Kingdom of Morocco



OFFICE NATIONAL DES HYDROCARBURES ET DES MINES

# Activity report 2007





His Majesty King Mohammed VI

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#### MESSAGE OF THE GENERAL DIRECTOR

By the end of fiscal year 2007, ONHYM achieved good results, thereby reinforcing the upward trend witnessed over the past few years in the core activities of the Office, namely Exploration, Promotion and Partnership. These accomplishments attest to the relevance of the strategic choices and the corroborating organizational and managerial tools placing ONHYM on the path of sustainable development.

Before presenting the activity of the Office, it is noteworthy to recall the stressful and difficult economic environment which prevailed in 2007 and which was primarily characterized by a historical increase in oil prices that crossed for the first time the mark of 100 dollars per barrel, involving in their wake the courses of all other commodities.

In terms of hydrocarbon exploration, a highly strategic activity, the year 2007 recorded an increase in various activities, i.e. those carried out by the proper human and financial resources of the Office and those conducted by ONHYM partners. This activity recorded a renewed interest in onshore basins in view of the discoveries made throughout the world in similar areas.

Hydrocarbon exploration permits expanded by 43 new blocks bringing the total number of awarded blocks to 128 covering 288.349 km<sup>2</sup>.

At the operational level, 29 study projects among which 26 in partnership and 3 projects with ONHYM equity were conducted over this period. Some significant trends were registered upon completion of the studies and exploration work, thereby confirming the relevance of the managerial tools put in place.

The completion of 530 km of 2D seismic acquired in Northern Boujdour basin and the implementation of the acquisition of 185 km<sup>2</sup> of 3D seismic in Meskala will permit to prepare an active phase in the process of petroleum drilling programmed for these potential basins.

Similarly, the partnership portfolio was expanded with the signing of 22 new petroleum agreements, implicating new partners who committed themselves to conduct large exploration projects.

In terms of hydrocarbon production, 2007 confirmed development of production and sales at the same record level reached in 2006.

Further, the governmental decision to amend the hydrocarbon code to include oil shale is likely to accelerate the pace of development of this highly strategic energy resource given that the country possesses geological reserves estimated at more than 50 billion barrels.

Likewise, Mineral exploration recorded tangible results in most of the 20 projects carried out this year, in conjunction with confirmation of the mining prospects for Azouggar N'tilili in Tantan province, Glibat Lafhouda and Lafwila in the southern zone characterized by the concentration of prospecting for precious and base metals, and precious stones. These very encouraging results will probably effect noteworthy improvement with exploitation of the results of a regional geochemistry campaign carried out in the Awserd region.

Similarly, promotion continued with intensity, this year recording the transfer of gold stock of Jbel Malek in the province of Bou Arfa, by issuance of an international call for bids and complete or partial transfer of some potential prospects whose economic viability was considerably appreciated, fuelled by rising prices. This refers to the Oumjrane (Cu), Zgounder (Ag) Bou Issafen (Zircon), Sidi Bou Othmane (Andalousite) and Boudkek (Magnesite) prospects.

Furthermore, on July 13, 2007 ONHYM was awarded ISO 9001 Version 2000 certification for its mine laboratories.



At the managerial level, 2007 saw the completion of the organizational survey and the application of the concepts and resulting new operating methods such as: management-by-project, service contracts, governance bodies and transversal committees. This step was materialized by the establishment of organization manuals and procedures pertaining to the missions and allocations-by-process, and constituting the basic curve for high performance of human resource management.

Furthermore, 2007 was marked by voluntary departures in the first quarter making it possible to readjust the number of staff members that were reduced to 391 employees. This also allowed halting mining activity outside the core business in the best conditions.

On the strength of its accomplishments and encouraging results, ONHYM is committed to shore up efforts geared to constantly improve achievements while remaining faithful to its prevailing values, namely technical excellence, contribution to sustainable development of the country, international openness and the managerial performance. These are all values driving the daily work of all Office staff members, whom we wish to congratulate here, for their professionalism and the perseverance allowing us to pursue with confidence our action, in accordance with the High Directions of HIS MAJESTY THE KING, MAY GOD ASSIST HIM.

Amina BENKHADRA

### INTERNATIONAL ENVIRONMENT AND NATIONAL SITUATION

#### International environment

### World economy: sustained growth in spite of soaring oil prices

According to the International Monetary Fund, in 2007, growth of the world economy settled at 4.9%, i.e. a level practically identical to that of 2006. These performances were reached despite the jump in prices of all raw materials, thanks to the sustained pace of growth in the large emerging countries that made it possible to largely compensate for the slowdown observed in the major industrialized nations (United States, Euro zone and Japan).

- The year 2007 has essentially been marked by 3 major facts :
- High prices of energy resources.
- Subprime crisis in the United States.
- Drop in the U.S. currency value.

The subprime crisis on real estate occurring in the United States in August 2007 had negative consequences on the U.S. economy. American GDP settled at 2.2% in 2007 vs. 2.9% one year earlier.

In the remainder of the world, in 2007, the Euro zone countries registered growth of 2.8% vs. 2.6% in 2006. Japan whose economy was in a growth cycle since 2003 saw its GDP grow by 2.1% in 2007.

The emerging countries of Asia (primarily China and India) henceforth constituting the engine of the world economy recorded average growth of 9% in 2007. Under the effect of the exports and the investment, China's GDP moved ahead by 11.4% in 2007. In India, growth remained at a relatively sustained pace of 9%, thanks to the strength of domestic demand and good behavior on the exports front.

Latin America recorded growth of 5.6%, i.e. a level slightly higher compared to that of 2006.

In Africa, economic progress remains satisfactory with a growth rate of 5.8% in 2007, slightly improving compared to the rate of 5.7% registered in 2006.

Regarding international transactions, world trade in 2007 saw growth of 6.9% vs. 9.2% one year earlier, under the effect of contraction in demand from the major industrialized countries.

### International energy situation: General rise in energy products

The international energy situation in 2007 was characterized by the jump in prices of energy sources (Coal, oil, natural gas and uranium ore).

In 2007 world primary energy consumption was up 2.4%. Two thirds of this increase occurred in Asia-Pacific region, particularly China where consumption registered a rise of 7.7% compared to 2006.

In a context of high commodity prices, oil prices rose throughout 2007. The average for Brent was US\$ 72.74 / barrel in 2007 vs. US\$ 61.11/ barrel in 2006, i.e. up by 19%.

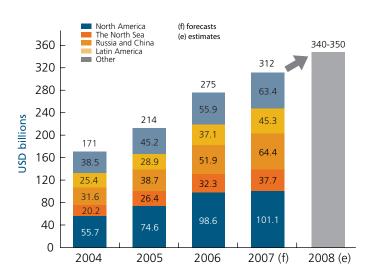
This rise in prices is accounted for by factors linked to supply and demand, in so far as demand saw a sustained growth in China, India and Brazil facing an output that is attempting, with difficulty, to keep up with consumption. Added to that are the difficulties connected to refining at the international level, the multiplication of geopolitical risks and more than anything else, speculation. These are all ingredients explaining why oil prices have reached such unprecedented levels. Most analysts estimate that the world has entered the era of high oil prices, even though in the future there may be a certain let-up.

