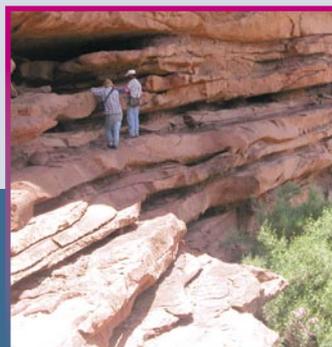


Kingdom of Morocco



المكتب الوطني للهيدروكاربورات و الممادات  
OFFICE NATIONAL DES HYDROCARBURES ET DES MINES



# Activity report 2006





**His Majesty King Mohammed VI**



# Activity report 2006

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## Message of the General Director

I am pleased to present to you the activity report for the year 2006, the first complete year for Office National des Hydrocarbures et des Mines (Onhym), marked by the setting up, on May 2nd, of its organization chart adopted by the Board meeting held on April 18 and by the introduction of new more dynamic managerial approaches both for managing petroleum and mining exploration and for managing human, financial and information resources.

It was actually necessary to endow the newly set up Office with an organisational basis allowing a guiding centred on performance. An organizational study was thus commissioned to a renowned consulting firm in the beginning of 2005. After setting up an organization chart ,Onhym managerial staff ,coached by experts from the consulting firm, has been mobilized to materialize an approach by process through formalizing a procedures manual aimed at optimizing flows of interactions, reducing the number of players and instituting new practices like the strategic application based on management by project as well as inhouse services contracts aimed at improving quality of all services and at allowing a better mastery of costs and delays. Concurrently, as part of the study, a scheme of information system - GIS core business and management- has been prepared. All the works will be completed by year end and the implementation of the new procedures will be undertaken in early 2007.

In the petroleum exploration field, Onhym has carried on the activity started in 2005 and which has concentrated on the five projects scheduled within the five-year plan on the Northern Atlantic offshore areas (Tanger-Larache), the Southern Atlantic offshore (Tarfaya-Lagwira), the Gharb, Essaouira-Maskala and Boujdour. As for the central areas of the Gharb basin, two wells with gas targets have been drilled, one of which has displayed a small field.

On the other hand, Onhym partners have confirmed their interest in our sub-soil as is attested by the relaunching of exploration investments which approached 500 million Dirham for acquiring seismic and gravimetry and magnetical data and for the reprocessing of some of these data and the drilling of 5 wells onshore.

As far as petroleum holdings are concerned, new agreements and several amendments to existing agreements have been signed with some of Onhym's partners: 4 reconnaissance contracts, 6 petroleum agreements, 2 amendments, 3 addenda and a memorandum of understanding.

These results are mostly the fruit of the effort made for the promotion of petroleum prospects through the active participation of Onhym in the most outstanding national and international events organized in the field of hydrocarbons E&P. They also reflect the excellent relationships between, Onhym and its partners and the professionalism of regular follow- up and coaching of work conducted within the projects signed.

In 2006, the axes of mining exploration have significantly been reoriented towards the identification of new type fields like Azougar N'tilili polymetallic/gold deposit (Tan Tan province), on the one hand,

and towards the research of new substances like niobium, tantalum and rare earth elements on the basis of confirmed indications, on the other hand. Exploration activity on traditional targets has been maintained and has concentrated on 21 targets defined as having a top priority during the previous year.

For precious metals, reconnaissance surveys by core drillings on Azougar N'Tilili and Bou Louttad projects have provided first encouraging results. As far as base metals are concerned, Guemassa-Haouz and Central Jebilet sectors as part of Onhym -CMG convention have been recognized by drillings. The Koudia Aïcha prospect entered into development phase with a shaft sinking. Exploration of rocks and industrial minerals has been carried on for fibrous clays in Guercif basin and Taourirt-Oujda passage way.

In 2006, Onhym has signed two prospecting agreements: one with Sanu (Ighrem), the other with Yabosmi (ex-Tiouine mine). In addition, an international tender call has been launched for the transfer of Jbel Malek gold prospect, in Bou Arfa region.

Concerning human resources management, a plan project has been adopted in accordance of the recommendations made by the latest Board Meeting, the terms and conditions of a voluntary redundancies process have been adopted in agreement with the supervising authorities. The launching of the operation is scheduled for early 2007. The compensation conditions are particularly attractive and give this action an unquestionable social dimension that should be crowned with success, thus contributing to better size the organisation.

Bye the end of 2006, the main actions aiming at Onhym setting up have been finalized, the work climate within the organisation is particularly serene, and the personnel has positively complied with the various requests of the management to contribute efficiently to run an institution that has already gained a large international repute and that operates successfully in an effort to promote and stimulate mining and petroleum exploration in our country, in accordance with the High and Enlightened orientations of His Majesty the King, May God Assist Him.

*Amina Benkhadra*



## National and international situation

### ■ National economy

In 2006, the national economy recorded remarkable performances. The main economic indicators and aggregates posted satisfactory rates. Thus the Gross Domestic Product (GDP) progressed by 8.1%. The remarkable growth was made possible thanks to the good behaviour of several sectors and to a good agricultural year.

The investment rate reached 29.4% of the GDP and the saving rate 33%. Despite the high increase in energy cost, inflation rate was curbed to 3.3%. The budget deficit was curbed to around 1.7% against 4% in 2005. Excluding privatization revenues, this deficit is set at 2.1%, against 5.3% the previous year.

At the level of external exchanges, exports have recorded a progression of 11.2%, with especially a growth of 14.4% in phosphoric acid exports and 12.8% in exports of natural and chemical fertilizers. Imports have posted an increase of 11%. The rise is essentially attributable to purchases excluding oil. The energy bill has reached 44.3 billion Dirham, representing an increase of 12% compared with 2005 figures. The oil bill has recorded an increase of 5.1 %, reaching 25.17 billion DH.

### ■ World economy

The good performance of the euro zone countries and a new year of double-digit economic growth in China showed a world GDP growth of about 5 %, in 2006.

In the United States, the GDP growth has

reached 3.3%, after a falling revision of this growth in the 4<sup>th</sup> quarter of 2006 (2.2% instead of 3.5%). In 2007, the American economy should record a slowdown with a growth of 2.9% expected over the whole year.

The Japanese economy has shown an increasing recovery after a decade of stagnation.

In Europe, growth in the 12 euro zone countries should be set at 2.7% in 2006 and slacken at 2% in 2007, according to European Union and The European Central Bank (ECB). However, these figures are very superior to the average of 1.4% recorded since 2001.

In Asia, the Chinese economy recorded a growth of 10.7% in 2006, which is the highest GDP growth rate since 1995, due to investment and exports vigour. India, whose economy has posted a remarkable growth for several years, has fixed a targeted growth rate of 9 % within the next five years against 8% at present.

The Latin American economies had a good behaviour in 2006 and their growth should continue to improve at the same rhythm in 2007. The giant Brazil should record a growth of 3% in 2006 and 3.4% next year.

In 2007, global economic growth should be marked by a slight slacking and should come back to 4.9%. The slowdown should affect mainly the industrialized countries. The Organisation for Economic Cooperation and Development (OECD) has thus revised its growth forecasts to 2.5% for 2007 against 2.9% expected before.

## National and international situation

### ■ International energy situation

Energy demand continues to witness a sustained growth as a result of the continuing of world economy expansion cycle and of a rapid consumption growth in certain developing countries like China and India that witness a rapid pace of industrialization and urbanization.

In 2006, world oil demand was set at 84.4 mb/d against 83.6 mb/d in 2005. Consumption in OECD member countries has accounted for 58% of this demand. World oil production amounted to 85.2 mb/d in 2006 against 84.5 mb/d in 2005. OPEC's part accounted for 40%.

In this context, we are faced with an erosion of oil production spare capacities, making oil market more and more vulnerable in face of any production interruption as a result of natural catastrophes or as a reaction to geopolitical events

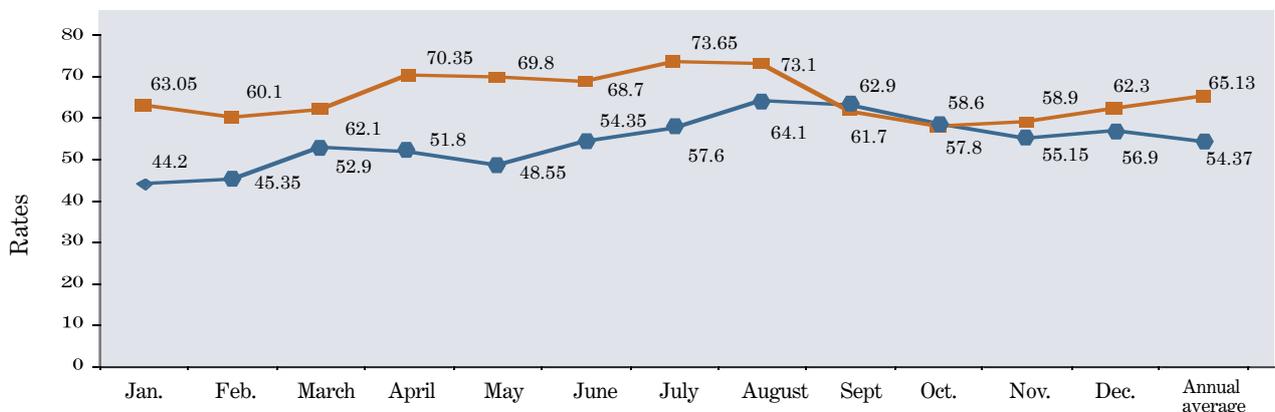
(nationalizations, civil wars or armed conflicts). The rocketing price of crude oil in 2006 reflects fairly well the tension situation at the supply level, stirred up by the exacerbation of some conflicts throughout the world.

### ■ International oil situation

In a context marked by a new record of oil price at 73.65\$/b in July, investments in E&P continued their growth in 2006 to reach 267 G\$ according to the French Institute of Petroleum, thus recording a rise of 25 percent compared with 2005 figures. This growth should continue in 2007 according to the same source.

The exploration sector has benefited from a favourable context over the last years, as shown by the number of drilling rigs in operation throughout the world that reached the historical high level of about 115 000 wells drilled, representing a rise of 15%.

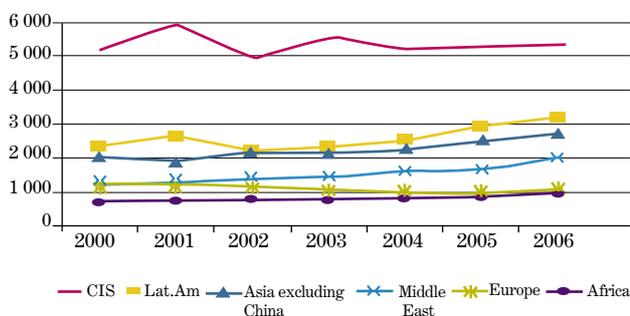
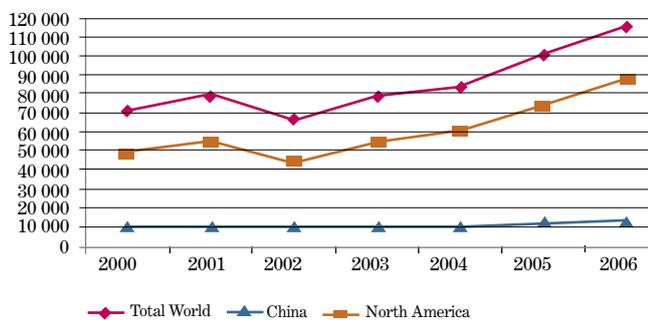
Evolution of Brent rates (\$/bbl)



## National and international situation

In 2006, the number of wells drilled worldwide recorded a rise of 16% onshore and 12% offshore. The utilisation rates of offshore drilling platforms have reached saturation levels in some regions. Consequently, the location rates of drilling rigs have increased considerably. Thus from June 2005 to June 2006, the rate of submersibles in the North Sea and in Gulf of Mexico recorded average rises of 170% and 103%, respectively.

