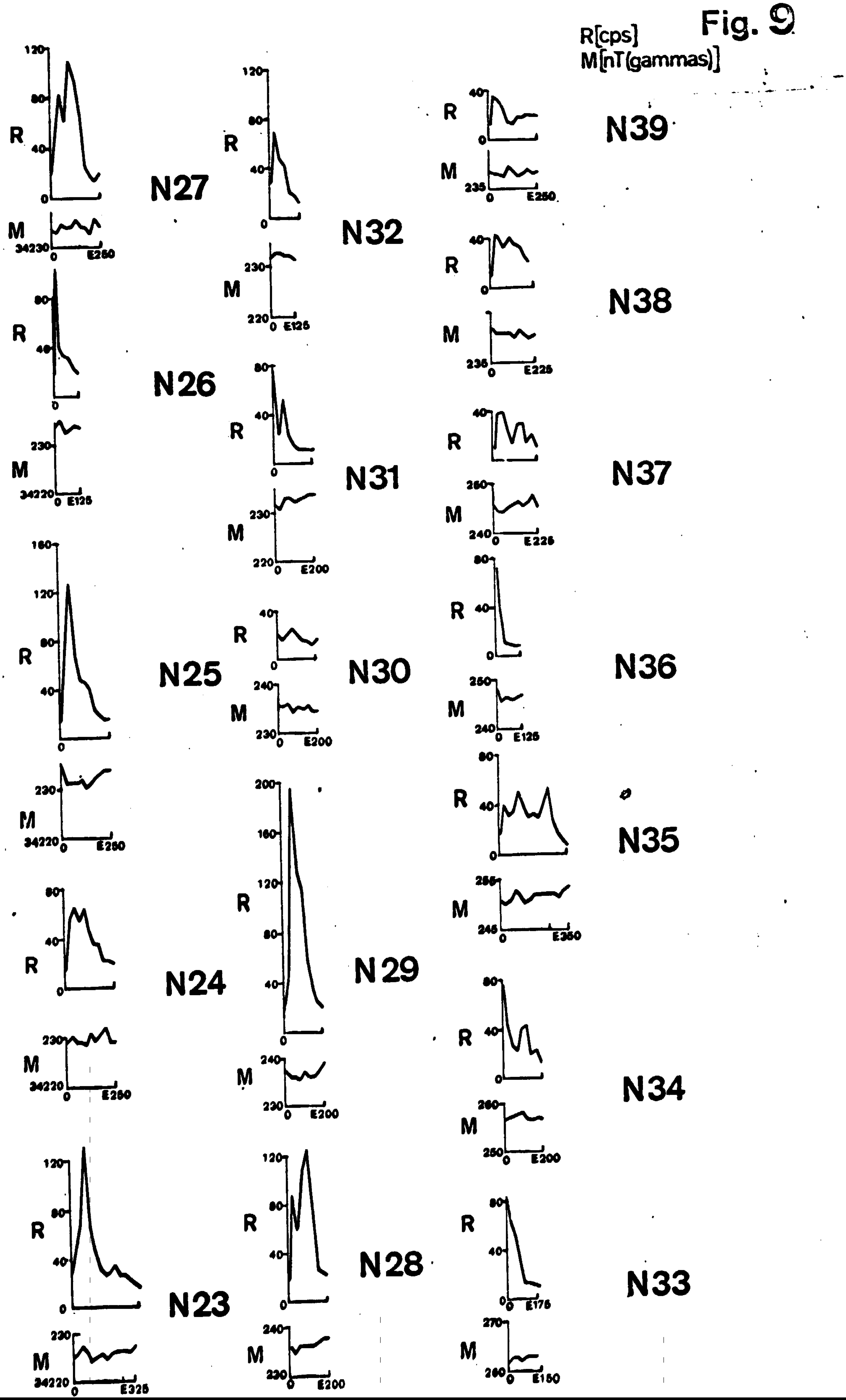


Fig. 9
R[cps]
M[nT(gammas)]
N23
N24
N25
N26
N27
N28
N29
N30
N31
N32
N33
N34
N35
N36
N37
N38
N39

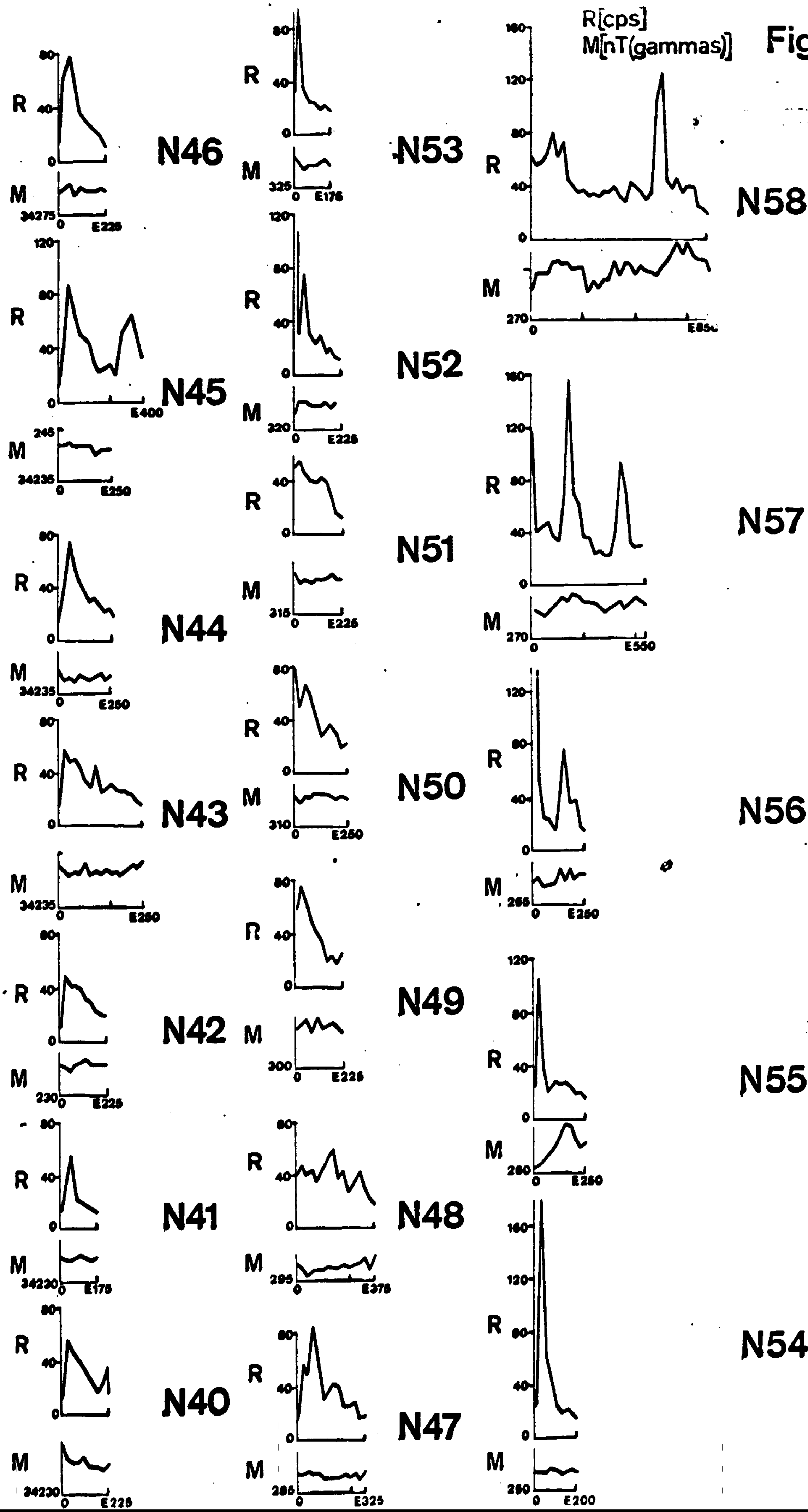

R[cps]
M[nT(gammas)]
N46
N45
N44
N43
N42
N41
N40
N53
N52
N51
N50
N49
N48
N47
N58
N57
N56
N55
N54

Fig.10

R[cps]
M[nT(gammas)]

Fig. 11

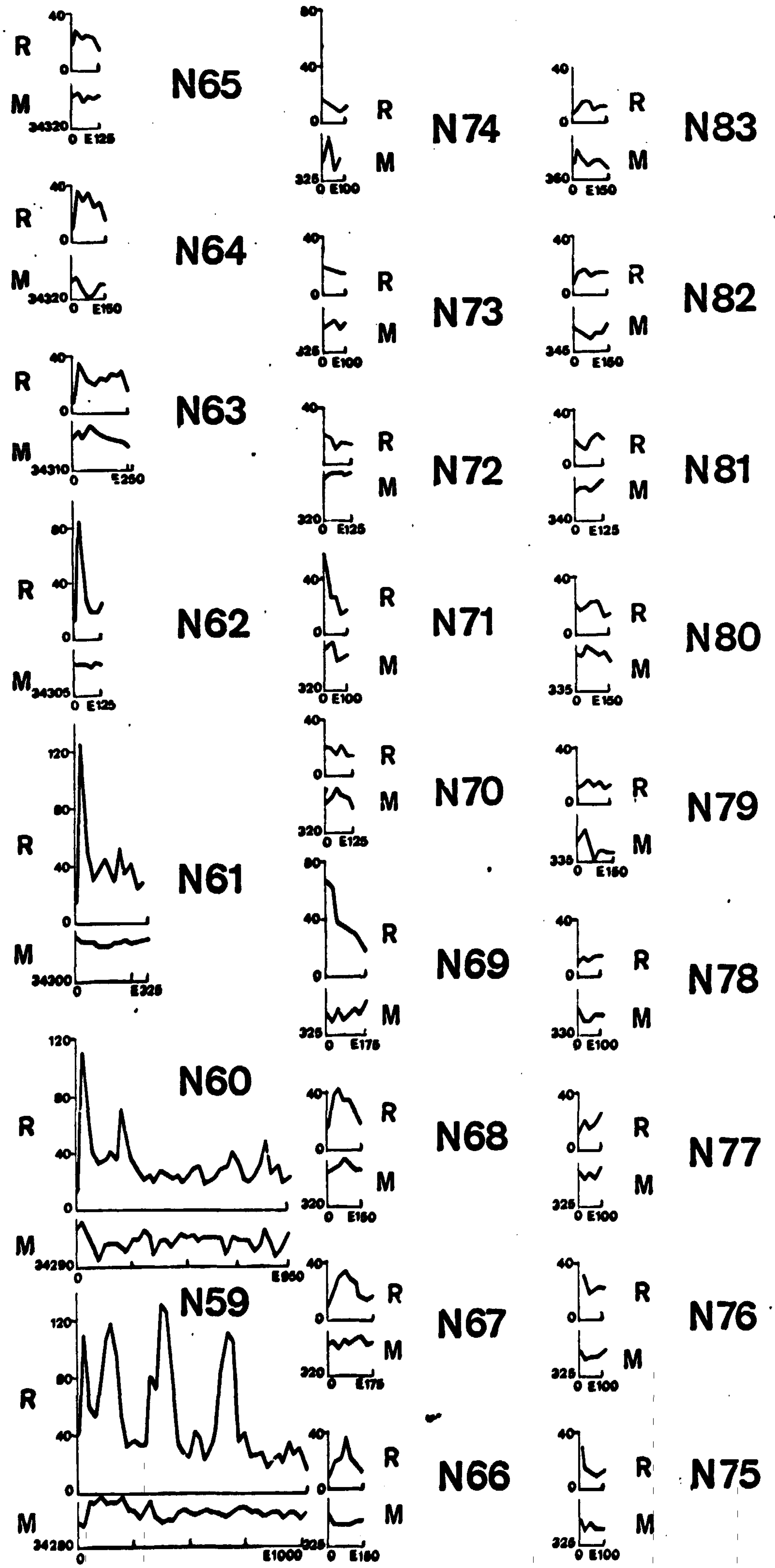


Fig. 12

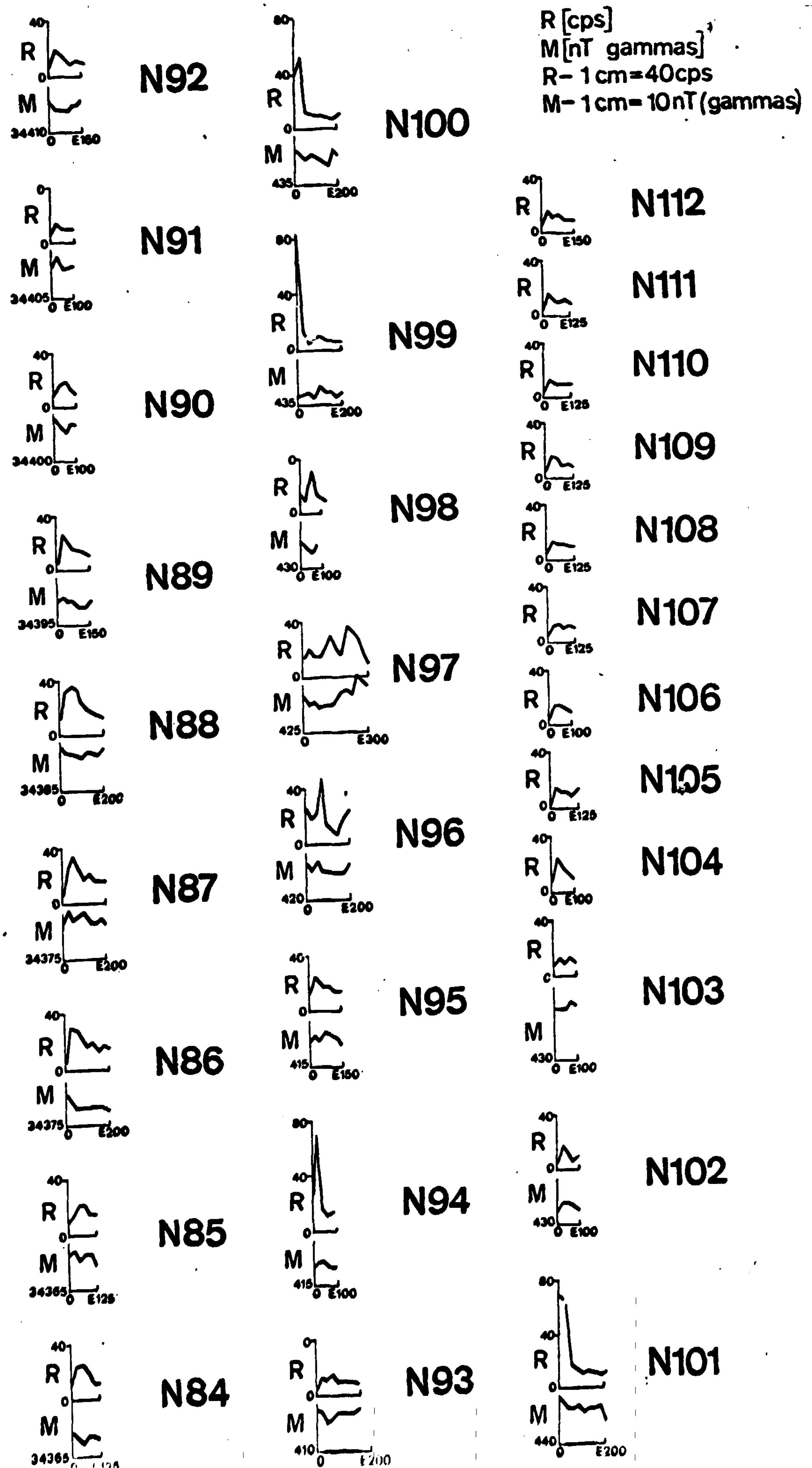

R [cps]
M [nT gammas]
R– 1 cm=40cps
M– 1 cm= 10nT (gammas)
N92
N91
N90
N89
N88
N87
N86
N85
N84
N100
N99
N98
N97
N96
N95
N94
N93
N112
N111
N110
N109
N108
N107
N106
N105
N104
N103
N102
N101

Fig. 13

R[cps]
M[nT (gammas)]

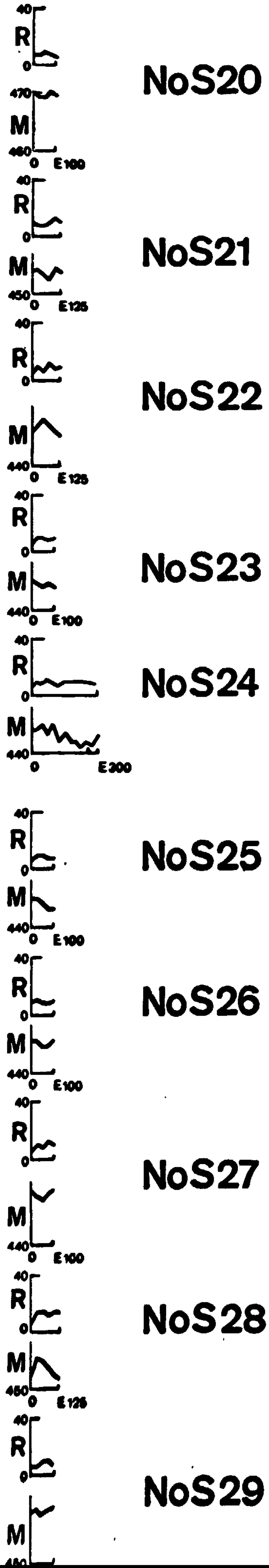


Fig. 14

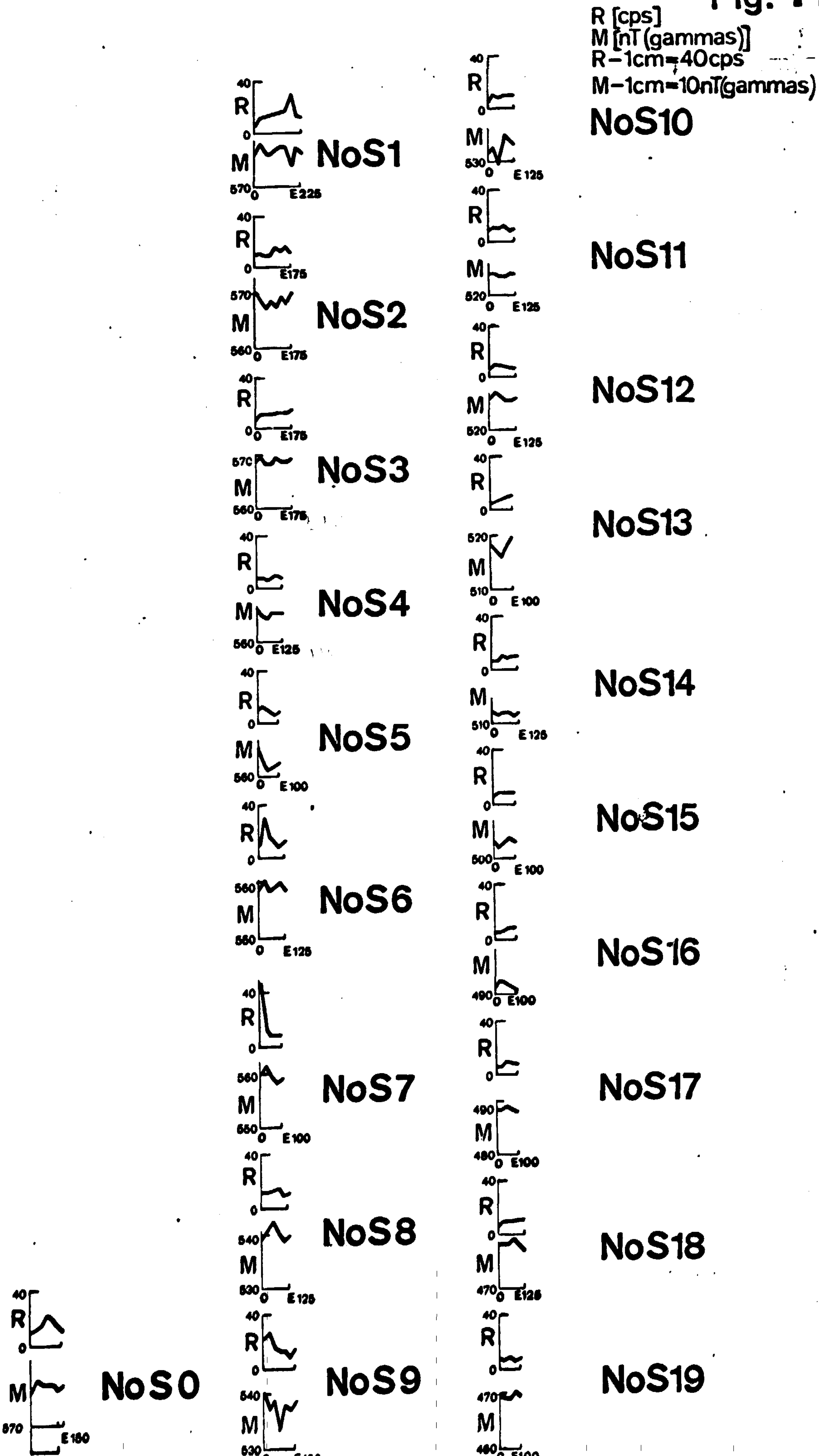
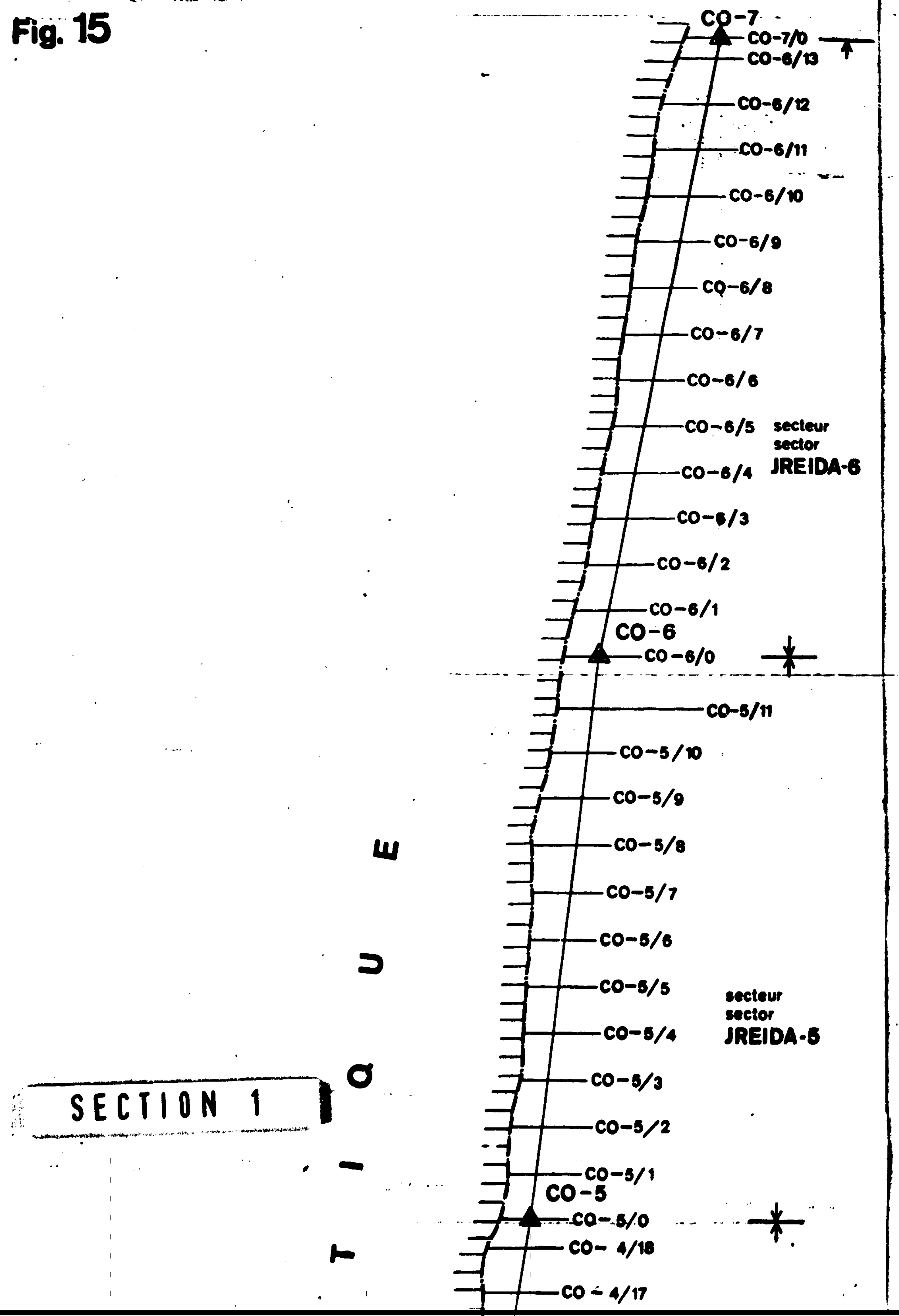
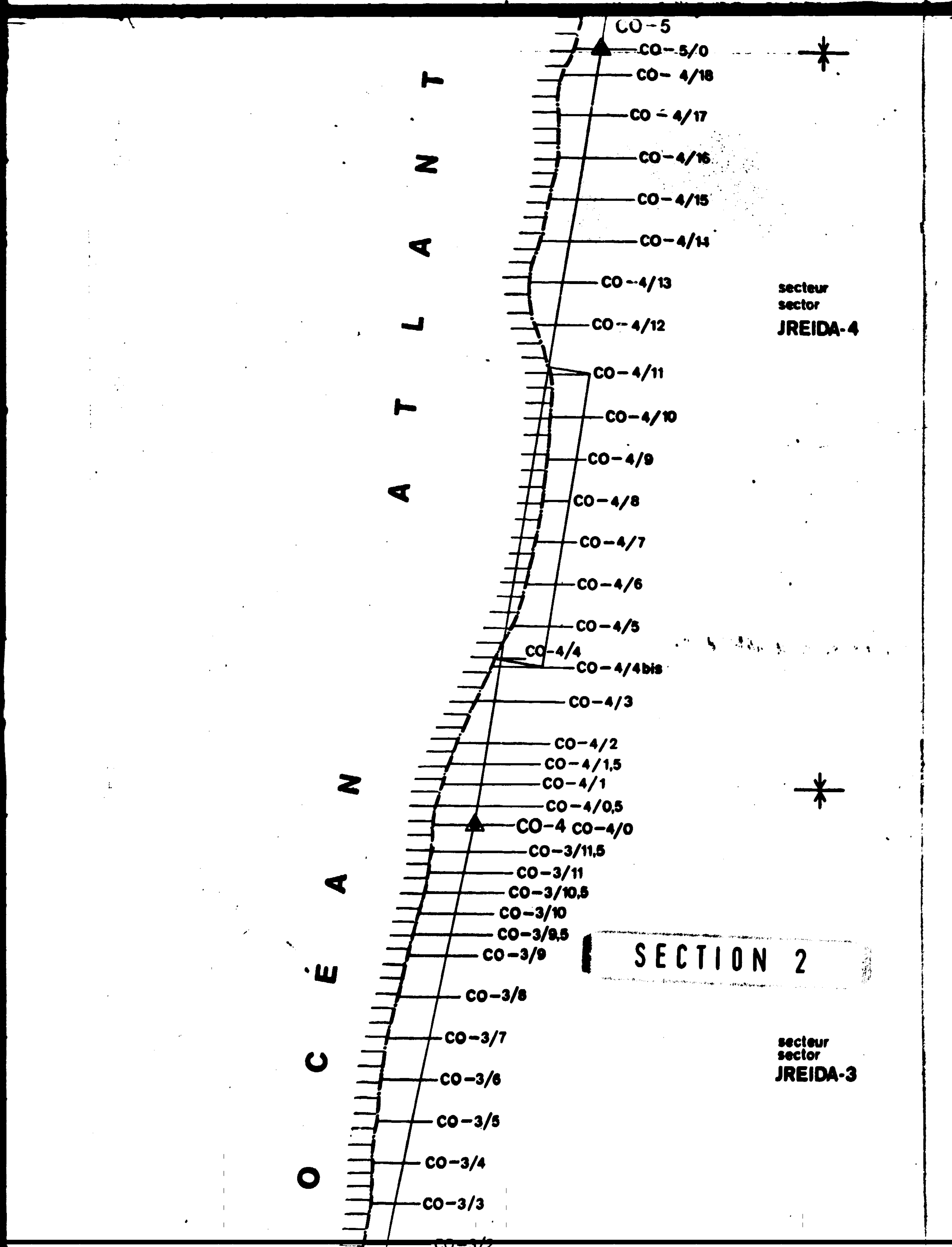
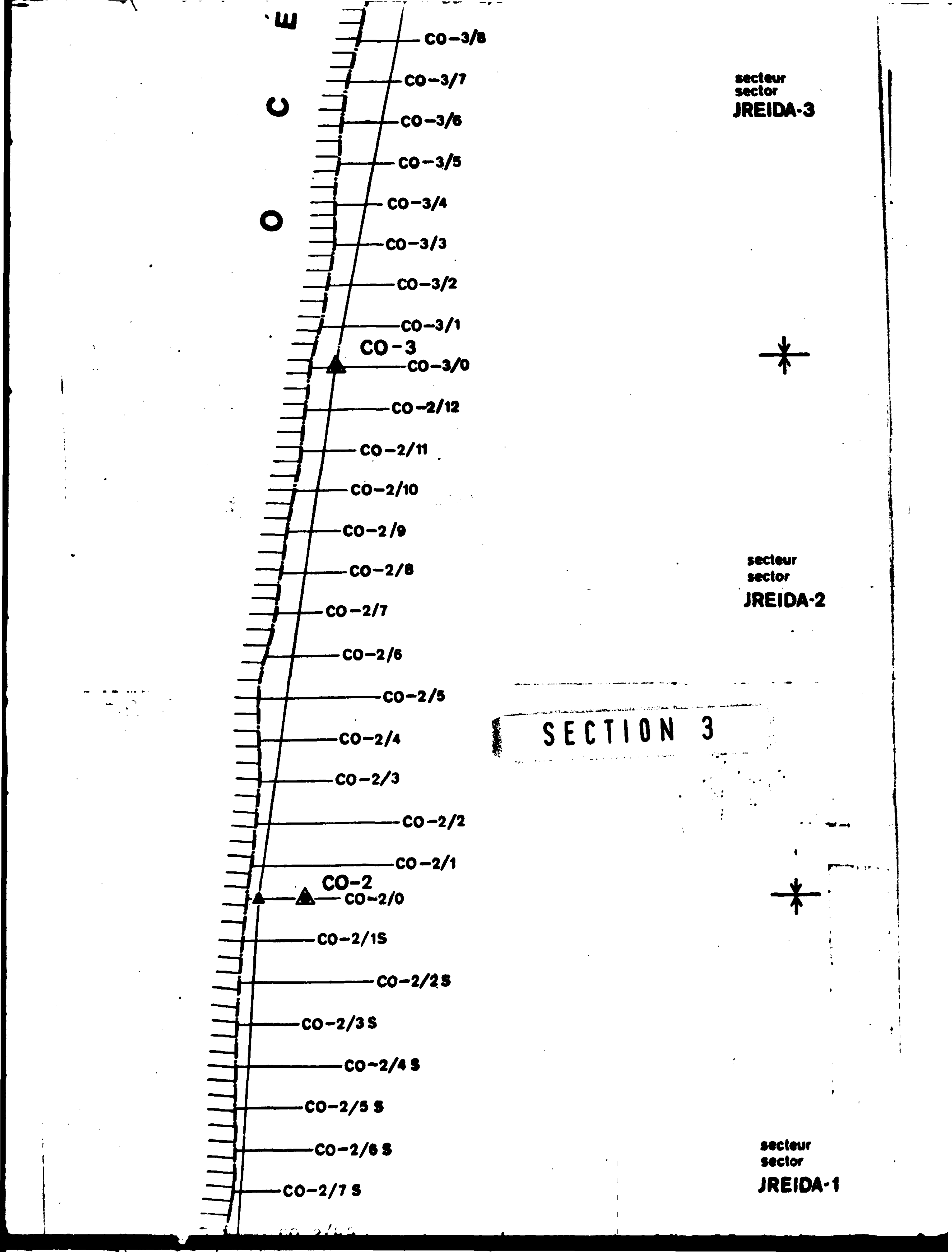

R [cps]
M [nT (gammas)]
R−1cm=40cps
M−1cm=10nT(gammas)
NoS0
NoS1
NoS2
NoS3
NoS4
NoS5
NoS6
NoS7
NoS8
NoS9
NoS10
NoS11
NoS12
NoS13
NoS14
NoS15
NoS16
NoS17
NoS18
NoS19

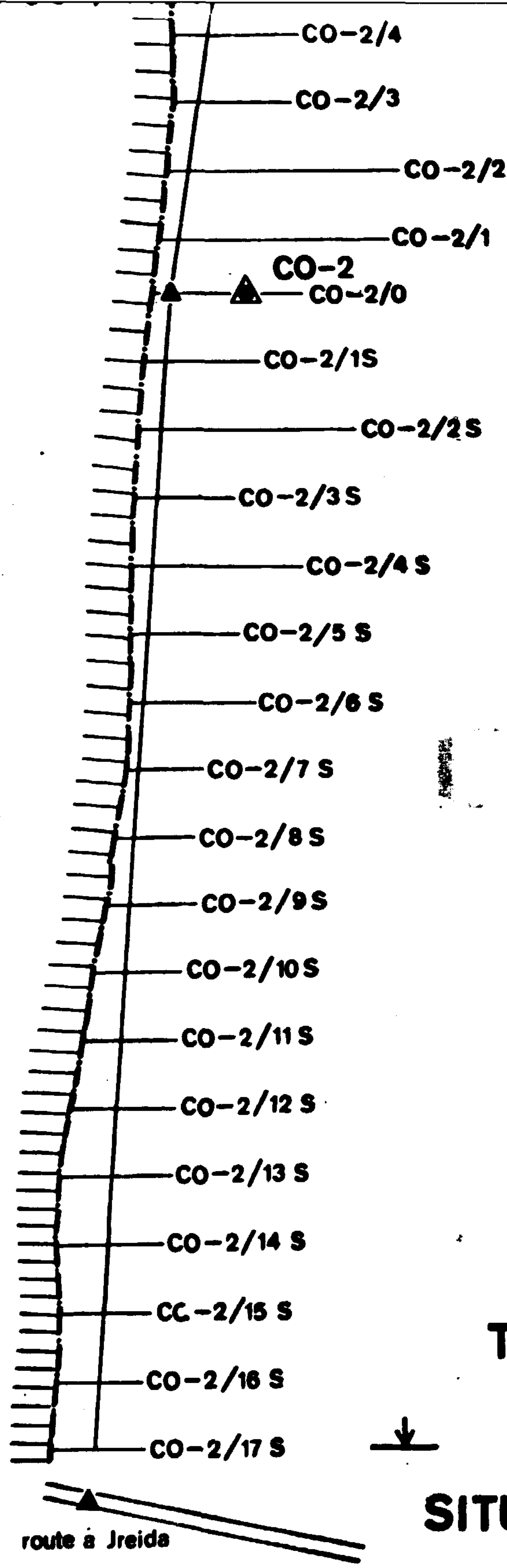
Fig. 15


CO-7
CO-7/0
CO-6/13
CO-6/12
CO-6/11
CO-6/10
CO-6/9
CO-6/8
CO-6/7
CO-6/6
CO-6/5
secteur
sector
JREIDA-6
CO-6/4
CO-6/3
CO-6/2
CO-6/1
CO-6
CO-6/0
CO-5/11
CO-5/10
CO-5/9
CO-5/8
CO-5/7
CO-5/6
CO-5/5
secteur
sector
JREIDA-5
CO-5/4
CO-5/3
CO-5/2
CO-5/1
CO-5
CO-5/0
CO- 4/18
CO - 4/17
SECTION 1
T I Q U E



OCÉAN ATLANT
CO-5
CO-5/0
CO-4/18
CO-4/17
CO-4/16
CO-4/15
CO-4/14
CO-4/13
CO-4/12
CO-4/11
CO-4/10
CO-4/9
CO-4/8
CO-4/7
CO-4/6
CO-4/5
CO-4/4
CO-4/4bis
CO-4/3
CO-4/2
CO-4/1,5
CO-4/1
CO-4/0,5
CO-4
CO-4/0
CO-3/11,5
CO-3/11
CO-3/10,5
CO-3/10
CO-3/9,5
CO-3/9
CO-3/8
CO-3/7
CO-3/6
CO-3/5
CO-3/4
CO-3/3
secteur
sector
JREIDA-4
secteur
sector
JREIDA-3
SECTION 2


O C E
CO-3/8
CO-3/7
CO-3/6
CO-3/5
CO-3/4
CO-3/3
CO-3/2
CO-3/1
CO-3
CO-3/0
CO-2/12
CO-2/11
CO-2/10
CO-2/9
CO-2/8
CO-2/7
CO-2/6
CO-2/5
CO-2/4
CO-2/3
CO-2/2
CO-2/1
CO-2
CO-2/0
CO-2/1S
CO-2/2S
CO-2/3 S
CO-2/4 S
CO-2/5 S
CO-2/6 S
CO-2/7 S
secteur
sector
JREIDA-3
secteur
sector
JREIDA-2
SECTION 3
secteur
sector
JREIDA-1



secteur
sector
JREIDA-1

SECTION 4

▲ Balise
Hydrographic marker

▲ Répere temporaire
Temporary marker

—·— Ligne de base
Base line

CO-2/0 , Profil et le numéro
Profile and its number

TRAVAUX DÉTAILLÉS

JREIDA

SITUATION DES PROFILS

1 : 10 000

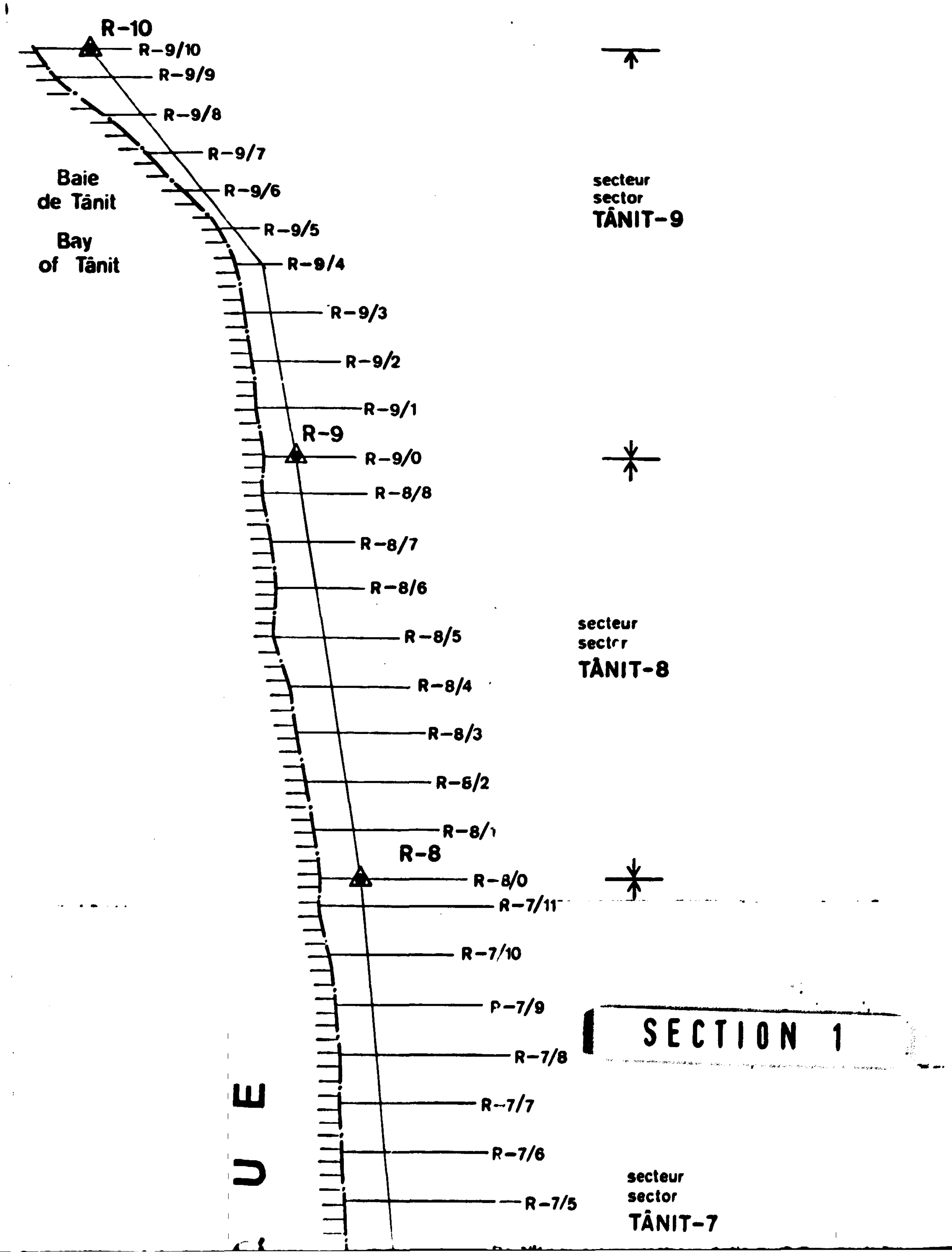
DETAILED SURVEY

JREIDA

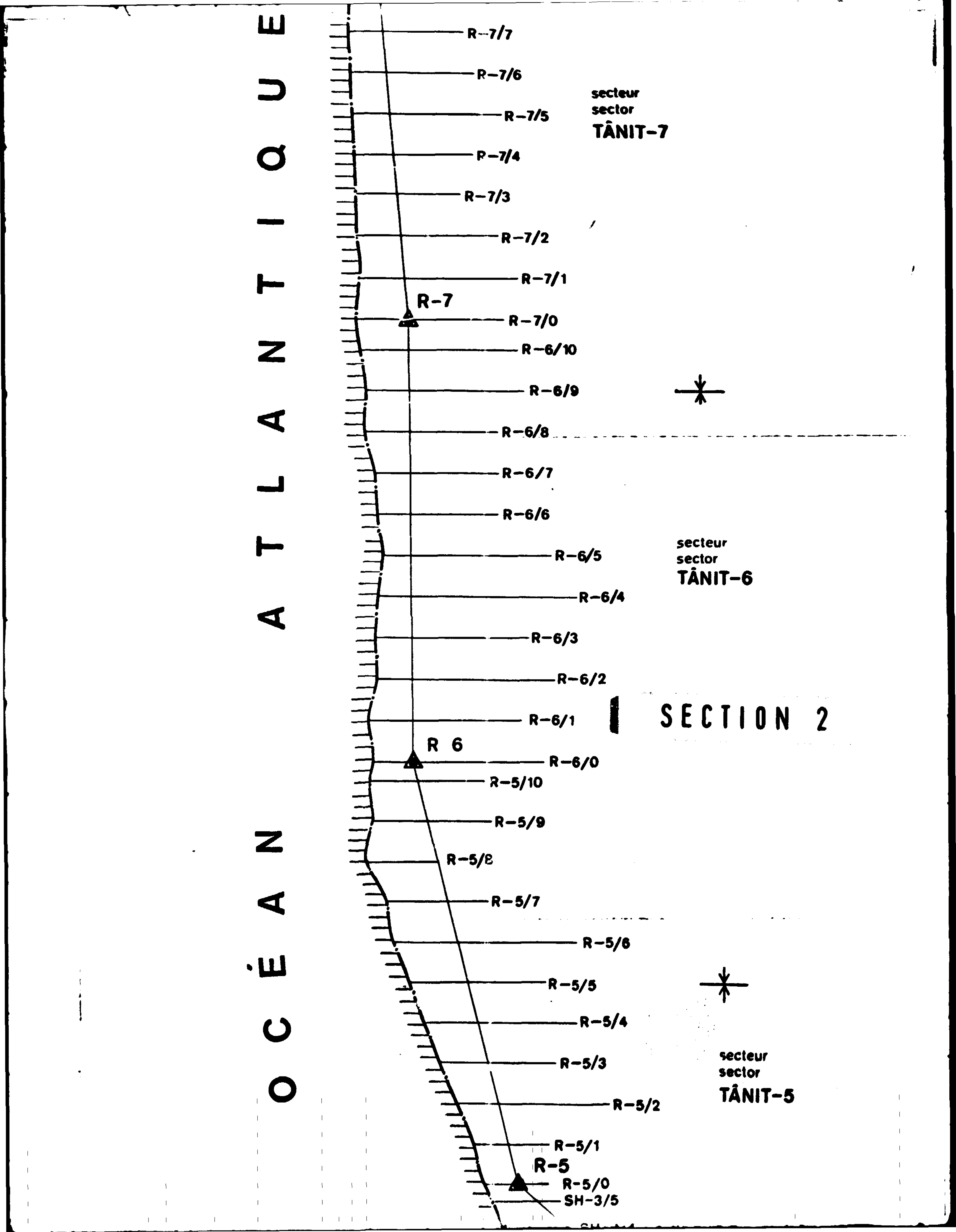
SITUATION OF PROFILES

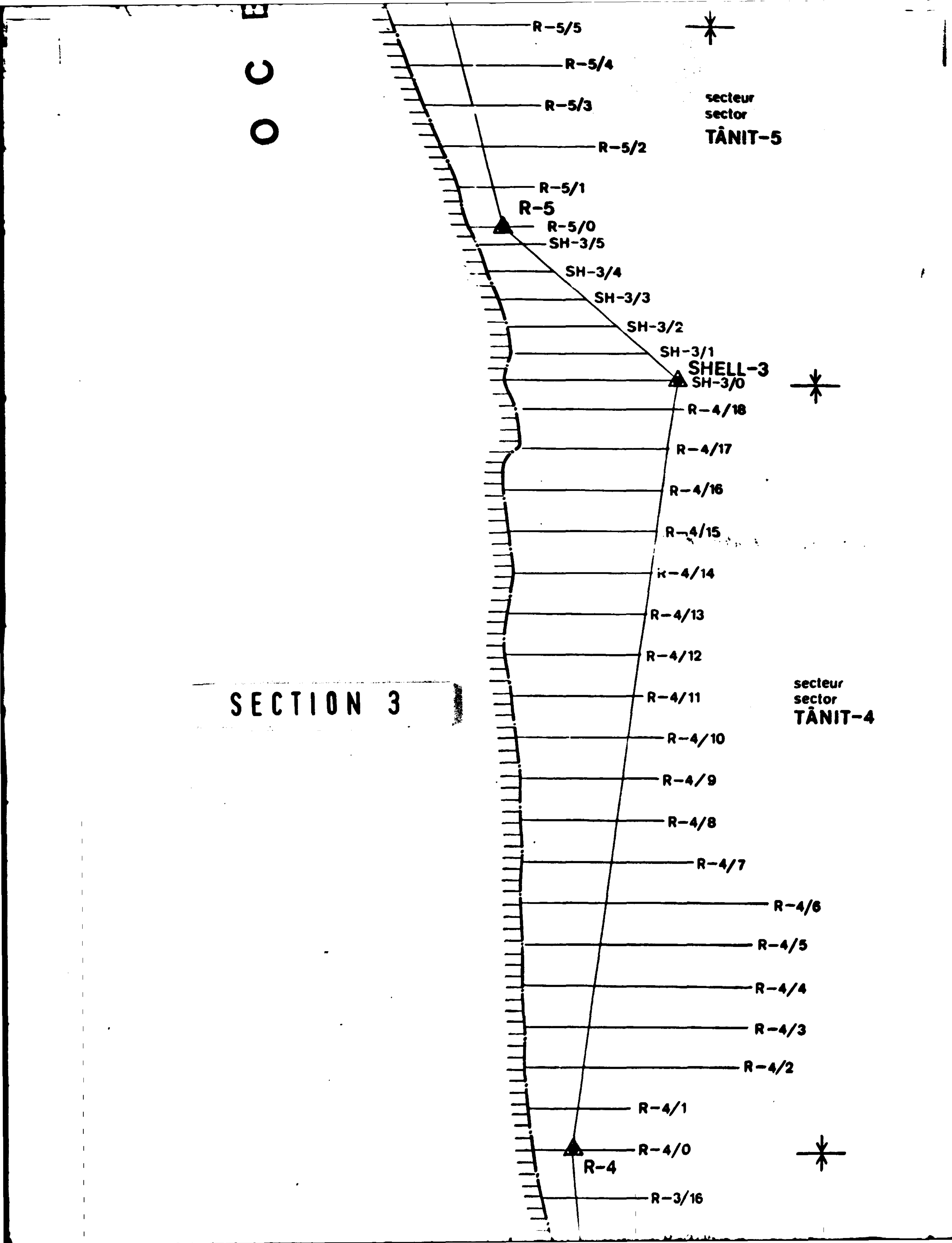
1 : 10 000

Fig. 16



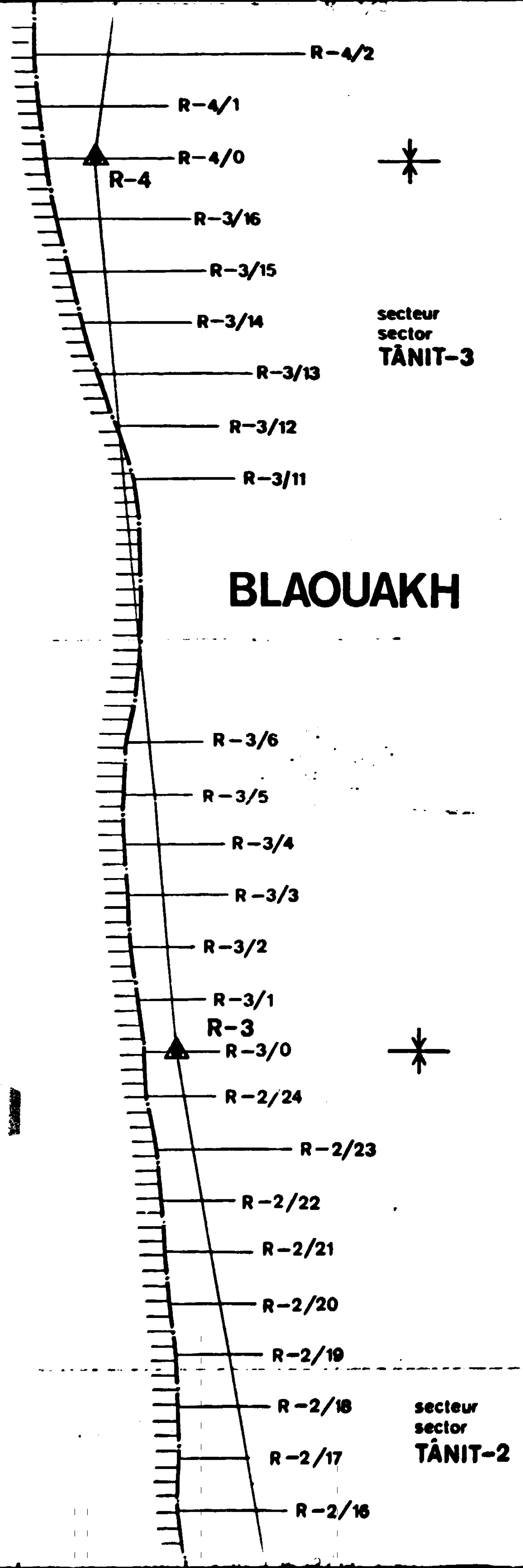
R-10
R-9/10
R-9/9
R-9/8
R-9/7
R-9/6
R-9/5
R-9/4
R-9/3
R-9/2
R-9/1
R-9
R-9/0
R-8/8
R-8/7
R-8/6
R-8/5
R-8/4
R-8/3
R-8/2
R-8/1
R-8
R-8/0
R-7/11
R-7/10
R-7/9
R-7/8
R-7/7
R-7/6
R-7/5
Baie de Tânit
Bay of Tânit
secteur
sector
TÂNIT-9
secteur
sector
TÂNIT-8
SECTION 1
secteur
sector
TÂNIT-7

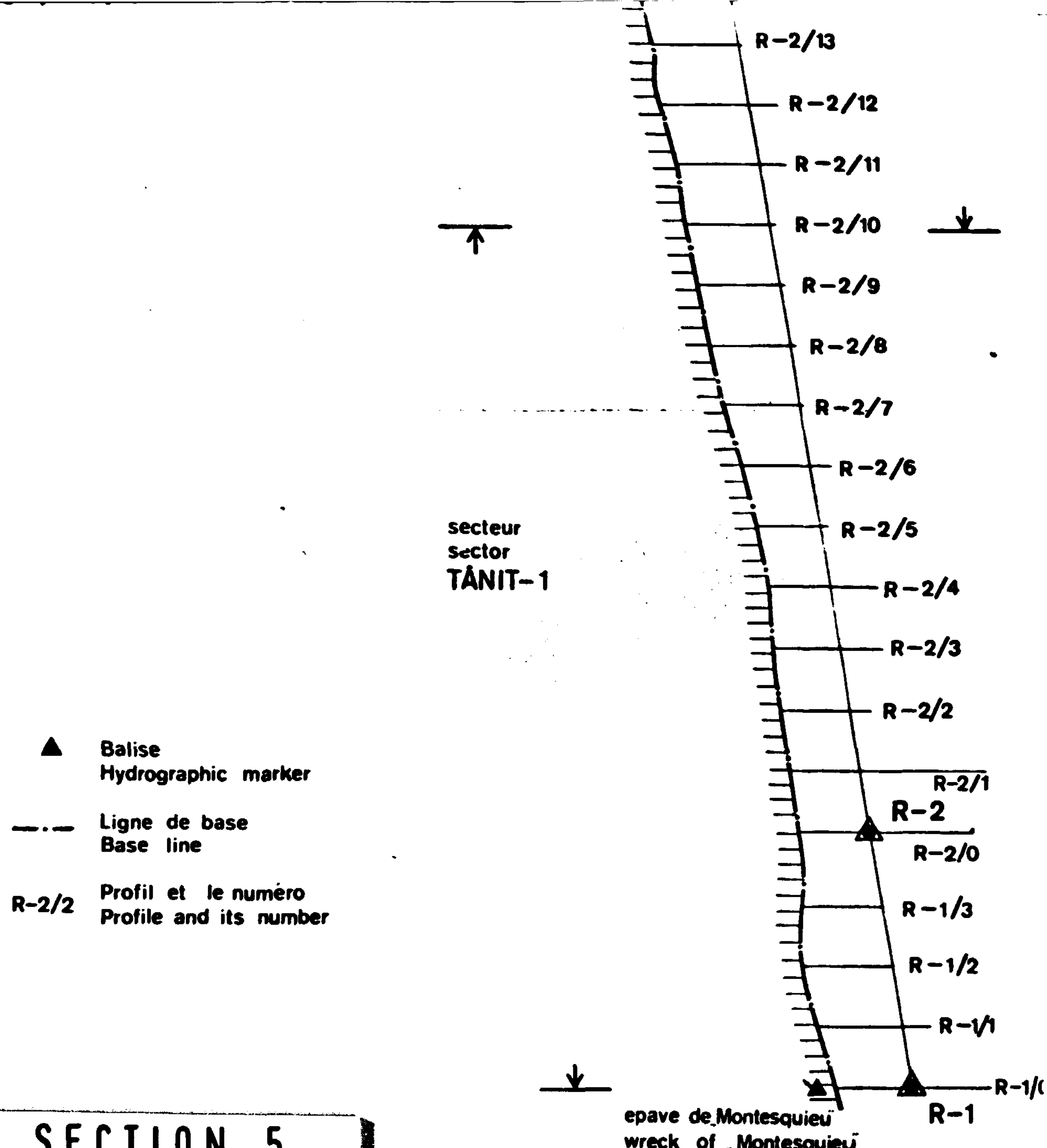

OCÉAN ATLANTIQUE
R-7/7
R-7/6
R-7/5
R-7/4
R-7/3
R-7/2
R-7/1
R-7
R-7/0
R-6/10
R-6/9
R-6/8
R-6/7
R-6/6
R-6/5
R-6/4
R-6/3
R-6/2
R-6/1
R 6
R-6/0
R-5/10
R-5/9
R-5/8
R-5/7
R-5/6
R-5/5
R-5/4
R-5/3
R-5/2
R-5/1
R-5
R-5/0
SH-3/5
secteur
sector
TÂNIT-7
secteur
sector
TÂNIT-6
SECTION 2
secteur
sector
TÂNIT-5



O C
R-5/5
R-5/4
R-5/3
R-5/2
R-5/1
R-5
R-5/0
secteur
sector
TÂNIT-5
SH-3/5
SH-3/4
SH-3/3
SH-3/2
SH-3/1
SHELL-3
SH-3/0
R-4/18
R-4/17
R-4/16
R-4/15
R-4/14
R-4/13
R-4/12
SECTION 3
R-4/11
secteur
sector
TÂNIT-4
R-4/10
R-4/9
R-4/8
R-4/7
R-4/6
R-4/5
R-4/4
R-4/3
R-4/2
R-4/1
R-4/0
R-4
R-3/16

SECTION 4


R-4/2
R-4/1
R-4/0
R-4
R-3/16
R-3/15
R-3/14
secteur
sector
TÂNIT-3
R-3/13
R-3/12
R-3/11
BLAOUAKH
R-3/6
R-3/5
R-3/4
R-3/3
R-3/2
R-3/1
R-3
R-3/0
R-2/24
R-2/23
R-2/22
R-2/21
R-2/20
R-2/19
R-2/18
secteur
sector
TÂNIT-2
R-2/17
R-2/16



SECTION 5

TRAVAUX DÉTAILLÉS
TANIT-BLAOUAKH
SITUATION DES PROFILS
1 : 10 000

DETAILED SURVEY
TANIT-BLAOUAKH
SITUATION OF PROFILES
1 : 10 000

Fig. 17

Explications pour figures 18–56
Explanations for figures 18–56

TRAUAUX DÉTAILLÉS
DETAILED SURVEY

Profils radiométriques

Radiometric profiles

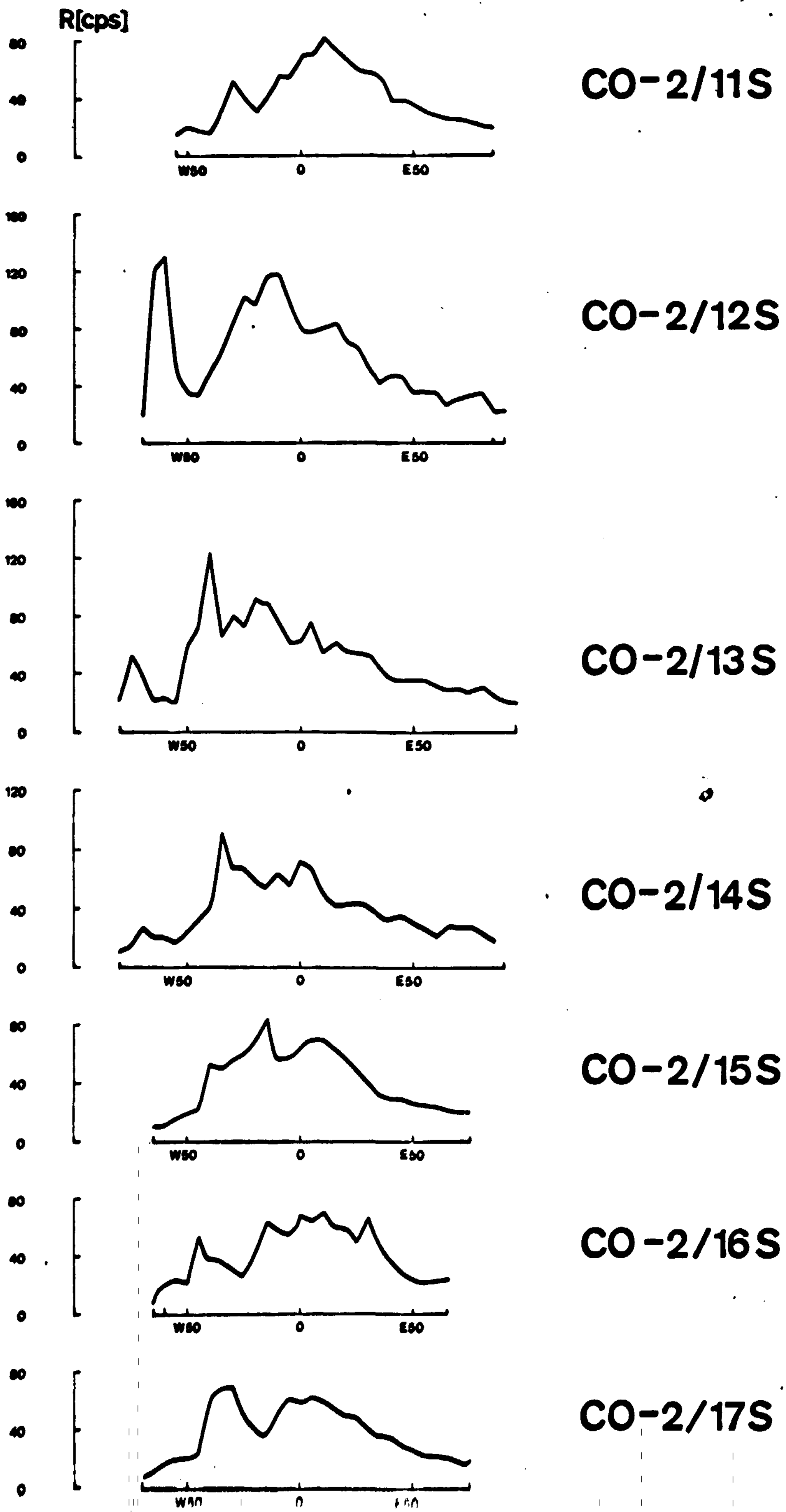
Echelle horizontale 1 : 2 500
Horizontal scale 1 : 2 500

JREIDA – Fig. 18–35

TÂNIT – BLAOUAKH Fig. 36–56

▼ J-1 forage
borehole

JREIDA Fig. 18



JREIDA Fig.19

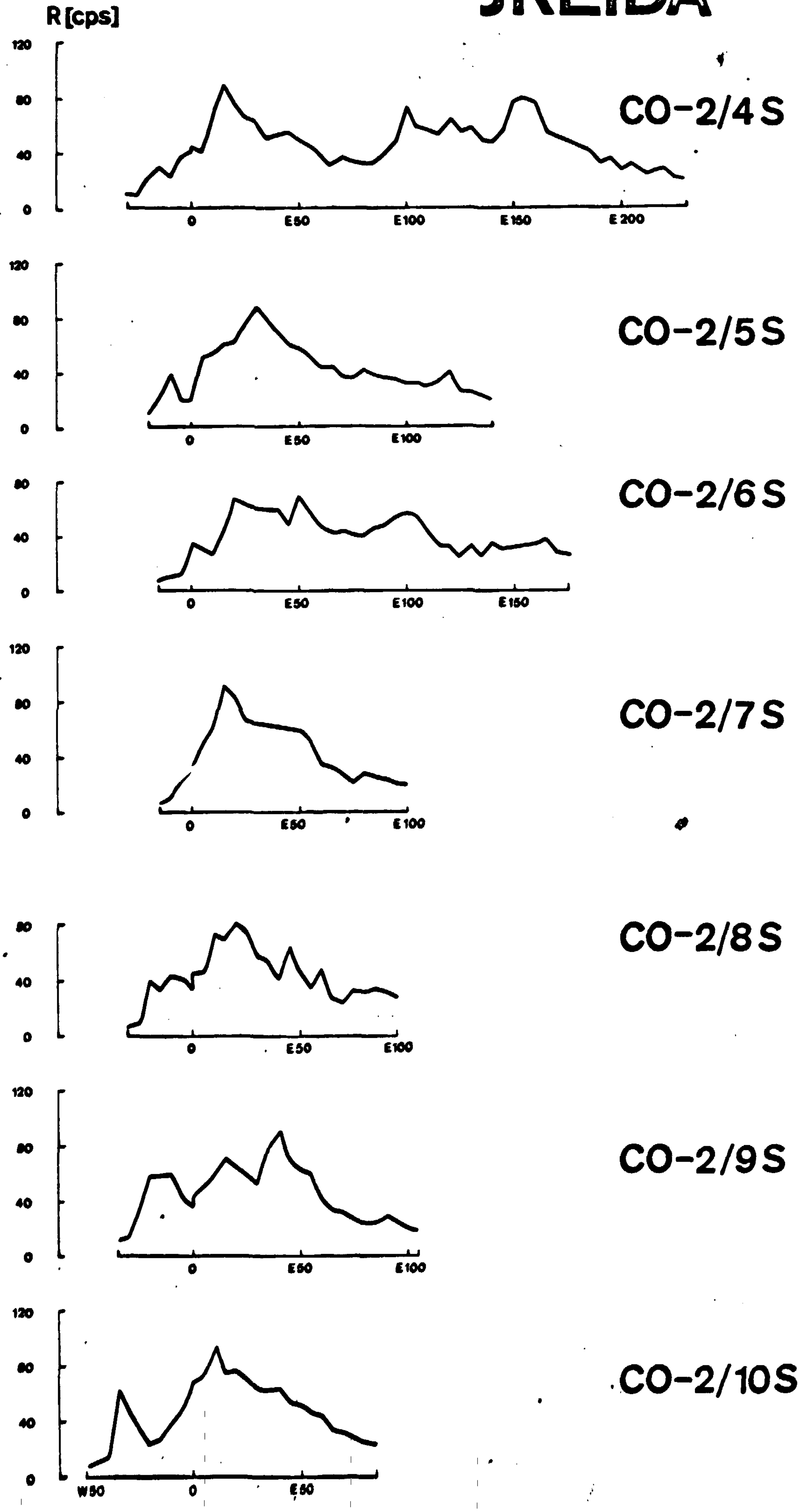


Fig.20

JREIDA

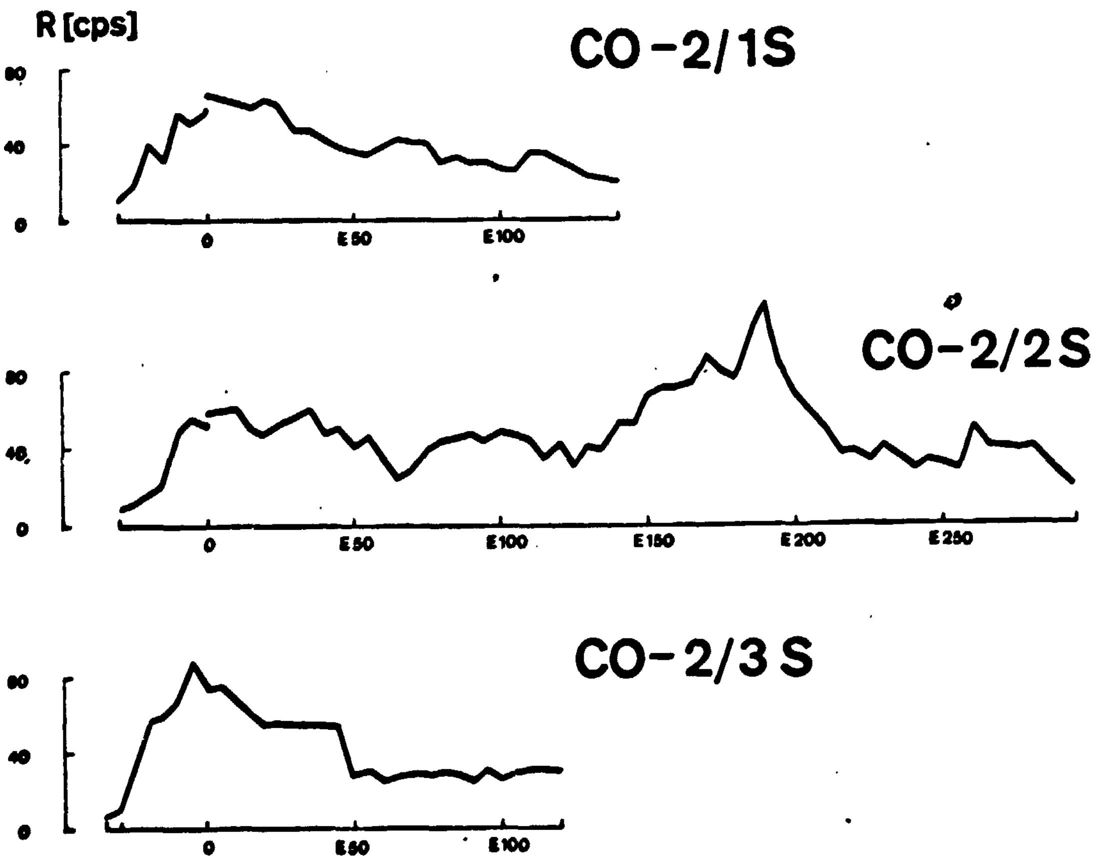
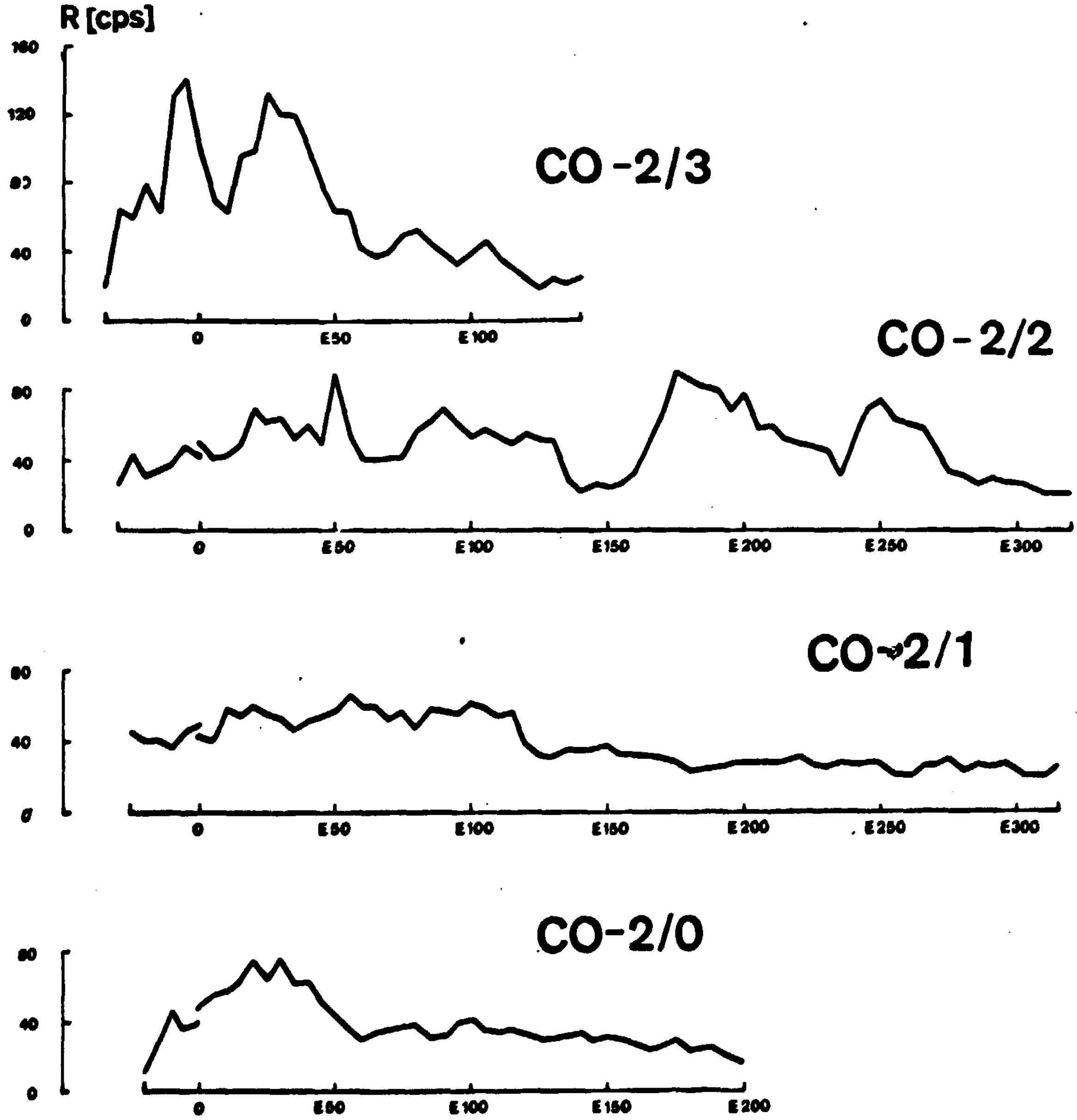