According to the BP Statistical Review of 2008, world crude oil production reached 81 533 million of b/d in 2007, i.e. a fallback of 0.2% compared to 2006. On the other hand consumption rose by 1.1% reaching the level of 85 220 million b/d.

The known world reserves increased by 1.1% on January 1st, 2008, amounting to 182 billion tons, representing approximately 50 years at the pace of current output.

Upstream of the oil industry, investment in exploration - production activities registered a growth of 13% in 2007 according to the Institut Français du Pétrole (IFP). However, this growth only represents a part of the exploration-production activity fuelled by the considerable rise that occurred over the past few years in the cost of equipments and petroleum-related services.

#### World E&P investment



Note: Oil majors have other expenses besides E&P. One must add operating costs, especially those relative to facility maintenance and repairs (a part of this spending represents a large market for certain companies in the related service and supply sector)

Source: IFP/DEE 2007

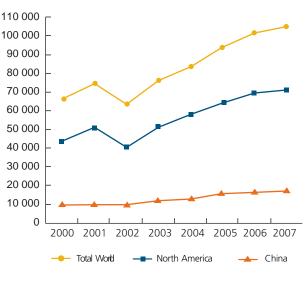
After reaching US\$ 275 billion in 2006, the investments in exploration and production wound up at US\$ 312 billion in 2007. According to IFP, the principal increases were recorded in Russia and in China, where expenses were up by 22% and 24%, respectively, reaching 45 and 64 billion US dollars. In North America, expenditure grew by only 8% reaching US\$ 74.4 billion while falling 10% in Canada to US\$ 26.4 billion. In the North Sea, the growth in investment continued but at a less sustained pace than in the past, with an increase of 17%, i.e. US\$ 32 billion.

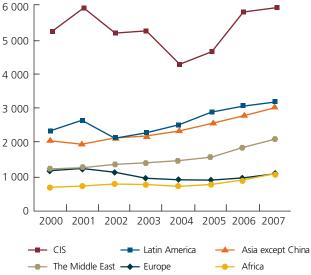
In the geophysical sector, the number of the active seismic crews both onshore and offshore

increased by 13% mainly in Africa and Europe. versus 26% in 2006.

Drilling activity in the world slowed down in 2007. After recording growth of 8% in 2006, the number of wells drilled moved ahead by only 3.5% in 2007 reaching 105 000 wells drilled. The geographical distribution of onshore drilling showed concentration in North America (69%) and China (17%). For offshore drilling, this activity was more highly diversified: 37% of offshore wells in Asia excluding China, 18% in the United States, 15% in Europe and 7 to 8% in Latin America and in China.

Wells drilled worldwide 2000-2007





Source: IHS Energy, Spears & Associates, AEUB - IFP/DEE 2007

#### International mining situation: Continuation of price rises of metals and record levels in budgets dedicated to exploration

The general rise in prices of commodities resulted, in terms of metal prices, in historic levels. From one year to the next, the prices of copper progressed on average by 6%, lead by 100% and tin by 64%. On the other hand, zinc registered a slight decline, the 3-month LME price from a high of 4 200 US\$/ton in May to a minimum of 2 250 US\$ per ton in December. With regard to precious metals, the gold prices showed an average of \$ 696 per ounce in 2007 vs. \$ 606 per ounce in 2006 while the ounce of silver rose from \$ 11.55 in 2006 to \$ 13.38 in 2007.

The increase in prices of mineral raw materials is the result of strong growth in demand of the large emerging countries, on the one hand and of contraction in the supply level, on the other hand. China plays a fundamental role in this regard; it represents today 30 to 35% of the world demand for base metals. Currently, this country consumes 47% of the iron ore marketed internationally, 32% of aluminum and 25% of copper.

Encouraged by high price levels for metals, mining companies devoted large budgets to mineral exploration. According to consultant Metals Economics Group, expenditure for mineral exploration in 2007 reached the record figure of 10.5 billion dollars, i.e. an increase of 40% compared to 2006. Non ferrous metals represented 36% of exploration expenditure. Gold alone represented 41% of capital, diamonds 10% and platinum 3%. Natural uranium, for the first time, was included and would have mobilized nearly 1 billion dollars and would have brought the global budget up to 11.4 billion dollars. The geographical apportionment of exploration expenditure places Latin America on top with one fourth. Canada comes in second place as choice destination with 19% of the investments. while the African continent ranks third with 16%. Australia ranks fourth (12%).

At the level of the companies, 2007 was marked by the continuation of mergers and acquisitions; the largest of which, without doubt, is the announcement in November 2007 of the intention of a takeover bid by mining giant BHP of its rival Rio Tinto.

#### **National situation**

### National economy: satisfactory performance in spite of a lackluster agricultural year

In spite of unfavorable climatic conditions and an international situation characterized by the increase in food and energy commodities, the national economy registered satisfactory results with regard to the quasi-totality of sectors apart from agriculture. Indeed, whereas the primary sector saw its value added decline by 20% from one year to the next, non-agricultural GDP moved ahead by 6% vs. 4% in 2006 thanks to the dynamism of the automotive, building and the public works, tourism and telecommunications industries. According to Bank Al-Maghrib, growth in GDP stood at 2.7% in 2007 vs. 7.8% in 2006.

Unemployment rate saw a level slightly below 10% in spite of diminishing agricultural activity while inflation has been maintained at 2% in 2007 vs. 3.3% the previous year thanks to government measures in support of basic foodstuffs.

With regard to transactions with the outside, the trade balance deficit saw an increase of more than 40% from one year to the next largely attributable to the energy bill and import of foodstuffs.

### Energy: Increase in the consumption and worsening of the energy bill

In 2007, national energy consumption was 13.7 million Tons of Oil Equivalent (TOE), essentially in the form of petroleum products (58.5%) and coal (28.1%). The quasi-totality of these needs was imported (96.6%) and the net energy bill for these imports represented more than 50 billion DH.

Electricity demand reached 22.608 GWh in 2007 registering a growth rate of 7.1% vs. 2006. Electricity consumption saw annual growth of 7 to 8% under the effect of the dynamics generated by major development projects and generalization of access to electricity by the entire country via the Global Rural Electrification Program (PERG).

In 2007, consumption of petroleum products rose to about 8 050 000 tons, i.e. a global rise of 4.5% compared to 2006.

At the end of 2007, energy imports taken altogether amounted to approximately 16.588.600 tons representing 51 724 billion DH, i.e. a rise of 15.2% in value. Crude oil imports reached 6 255 700 tons corresponding to 6. 256 billion DH, i.e. up by 4.3% compared to 2006.

In 2007, investments made in energy reached approximately 9 billion DH, of which about 4 billion in the oil sector.