Wells drilled worldwide in 2006



Sources : IHS Energy, Spears & Associates  
IFP

### ■ International mining situation

As for the mining industry, the year 2006 will have been the year of all record levels.

An unprecedented rise in metal prices: metals witnessed an exceptional year with increases ranging from 20 to 160%. Copper, zinc, lead, and tin have hit all highs by posting high increases of 86%, 135%, 34% and 20%, respectively. Precious metals did not escape the frenzy that characterized base metals. Gold recorded a rise of 36% compared with 2005, with a peak of 730 the ounce in May 2006, a level that has not been reached for more than 26 years. This increase is accounted for by the role played by the yellow metal as a refuge value to guard against the geopolitical risks but also by the massive purchases made by central banks and private investors wishing to secure against inflation risks or the slowdown of world economy. Silver, another precious metal, has posted an average rise of 54 % compared with 2005 level.

In the upstream, mining exploration activity continued at a sustained pace in 2006, as mining exploration allocations recorded an increase of 47% compared with their 2005 level, according to the Canadian Metal Economics Group. Exploration budgets reached the record figure of 7.13 billion \$ in 2006, thus exceeding the peak reached in 1997. The share of junior companies has accounted for more than a half of the overall expenses allocated to exploration and, on the whole, their contribution will have increased by 600% since 2002. The breakdown of exploration

## National and international situation

budgets by regions has not undergone a noticeable change, as Latin America continues to take the lion's share with 24% followed by Canada (19%), Africa (16%), Australia (11%) and the United States (8%).

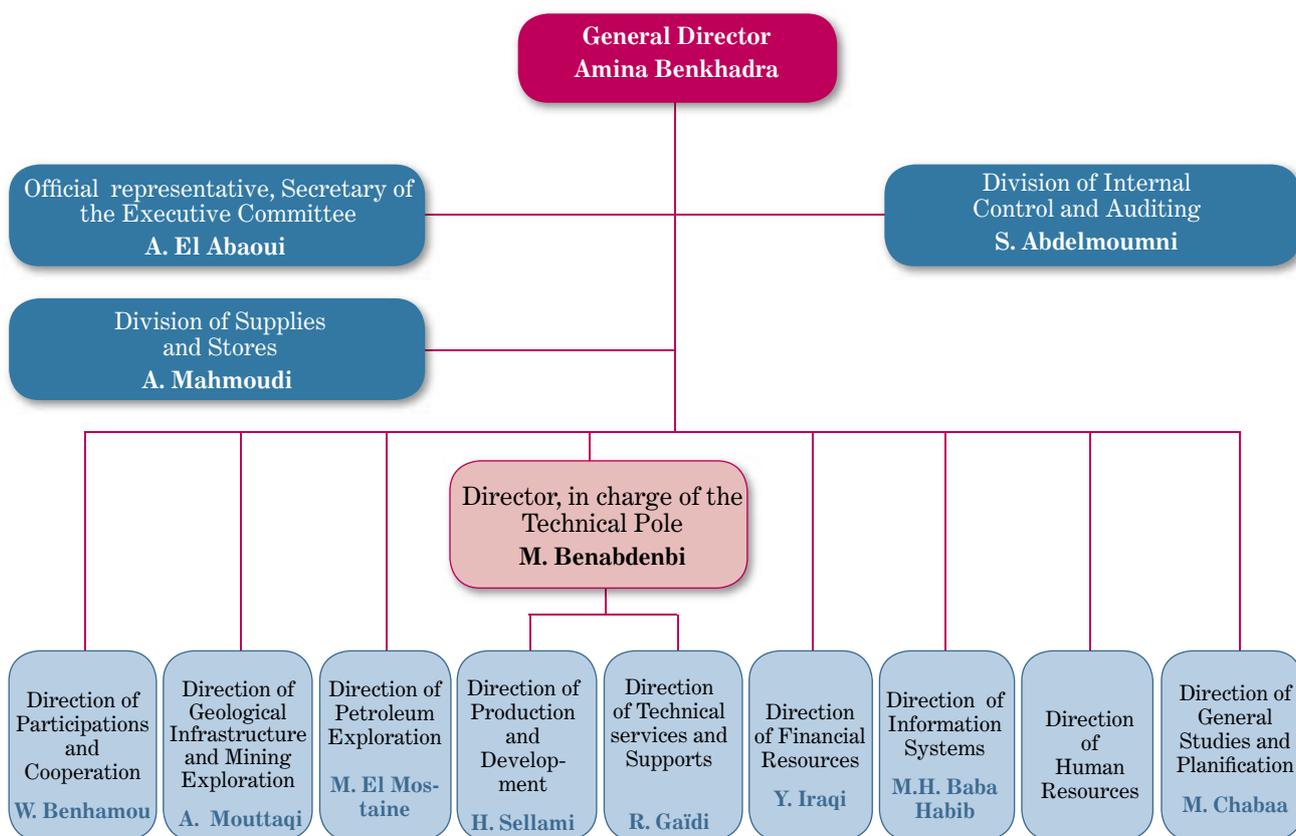
Steel output also recorded a high level in 2006, as crude production grew by 8.8%, compared with 2005, to 1.239 billion tonnes, the highest level ever reached. According to the International Iron and Steel Institute, global steel industry continues to be led by Asia which now produces almost 54% of world steel output. China remains the first world producer (418.8 million tonnes) and comes before Japan (116.2 million tonnes) and the United States (98.5 million tonnes).

Iron ore prices benefited from this favourable situation as they witnessed a rapid rise over the past 4 years. In 2006, iron ore prices rose by 19% after a jump of 71.5% in 2005. Globally, after five years of consecutive increases, the iron ore prices increased by 189% compared with its 2002 level.

Finally, the world mining industry continued its consolidation in 2006 through the mergers/acquisitions operations that amounted to 87.6 billion \$ by the end of November 2006 against 57.2 billion \$ throughout 2005. The operations of acquisitions operated in 2006 have been led by several major players of mineral resources steel and coal industry.

## Onhym Organization chart

A new organization and a good governance



The organizational study Onhym launched in 2005 allowed to prepare cartography of processes, and to reframe the sphere of activities centered on the core business (mine and petroleum exploration) and to build an organizational chart set up in May 2006.

The structure has been completed by the creation of transverse bodies :

- “Strategy and Budget” committee,

- “Human Resources” committee,
- “Information System” committee.

All the managerial system is energized by the adoption of new governance rules, among which :

- Management by project, each project is guided by fully responsible teams,
- Contractual arrangements of inhouse services.

## Highlights

### ■ At the management level

- Setting up of a new Onhym organization chart adopted by the Board meeting in its second session held on April 18, 2006;
- Launching of the detailed formalization of the organization and the information system survey through its master plan;
- Preparation of a project fixing the detailed terms and conditions of a voluntary redundancies operation, in pursuance of the recommendations made by the Board meeting held on April 18, 2006.

### ■ At the operational level

#### ▶ Hydrocarbons

- Launching of geological surveys and an international tender call for seismic acquisition on Boujdour basin and Meskala/Toukimt producing field;
- 3D seismic acquisition surveys (2.715 km<sup>2</sup>), 3D ADD-HR (818 km<sup>2</sup>), 2D (110 km) gravity-mag (1.563 km<sup>2</sup>) and gravity and airborne magnetometry (8.620 km) carried out by Onhym partners;
- Signature of 4 petroleum reconnaissance contracts, 6 petroleum agreements and 5 amendments to the petroleum agreements and reconnaissance contracts;
- Drilling of 7 wells 5 of which in the Gharb(Onhym: 2, Cabre: 2, Heyco:1)

and 2 by MPE on Tendrara permit with interesting results on a well;

- Net increase in gas and condensate sales as result of higher OCP purchases and of price increases.

#### ▶ Mines

- Launching of an international tender call for the transfer of Jbel Malek auriferous prospect in Bouarfa sector;
- Recording of encouraging results by the survey of reconnaissance by drillings of the new promising prospect of Azougar N'Tilili in the Bas Draa area(Au, Pb, Zn, Ag);
- Carrying out of the first reconnaissance survey by drillings on gold indicators in the South.



*Onhym Board meeting : April 18, 2006*

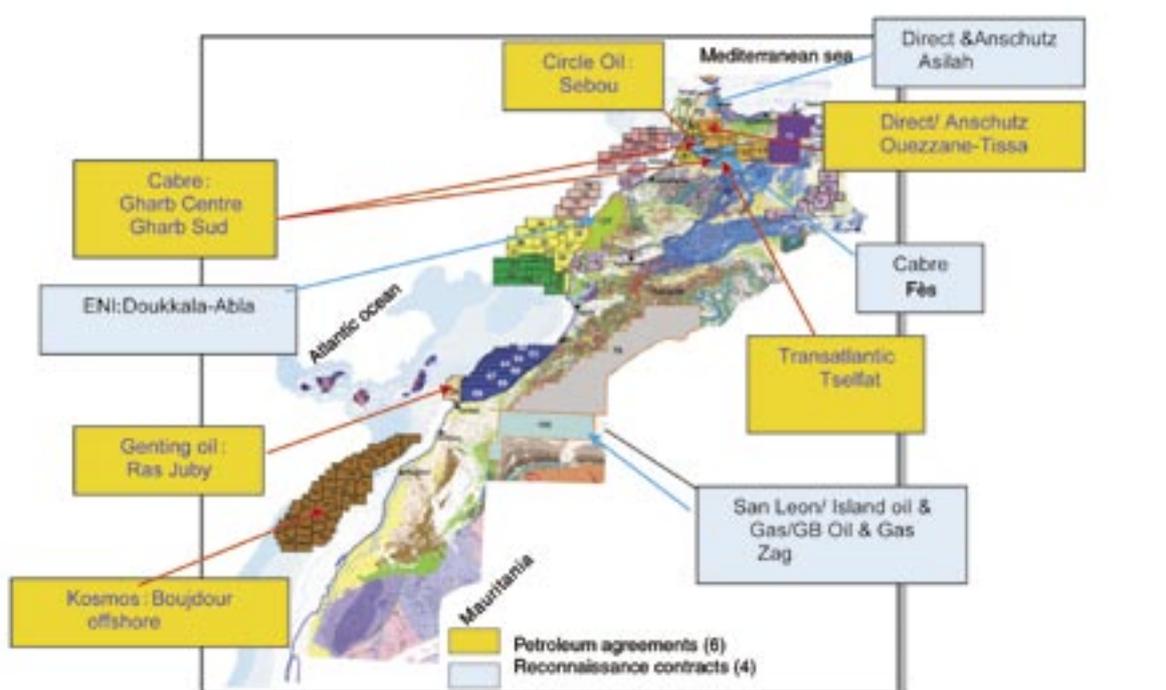
## Petroleum licensing

The remarkable evolution recorded in 2005 concerning the acreage covered by hydrocarbons exploration permits or reconnaissance licenses was consolidated in 2006.

Globally, 91 exploration permits, 8 reconnaissance licenses, and 10 exploitation concessions, covering a total area of 268 634.20 km<sup>2</sup>, were in force, as of December 31, 2006.

Description	Number	Area in square kilometer
Onshore permits	20	31 047.24
Offshore permits	71	125 935.20
Onshore reconnaissance licenses	8	111 534.40
Exploitation concessions	10	117.36
<b>Total area</b>		<b>268 634.20</b>

### New petroleum agreements and reconnaissance contracts : 2006



## Petroleum exploration

### A wider and better targeted exploration

#### □ Onhym, proper activity

##### ■ Onshore and offshore evaluation surveys

Five study projects have been scheduled in the course of 2006. These projects have concerned the Gharb and Essaouira-Meskala producing basins, Boujdour promising basin, the North Tanger-Tarfaya Atlantic offshore area and the South Tarfaya- Lagwira Atlantic offshore area.

##### ► Producing and promising basins

###### • The Gharb basin: Onhym concessions

As part of this project, works carried out have focused on the drilling of two wells in Ouled N'zala concession (ONZ-4 and ONZ-5). The 2 well drillings aimed at the increase of gas production in the Gharb basin with the purpose of maintaining and developing the domestic market.