Fig. 21

JREIDA



JREIDA Fig. 22

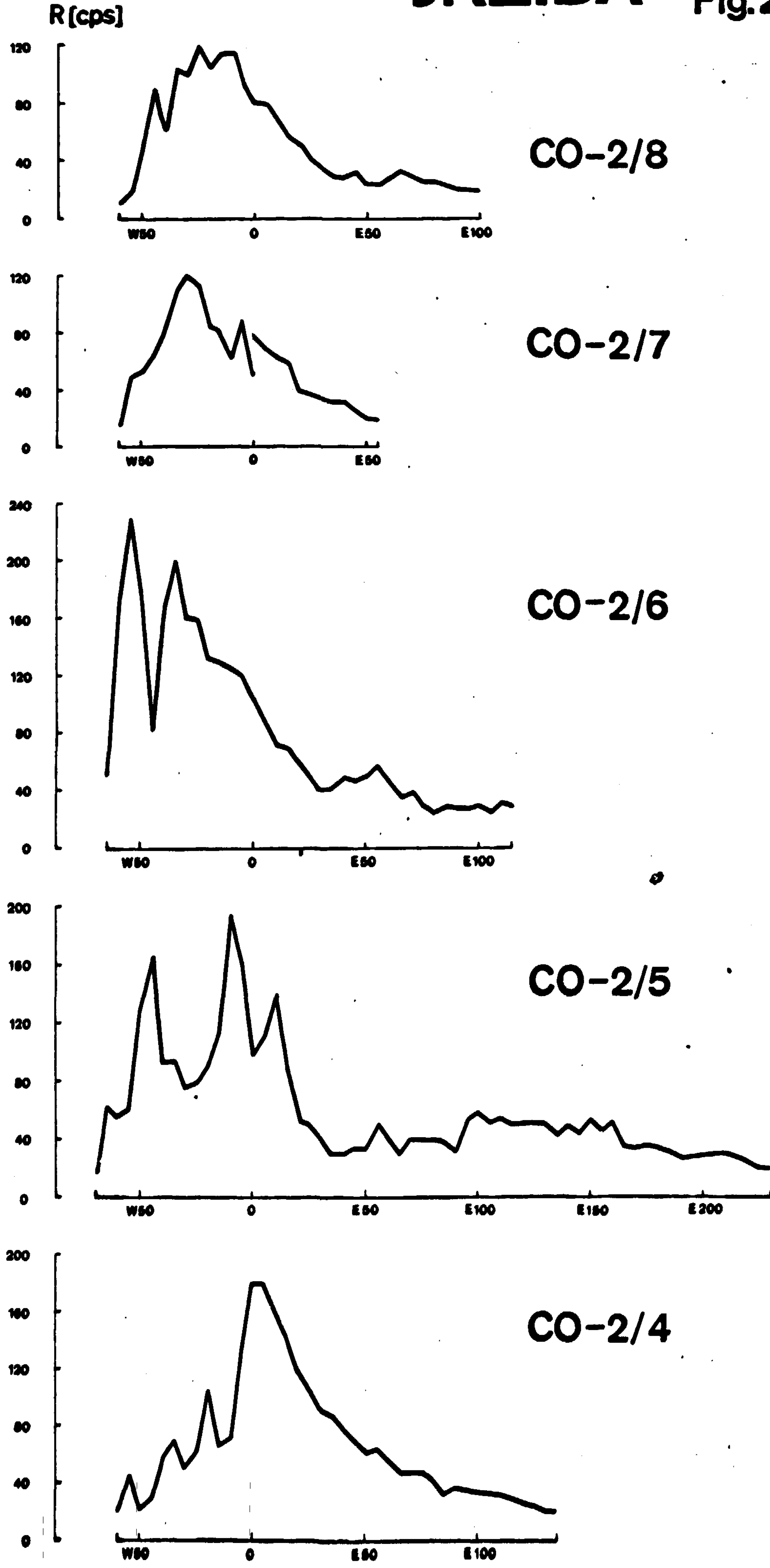
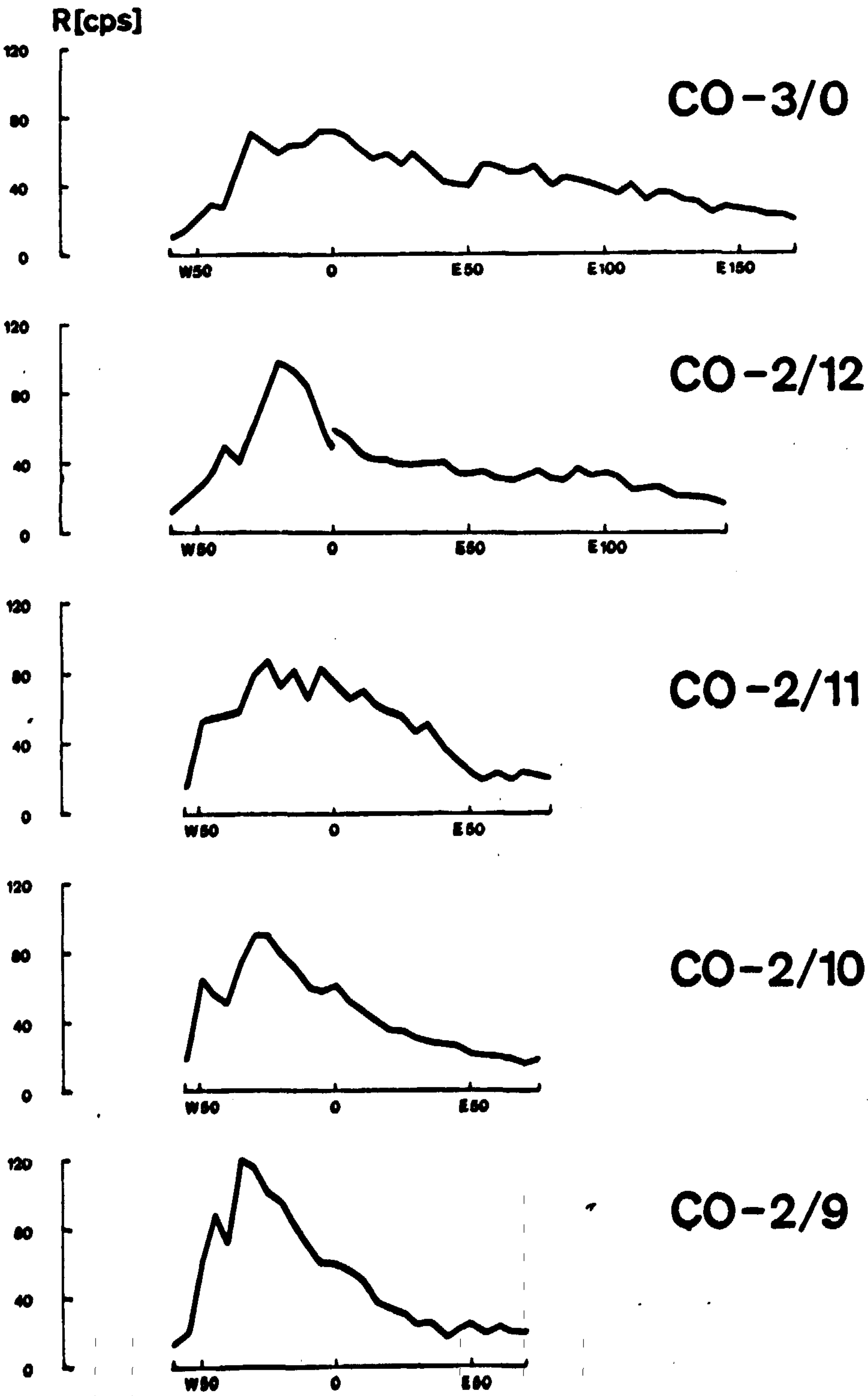
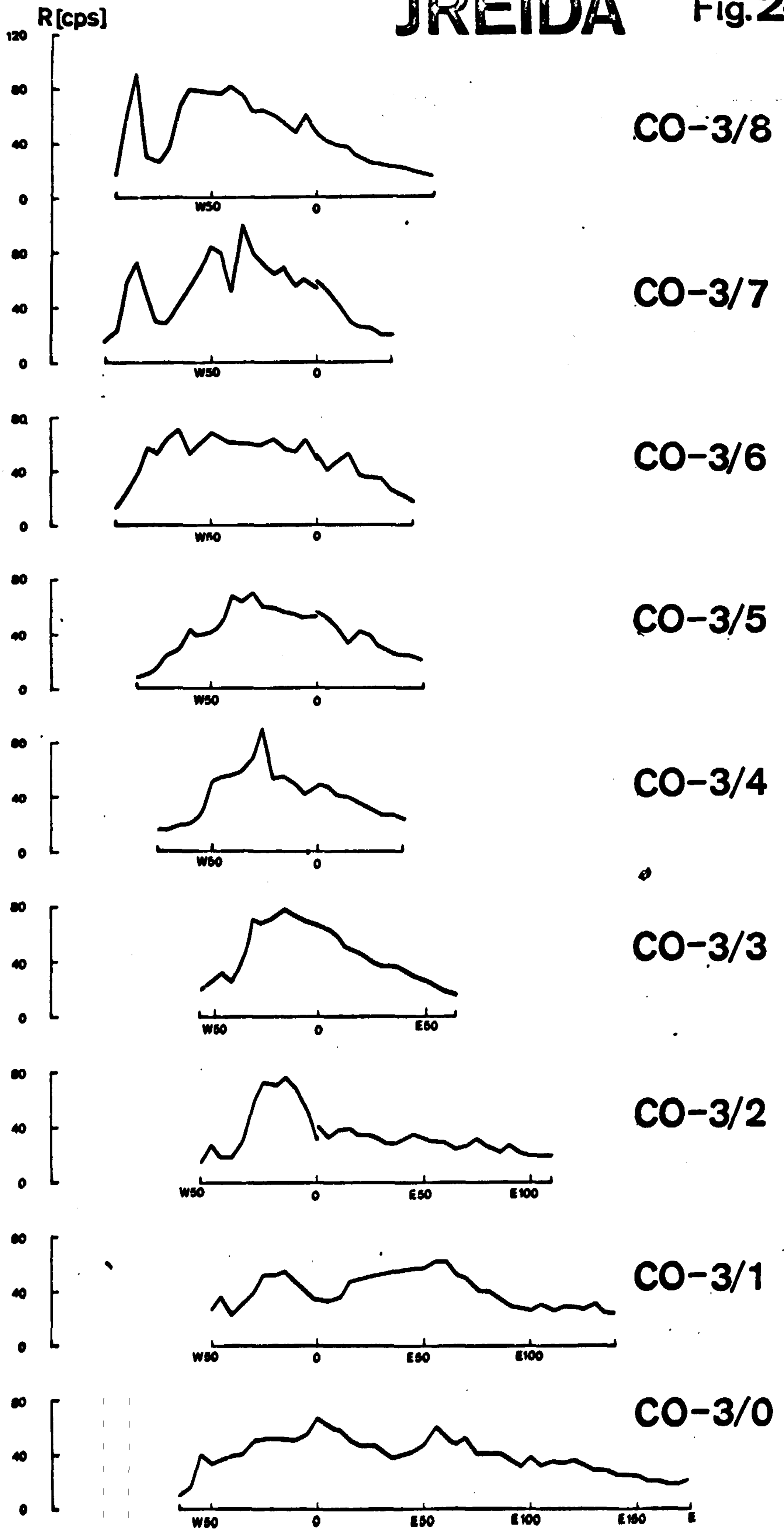


Fig. 23

JREIDA



JREIDA Fig. 24



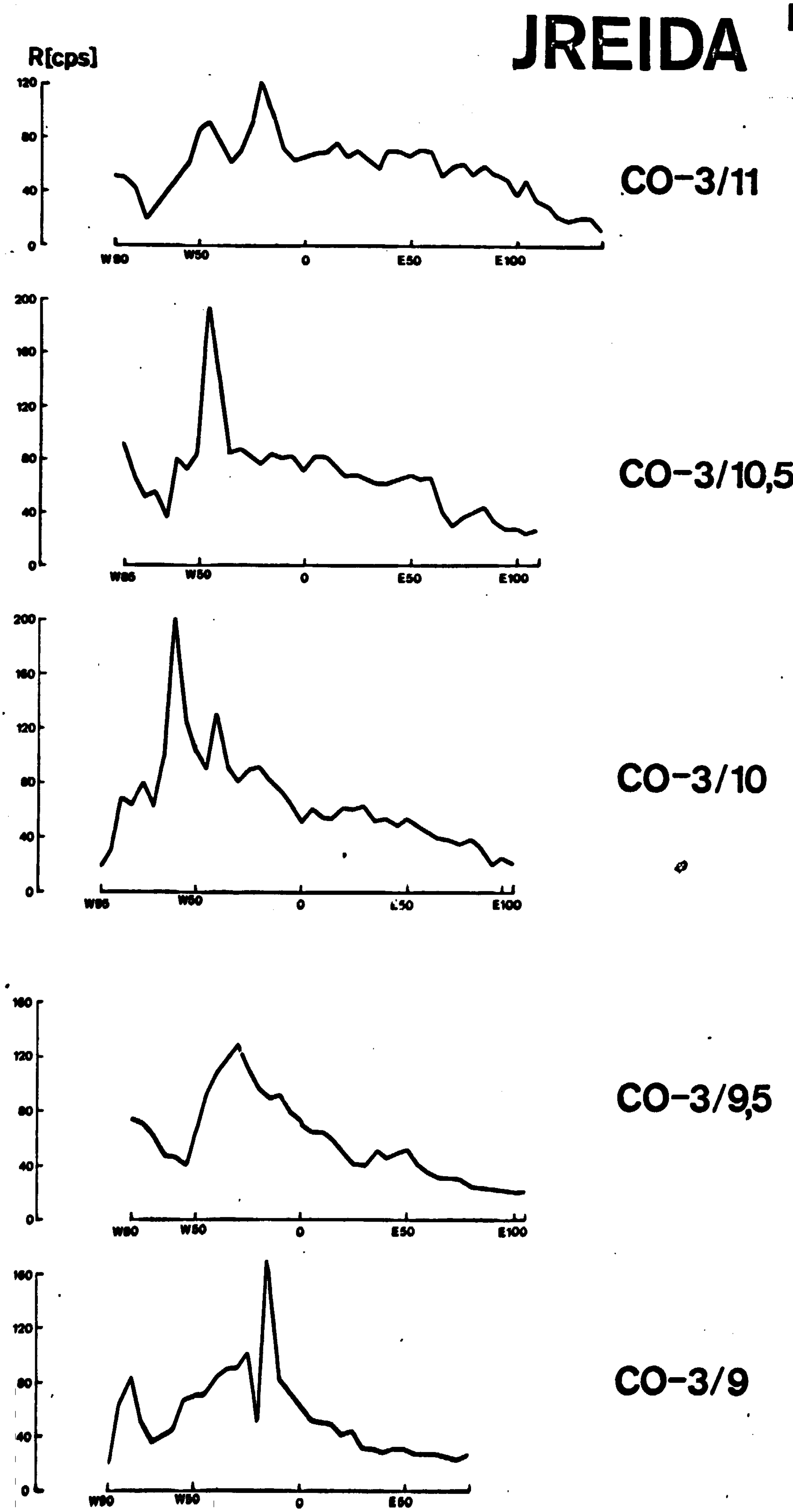
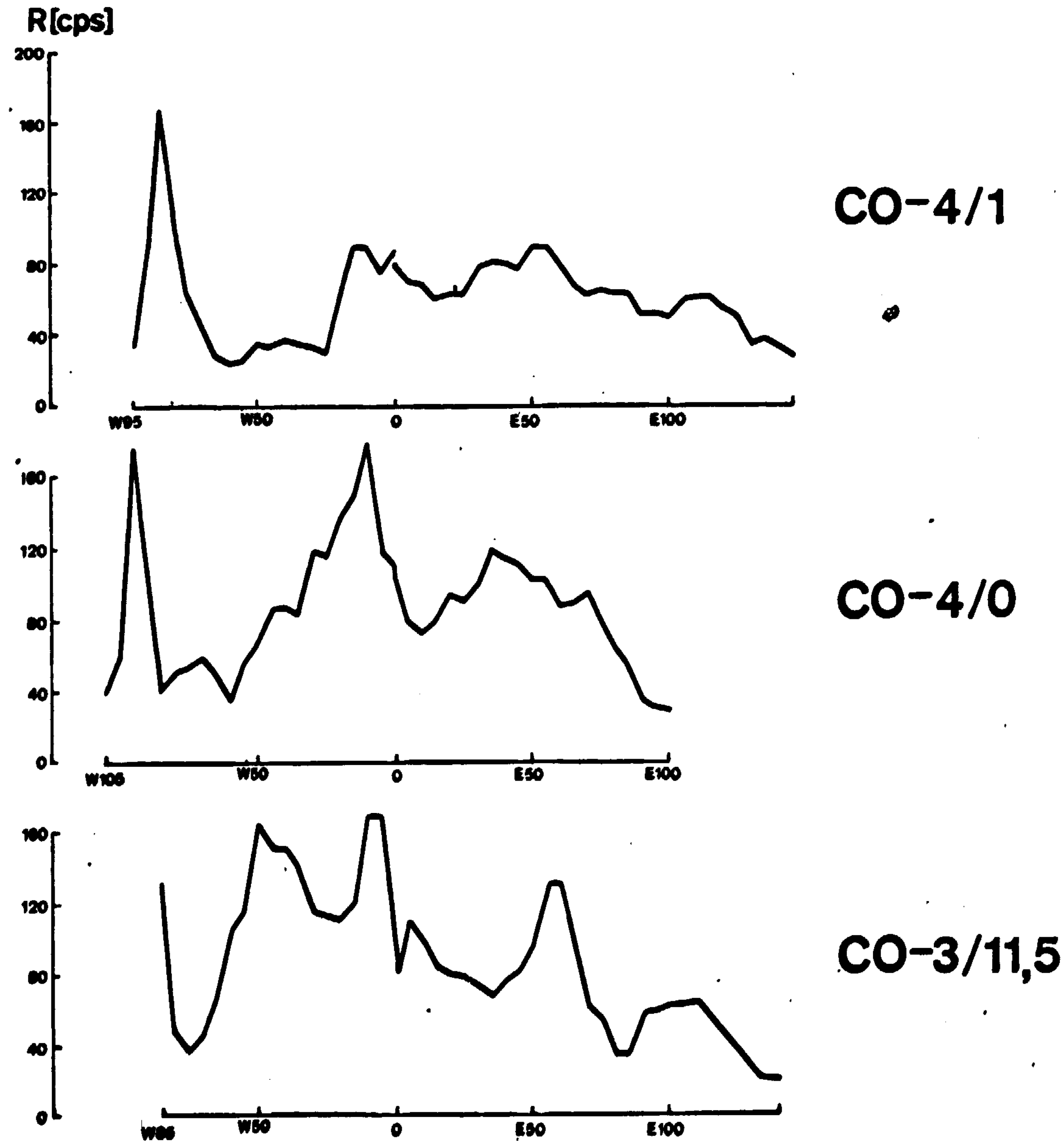

JREIDA
R[cps]
120
80
40
0
W80
W50
0
E50
E100
CO-3/11
200
160
120
80
40
0
W85
W50
0
E50
E100
CO-3/10,5
200
160
120
80
40
0
W95
W50
0
E50
E100
CO-3/10
160
120
80
40
0
W80
W50
0
E50
E100
CO-3/9,5
160
120
80
40
0
W90
W50
0
E50
CO-3/9

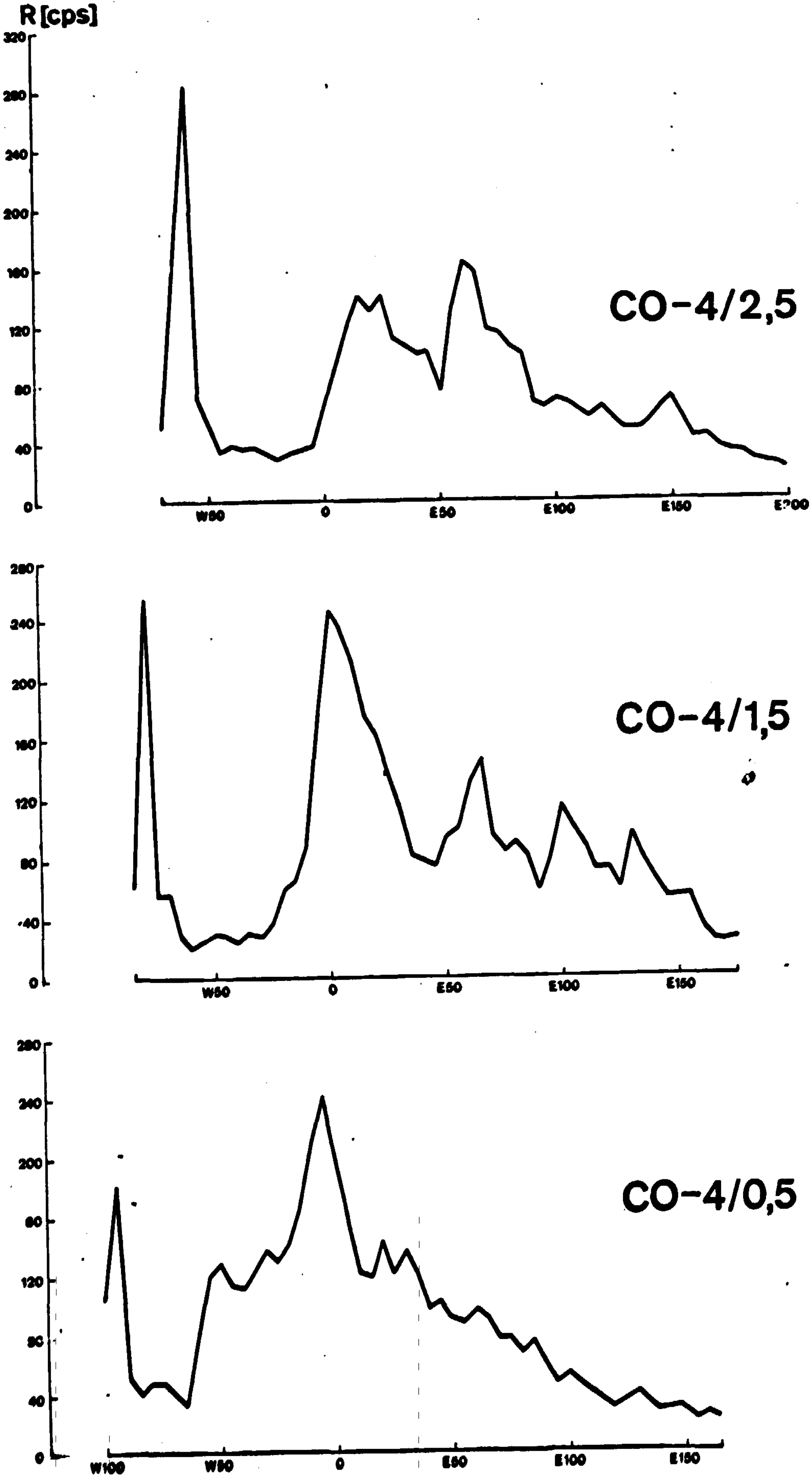
Fig.25

Fig. 26

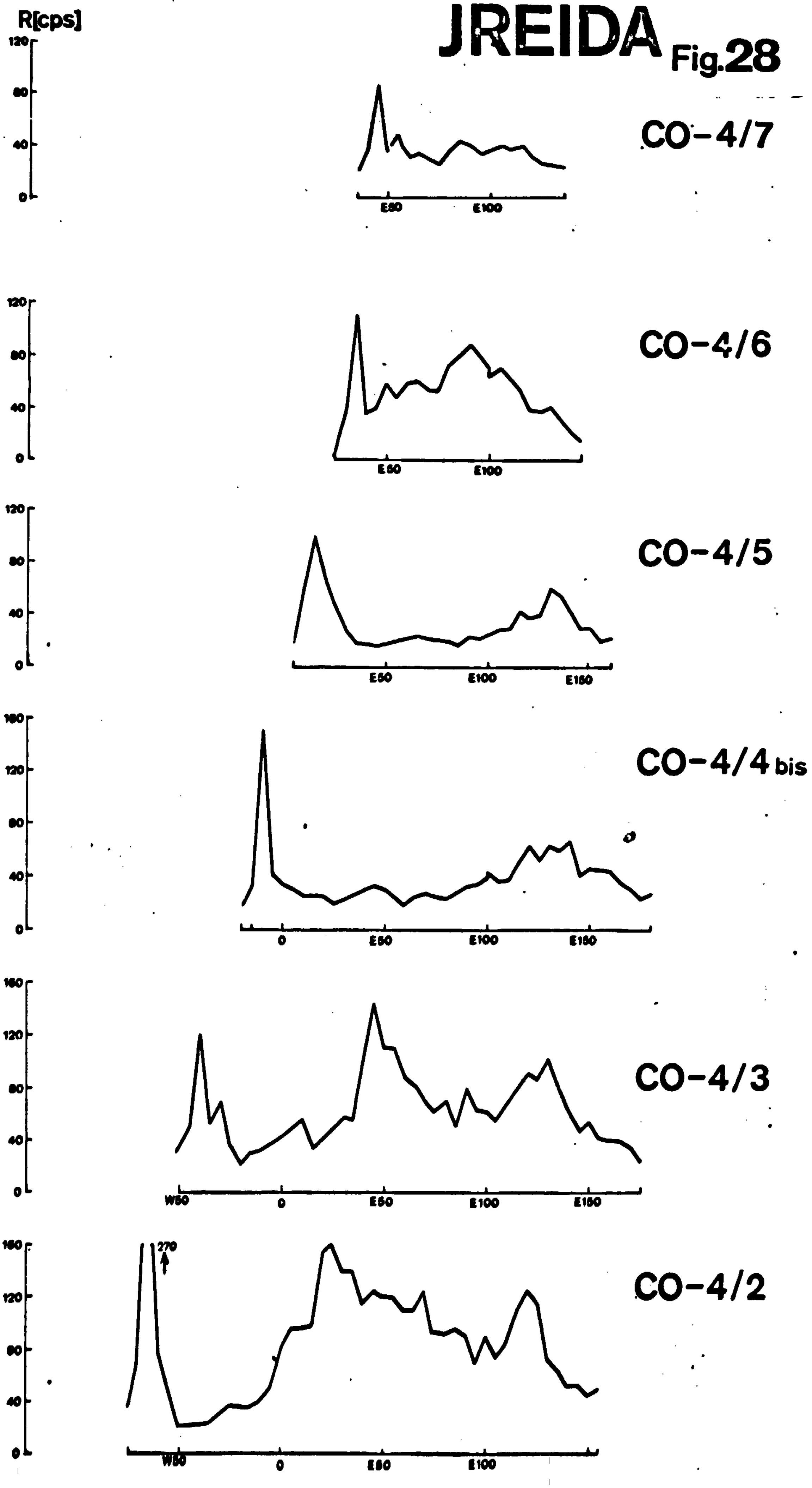
JREIDA



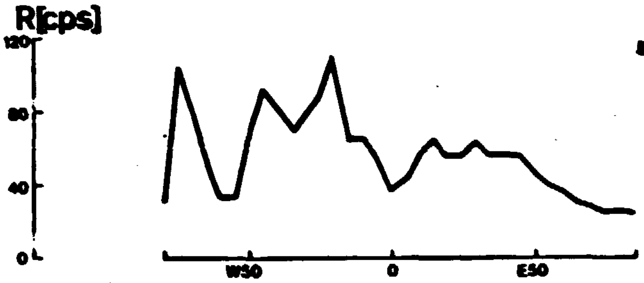
JREIDA Fig. 27



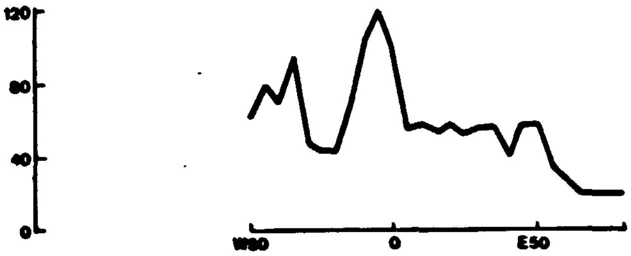
JREIDA Fig.28



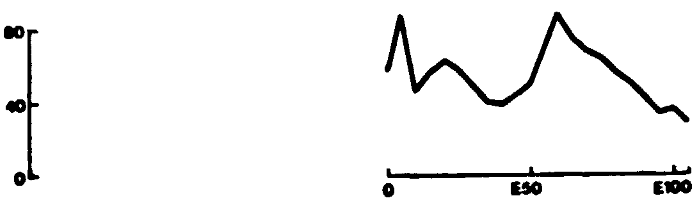
JREIDA Fig.29



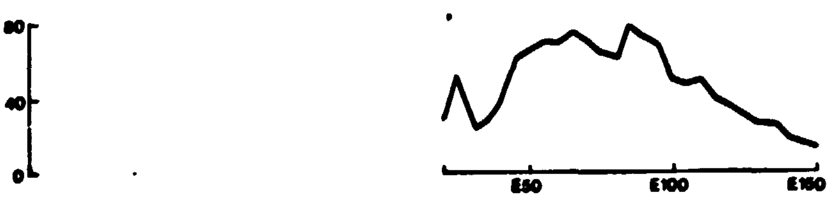
CO-4/13



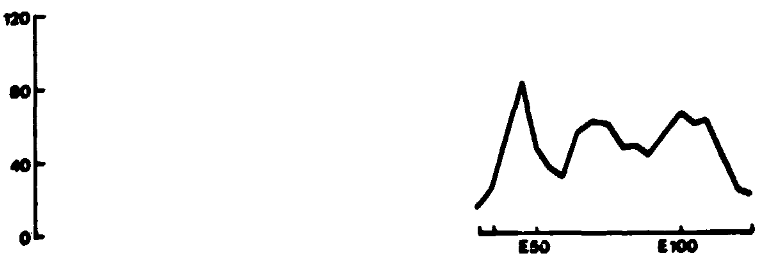
CO-4/12



CO-4/11



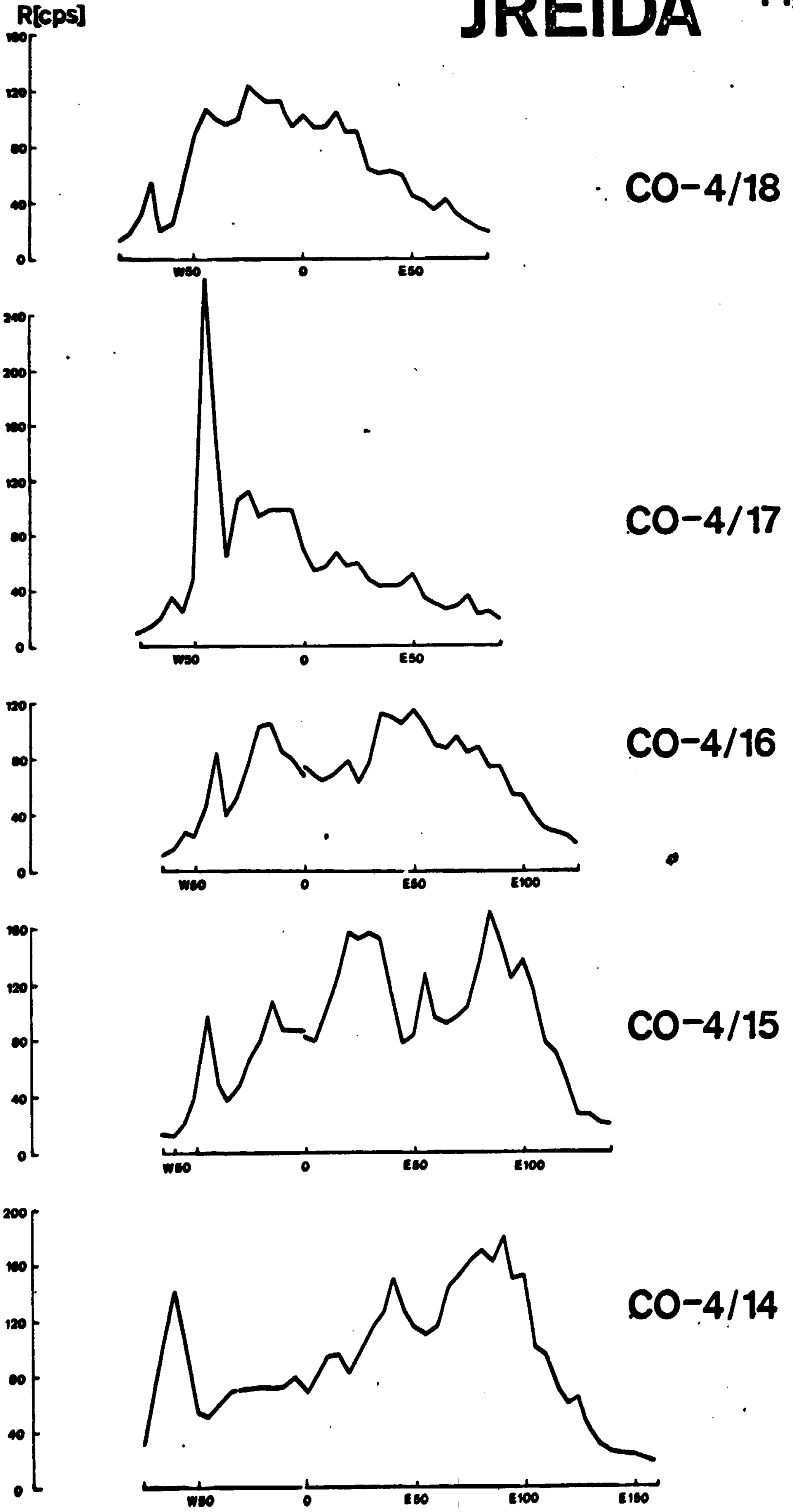
CO-4/10



CO-4/9

CO-4/8

JREIDA Fig.30



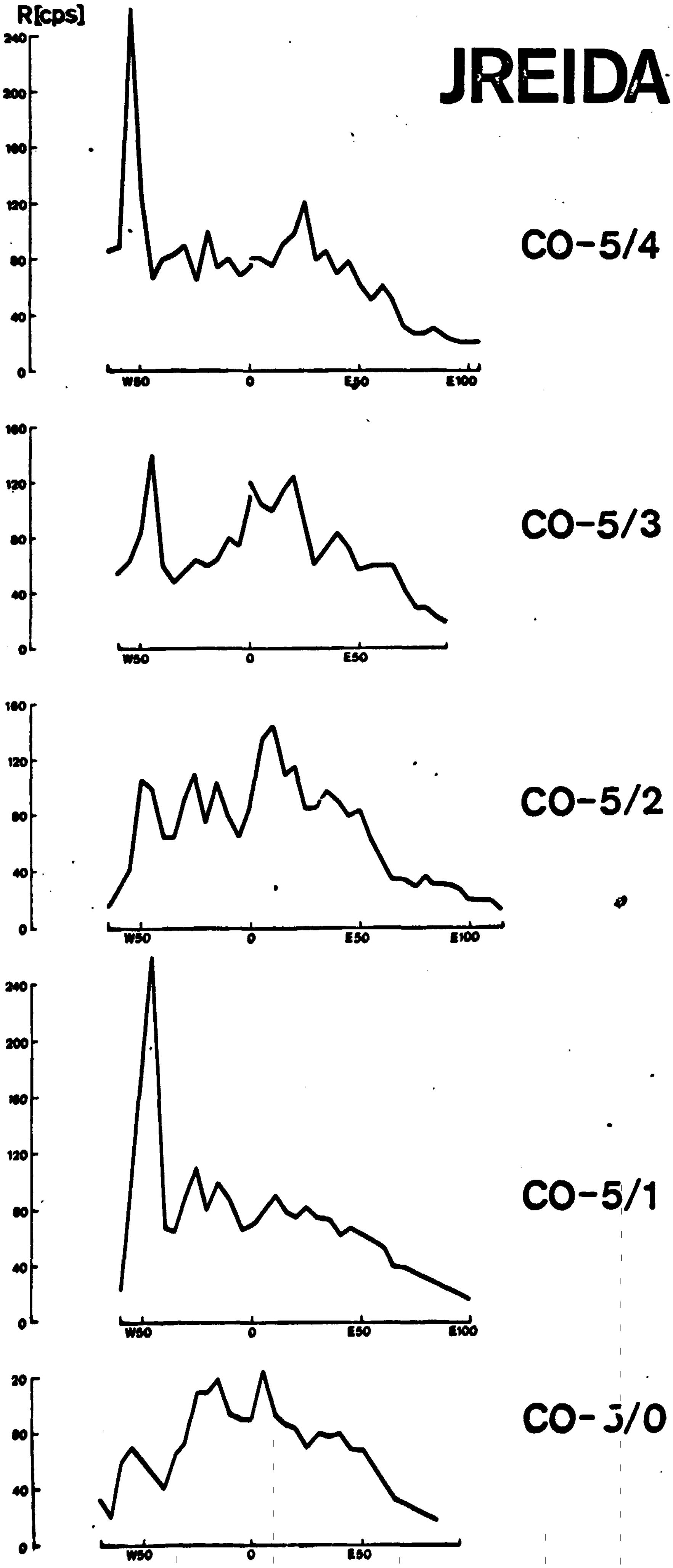

JREIDA
R[cps]
240
200
160
120
80
40
0
W50
0
E50
E100
CO-5/4
CO-5/3
CO-5/2
CO-5/1
CO-5/0

Fig.31

JREIDA

Fig.32

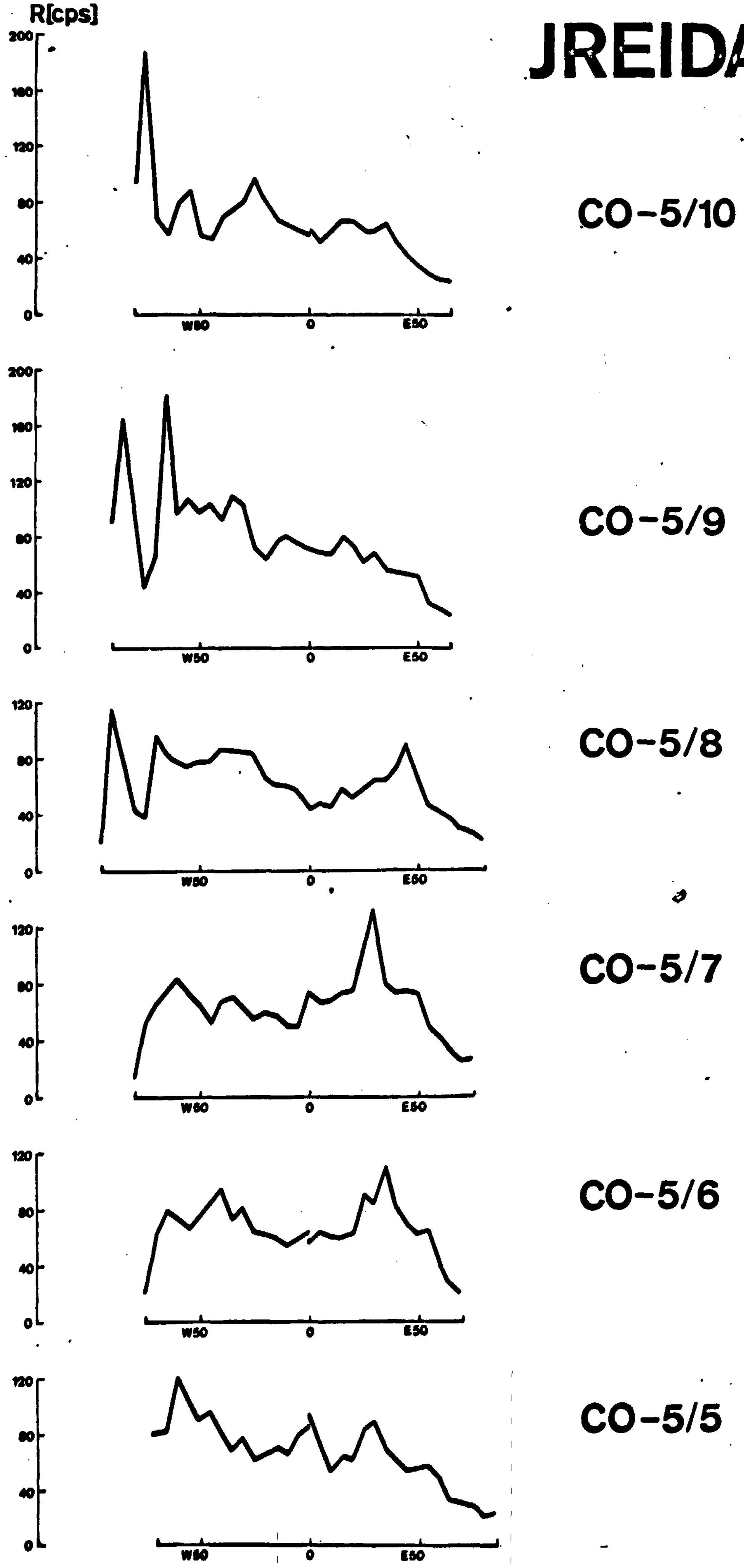
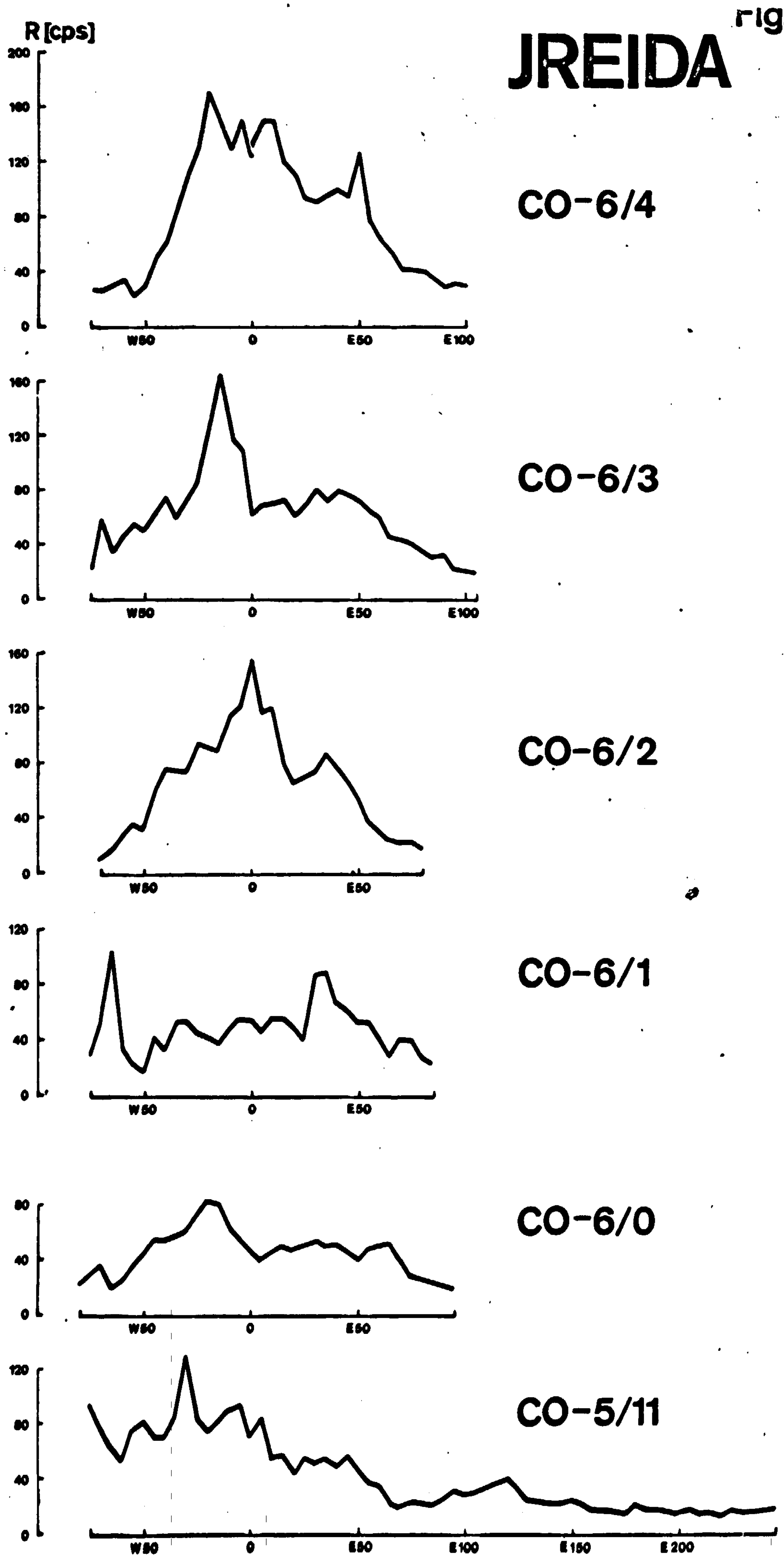


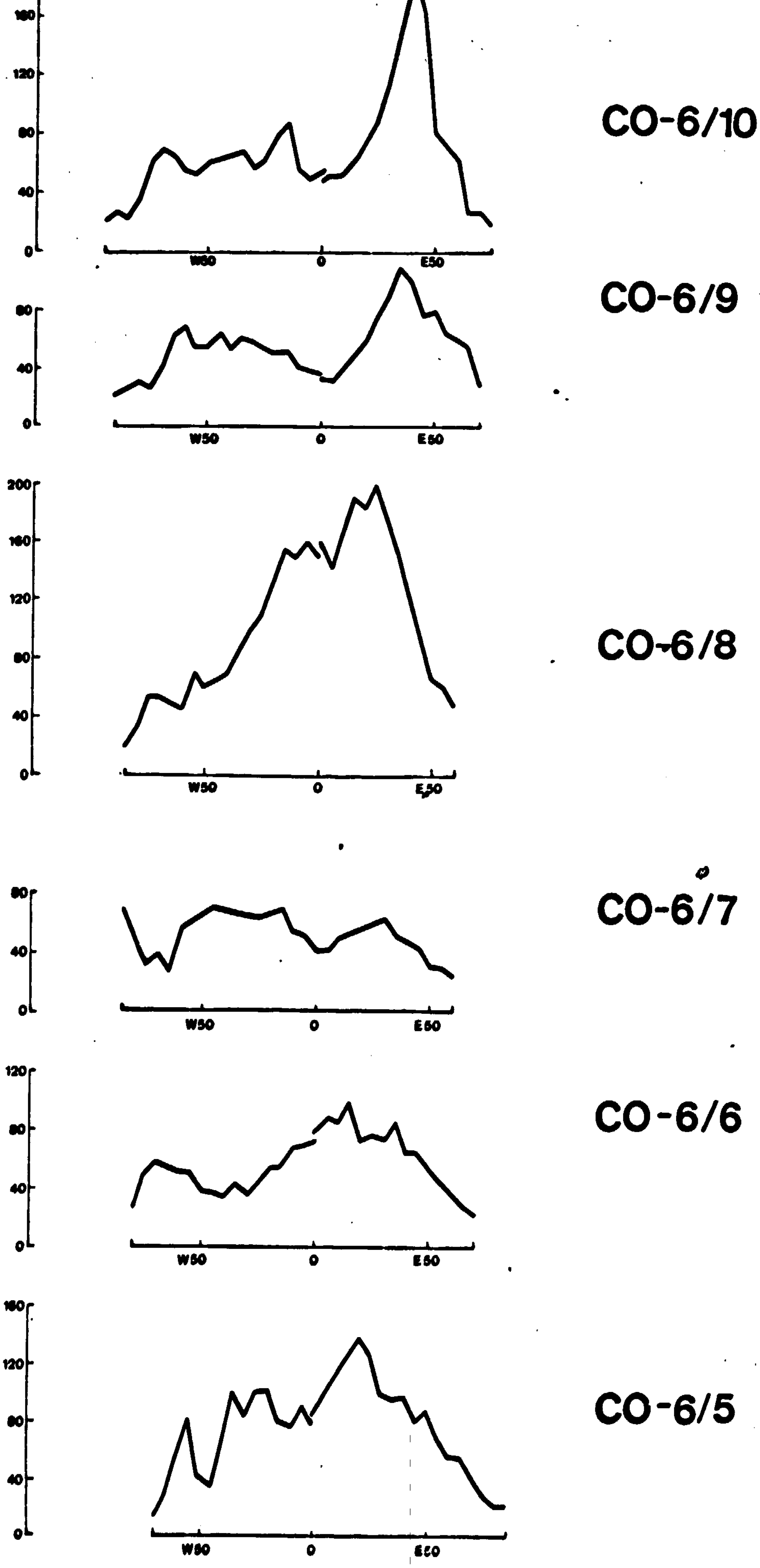
Fig.33·

JREIDA

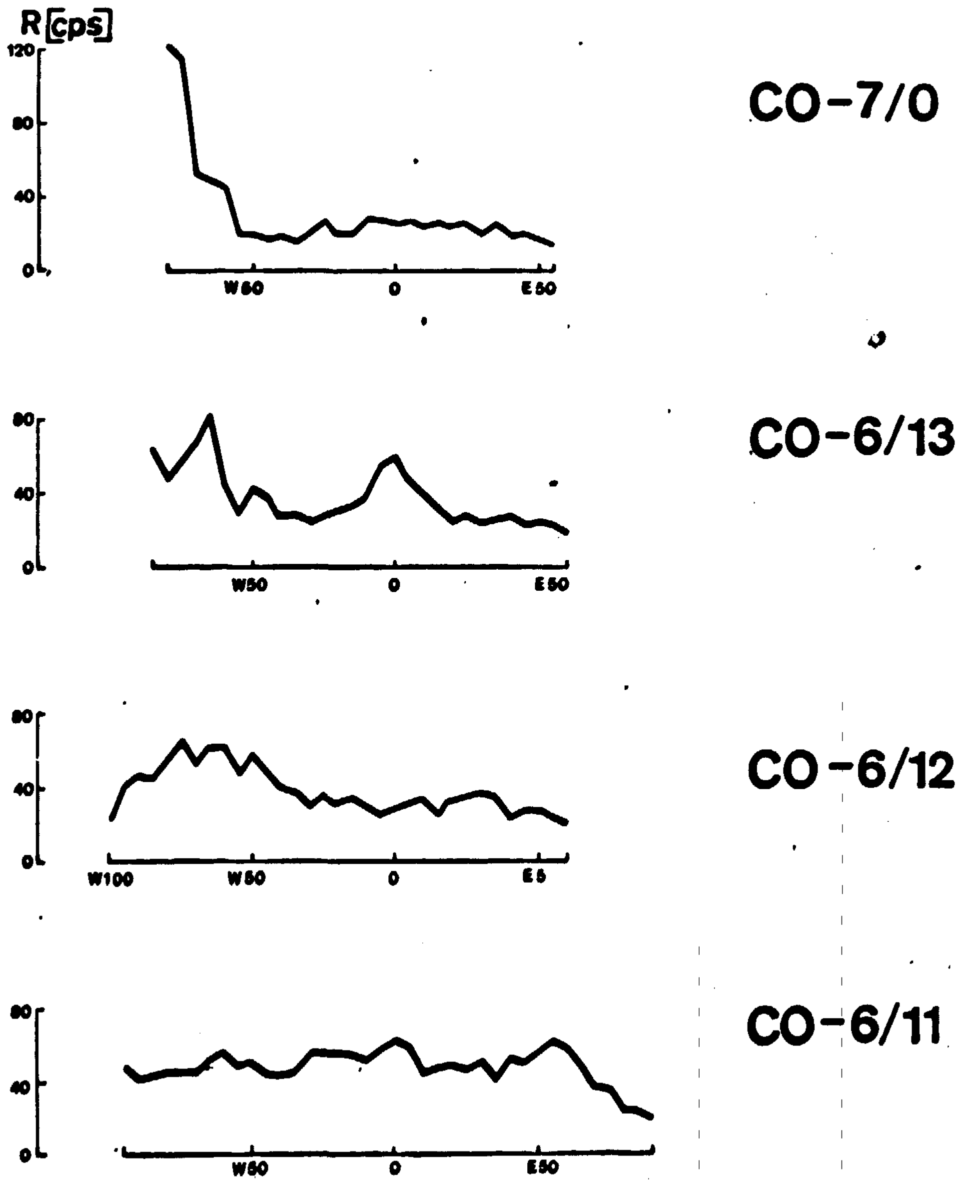


JREIDA

Fig.34.

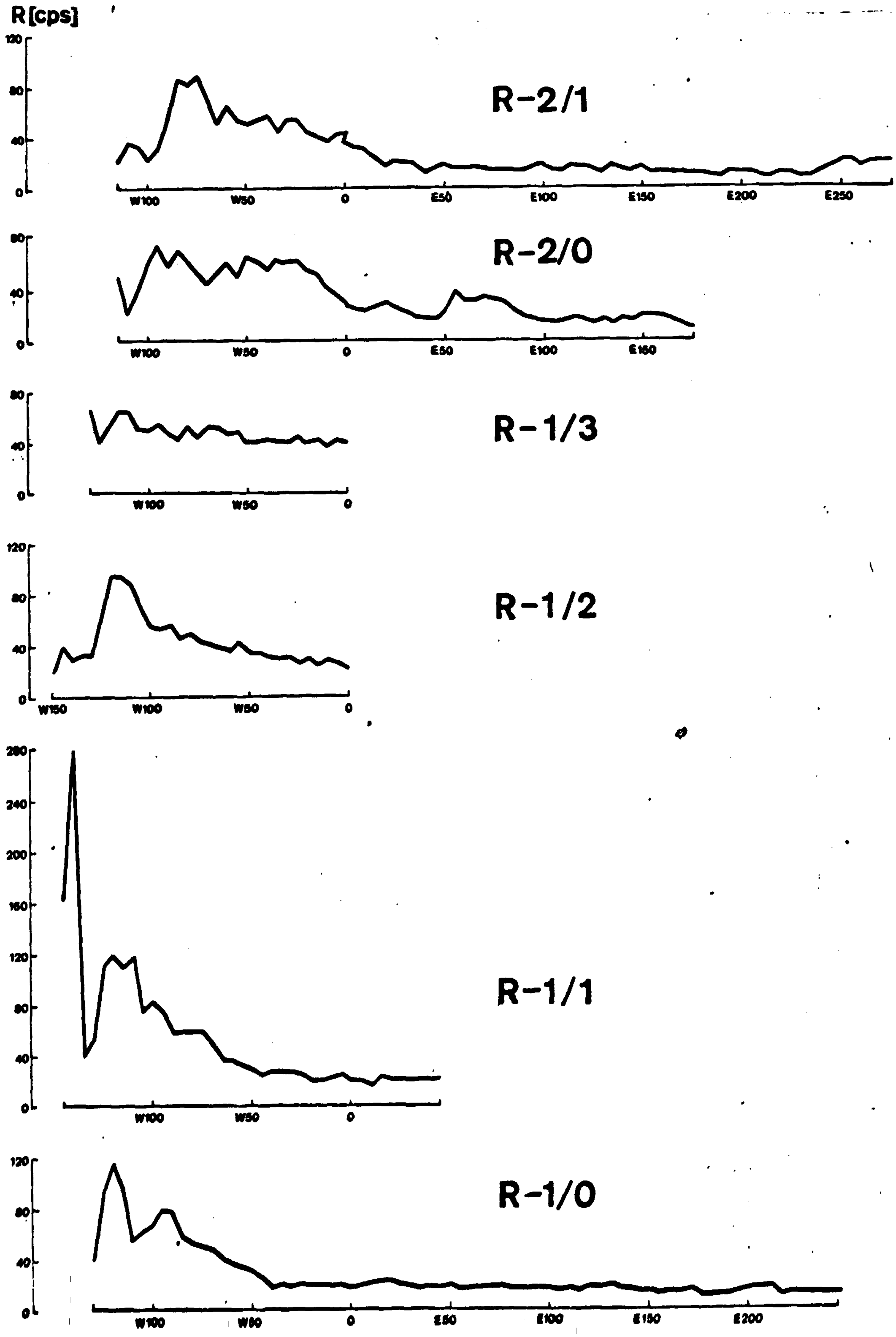


JREIDA Fig. 35



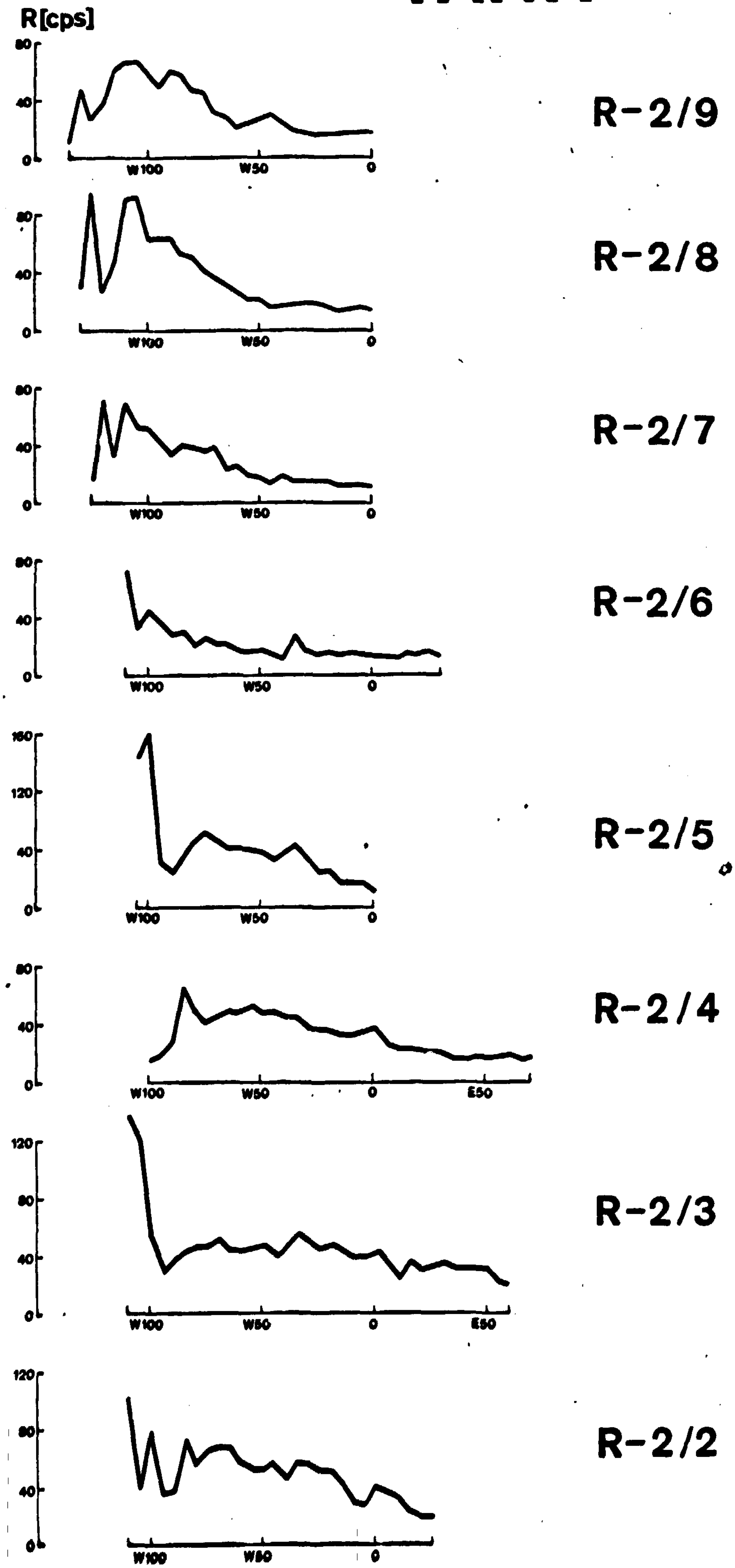
TÂNIT

Fig. 36


R [cps]
R-2/1
R-2/0
R-1/3
R-1/2
R-1/1
R-1/0
W150
W100
W50
0
E50
E100
E150
E200
E250

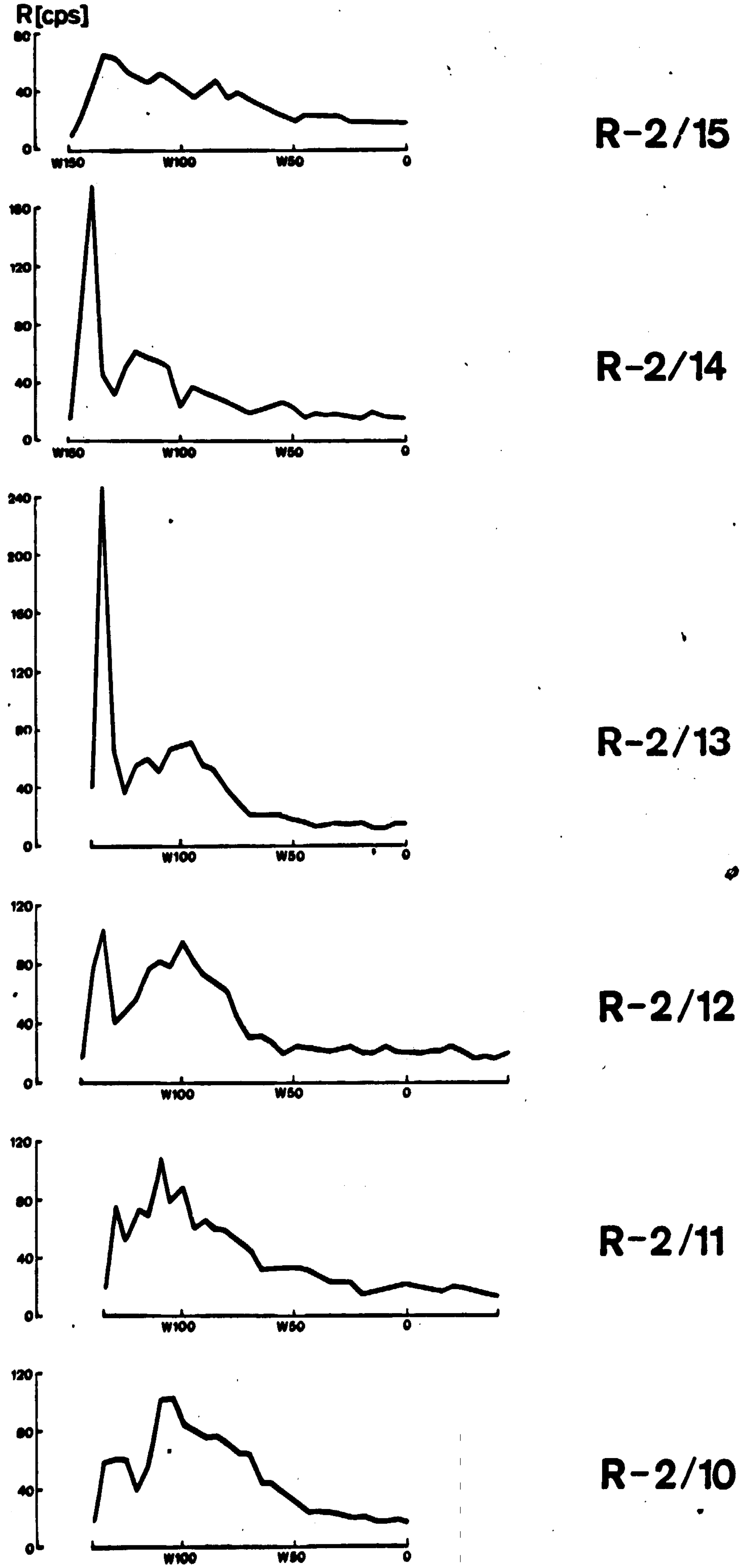
TÂNIT

Fig. 37

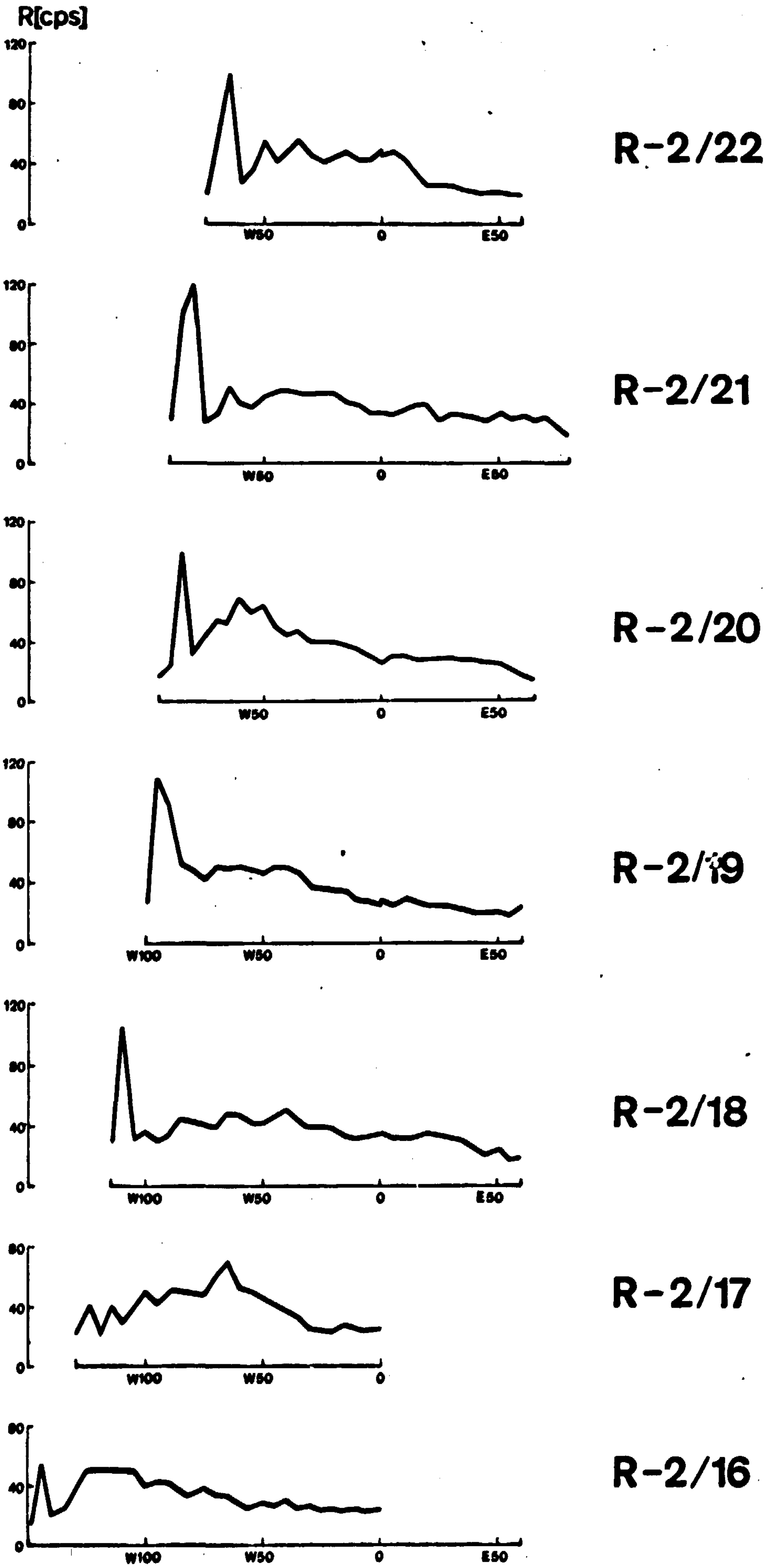

R[cps]
R-2/9
R-2/8
R-2/7
R-2/6
R-2/5
R-2/4
R-2/3
R-2/2
0
40
80
120
160
W100
W50
0
E50