### Mines: rise of the production and the turnover in the mining sector

In 2007, national mining output totaled 32.6 million tons (of which 31.1 million tons of crude phosphate and derivatives). Turnover in the sector reached 33.2 billion DH (including 26 billion DH in exports) thanks to an international situation marked by an upward trend in ore and metal prices. The prices for crude phosphates in particular, were able to take advantage of the increase in the agricultural products and rising demand for fertilizers.



Boujdour offshore: seismic acquisition vessel

#### HIGHLIGHTS

The year 2007 was marked by the appointment to the new government by His Majesty the KING, on October 15. 2007, of Ms. Amina Benkhadra, Minister of Energy, Mines, Water and the Environment.

#### At the organizational level : Completion of the organization of the new Office and setting up of new governance entities

- Completion of the organizational survey and application of new concepts and management methods, in particular, management-byproject and the inter entity service contracts.
- Launching of transversal committees: «strategy and budget», «Human resources, "Information system"». An executive committee assures follow-up operations.
- Setting up of organization manuals and procedures defining missions and assignments per process.
- Procedures for voluntary early departures aiming at readjusting ONHYM staff.
- Modernization of personnel management rules in view of giving impetus to careers and to better reward for positive results.
- Setting up of the Information System master plan (SDI) spreading over a five-year period (2007-2011) with a clear, shared vision for getting the most out of the different components of the Information system and their evolution by 2011.

#### At the operational level: **Continuation of exploration** activities and signing of new partnership contracts

#### **Hydrocarbons**

- Signature of 8 petroleum agreements, 4 reconnaissance contracts, 5 amendments to oil agreements, 2 addenda to reconnaissance contracts, 1 memorandum of agreement, a confidentiality agreement and 1 memorandum of understanding.
- Study of petroleum evaluation of the basins of Boujdour, Meskala and the Atlantic offshore between Agadir and Ifni.
- New acquisitions and 2D and 3D seismic processing for offshore and onshore exploration.
- Drilling of 2 exploratory wells in the Gharb basin.
- Promotion of the free zones for exploration.
- Launch of the work of the inter-ministerial commission to reflect on a suitable legal and fiscal framework for development of oil shale valorization projects.

#### **Mines**

- Five calls for bids for the transfer of Zgounder (Ag), Oumeirane (Cu), Bou Issaffen (Zircon), Sidi Bou Othmane (Andalousite) and Boudkek (Magnesite) projects have been launched.
- Confirmation of the mining potentialities of the Azouggar N'Tilili, Glibat Lafhouda and Lafwila prospects in the south distinguished by the concentration of the prospecting work for precious and base metals, and precious stones.
- Obtaining of certification by Mine laboratories in accordance with the ISO 9001 version 2000.

#### HYDROCARBON LICENSING

Licensing for hydrocarbons strengthened in 2007 with a total of 110 exploration permits, 7 reconnaissance licenses and 10 concessions covering a surface of 288 348.92 km<sup>2</sup> as follows:

Designation	ONHYM alone	in partnership	Surface Km <sup>2</sup>
Onshore exploration permits	13		25 184.90
Onshore exploration permits		44	73 003.29
Offshore exploration permits		53	93 153.47
Onshore reconnaissance licenses		7	96 889.9
Exploitation concessions	6		98.51
Exploitation concessions		4	18.85
Total surface			288 348.92

#### **ONHYM organization chart General Director** Amina Benkhadra In charge of a mission, Division of Internal Secretary of the Executive control and Auditing Committee S. Abdelmoumni A. El Abaoui Division of Supplies and Stores A. Mahmoudi Direction of Direction of Direction of Direction of Direction of Participations and General Studies and Petroleum Technical services Information Cooperation and Supports Exploration Systems Planification M. Chabaa W. Benhamou M. El Mostaine M.H. Baba Habib R. Gaïdi Direction of Geological Direction of Direction of Direction of Infrastructure and Production and Financial Human Mining Exploration Development Resources Resources H. Sellami Y. Iraqi M. Aboubi A Mouttaqi

#### PETROLEUM EXPLORATION: ACTIVITIES SUPPORTED BY THE OFFICE AND ITS PARTNERS

#### **ONHYM** activity

Petroleum exploration of the Moroccan basins has seen new impetus over the past few years. In FY 2007 the activity was principally devoted to:

- Study of petroleum evaluation of Boujdour and Meskala basins and the Atlantic offshore between Agadir and Ifni.
- New seismic acquisitions and processing onshore.
- Drilling of 2 exploratory wells in the Gharb basin.
- Promotional actions of the open acreage and relinquished blocks.
- Constitution of Oil GIS database, vectorizing of seismic, log and map data, transcription and transfer of the data to partners.



#### **Evaluation studies**

In terms of own work, ONHYM focused its efforts on three petroleum evaluation projects two of which are located onshore in Meskala and Boujdour North ,respectively, and one offshore, conducted on the deep portion of Ifni Agadir. The latter, dedicated to the promotion of the relevant zones, had the aim of attracting new partners and reinforcing exploration efforts in this promising segment.

#### **Boujdour basin: Coastal areas**

As part of the phase aimed at developing play concepts in the coastal areas of Boujdour, FY 2007 was characterized by the acquisition of the 1st seismic campaign (530 Km 2D), designed to explore the Cretaceous and Jurassic formations.

The preliminary works of evaluation of the petroleum potential of this zone, the geological reconnaissance and laboratory analyses confirmed the presence of oil-bearing source rocks of the Upper Cretaceous. The sand-like potential at the Lower Cretaceous was defined by petrophysical works and log analysis. Carbonate reservoirs of Upper Cretaceous with medium petrophysical characteristics were recognized. The parameters of the latter could be improved by the mapped fracture network.

#### Essaouira – Meskala basin

This project, in the framework of the development of Meskala and Toukimt fields, was reinitiated by the acquisition of a 3D seismic program totaling 185 Km<sup>2</sup>. This campaign, associated to the infield geology work, petrophysic and log analyses will enable greater precision of Triassic and Liassic reservoirs (supra-doleritic).

#### The Atlantic offshore: Agadir-Ifni

To reinitiate the exploration efforts in this segment, the activity was focused on the control of existing play concepts in the light of the data acquired by the partners and on the definition of new exploration concepts, notably the Upper Jurassic, the Cretaceous and base Tertiary. The re-interpretation on the Petrel station, of the existing 2D (14 637 Km) and 3D (8 000 Km<sup>2</sup>) data, as well as the sedimentological studies carried out in onshore zones, made it possible, on the one hand, to bring favourable elements to the development of reservoir rocks in the Upper Cretaceous and the Tertiary and, on the other hand, to map new salt-bearing structures, elements deemed to be sufficiently interesting for the re-launch of this project.

#### **Promotion**

On the promotional side, ONHYM participated in 9 international conferences, SEG, Offshore Europe 2007, Eage, Magmed, Aapg annual convention, Apex, Eage Libya, Mapg and Aapg Europe.