In addition to the completion of biostratigraphical analyses on DRJ-4 and DRJ-5 wells, the studies in the Gharb central district have also included the carrying out of new stratigraphical and geochemical analyses on the cuttings of the new wells ONZ-4 and ONZ-5 drilled this year.

The ONZ-4 well has displayed several reservoir levels between the intervals of 460 m and 965 m. Three intervals located respectively between 915 m - 916,2 m – 918,2 m and 919,2 m – 921,2 m , show high gas saturations and excellent petrophysical characteristics. These three intervals have been perforated. The test results will help evaluate the potential of commercialization of this discovery.

The ONZ-5 well has displayed several reservoir

levels between the intervals of 474 m and 901 m, showing gas saturations not exceeding 10 to 30%. The cumulated thickness of these levels is about 175 m, but the charge factor in gaseous hydrocarbon, that proved weak at the well level, did not lead to a commercial accumulation.

###### • Essaouira-Meskala basin

The works undertaken as part of this project are the continuation of the reservoir simulation survey carried out by I-Reservoir Company. They aimed at delimitating new gas compartments for the choice of the location of production wells.

Interpretation works of 2D seismic data, the drawing of isobaths maps at the top of reservoirs and investigations led on the field have enabled to improve knowledge on the parameters of Triassic reservoirs.

Concurrently, a 3D seismic program of 180 km<sup>2</sup> has been finalized as a result of topographic reconnaissance on the field and will be shot in 2007.



## Petroleum exploration

### • Boujdour basin

The survey aimed at evaluating the petroleum potential of the promising district of Boujdour following the oil shows met by hydraulic wells. Thus, structural lineament maps have been prepared based on gravimetric and magnetometric data. Geochemical modeling analyses and log interpretations have been made on Cretaceous and Tertiary data in order to characterize the parameters of the source rock and the reservoirs identified in the area. Moreover, stratigraphical studies and correlations of Mesozoic formations have been carried out on the wells and four main sequences have been identified and delimited.

The petroleum traps would be linked both to flower structures and anticlines with weak amplitudes and with large curved rays having an effect on the Mesozoic series. The latter, like the stratigraphic traps, should be mapped and defined by a regional reconnaissance program totaling 530 km of 2D seismic.



### ► Basins to be promoted

#### • The North Atlantic offshore: Tanger-Tarfaya

This project has been concentrated on the integration of the interpretation of new geophysical data recently acquired by our partners and the results of geochemical and petrophysical analyses on well and outcrops samples in the coastal regions. These works aimed at improving the various parameters of play concepts and petroleum prospects.

Thus, the geological studies have aimed at characterizing potential reservoirs of Lower Cretaceous, Upper Cretaceous and Tertiary age formations crossed by onshore and offshore wells of the Moroccan Atlantic margin. They have also concentrated on the electro sequential and strati-sequential cutting of these formations on the basis of log and lithostratigraphic data. Regional cuts based on seismic lines crossing these wells have been prepared.

Geological and geochemical modeling on the previous wells has helped to characterize the geothermal gradients and the thermal flow as well as the preparation of hiding and maturation curves of potential source rocks.

Within the framework of preparation of promotion campaigns of the Atlantic offshore segment, Onhym has called upon the services of a consultant to undertake a critical study of the results of drilled wells in the deep offshore and in order to give priority to the plays and prospects defined. The analysis of data has allowed confirming that the petroleum potential of the region remains intact, especially at the level the Lower Cretaceous and the Jurassic,

## Petroleum exploration

that had not been tested by the wells drilled in the deep offshore. Thorough studies of seismic data reprocessing are necessary to increase the interest for these areas.

A promotion campaign of this offshore segment was undertaken in October 2006, in Calgary.

- **The South Atlantic offshore : Tarfaya-Lagwira**

The works carried out have focused on the biostratigraphical and geochemical analyses and interpretations followed by geological and thermal modelling at the level of the wells of this segment.

This re-evaluation study has also integrated the analysis of paleo environments of formations of Meso Cenozoic age of Tarfaya–Lagwira basin in onshore and offshore and the precision of stratigraphic cuts. Four correlation sections between various onshore and offshore wells according to East-West directions and paleogeographic maps of Lower and Upper Cretaceous have been prepared in order to better illustrate the environment and the nature of Meso Cenozoic sedimentary deposits.

The potential source rocks of Cretaceous, especially those of the Albian base would be located at the beginning of the oil window and the reservoirs would be constituted by Lower Cretaceous deposits of deltaic type and those of Coniacian and Santonian of turbiditic nature.

### ■ Intense activity in 2D and 3D seismic and geophysics

Two 2D and 3D onshore seismic acquisition surveys have been prepared on Boujdour basin and Meskala-Toukimt fields, respectively. Geologi-

cal and topographical reconnaissance surveys have been carried out on the areas concerned to fix the acquisition parameters.

Onhym has ensured the supervision of geophysical acquisitions conducted in partnership on Tanger-Larache, Safi Offshore, Tarfaya Shallow and Ras Juby permits and on Bouanane, Asilah-Tissa and Guercif-Beni Znassen reconnaissance licenses.

On the other hand, Onhym has undertaken the cession of data available on the Gharb, Boudnib, Tarfaya Shallow, Ras Juby, Doukkala, Sebou and Boujdour offshore blocks at the request of partners operating in these areas.

Vectorization operations of geophysical, geological and paleogeographical maps and seismic lines and logs of various Moroccan basins have been carried on in a bid to ensure the timelessness of the Office geoscientific patrimony and the setting up of Petroleum GIS.

### ■ A more dynamic promotion

Onhym has maintained and consolidated its efforts in promoting the petroleum potential of



*National energy debate, Oct. 30, 2006*

## Petroleum exploration

the various Moroccan basins to worldwide petroleum companies by taking part in the international events pertaining to the oil industry and by delivering technical papers to the companies that have visited Onhym in the course of 2006. The topics debated during these presentations have concentrated on play concepts developed in the various basins open to exploration and on the attractive terms of the hydrocarbon code.

Onhym has also organized, in Marrakech, on 17<sup>th</sup> and 18<sup>th</sup> May 2006, the 4<sup>th</sup> edition of Maghreb & Mediterranean Oil & Gas Conference, in association with the international company Global Pacific & Partners. During this conference, technical papers on exploration activities and programmes undertaken by Onhym and its partners in Morocco have been delivered. Other technical papers have been presented by other international oil companies on similar basins.

In 2006, Onhym took part in several international events, namely Cnuuced, Aapg, North Africa Oil and Gas, WPC, 5<sup>th</sup> Summit of Energy, 10<sup>th</sup> conference on Exploration & Production, Africa Upstream, Petex 2006 Conference and

Exhibition, 3<sup>rd</sup> Euro - Mediterranean Energy Forum. Several technical papers on the petroleum potential of Moroccan basins open to promotion have been delivered to the companies that have attended these events, and booths have been organised to the visitors of the exhibition halls.

A delegation from Onhym held on October 10, 2006 a road show on the Atlantic offshore- Agadir and Dakhla-Lagwira sections in Calgary, Canada which was attended by 23 companies and oil groups.

At the domestic level, technical papers on the areas open to exploration have been delivered to the companies that visited Onhym in 2006, namely Roundstone, Genting, OMV, Eastern Petroleum, GB Petroleum, OMV, Chevron-Texaco, Eni, Circle Oil, PlusPetrol, Supex, San Leon Energy, Stratic Energy and Wilton Petroleum.

### □ Numerous and active partners

In an effort to valorise the petroleum targets defined and to constitute new prospect portfolios, geophysical surveys totalling 1563 km<sup>2</sup> of gravimetry, 8620 km of airborne gravimetry and magnetometry, 2715 km<sup>2</sup> of 3D seismic and 110 km of 2D seismic have been acquired by Onhym partners.

Onhym partners have also drilled 5 wildcats, 4 of which with gas targets: two in Tendrara and two in the Gharb basin.

A regular follow-up work, on a semester basis, has been undertaken by Onhym for the works



## Petroleum exploration

and surveys carried out, and for the conformity of the financial commitments to contractual programmes.

Concurrently, and as part of its partners coaching, Onhym, concerned about optimizing the results of their researches, has organized field missions and workshops that helped to complete and orient their works and studies.

### ► Repsol

#### • Tanger-Larache permit

The 3D (534 km<sup>2</sup>) and 2D (110 km) seismic acquisition survey undertaken by Repsol company on Tanger-Larache permit was completed in March 28, 2006. The preliminary interpretation of seismic has enabled to identify two new prospects in addition to those already defined on the basis of 2D seismic. These prospects require a detailed mapping in order to specify structural closures.

### ► MPE

#### • Tendirara permit

MPE Company has drilled in the course of 2006, two wildcats TE-4 and TE-5 on Tendirara permit. The wells have helped to display encouraging gas shows for TE-5 and tests have been carried out on the potential reservoirs.

### ► Hydro/Dana

#### • Safi offshore North West permit

Hydro and Dana companies have carried out a 3D seismic acquisition survey totalling 2 183 km<sup>2</sup> of which 1167 km<sup>2</sup> in 2006. Interpretation and petroleum evaluation works are under way.

### ► Petronas

#### • Rabat-Salé Haute Mer permit

Preparation for drilling works and the agreements concluded with the providers of services are being finalized. The well is expected to be drilled by the end of the first semester of 2007. The delay of the drilling of the well is due to the unavailability of the drilling rig.

### ► Vanco

#### • Ras Tafelney permit

Under this permit, works have been carried on with the purpose of consolidating the portfolio of prospects including new targets at the level of lower Cretaceous and the Jurassic. In Ras Tafelney block, 18 leads, under the subsalt, have been defined by 2D seismic.

#### • Safi Haute Mer permit

Vanco has conducted geological and geophysical works in order to reduce exploration risks for Paprika prospect. Vanco has also carried out a survey on the existence and the development of clastic deposits in the Moroccan Atlantic offshore, especially at the level of Safi Haute Mer and Ras Tafelney permits. Moreover, Vanco has undertaken a promotion campaign on Paprika prospect.

### ► Maersk Oil

#### • Tarfaya Shallow permits

The works carried out on these permits have focused on the seismic interpretation, geochemical analyses, thermal modelling and integration of biostratigraphical data. These works

## Petroleum exploration

have enabled to prepare facies maps of potential reservoirs and maturation maps of the source organic matter. Maersk has acquired 508 km<sup>2</sup> of 3D seismic on these permits between November 8, 2006 and December 1<sup>st</sup>, 2006. The interpretation of this seismic will help to better build the petroleum potential of this part of the Atlantic offshore.

### ► Genting Oil

- Ras Juby permit

A 3D seismic programme totalling 506 km<sup>2</sup> has been scheduled and carried out by Genting company on December 29, 2006 on Ras Juby permit. This seismic is meant to specify the extension of karstified and reservoirs impregnated with heavy oil at the level of Cap Juby saliferous structure.

### ► Kosmos

- Boujdour offshore permit

Kosmos has prepared a geological and geophysical synthesis on the data available which has enabled to define three types of play concepts. In order to improve the parameters of defined prospects, Kosmos company will conduct further studies on source rocks.

### ► Tethys Oil

- Bouanane reconnaissance area

A field mission has been carried out on Boudenib area with representatives from Tethys Oil to observe Paleozoic outcrops south of Tamelalt, Tafejjart structure and similar outcrops in Erfoud and Rissani regions.

A gravimetry acquisition programme has been conducted on an area of 1563 km<sup>2</sup>. The repro-

cessing of older seismic data and their interpretation has helped to draw isopach maps at the level of the Silurian and Devonian. The latter have shown the presence of a structure corresponding to a Palaeozoic high zone whose size ranges between 57 and 137 km<sup>2</sup>. Tethys Oil organized, in Lausanne, on 1<sup>st</sup> and 2<sup>nd</sup> of June 2006, a workshop on the results of the evaluation of this area.