TÂNIT

Fig. 38

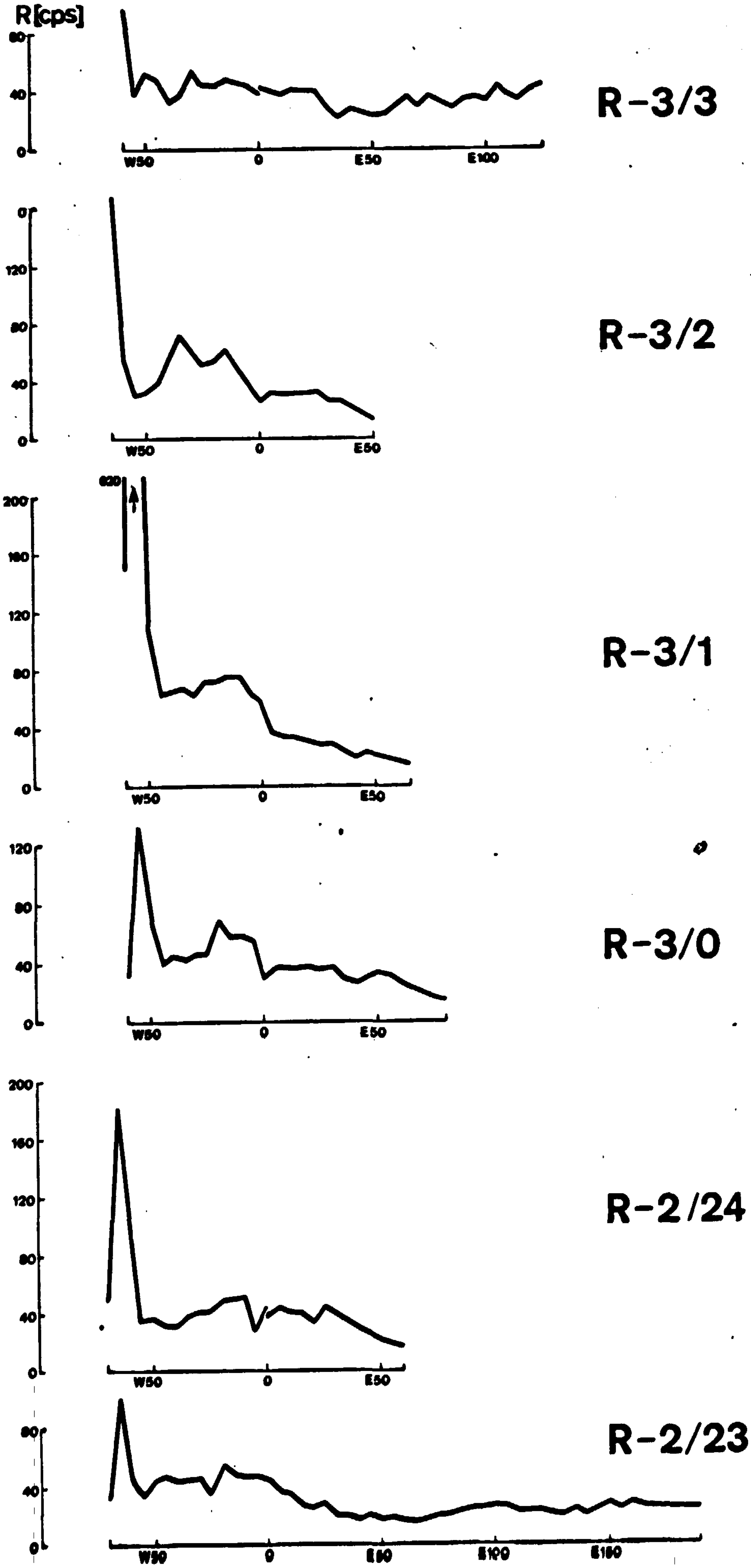


TÂNIT Fig. 39


R[cps]
120
80
40
0
W100
W50
0
E50
R-2/22
R-2/21
R-2/20
R-2/19
R-2/18
R-2/17
R-2/16

TÂNIT

Fig. 40



TÂNIT

Fig. 41

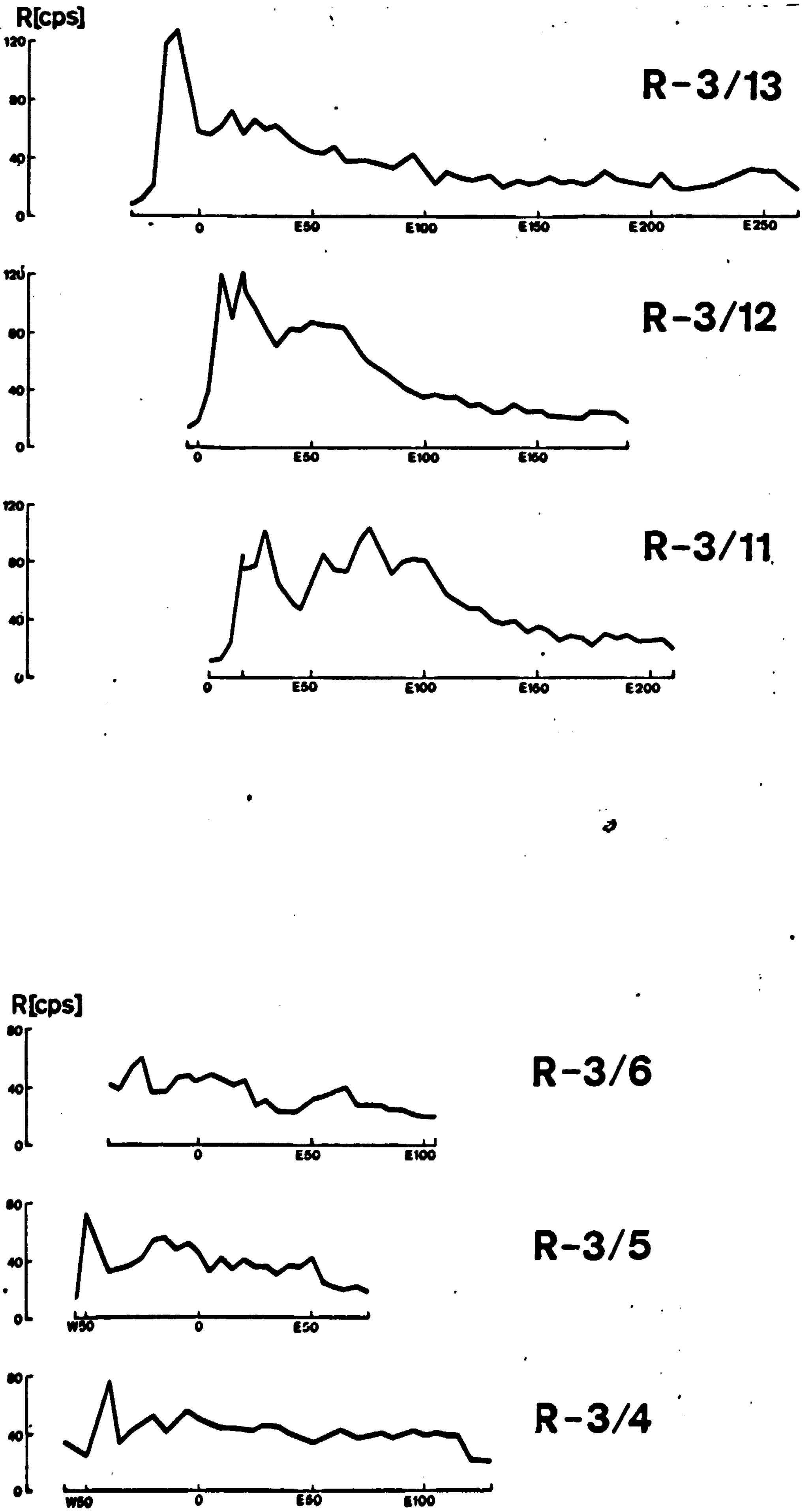
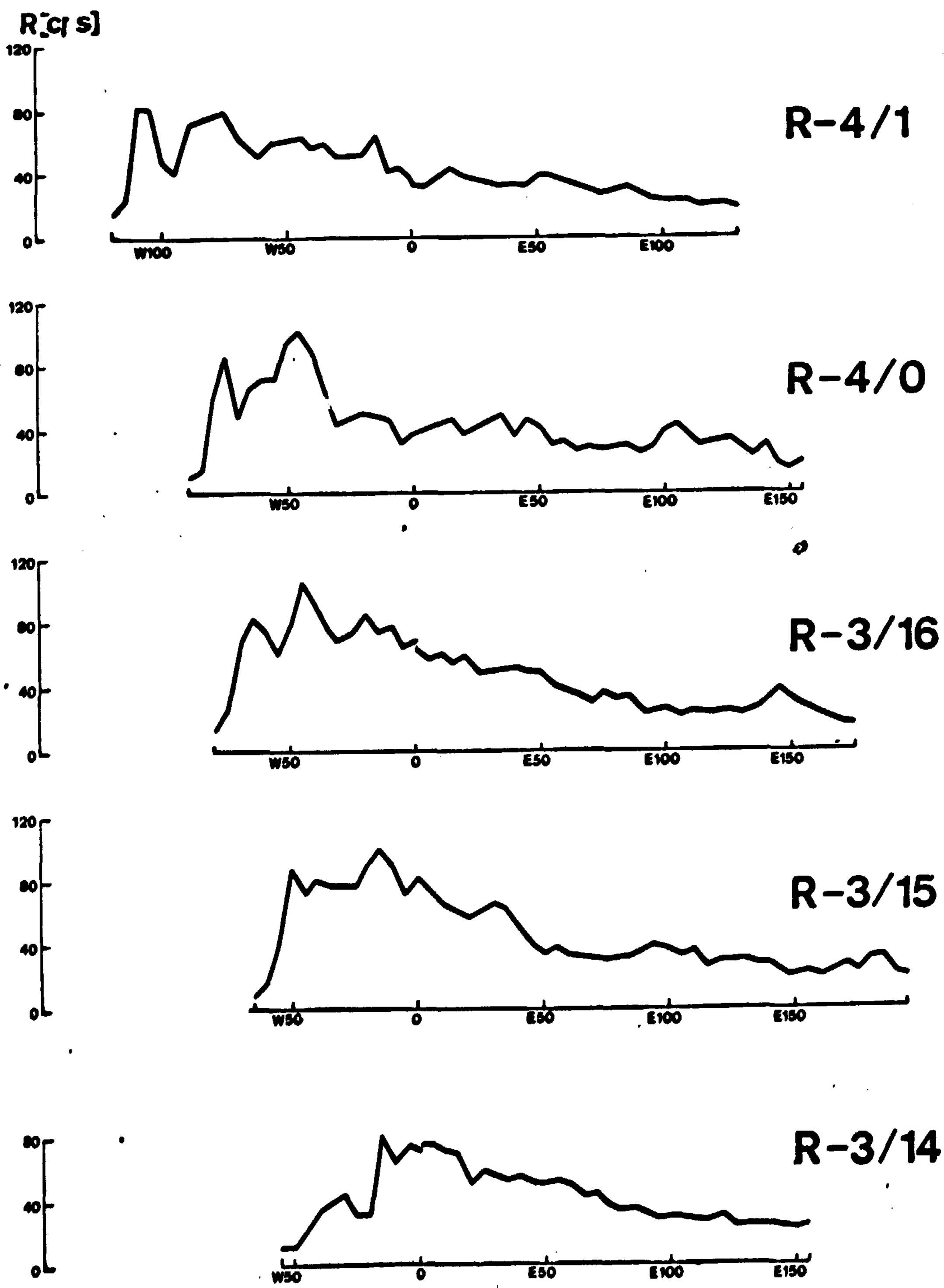

R[cps]
120
80
40
0
0
E50
E100
E150
E200
E250
R-3/13
120
80
40
0
0
E50
E100
E150
R-3/12
120
80
40
0
0
E50
E100
E150
E200
R-3/11
R[cps]
80
40
0
0
E50
E100
R-3/6
80
40
0
W50
0
E50
R-3/5
80
40
0
W50
0
E50
E100
R-3/4

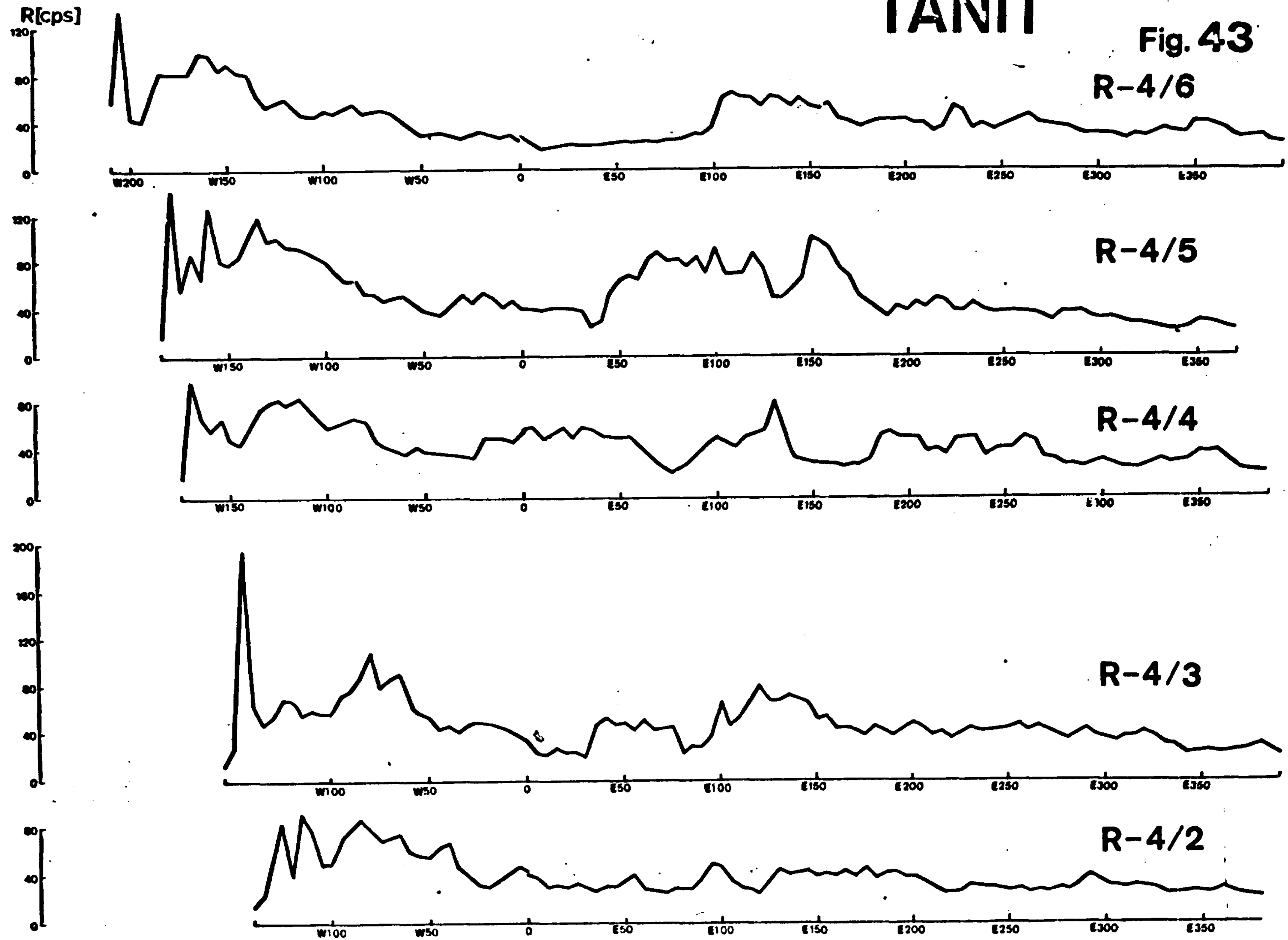
Fig. 42

TÂNIT



TÂNIT

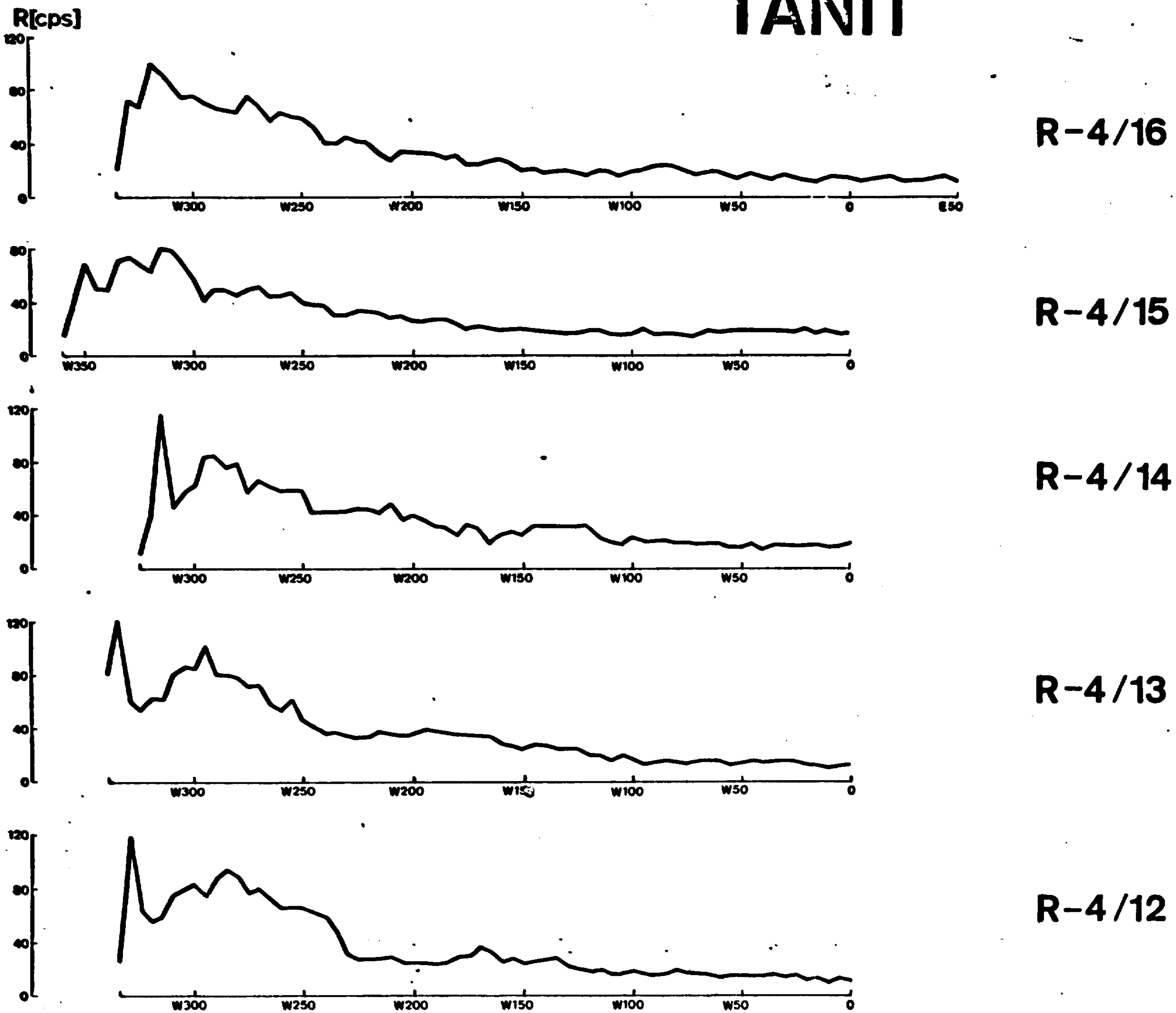
Fig. 43

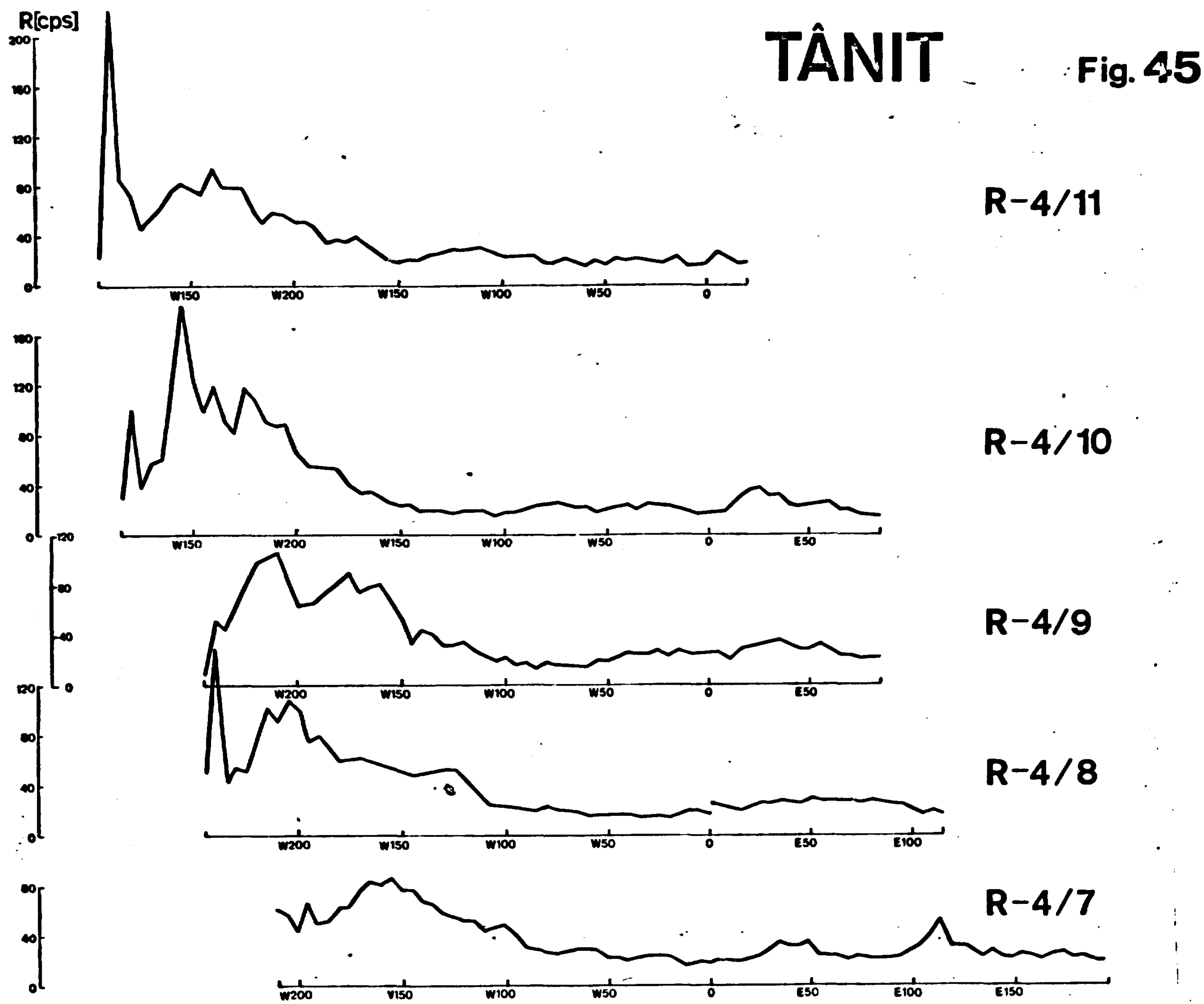


R[cps]
R-4/6
R-4/5
R-4/4
R-4/3
R-4/2
0
40
80
120
160
200
W200
W150
W100
W50
E50
E100
E150
E200
E250
E300
E350

TÂNIT

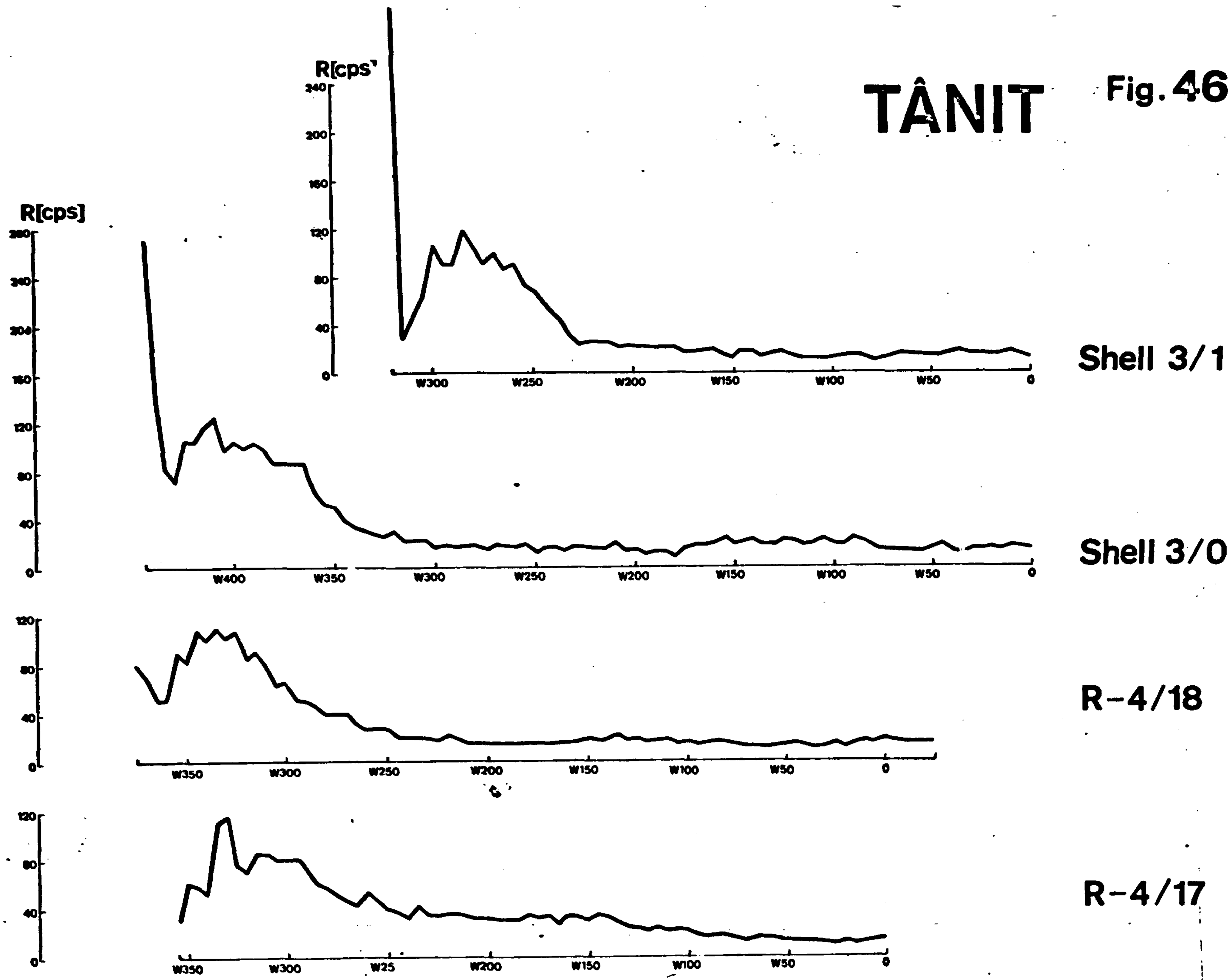
Fig. 44


R[cps]
120
80
40
0
W300
W250
W200
W150
W100
W50
0
E50
R-4/16
W350
R-4/15
R-4/14
R-4/13
R-4/12

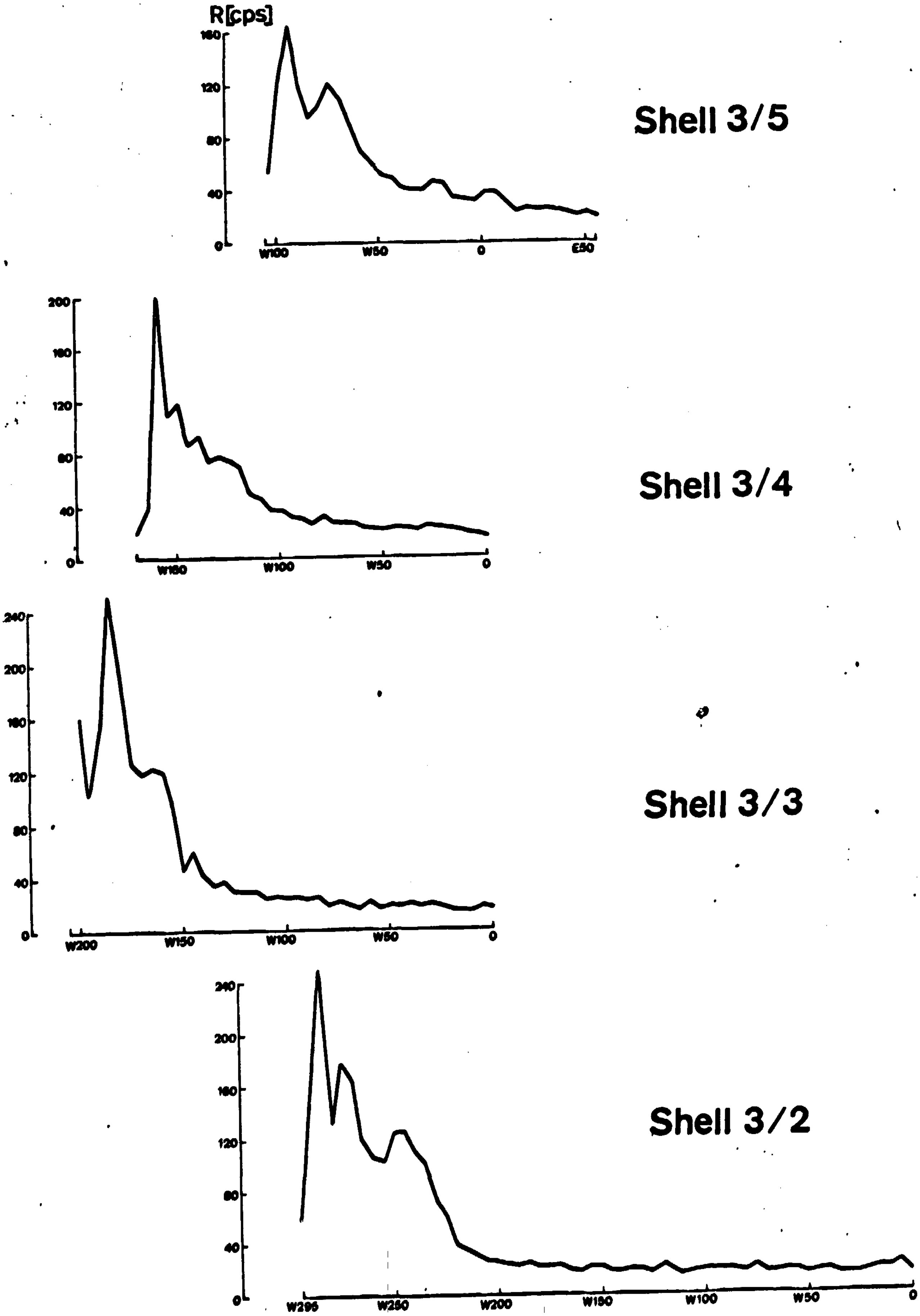


TÂNIT
Fig. 45
R[cps]
R-4/11
R-4/10
R-4/9
R-4/8
R-4/7
W150
W200
W100
W50
0
E50
E100
E150

TÂNIT Fig. 46

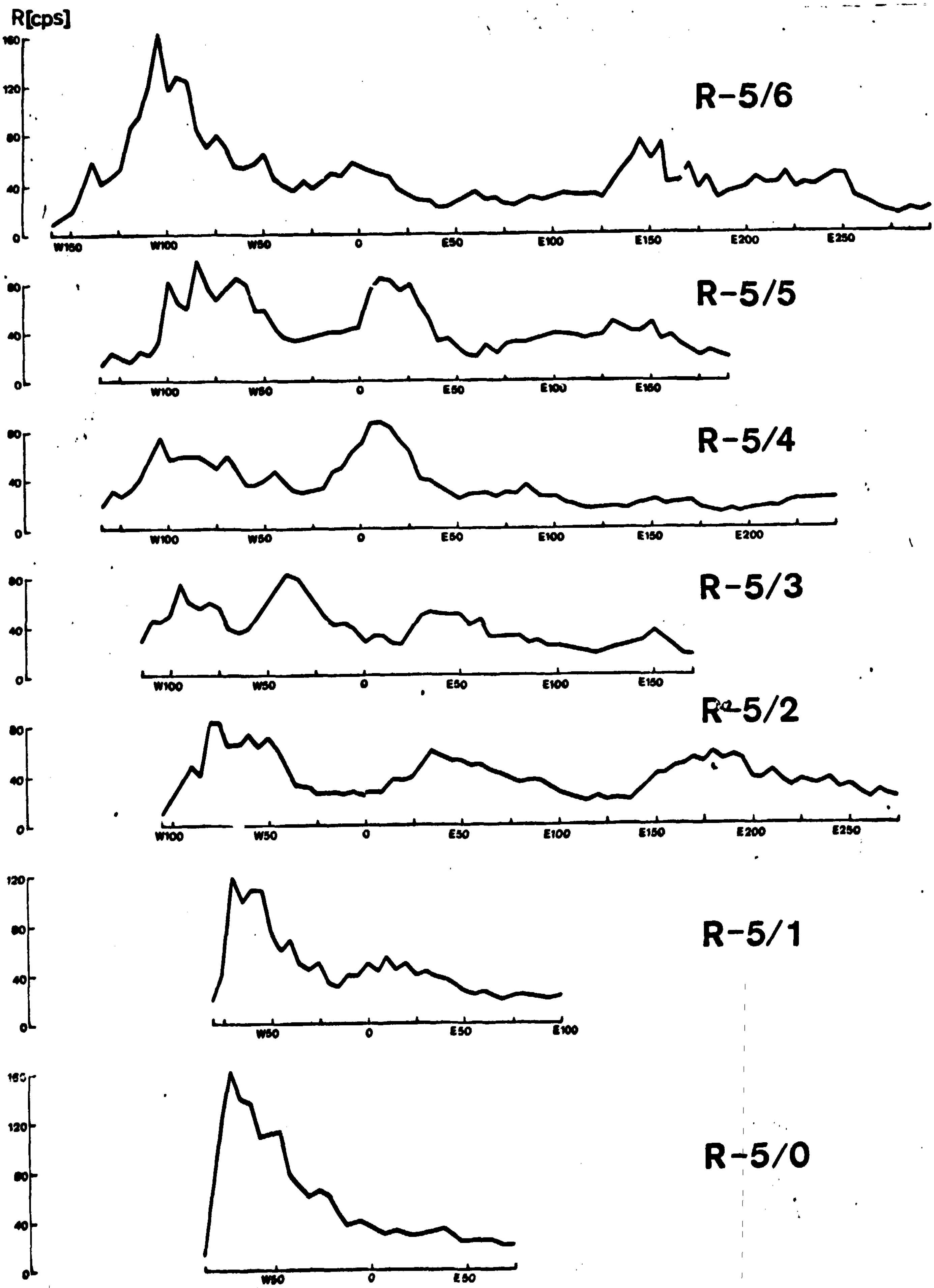


TÂNIT Fig.47


R[cps]
Shell 3/5
0
40
80
120
160
W100
W50
0
E50
Shell 3/4
0
40
80
120
160
200
W150
W100
W50
0
Shell 3/3
0
40
80
120
160
200
240
W200
W150
W100
W50
0
Shell 3/2
0
40
80
120
160
200
240
W295
W250
W200
W150
W100
W50
0

TÂNIT

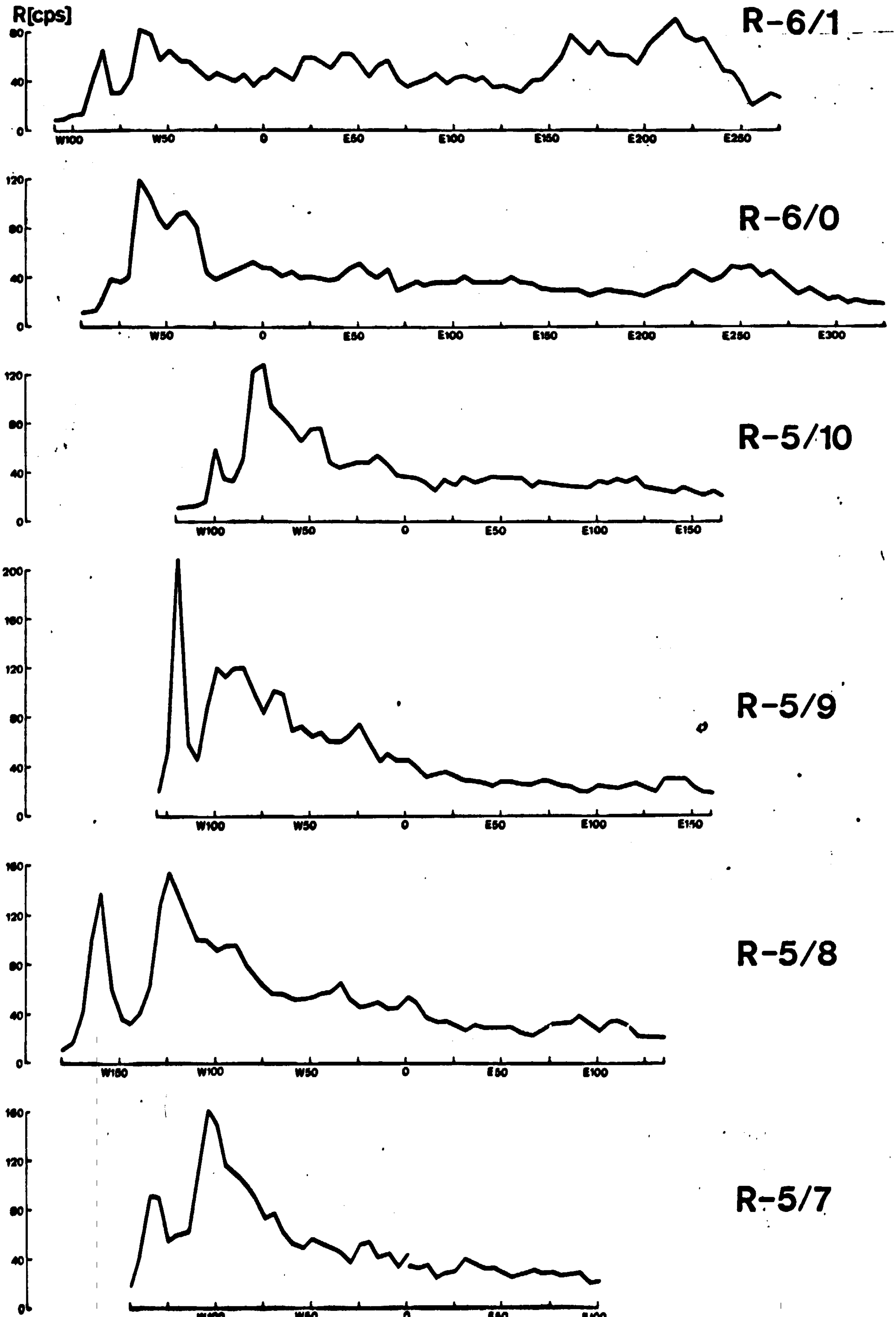
Fig. 48



R[cps]
R-5/6
0
40
80
120
160
W150
W100
W50
0
E50
E100
E150
E200
E250
R-5/5
0
40
80
W100
W50
0
E50
E100
E150
R-5/4
0
40
80
W100
W50
0
E50
E100
E150
E200
R-5/3
0
40
80
W100
W50
0
E50
E100
E150
R-5/2
0
40
80
W100
W50
0
E50
E100
E150
E200
E250
R-5/1
0
40
80
120
W50
0
E50
E100
R-5/0
0
40
80
120
160
W50
0
E50

TAHITI

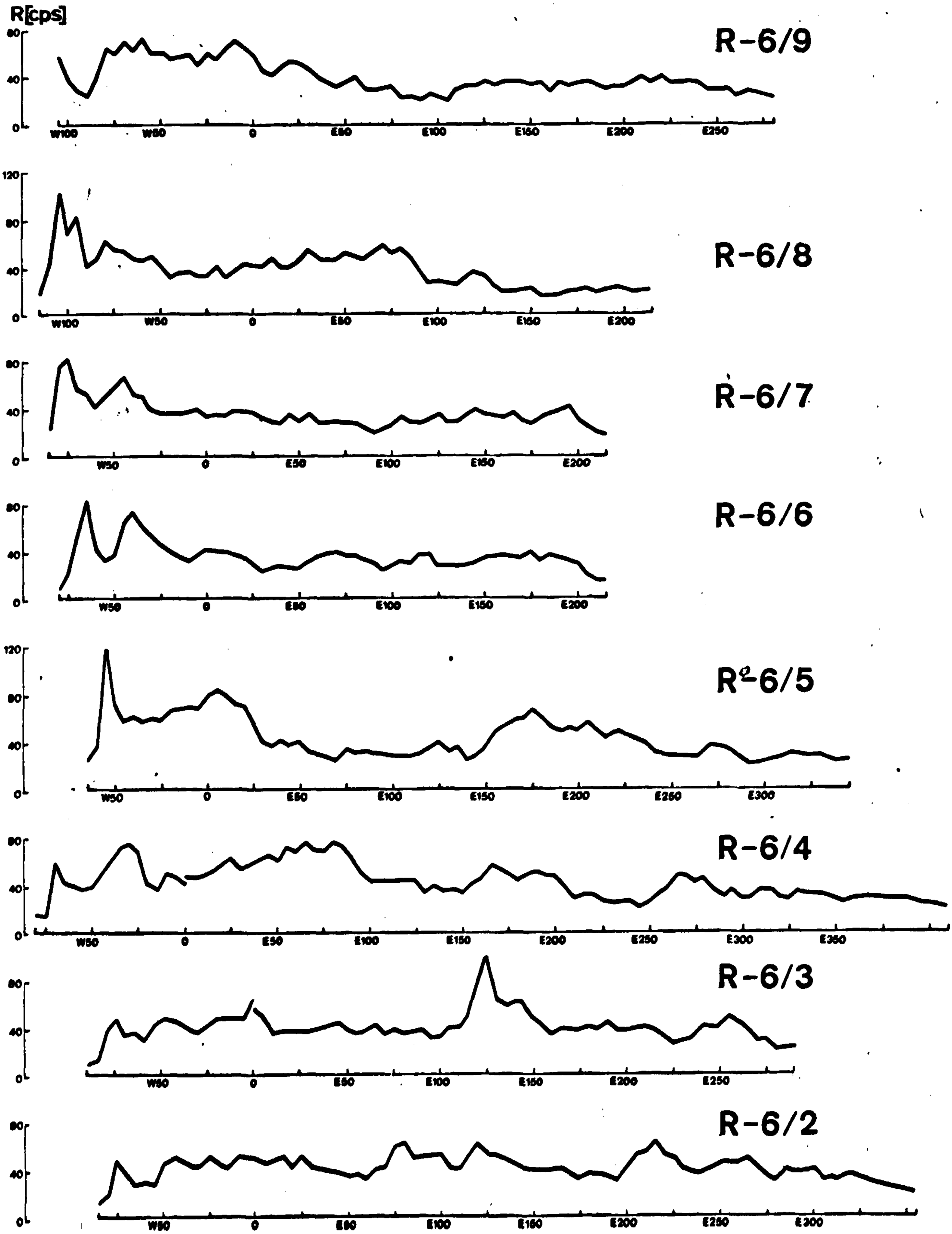
Fig. 49



Secteur–sector

TÂNIT

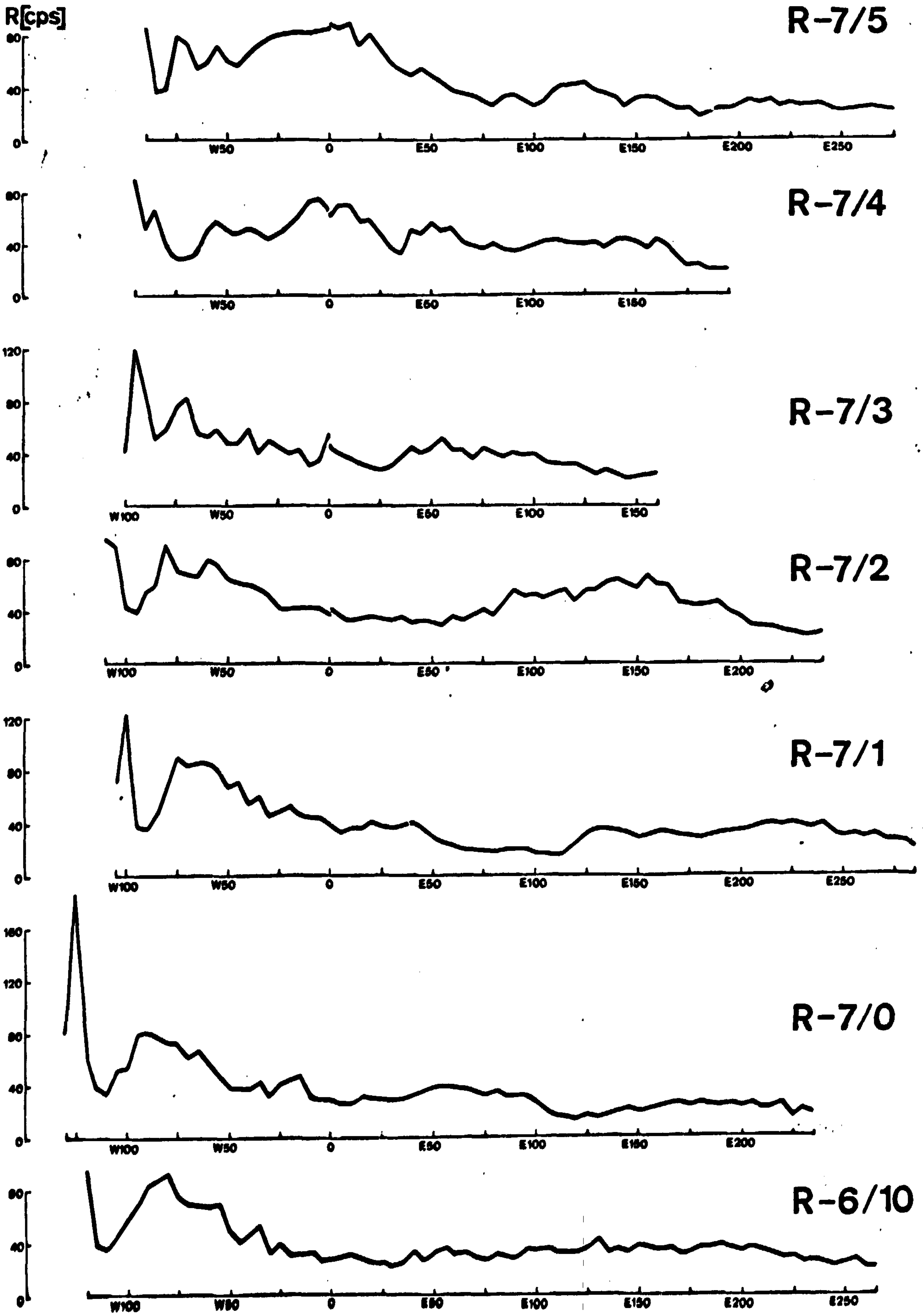
Fig. 50



R[cps]
R-6/9
R-6/8
R-6/7
R-6/6
R-6/5
R-6/4
R-6/3
R-6/2
0
40
80
120
W100
W50
0
E50
E100
E150
E200
E250
E300
E350

TÂNIT

Fig. 51


R[cps]
R-7/5
R-7/4
R-7/3
R-7/2
R-7/1
R-7/0
R-6/10
W100
W50
0
E50
E100
E150
E200
E250

TÂNIT Fig. 52

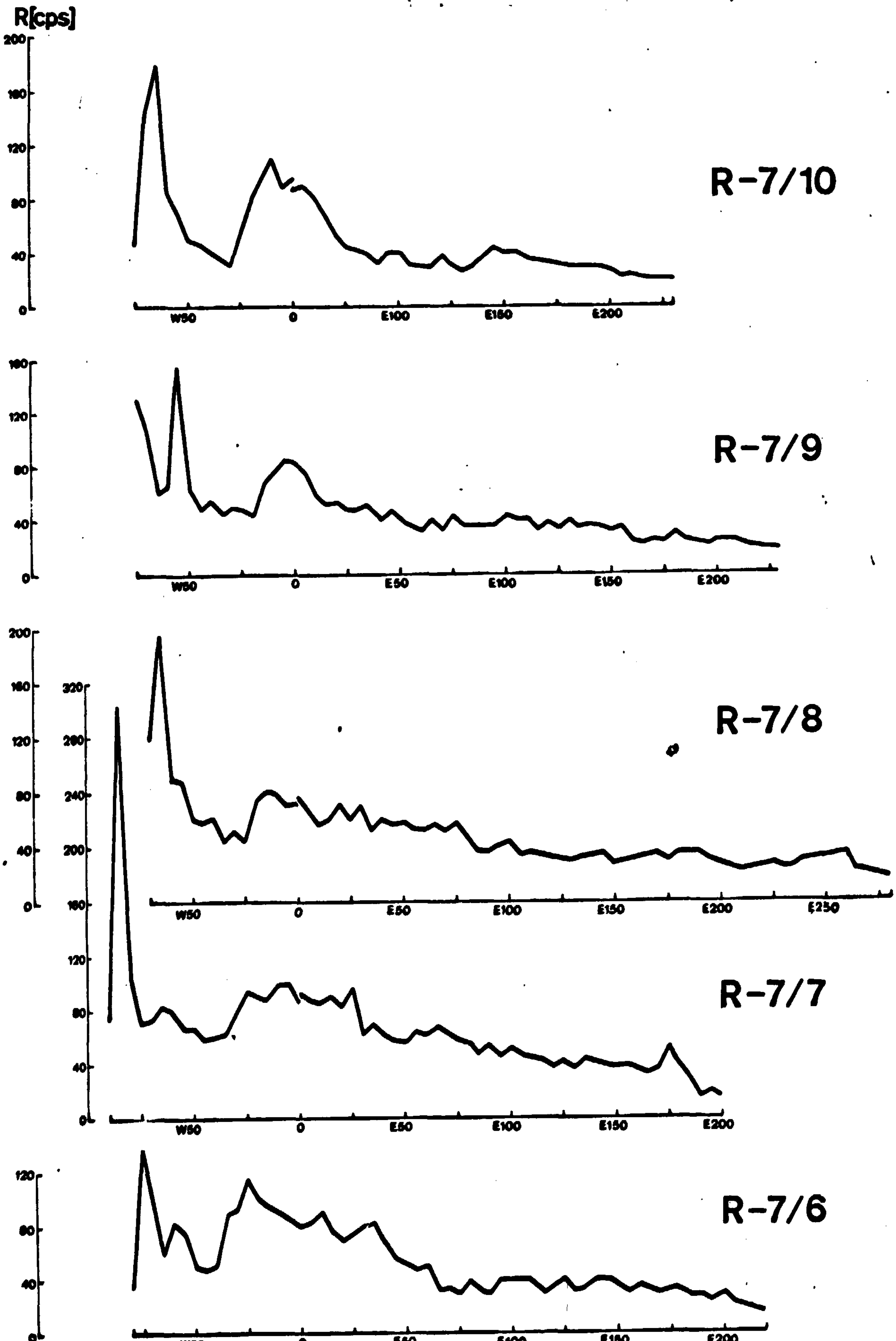
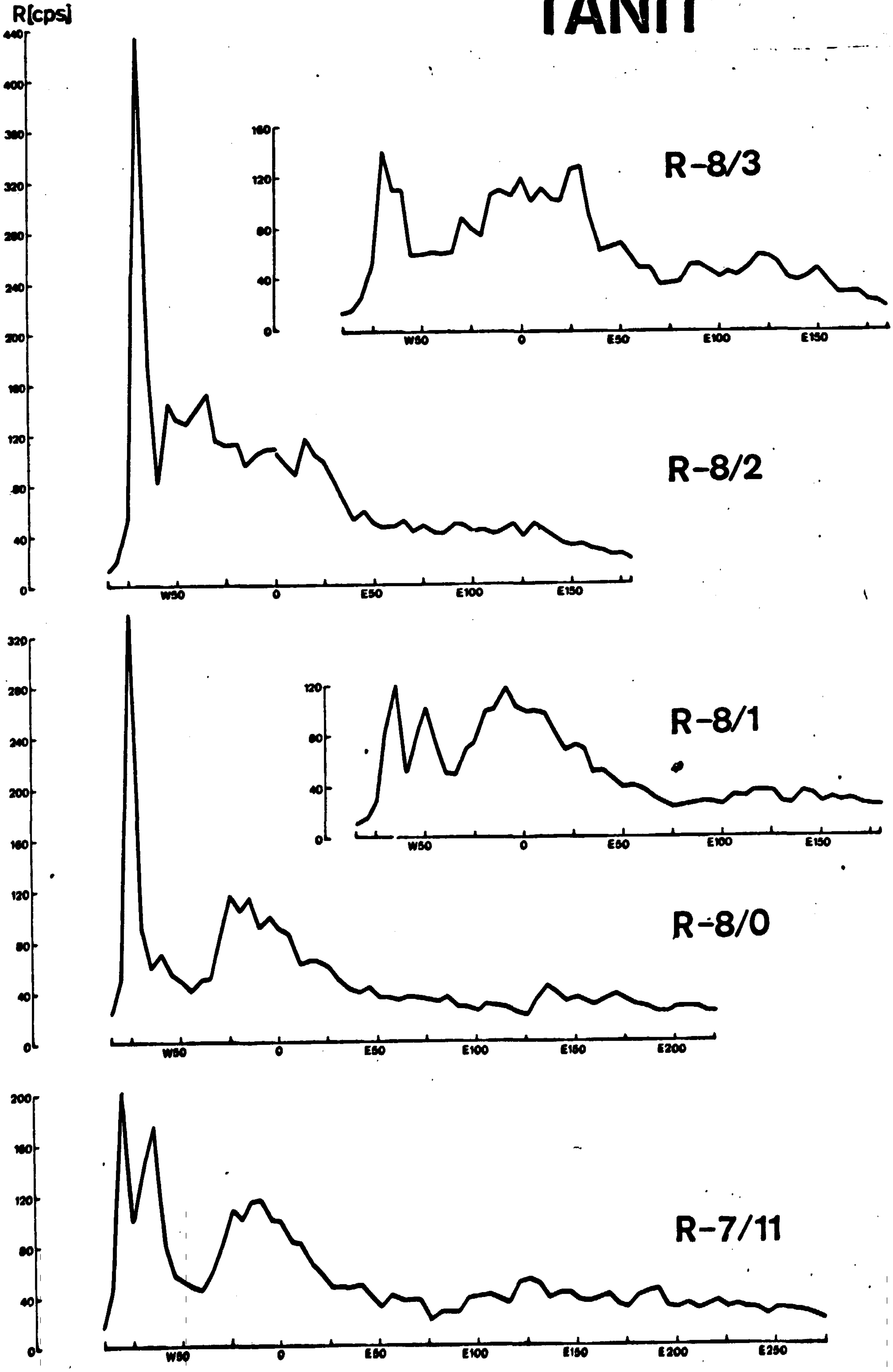
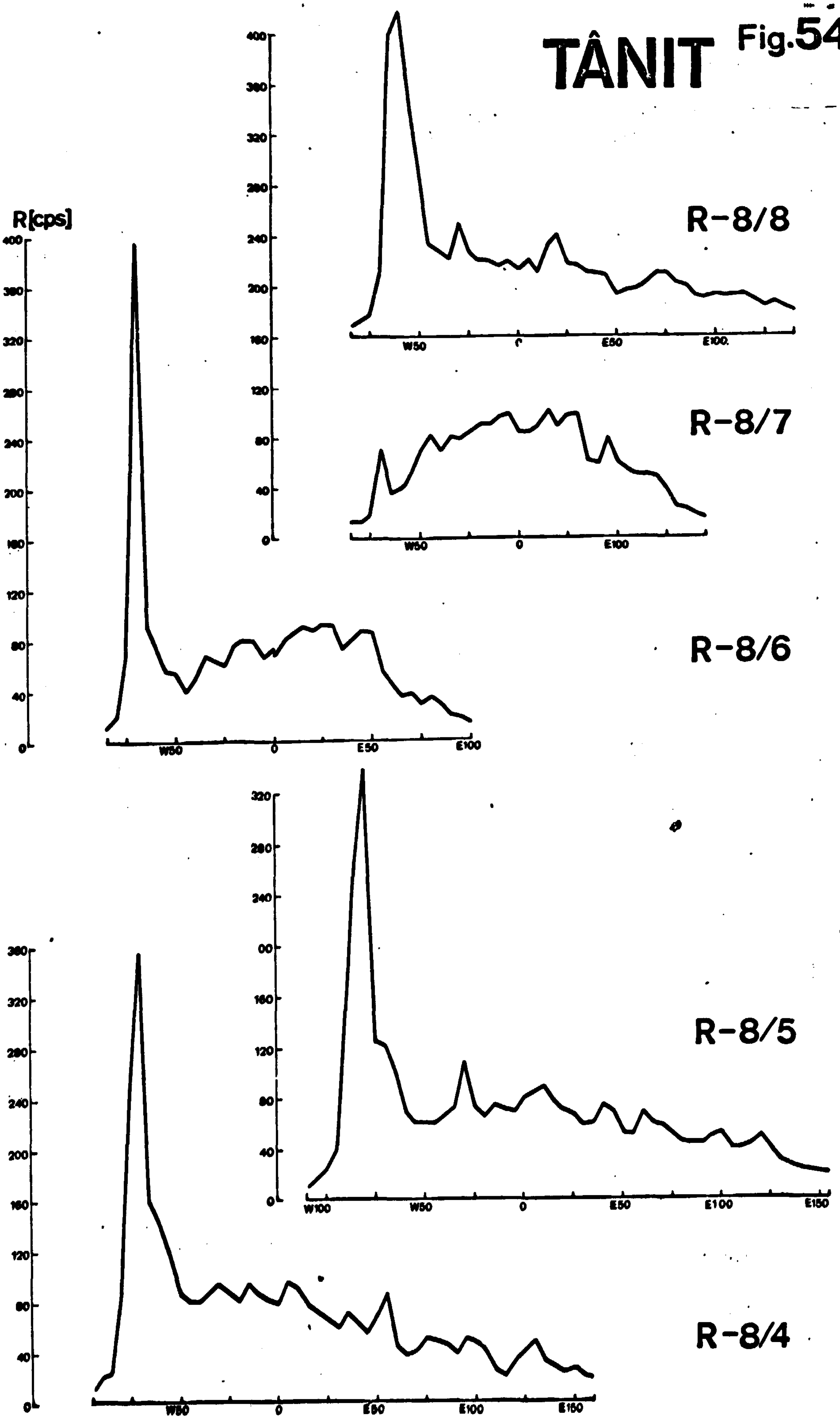


Fig.53

TÂNIT



TÂNIT Fig.54



TÂNIT

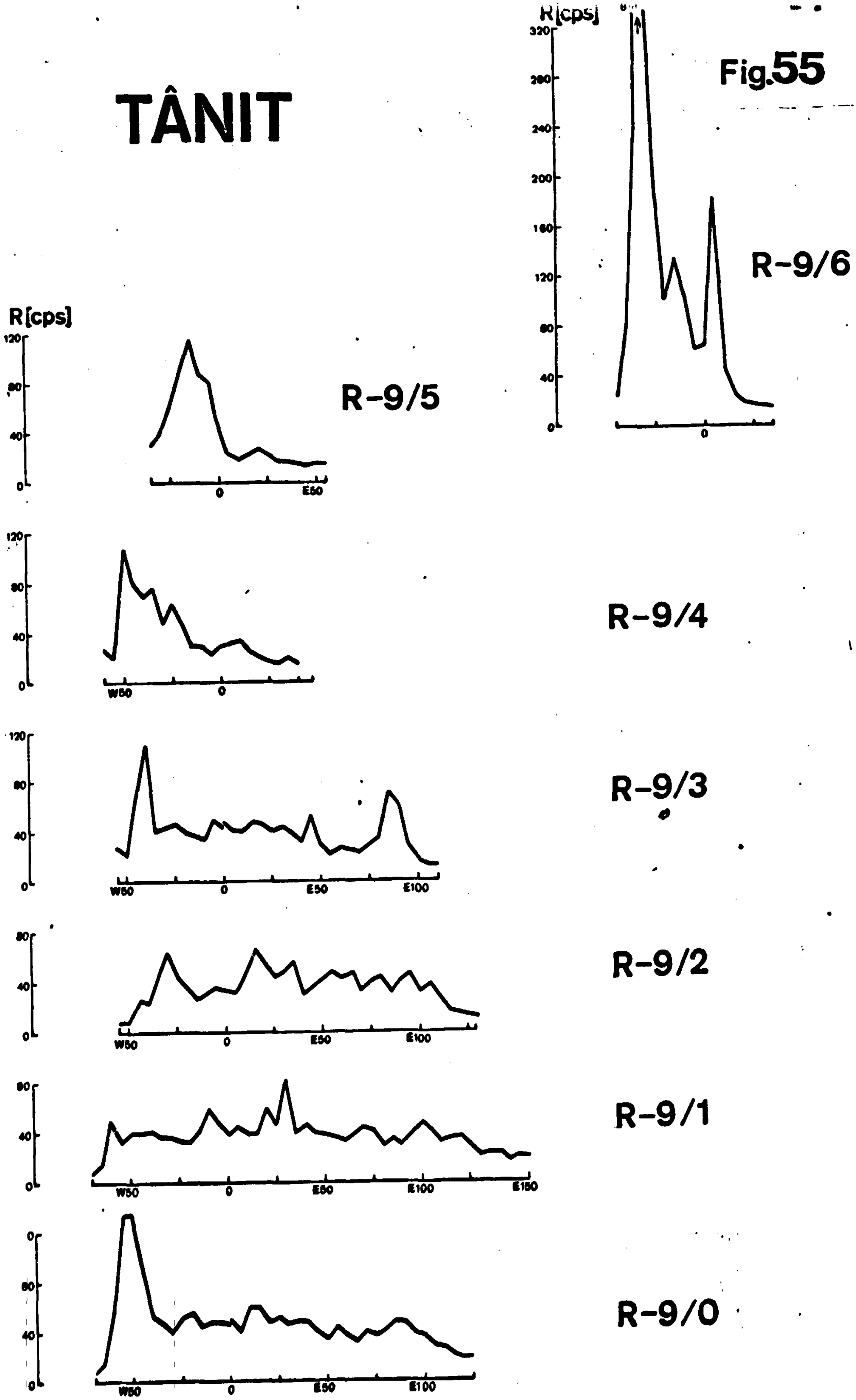
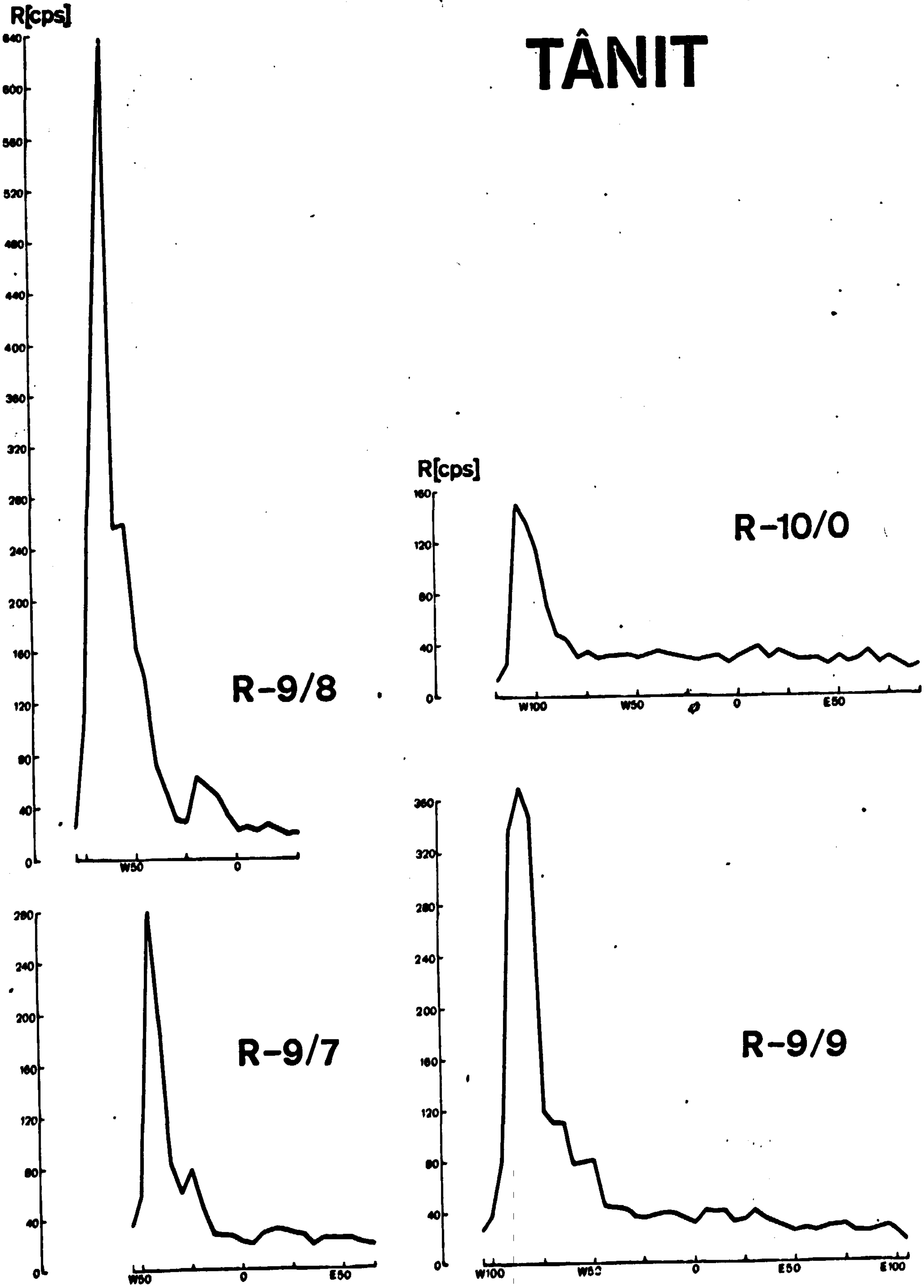