Otherwise, the representatives of 20 international companies visited ONHYM. The interest of the visitors concerned the following basins: offshore Mediterranean, Deep offshore Agadir, Deep offshore Draa, Deep offshore Tiznit, ultra Deep offshore Ifni, Gharb, Tadla-Haouz, Missour, Tarfaya-Laayoune onshore, Boudenib-Errachidia, Dakhla offshore, Haha-Essaouira, Rabat onshore and offshore, El Jadida offshore, Saiss and Guercif.

Furthermore, ONHYM conducted, from December 10 to 14, 2007, a door-to-door promotional campaign targeting 7 international companies promoting the zones of Deep Agadir, Deep Draa, North Dakhla offshore, Center & South, Ras Tafelney and Safi Haute Mer.

These promotional events led to the signing of 8 new agreements and 4 reconnaissance licenses. This also led to the opening of negotiations regarding the zones of Tiznit, Tadla, Missour West and Dakhla offshore. These will be finalized in 2008 and will bring to fruition the promotional efforts deployed by the signing of new contracts.

#### **Activity of partners** and cooperation

In 2007 the activity of partners continued in the form of preparations for drilling of the programmed wells, the continuation of seismic acquisitions, processing and reprocessing and petroleum evaluation studies for different zones and permits.

#### **Offshore Zones**

#### Tanger- Larache permits (Repsol / Dana)

Analysis of the economic risk of the eight prospects identified has been completed. Repsol had two drilling sites (Daurade and Anchois). The preparation work for complementary geophysical work on these sites, is currently underway.

#### Rabat-Salé Haute Mer permit (Petronas)

On this permit, eight prospects have been identified and classified, taking into account the following geological parameters: source rocks, reservoir, trap and the timing of migration.

Further to this classification, Petronas decided to test the C prospect with a Lower Cretaceous target. The drilling device arrived on the site where drilling should begin in early January 2008.



#### Casa offshore permit (MPE)

The work was carried on by defining petroleum systems.

#### Loukos offshore permit (MPE)

In the light of the results of seismic stratigraphy and the analysis of the DHI scorers, MPE considers reviewing the Turonian infra-layers and developing biogenic gas prospects similar to the findings in the Gharb onshore basin. Contacts have been made with Dana for an eventual association on these permits.

#### West North Safi offshore permit (Hydro / Dana)

On this permit, Hydro / Dana completed the detailed interpretation and geo-chemical modeling on the most prospective prospect (Chebbi) where petroleum parameters have promising features. Further, an evaluation study of geological and volumetric risk of the Chebbi prospect was conducted.

#### Ras Tafelney permit (Vanco)

Seven prospects, two of which having a relatively large size, were defined and mapped on the RasTafelney block. These prospective zones present play concepts of " toes thrust " and " basin floor fan " subsalt type.

#### Agadir offshore permit (GBP)

The Pstm reprocessing made on 3 600 Km of 2D seismic lines of the two offshore permits permitted to define the major structural elements of the basin, confirm the structural leads and delineate new stratigraphic leads.

To delimit the principal kitchen zones, maturation time modeling and the expulsion phase of HC were carried out.

#### Tarfaya Shallow permit (Maersk)

The processing (migration velocities) of 508 Km<sup>2</sup> was completed in Tarfaya Shallow permit. Interpretation of the data is in progress.

#### Ras Juby permit (Genting)

The processing of the 3D seismic, acquired at the end of 2006, started early January 2007 and was completed in June 2007. Interpretation of the amplitude maps shows good porosities in the surroundings of MO-8 well. A study on the reserve assessment of the Cap Juby structure is in progress.

#### **Boujdour offshore permit (Kosmos)**

The establishment of isochrone maps permitted to identify 97 leads and prospects, 10 of which (4 in the northern part and 6 in the southern part) are of large size, i.e. approximately 50 to 1700 Km<sup>2</sup> surface. A survey of evaluation of the risk and classification of prospects was completed.

Further to this work, Kosmos started farm out contacts for Boujdour offshore to find partners to share in the risk of the exploration drilling.

#### **Onshore zones**

#### Ouezzane-Tissa exploration permits (Direct / Anschutz)

The 2D seismic acquisition on these permits concerned a total of 204.5 Km of lines. The data processing is in progress. The same applies to the ADD-HR campaign that covered a surface of 1420 Km<sup>2</sup>.

#### Asilah permit (Direct / Anschutz)

An ADD-HR campaign (820 Km<sup>2</sup>) was completed. Interpretation of the data is in progress.

#### Rharb Centre, Rharb Sud permits (Cabre)

Among the gas prospects defined on the basis of new seismic reprocessing, Cabre completed the drilling of two wells (DNO-1 and AHF-1). Long term testing was conducted to determine the recoverable reserves and is still ongoing.



#### Fès permit (Cabre)

Among the leads and prospects identified in this permit, Cabre chose one to be drilled in 2008. Topographic site reconnaissance was carried out during the year.

#### Moulay Bousselham permit (HSE)

The economic evaluation of gas prospects identified on the Moulay Bousselham permit is in the process of finalization by Hevco.

#### Sebou permit (Circle Oil)

Start-up on September 28, 2007 of the 3D seismic acquisition on Sebou permit. At the end of the year, 71.1% of the first program on Oulad N'Zala-Ksiri was achieved.

#### **Tselfat permit (Transatlantic)**

The petroleum evaluation of this permit continued by calculation of petroleum reserves and the preparation of a 3D seismic program over 110 Km<sup>2</sup> to be acquired by early 2008.

#### **Tendrara permit (MPE)**

The evaluation of gas accumulation shown by TE-5 well continued via technical and economic studies to appraise the gas potential and study the possibility to develop this gas field.

#### Missour Est reconnaissance zone (MPE)

MPE conducted the seismic reprocessing of the existing 2D seismic data.

#### Boudnib permit and Ouarzazate reconnaissance (MND)

The seismic data of Boudnib and Ouarzazate basins, consist of 72 lines totalizing 2 781 Km. This data was scanned and vectorized for possible reprocessing in 2008. Concurrently, MND expects to acquire the gravimetry and HRAM and aerometric surveys over the permits.

#### **Ounara Est and Ouest permits (MPE)**

In these permits, the work conducted concerned the study of hydrocarbon habitat. MPE was contacted by PEL and Boynes Energy to negotiate a potential association on these permits.

#### Tadla reconnaissance license (Hunt)

Hunt finished the seismic reprocessing undertaken in the basin and the petroleum synthesis. Two play concepts, linked to the Atlasic tectonics, were identified (Subthrust and overthrust). Negotiations, for transforming the zone into an exploration permit and granting of another reconnaissance zone on the northern flank of the High Atlas (Missour side), are in progress.



#### Doukkala-Abda reconnaissance license (ENI)

ENI continued the seismic re-processing and completed the petroleum evaluation in this zone. About 4 180 Km of seismic lines were reprocessed. The Permo-Triasic play constitutes the principal target in this zone.