### ► Petro-Canada

- Bas Draa reconnaissance area

A field mission has been carried out on Assa-Zag and the surrounding regions to complete the works related to the first survey conducted in November 2005. The main Palaeozoic outcrops have been studied.

As a result of the field works and geochemical analyses that confirmed the interest for this zone, Petro-Canada company has presented an acquisition programme of gravity and magnetometry airborne campaigns aimed at showing substratum structures. The campaigns will be used for the definition of a future acquisition programme of 2000 km of 2D seismic on this zone.

### ► Transatlantic/Stratic Energy

- Guercif-Béni Znassen reconnaissance zone and Tselfat permit

The gravity and magnetometry airborne campaign acquired on this zone and that ended on February 6, 2006, has totalized 9839 km. The geochemical analyses of samples taken out and the interpretations of well logs are encouraging.

The initial reprocessing in Pstm has shown a clear improvement of the quality of old seismic

## Petroleum exploration

data. The processing and the interpretation of gravity and magnetometry surveys are being carried out.

Besides, the works carried out on Tselfat permit have been devoted to the interpretation of geological, geophysical data and to the study of reservoirs of old fields (Haricha, Boudraa and Tselfat).

### ► Heyco/Stratic Energy/Energy Corp.

- Maamoura and Moulay Bousselham permits

Biogenic gas and oil prospects have been defined at the level of Moulay Bousselham permit. HSE has selected Menadra-1 oil prospect to be tested by a drilling. MED-1 well was dry and abandoned at the final interval of 1503.1m.

### ► Cabre

- Gharb Centre, Gharb Sud and Fès permits.

Following the signature of a new petroleum agreement, Cabre company has undertaken the drilling of two wells BTA-1 and BFD-1 during the summer 2006 on the Gharb Centre permit. The wells have shown very good reservoirs in the Upper Miocene. The tests carried out have not been conclusive.

### ► Direct Petroleum

- Ouezzane and Tissa permits

Following the encouraging results obtained by the ADD-HR interpretations, Direct Petroleum company has decided to go into the petroleum permit stage. In order to better prepare the well drilling campaign expected between late 2007 and early 2008, DPE expects to acquire

an additional 2D seismic of 151 km with the purpose of specifying the closures of targets to be drilled. This programme will be distributed in 77 km on the Neogene play and 74 km on the Mesozoic play.

### ► Direct Petroleum

- Asilah reconnaissance license

Following the encouraging results obtained by the ADD-HR interpretations, Direct Petroleum company has decided to enter the petroleum permit stage. Negotiations are under way to conclude a petroleum agreement. In this regard, the Company proposes to acquire an additional ADD-HR programme of 200 km<sup>2</sup> and a 2 D seismic programme of 200 km.



### ► San Leon/Island Oil & Gas/GB Oil and Gas

- Zag basin reconnaissance zone

These companies are committed to carry out, on Zag basin, geological surveys and an evaluation of the petroleum potential of the reconnaissance zone.

## Petroleum exploration

### ► ENI

- Doukkala-Abda reconnaissance zone

ENI intends to carry out the reprocessing of all seismic data available on this zone and will undertake an evaluation survey of petroleum potential of this basin.

### ► Cnooc

- Haha and Missouri zones

Cnooc has completed the evaluation survey of Haha and Missouri. The company has retired from the two zones for budgetary reasons

Geophysical activities in 2006			
Company	Permits or reconnaissance zones	Seismic	Km <sup>2</sup>
Hydro/Dana	Safi offshore North west	3D	1168 km <sup>2</sup>
Repsol	Tanger-Larache	3D	534 km <sup>2</sup>
Repsol	Tanger-Larache	2D	110 km
Maersk Oil	Tarfaya Shallow	3D	508 km <sup>2</sup>
Genting	Ras Juby	3D	506 km <sup>2</sup>
Direct Petroleum	Asilah	ADD-HR	168 km <sup>2</sup>
Direct Petroleum	Ouezzane	ADD-HR	650 Km <sup>2</sup>
Tethys Oil	Bouanane	gravimetry	1563 km <sup>2</sup>
Transatlantic	Beni Znassen-Guercif	grav. et mag.	8620 km

Drilling activities in 2006		
Company	Permits or reconnaissance zones	Wells
MPE	Tendrara	TE.4
MPE	Tendrara	TE.5
HSE	Maamoura Moulay Bouselham	MED.1
Cabre	Gharb Centre Gharb South and Fès	BTA.1
Cabre	Gharb Centre Gharb South and Fès	BFD.1
Onhym	Ouled N'zala	ONZ.4
Onhym	Ouled N'zala	ONZ.5

## Petroleum holdings and cooperation maintained at a high level

The year 2006 has been marked by the conclusion of 6 petroleum agreements, 4 reconnaissance licenses, 2 amendments to the petroleum agreements, 3 addenda to the reconnaissance contracts and 2 cooperation agreements.

### ■ Petroleum agreements

#### ► Kosmos

- Boujdour offshore zone

Signature on May 3, 2006 of the petroleum agreement related to Boujdour offshore zone covering 12 exploration permits. Kosmos is committed to acquire, during the initial validity period of 18 months, 15 230 km of 2D speculative seismic and to carry out geological and geophysical works.

#### ► Cabre Maroc Ltd

- The Gharb zone

Signature on May 18, 2006 of the petroleum agreement related to the Gharb zone. The agreement, which relates to the Gharb Sud and the Gharb Centre, with an initial validity period of three years, expects, within the three years, to drill several exploration wells, two of which will be drilled before the end of 2006.

#### ► Transatlantic Maroc Ltd

- Tselfat zone

Signature on May 18, 2006 of a petroleum agreement related to the Tselfat zone. Transatlantic, expects to carry out, during the first three years, a 3D seismic survey and the drilling of an exploration well.

#### ► Genting Oil Morocco Ltd

- Ras Juby zone

Signature on May 18, 2006 of a petroleum agreement related to Ras Juby zone. Within the framework of this petroleum agreement, Genting Oil is committed to carry out a 3D seismic campaign during the initial validity period of 2 years.

#### ► Circle Oil

- Sebou onshore zone

Onhym and Circle Oil signed on June 14, 2006 a petroleum agreement related to Sebou onshore zone for an initial validity period of three years. Circle Oil expects during this period to acquire 3D seismic and to drill wells.

#### ► Direct Petroleum and Anshutz

- Ouezzane Tissa zone

Onhym, Direct Petroleum Morocco and Anschutz Morocco Corporation signed on December 12, 2006 a petroleum agreement covering Ouezzane Tissa zone encompassing 5 exploration permits: Ouezzane Tissa 1 to 5. The agreement expects during the two and a



Signature with ENI, on November 2, 2006 of a reconnaissance contract covering «Abda Doukkala zone»

## Petroleum holdings and cooperation

half years initial period of the permits to drill wells and to acquire ADD-HR seismic.

### ■ Reconnaissance contracts

#### ► Cabre

- Fès zone

Signature on May 18, 2006 of a reconnaissance contract related to Fès zone. Under this contract, during the one-year initial validity period, Cabre is committed to carry out synthesis studies on this zone.

#### ► Direct Petroleum Morocco

- Asilah zone

Onhym and Direct Petroleum Morocco signed on September 12, 2006 a reconnaissance contract covering Asilah zone for a four-month initial validity period ranging from September 15, 2006 to January 14, 2007 with a view to acquire 150 km<sup>2</sup> of seismic using ADD-HR technology.

#### ► ENI

- Abda-Doukkala zone

Onhym and ENI signed on November 2, 2006 a reconnaissance contract covering Abda Doukkala zone for a twelve-month initial validity period ranging from November 21, 2006 to November 20, 2007 in order to carry out geological and geophysical studies on this zone.

#### ► San Leon, GB Oil and Island

- Zag basin zone

Onhym, San Leon, GB Oil & Gas and Island Oil & Gas signed on December 5, 2006 a reconnaissance contract covering Zag basin. During the initial validity period ranging from December 25,



*Signature with Direct Petroleum and Anshutz, on December, 12, 2006 of a petroleum agreement covering «Ouazzane - Tissa zone»*

2006 to December 24, 2007, the partners are committed to carry out various reconnaissance surveys in order to evaluate the zone petroleum potential.

### ■ Amendments to petroleum agreements

#### ► Vanco

- Safi Haute Mer zone

Onhym and Vanco signed on July 20, 2006 the 5<sup>th</sup> amendment of the petroleum agreement related to Safi Haute Mer zone by virtue of which the initial validity period of the permits is extended by twelve months from July 21, 2006 to July 21, 2007, with a view of carrying out further studies jointly with Onhym.

#### ► Repsol YPF and Dana

- Tanger-Larache zone

Onhym, Repsol YPF and Dana signed the 1<sup>st</sup> and the 2<sup>nd</sup> amendments of the petroleum agreement related to Tanger-Larache following the transfer of 15% of Repsol interest parts to Dana

## Petroleum holdings and cooperation

as part of the agreement and at the parties' request, extend the initial period of the permits validity by six months.

### ■ Addendum to reconnaissance contracts

#### ▶ Transatlantic/Startic

- Guercif-Beni Znassen zone

Onhym and Transatlantic/Startic signed on May 18, 2006 an addendum that runs the first six-month extension period related to Guercif-Beni Znassen license starting from the expiry date of the initial validity period of this license, on June 27, 2006, with a view of carrying out an additional work programme.

#### ▶ Anschutz and Direct Petroleum

- Asilah-Tissa zone

Onhym, Anschutz and Direct Petroleum signed the 1<sup>st</sup> addendum of Asilah-Tissa reconnaissance contract that extends the license validity by three months from May 31, 2006 to August 30, 2006, with a view of carrying out an additional work programme.

#### ▶ Petro-Canada

- Bas Draa zone

Onhym and Petro-Canada signed the 1<sup>st</sup> addendum of Bas Draa reconnaissance contract that extends the license validity by one year from July 18, 2006 to July 17, 2007, with a view of carrying out an additional work programme.

### ■ Cooperation agreements

#### ▶ Cnooc

- Haha and Missouri zones

Onhym and Cnooc Morocco Ltd signed on February 21, 2006 the 1<sup>st</sup> memorandum of understanding concerning Haha and Missouri zones

with a view of extending by six months the validity period of said memorandum that is due to expire on August 20, 2006.

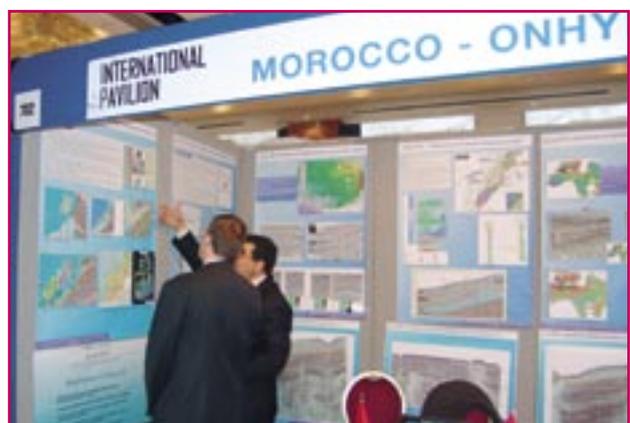
#### ▶ Aurep

- Agreement

Onhym and the Malian Authority for Promotion and Petroleum Research (Aurep) signed on March 13, 2006 an agreement, for the development of cooperation in the fields of exploration, promotion, drilling and production and for the exchange of experiences in the fiscal and regulation frameworks.

### ■ Contacts

Several companies have expressed their keen interest in carrying out reconnaissance studies and exploring hydrocarbons in onshore and offshore areas, namely, OMV, (Tadla), Roundstone (Tiznit, Cap Draa, and Dakhla), Circle Oil (Meskala), Hunt Oil (Mediterranean offshore), PlusPetrol (Tadla, Haha and Missouri), MPE (Missour), Atlas Sahara (Dakhla offshore), Chevron Texaco, Suppex, Pancontinental Oil & Gas NL (various Moroccan sedimentary basins).