Fig.55

Fig. 56

TÂNIT


R[cps]
R-9/8
W50
0
R-10/0
W100
W50
0
E50
R-9/7
W50
0
E50
R-9/9
W100
0
E50
E100

LEVÉ DÉTAILLÉ
DETAILED SURVEY

Fig. 57

SECTION 1

Explications pour figures 58-72
Explanations for figures 58-72

CARTE DE RAYONNEMENT GAMMA
RADIOACTIVITY CONTOUR MAP

ÉCHELLE / SCALE 1:2500

JREIDA secteurs / sectors 1-6 (Fig.58-63)

TÂNÎT-BLAOUAKH secteurs / sectors 1-9 (Fig.64-72)

R-1/3 Profil radiométrique avec le numéro
Radiometric profile and its number

Ligne de base
Baseline

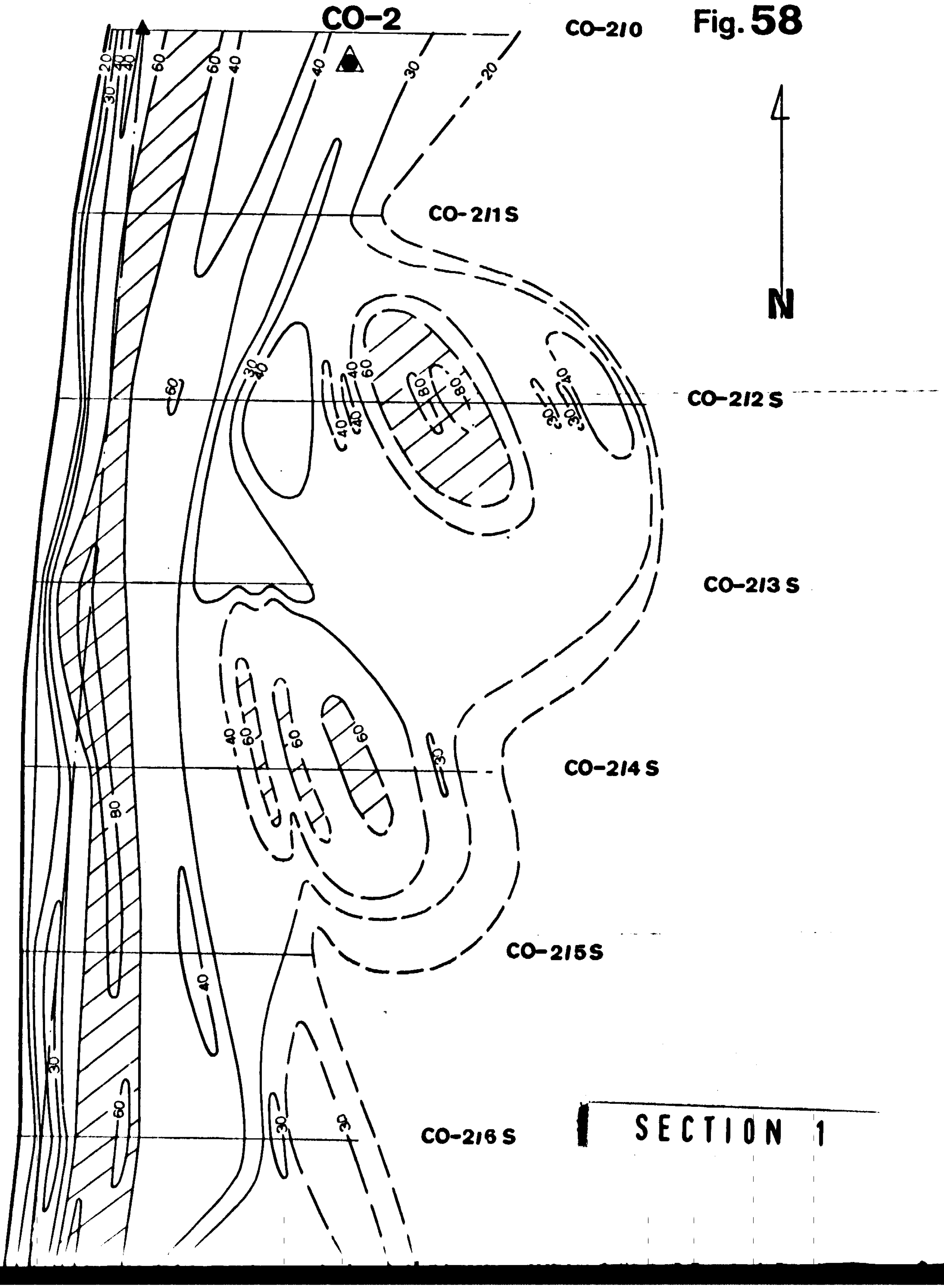
CO-2 Balise
Hydrographic marker

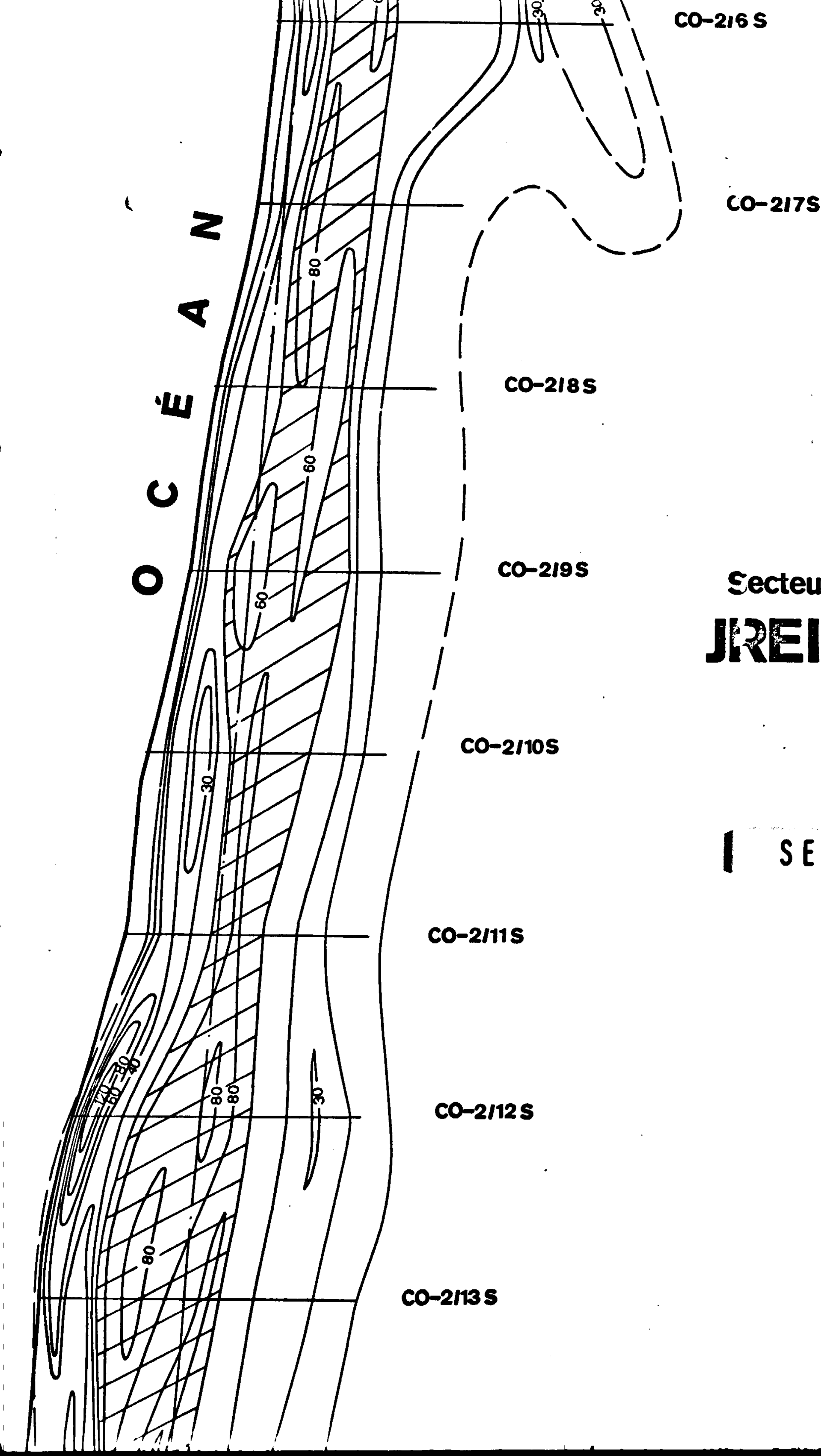
Répère

SECTION 2

R-1/3	Profil radiométrique avec le numéro Radiometric profile and its number
	Ligne de base Baseline
CO-2	Balise Hydrographic marker
	Répère Temporary marker point
20	Isocontours de rayonnement gamma Gamma radiation contours
20, 30, 40, 60, 80, 120, 160, 240, 320	Valeurs de isocontours de rayonnement gamma en coups par secode (cps) Values of gamma radiation contours in counts per second (cps)
J-9	Forage „profond" Deep borehole
J-1	Forage peu profond Shallow borehole
R-8/7	Profil échantillonné Sampled profile

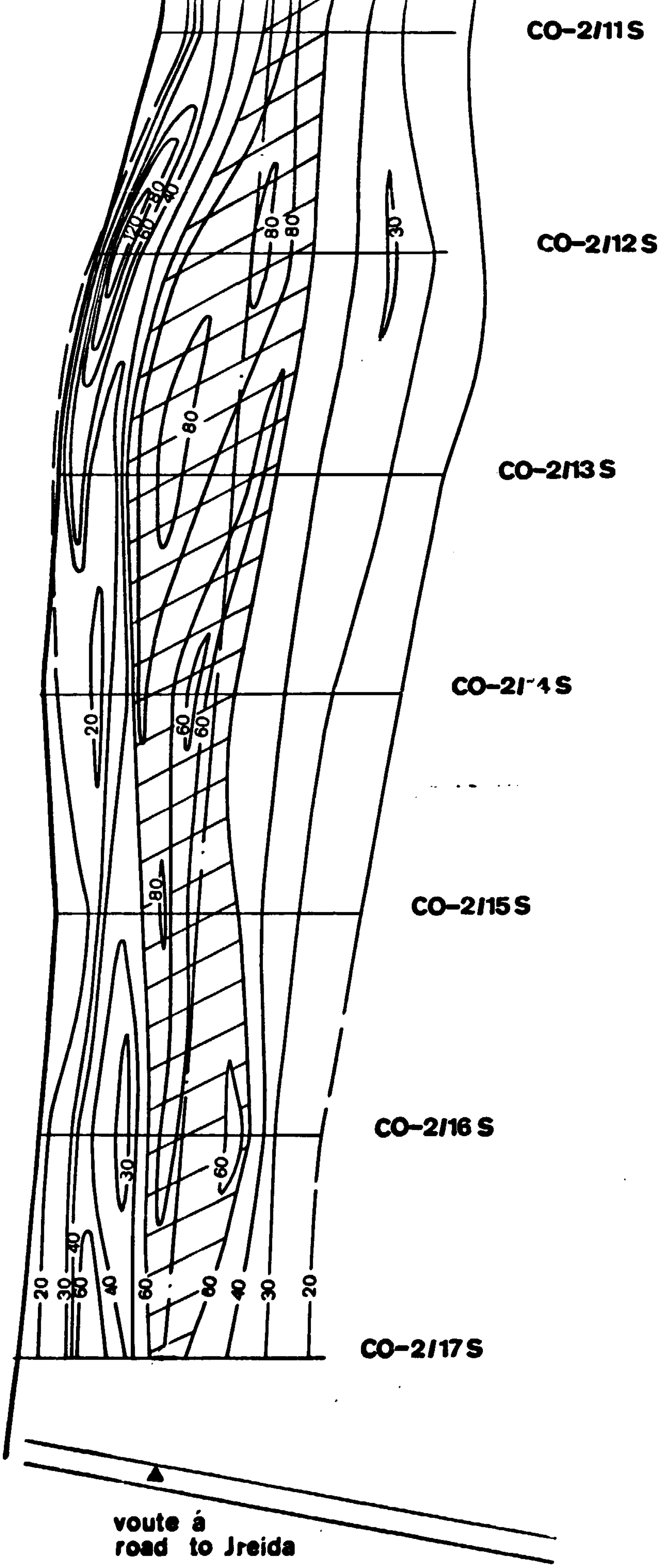
Fig. 58





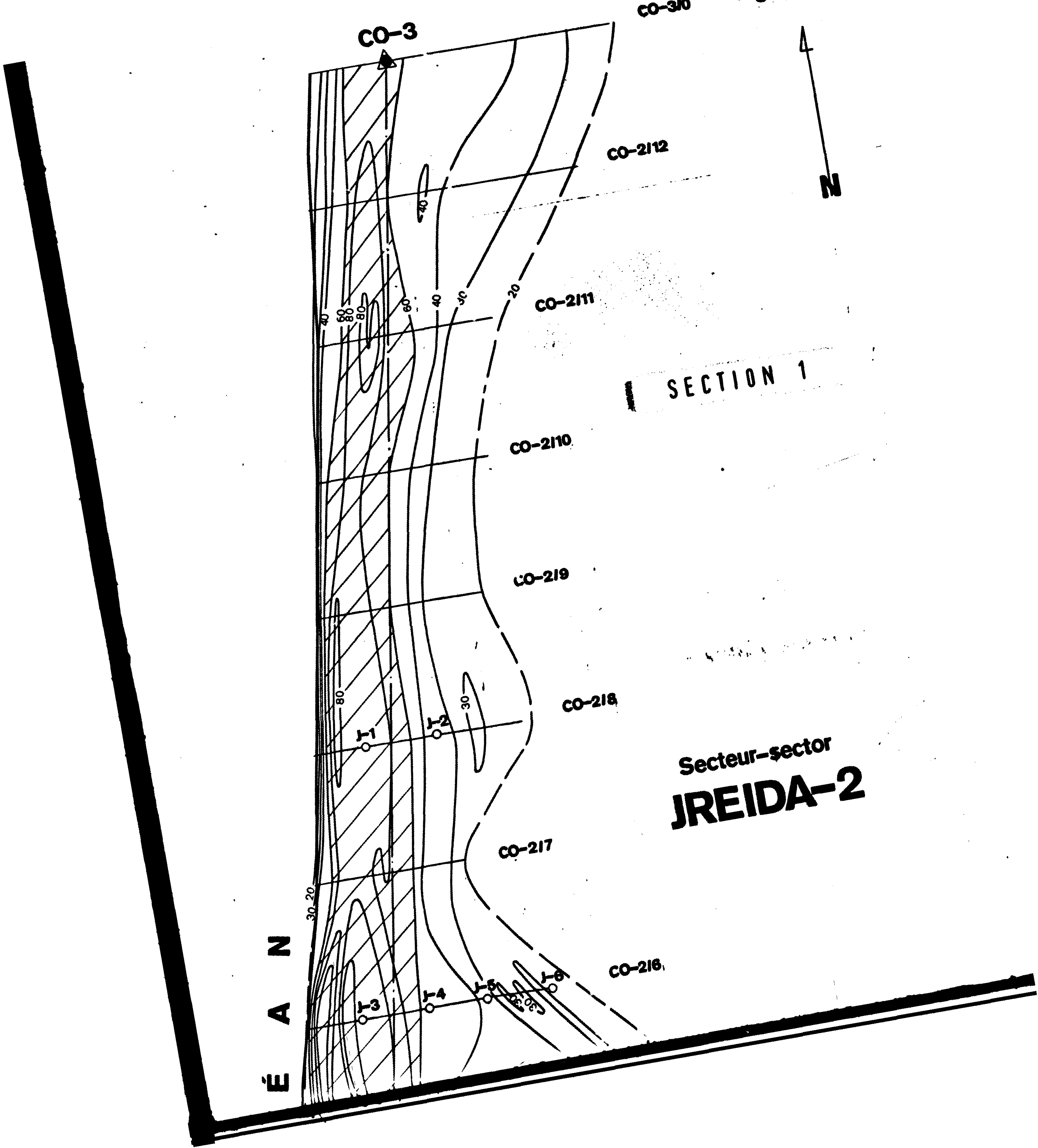
Secteur-sector
JREIDA-1

SECTION 2


CO-2/11 S
CO-2/12 S
CO-2/13 S
CO-2/14 S
CO-2/15 S
CO-2/16 S
CO-2/17 S
20
30
40
60
80
120
voute á
road to Jreida

SECTION 3

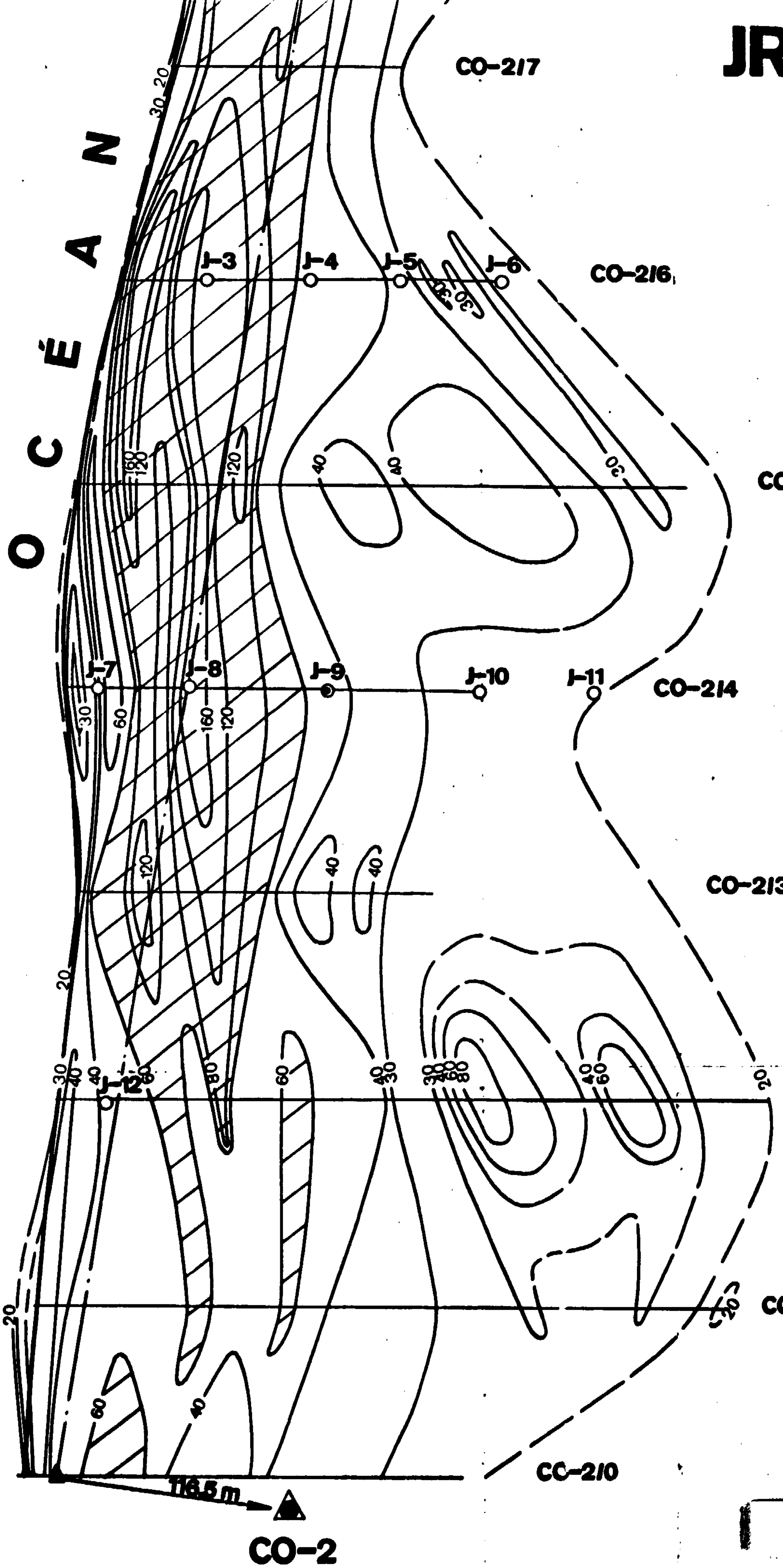
Fig. 59



Secteur-sector

JREIDA-2

JREIDA-2



SECTION 2

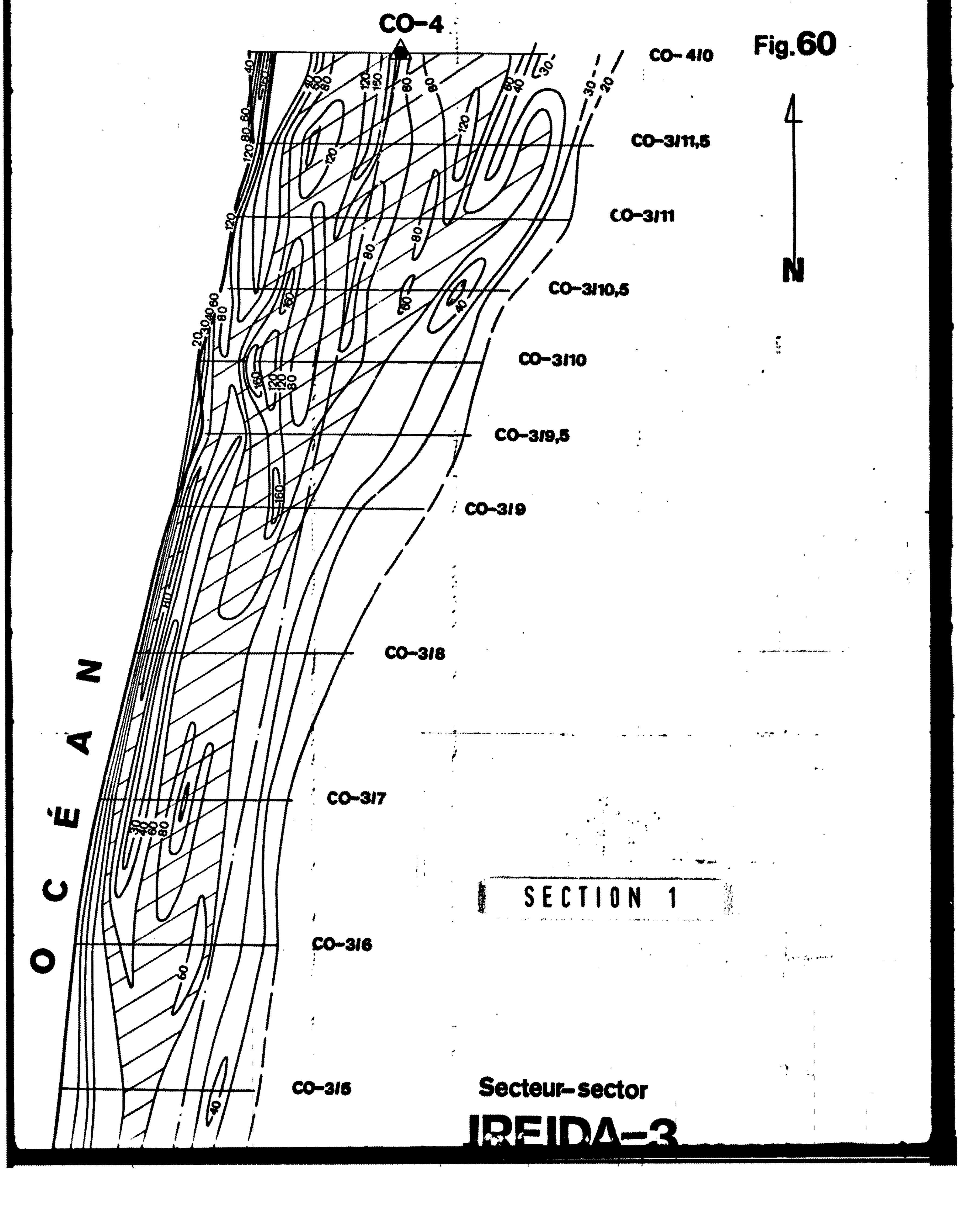
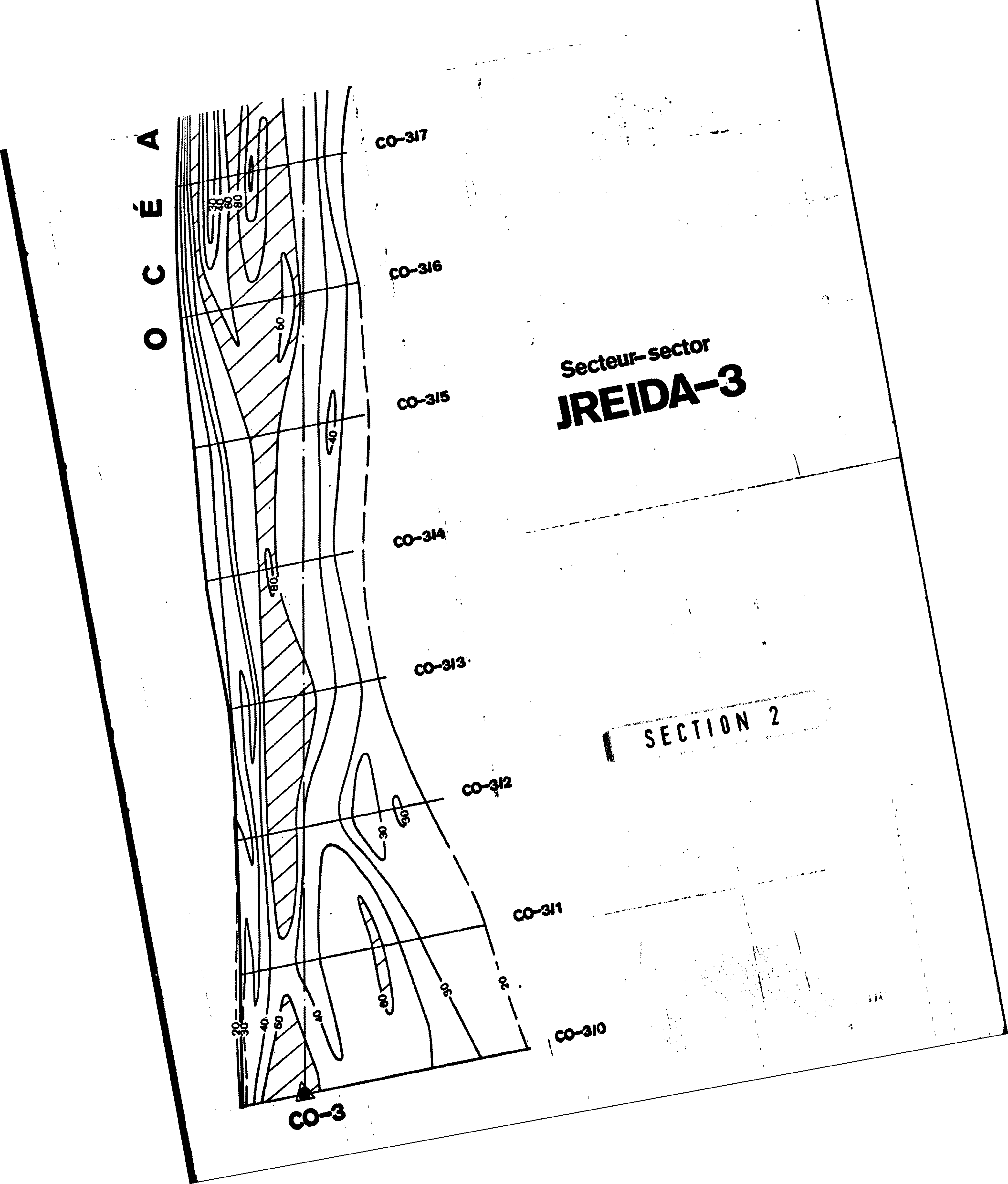


Fig. 60

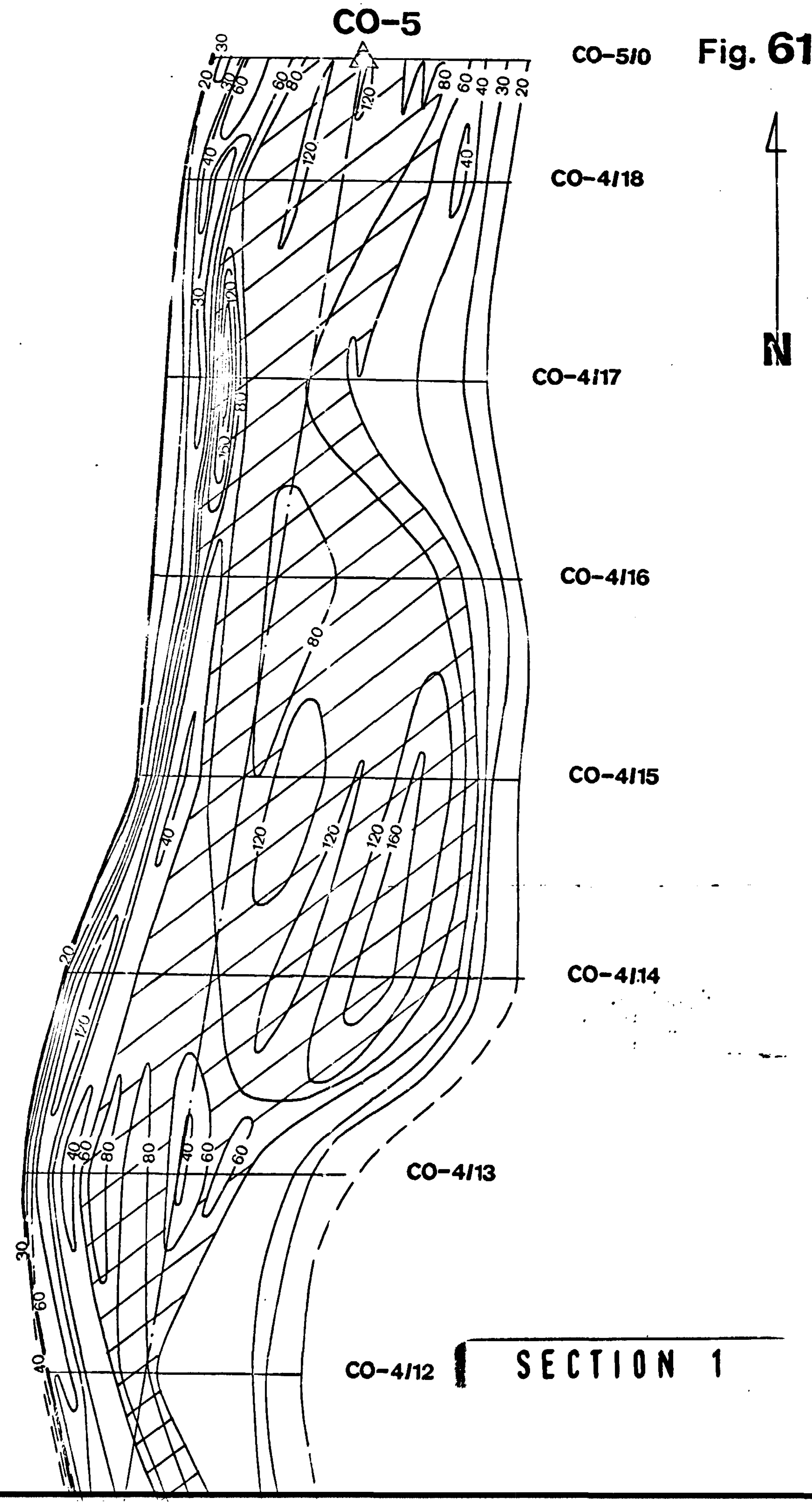
Secteur-sector

IBEIDA-3

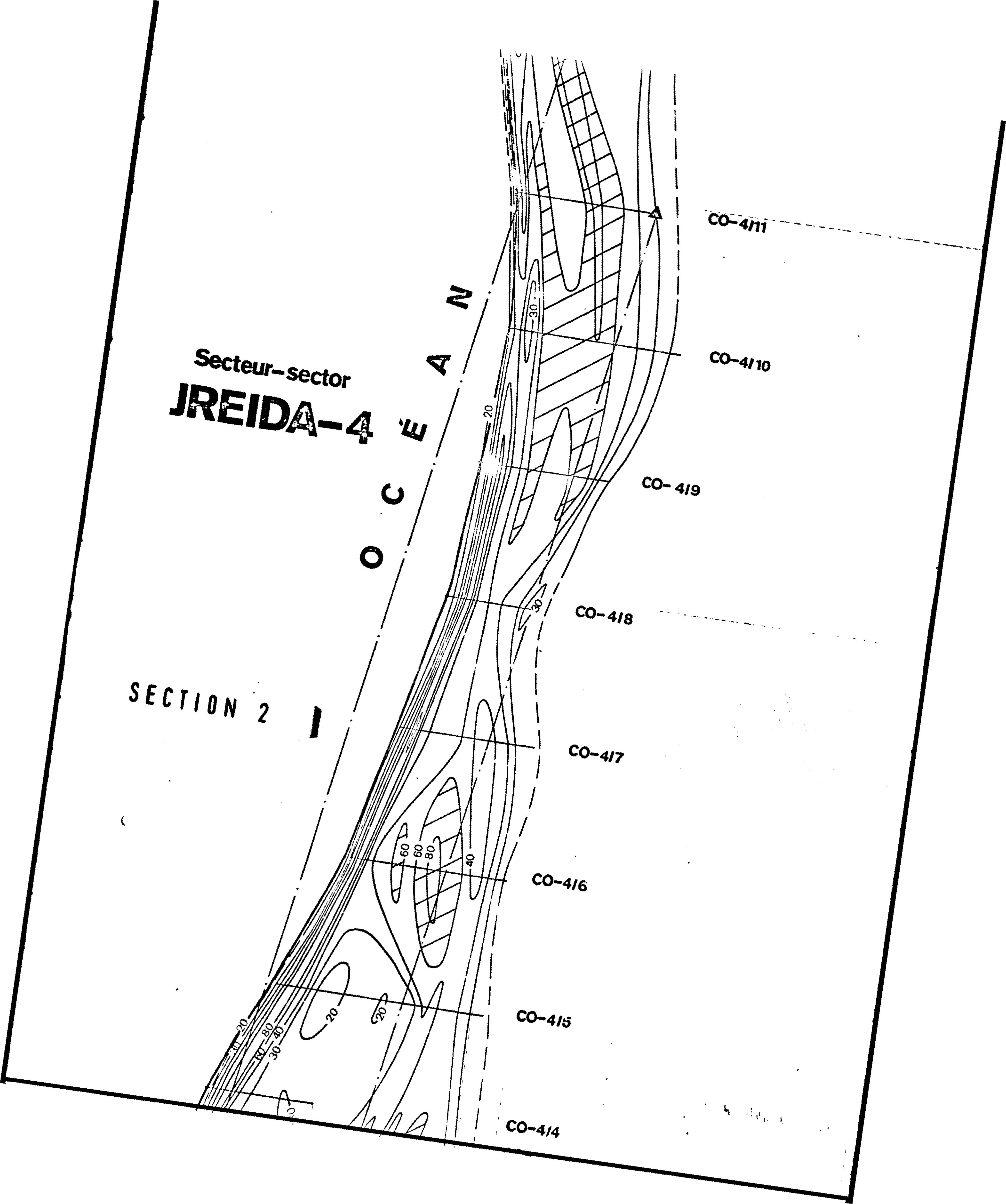


O C É A
CO-3/7
CO-3/6
CO-3/5
CO-3/4
CO-3/3
CO-3/2
CO-3/1
CO-3/0
CO-3
Secteur-sector
JREIDA-3
SECTION 2

Fig. 61



SECTION 1



Secteur-sector
JREIDA-4
OCÉAN
SECTION 2
CO-4/11
CO-4/10
CO-4/9
CO-4/8
CO-4/7
CO-4/6
CO-4/5
CO-4/4
30
20
30
60
60
80
40
20
20
20
80
40
60
30

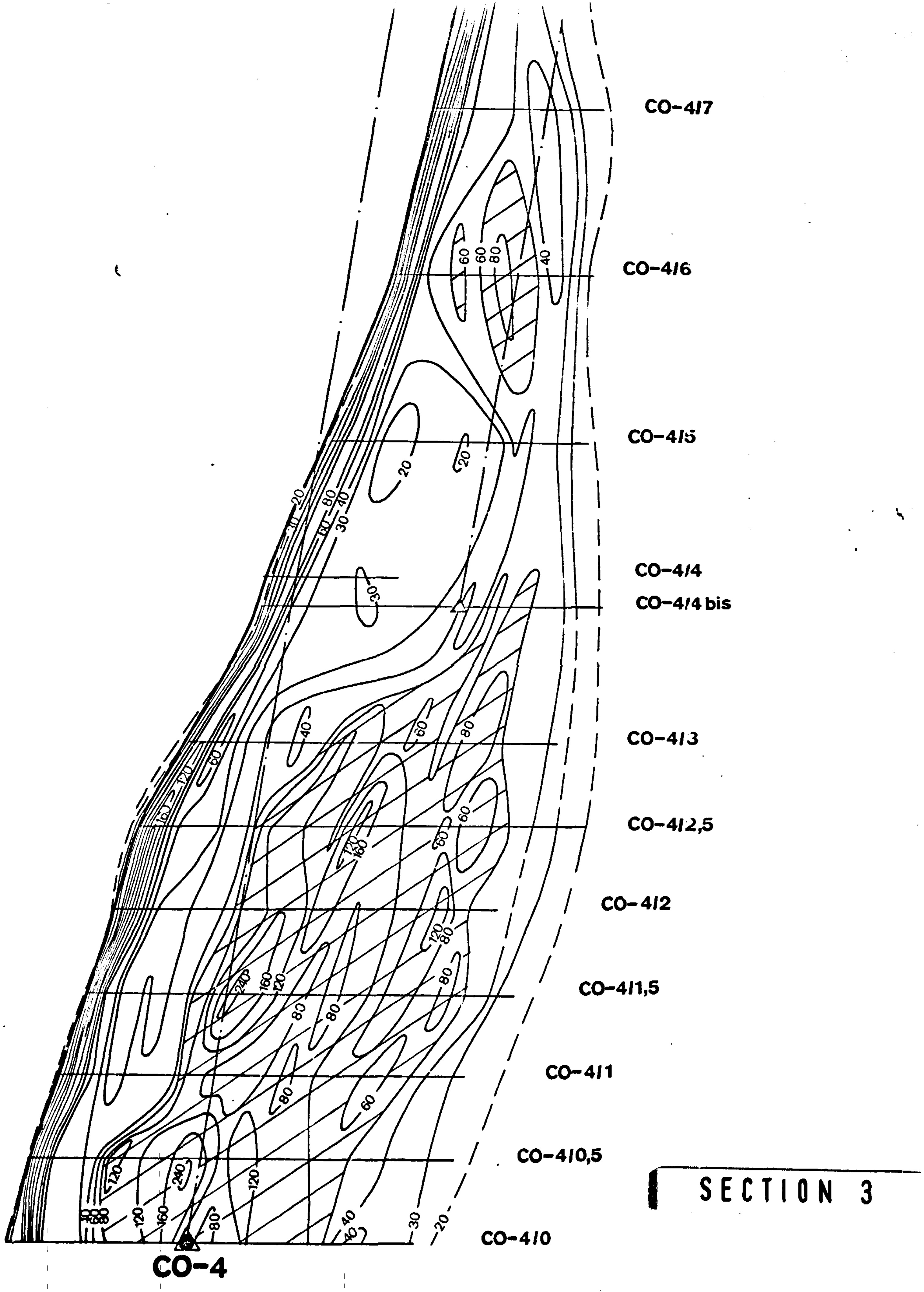
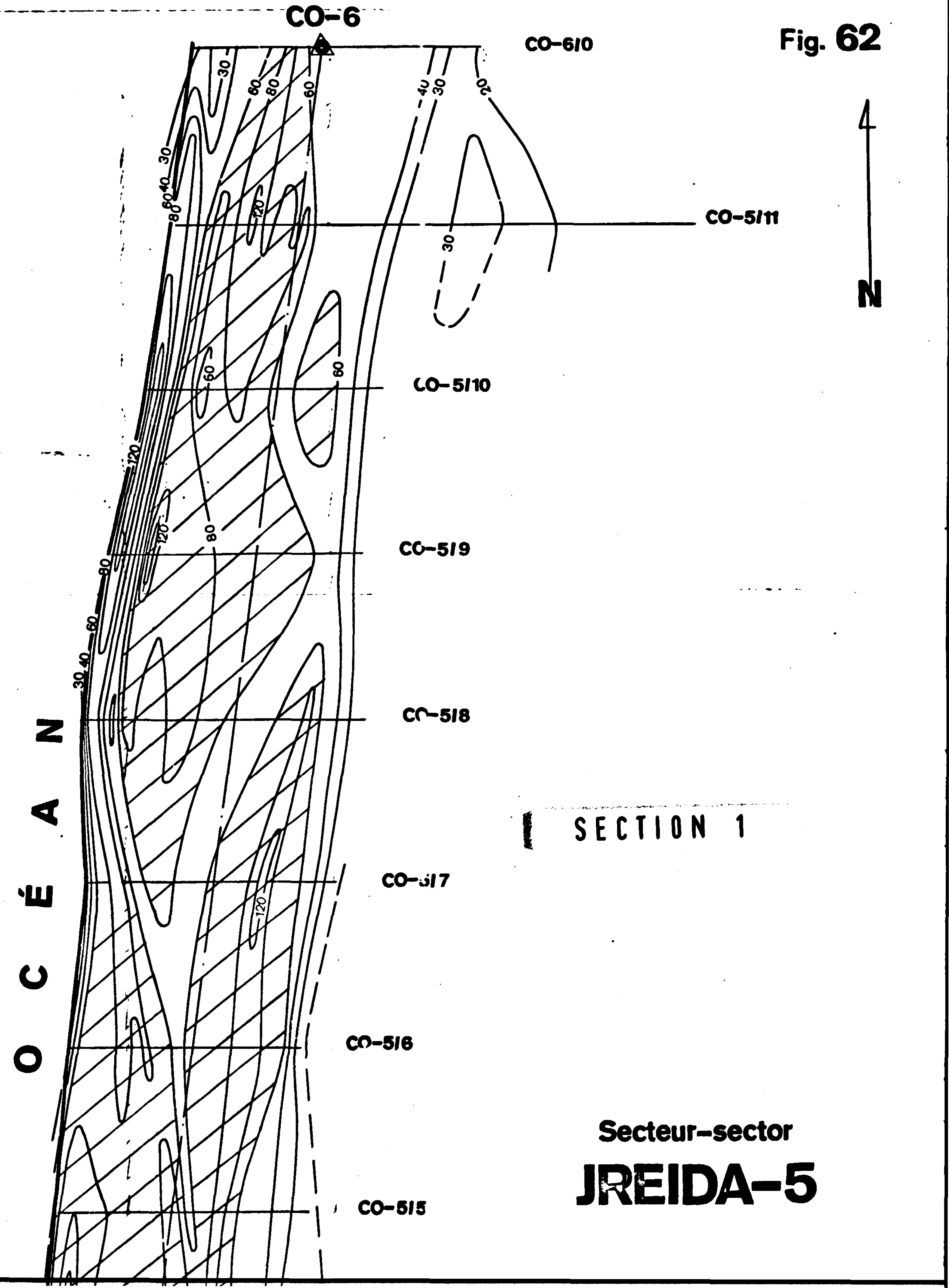
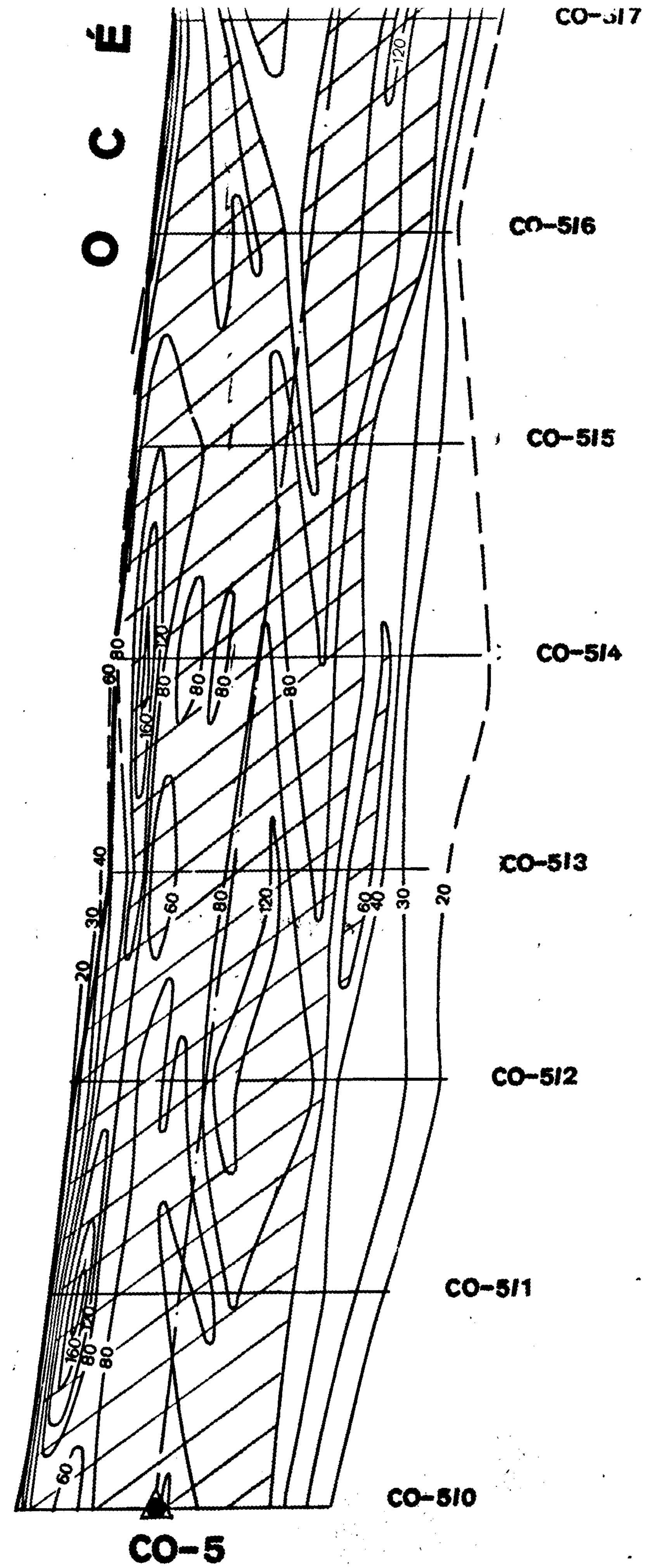

CO-4/7
CO-4/6
CO-4/5
CO-4/4
CO-4/4 bis
CO-4/3
CO-4/2,5
CO-4/2
CO-4/1,5
CO-4/1
CO-4/0,5
CO-4/0
CO-4
SECTION 3

Fig. 62



Secteur-sector

JREIDA-5



Secteur–sector

JREIDA–5

SECTION 2

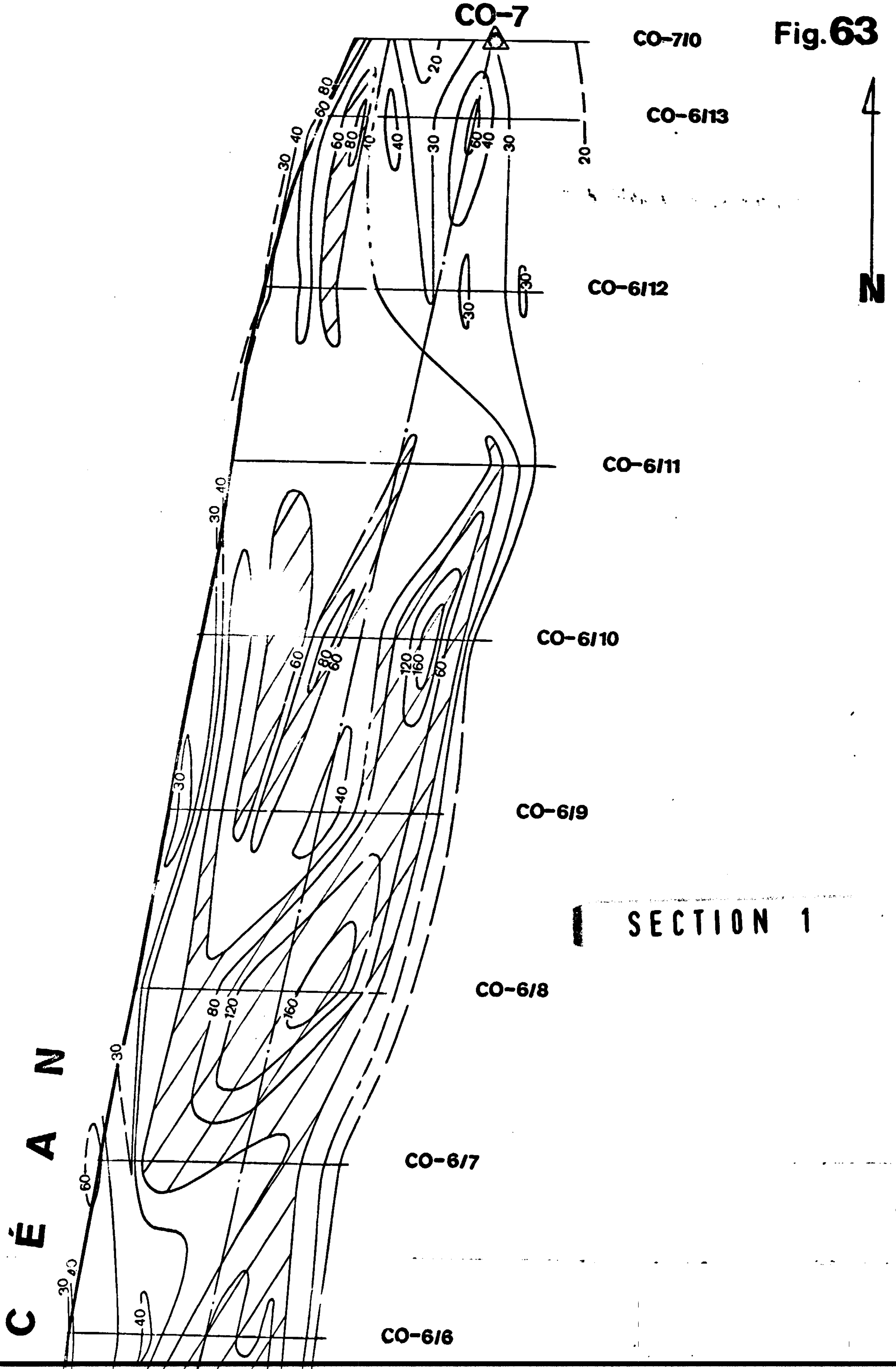
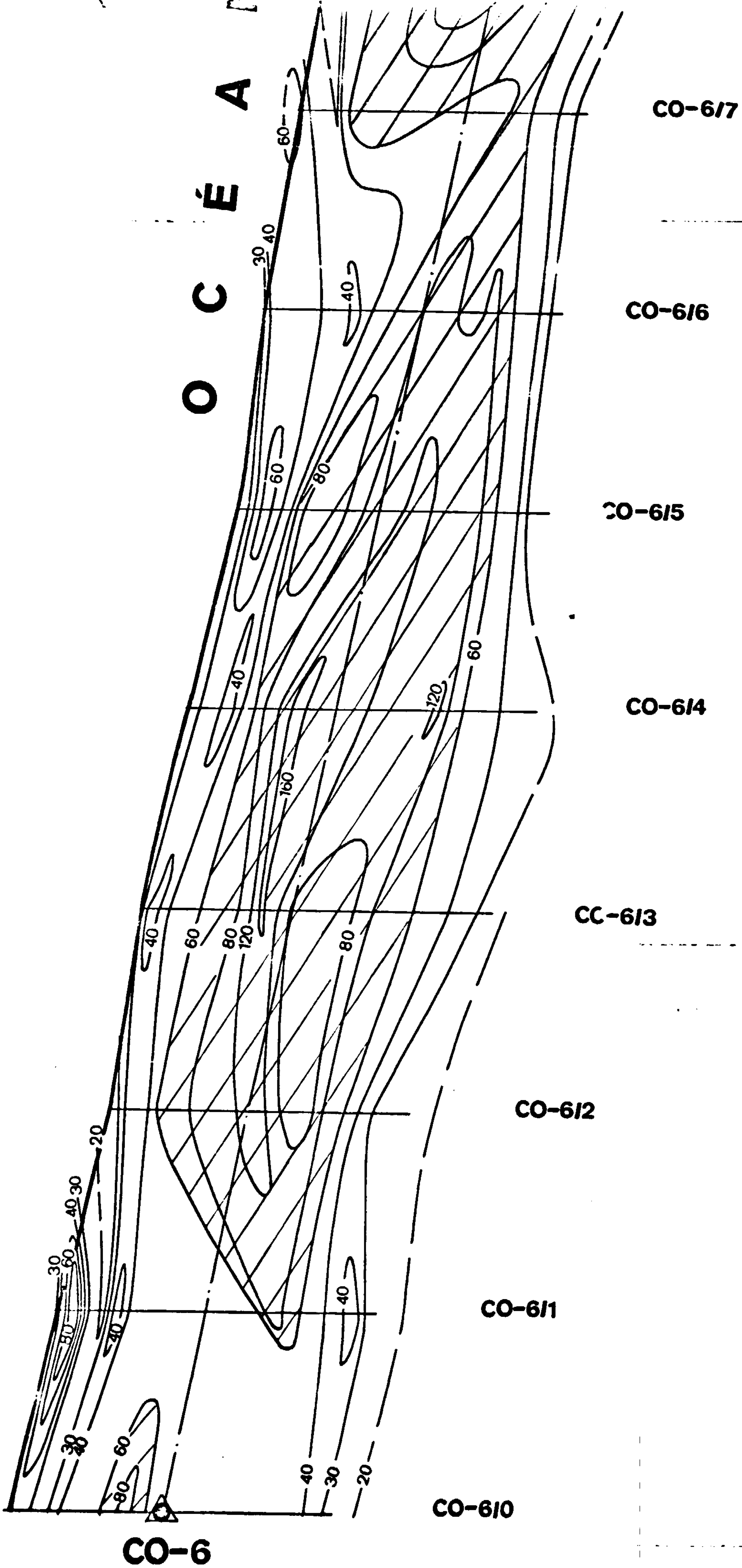

CO-7
CO-7/0
CO-6/13
CO-6/12
CO-6/11
CO-6/10
CO-6/9
CO-6/8
CO-6/7
CO-6/6
N
SECTION 1
CÉAN

Fig. 63



Secteur-sector

JREIDA-6

SECTION 2

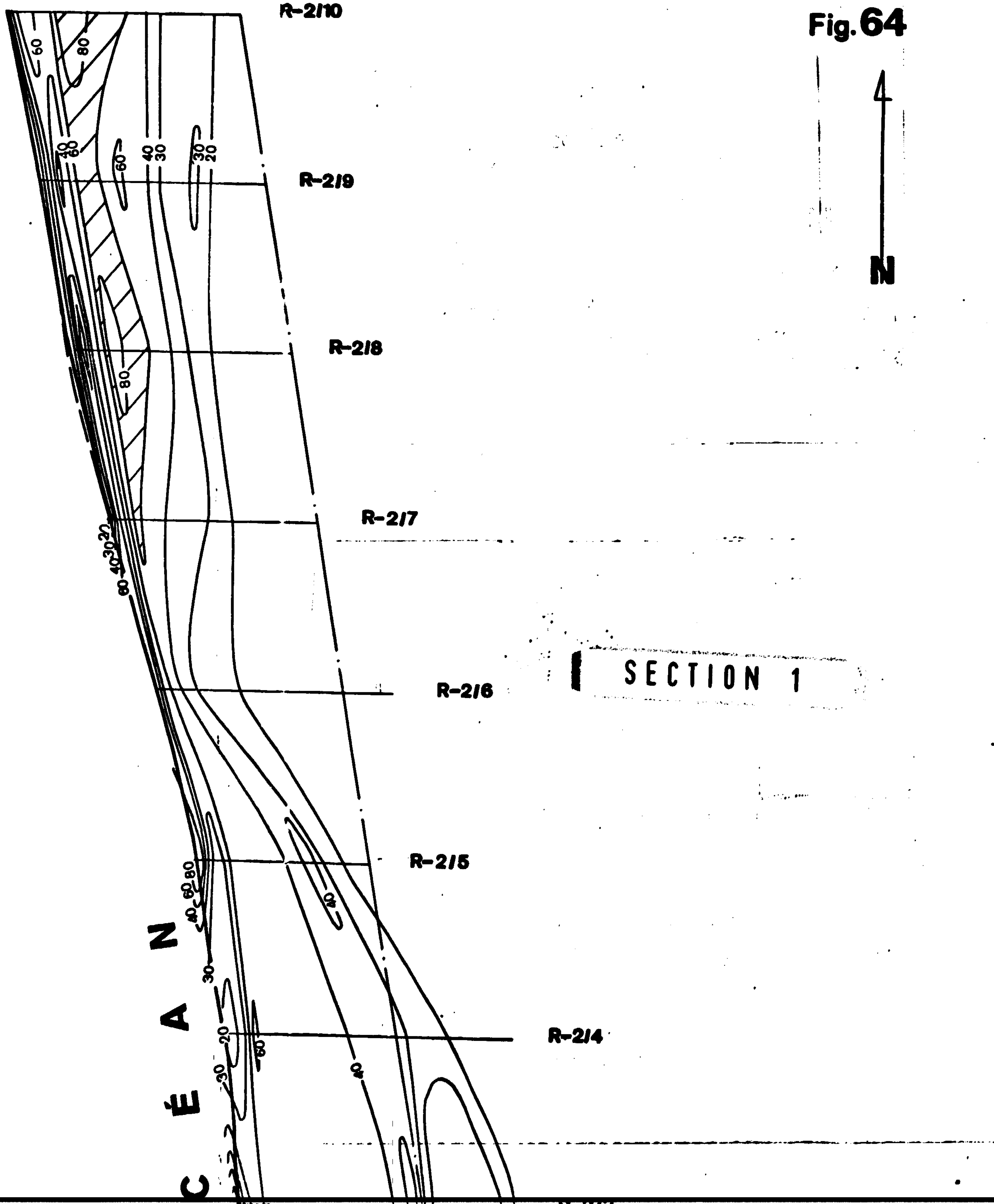
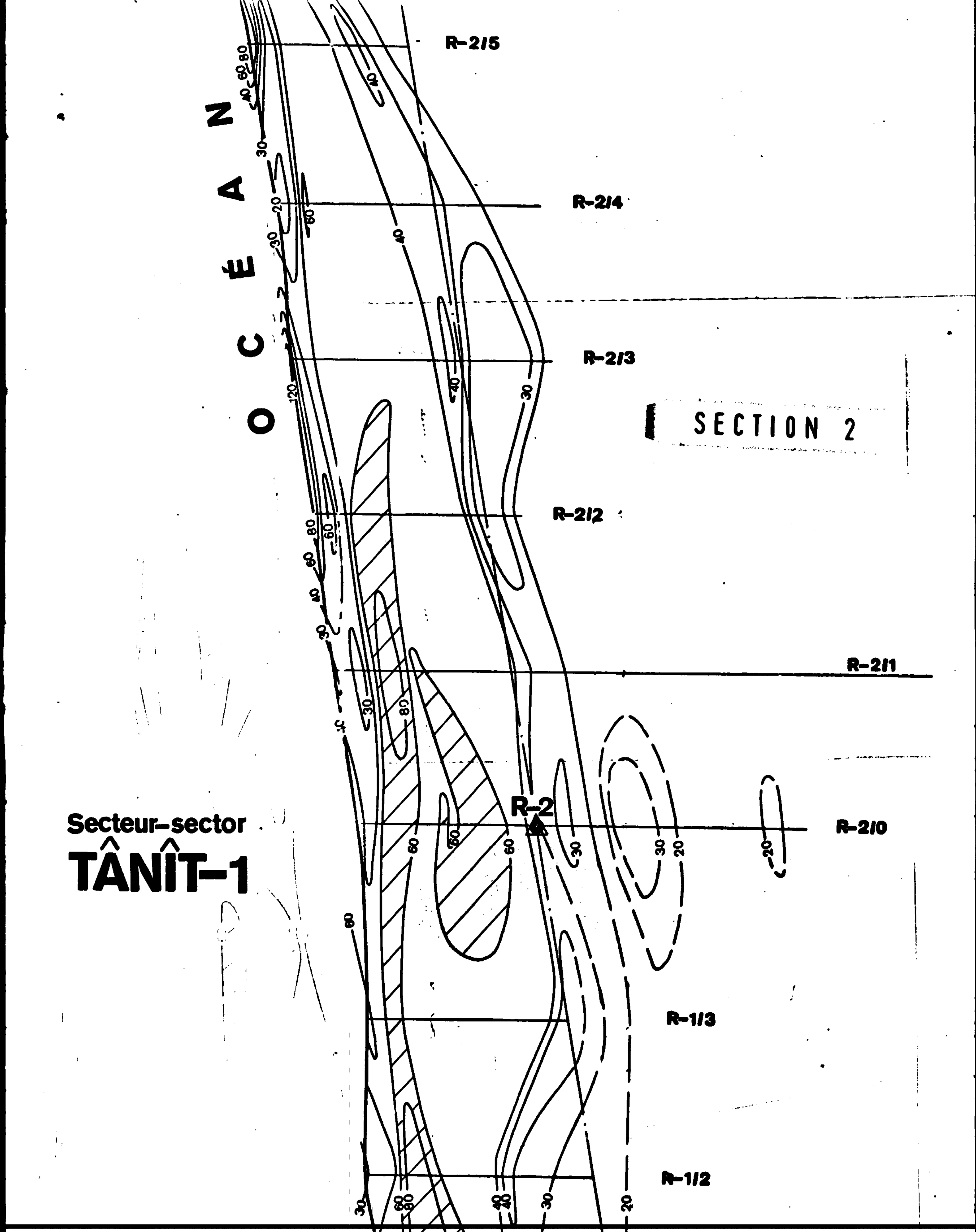
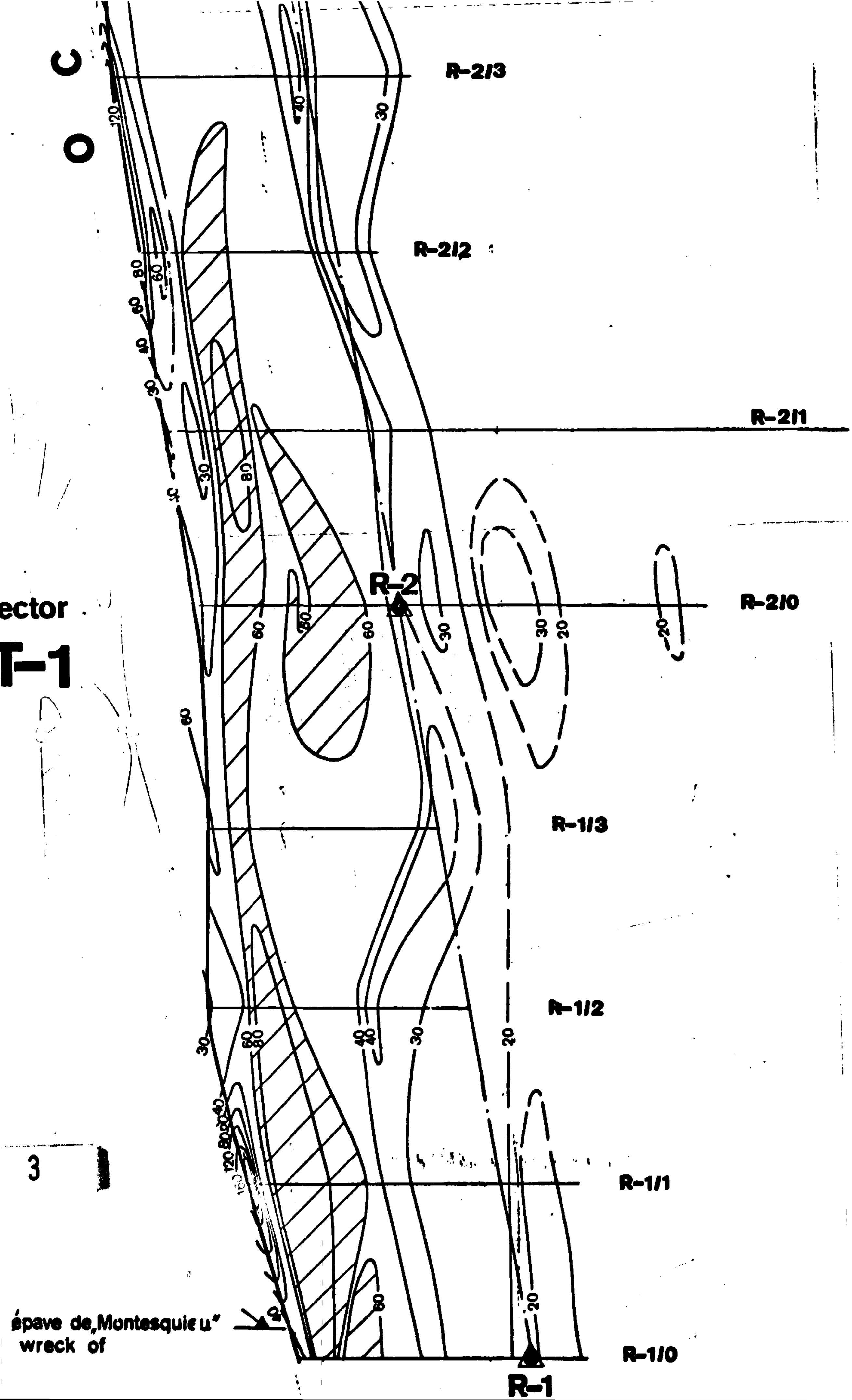