#### Souss-Ouest reconnaissance license (BGP)

A total of 818 Km of 2D seismic data has been reprocessed using PSTM. A significant improvement was noted on all the lines re-processed.

Interpretation allowed identification of 14 major horizons (from base Pliocene to Upper Triassic) with identification of closed structures against the fault at Lower Liassic and channels of the Aptian.

#### Bas Draa reconnaissance license (Petro-Canada)

The gravimetric and magnetometric airborne campaign, launched in the 2<sup>nd</sup> quarter by Petro-Canada, was completed in late July, totalizing 15 269 Km of lines. Interpretation of the data is in progress.

#### Zag Basin reconnaissance license (San Leon **Energy, Stratic Energy and GB Oil & Gas)**

Exploration work focused on interpretation of LandSat images and the correlation between Zag and Boudenib basins in Morocco and Reggane basin in Algeria. This study made it possible to confirm the occurrence of three petroleum systems. The similarity between these basins constitutes an encouraging factor for the continuation of exploration in Zag and Boudnib basins.

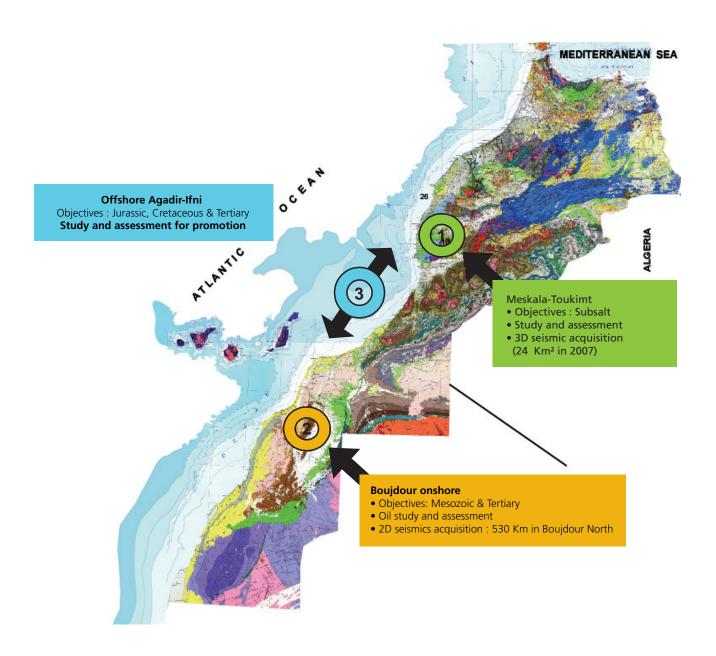


#### **Summary of works carried out in 2007**

#### **GEOPHYSICAL ACTIVITY**

Permits	Company	2D Seismic	3D Seismic	ADD-HR	gravimetry
Sebou	Circle Oil		55 Km²		
Meskala	ONHYM		24 Km²		
Boujdour onshore	ONHYM	530 Km			
Ouezzane-Asilah	Direct-Anshutz			254 stations (820 Km²)	
Ouezzane – Tissa	Direct-Anshutz	204.5 km	876 stations (1420 Km²)		
Ras Tafelney	Vanco	1375 km			
Bas Draa	Petro-Canada				15 269 km
Total		1905 Km	79 Km²	1130 stations (2240 Km²)	15269 Km
ORILLING ACTI	VITY				
Permits	Company	Drillings	Final interval	Dates	
Gharb Centre	Cabre	DNO.1	838 m	From 04 to 25 Nover	nber, 2007
and Sud		AHF.1	855.5	From 11 to 24 Decer	nber, 2007
Total		2	1693.5 m		

#### **ONHYM EXPLORATION WORK IN 2007**



#### PETROLEUM PARTICIPATIONS AND COOPERATION

The promotional efforts made during 2007 on Moroccan sedimentary basins led to the signing of 8 new petroleum agreements, 4 reconnaissance contracts, 5 amendments

to petroleum agreements, 2 addenda to reconnaissance contracts, 1 memorandum of agreement, 1 confidentiality agreement and 1 memorandum of understanding.

#### **Petroleum Agreements**

Partners of ONHYM	Number of permits	Zone	Surface	Validity	Work
GPB Exploration	2 exploration permits 'Agadir offshore1 and 2'	Agadir offshore	3 259.27 km²	5 years	Geological, geophysical and drilling work
Direct Petroleum / Anschutz	2 onshore exploration permits 'Asilah 1 and 2'	Asilah	2 744.2 km²	2 years	Various geological and geophysical works in the zone of interest.
Petroleum Exploration Limited	Exploration permit «Haha 1, 2 and 3»	Haha	4 919 km²	2 years	2D seismic campaign geological and geophysical studies
Dana Petroleum PLC, Tethy's Oil AB, Eastern Petroleum Cyprus Ltd	2 exploration permits «Bouanane 1 and 2»	Bouanane onshore	2 115 km²	two years and 6 months	Geological and geophysical works or drilling of an exploration well
Cabre Morocco Ltd	1exploration permit	Fès	2 000 Km²	18 months	drilling of an exploration well
MND Morocco Ltd	9 exploration permits	Boudenib onshore	16 823.60 Km²	3 years	Geological, geophysical work and drilling of an exploration well
Transatlantic Morocco Ltd, Stratic Exploration Morocco Ltd, Sphere Petroleum QSC	2 onshore exploration permits called «Guercif Est» and «Guercif Ouest»	Guercif	3 893.4 Km²	3 years	Campaign for acquisition of 2D seismic lines.
Longreach Oil and Gas Venture Ltd, San Leon Morocco Ltd, Island International Exploration Morocco	7 exploration permits	Tarfaya onshore	13 434 Km²	2 years	Geological and geophysical work

#### **Reconnaissance contracts**

Partners of ONHYM	Zone	Surface	Period of initial validity	Works
GBP EXPLORATION MOROCCO	West Souss onshore	4 445 km²	12 months	Conducting various geological and geophysical studies.
Hunt Overseas Oil Company	Tadla	28 117.5 km²	12 months	Evaluation works
Maghreb Petroleum Exploration	Missour Est	7 937 km²	12 months	Evaluation works
MND Morocco Ltd	Ouarzazate	24 545.6 Km²	12 months	Geological and geophysical works

#### Amendments to petroleum agreements

Partners of ONHYM	Zone	amendments	Object	
Petronas Carigalli	Rabat Salé Haute Mer	Amendment n°1 to « Rabat Salé Haute Mer» petroleum agreement	Extension of the duration of validity of the initial period of the permits by 4 years	
Maersk Oil Morocco	Tarfaya Shallow	Amendment n°1 to «Tarfaya Shallow» petroleum agreement	Extension of the duration of validity of the initial period of the permits by 12 years	
МРЕ	Casablanca, Ounara and Loukos	Amendment n°5 to 'Casablanca, «Ounara» and «Loukos» petroleum agreements	Extension of the duration of validity of the initial period of the permits by 12 years	

#### Addendum to the reconnaissance contracts

Signature of two addenda with the following partners:

- MPE: addendum n°5 to «Aït Riouch» reconnaissance contract extending the duration of the reconnaissance license by a 12-month additional period.
- ENI Morocco BV: addendum n°1 to «Doukkala Abda» reconnaissance contract extending the duration of the reconnaissance license by a 12-month additional period with a view of carrying out an additional work program.