## Petroleum drillings and a growing gas production

In 2006, Onhym activity focused on the drilling of 5 petroleum wells in the Gharb basin, the follow-up of partners drilling activity and production and, on the continuation of negotiations with the companies having expressed their interest in oil shale projects.

### ■ Petroleum drillings

#### ▶ Onhym drillings

##### • ONZ - 4 well

ONZ-4 well was drilled in June 2006. It reached the total depth of 969 m and met a reservoir level located between 914,9 m and 920,7 m and was completed.

##### • ONZ - 5 well

ONZ-5 drilling works were carried out in July 2006 and stopped at the total depth of 905 m. Abandonment plugs have been set.

#### ▶ Cabre drillings

##### • BTA-1 well

BTA-1 well, drilled in June, has reached the total depth of 1137 m. Following the results of electrical logs, the well has been abandoned.

##### • BFD-1 well

BFD-1 well, drilled in September 2006, has reached the total depth of 1444 m. The well has been completed to test the gas shows met during the drilling operations carried out between 885 m and 892 m.

#### ▶ Heyco drillings

##### • MED-1 well

MDE-1 well, drilled in November 2006, has

reached the total depth of 1503 m. Following the results of electrical logs, the well has been abandoned.

### ■ Exploitation works

The year 2006 has been marked by the continuation by Onhym of the exploitation of Meskala and Essaouira fields as well as those in partnership with Cabre and Samir companies in the Gharb basin, the free of charge recovery by Onhym of Korimat-Youssoufia (125 km) gas pipe line belonging to Samir and that of Ouled Youssef, the achievement of the study of the layout of the new gas pipe line section in replacement of that crossing Youssoufia city as well as the launching of the tender call for its laying. On the other hand, MAO-1 well, recovered by Samir has been put on stream on July 23, 2006.



## Petroleum drillings and a growing gas production

### ► Interventions on wells and tests

This activity was marked by the carrying out of tests on ONZ-4 and BFD-1 wells by Onhym own means.

### ► Domestic hydrocarbons production in rapid growth

Compared with 2005, production has increased

by 46% for natural gas and 48% for condensate and crude. Concerning Essaouira zone, the rise is mainly due to the increase in withdrawing recorded in Youssoufia mining centre after the start of operation of OCP washing units. On the contrary, natural gas from the Gharb wells has almost stagnated.

#### Domestic hydrocarbons production

Fields	2006	2005	2006	2005
	Condensate/crude in tons		Natural gas in nm <sup>3</sup>	
<b>1) Production</b>				
Meskala/Essaouira	8 203	3 906	36 148 107	17 065 881
Gharb			1 234 918	73 168
S/Total	8 203	3 906	37 383 025	17 139 049
<b>2) Onhym /Partners production</b>				
ZHA-2 / Cabre			3 191 865	4 757 807
ZHA-3 / Cabre			510 517	1 528 777
SAR-1 / Cabre			4 598 231	259 462
OLB-1 / Samir			10 710 495	14 648 666
LTO-2 / Samir				154 098
S/Total			19 011 108	21 348 810
<b>3) Samir production</b>	2 018	2 980	-	-
<b>Grand total</b>	<b>10 221</b>	<b>6 886</b>	<b>56 394 133</b>	<b>38 487 859</b>

## Petroleum drillings and a growing gas production

### ► Hydrocarbons marketing

The volumes of natural gas and condensate marketed by Onhym during 2006 have recorded an increase of 72% and 108%, respectively, compared with the previous year. Thus, the turnovers achieved from the gas and condensate sales have progressed by 122% for natu-

ral gas and 149% for condensate. This increase is due to the rise in the price of heavy fuel N°2 on which gas and condensate price is indexed.

On the whole, revenues from hydrocarbons sales have shown a rise of 128 % compared with the year 2005, as a result of the rocketing prices of oil products.

Fields/ Supplies	2006		2005	
	Volumes	Turnover in KDH taxes excluded	Volumes	Turnover in KDH taxes excluded
Natural Gas(volume in nm <sup>3</sup> )	42 623 800	79 911.900	24 726 600	36 002.200
Essaouira / Ocp	34 178 700	64 682.100	15 393 400	22 243.300
Gharb / Cmcp	8 445 100	15 229.800	9 333 200	13 758.900
Variations in % 2006/2005	+72.38	+121.96		
Condensate (volume in tons)	7 900	29 172.800	3 800	11 733.700
Variations in % 2006/2005	+107.89	+148.62		
<b>Total revenues in DH taxes excluded</b>		<b>109 084.700</b>		<b>47 735.900</b>
Variations in % 2006/2005		+128.52		

## Oil shale

The year 2007 was marked by the reactivation of oil shale file as part of the new strategy followed by Onhym with the purpose of promoting this important energy resource.

The reactivation has begun to take shape through the contacts and negotiations undertaken by Onhym with several companies interested in developing oil shale.

In this context, negotiations are in an advanced stage with four world class companies having

expressed a keen interest in valorising Timahdit, Tarfaya and Tanger oil shale deposits. On the other hand, Onhym has reserved several zones in an effort to gather further exploration data and physico-chemical characteristics of oil shale in order to define and delimit these regions potential.

Onhym has initiated a reflection on a regulatory, legal and fiscal framework.



## Mining exploration

In the course of 2006, mining exploration activity has been concentrated on the sectors and prospects given a top priority following the results obtained during the previous years. This activity has focused on 21 objectives broken down according to the following three main mineral categories : precious metals: 15; base metals : 05; rocks and industrial minerals : 01.

### ■ Precious metals : new promising prospects

#### ► Tamlalt (Au)

The Jbel Malek gold deposit (Tamlalt inlier, Figuig province) has been subject of a synthesis report of estimated resources at 1 074 463.53 t with a grade of 3.76 g/t Au of indicated resources and at 614 260.6 t with a grade of 4.94 g/t Au of inferred resources. An international tender has been launched for the transfer of this deposit.

#### ► Azougar N'Tilili (Au, Pb, Zn, Ag)

The polymetallic and gold bearing prospect of Azougar N'Tilili (Tan Tan province) has been subject of drillings carried out in an effort to recognize several structures at depths ranging between 25 to 85 m and which have yielded encouraging results : AZ1 : 12.15g/t Au, 9.37% Zn and 10.18% Pb on an average thickness of 1.4 m; AZ3: 5.56 g/t Au and 6.78 % Zn on an average thickness of 1 m; AZ4: 7.24 g/t Au on 1.2 m and 4.74 % Zn on 3.3 m; AZ6: 3,15 g/t Au on 1.93 m ; 3.72 % Zn on 3.34 m and 2.8% Pb on 3 m.

#### ► Had Imawn (Au)

Had Imawn gold bearing deposit has been subject of an estimation of geological resources

evaluated at 1 333 616 t grading 2.55 g/t Au, for an average thickness of 20 m or 500 890 t with a grade of 6.21 g/t for an average thickness of 3.44 m. Moreover, the preliminary control of the structures extension towards the north has given encouraging contents ranging from 0.1 g/t Au and 7.2 g/t Au for thicknesses of the order of 3 m.

Works are being carried on as part of the convention concluded with the Canadian company Sanu.

#### ► Bas Draa (Au, Ag, Cu, ...)

In the Bas Draa inlier, (Guelmim and Tan Tan provinces) exploration has allowed to delimit AK1 structure (0.1 to 6.2 g/t Au with exceptional thicknesses of 67.5 and 147 g/t Au ) and AK4 structure (4.7 to 56 g/t especially at the level of the surrounding formation to the west with thicknesses ranging from 0.3 to 1.2 m).



## Mining exploration

### ► Southern provinces (Au, Ag, Cu, Pb,...)

In the Southern provinces, the works undertaken have been concentrated on two prioritized sectors that enabled to :

- Discover niobium , tantalum , iron prospects with interesting grades: 1.68% Nb, 0.17% Ta and 50.3% Fe;
- Highlight a gold bearing mineralization (36 g/t Au and 1.2% Pb) and a ferriferous formation with very interesting grades (84 and 92 % Fe<sub>2</sub>O<sub>3</sub>) on an extension probably exceeding 5 km.

On a regional level, a geochemical campaign covering a surface area of 5000 square kilometres is under way.

The works carried out with a Canadian company have helped to delimit numerous precious metals and base metals anomalies. Considering the recorded encouraging results, these anomalies will be controlled in 2007 as part of an agreement under finalization (Onhym: 40%; partner : 60%).

### ► EÇ-Çour (Au, Cu)

In Eç-çour district, located west of Agouim in south Atlas passage (Ouarzazate province), geological prospecting has given encouraging results, reaching 3 g/t Au and 60 g/t Ag.

### ► Bou Teglimt (Au, Ag)

In Bou Teglimt sector, located at some 20 km SE of Boulemane, the lithochemical works carried out on PII shaly rocks have revealed the occurrence of quartz veins and veinlets linked to crushed zones (1.6 g/t Au).

### ► Ouarzazate (Au, Ag, Cu)

In Ouarzazate target, Talkhoumt quartz structures have revealed gold bearing structures reaching 18.5 g/t Au with average thicknesses of 1 m.

### ► Sirwa (Au, Ag, Cu)

In Sirwa sector, (Ouarzazate province), the control of geophysical and geochemical anomalies has enabled to identify quartz and carbonate structures with index contents in Cu (0.10 to 2.3%), in Au (57 to 640 ppb) and in Ag (2 to 46 g/t).

### ► Assaka (Au, Ag, Cu)

In Assaka sector, located SW of Igherm (Taroudant province), iron oxide quartz structures gave low gold contents.

### ► Eastern Akka (Au,Ag, Cu,Pb, Zn)

In the eastern lobe of Akka inlier ,located at 260 km of Agadir, the works carried out have concentrated on the geologic control of alluvial anomalies by soil geochemistry with grades reaching 30 ppb Au.

### ► Western Akka (Au, Ag, Cu,Pb, Zn)

In the western lobe of Akka inlier, the detailed alluvial geochemical works carried out on Imoutl sector have revealed grades that reach 64 g/t Au in pan concentrates.

### ► Central High Atlas (Au ,Ag, Cu,Pb, Zn)

In the South limb of central High Atlas (Ouarzazate province) a geochemical prospecting survey has been conducted over a surface area of 320 km<sup>2</sup> and has enabled to limit some anomalies whose grades reach 5967 ppb in concentrates.

## Mining exploration

### ■ Base metals : encouraging Polymetallic prospects

#### ▶ Guemassa – Haouz (polymetallic)

As part of Onhym - CMG agreement, Guemassa-Haouz sector, located West of Marrakech (Al Haouz province) has been the subject of exploration works that have focused mainly on Khwadra, East Frizem, Nzala and Mjed sectors.

- On Khwadra prospect, two bore holes have been drilled. Kh20 bore hole has intercepted 5.7 m of massive sulfides with 4.75% Zn, 1.70% Pb, 0.34% Cu and 30 ppm Ag. The last calculation of resources has defined a tonnage of 2 010 000 tonnes at 5.11% Zn; 1.12% Pb; 0.35% Cu and 25.20 g/t Ag, or 7.04% ZnEQ for cut off grade of 5% ZnEQ.
- N'Zala prospect has been subject of a new drilling campaign that showed several mineralized passages with zinc grades that sometimes exceed 4% Zn over passes reaching up to 5 m. The evaluation of the prospect is under way.
- The only drilling carried out on East Frizem prospect, following the modelling of geophysical anomalies did not give encouraging results. Reconnaissance surveys are being carried out on the sector.
- Concerning Mjed magnetic anomaly, located East of Guemassa massif, geophysical surveys by magnetometry and electromagnetism have been carried out. MJ5 drilling, installed in the magnetic anomaly, has

crossed a horizon of 80 m of disseminated mineralization of pyrrhotine including a level of 4 m of submassive sulfides to pyrrhotine.

#### ▶ Jebilet (polymetallic)

In the Jebilet sector (Onhym - CMG Agreement), exploration works have concerned the launching of development works by mining works on Koudiat Aïcha deposit.