Fig. 64


R-2/5
R-2/4
R-2/3
SECTION 2
R-2/2
R-2/1
R-2
R-2/0
R-1/3
R-1/2
OCÉAN
Secteur-sector
TÂNÎT-1
80
60
40
30
20
120

Secteur–sector TÂNÎT–1



SECTION 3

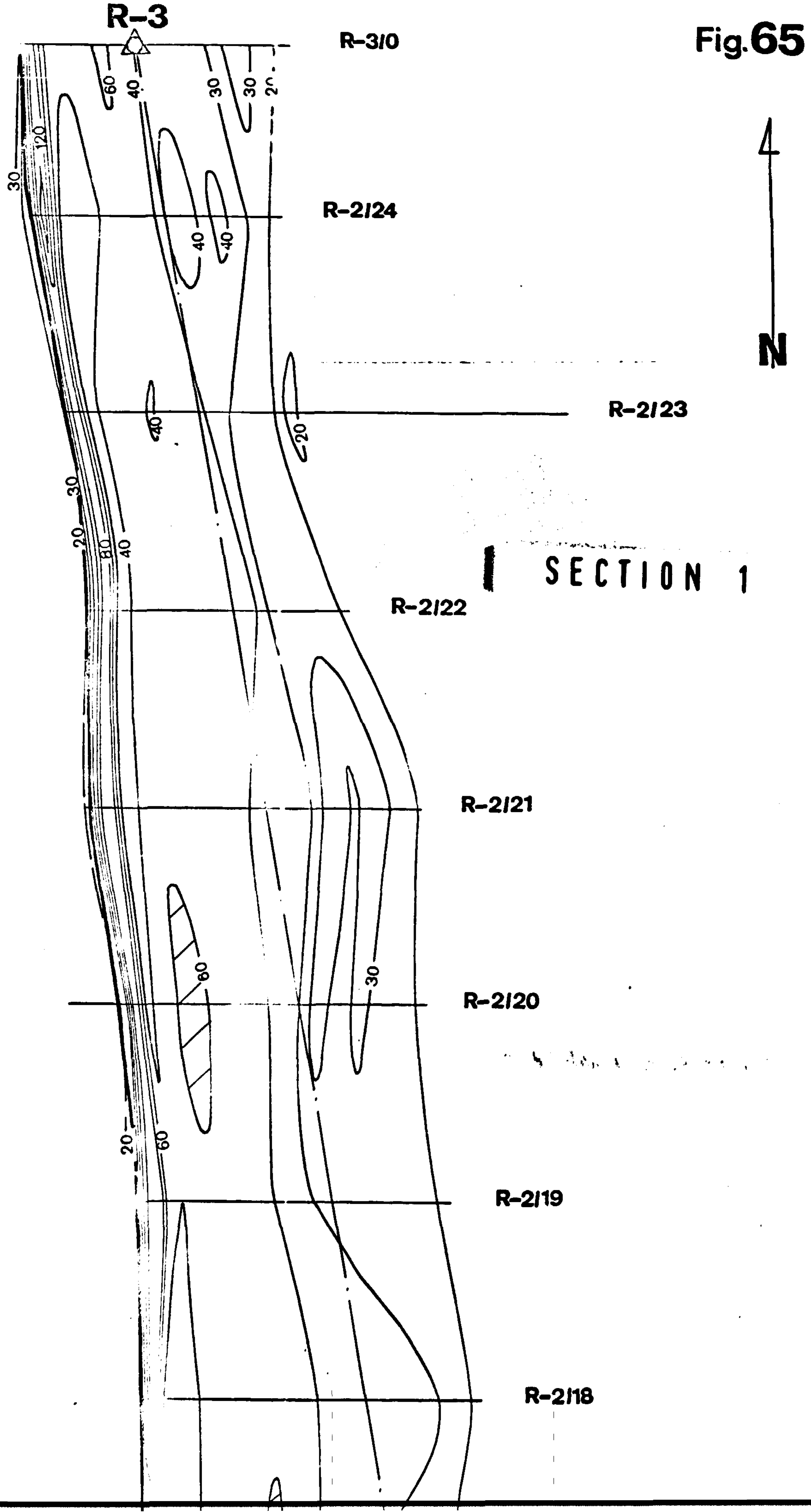
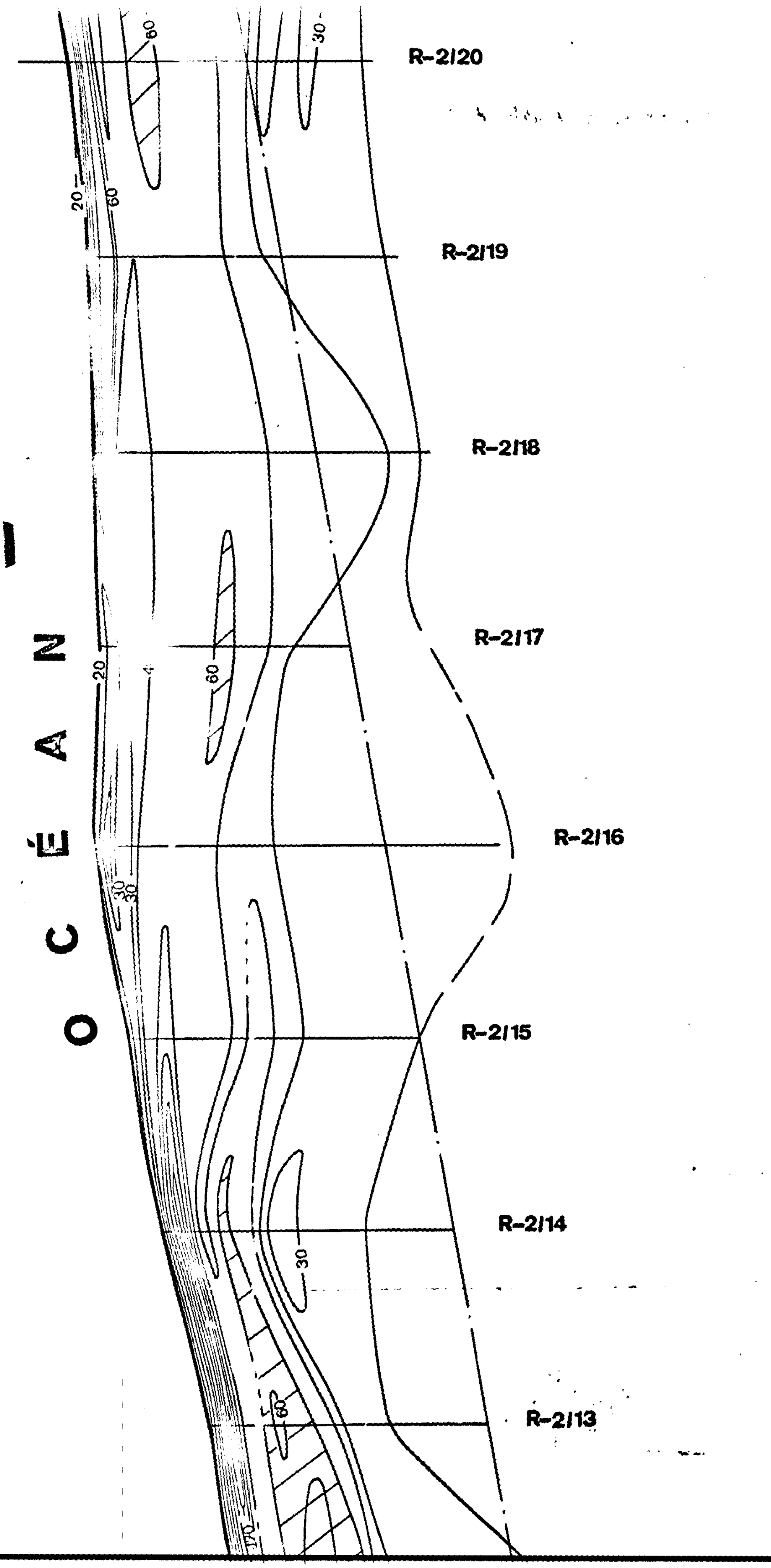


Fig. 65
R-3
R-3/0
R-2/24
R-2/23
R-2/22
R-2/21
R-2/20
R-2/19
R-2/18
N
SECTION 1
120
60
40
30
20
80

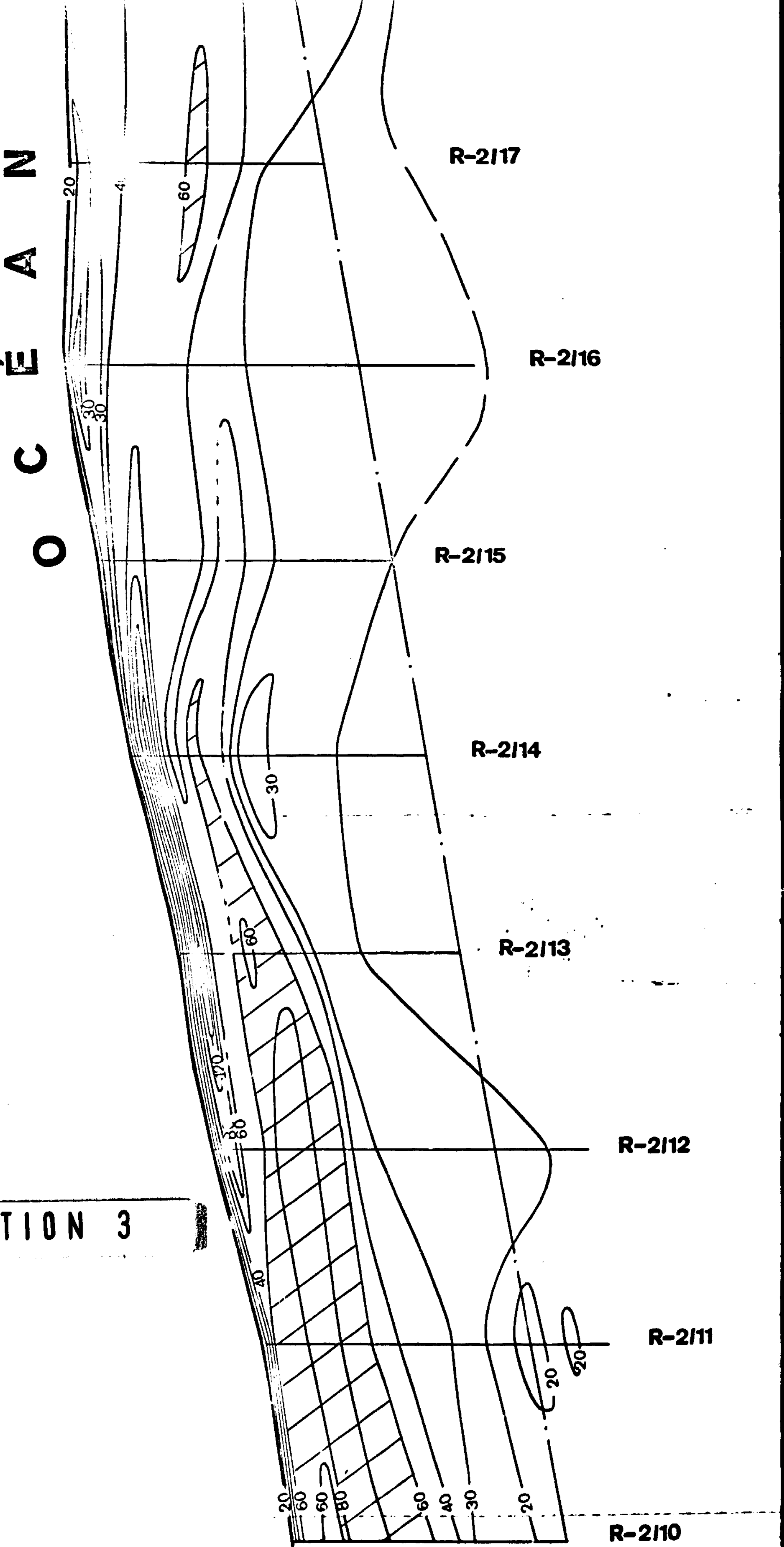
SECTION 2

Secteur–sector

TÂNÎT-2

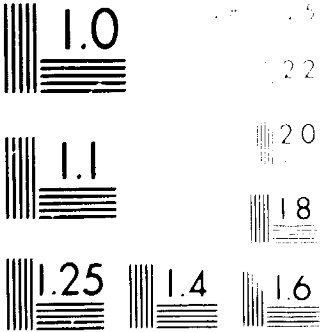


Secteur–sector TÂNÎT-2



SECTION 3

83.11.07
AD.85.03


1.0
2.2
1.1
2.0
1.8
1.25
1.4
1.6

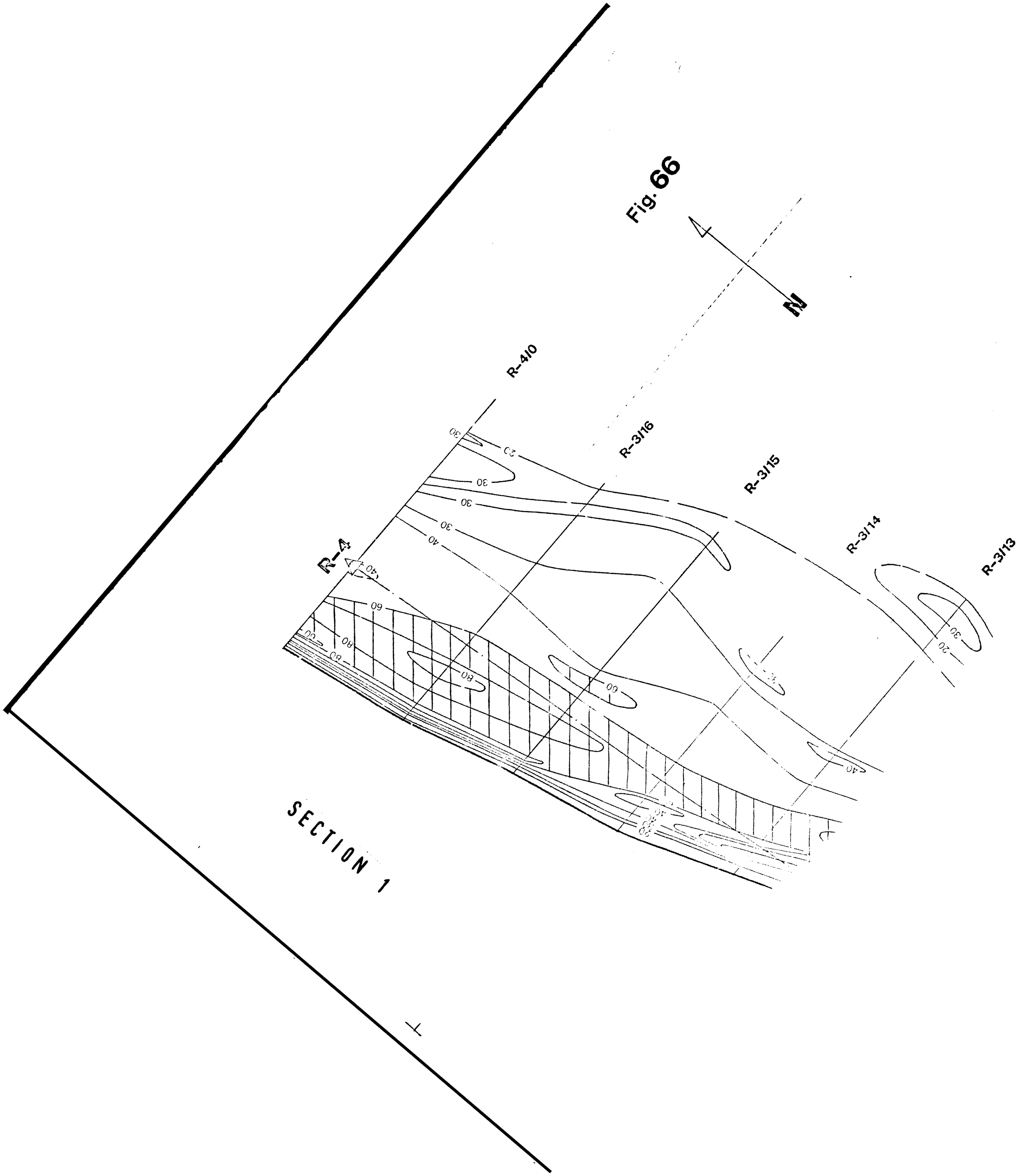
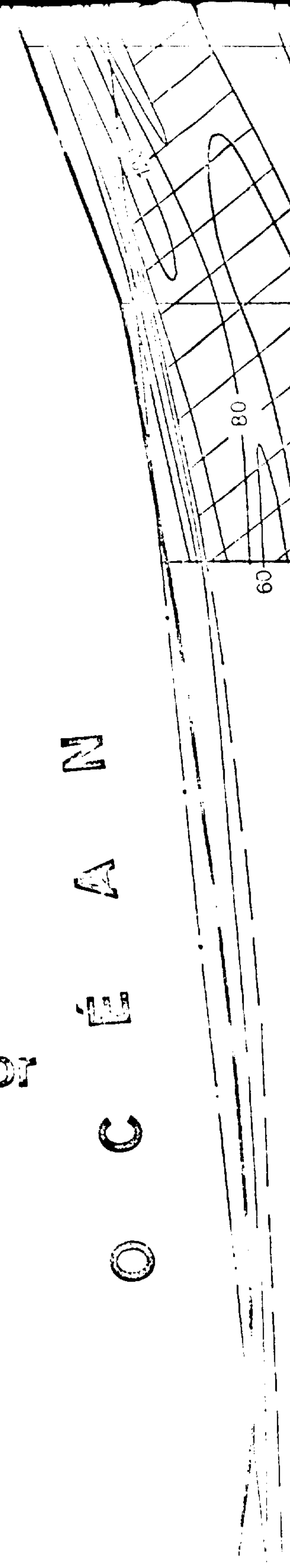


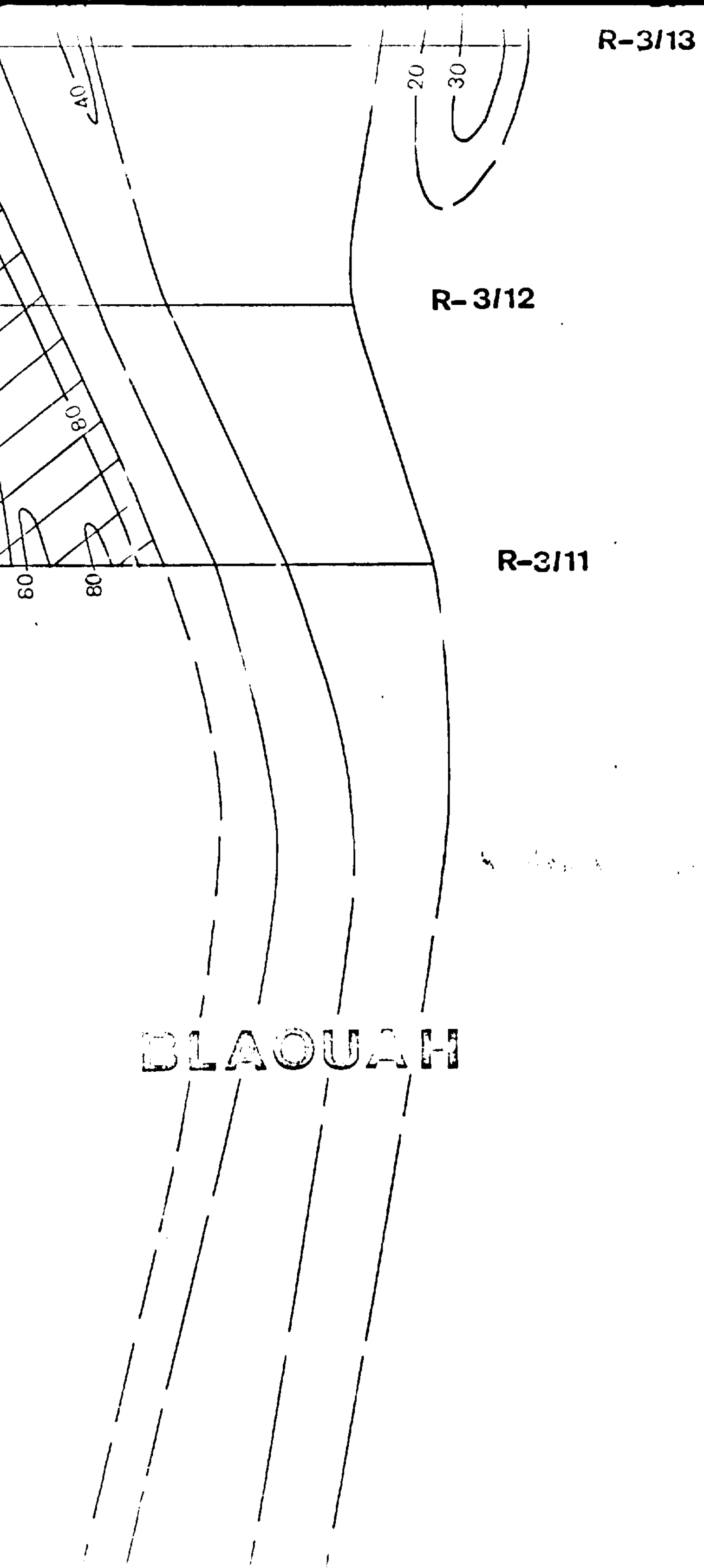
Fig. 66

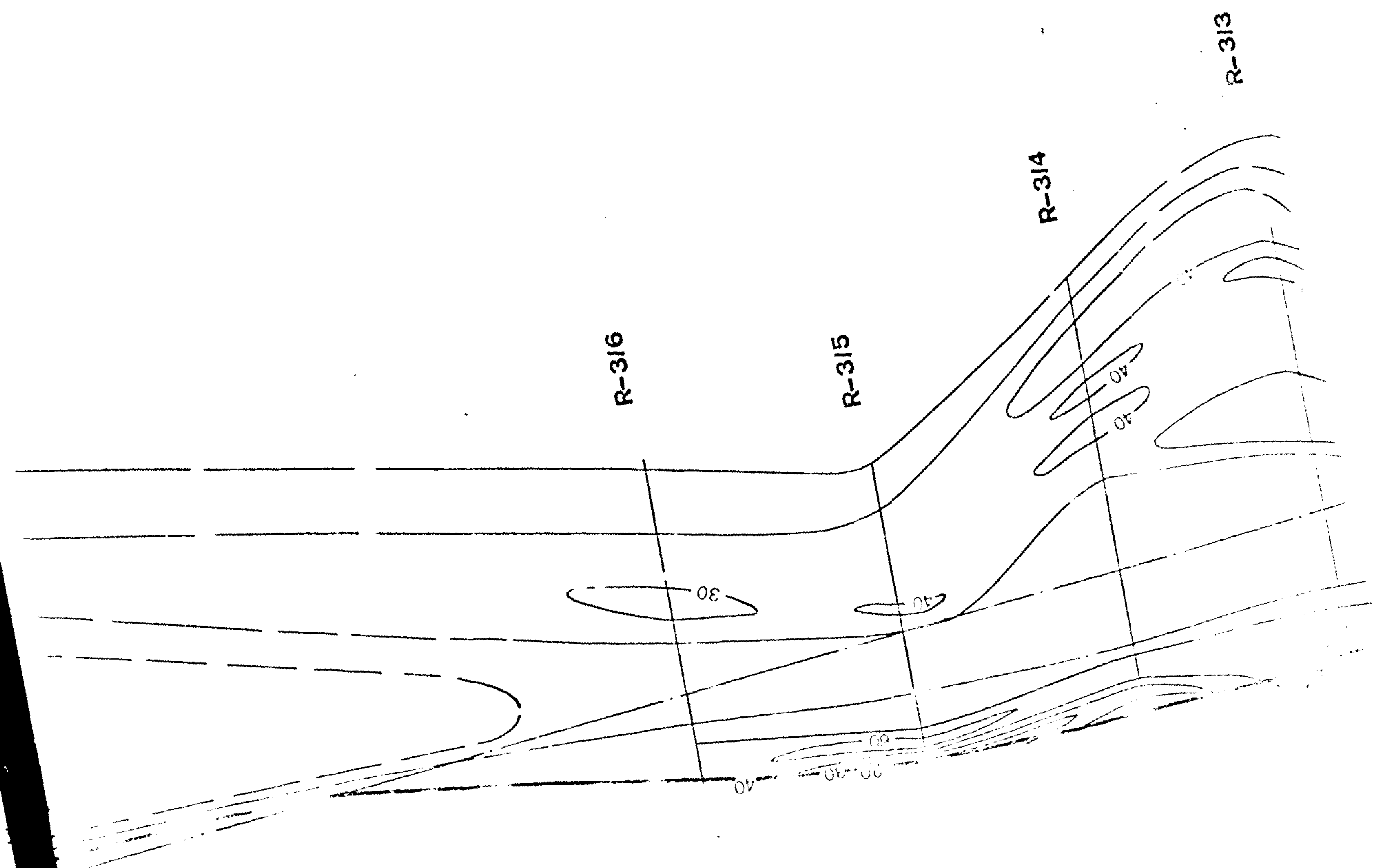
SECTION 2

Secteur-sector

TÂNÎT-3

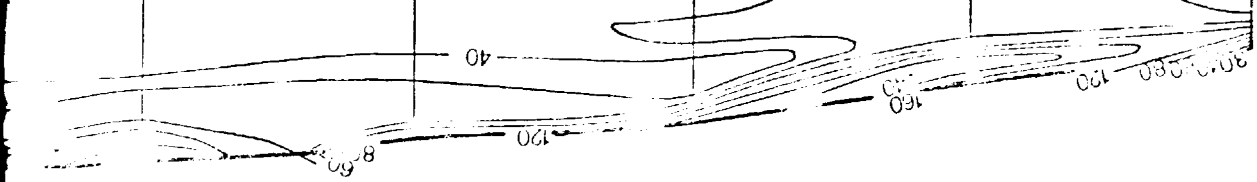



R-3/13
20
30
40
R-3/12
80
R-3/11
60
80
BLAOUAH

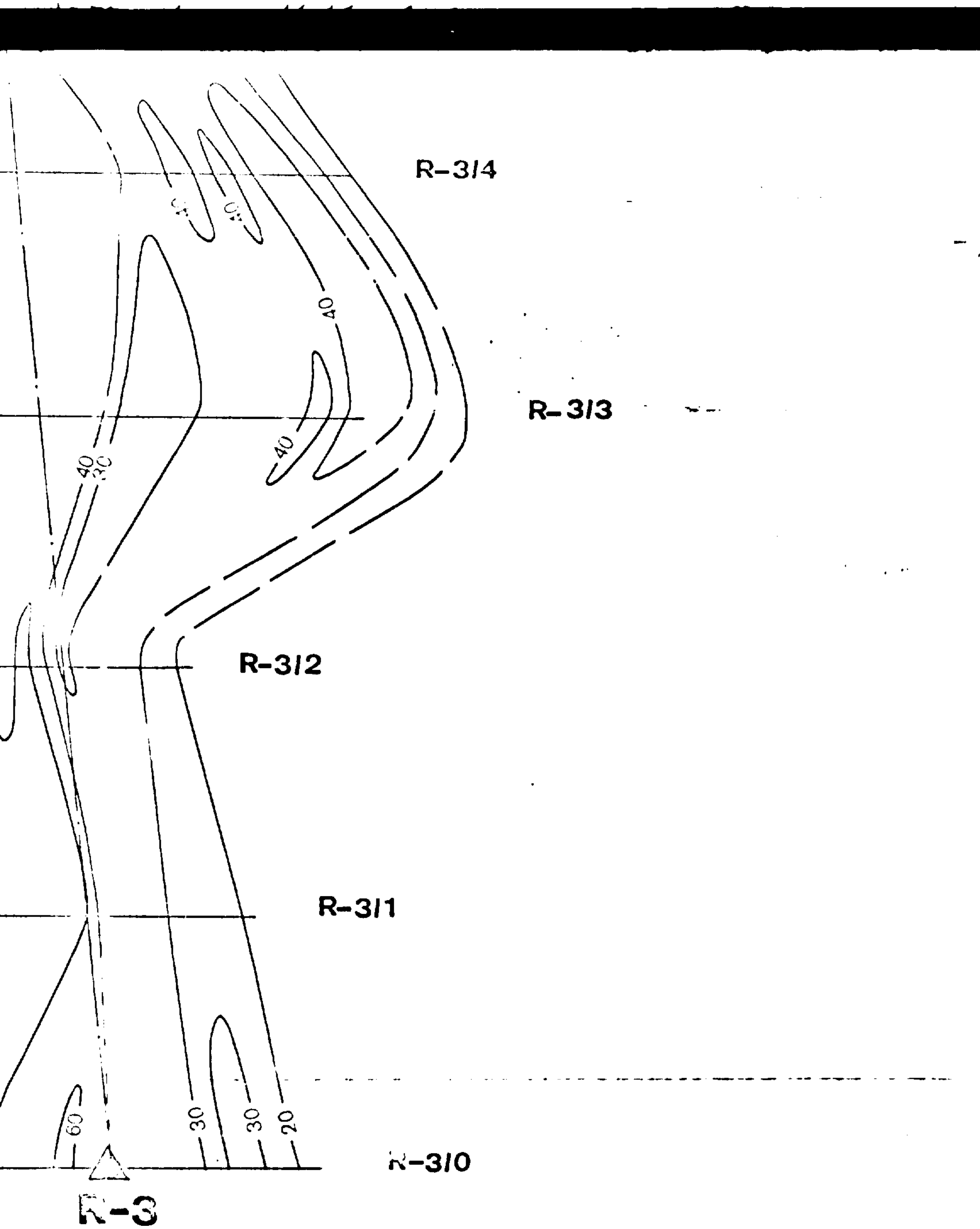


TANIT-3

SECTION 3

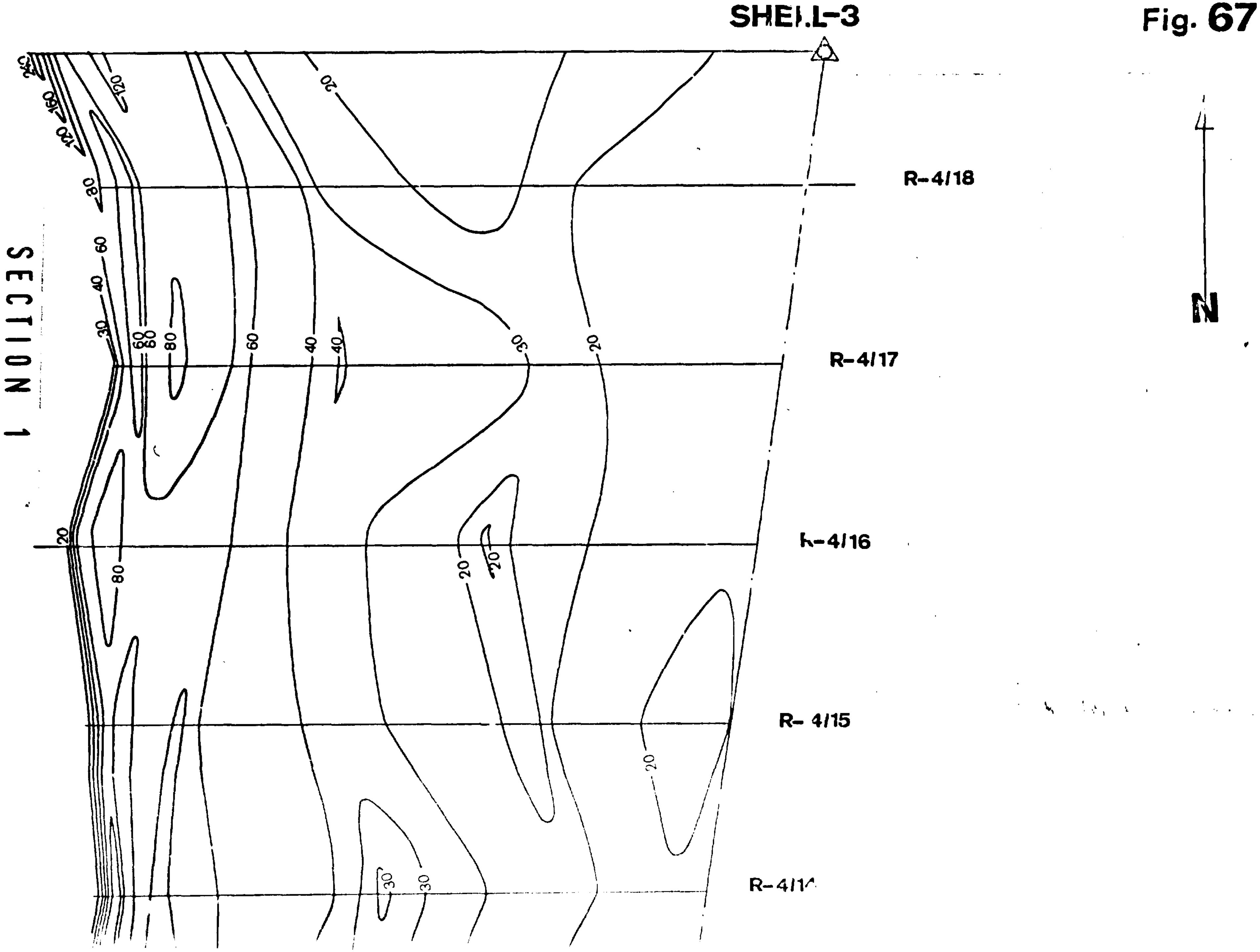


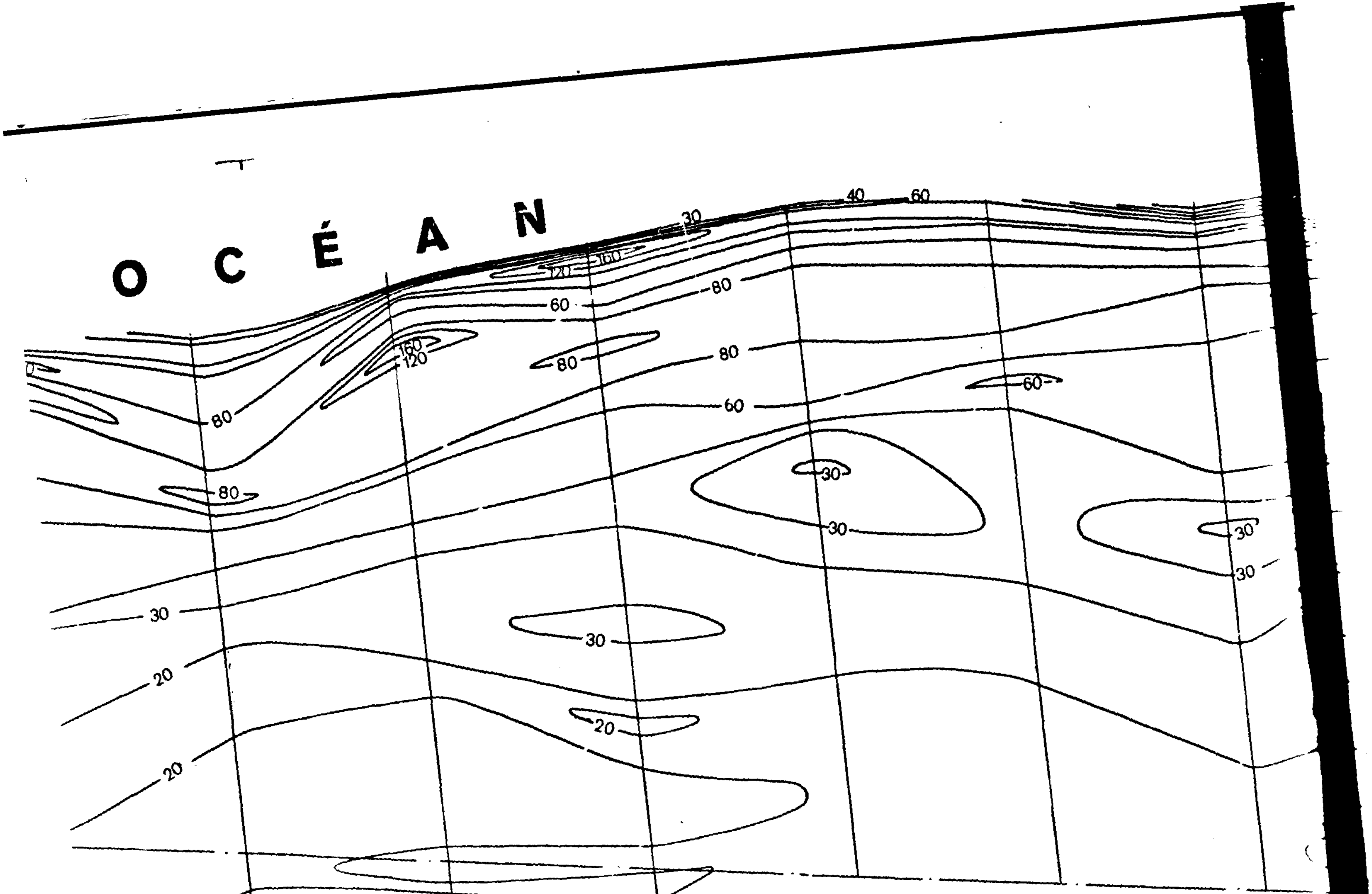
SECTION 4

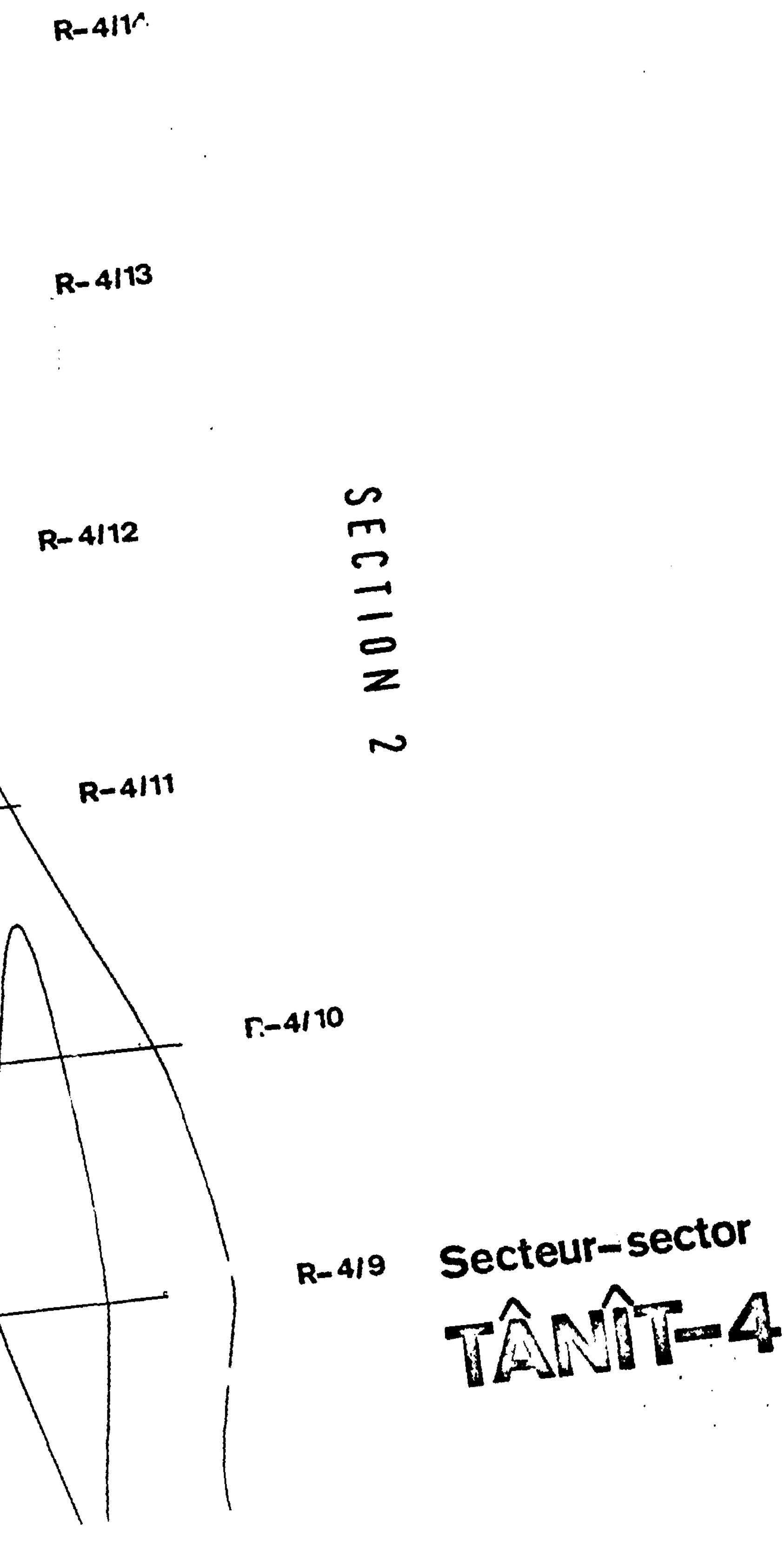


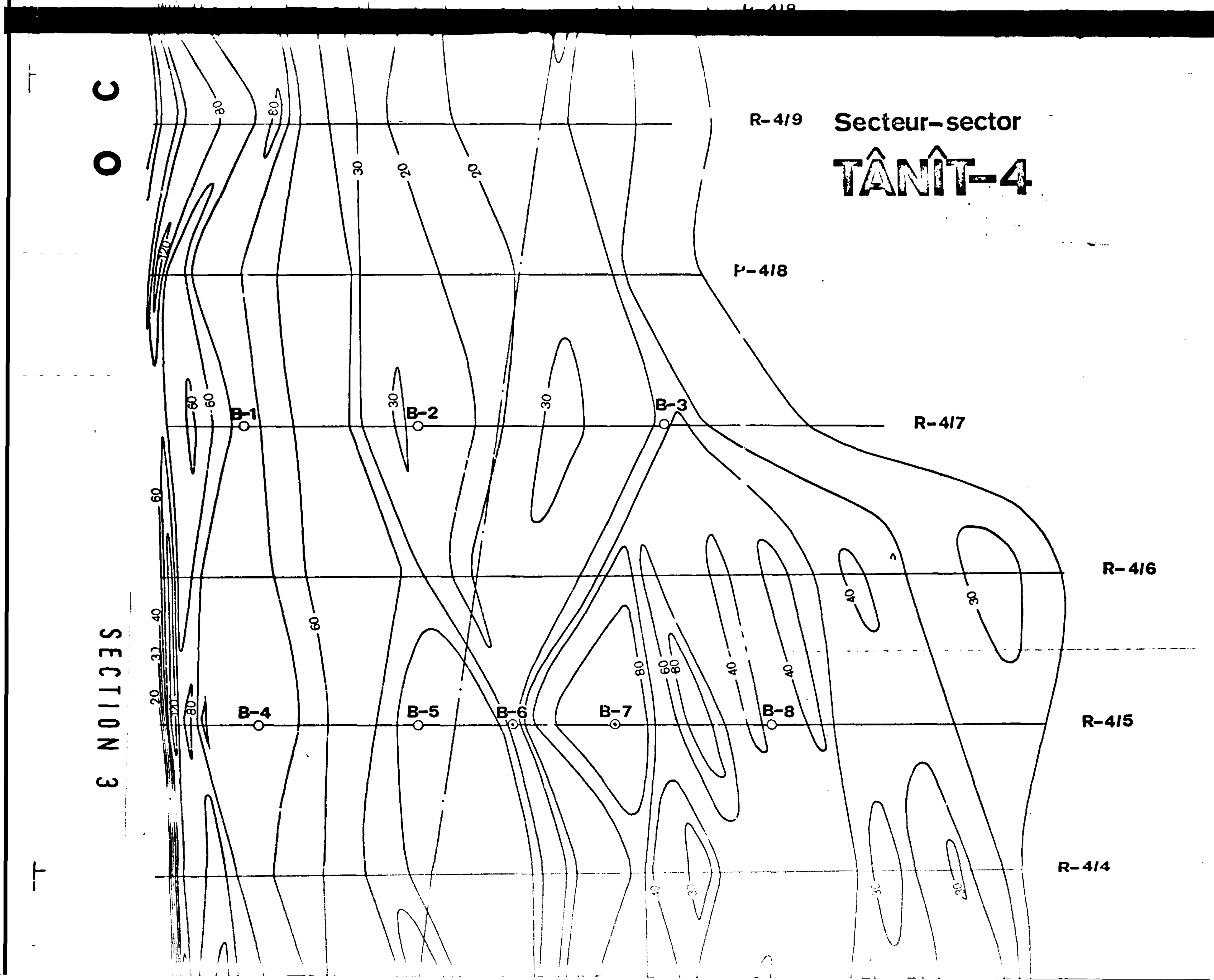
R-3/4
40
40
40
R-3/3
40
40
30
R-3/2
R-3/1
60
30
30
20
R-3/0
R-3

Fig. 67


SHELL-3
R-4/18
R-4/17
R-4/16
R- 4/15
R-4/14
SECTION 1
N
240
200
160
120
80
60
40
30
20


OCÉAN


R-4/14
R-4/13
R-4/12
SECTION 2
R-4/11
R-4/10
R-4/9
Secteur-sector
TÂNÎT-4



Secteur–sector
TÂNÎT-4
R-4/9
R-4/8
R-4/7
R-4/6
R-4/5
R-4/4
B-1
B-2
B-3
B-4
B-5
B-6
B-7
B-8
SECTION 3
O C

SECTION 4

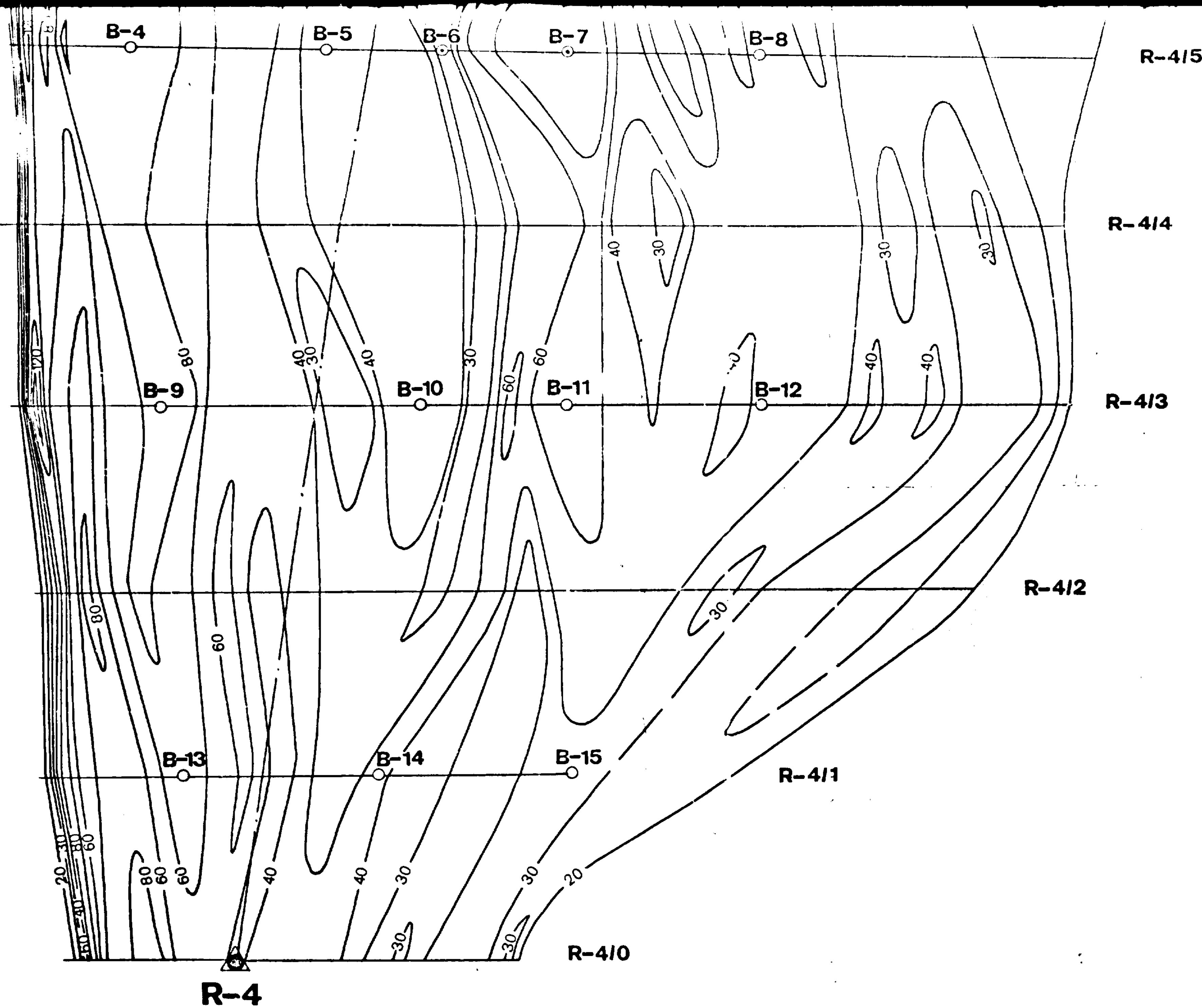
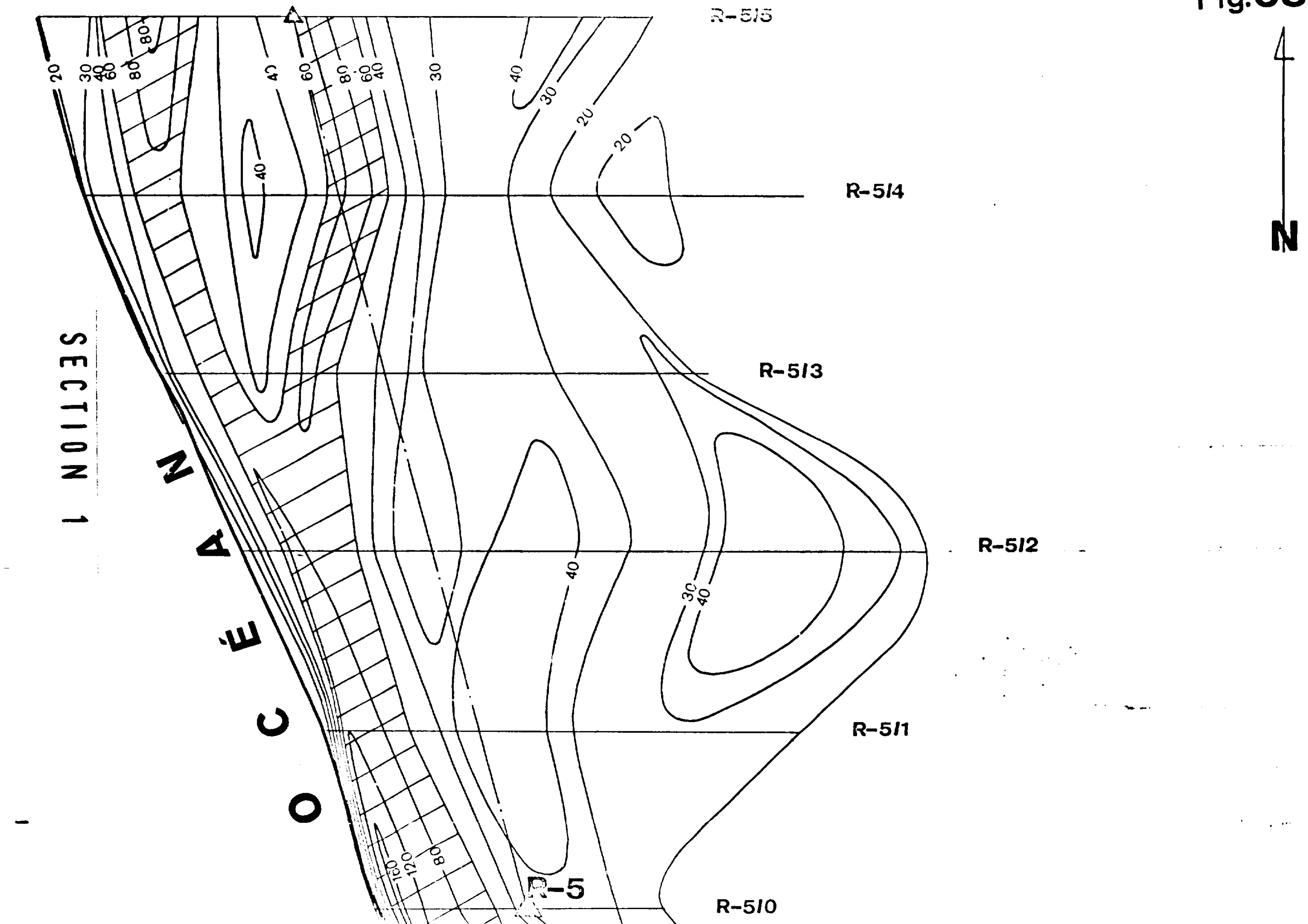

B-4
B-5
B-6
B-7
B-8
R-4/5
R-4/4
B-9
B-10
B-11
B-12
R-4/3
R-4/2
B-13
B-14
B-15
R-4/1
R-4/0
R-4

Fig.68



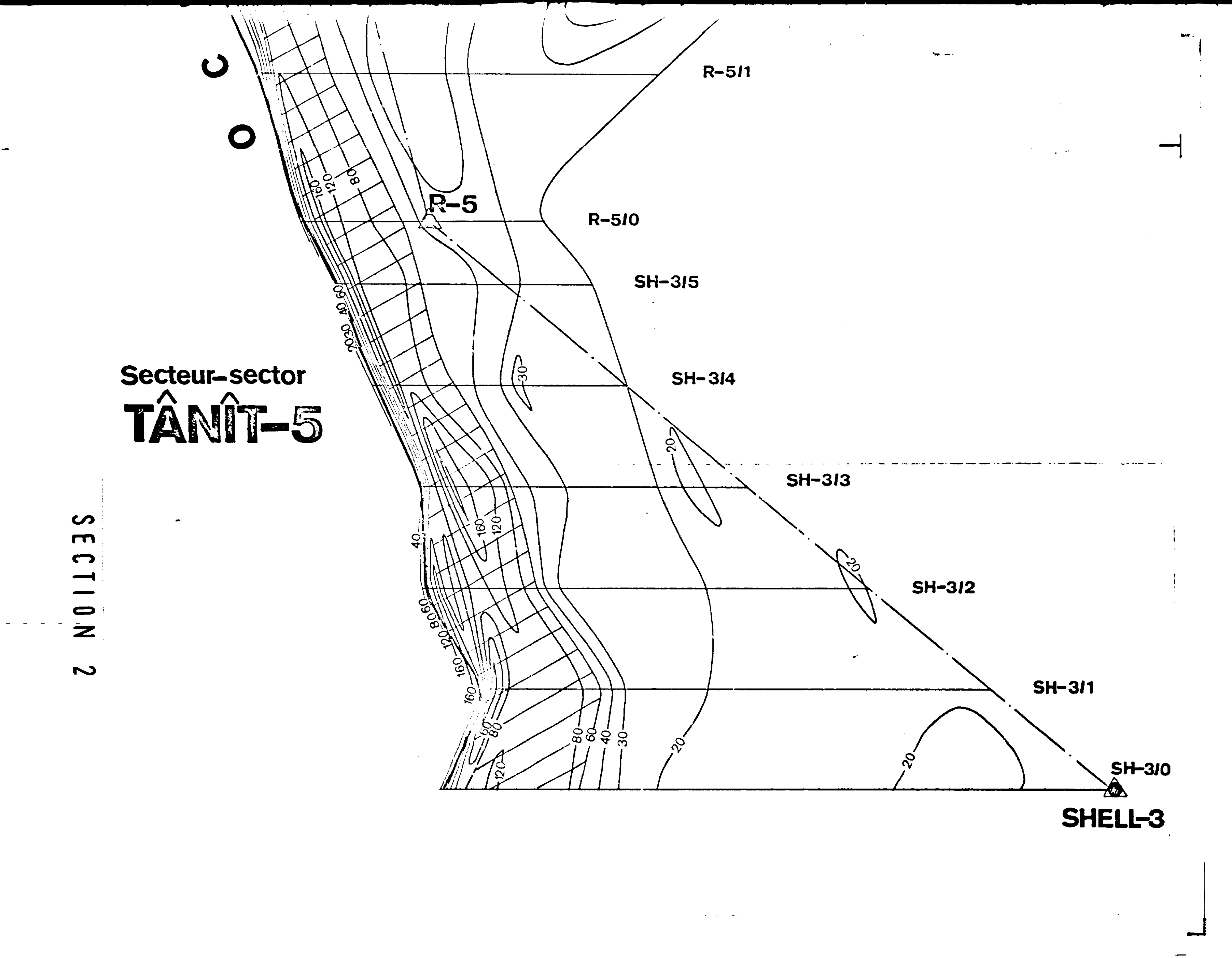
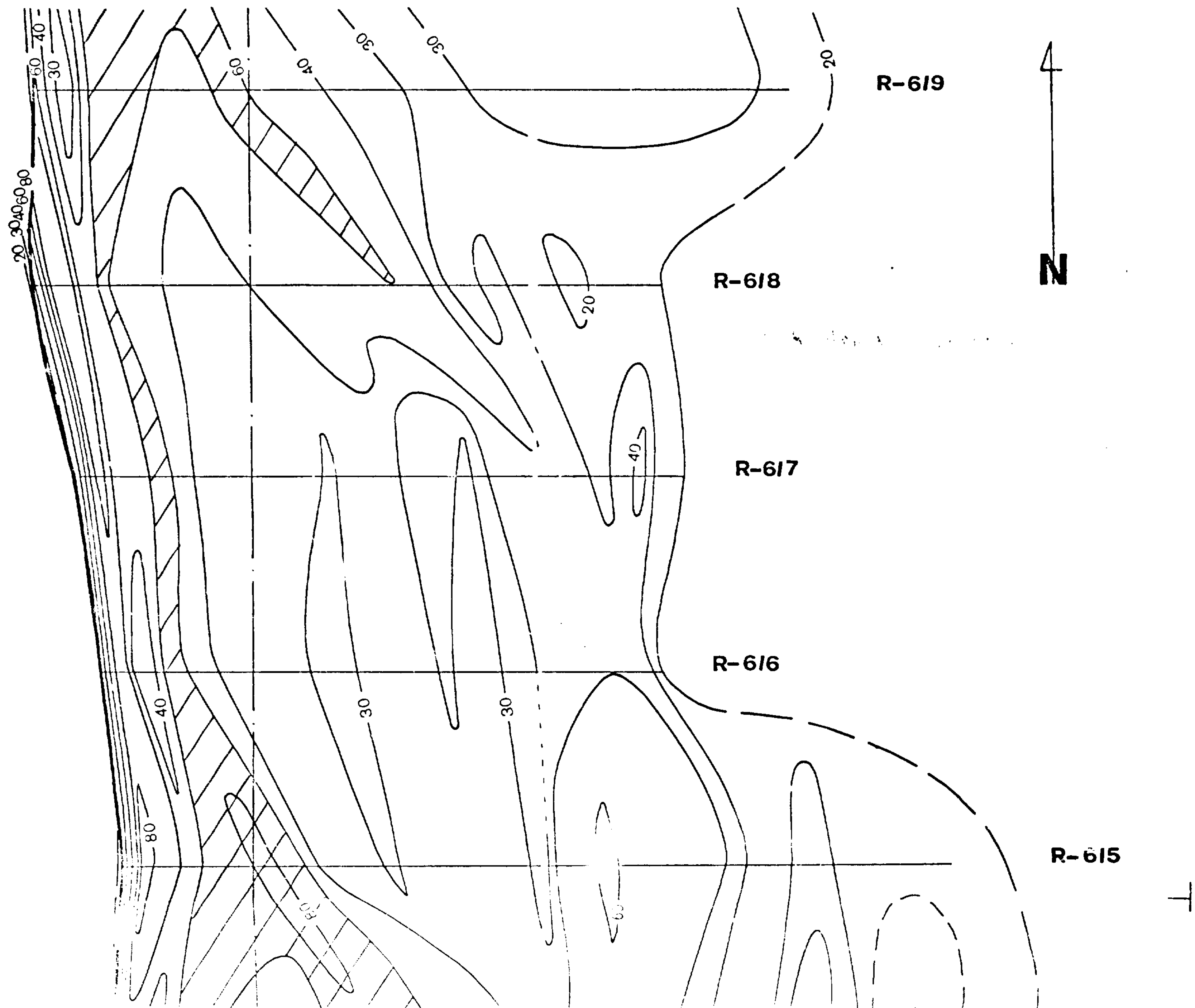
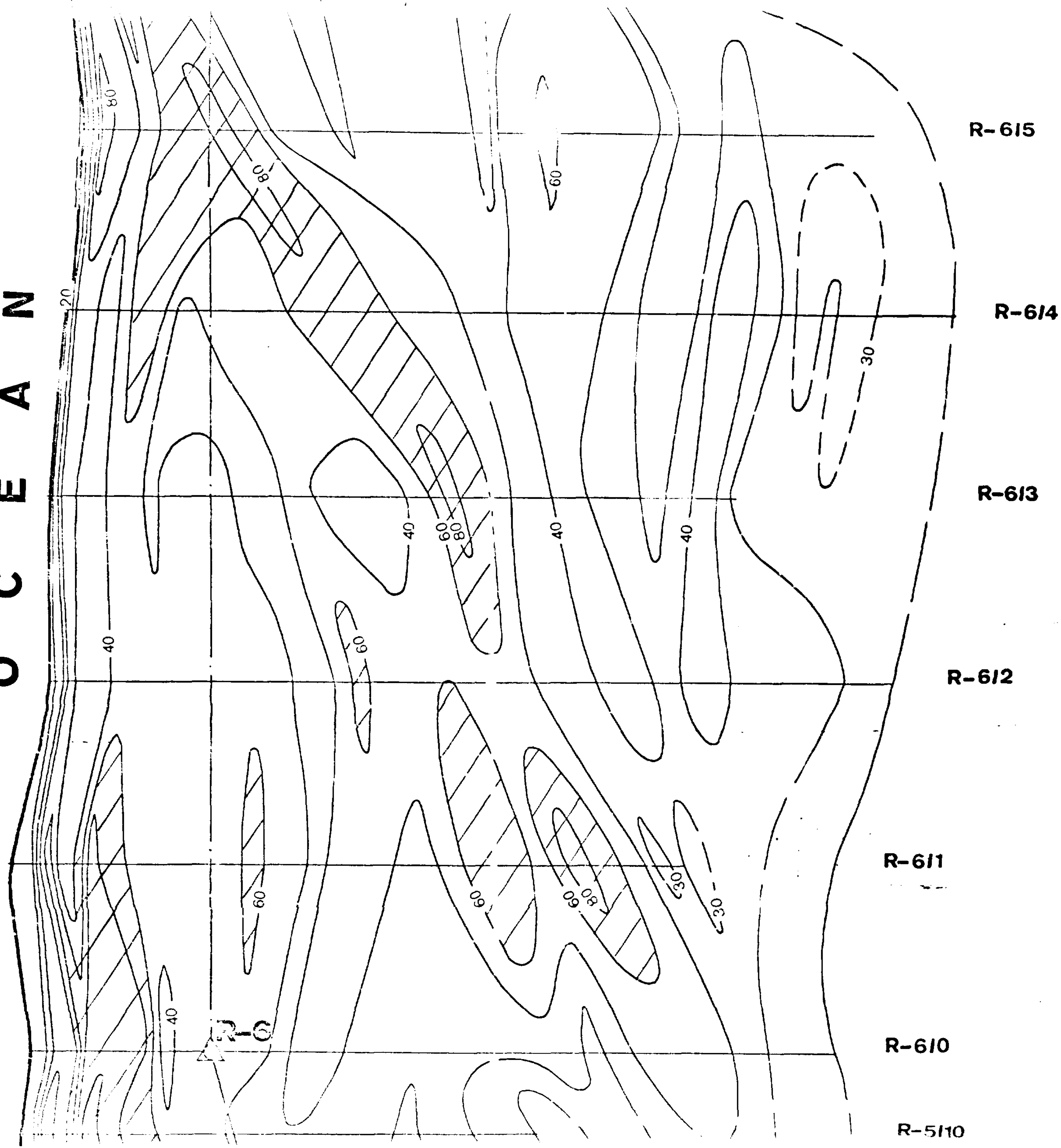

C
O
Secteur-sector
TÂNÎT-5
SECTION 2
R-5/1
R-5
R-5/0
SH-3/5
SH-3/4
SH-3/3
SH-3/2
SH-3/1
SH-3/0
SHELL-3
160
120
80
60
40
30
20