#### Other agreements

- Hunt: Signature with Hunt of a memorandum of understanding concerning the «West Mediterranean Sea» zone.
- Total: Signature of a confidentiality agreement aimed at evaluating the oil shale potential of the Tarfaya and Tangiers zones.
- Petrobras: A memorandum of agreement for the feasibility study for exploitation of the oil shale in a part of the Timahdit zone was signed on June 14, 2007, with the Brazilian company, Petrobras.

#### PETROLEUM DRILLINGS AND PRODUCTION

For the drilling and the production of hydrocarbons, ONHYM activity in 2007 primarily focused on the following:

- Drilling of 2 petroleum wells for Cabre on the Gharb permit.
- Execution with the H.525 device of an intervention on behalf of Somas.
- Preparations for the drilling of Boujdour stratigraphic well and for workovers on MKL-102 well.
- Production and marketing of hydrocarbons (gas and condensate).

#### **Petroleum drillings**

ONHYM began the acquisition of the services and consumables required for workovers on MKL-102 well. It also drilled 2 wells for Cabre in the Gharb basin (DNO-1 and AHF-1), as well as an intervention on behalf of Somas. Likewise, it conducted the acquisition of the consumables required for the drilling of Boujdour stratigraphic well.



#### **Hydrocarbon production**

National hydrocarbon production amounted to 60 Million of NM3 for the natural gas and close

to 11 000 tons for crude and condensate. This is a growth of 7% compared to 2006 due to the improvement of tapping work by OCP. The share of ONHYM in this production amounted to 80% for the natural gas and 83% for condensate and crude coming from its own fields and participation in those of its partners.

Production	Condensate in tons	Natural gas in Nm³
ONHYM	9 060	41 052 725
ONHYM / Partners • ZHA-2 / Cabre • SAR-1 / Cabre • OLB-1 / Samir		1 358 169 7 392 835 10 536 072
TOTAL		19 287 076
SAMIR Sidi Rhalem (RH-2)	1 855	
SUM TOTAL	10 915	60 339 801

#### **Hydrocarbon marketing**

ONHYM turnover regarding the marketing of hydrocarbons amounted to nearly 110 MDH, a practically identical level to that of 2006 (109 MDH) in spite of the improvement of the volumes marketed that showed the respective increases of 9% and 13% for natural gas and condensate. This situation is accounted for by the fall in natural gas prices as a result of the decision taken by the public authorities to reduce the prices of fuel n° 2 on which the natural gas prices are indexed.

#### **Exploitation works**

ONHYM continued to ensure exploitation works for its own account or on behalf of its partners Samir and Cabre on OLB-1, ZHA-2 and SAR-1 fields.

#### **Hydrocarbon marketing**

	Years					
Fields / Deliveries	2	007	2006			
	Volumes	turnover in DH (exc. Tax)	Volumes	turnover in DH (exc. Tax)		
Natural gas (volumes in Nm³)	46 603 876	78 842 300	42 623 776	79 911 900		
- Essaouira / OCP - Gharb / Cmcp	38 430 597 8 173 279	64 226 100 14 616 200	34 178 684 8 445 092	64 682 100 15 229 800		
Fluctuations in % 2007/2006	9.34	-1.34				
Condensate / Samir (volumes in tons)	8 881	31 060 600	7 875	29 172 800		
Fluctuations in % 2007/2006	12.77	6.47				
Total of the receipts in MAD (exc. tax)		109 902 900		109 084 700		
Fluctuations in % 2007/2006		0.75				



#### **OIL SHALE**

In the framework of the national energy strategy aimed at valorizing national resources in 2007 ONHYM began a series of initiatives for the development of oil shale valorization projects.

For this purpose, an inter-ministerial commission was set up to induce reflection on a suitable legal and fiscal framework for developing projects geared to the enhancement of oil shale.

The works of this commission led to the governmental decision to amend the hydrocarbon code to include oil shale.

Further, in the framework of Initiatives of intense promotion headed by the Office, this year was also characterized by the signing of a memorandum, with Brazilian Petrobras, concerning the implementation of a 2-year work program for analysis of data pertaining to the "Timahdit-1" zone.

Similarly, several contacts were undertaken with numerous international companies interested in the national oil shale deposits.

Finally, two ONHYM delegations went to Canada and the USA to inquire on the technological progress in the development of sand and oil shale.



Timahdit pilot unit

#### MINING EXPLORATION

- Development of new types of exploration targets and broadening of research to new substances.
- Strengthening of change in the geographical distribution of the objectives
- Certification of ISO 9001/2000 obtained by Mine laboratories and consolidation of the management of the exploration according to the project method.

During FY 2007, mining research concerned 20 objectives spread out among the following three central points: precious metals, (13) base metals (6), rocks and industrial minerals (1).

while Generally, pursuing exploration investigations in zones that are traditionally the most promising (the Anti-Atlas, High - Atlas and Jebilets-Guemassa), the research efforts were focused on southern provinces, thereby contributing to strengthening change both on the geographical distribution of objectives and on the nature of the themes developed, as has been observed since 2004.

In addition to this research, the year was also marked by the launch of five calls for bids for the transfer of the Zgounder (Ag), Oumeirane (Cu), Bou Issaffen (zircon), Sidi Bou Othmane (andalousite) and Boudkek (magnesite) projects.

Regarding the laboratories activity, in addition to production, 2007 was marked by the certification obtained by Mine laboratories in compliance with ISO 9001 version 2000.

The results of work by objective were as follows:

#### **Precious metals**

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

In the polymetallic prospect of Azougar N'Tilili, located at about fifty kilometers to the East of the city of Tan Tan, a second campaign of core drilling totalizing 1070.75 m has been performed. The results are as follows:

Structure	N° drilling	Grades and thickness
	AZS-17	<ul> <li>3.1 g/t Au on 0.4 m; 1.66% Zn and 0.98% Pb on 1.54 m (no outcropping structure).</li> <li>11.8 g/t Au; 1.5% Zn and 6.73% Pb on 0.3 m (no outcropping structure).</li> <li>3.6 g/t Au 0.8 m and 0.98% Zn on 1.82 m (AZ1 structure)</li> </ul>
AZ1	AZS-18	4.3 g/t Au; 15.7% Zn; 21% Pb and 115 Ag g/t over 0.25 m.
	AZS-23	3.3 g/t Au ; 0.23% Pb and 0.51% Zn over 1.42 m for Au and 3.22 m for Pb and Zn.
	AZS-24	2.87 g/t Au, 1.43% Zn and 0.28% Pb over 0.2 m.
	AZS-19	indexed
AZ4	AZS-20	1.42 g/t Au over 1m; 105 Ag g/t on 0.3 m; 8.61% Zn over 4 m and 3% Pb over 1.6 m.
A76	AZS-21	indexed
AZ6 -	AZS-22	1.15 g/t Au over 3 m; 5.5% Zn over 2.5 m and 7.21% Pb over 2.5 m

An appraisal report on this phase is being prepared to take a decision regarding future programs on this objective.