#### ▶ Tekna-Marrakech (polymetallic)

An agreement project with CMG is under preparation on Tekna-Marrakech sector, located west and south west of Marrakech for exploration of polymetallic mineralizations.

#### ▶ Bled Jemaa (Pb, Au, Ag,Zn)

Bled Jemaa structure (Khenifra province) yields mineralization in Pb, Zn, Afg, and Au. The structure extends over 600 m. The geophysical works conducted in the course of the year have focused on the rooting and the



*Onhym vectorization center*

## Mining exploration

extension study of the microdiorite bearing the mineralization, using the electrical drilling method combined with the induced polarization method.

### ► Ighir ou Roumi (Pb, Ag,Zn,Au)

In Ighir ou Roumi sector, (Khenifra province), located in central Morocco at 5 km NE of Moulay Bou Azza, a mineralized zone in Pb has been observed on the surface over 200 m and has been the subject of detailed topographic and geological surveys aimed at exploring extensions.

### ► General exploration (Pb, Ag,Zn,Au)

In terms of general exploration, works have been concentrated on :

- Kelaat Sraghna – Mkhalf prospect (El Kelaa Sraghna province) in which the first results of analyses from Charfa and Snoussine structures reach 4.9% Cu.
- Sud Bani prospect (Tan Tan province) in which the works undertaken for ore research have allowed to locate a ferriferous level of kilometre extension which was the subject of systematic sampling.

## ■ Industrial minerals

### ► Tertiary basins (Bentonites)

At the level of Tertiary basins (Onhym -Tolsa agreement), the works achieved aimed at extending Tizza bentonite deposits and at evaluating sectors around Afrha. The results obtained are encouraging and industrial tests have been carried out.

### ► General exploration

In Guercif basin and Taourirt-Oujda passage, two sectors have been identified for research of fibrous clays (attapulgitite) in Ain Fritissa and Mezguitem regions.

In the Gharb and Prerif basins, Tertiary clays and marls have been sampled.

At the level of Tancherfi, Jerada, Sefrou and Oued Beht, favourable zones have been circumscribed for dolomites that can be used in flat glass industry.



## Mining exploration

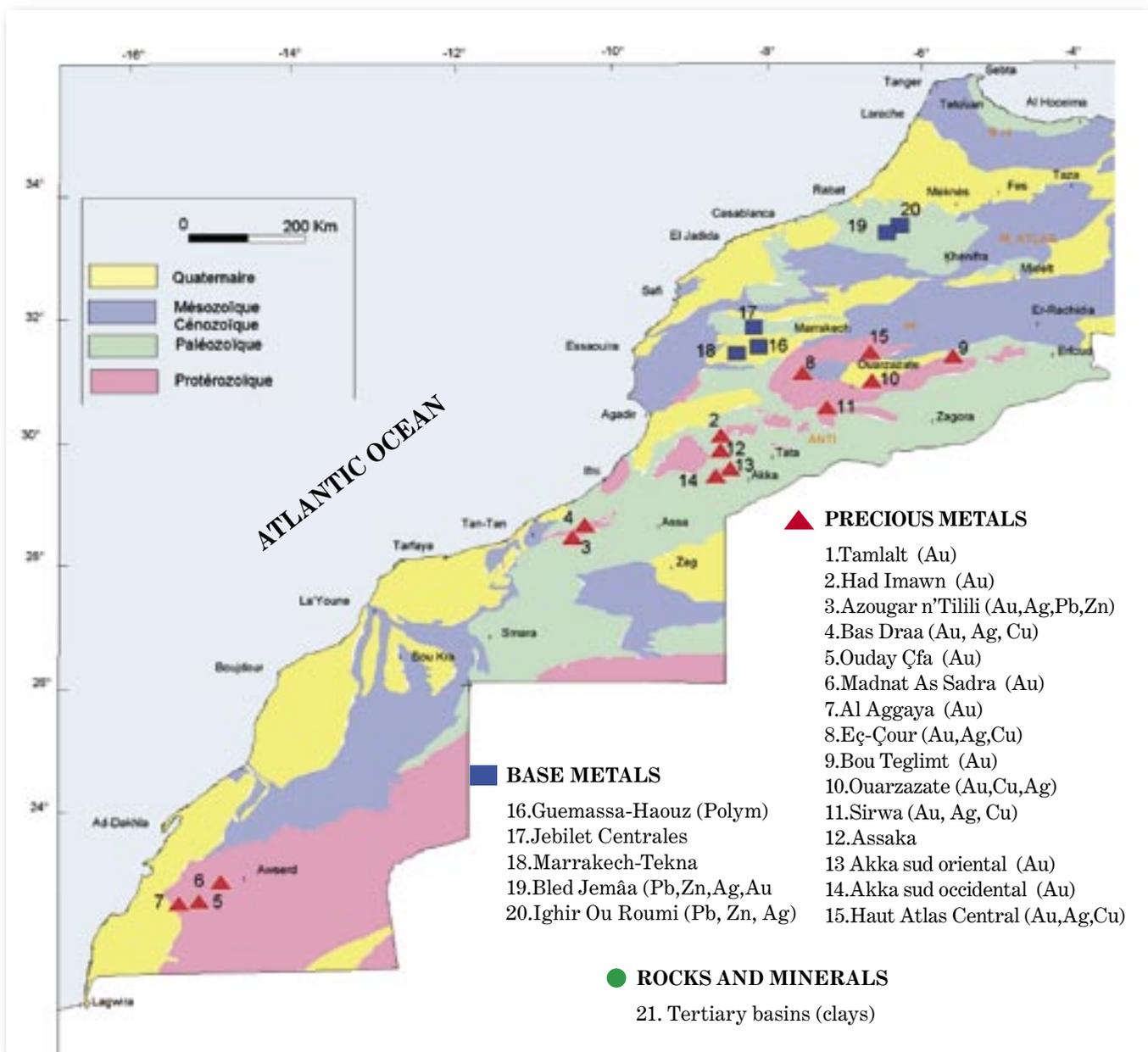
### Objectives worked in 2006

Objectives	Substances	Provinces	Works carried out
<b>Precious metals</b>			
Tamlalt	Au	Figuig	resources assessment and tender for transfer
Had Imawn	Au	Taroudant	resource assessment- Sanu- Onhym agreement
Azougar N'tilili	Au, Zn, Pb, Ag	Tan Tan	Drilling: :917,50 m- geol.
Madina Assadra	Au, Ag, CU, Zn	Awserd	Geol.,lithogeochem., sampl.,drill.: 921,4 m
Ouday Çfa	Au, Ag, Cu, Zn	Awserd	Geol.lithogeochem.sampl. geoph.
Alaggaya	Au, Ag, Cu, Zn	Awserd	Geol.lithogeochem.sampl. geoph.
Assaka	Au, Ag, Cu	Taroudant	Geol.,sampl.
Ouarzazate	Au, Cu, Ag	Ouarzazate	Geol.,Lithogeochem.
Sirwa	Au, Ag, Cu	Ouarzazate, Taroudant	Geol.,Lithogeochem.
Bou Teglimt	Au, Ag	Ouarzazate	Geol., Lithogeochem.
EÇ- Çour	Au, Ag, Cu	Ouarzazate	Geol.,sampl., topogr. .
Bas Draa	Au, Ag, Cu	Guelmim, Tan Tan, Assa Zag	Geol, alluv.
Western South Akka	Au, Ag, Cu, Pb, Zn	Tata	Geol.,sampl., alluv.
Eastern South Akka (Jica)	Au, Ag, Cu, Pb, Zn	Tiznit, Tata	Geol.,sampl.,soil geochem.
Central High Atlas	Au, Ag, Cu, Pb, Zn	Ouarzazate	Geol.,sampl., alluv.
<b>Base metals</b>			
Guemassa Haouz	polymetallic	West Marrakech	Drill.:1958.45(685.46*m)-shaft:164.2 (65.n68*m)-gallery: 38 (15.20 m)
Jebilet (CMG - Onhym)	polymetallic	West Marrakech	Rock sampling – Chemical analysis
Marrakech – Tekna	polymetallic	West Marrakech	Agreement under way
Bled Jemaa	Pb, Zn, Ag, Au	Khenifra	Geol.,sampl., topogr.
Ighir ou Roumi	Pb, Ag, Zn, Au	Khenifra	Geol.,sampl., topogr.
<b>Industrial minerals</b>			
Tertiary Basins (Onhym-Tolsa)	Bentonite	Nador	Sampling, drill.
Guercif-Oujda-Gharb	Clays, dolomites	Oujda, Taourirt-Sefrou...	sampling – analysis

\*Onhym' share

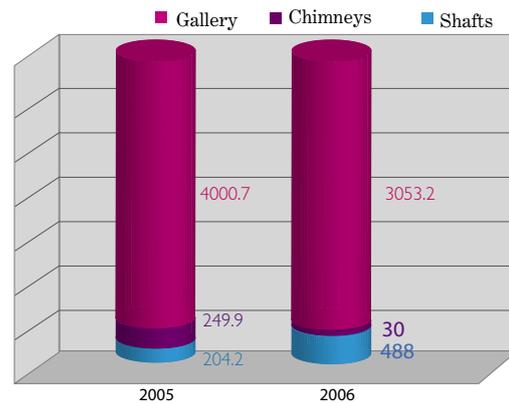
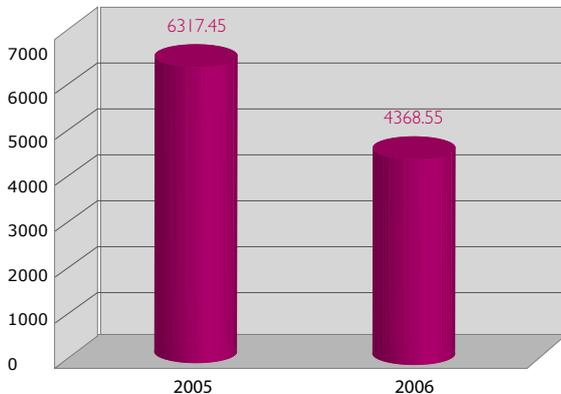
## Mining exploration

Location map for works scheduled in 2006



## Drillings and mining works

The structural decline recorded in drilling and mining works activity was confirmed in 2006. This is due mainly to the slowdown of our clients' works.



### ■ Mining drillings

During the year 2006, mining drilling teams have been active on 4 workings. The volume

of drilling works carried out is given in the following table :

Workings	Core drill (ml)	Track (ml)
□ Onhym work		
Azougar N'Tilili	907.50	239.00
Azougar N'Tilili 2	311.7	
Madnat Assadra	920.9	
Guemassa Haouz (Onhym -Tolsa)	685.5	
Jbilet (Onhym -CMG)	108.00	
<b>Total works Onhym</b>	<b>2933.6</b>	<b>239.00</b>
□ Work under agreement	1272.99	
Guemassa-Haouz- Onhym -CMG	162.00	
Jbilet Onhym -CMG		
<b>Total works under agreement</b>	<b>1434.99</b>	
<b>Overall total as of December 31<sup>st</sup> 2006</b>	<b>4368.55</b>	<b>239.00</b>

## Drillings and mining works

### ■ Mining works

During the year 2006, mining works teams have been active on 5 workings one of which within the framework of an agreement and

three for third parties' account. The volume of works carried out by working is shown in the following table :

Working	Shafts (ml)	Chimneys (ml)	Gallery Cross drifts (ml)	Concrete	Widening
□ Onhym works					
Jbilet Onhym -CMG	65.68		18.88	237.96	117.20
□ Works under agreement					
Jbilet Onhym -CMG	98.52		28.32	356.94	175.80
□ Third party works					
Imiter		29.90	2752.30		2800.00
Igoudrane	38.60		7.80		136.00
Iourirne Bure sud	228.80		57.70	36.12	25.52
Various actions	56.60		188.20		56.50
<b>Total third party works</b>	<b>324.00</b>	<b>29.00</b>	<b>3006.00</b>	<b>36.12</b>	<b>3018.02</b>
<b>Grand total as of 31 dec, 2006</b>	<b>488.20</b>	<b>29.90</b>	<b>3053.20</b>	<b>631.02</b>	<b>3311.02</b>



## Mining holdings and cooperation

### ■ Reactive promotion and partnership with new international players

As part of its promotion actions, Onhym concluded in 2006 four partnership agreements with private national and international partners :

- Signature on April 21, 2006 of an addendum to the co-operation draft agreement with the Mauritanian Office of Geological Survey;
- Agreement signed on April 29, 2006 with the Canadian company Sanu Resources Ltd on gold bearing mineralizations of Ighrem and Agadir Melloul mining domain in Taroudant region;
- Lease agreement signed on October 4, 2006 with the Moroccan company Yabosmi ex-Tiouine-Taznakht mine;
- Draft agreement signed on November 2, 2006 with the Australian company Kasbah Resources on El Karit tin bearing deposit.