Fig. 69

SECTION 1



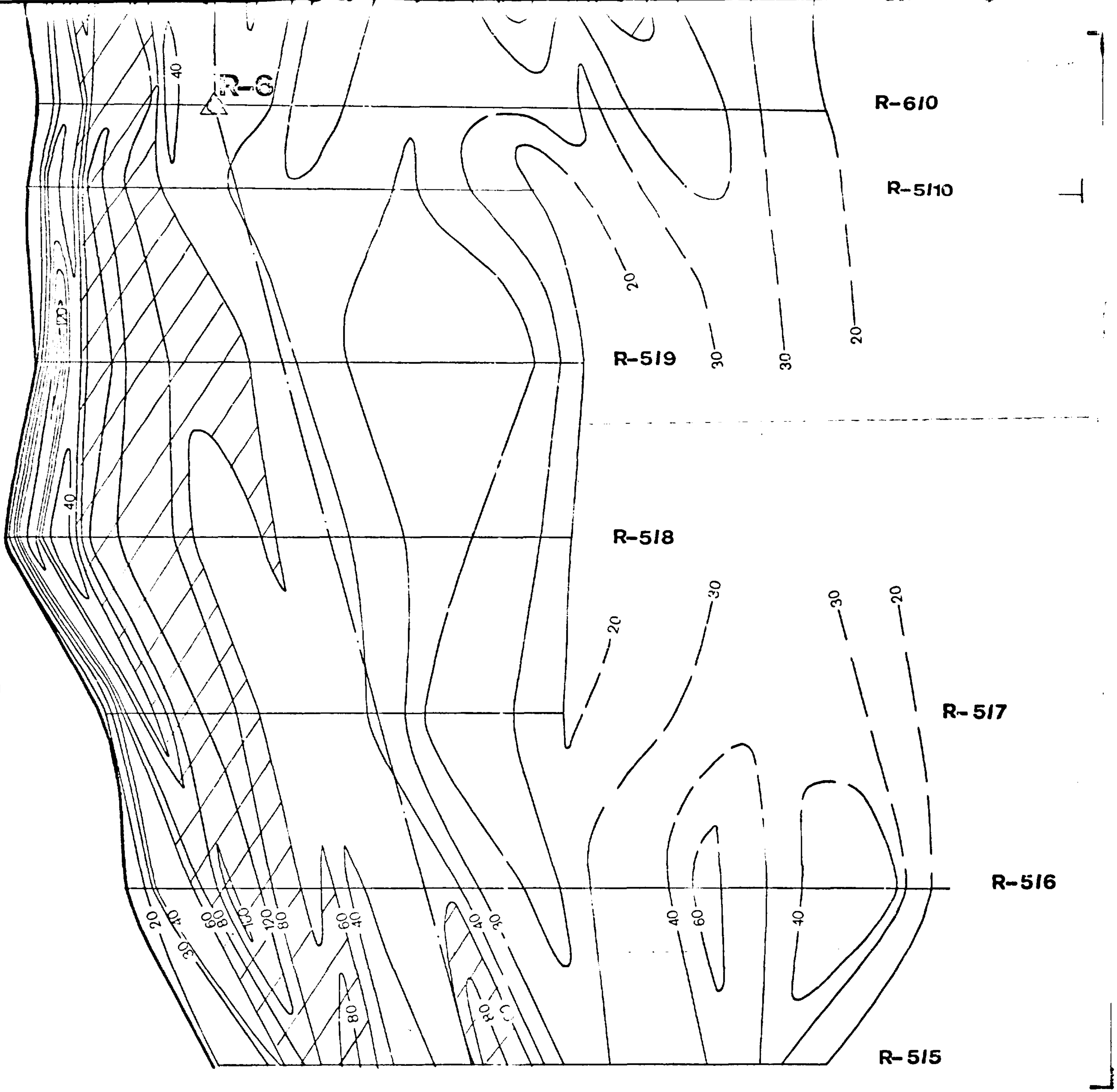
SECTION 2

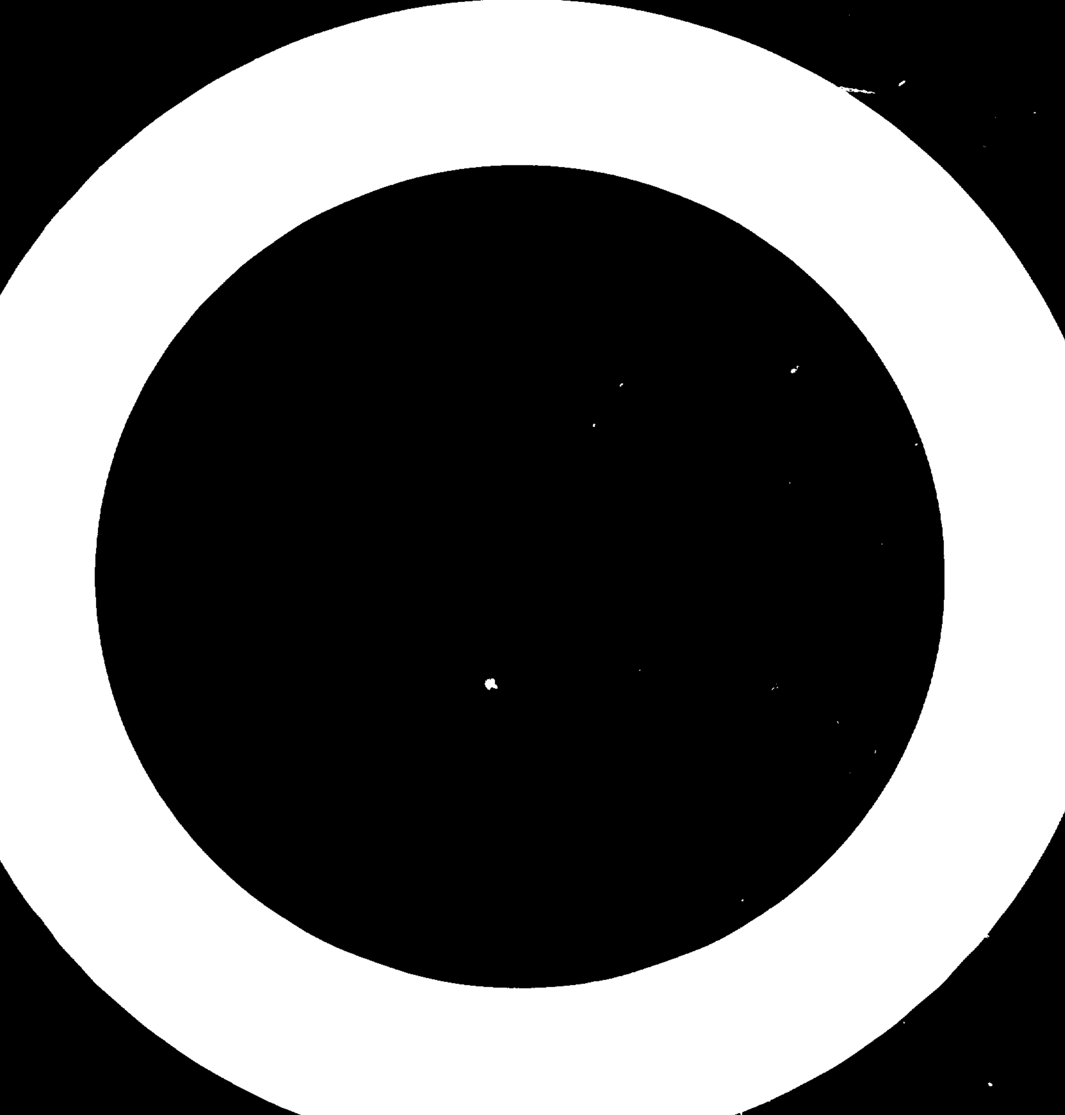


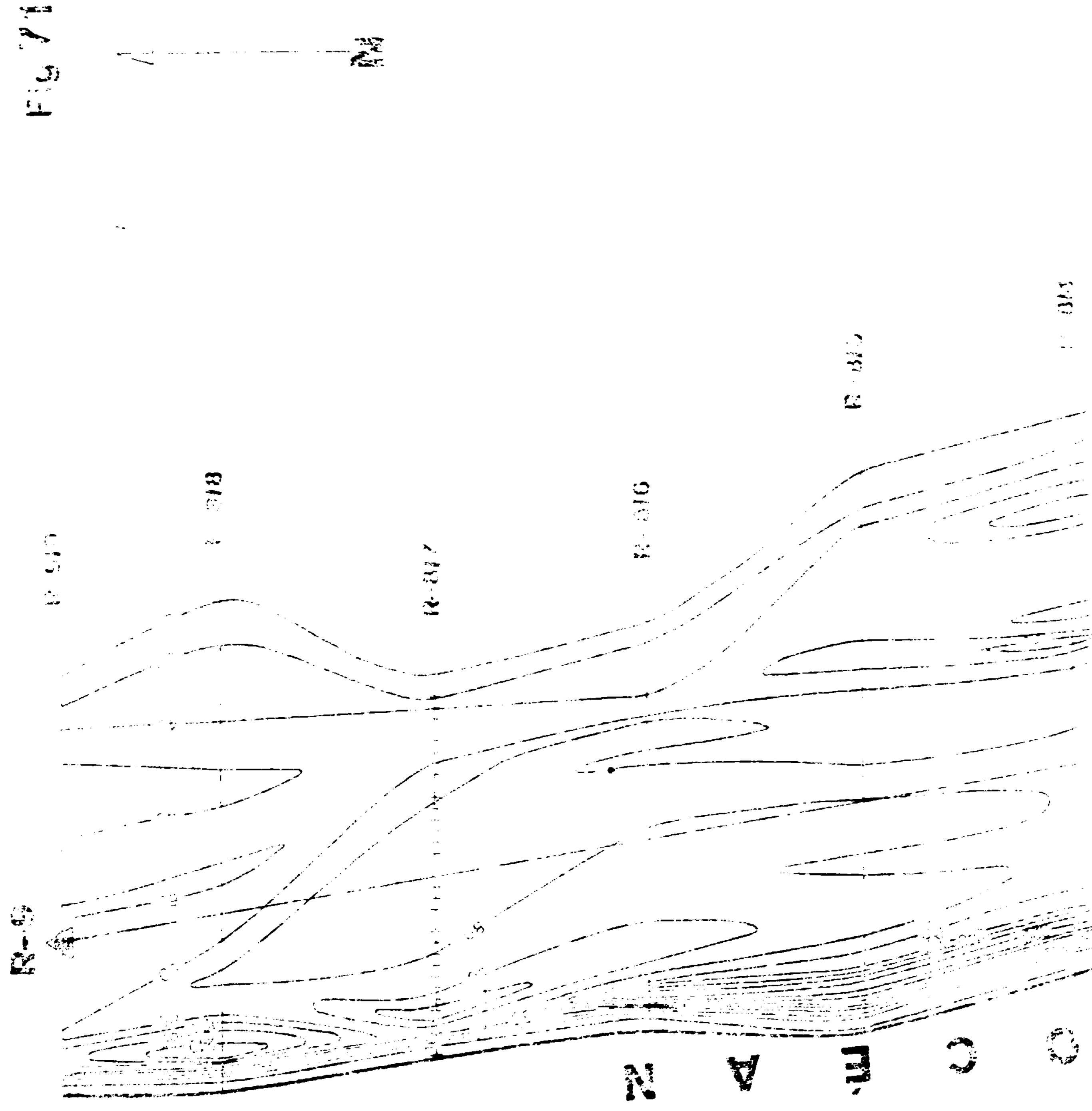
Secteur–sector

TÂNÎT–6

SECTION 3



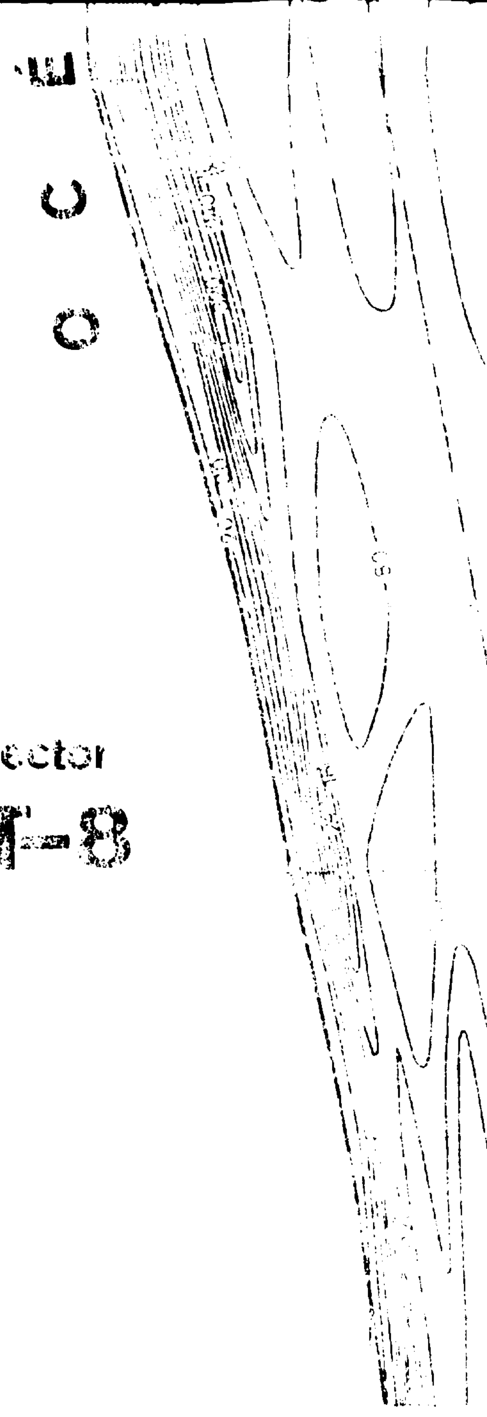


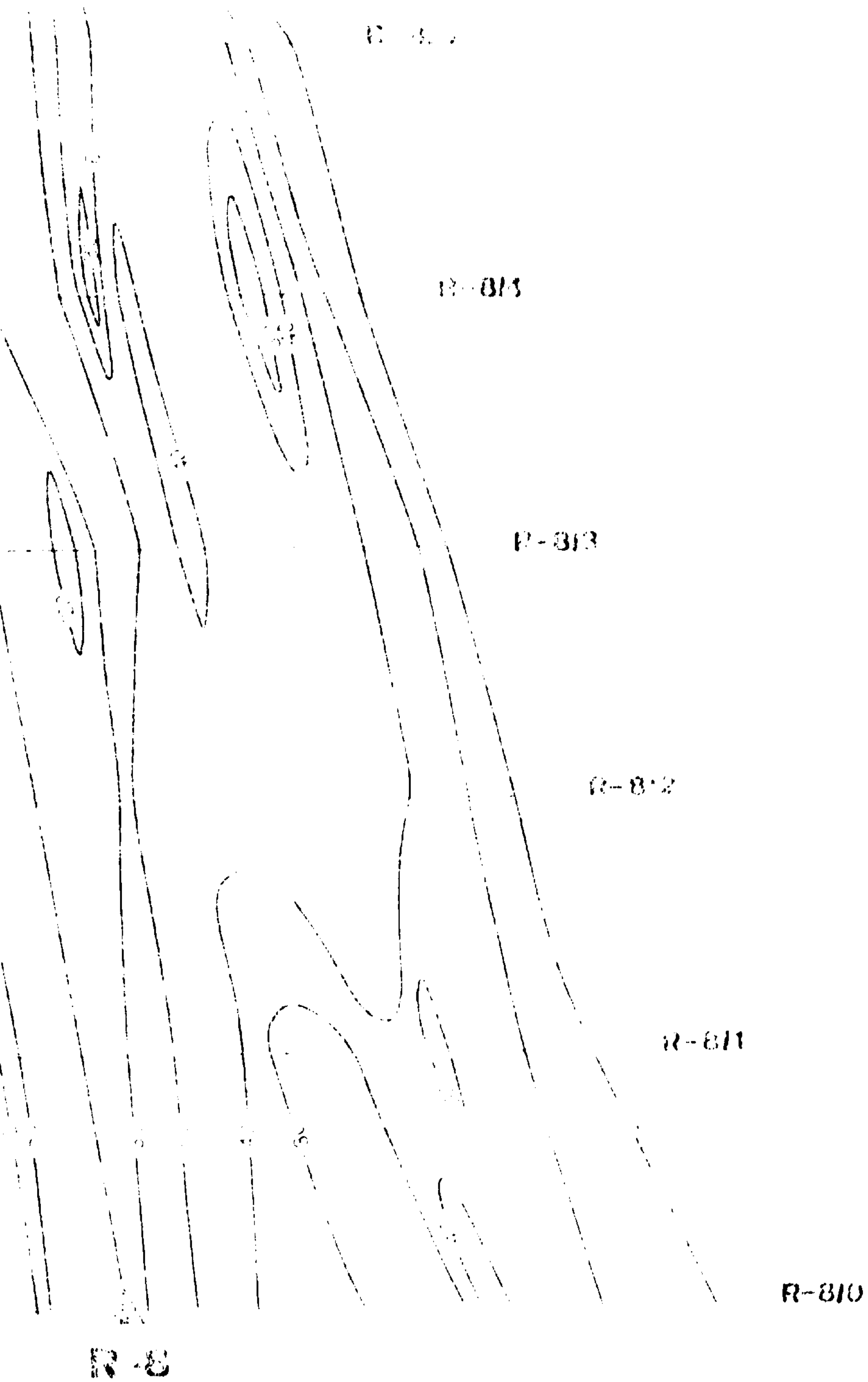


SECTION 1

SECTION 2

Secteur-sector
TÂNIT-8




R-813
R-811
R-810

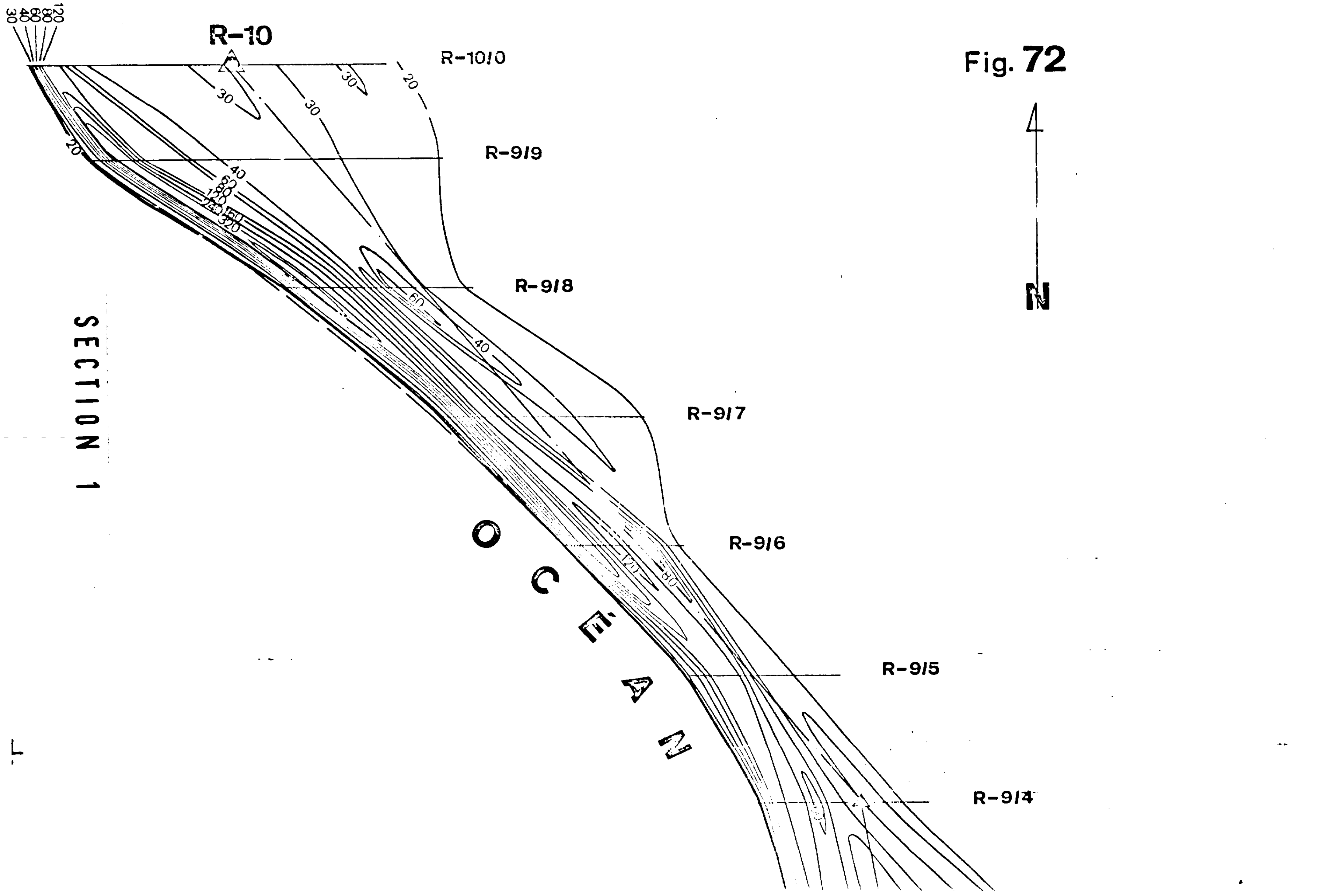


Fig. 72

Secteur-sector
TÂNÎT-9

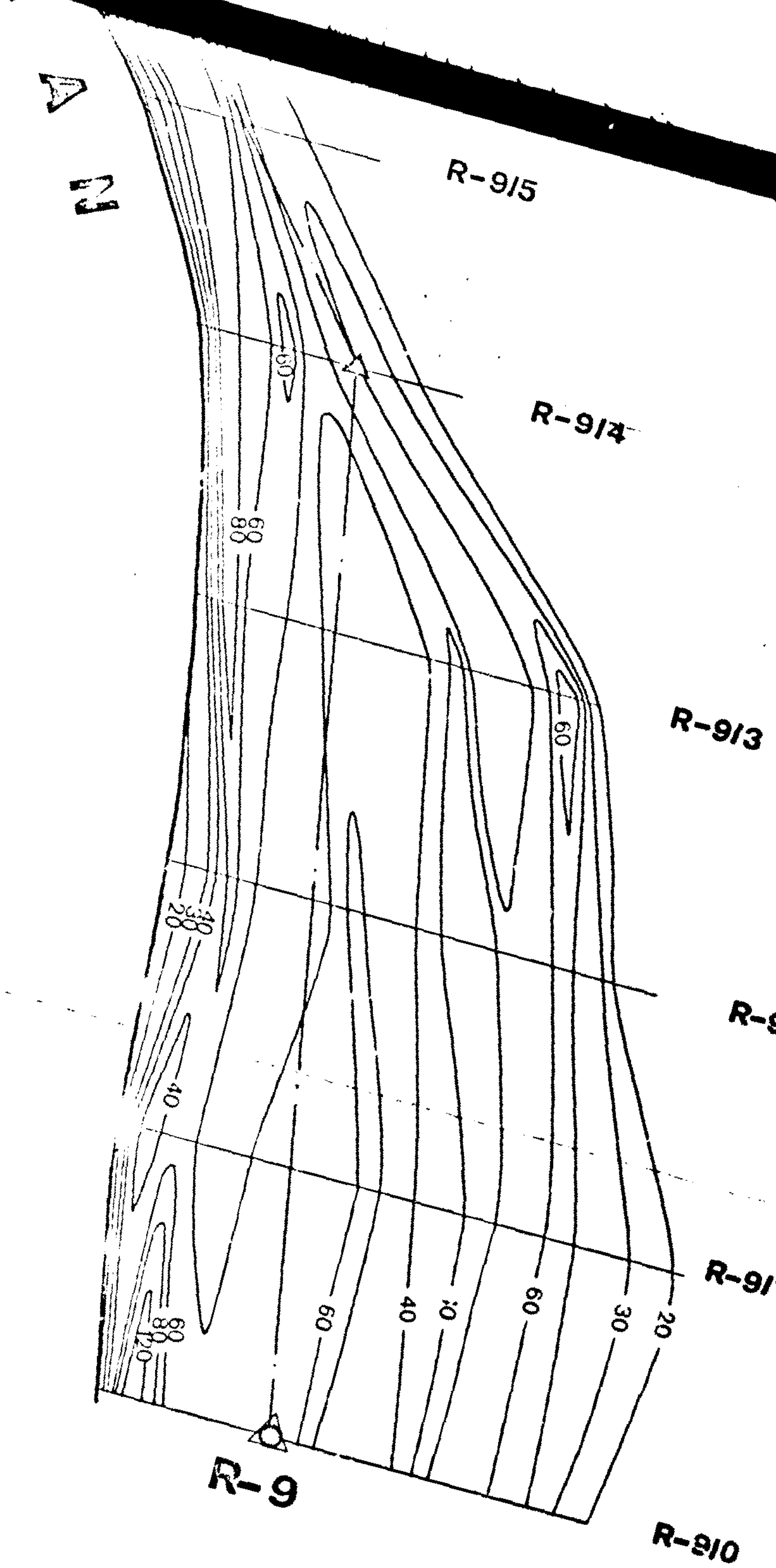


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Fig. 73

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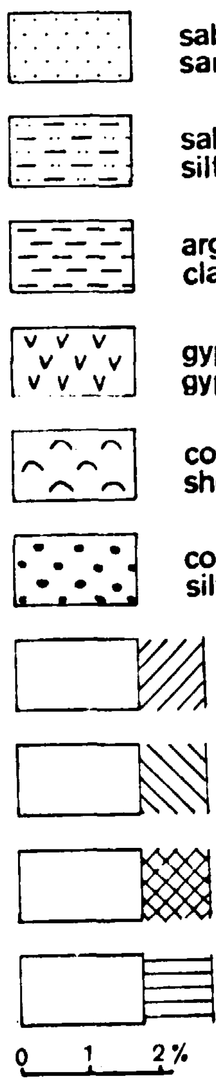
Jreida 82–85

Sondages „profond" 86
Borecholes deep 86

PROFILES LITOLOGIQUES DES SONDAGES
LITHOLOGICAL PROFILES OF BOREHOLES

LEGENDE:

LEGEND:



sable
sand

sable argileux
silty sand

argile
clay

gypse
gypsum

coquilles libre
shells

concretions argileux
silty concretions

jaune
yellow

blanc
white

rouge–brun
red–brown

vert–gris
green–gray

0 1 2% teneur des minéraux lourds
contents of heavy minerals

Fig. 74

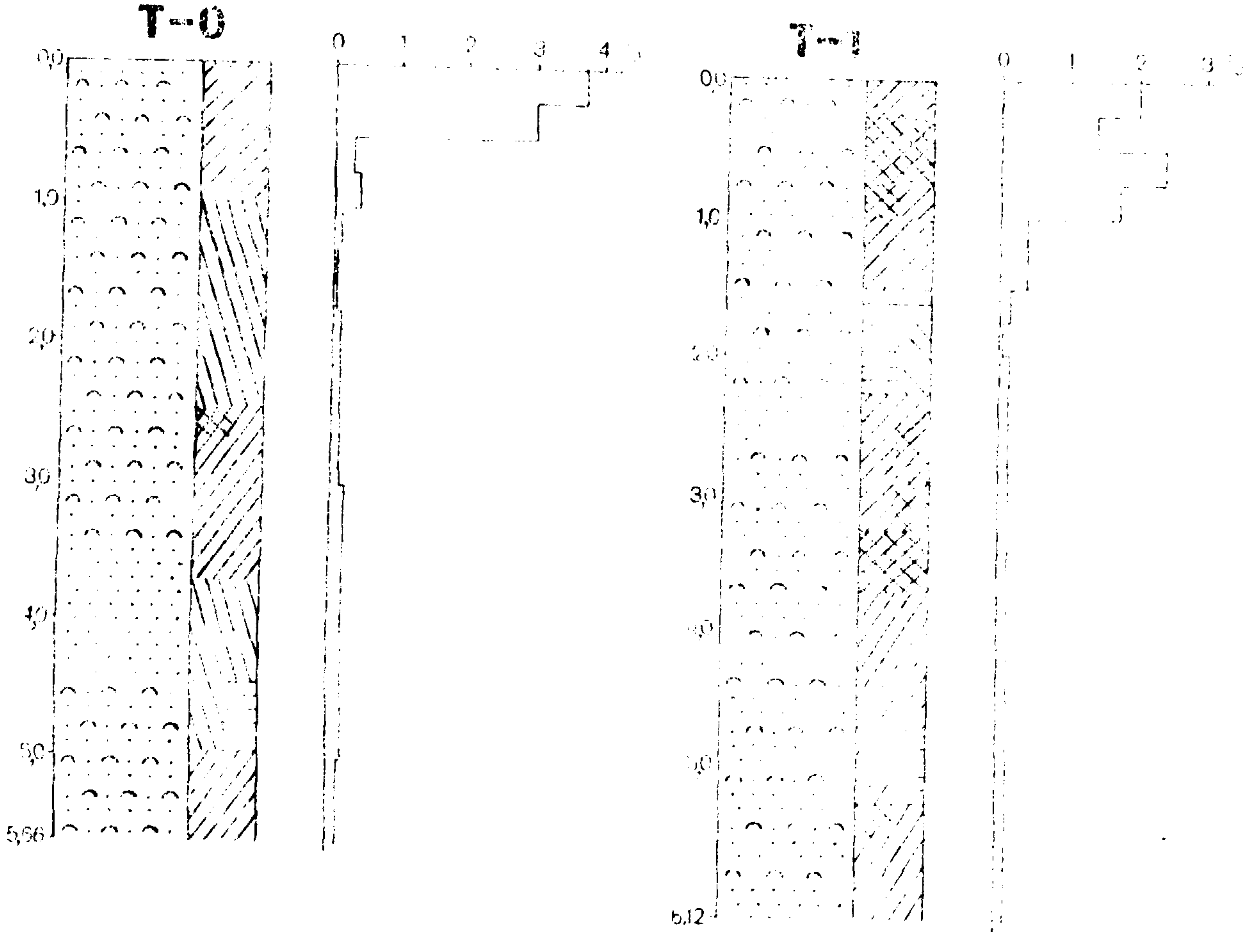
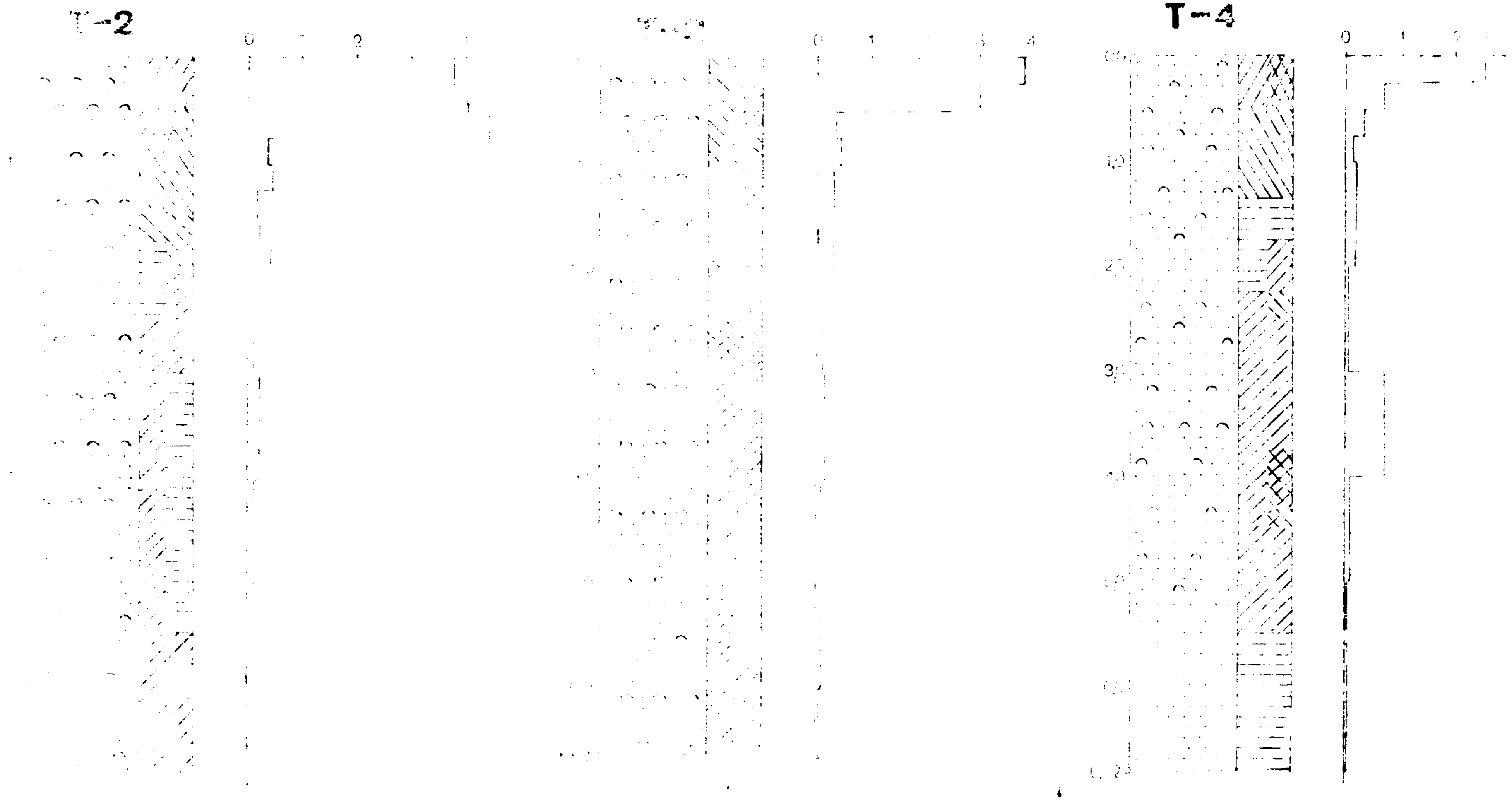
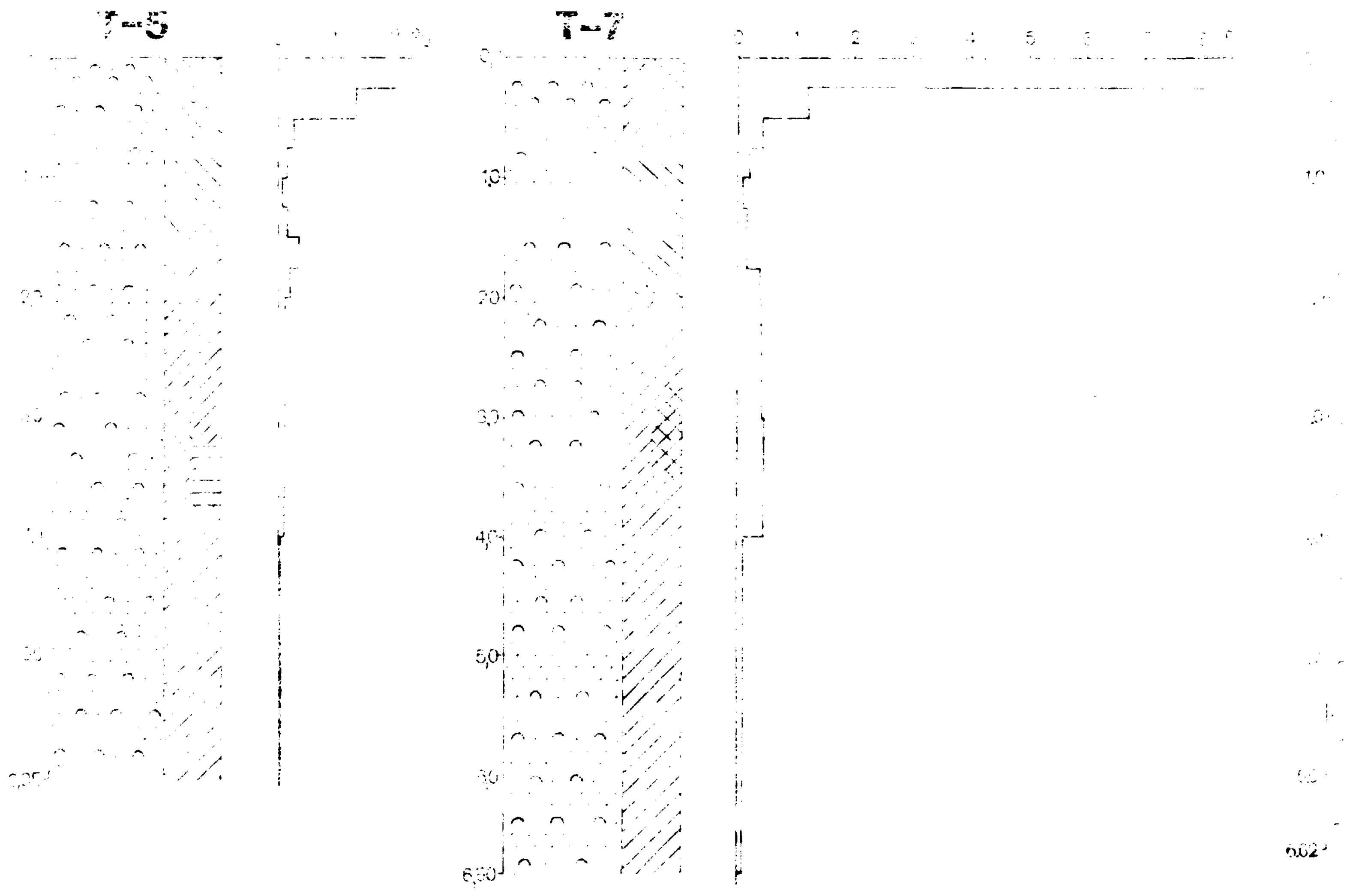


Fig. 75





SECTION 1

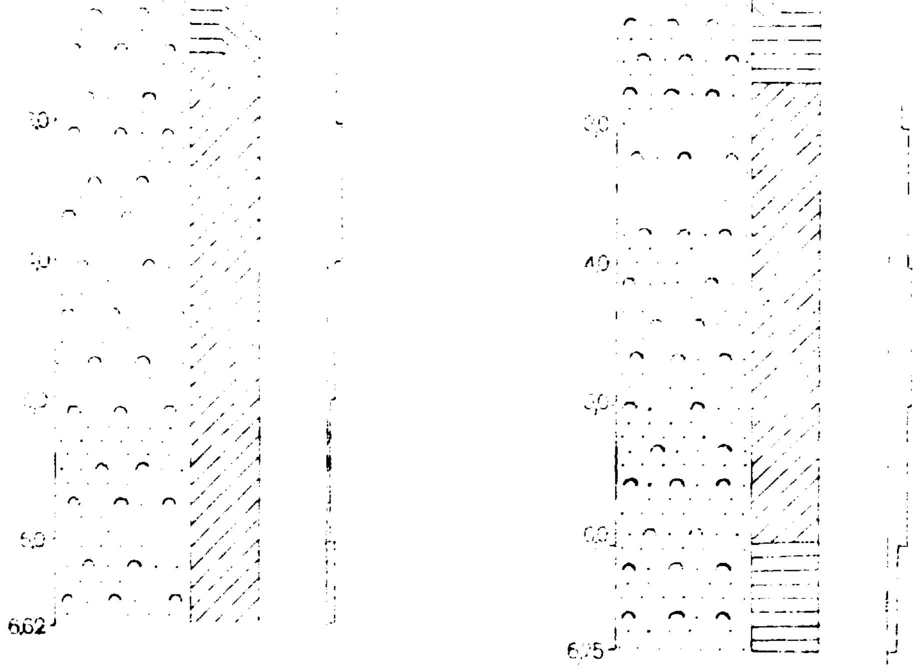


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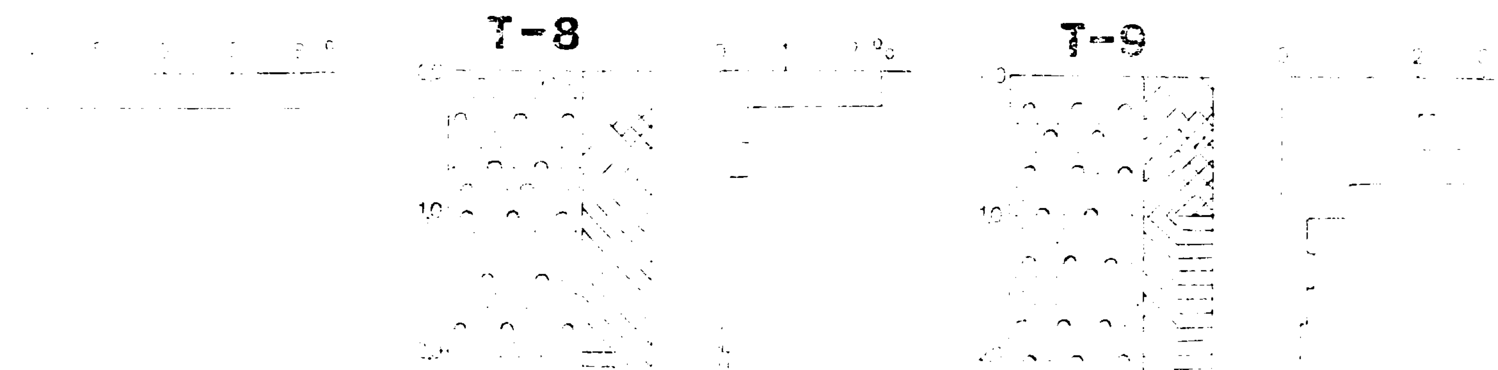
Fig. 76



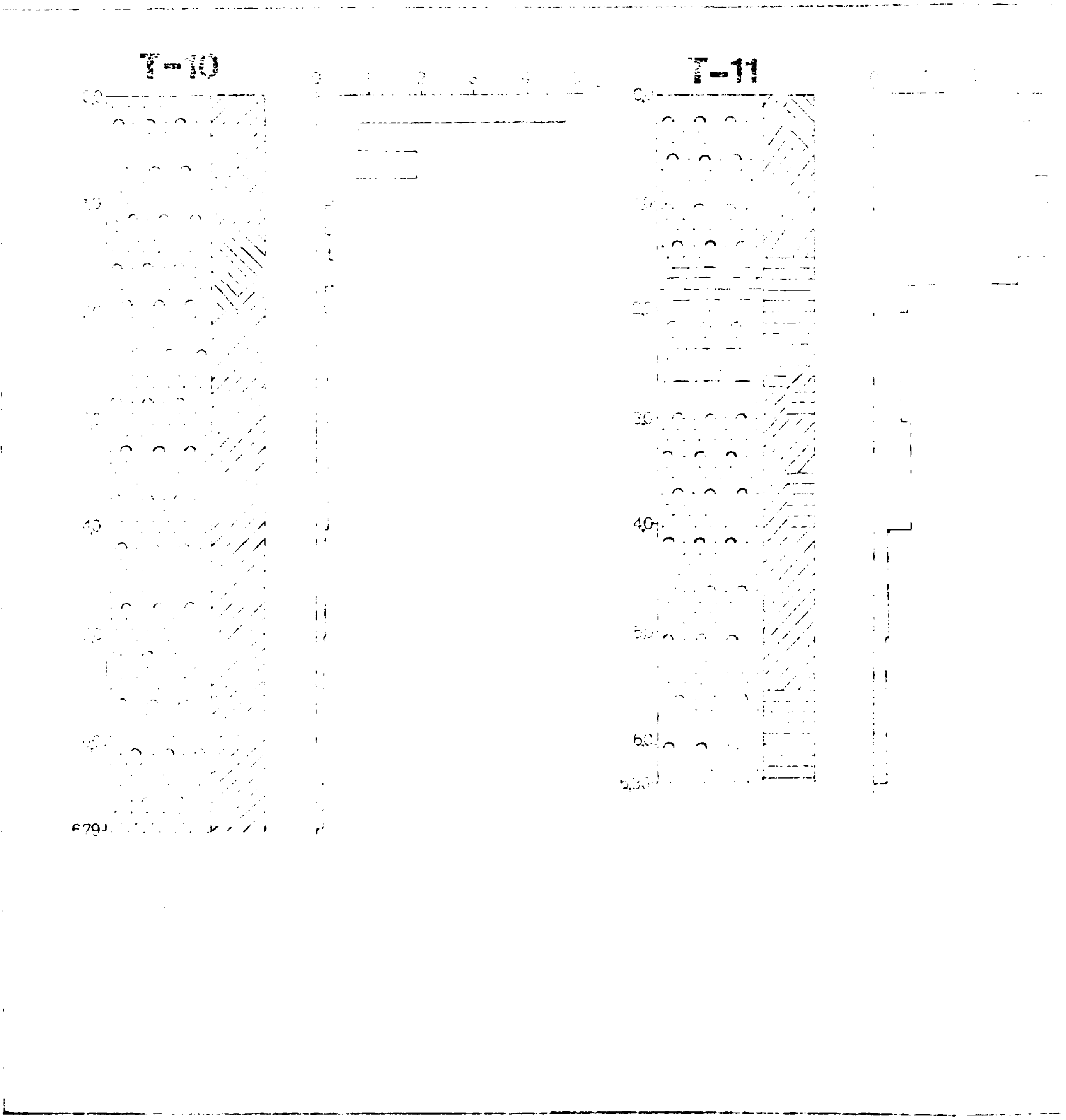


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Fig. 77

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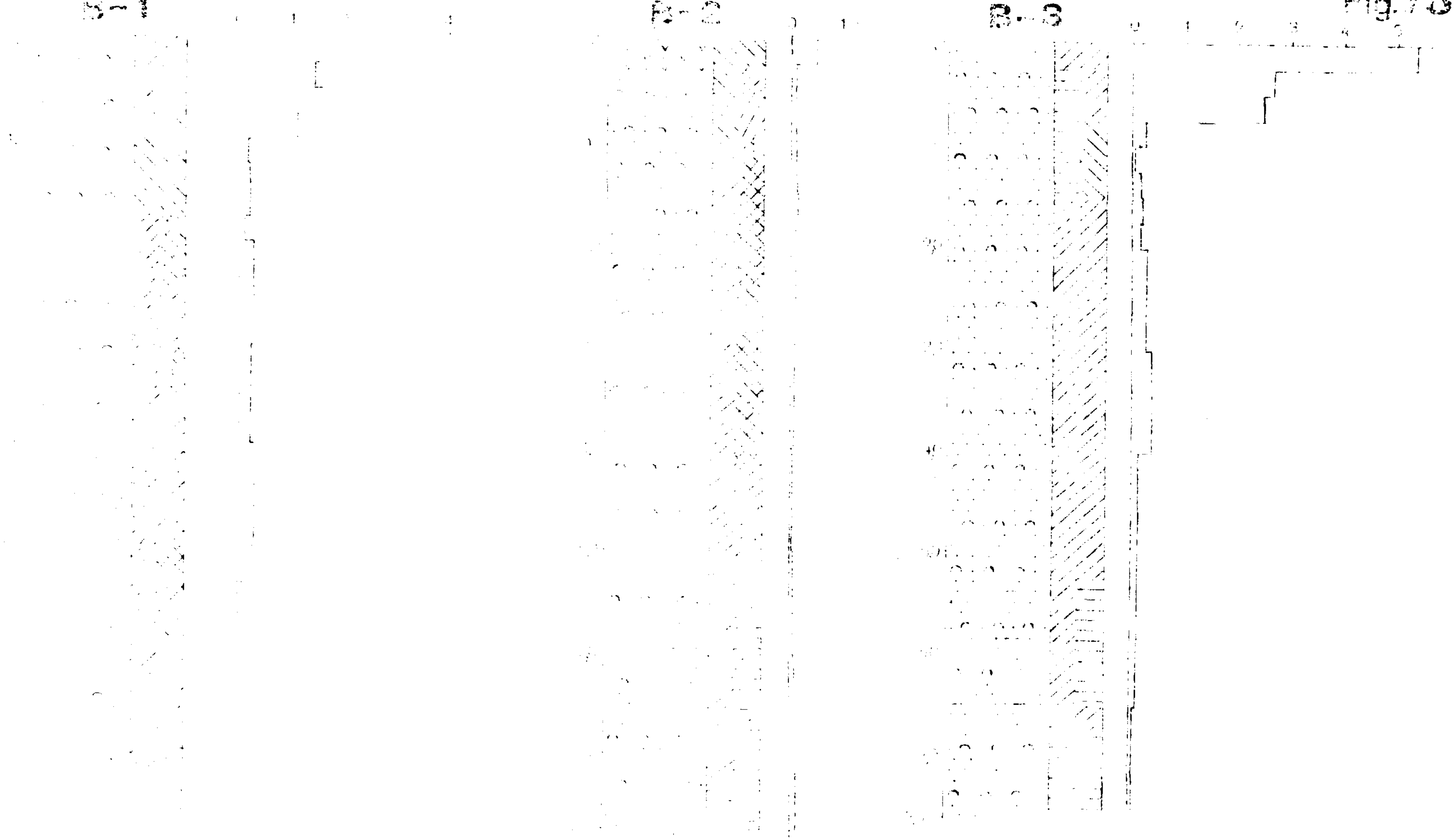
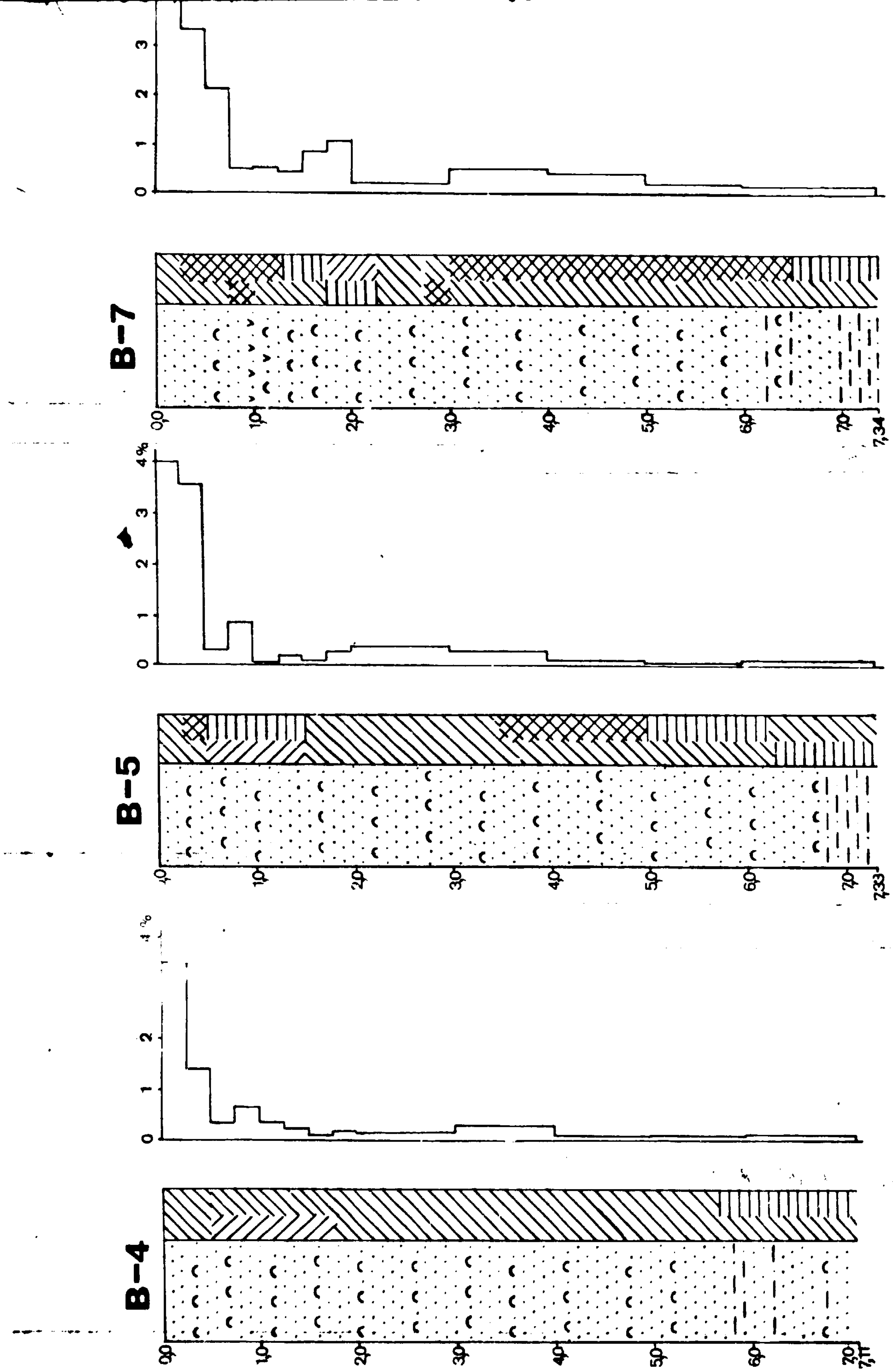
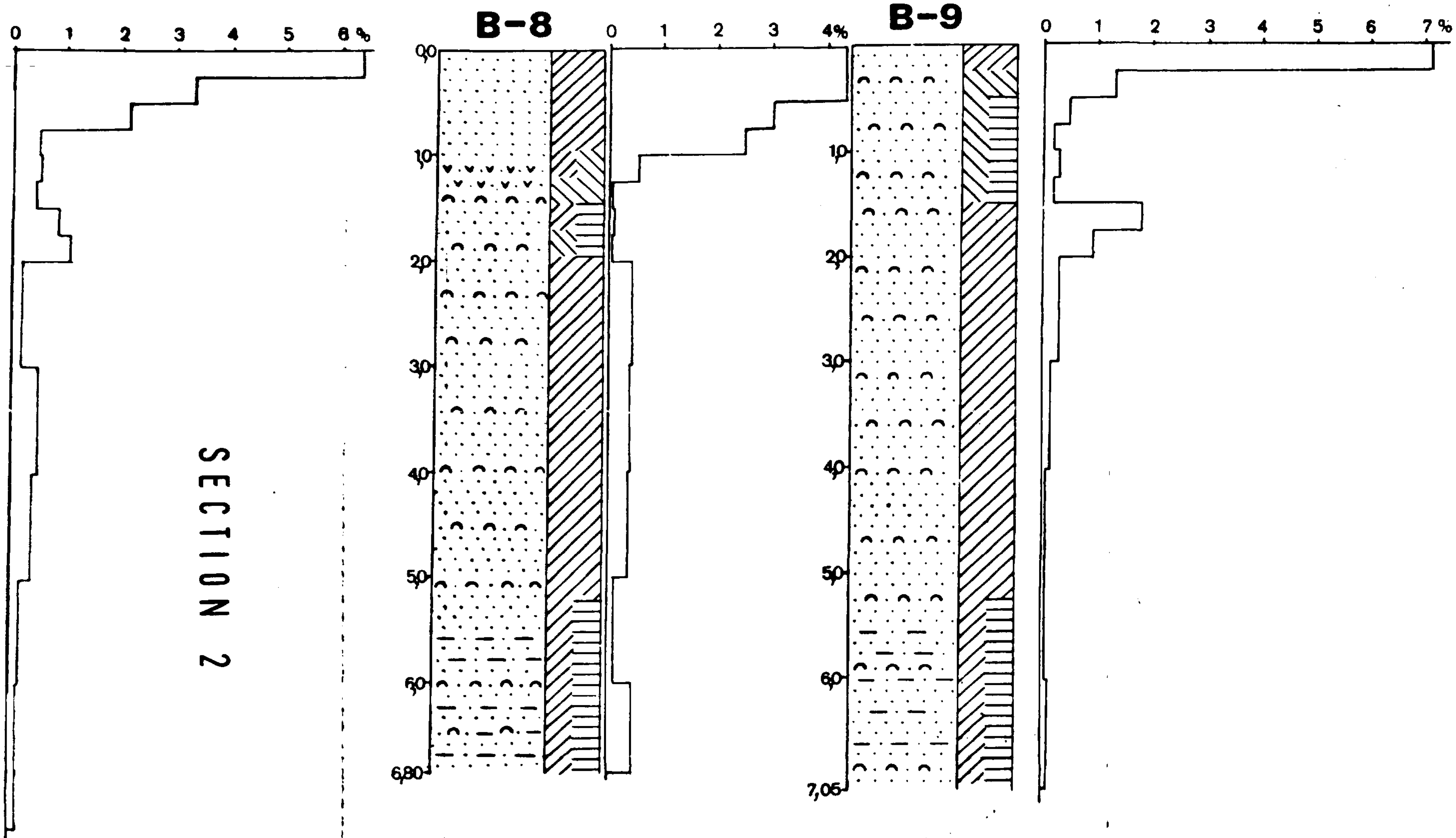
Fig. 7B



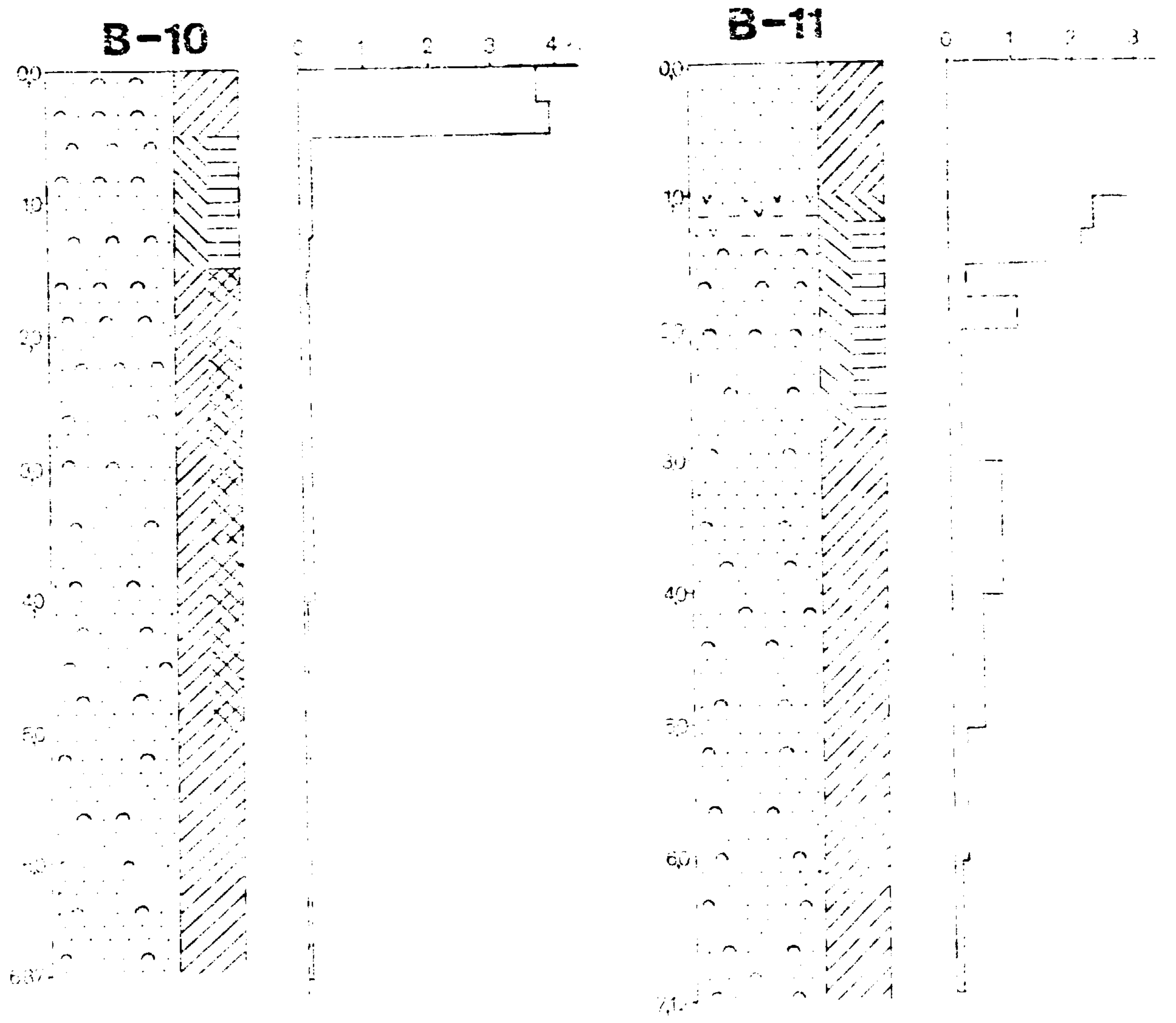


SECTION 1

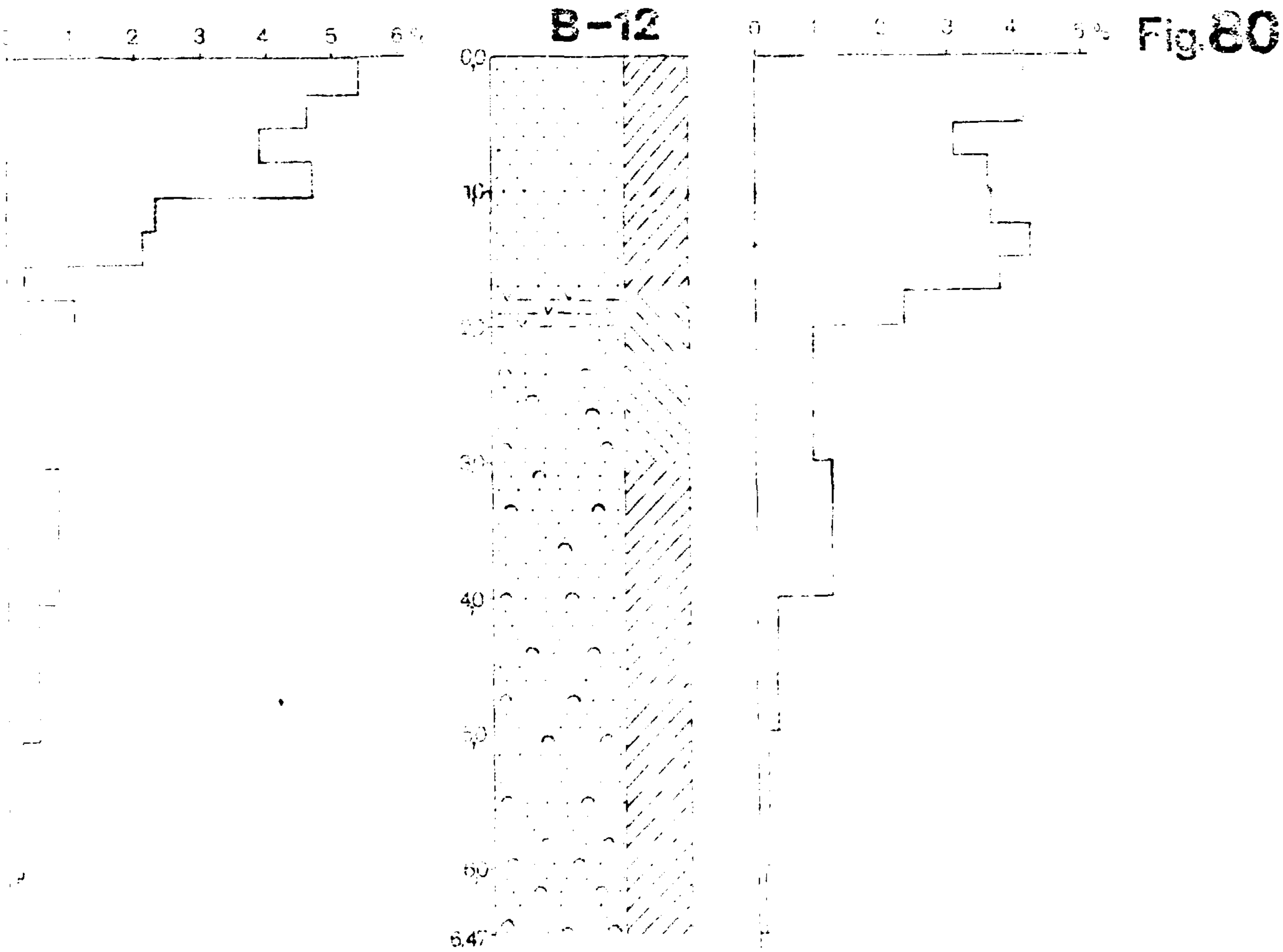
Fig.79



B-8
B-9
0 1 2 3 4 5 6 %
0 1 2 3 4%
0 1 2 3 4 5 6 7 %
0,0
1,0
2,0
3,0
4,0
5,0
6,0
6,80
7,05
SECTION 2

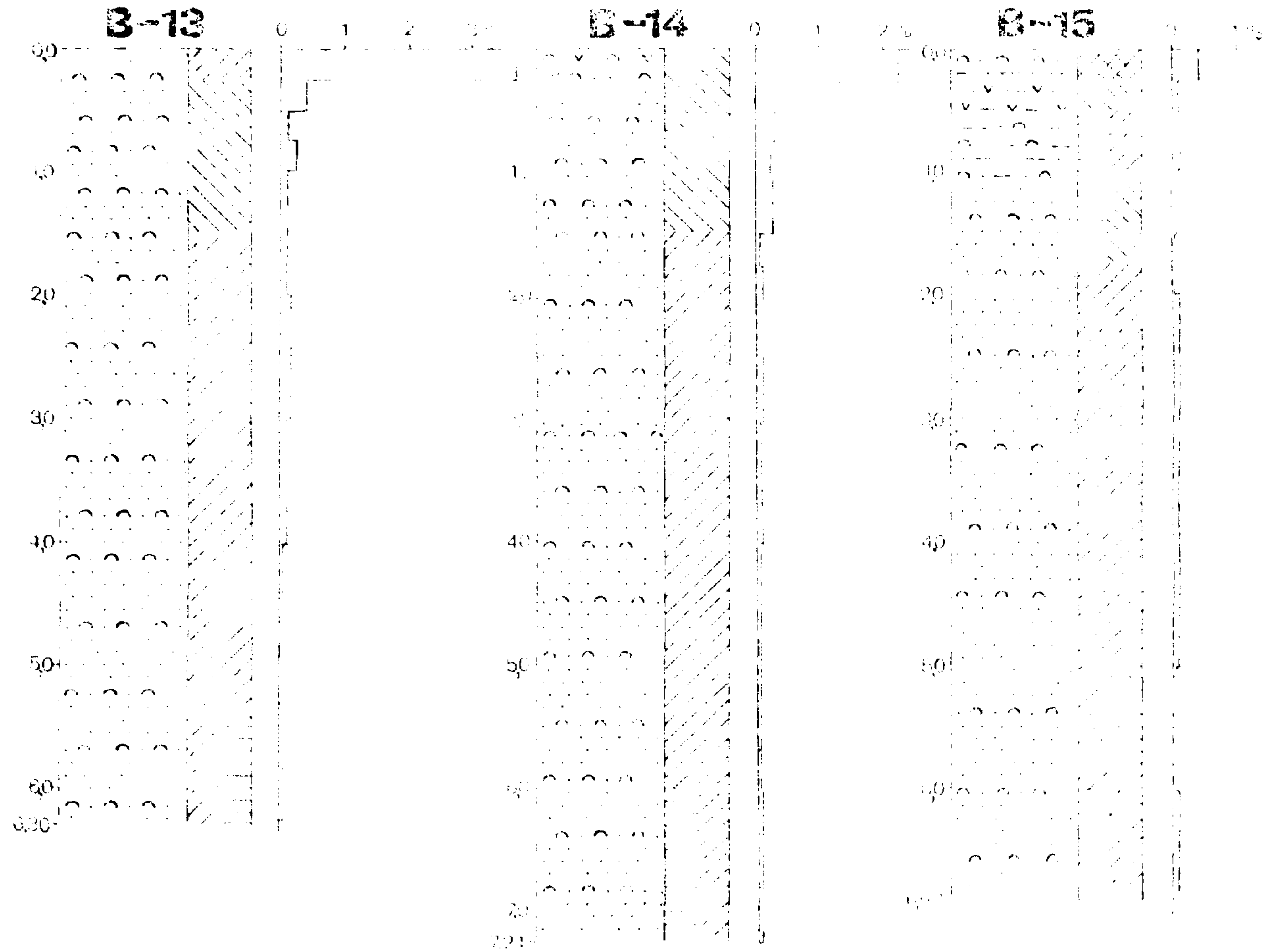


SECTION 1

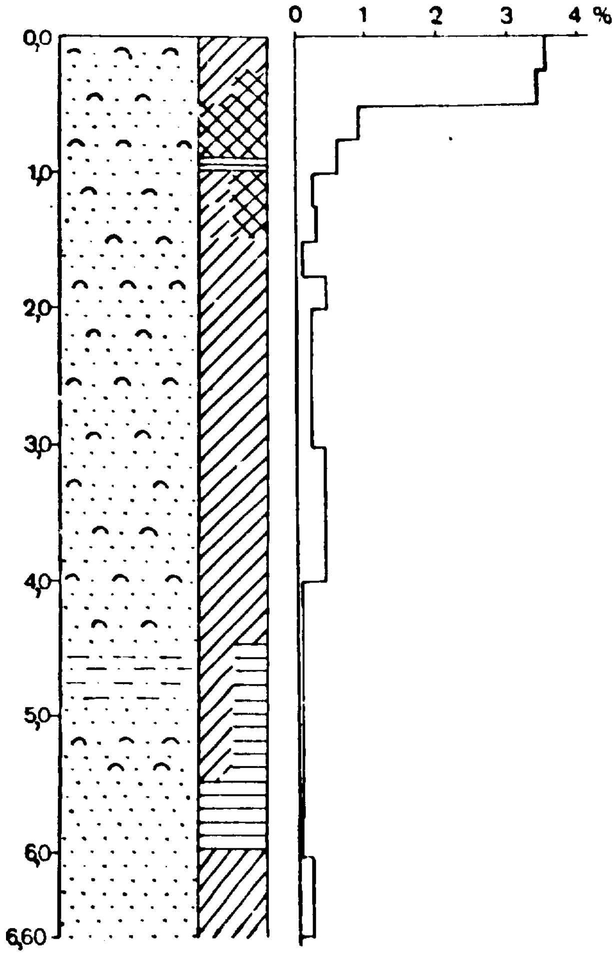


SECTION 2

Fig.81



J-1



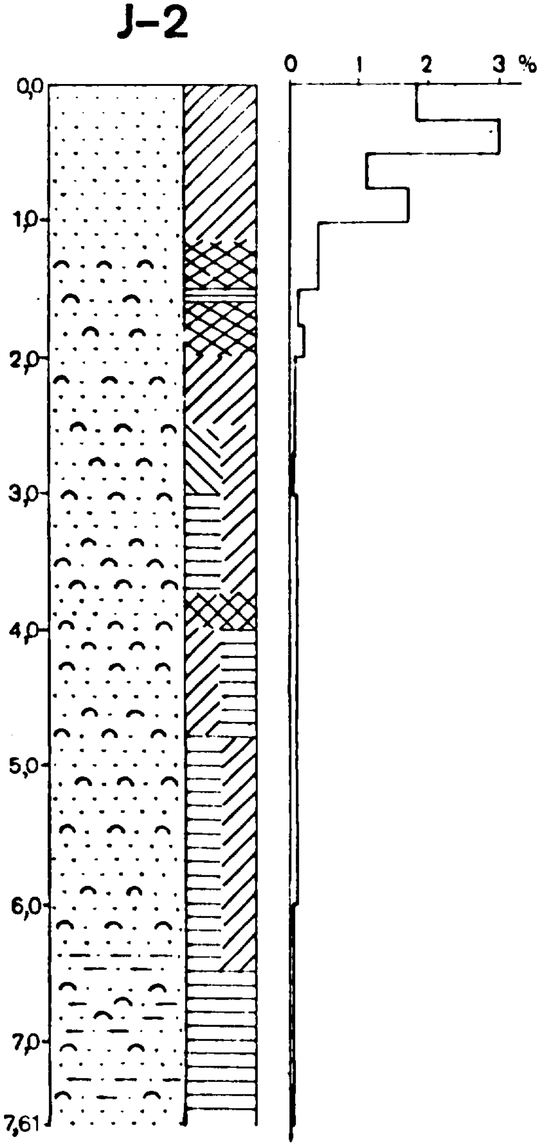
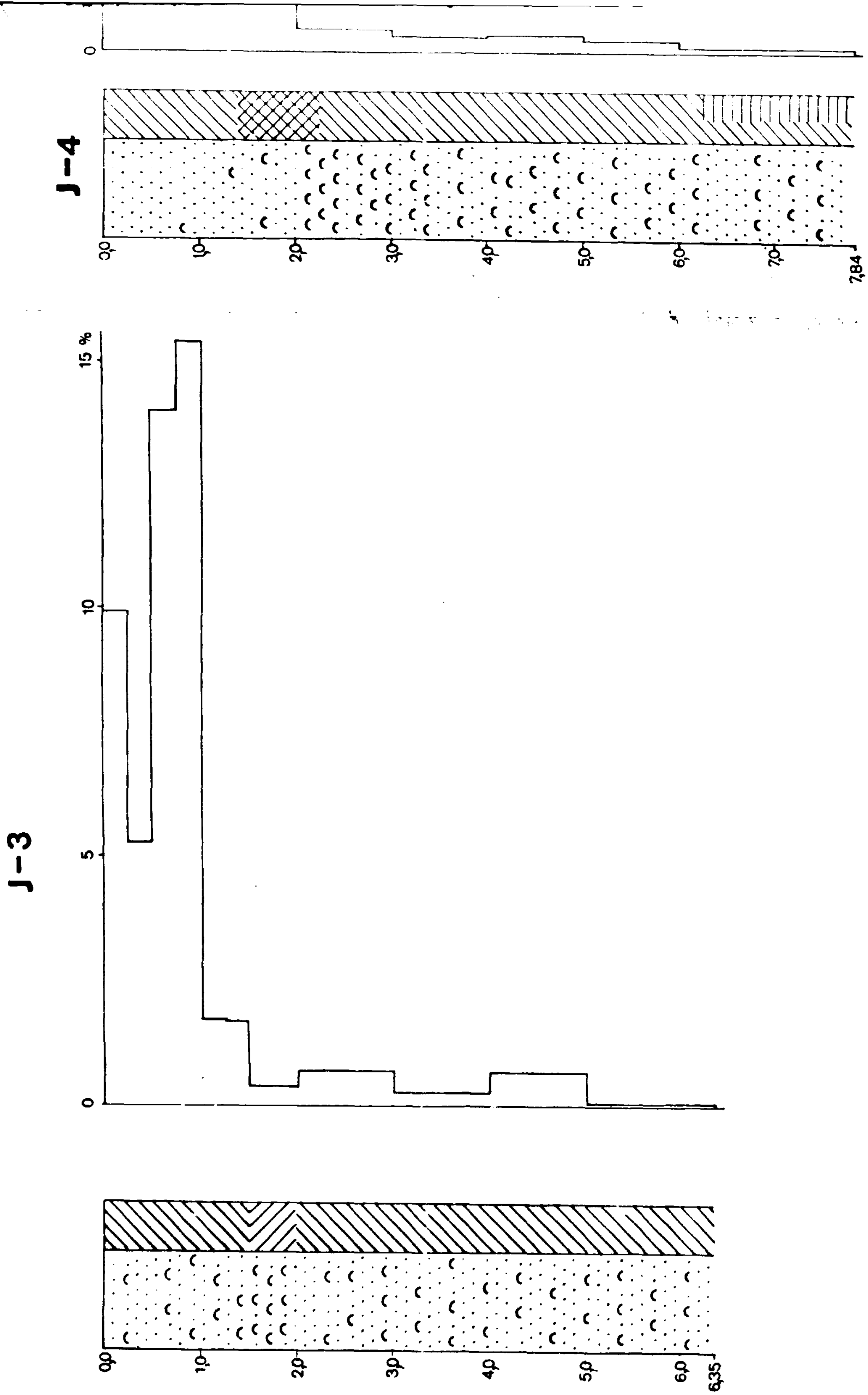
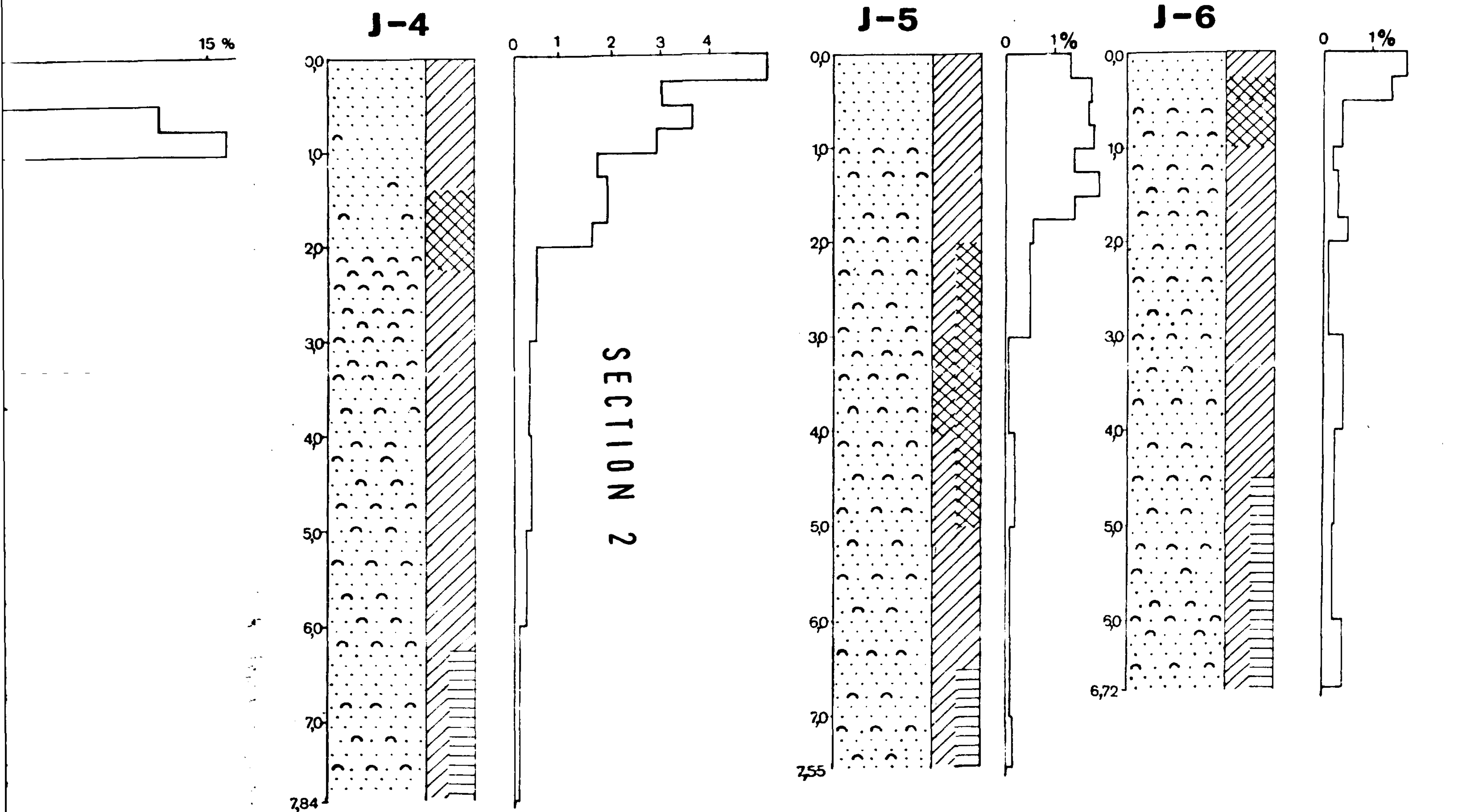