#### Lafwila (Au, Ag, Pb, Cu)

The three Lafwila shows, situated at about 300 km to the South of the city of Dakhla (province of Awserd), have been recognized by ten trenches totaling 400 m³, geological surveys, detailed sampling and chemical analysis that helped to clearly delimit the mineralized structure with contents of about 1.3 to 12 g/t Au.

#### **Glibat Lafhouda (Nb, Ta, REE)**

The Glibat Lafhouda carbonatites prospect, located at 75 km to the southwestern part of the city of Awserd (Awserd province), has been recognized by a campaign of core drillings totaling 839.50 m. These drillings encountered iron oxide and pyrite ore deposits:

Structure	N° drilling	Grades and thickness
Э	GLS-1	$0.45\%~{\rm Nb_2O_5}.~141~{\rm Ta_2O_5}~{\rm ppm}$ ,360 ${\rm U_3O_8}~{\rm ppm}$ and 0.26% of light rare earth (Ce+Eu+La+Nd+Pr+ Sm) on a visible thickness of 56.3 m
Glibat Lafhouda	GLS-2	$0.52\%~{\rm Nb_2O_5},~175~{\rm Ta_2O_5}~{\rm ppm},~427$ ${\rm U_3O_8}~{\rm ppm}~{\rm and}~0.27\%~{\rm of}~{\rm light~rare}$ earth (Ce+Eu+La+Nd+Pr+ Sm) on a visible thickness of 39.6 m.
9	GLS-3	1271 $Nb_2O_5$ ppm, 100 $Ta_2O_5$ ppm, 166 $U_3O_8$ ppm on a length of 160 m (length of drilling) and 0.4 ppm Au over 1 m.

#### Al Aggaya (Au, Ag, Cu, Pb)

The works undertaken in this sector, located in the region of Bir Gandouz at about 250 Km to the South of the city of Dakhla (Awserd province), led to the identification of a magmatic megastructure of about 6 Km in diameter and composed of vuggy silica, and iron oxide carbonatites. The first results of the analysis show grades between 50 and 60% total iron, going up to 1.76% La, 1.64% Ce,1% Nd and 1.4% Nb<sub>2</sub>O<sub>5</sub>.

#### Bas Draa (Au)

In the Bas Draa inlier (provinces of Guelmim, Tan Tan), the structures of Aïn Karma gave promising

results in surface (AK1: 0.1 to 6.2 g/t Au with exceptional values of 67.5 and 147g/t Au; AK4: 4.7 at 56g/t Au). The drillings made on these structures gave some index results.

To the North East of Aount Ait Oussa, a heap of ferruginous quartz revealed interesting surface contents of gold and base metals. They vary from 0.2 to g/t Au; from 0.1% to 2.7% Zn and from 0.2% to 3.4% Pb.

#### Had Imawn (ONHYM-Sanu Agreement)

On gold deposit of Had Imawn, situated at 190 km to the South-east of Agadir (Taroudant province), works that have been carried out in the framework of an agreement concluded with the Canadian firm SANU consist of a drilling campaign that gave grades ranging between 0.1 and 13 g/t Au over metric thickness.



#### Tidili (Au)

In Tidili, situated at 90 km to the West of Ouarzazate (Ouarzazate province), the results of the samples taken from quartz structures revealed contents of 0.18 to 1.23% Cu; 1 to 24 ppm Ag and 100 to 323 ppb Au.

#### Sirwa (Au)

In Ouarzazate province, control of the alluvial anomalies in Sirwa gave metal contents ranging from 0.28 to 1.19% Cu and 0.6 g/t Au. In the Tidili area, the litho geochemical samplings showed contents of 0.18 to 1.23% Cu; 1 to 124 Ag g/t and 0.1 to 0.3 g / tAu.

#### **Kerdous (Au)**

In Amein valley area situated at 120 km to the Northeast of Tiznit (Tiznit province), control of the alluvial anomalies allowed to circumscribe the structure of Assoul with contents varying from 0.1 to 1.2 g/t Au.

#### **General research (Precious metals)**

#### Western High Atlas (Au)

In Western High Atlas (Taroudant, Chichaouas and Al Haouz provinces), quartz structures revealed grades ranging from a few ppb to 14 g/t Au.

#### South zone (Au, Ni, Cr)

In this area situated at about 350 km to the Southeast of the city of Dakhla, in Awserd province, geological control of the geophysical and geo-chemical anomalies permitted to identify some banded ferruginous quartzites, notably, in Gleyb Awhifrit and in Gleyb Ad-Diab with contents between 30 and 40% total Iron, as well as ultrabasic dykes around Gleyb Ad-Diab with contents between 1000 and 3100 ppm Ni and between 2000 and 7500 ppm Cr.

Moreover, a subcontracted geochemistry survey was carried out in the Southern provinces, over a surface of 5000 km<sup>2</sup>. The samples taken are distributed into 9986 soil samples, 1016 alluvial samples and 30 samples of rock. Interpretation of the data acquired under this survey is currently underway.

#### **Base metals**

#### **Guemassa- Haouz (Polymetallic)**

In the Guemassa - Haouz sector, (ONHYM – CMG agreement), situated to the West of Marrakech (Marrakech-Menara province), the works basically consist of compiling and re-interpretation of the geological and geophysical data in light of the data acquired by the team of the Russian experts of V/O «Zarubezhgeologia federal State enterprise», under a contract with Guemassa Mining Company (CMG).

Works of «soil geochemistry», trenches and sampling rocks were completed in the Nzala



region. The results of these works, on the Northern part of this zone are encouraging with mineral contents up to 11.32% Zn.

#### Jebilet (Polymetallic)

In Central Jebilet sector (ONHYM - CMG agreement), located to the Northwest of Marrakech (Sidi Youssef Ben Ali province), the work was concentrated on development by drilling in Kettara – East that yielded encouraging results (6.58% Zn, 1.36% Pb and 0.7% Cu). On the veins of Bou Gader, the surface contents are interesting (0.5% to 12% Zn and 120g/t Ag) and those of the drillings conducted so far show 6.6% Zn. In El Mna, a borehole was drilled (92 m) in early December to recognize the gossan located in contact with the southern rhyolite as well as the associated magnetic anomaly.

#### Bled Jemaa (Pb, Au, Ag, Zn)

In Bled Jemaa sector (Khenifra province), situated in central Morocco 1.5 Km to the SW of Moulay Bou Azza, the works concerned a NE structure of 600 m mineralized with Pb, Zn, Ag and Au and NE oriented following contact with microdiorite dykes.