### ▶ Onhym -Metalex agreement

As part of the agreements signed on May 11, 2004 and May 3, 2005 between Onhym and the Canadian company Metalex Ventures Ltd aimed at the carrying out of regional reconnaissance work in the South of Morocco, a draft agreement has been prepared by both parties to carry on partnership work on precious metals and base metals exploration.

### ▶ Onhym-Tolsa agreement

The Management committee set up in pursuance of the agreement signed on May 3, 1995 between Onhym and the Spanish company Tolsa, related to the exploration of clays in Tertiary basins of Morocco was held on February 3, 2006.

### ▶ Onhym-Sanu agreement

The Management committee set up in pursuance of the agreement signed on March 29, 2006. between Onhym and the Canadian company Sanu Resources Ltd, held its first meeting on May 31, 2006. The agreement plans to implement a work and studies programme for a total amount of 2.5 million US \$, which is entirely chargeable to the partner to allow this latter to have a 65% stake in the agreement.

### ▶ Onhym-Fuyuan memorandum

Onhym and the Chinese company Fuyuan have undertaken negotiations aimed at the conclusion of a memorandum of understanding related to the evaluation of the mining potential in zinc in some sectors of the High Atlas, Middle Atlas and the Rif.

### ▶ Onhym-Kasbah Resources draft agreement

In the frame of the draft agreement signed between Onhym and the Australian company Kasbah Resources for the development of Achmmach deposit, an amendment was signed on November 2, 2006 between the parties extending by 12 months the second phase period of works to be carried out. The extension period will help Kasbah Resources to further evaluate Achmmach deposit.

### ▶ Onhym-Managem partnership

Within the frame work of the partnership between Onhym and Managem, several meetings have been held in view of examining the progress state of some projects (Koudiat Aïcha and Tekna polymetallic deposits, Tafrent auriferous deposit, Ait Ammar ore deposit, Bou Issaffen zircon and East Akka-Angarf agreement).

## Mining holdings and cooperation

### ► Transfer of Jbel Malek auriferous deposit

An international tender was launched by Onhym on June 26, 2006, for the total or partial transfer of Jbel Malek auriferous deposit. After submission of tenders by 3 bidders, the evaluation commission has validated the proposal made by a company with which the details a transfer agreement will be discussed in the early 2007.

### ■ Mining participations

The main facts that marked Onhym activity with regard to mining participations in 2006 are summarized as follows :

#### ► At the level of social acts

##### ● Board meetings

- The whole subsidiary companies and joint ventures and their branches convened their meetings, within the required time as provided by the law, of the Boards for the closing of accounts for the year 2005. The Boards have also examined the activity of the first months of 2006 and future prospects.

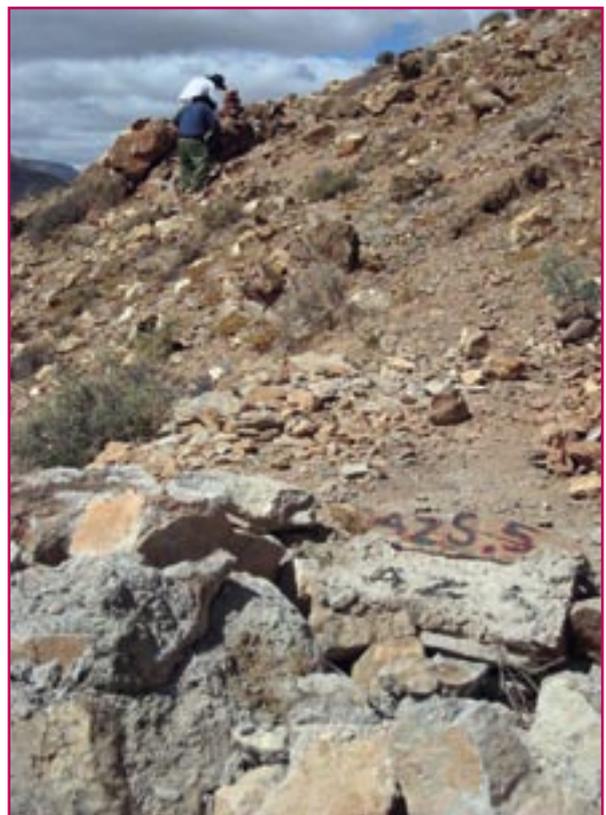
##### ● Ordinary general assemblies

- Almost all the subsidiary companies and joint ventures and their branches have convened their ordinary general assemblies decreeing the accounts closed as of 31/12/2006
- Charbonnages du Maroc (CdM) shareholders held a meeting on July 21, 2006, to deliberate on progress reports on the liquidation and estimated work in view of ensuring continuity of the process. It has been decided to continue the amicable liquidation of the company and to renew the liquidator's mandate for an additional twelve-months period.

- Achievement of formalities for filing applications, registration, advertisement, and updating of the Trade Register.

#### ► At the level of portfolio incomes

Portfolio incomes recorded an increase of 54% in 2006, mainly as a result of the increase in metals prices.



## A sustained attention to safety, environment and quality

### ■ Safety, environment and quality

#### ▶ A permanent watch on safety

Safety for persons and equipment is a main and permanent objective for all within Onhym. It is ensured through a set of rules and devices that have undergone regular checks and controls in the course of 2006. It should be mentioned, as an example, that the drilling rig H525 and its equipment have been checked before the start of well drilling in the Gharb basin and control visits have been carried out on mining work premises.

In an effort to keep being updated in this field, Onhym took part, in 2006, in the training workshop 'Safety in industrial environment and prevention of risks in the enterprise' organized by the high School of Technology in Casablanca. Onhym took also part in a one-day study on professional diseases, organized by the Federation of Mining Industry.

#### ▶ Respect of the environment

As far as environment is concerned, Onhym is keen on conforming to legal arrangements and brings its active support to its partners in all the stages of the moves necessary to prepare and validate the environmental impact studies they are requested to carry out before undertaking seismic acquisition and drilling operations. Thus in 2006, Onhym cooperated with scientific intervening parties, representatives of partners

and concerned ministries for the preparation and presentation of 3 environmental impact studies: one concerned with seismic acquisition and drilling operations impact in Tselfat permit, the others concerned with Heyco and Maersk seismic acquisitions.

A technical and regular watch is set up to update our knowledge in this field. In this context, Onhym has taken part in the round table on the environment entitled: 'discharges, flows, disposals, direct or indirect deposits in superficial waters', organized by the Federation of Mineral Industry to fix the royalty rates applicable to waste water spills and to define pollution unit.

#### ▶ Quality certification expected in 2007

The necessary steps that the Mine laboratories has undertaken for several years to obtain an ISO certification have been crowned with success and works for the building and equipment of new premises for laboratories are being completed. This has allowed to schedule the final auditing of mine laboratories certification for February 2007.

Two groups, in charge of quality improvement, accompanied by a specialized consulting office, are active in Petroleum laboratories in an effort to optimize the operating modes and follow similar useful steps adopted in the Mine laboratories.



## An Information System in full evolution

### ► A significant step towards the integration of Onhym information systems

As part of the organizational study, the terms of reference and the reframing of work on the study of a master plan of Onhym information system have been prepared. The corresponding computerization project aims, within the next five years at integrating in a unique system the information system of the transitional management set up after Onhym creation, the Mines GIS in operation for several years and the Petroleum GIS which is being setting up.

### ► More performant information tools for a more reactive management

The pay software Agirh, whose implementation started in January 2006, has been finalised and integrated in the existing application environment and its exploitation has progressively been taken over by users.

- Implementation of a pilot platform based on Microsoft Share point tool for management and achievement of documentary products and for communication.
- Acquisition and implementation, as part of the preparation of the Office organization manual, of a modelling tool of «Mega process».
- Acquisition and implementation of an information solution Helpdesk in an effort to rationalize the management of internal support to the users of information tools.

### ► Launching of Petroleum GIS development

A pre-selection tender for development of petroleum GIS, in synergy with Mines GIS and the cartography GIS of the Ministry of Energy and Mines has been launched. The tender also

encompasses transcription with the indexing of part of the geophysical patrimony, the recovery, the conversion and the loading of seismic navigation data.

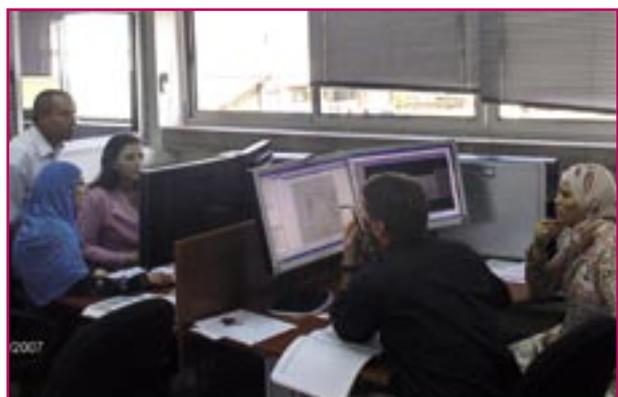
A database platform in accordance with Petroleum GIS model has been set up in order to integrate the data already available in view of their loading in the future system.

Concurrently, a seismic interpretation solution has been acquired and the hardware platform set up; the application includes all the necessary utilities to load and manage locally the projects and edit the results of the seismic interpretation. The application is operational and the upgrading of the centre of geophysical transcription has been launched.

### ► Upgrading of Mines GIS

Acquisition of the extension of the park of GDM software, used as an exploration tool by geologists and Normat software.

Enrichment of the Mines GIS database by integration of data from the Ministry of Energy and Mines.



*Onhym interpretation seismic center*

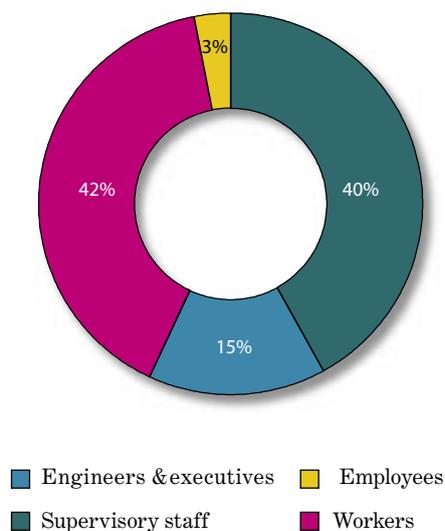
## Human resources

### Onhym staff

As of December 31, 2006, Onhym overall staff was 1359 employees broken down as follows:

Engineers and executives	204
Supervisory staff	540
Employees	45
Workers	570

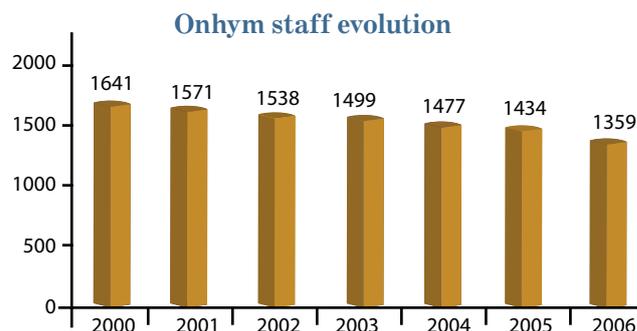
The breakdown of the staff by professional category has not undergone a significant change during 2006. The proportion of engineers and executives with regard to the whole personnel is 15%. The operation of voluntary redundancies prepared during the year should allow to reinforce the managerial staff rate as early as 2007.