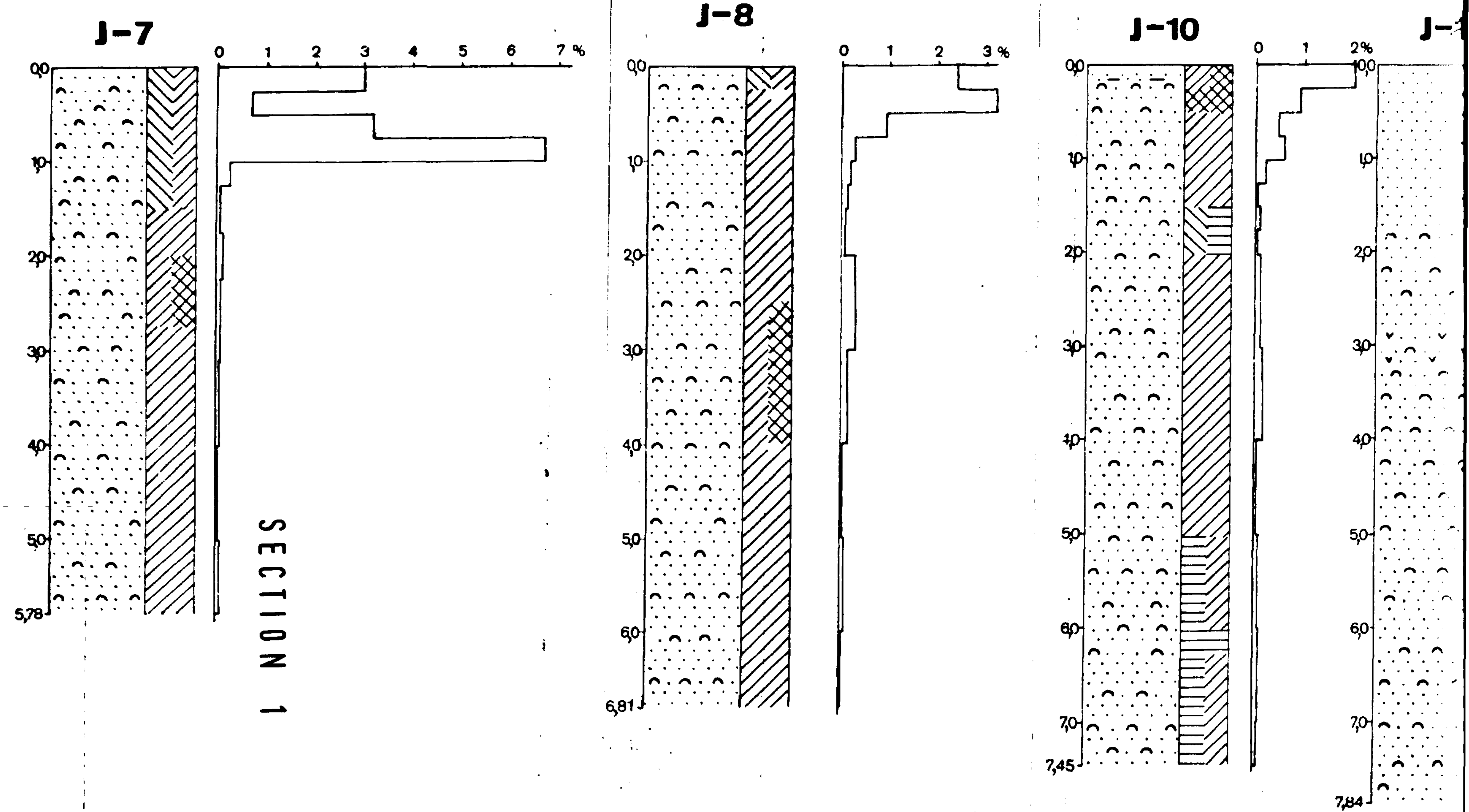
Fig. 82



SECTION 1

Fig. 83





J-7
J-8
J-10
SECTION 1
5,78
6,81
7,45
7,84

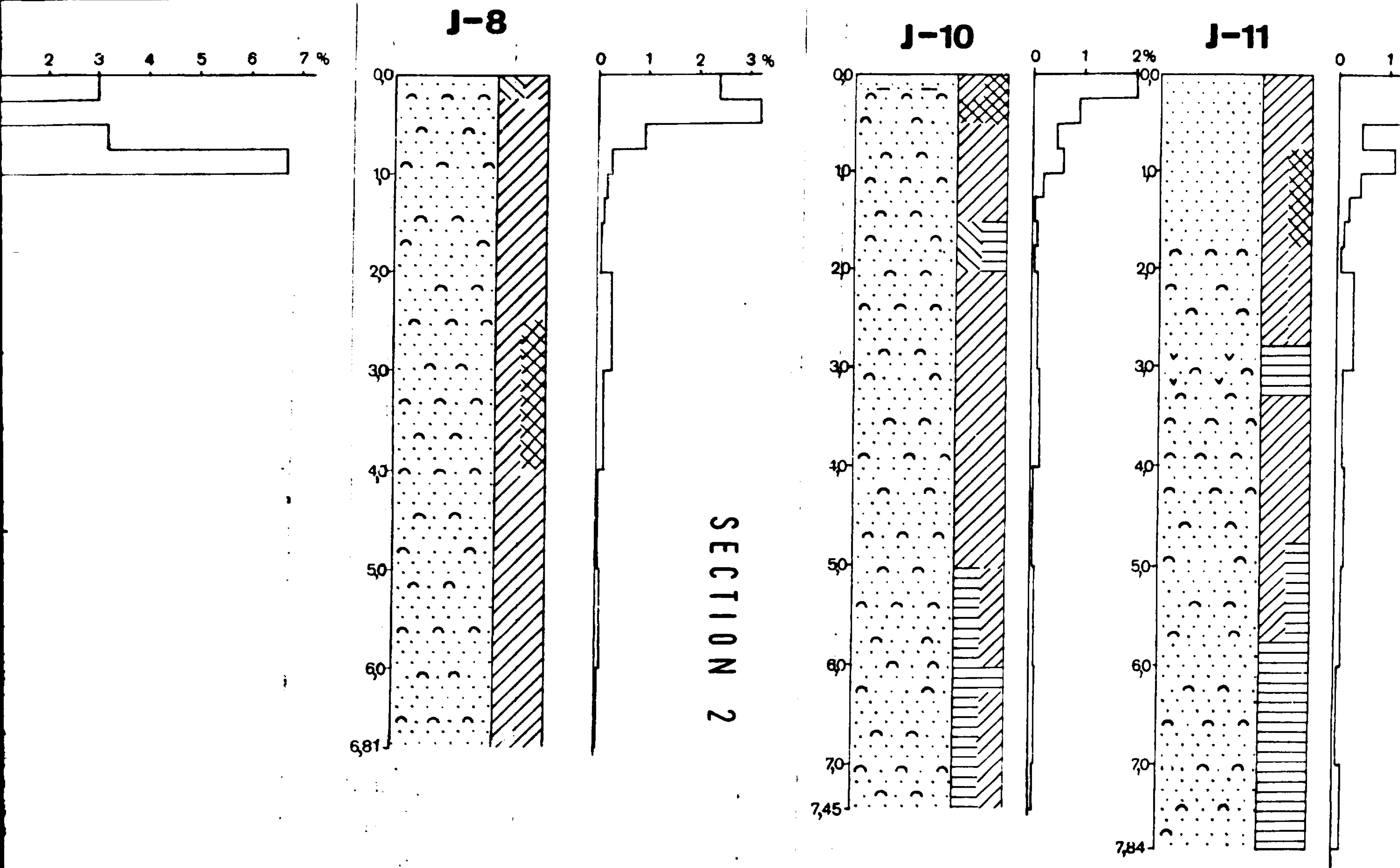
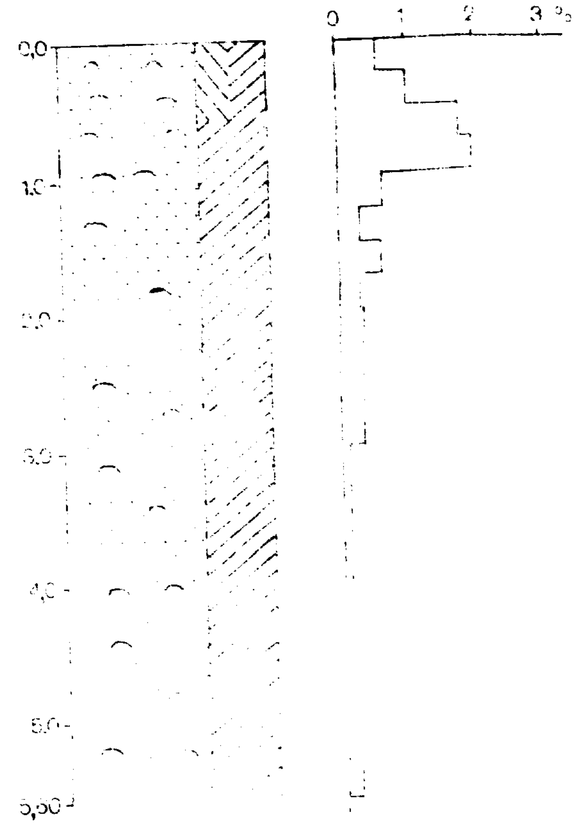

J-8
J-10
J-11
2 3 4 5 6 7 %
0 1 2 3 %
0 1 2%
0 1 2 %
0,0
1,0
2,0
3,0
4,0
5,0
6,0
6,81
7,0
7,45
7,84
SECTION 2

Fig. 84

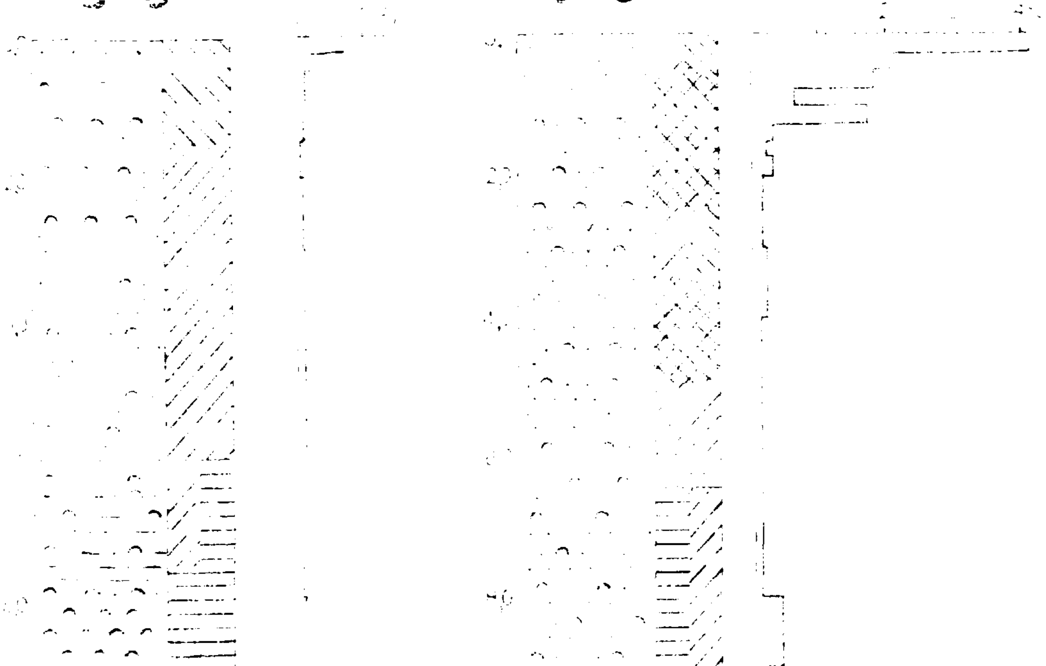
Fig.65

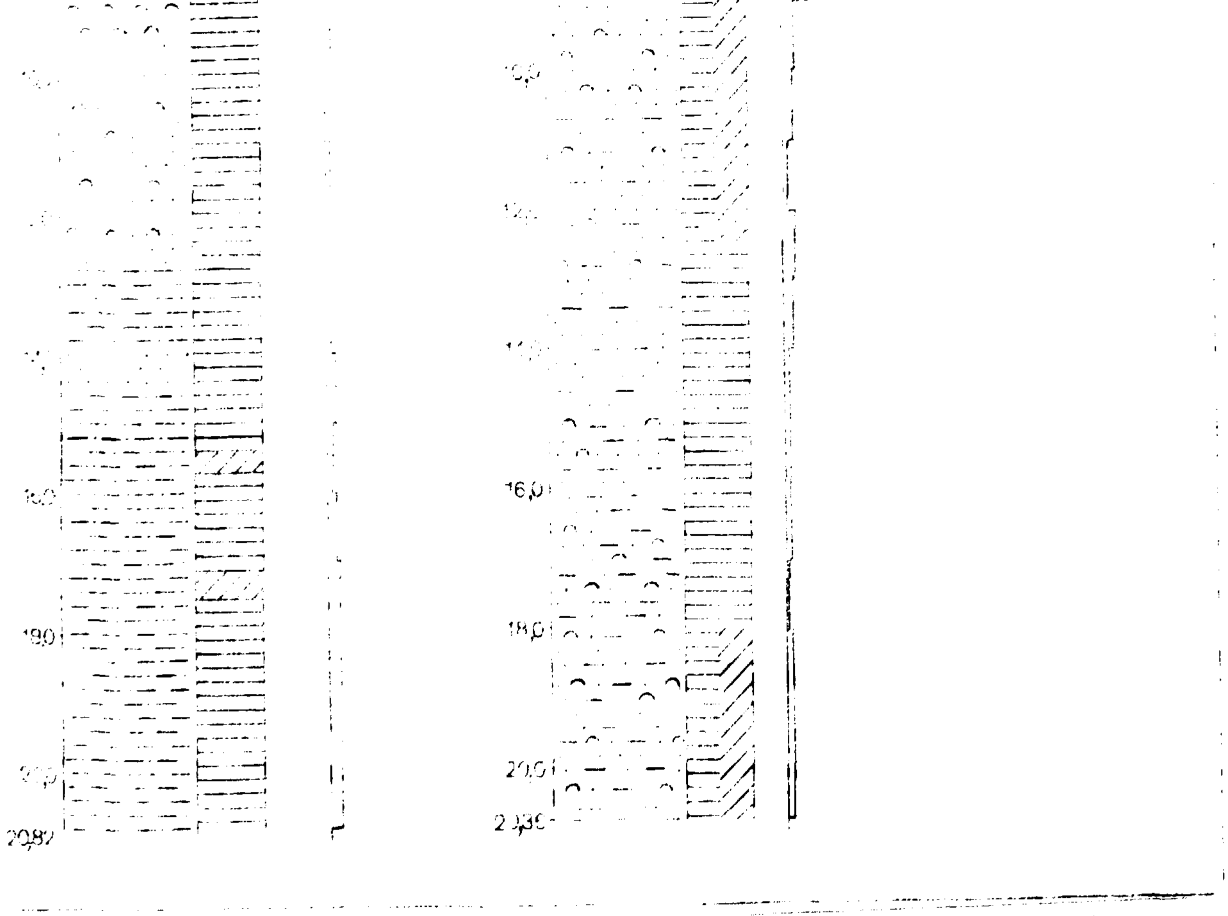
J-12



SECTION 1

Fig. 86





SECTION 2

Fig. 87

La comparaison de la classification des sables appliquée dans les travaux de laboratoire par rapport à celle de Wenthworth et Krumbein

Grain size scale applied in the present work as compared with those of Wenthworth and Krumbein

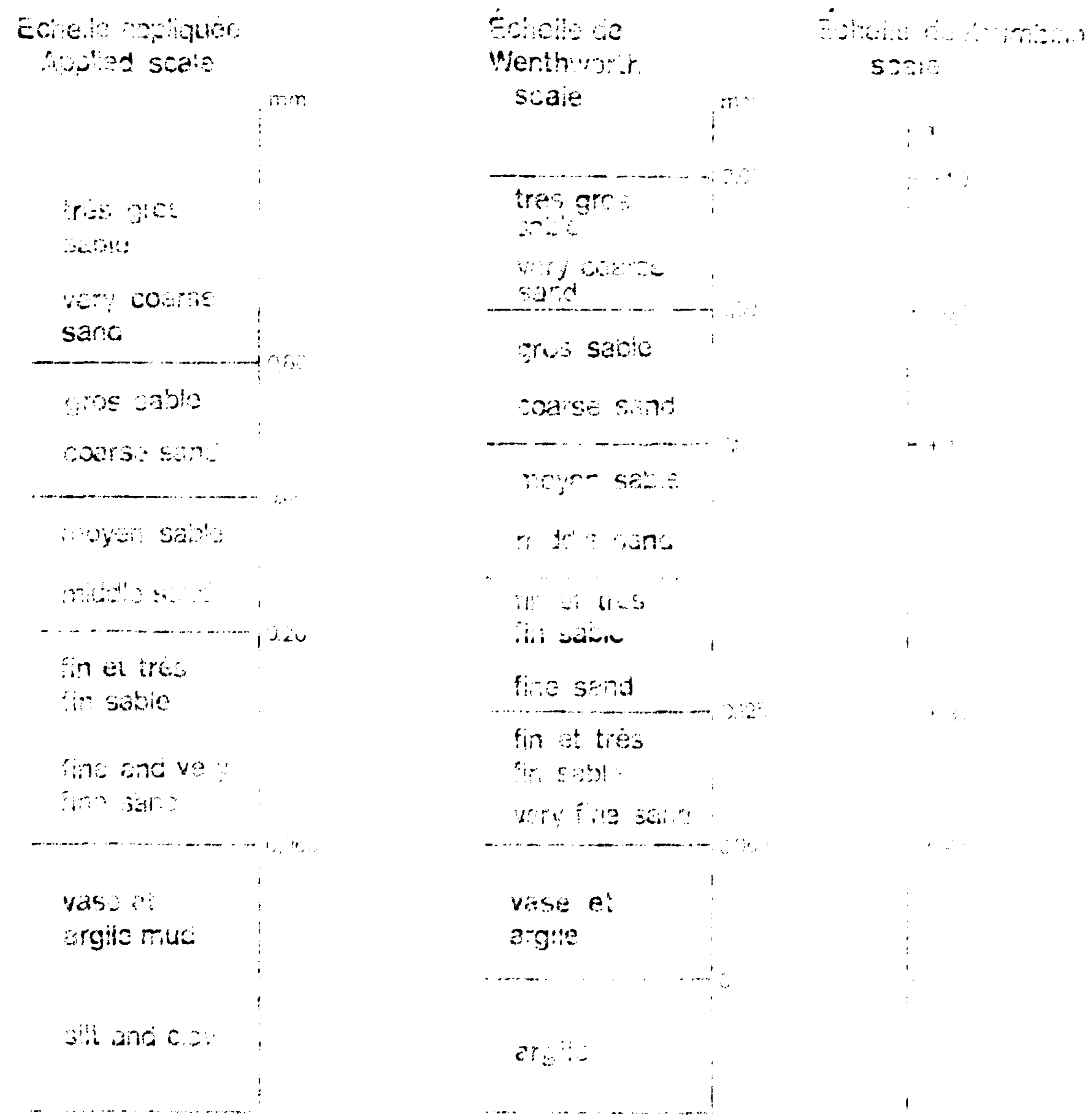
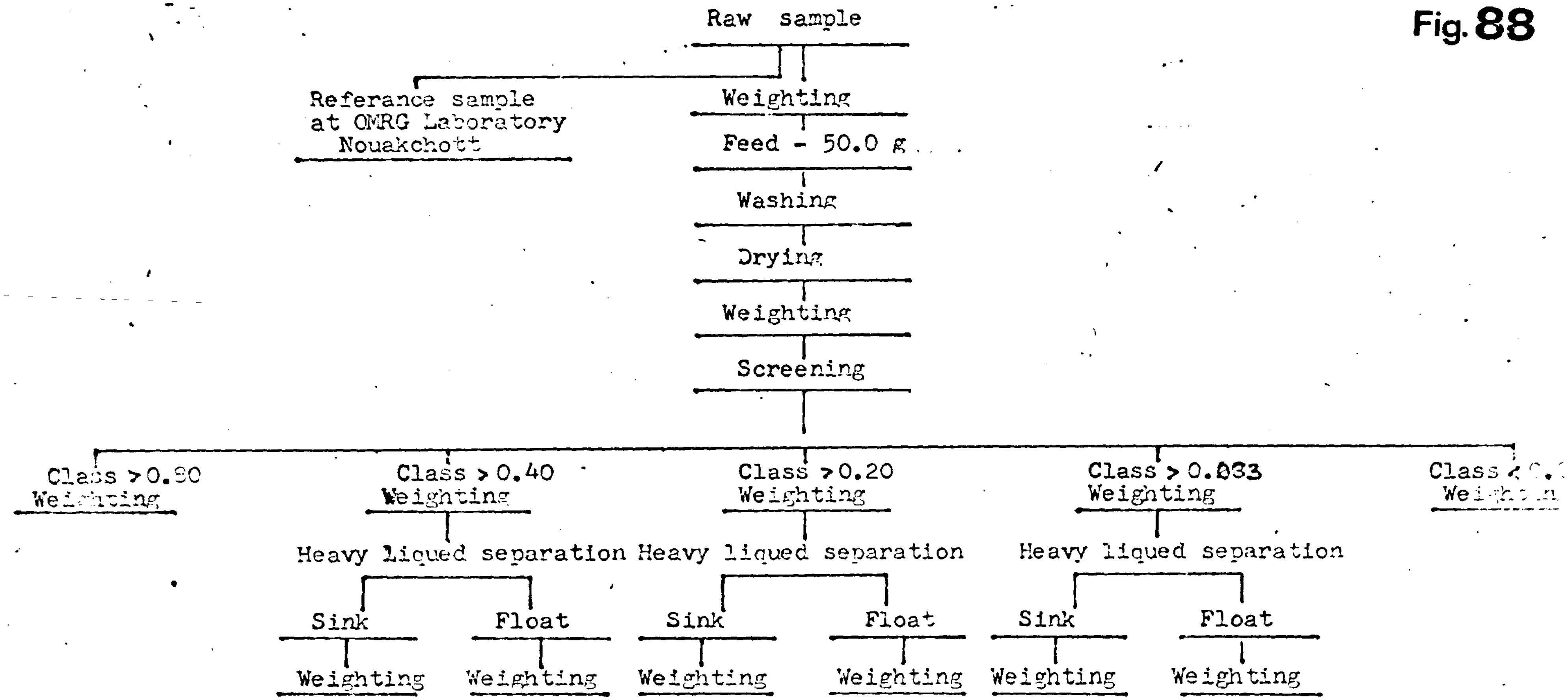
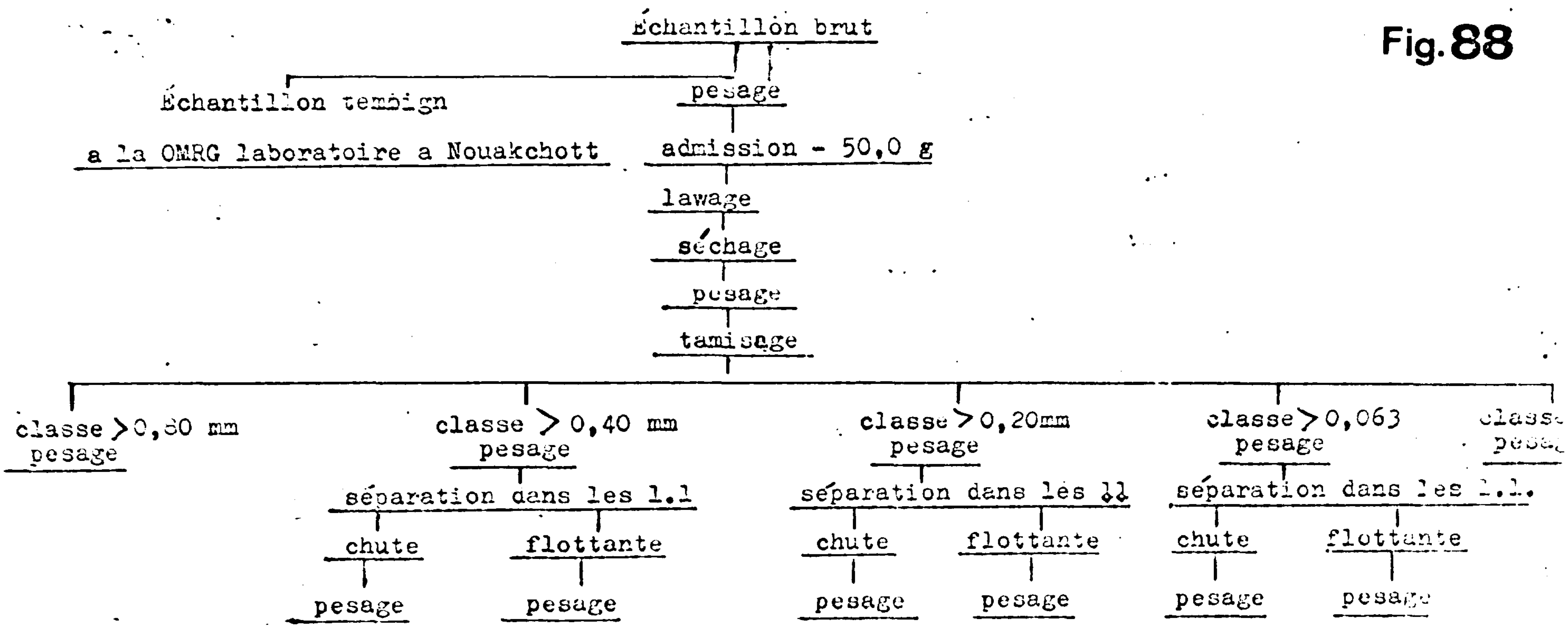


Fig. 88



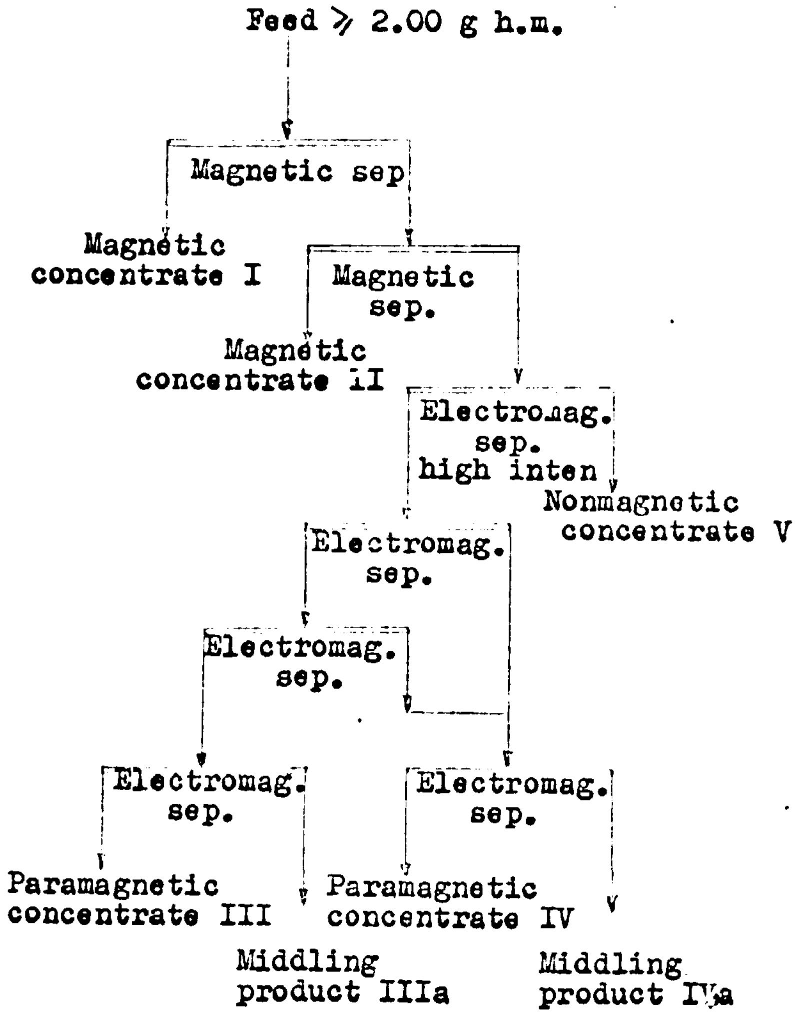
Flowsheet employed to the 1-st stage mineralogical examination

Fig. 88



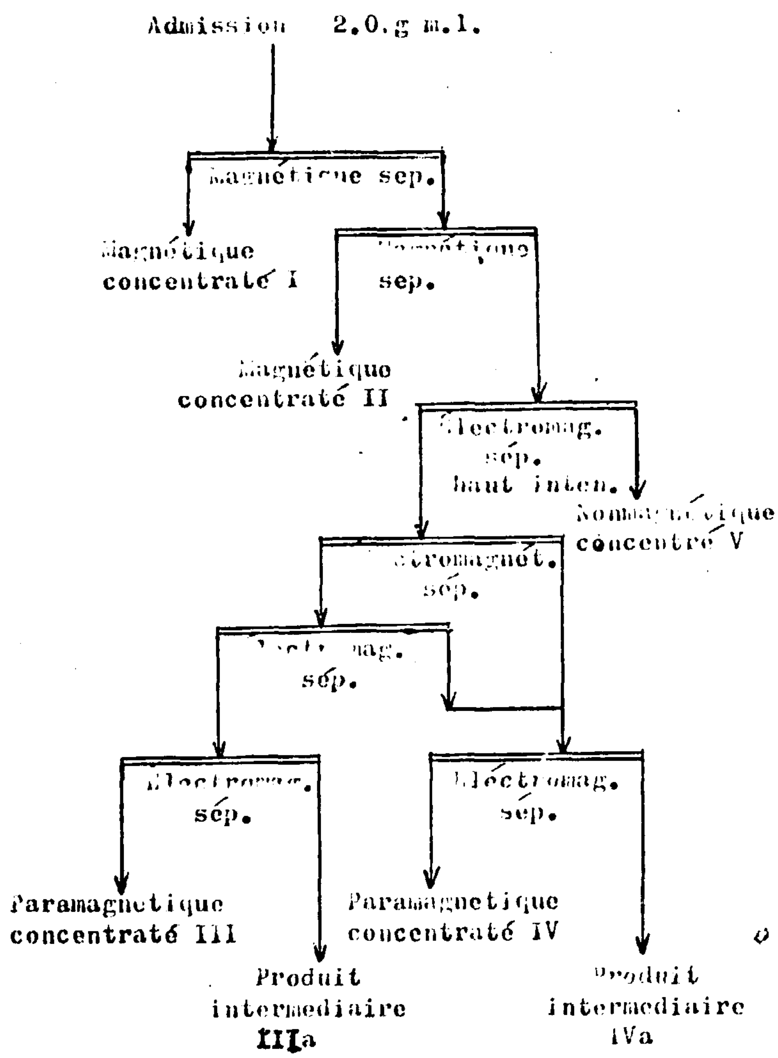
Procédure utilisé dans la première étape de l'examination minéralogique

Fig.89



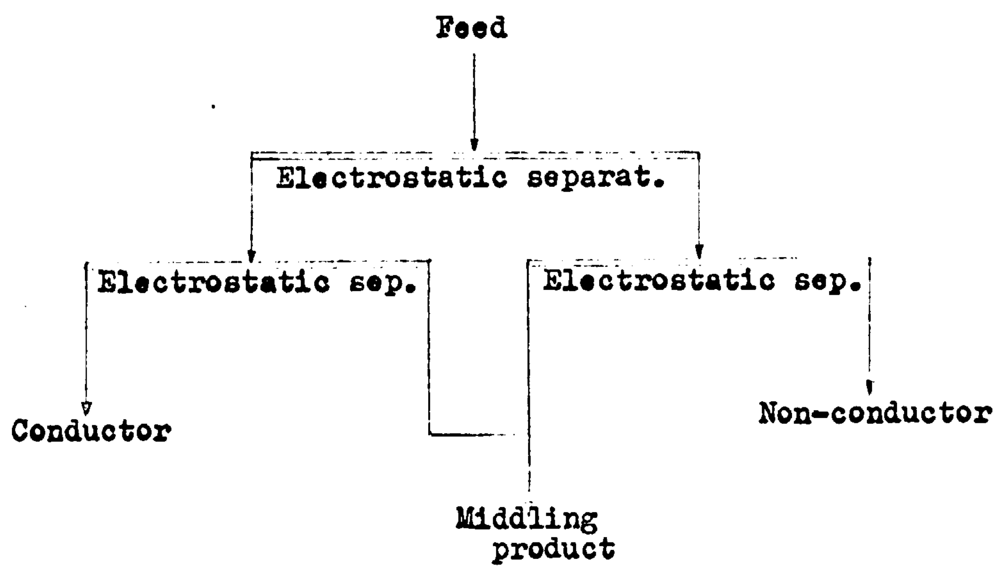
Flowsheet of the magnetic and electromagnetic separation

Fig. 89



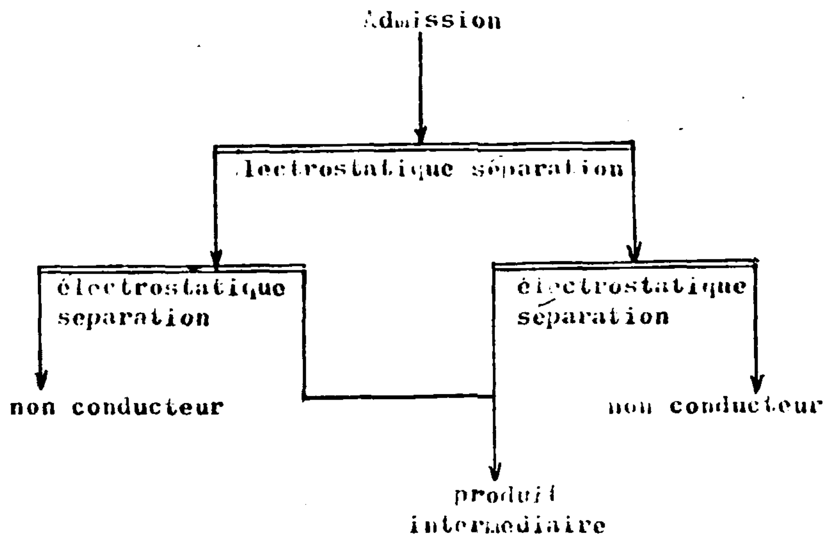
Procédure utilisée dans la séparation magnétique et electromagnétique

Fig.90



Flowsheet of the electrostatics separation

Fig. 90



Procédure utilisée dans la séparation électrostatique

Courbe cumulative des échant. T1/7 et T1/8
Cumulative curve of the samples T1/7 and T1/8

Fig. 91

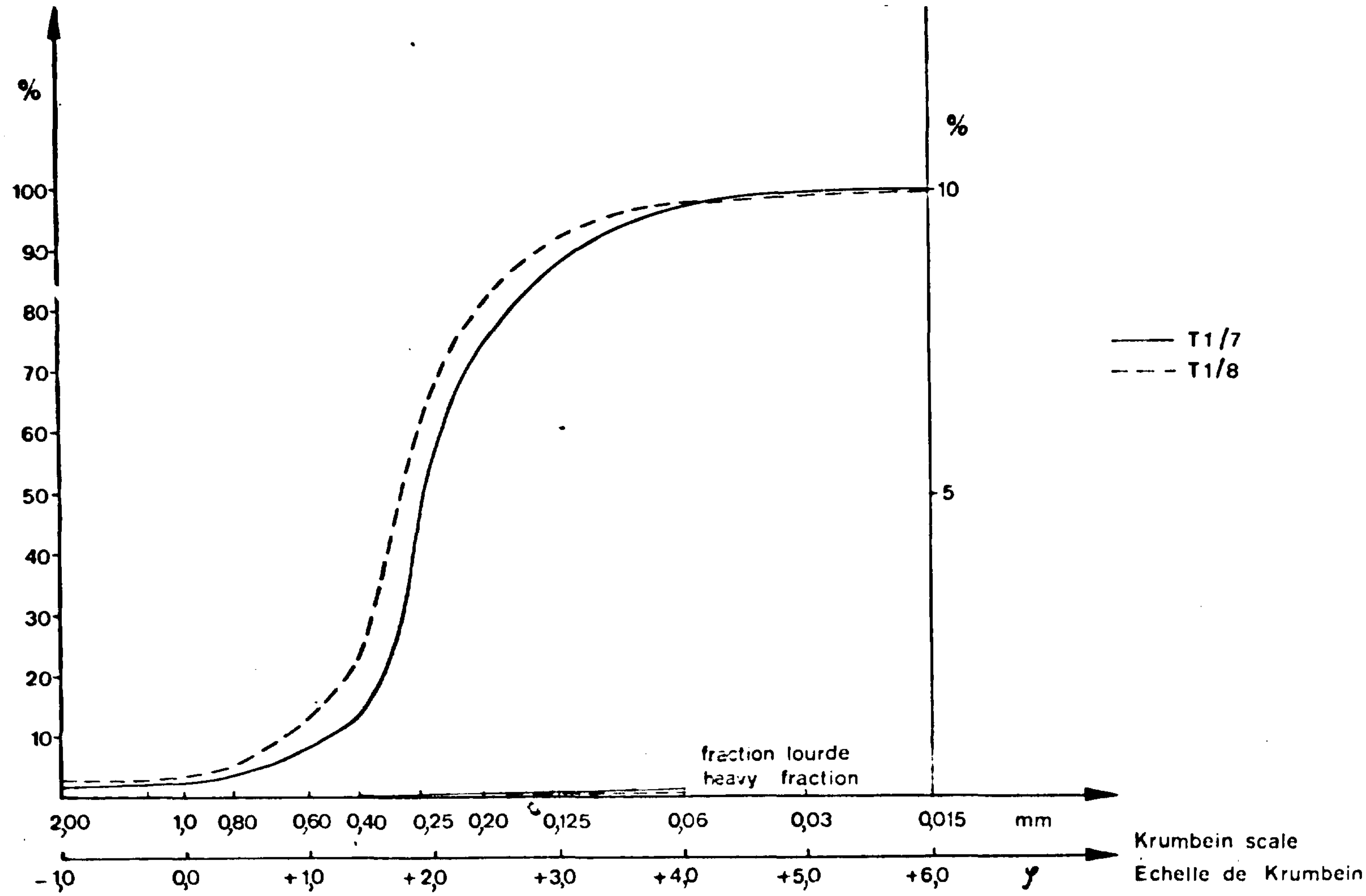


Fig. 92

Courbe cumulative des échant. T4/1 et T4/2
Cumulative curve of the samples T 4/1 and T 4/2

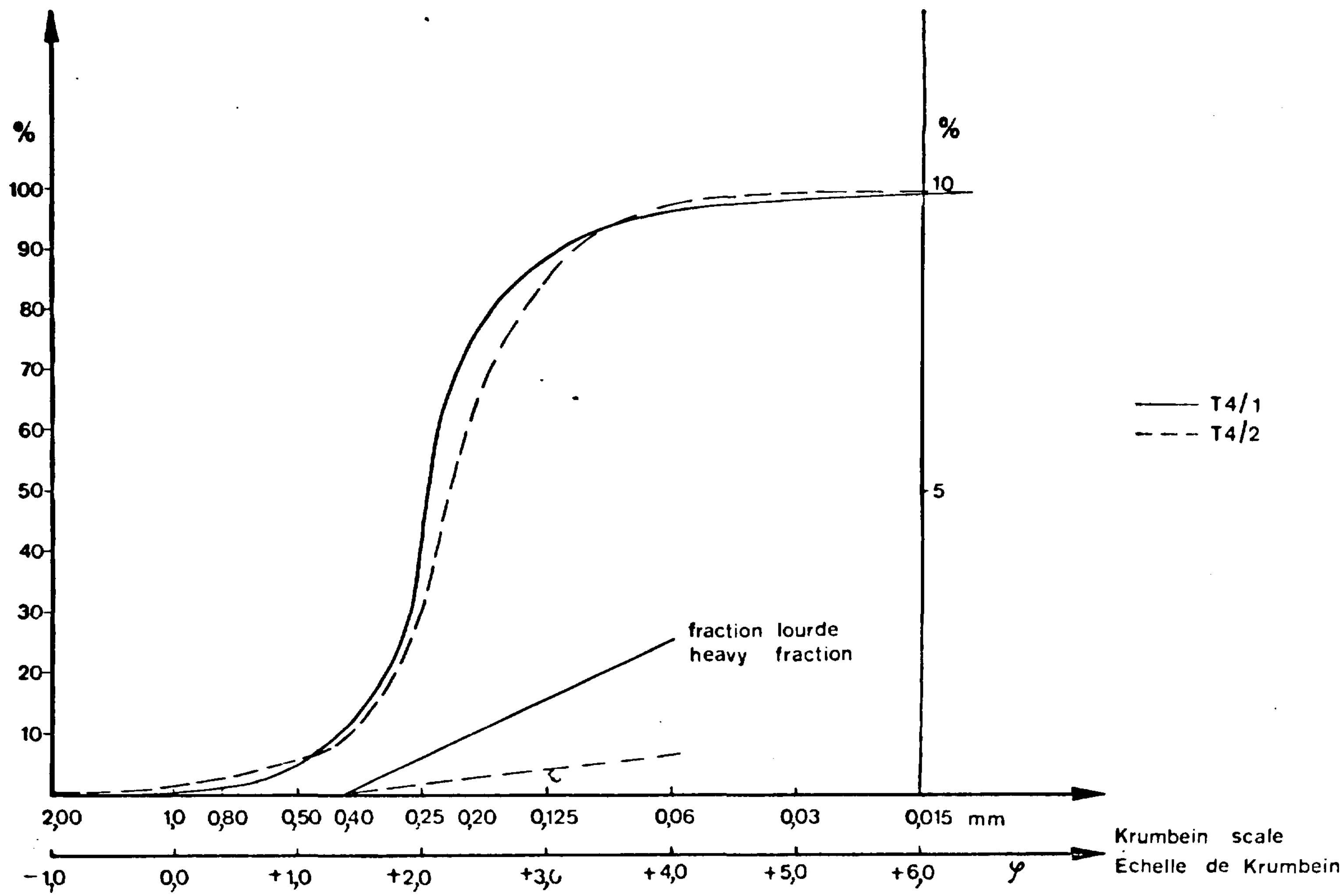


Fig. 93

Coefficient de classement SA contre mediane GSS pour sables des sondages T–10, T–11 et T–12

Sorting coeficient SA versus median GSS for sands from boreholes T–10, T–11 and T–12

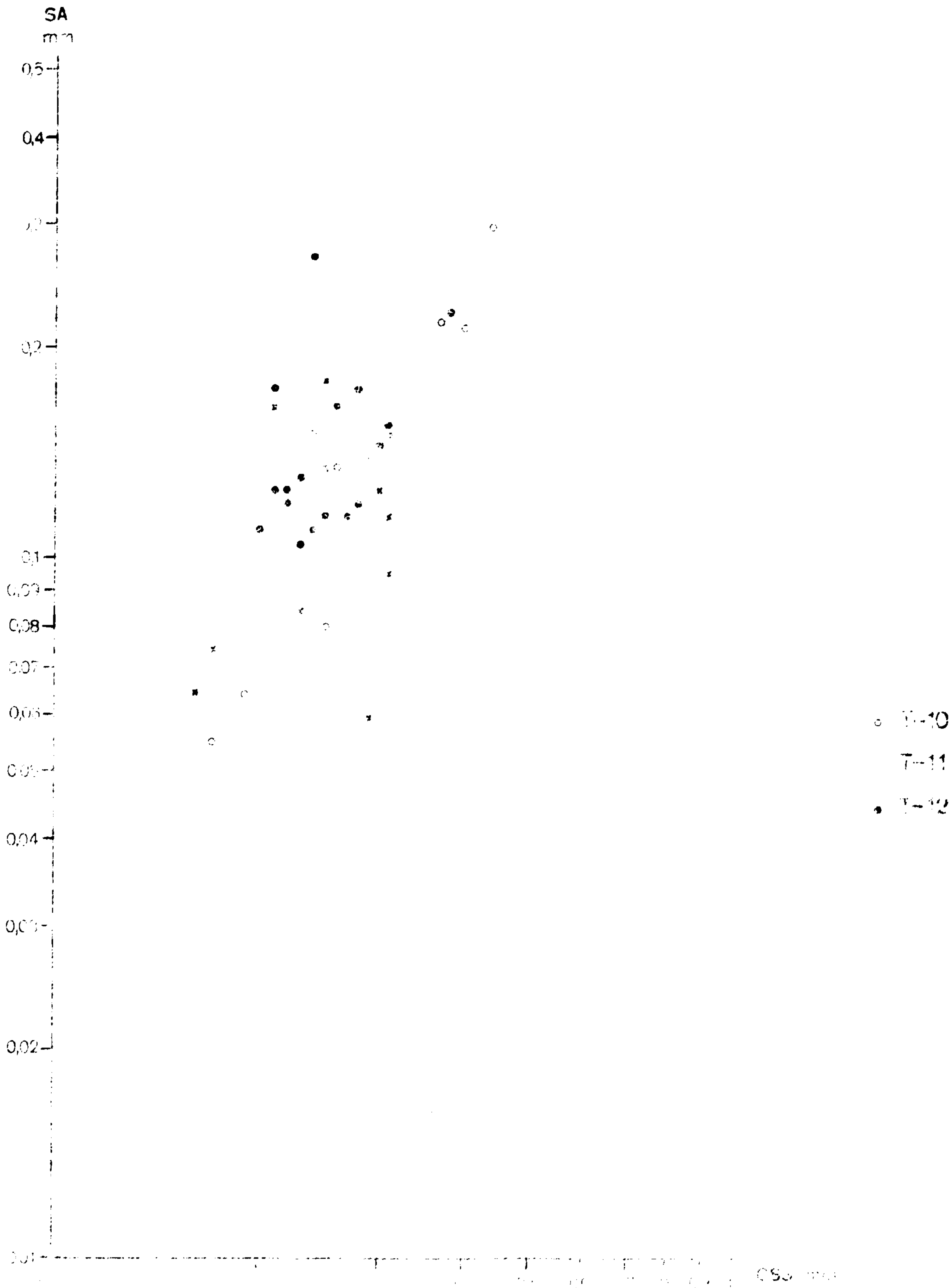


Fig. 94

Courbe cumulative des échant. B7/1 et B7/2
Cumulative curve of the samples B7/1 and B7/2

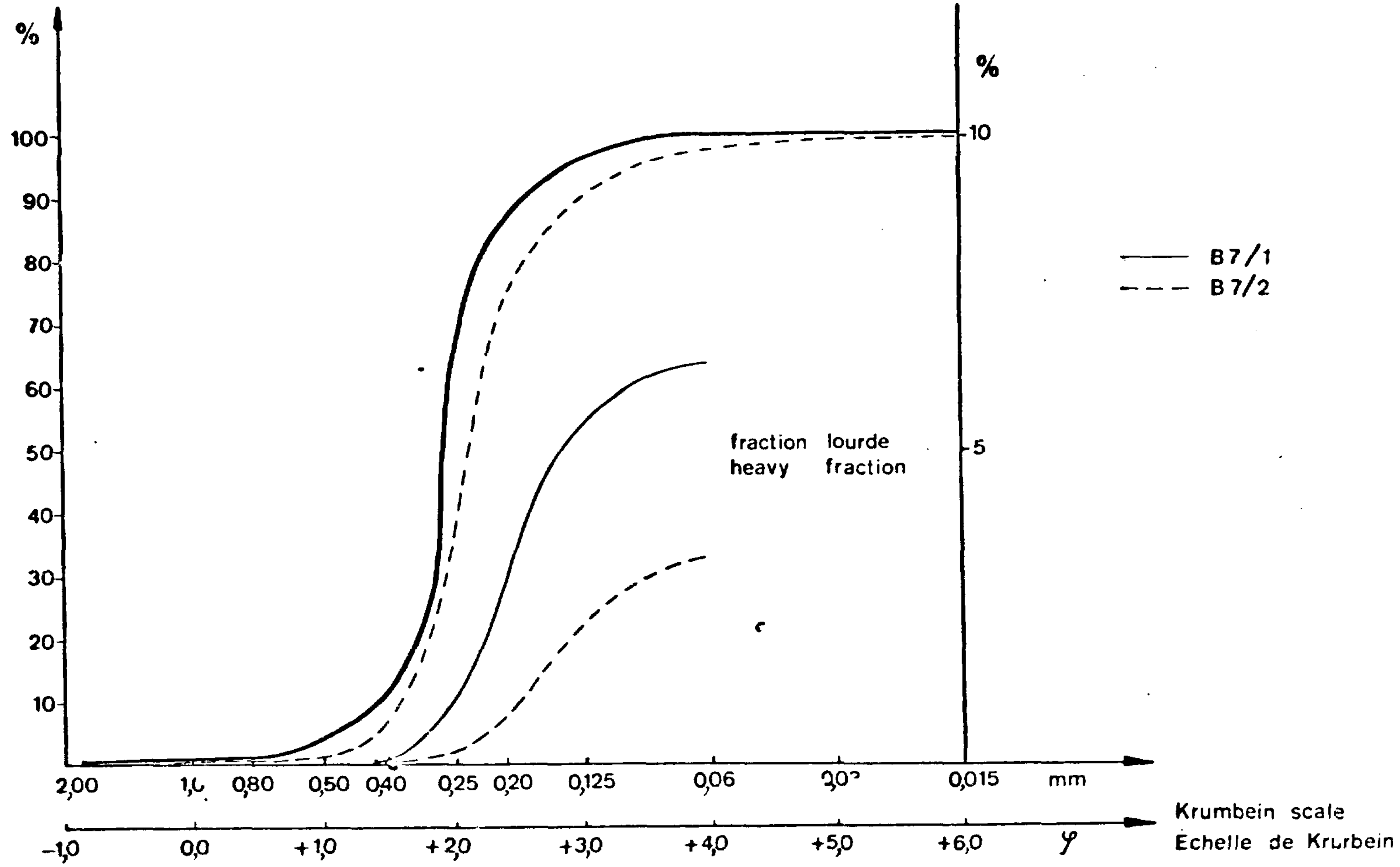


Fig. 95

Courbe cumulative des échant. B9/9 et B9/10
Cumulative curve of the samples B9/9 and B9/10.