### Regular decrease of Onhym staff

The overall staff has regularly decreased during the last decade as a result of the combined effects of departures (mainly retirement and voluntary redundancies) the freezing of recruitments, reopened in small proportions since 1998.

From 2000 to December 31, 2006, the overall workforce of the merged offices has decreased by 282 persons, going from 1641 agents to 1359 as shown in the figure below :



### Maintenance of the level of socio-cultural actions

Field	Number of beneficiaries
Loans for lodging	60
Pilgrimage	11
Exceptional advances	194
Vacation centres	228
Cultural activities	230
Holiday camps	482
Medical care	1751

## Human resources

### ► Harmonization of personnel management rules

Following the effective setting up of Onhym, works aimed at harmonizing management rules as applied to human resources have been launched. They have concentrated on the personnel pay, the administrative number, category codes, travel allowances, computer bonus, family allowances, salary grids, date of retirement and maternity leave and also on various actions pertaining to social management with the functioning of a new insurance policy-maternity improving the risk cover.

The harmonization approach will continue next year concurrently with the advance of new projects of personnel statutes.

### ► Training

The training programme has concerned 111 individual or collective continuous training actions for the benefit of 330 participants resulting in a volume of 1039 men/day/training and a total cost of 1670 KDH.

#### ► Para Training actions that contribute to the youth human development

- Supervision of some 93 students from higher education (schools, universities, institutes and mining schools) during their training sessions;
- Granting of 1190 scholar grants for the benefit of 558 children of Onhym personnel, representing the total amount of 170 KDH.

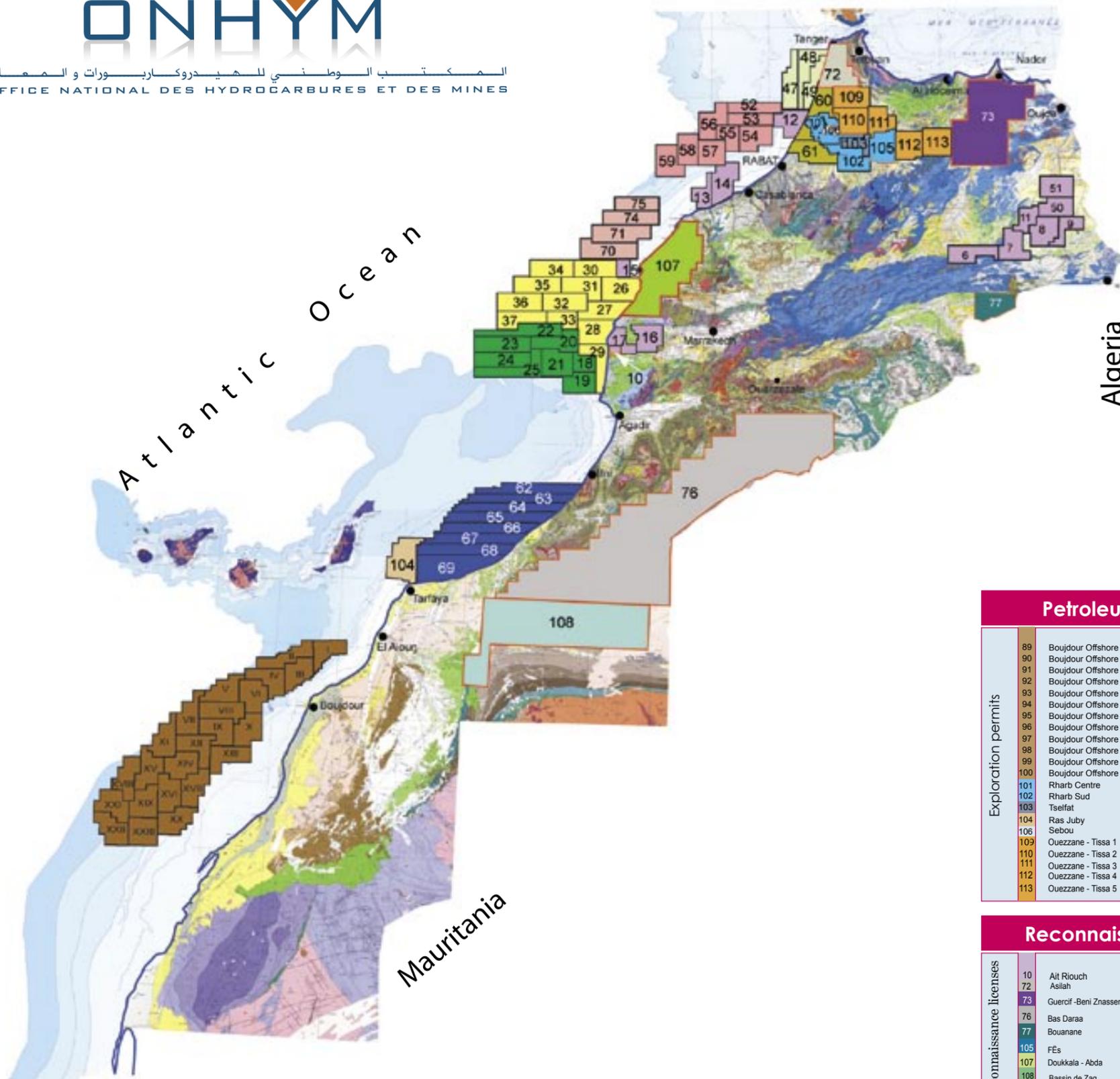
Training field	Nbr of actions	Nbr of participants	Nbr of M/D/T*
Training actions abroad (forum ...)	11	20	93
E & P and technical subjects	24	146	415
Data processing & information systems	12	28	82
Management, personnel development & HRM	17	68	193
Quality, security, maintenance and environment	13	21	73
Managerial techniques	24	33	85
Total seminars and training actions	101	316	940
English language courses	10	14	99
Total continuous training	111	330	1039

\*M/D/T: man/day/training

*Petroleum exploration  
permits and reconnaissance  
licenses map*

Mediterranean sea

## Petroleum exploration permits and reconnaissance licenses map



### Petroleum Agreements

	Area	Company	Km <sup>2</sup>
12	Loukos Offshore	ONHYM - MAGH PET EXP	1925
13	Casablanca Offshore I		1010
14	Casablanca Offshore II		1990
15	Safi Offshore		500
16	Ounara Est	ONHYM - VANCO - CNOOC	2000
17	Ounara ouest		818
18	Ras Tafelney Offshore 1	ONHYM - VANCO	870
19	Ras Tafelney Offshore 2		1480
20	Ras Tafelney Offshore 3		1700
21	Ras Tafelney Offshore 4		1930
22	Ras Tafelney Offshore 5		1980
23	Ras Tafelney Offshore 6		1970
24	Ras Tafelney Offshore 7		1970
25	Ras Tafelney Offshore 8		1880
26	Safi Haute mer 1	ONHYM - REPSOL YPF	1950
27	Safi Haute mer 2		1550
28	Safi Haute mer 3		1750
29	Safi Haute mer 4		1630
30	Safi Haute mer 5		1570
31	Safi Haute mer 6		1840
32	Safi Haute mer 7		1790
33	Safi Haute mer 8		1040
34	Safi Haute mer 9		1700
35	Safi Haute mer 10		1960
36	Safi Haute mer 11		1880
37	Safi Haute mer 12		1670
47	Tanger-Larache 1	ONHYM - MAGH PET EXP	2000
48	Tanger-Larache 2		1985
49	Tanger-Larache 3		1510
6	Tendrara "A"	ONHYM - PETRONAS Carigali	1594,7
7	Tendrara "B"		1598,3
8	Tendrara "C"		1595,6
9	Tendrara "D"		1046,5
11	Tendrara "E"		970,1
50	Tendrara "F"		1348,9
51	Tendrara "G"		1510
52	Rabat-SalÉ Haute mer I	ONHYM - HEYCO - STRATIC ENERGYCORP.	1428
53	Rabat-SalÉ Haute mer II		1440
54	Rabat-SalÉ Haute mer III		1999
55	Rabat-SalÉ Haute mer IV		1279
56	Rabat-SalÉ Haute mer V		1968
57	Rabat-SalÉ Haute mer VI		1792
58	Rabat-SalÉ Haute mer VII		1637
59	Rabat-SalÉ Haute mer VIII		1998
60	Moulay Boussselham	ONHYM - MAERSK OIL	1982,5
61	Mamora		1999,35
62	Tarfaya Shallow I	ONHYM - NORSK HYDRO/DANA	1910
63	Tarfaya Shallow II		1831
64	Tarfaya Shallow III		1893
65	Tarfaya Shallow IV		1990
66	Tarfaya Shallow V		1959
67	Tarfaya Shallow VI		1840
68	Tarfaya Shallow VII		1865
69	Tarfaya Shallow VIII		1421
70	Safi Offshore N.O. I	ONHYM - KOSMOS	1928,1
71	Safi Offshore N.O. II		1954,5
74	Safi Offshore N.O. III		1549,5
75	Safi Offshore N.O. IV		1231,1
78	Boujdour Offshore I		1615
79	Boujdour Offshore II	ONHYM - SAN LEON ISLAND OIL & GAS - GB OIL & GAS	1869
80	Boujdour Offshore III		1758
81	Boujdour Offshore IV		1875
82	Boujdour Offshore V		1926
83	Boujdour Offshore VI		1925
84	Boujdour Offshore VII		1934
85	Boujdour Offshore VIII		1924
86	Boujdour Offshore IX		1929
87	Boujdour Offshore X		1952
88	Boujdour Offshore XI		1936

### Petroleum Agreements

Exploration permits	Area	Company	Year
89	Boujdour Offshore XII	ONHYM - KOSMOS	1933
90	Boujdour Offshore XIII		1946
91	Boujdour Offshore XIV		1937
92	Boujdour Offshore XV		1939
93	Boujdour Offshore XVI		1944
94	Boujdour Offshore XVII		1937
95	Boujdour Offshore XVIII		1950
96	Boujdour Offshore XIX		1947
97	Boujdour Offshore XX		1957
98	Boujdour Offshore XXI		1948
99	Boujdour Offshore XXII	1954	
100	Boujdour Offshore XXIII	1953	
101	Rharb Centre	ONHYM - CABRE	1941,7
102	Rharb Sud		1939,7
103	Tselfat	ONHYM - TRANSATLANTIC	899,8
104	Ras Juby	ONHYM - GENTING OIL	2000
106	Sebou	ONHYM - CIRCLE OIL Plc.	269,29
109	Ouezzane - Tissa 1	ONHYM - DIRECT- ANSCHUTZ	1998,4
110	Ouezzane - Tissa 2	ONHYM - DIRECT- ANSCHUTZ	1999,1
111	Ouezzane - Tissa 3	ONHYM - DIRECT- ANSCHUTZ	1624,3
112	Ouezzane - Tissa 4	ONHYM - DIRECT- ANSCHUTZ	1912,3
113	Ouezzane - Tissa 5	ONHYM - DIRECT- ANSCHUTZ	1998,7

### Reconnaissance contracts

Reconnaissance licenses	Area	Company	Year
10	Ait Riouch	ONHYM - MAGH PET EXP	224
72	Asilah	ONHYM - DIRECT	2754,2
73	Guercif - Beni Znassen	ONHYM - TRANSATLANTIC - STRATIC	13750
76	Bas Daraa	ONHYM - PETRO CANADA	59067
77	Bouanane	ONHYM - TETHYS/EASTERN	2116
105	FÈs	ONHYM - CABRE	2003,2
107	Doukkala - Abda	ONHYM - ENI	9813
108	Bassin de Zag	ONHYM - SAN LEON ISLAND OIL & GAS - GB OIL & GAS	21807



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