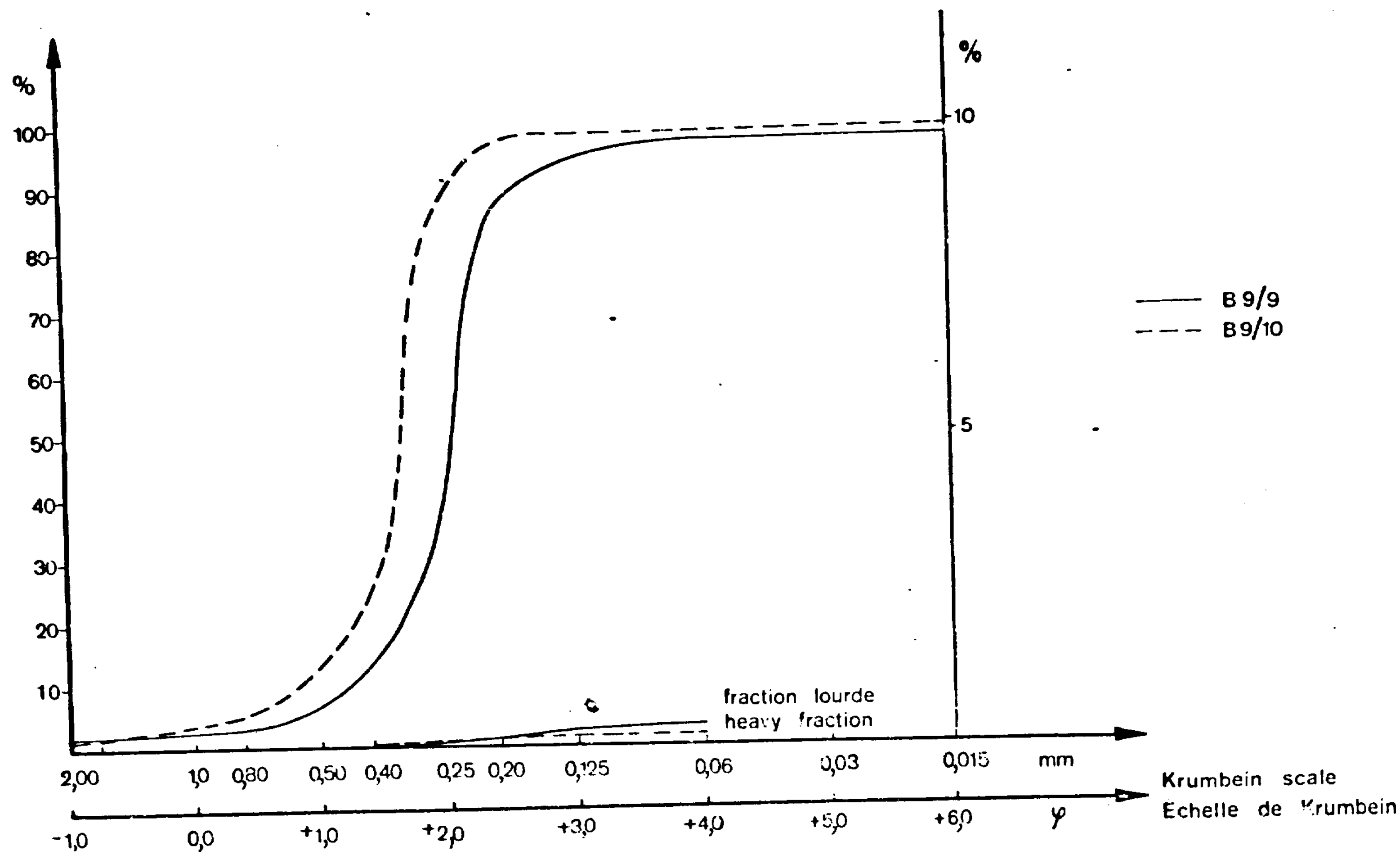


Fig. 96

Coefficient de classement SA contre mediane GSS pour sables des sondages B-1, B-2 et B-3

Sorting coeficient SA versus mediane GSS for sands from boreholes B-1, B-2, and B-3

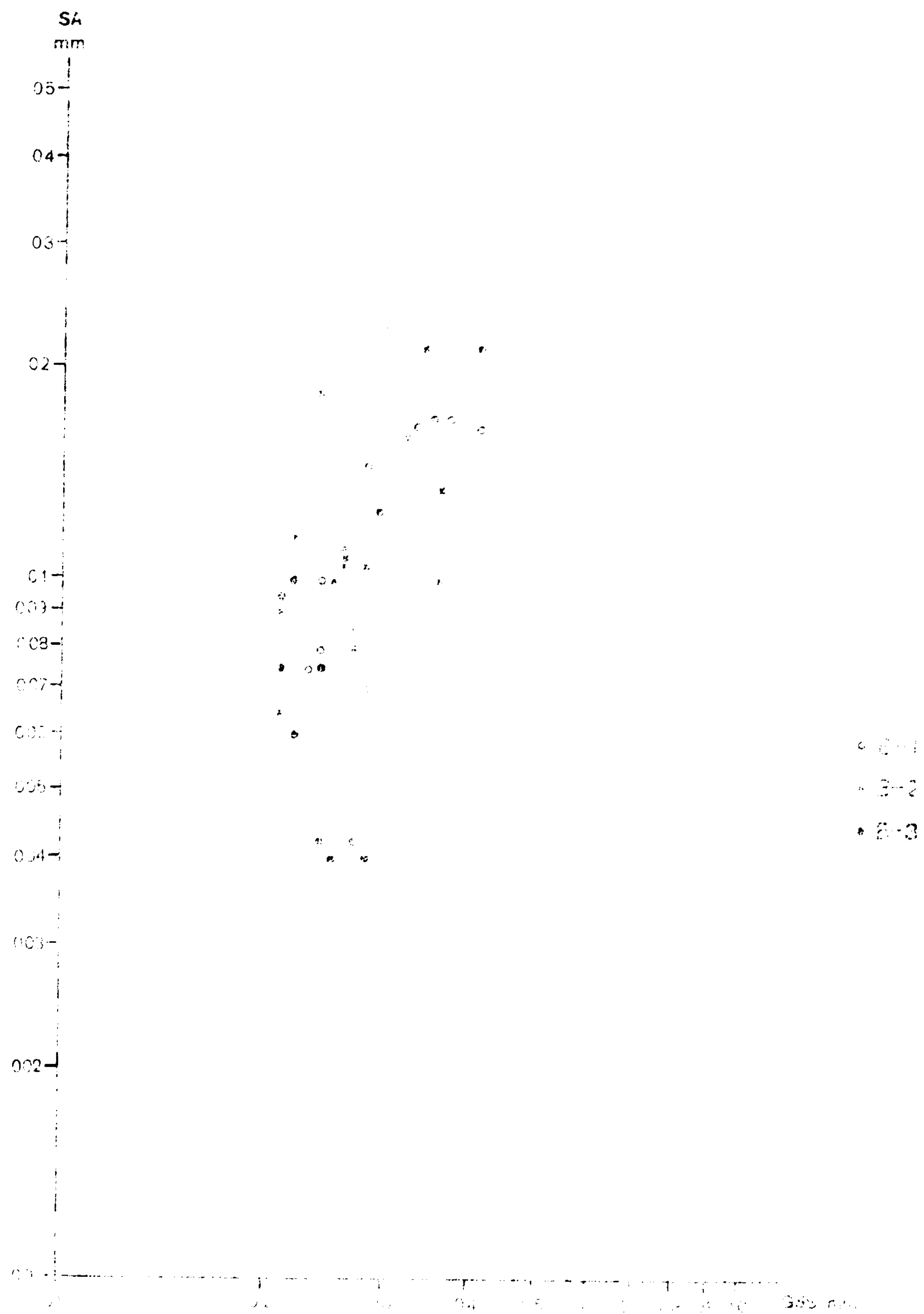
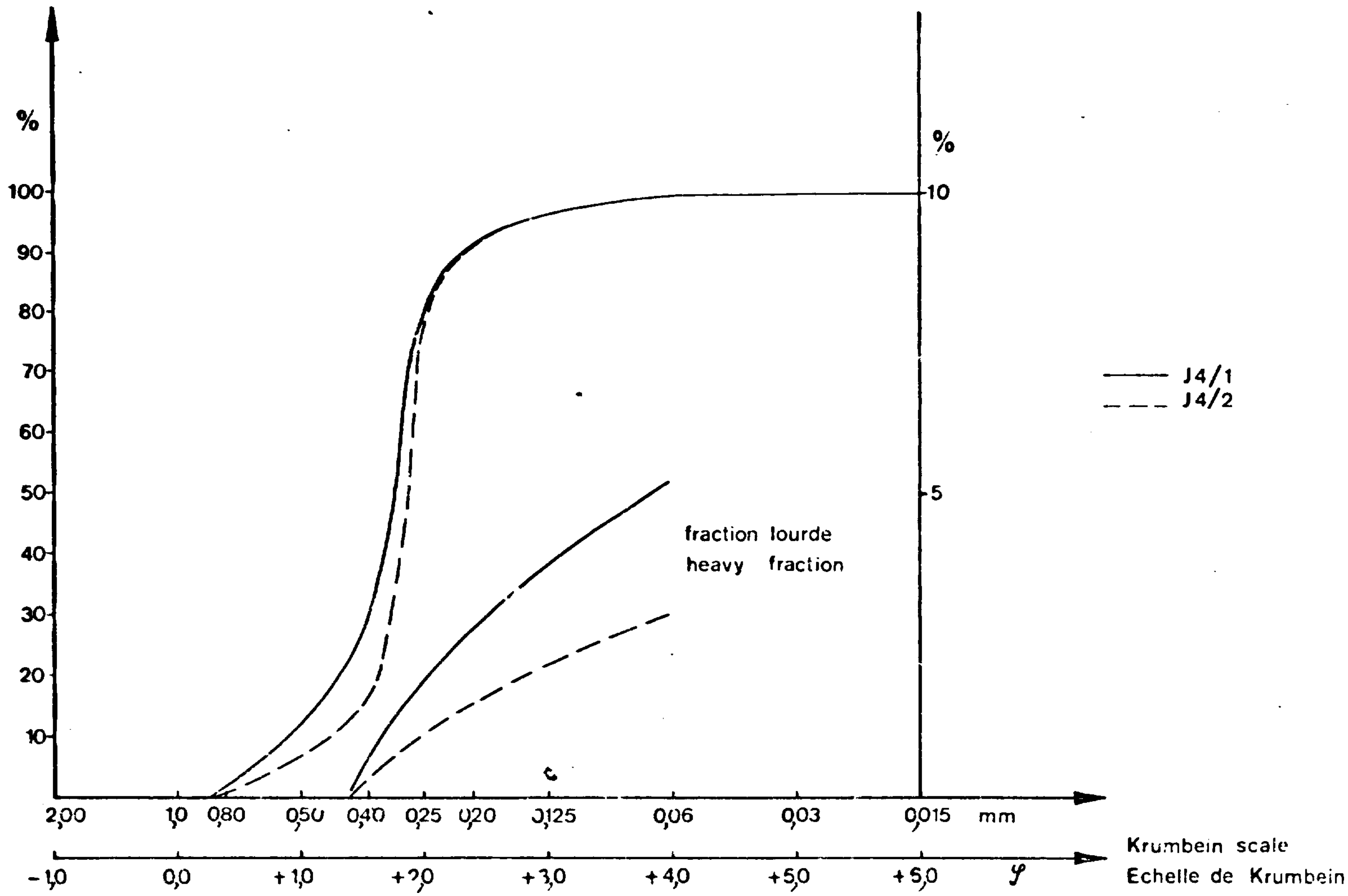


Fig 97

Courbe cumulative des échant J4/1 et J4/2
Cumulative curve of the samples J4/1 and J4/2



Courbe cumulative de échant. J 6/13
Cumulative curve of the samples J 6/13

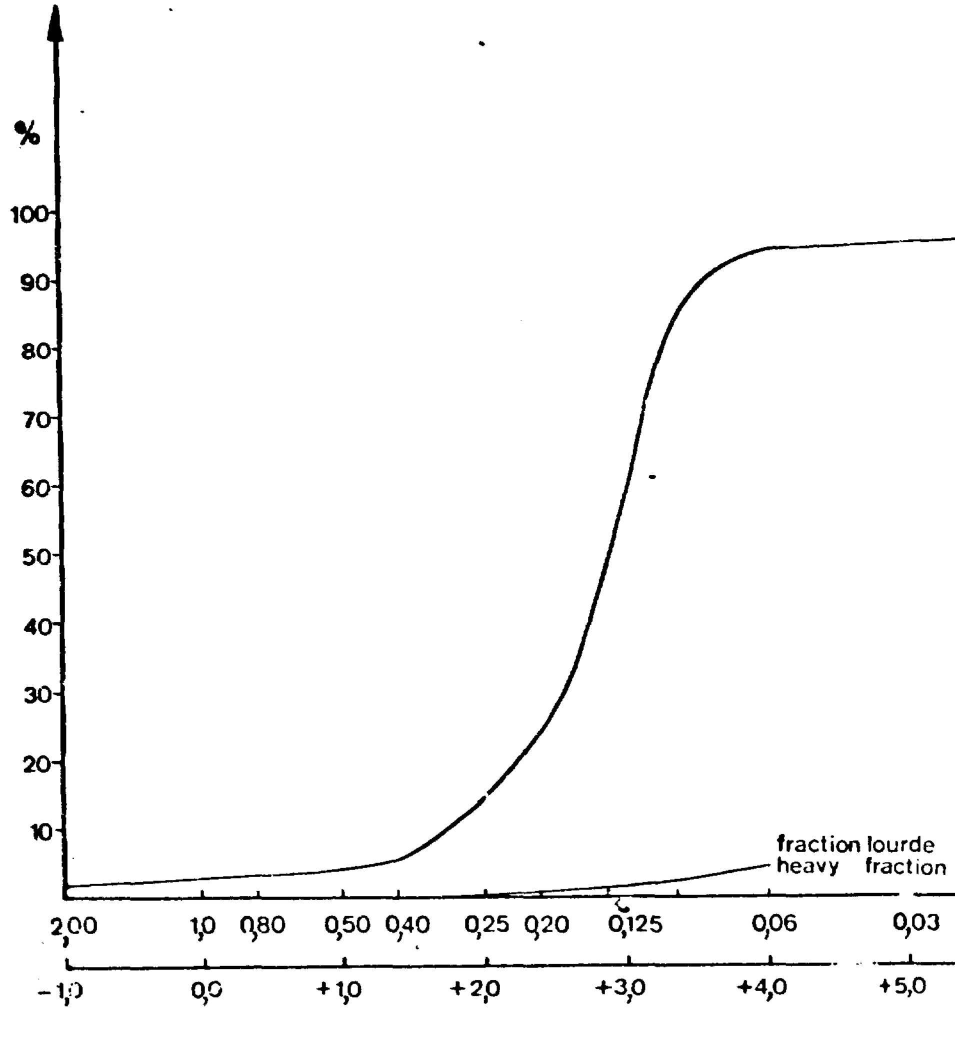
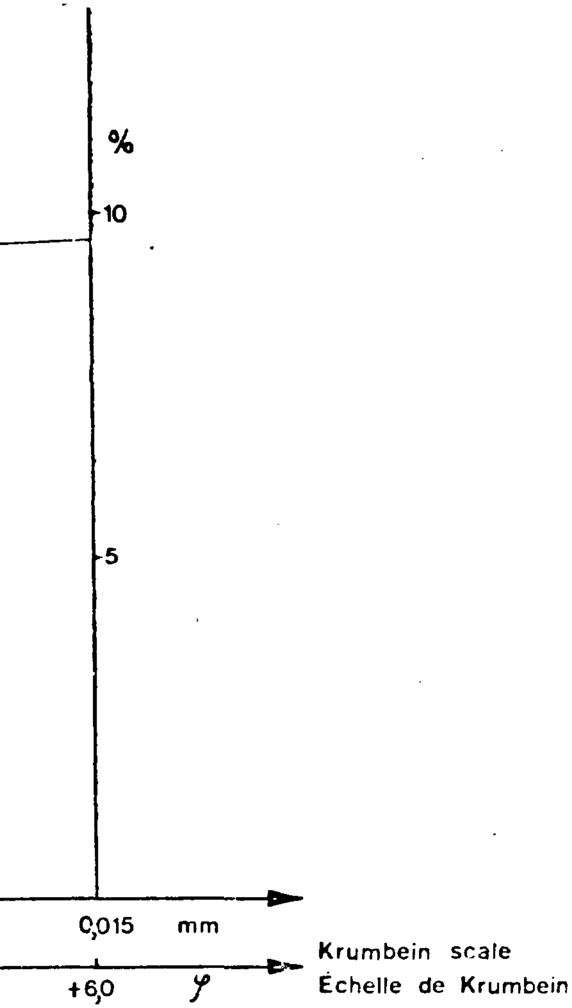


Fig. 98



Coefficient de classement SA contre mediane GSS pour sables des sondages J-1, J-2 et J-3

Sorting coefficient SA versus median GSS for sands from boreholes J-1, J-2 and J-3

Fig. 99

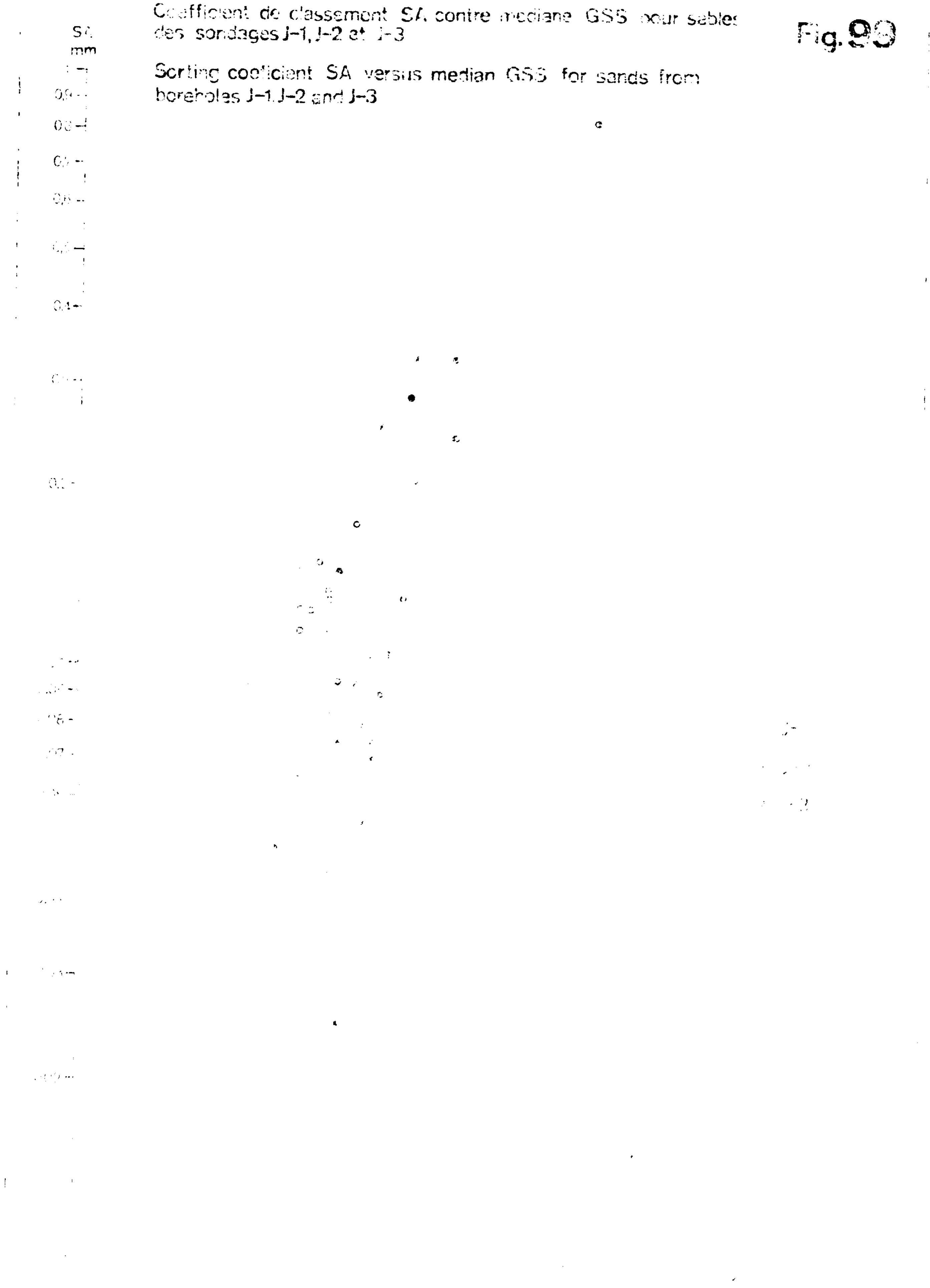
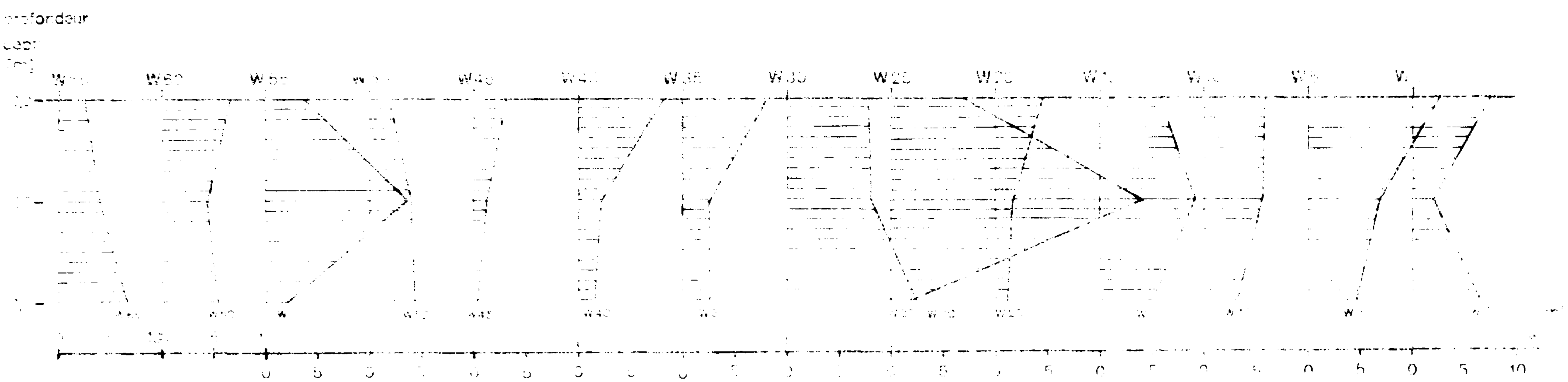


Fig.100

Contenue des minéraux lourds dans la partie occidentale du profil radiométrique R 8/7

Heavy minerals content in the W part of the radiometric profile R 8/7



Contenue des minéraux lourds dans la pa

Heavy minerals content in the E part of

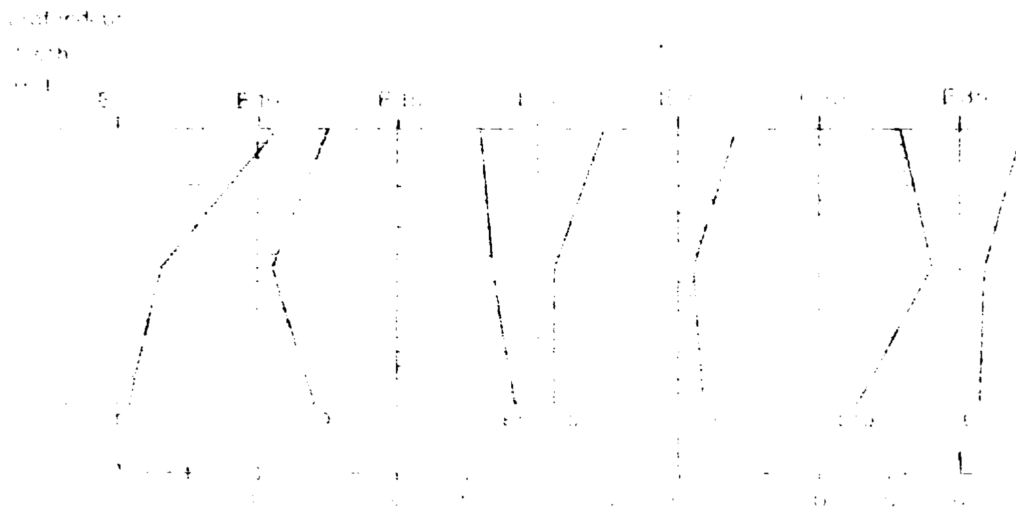
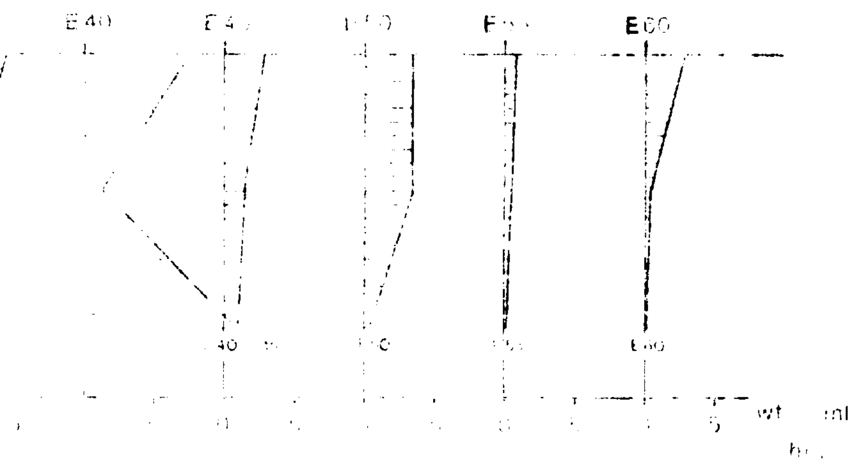


Fig. 10 I

...rtie orientale du profile radiometrique R 8/7

...the radiometric profile R8/7



Comparaison de radioactivité sur terrain (a) et mesures de laboratoire des échantillons de différents profondeurs (b,c,d) partie occidentale du profil R 8/7

Fig. 1.22

Field radioactivity (a) as compared with that of the laboratory samples from different depth (b,c,d) – W part of radiometric profile R 8/7

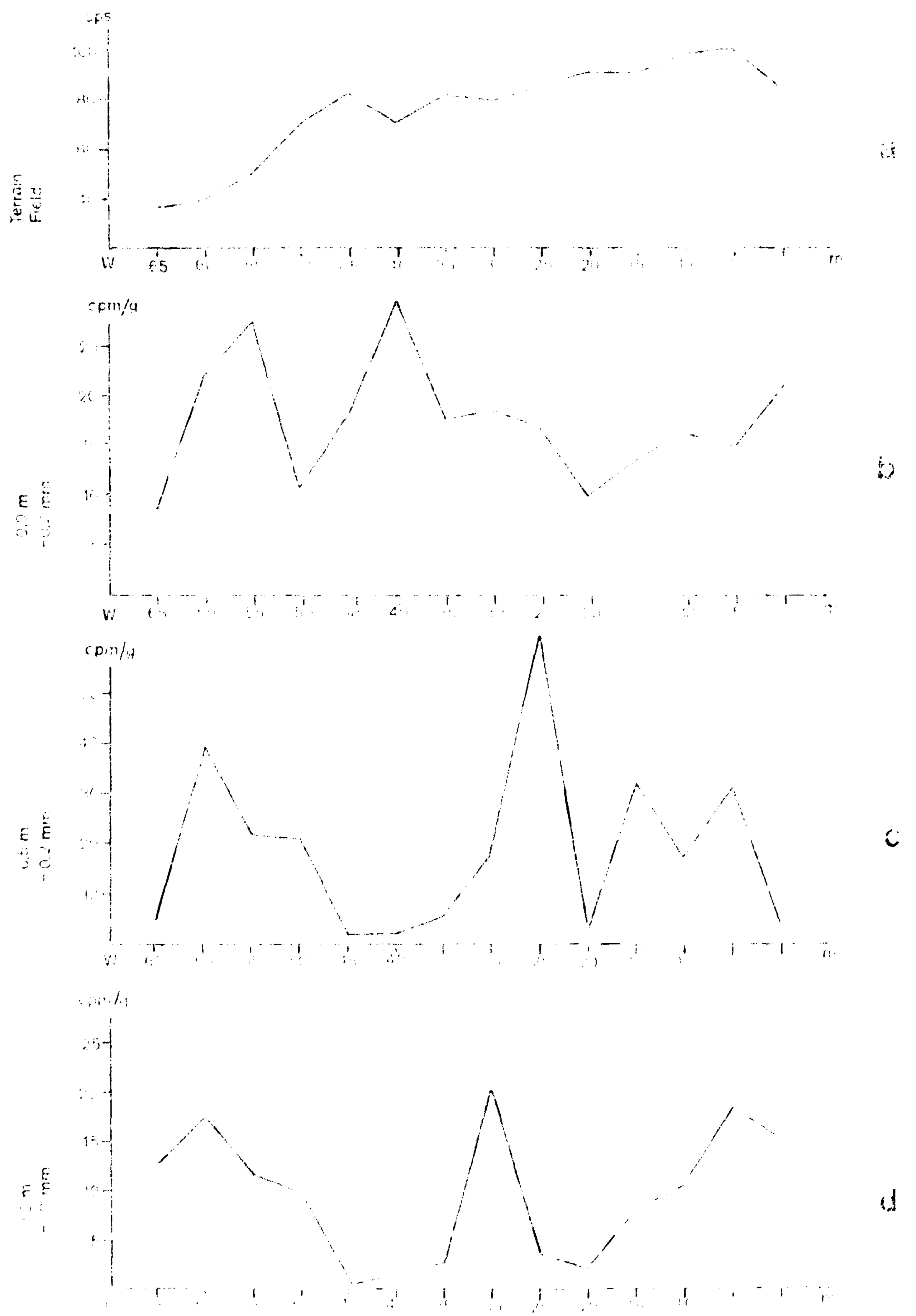
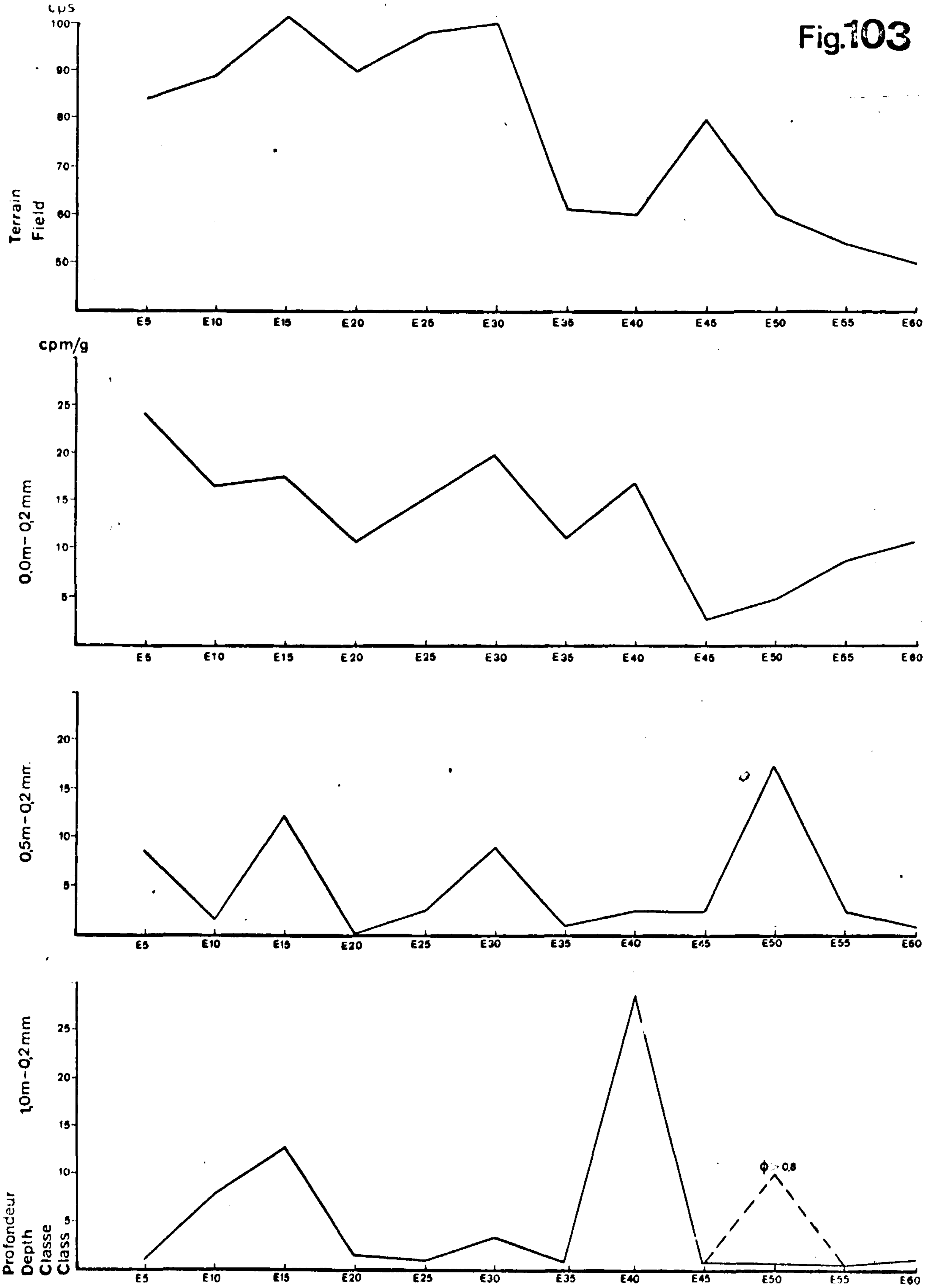


Fig.103



Comparaison de radioactivité sur terrain(a) et mesures de laboratoire des échantillons de diférents profondeurs (b,c,d) partie orientale du profil R8/7

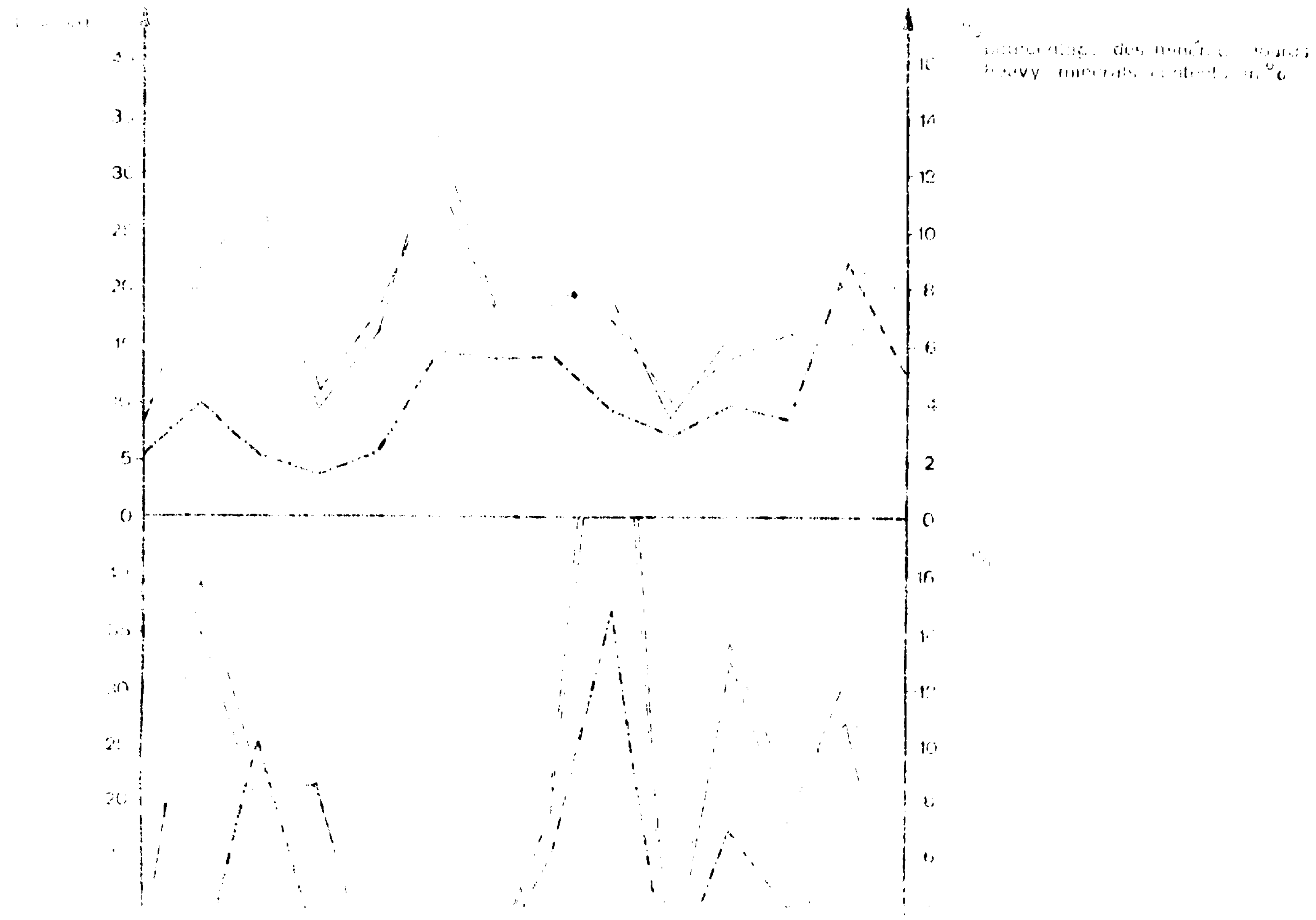
Field radioactivity (a) as compared with that of the laboratory samples from different depth (b,c,d) E part of radiometric profile R8/7

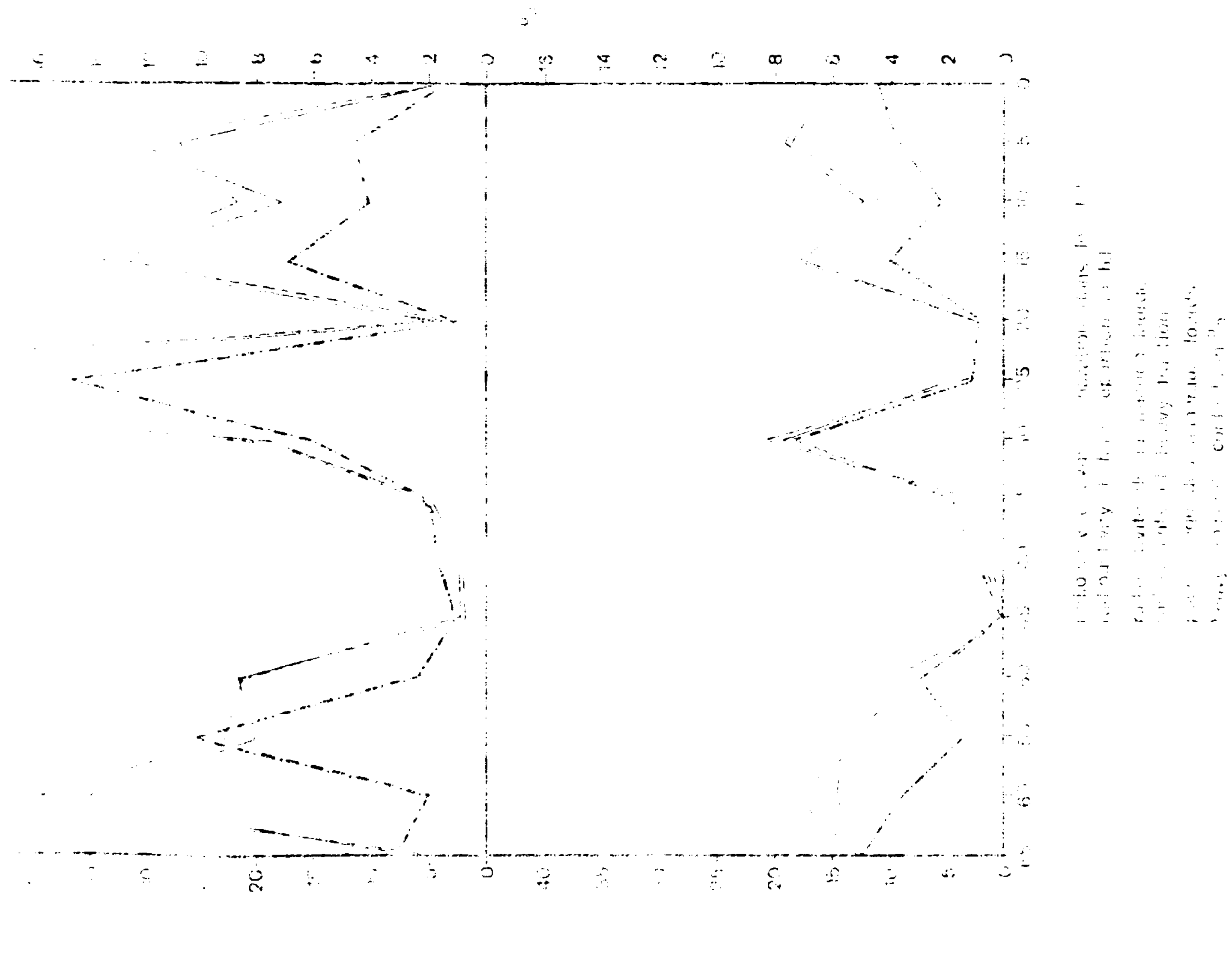
Fig. 104

Comparaison de teneur des minéraux lourds dans les échantillons et leur radioactivité partie occidentale du profil R 8/7

Comparison of heavy minerals content of the samples and their radioactivity, western part of the profile R 8/7

SECTION 1



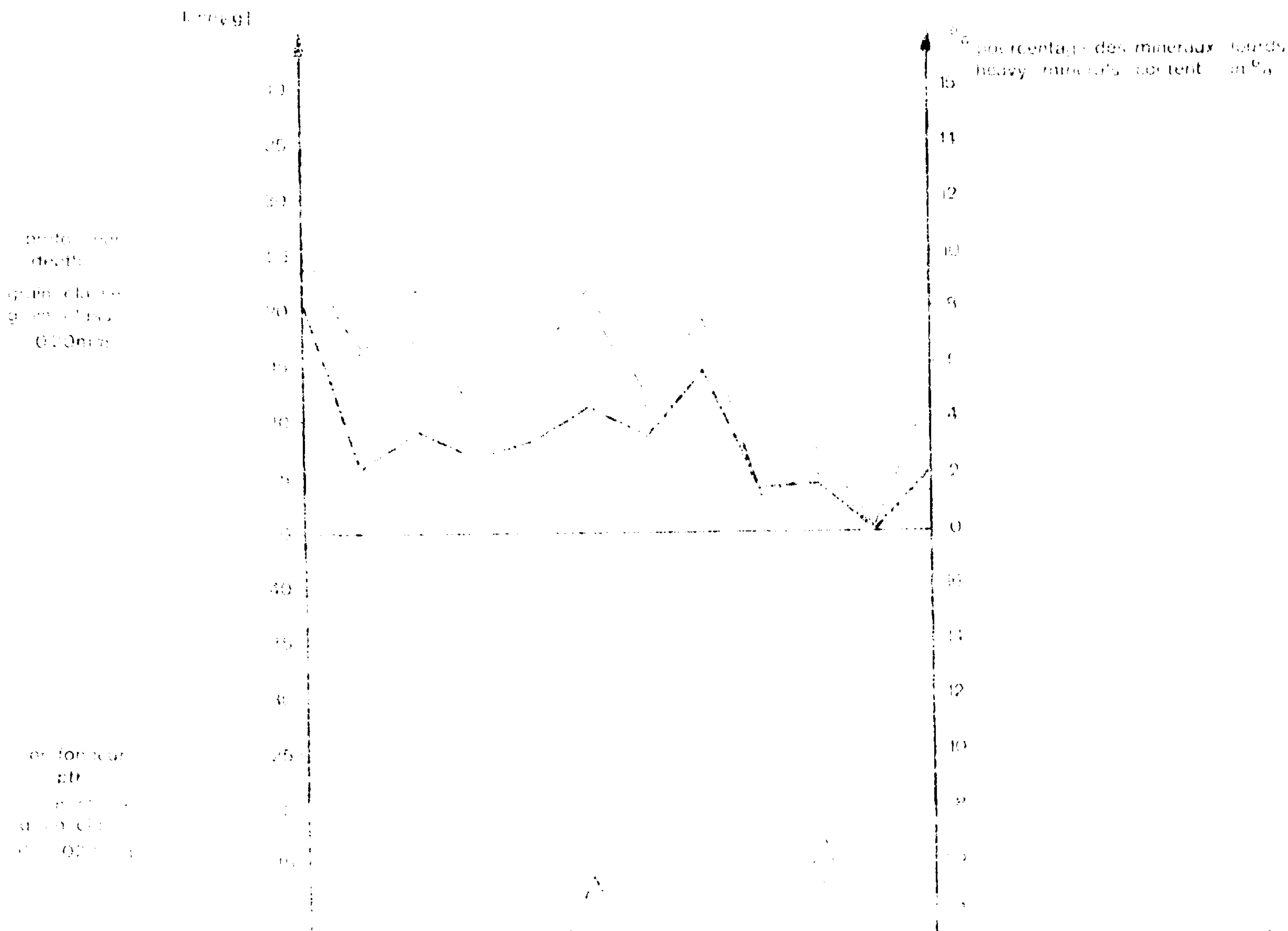


SECTION 2

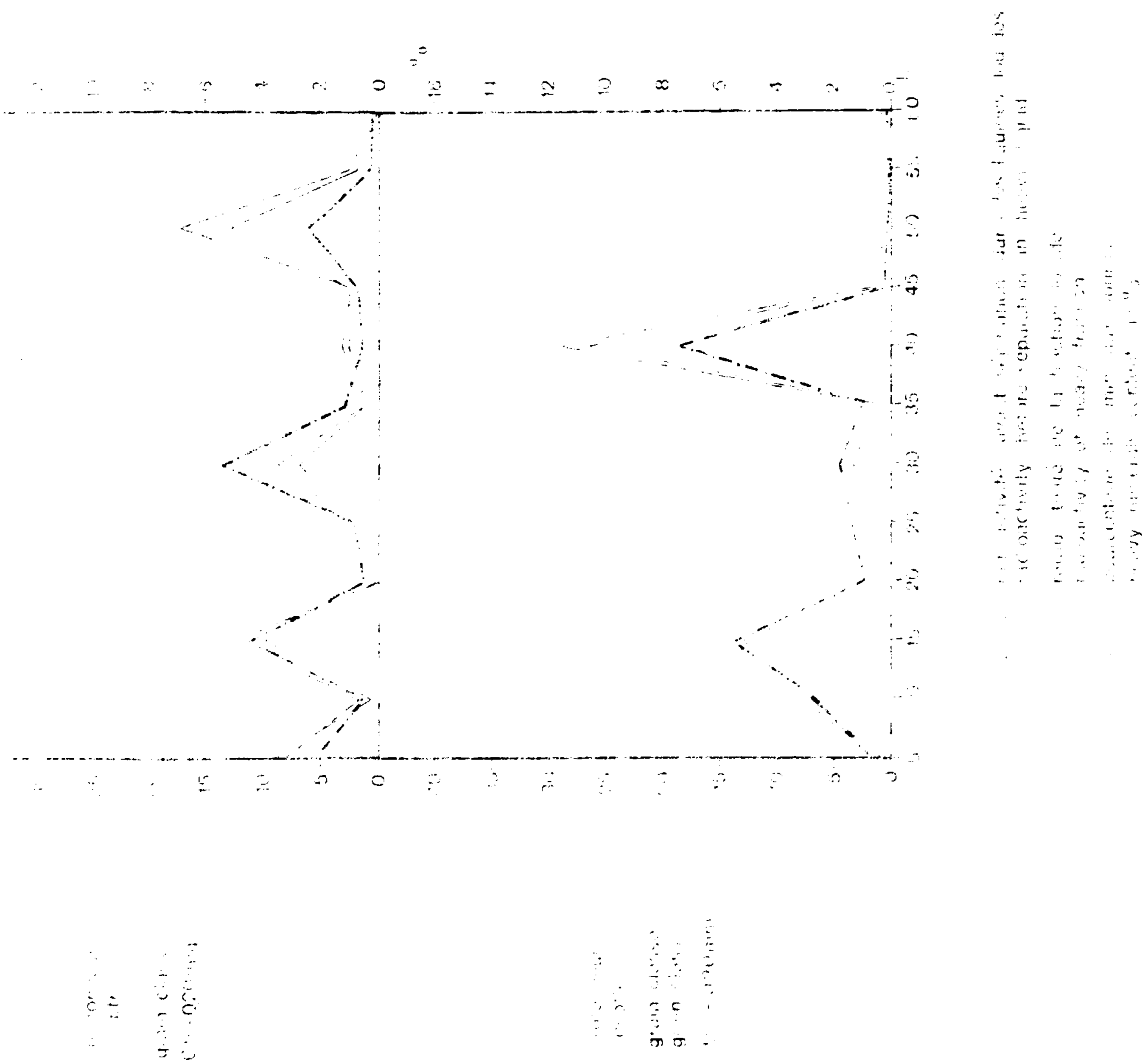
Fig. 105

Comparaison de teneur des minéraux lourds dans les échantillons et leur radioactivité partie orientale du profil R 8/7

Comparison of heavy minerals content of the samples and their radioactivity eastern part of the profile R8/7



SECTION 1



SECTION 2

Fig. 103

Comparaison de radioactivité sur terrain et teneur des minéraux lourds dans la partie occidentale du profil R8/7

Comparaison of the field radioactivity with the heavy minerals content from the western part on the profile R8/7

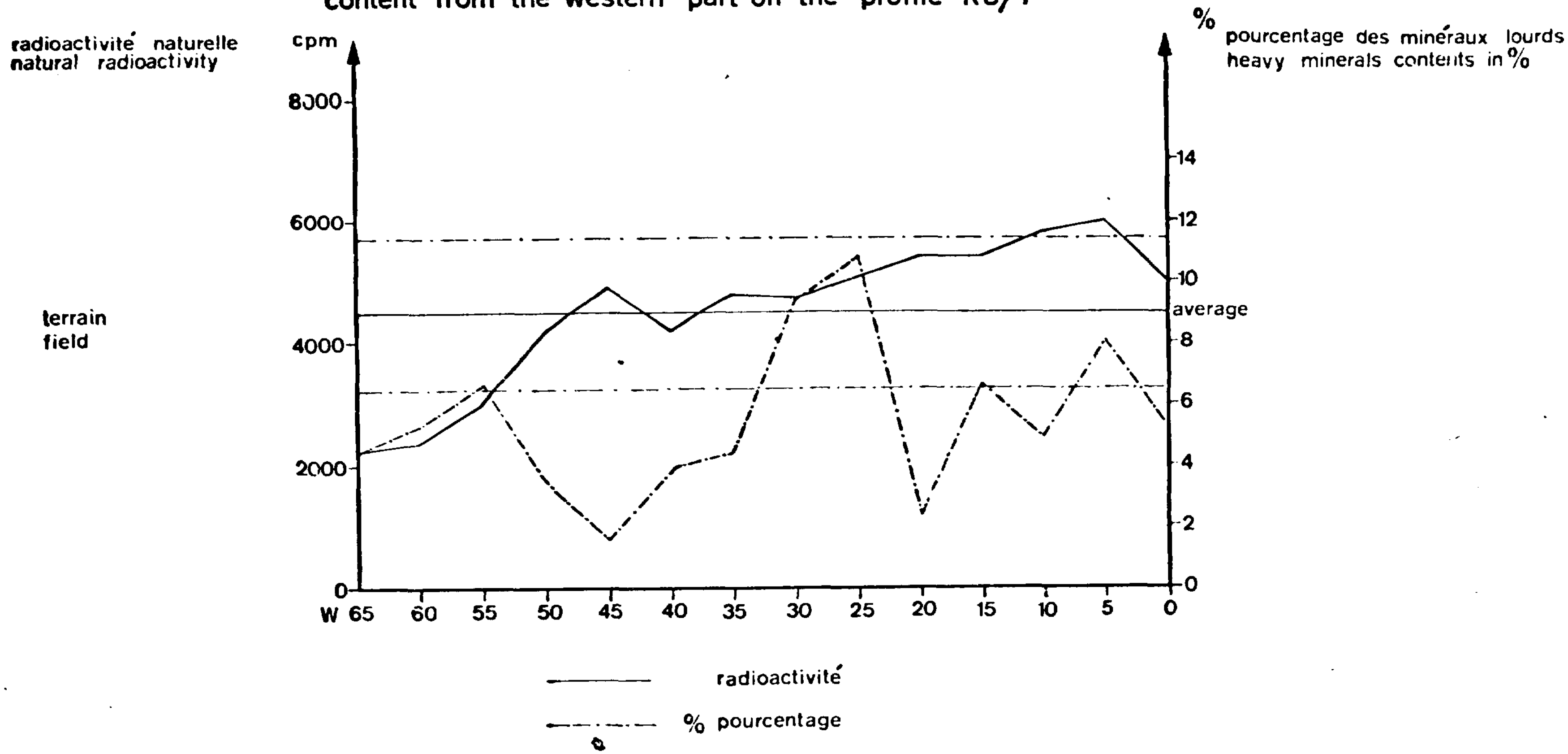
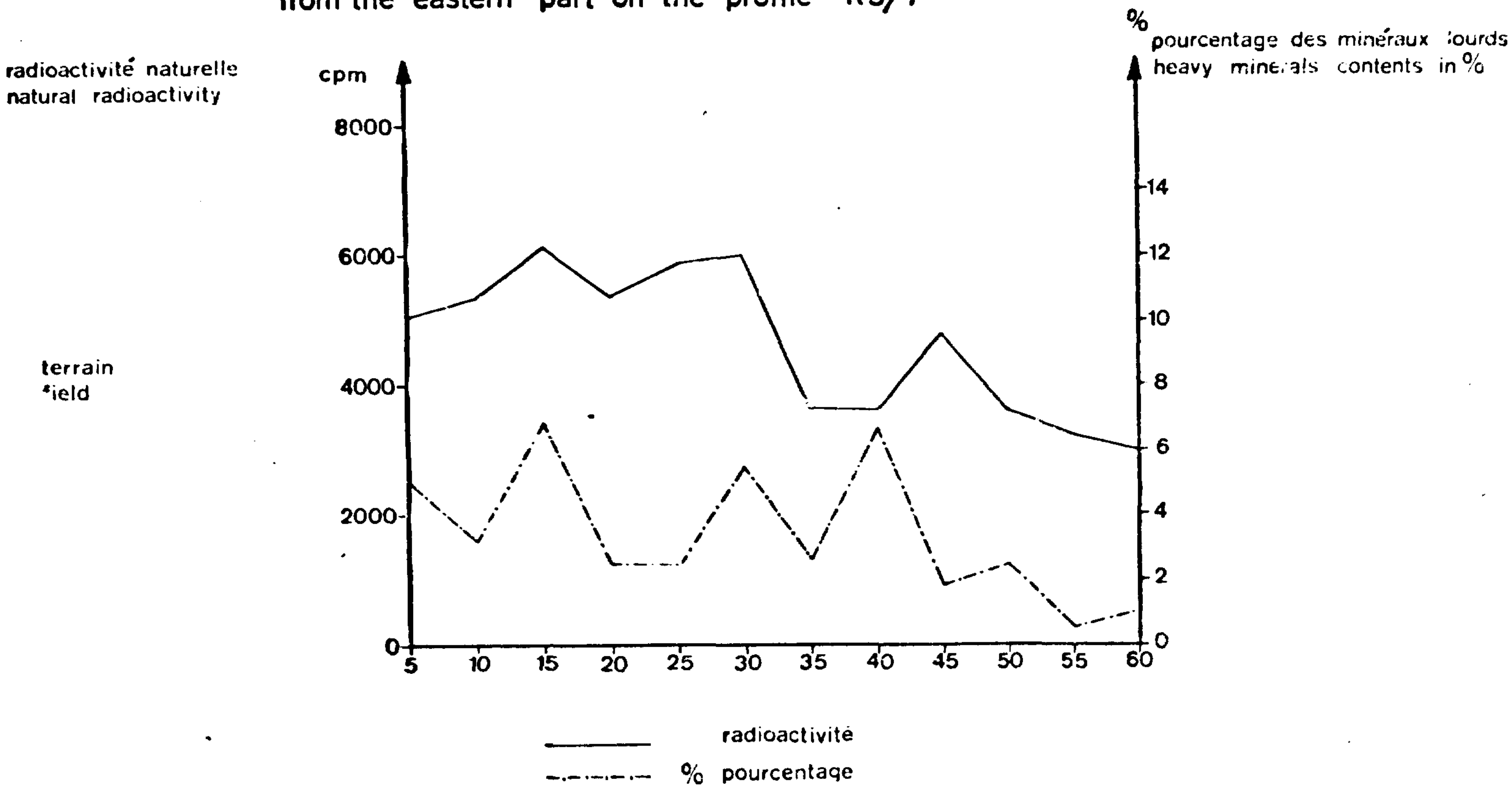


Fig. 107

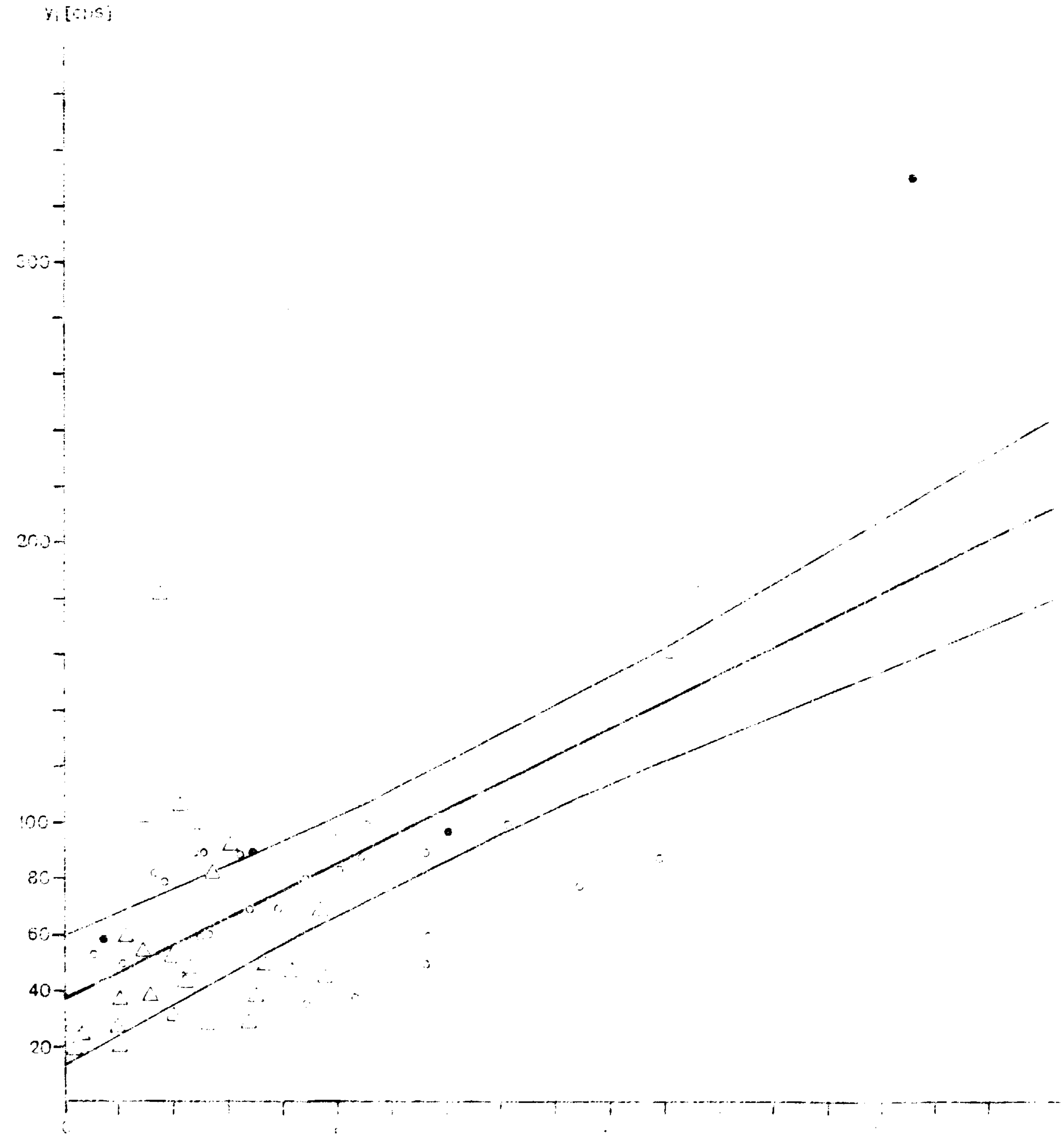
Comparaison de radioactivité sur terrain et teneur des minéraux lourds dans la partie orientale du profil R8/7

Comparaison of the field radioactivity with the heavy minerals content from the eastern part on the profile R8/7



La correlation de la radioactivité sur terrain et teneur moyenn
Profil radiométrique R8/7 (◦) dune El Msid. (◦) et fora

Medium of heavy minerals content correlated with natural
Radiometric profile R8/7 (◦) dune El Msid (◦) and Bor



SECTION 1

Fig. 108

et teneur moyenne en minéraux lourds
Msid. (∘) et forages (△)

ated with natural radioactivity in the field
Msid (∘) and Boreholes (△)

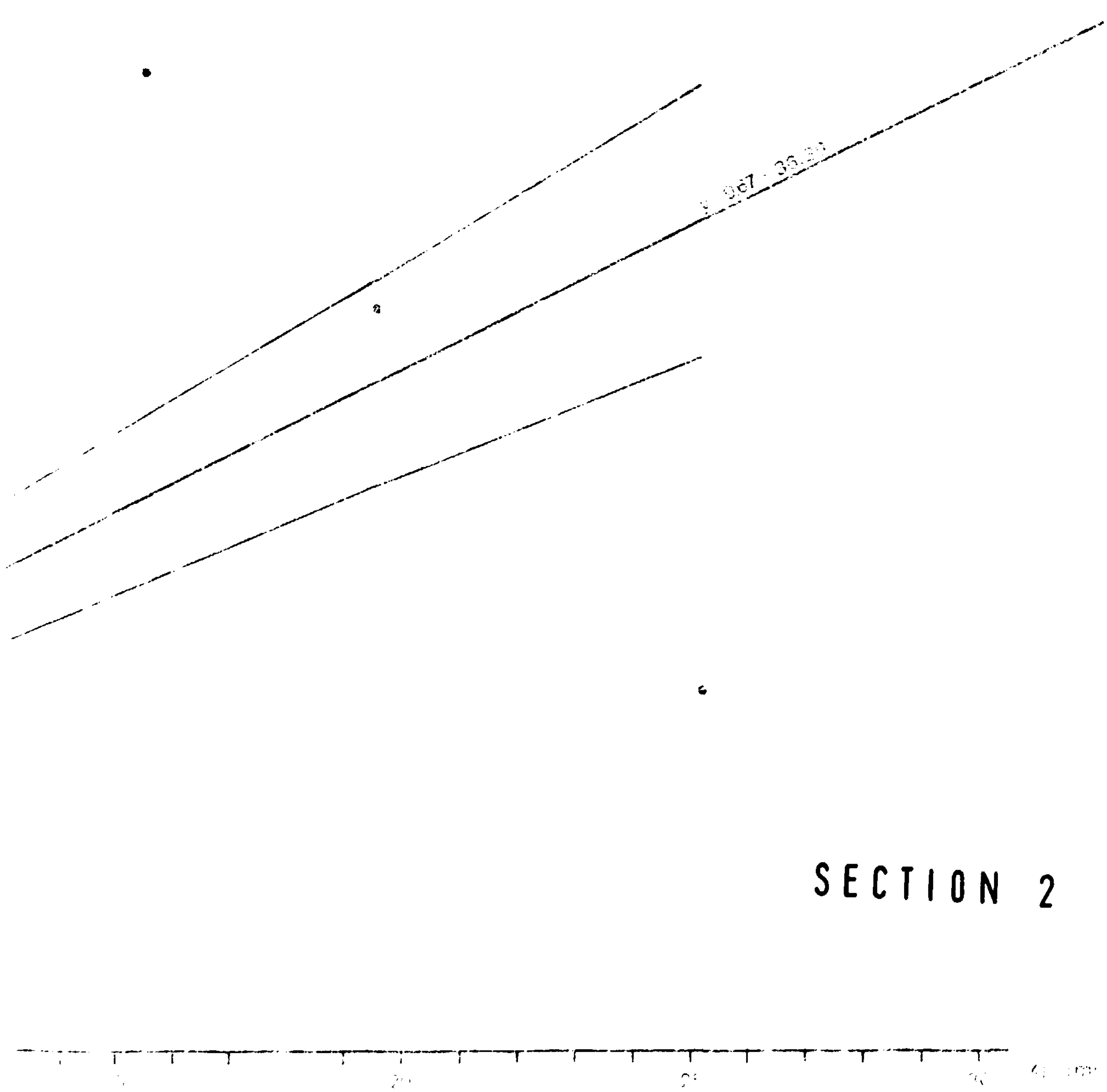
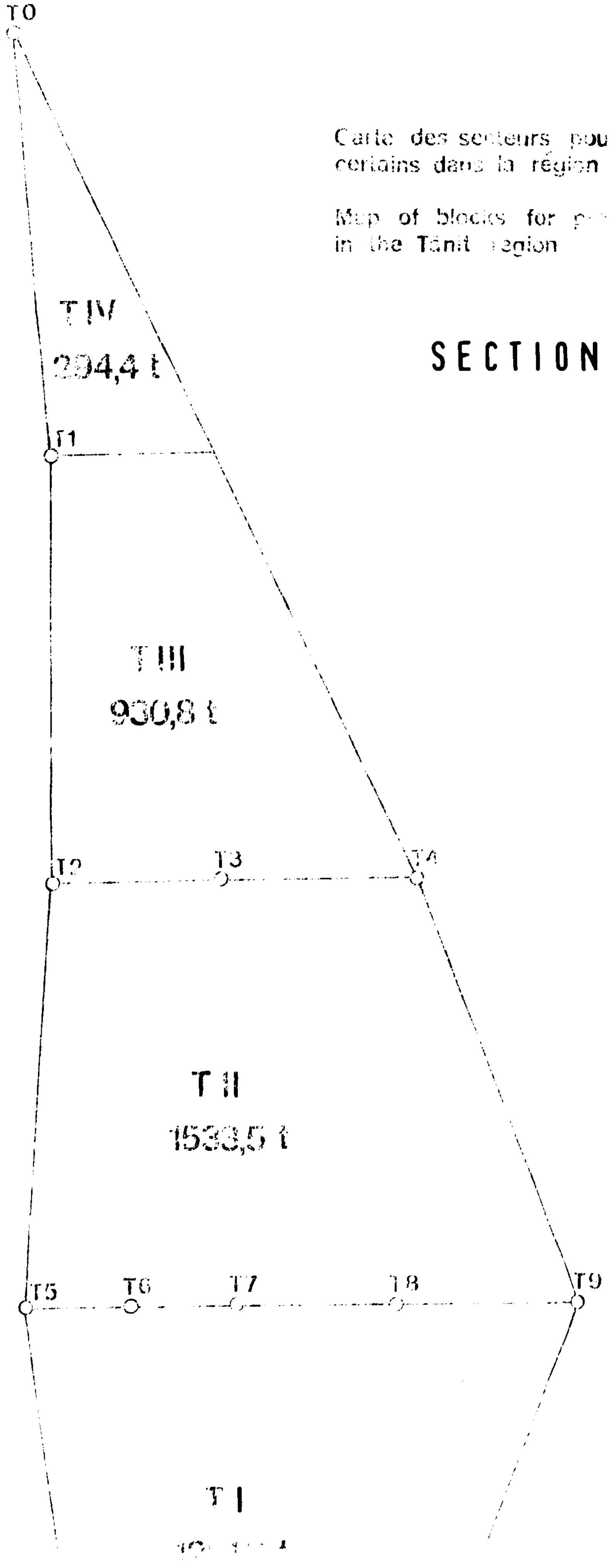


Fig 109

Carte des secteurs pour calculation des réserves certains dans la région de Tânit

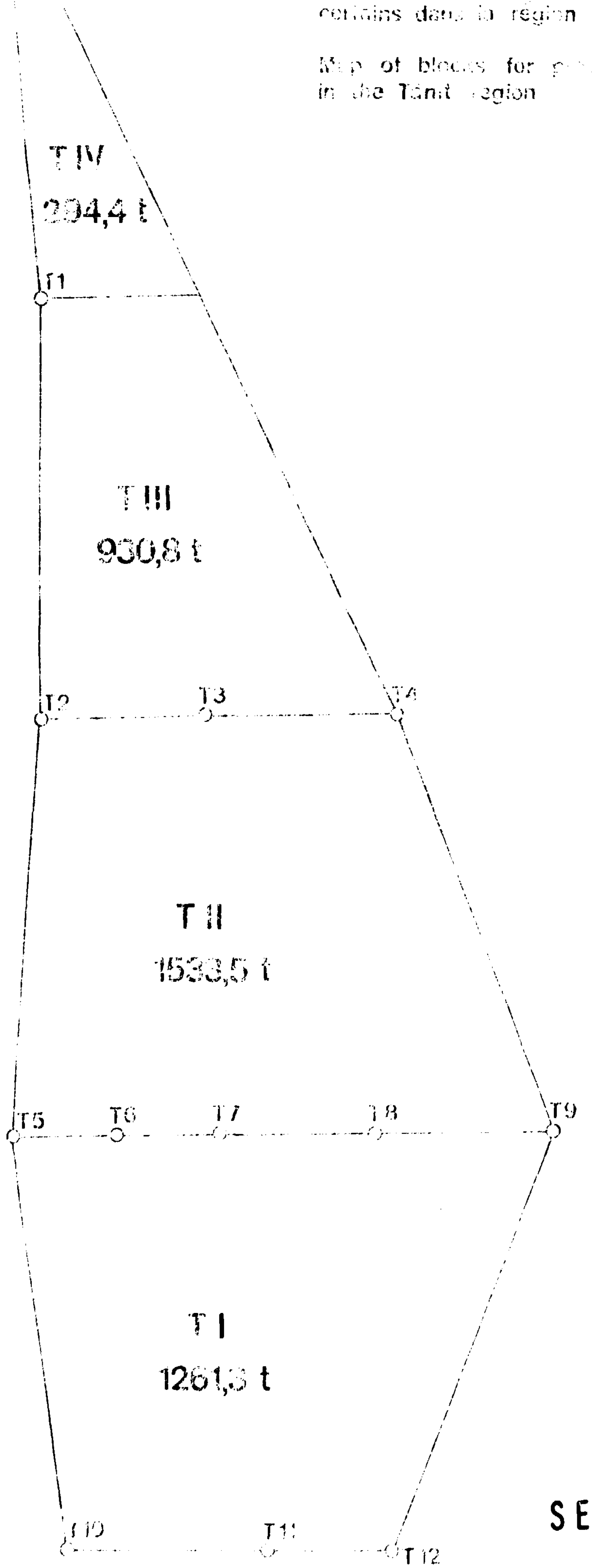
Map of blocks for [illegible] reserves calculation in the Tânit region

SECTION 1



contenus dans la région de Tanit

Map of blocks for p... reserves calculation in the Tanit region



SECTION 2

Fig. 110

Carte des secteurs pour calculation des réserves certains dans la région de Blaouakh

Map of blocks for proved reserves calculation in the Blaouakh region

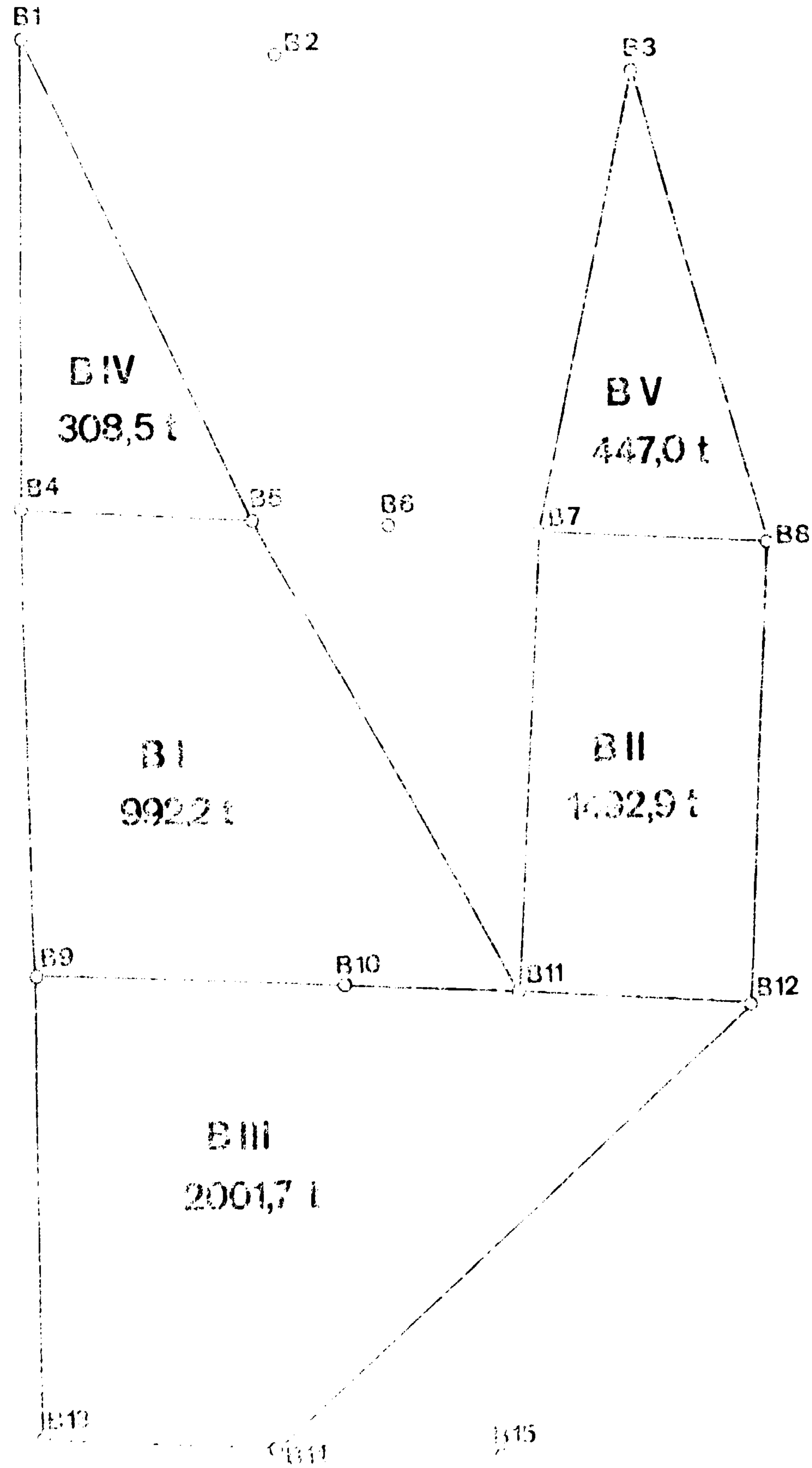


Fig. 111

Carte des secteurs pour calculation des réserves certains dans la région de Jreida

Map of blocks for proved reserves calculation in the Jreida region