Five boreholes totaling 835.9 m have been drilled and cut through the targeted structures with Pb sulphides and Zn. A 6th borehole (47.20 m) is being drilled. The drilling shows contents of Au reaching 19 g/t Au and up to 4.5% Pb and 3% Zn in metric thickness. The results of analysis of the 2<sup>nd</sup> borehole (151.10 m) show contents reaching 5.28g/t Au. A passage of a real thickness of 2.30 m shows an average grade of 1.57g /t Au. The 3<sup>rd</sup> drilling (171.10 m) shows very low grades of Au less than 207 ppb. The 2 other drillings are being analyzed.



#### South Bani (Fe)

In South Bani sector (Tan-Tan province), the works undertaken for iron research in the Devonian and Ordovician formations allowed to show several ferriferous levels of kilometric extension and metric thickness. The most significant ferriferous shows are hosted in Ordovician quartzite sandstone of Jbel Zini. The sampling showed grades of total iron ranging from 32% to 57%.

#### **General research (Base metals)**

In the Kelaat Sraghna Mkhalif sector (Kelaat Sraghna province), situated in the Eastern Jebilet to the North and Northeast of Marrakech. the Chorfa sector shows several mineralized structures of quartz and carbonates veins with sulphides. The results of chemical analysis show contents of copper up to 6.3%.

In the western part of Skoura inlier, on the Southern side of the Central High Atlas, geological and structural reconnaissance work was undertaken. According to an initial evaluation, three zones are of priority status: Ighir-n-Ougri, A'bidalli and

Bergoun-Lhouant. These zones were the subject of a detailed geological and structural mapping. The results of analyses show contents reaching 5% Cu. A geophysical survey by magnetometry and resistivity-chargeability will be conducted to recognize the down dip of these structures.

The geological reconnaissance and examination of shows in central Morocco concerned the regions of Zaër, Oulmès and Bouchber consisting of geological surveys at 1/1000 scale with a selective sampling of the structures, completed by soil sampling.

The works completed in Zaër were conducted to identify copper, lead and tin indices. The surface sampling in the former copper mine Ghouirat n'Has shows tin content up to 0.25%. Those of Oulmès focused on former mine of Zguit where samples taken from certain veins gave up to 1%W. Furthermore, control of anomalies of Sn and W to the North of the Oulmès granite show structures with contents up to 0.2% Sn and a relatively large placer has been localized to the NW of this granite.

#### Rocks and industrial minerals

The work was carried out on the following substances:

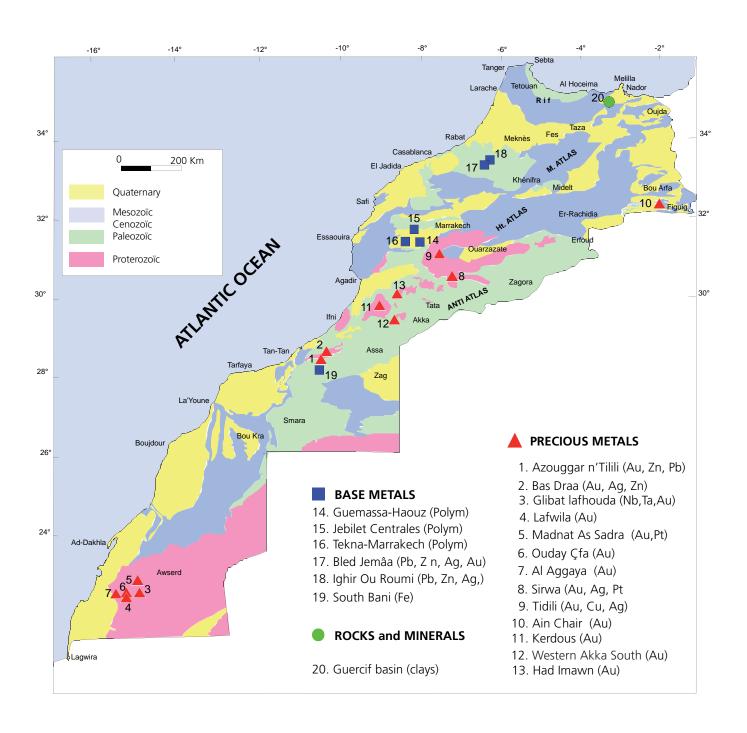
- The fibrous clays in Guercif basin, Taourirt corridor, Oujda and Boudinar basin. Eightynine samples have been taken for chemical analysis and survey and RX determinations. Following the initial results, samples of the Aïn Fritissa region proved to be the richest in attapulgite and sepiolite. Detailed work will be completed in this region in 2008 (detailed surveys, drillings).
- Dolomites in the region of Oued Beht (Tachamachat, El Oulia, Oulad Sidi Dkor) where 18 samples have been taken. The results of chemical analyses allowed to locate areas containing industrial dolomites.
- Quartz in the regions of Jebilet and Rehamna where 33 samples have been taken on favorable quartz veins and 12 have been handed over to the persons in charge of Avanzit Technology Morocco company for chemical analysis.

#### **OBJECTIVES ACHIEVED IN 2007**

Objectives	Substances	Provinces	Works carried out
Precious metals			
AZOUGAR N'TILILI	Au, Zn, Pb, Ag	Tan Tan	Drilling.: 1070.75 m, Geol., Sampling
LAFWILA	Au, Ag, Cu, Zn	Awserd	Samp., mapping – Trench: 400 m³
OUDAY ÇFA	Au, Ag, Cu, Zn	Awserd	Geol. Lithogeoch.,Samp. Geoph.
GLIBAT LAFHOUDA	Nb, Ta, REE	Awserd	GeophyTopo - borehole: 839.5 m
MADNAT AS SADRA	Au, Ag, Cu, Zn	Awserd	Geol. Lithogeoch.,Samp.
AL AGGAYA	Au, Ag, Cu, Zn	Awserd	GeochGeoph – Hole: 385.8m.
BAS DRAA	Au, Ag, Cu	Guelmim, Tan Tan, Assa Zag	Geol., Samp. Topography, Drilling: 744.05 m
HAD IMAWN	Au	Taroudant	Geol. Lithogeoch, Drilling: 903.60 m Sanu-ONHYM agreement
TIDILI	Au, Ag, Cu	Ouarzazate	Geol., Samp. Alluv.
SIRWA	Au, Ag, Cu	Ouarzazate, Taroudant	Geol. Lithogeoch.
WESTERN AKKA SOUTH	Au, Ag, Cu, Pb, Zn	Tata	Geol., Samp. Soil
KERDOUS	Au, Ag, Cu, Pb, Zn	Tiznit	Geol., Samp.
AIN CHAIR	Au	Figuig	Geol., Samp.
RG-MP-ANTI ATLAS	Au, Ag, Cu, Pb, Zn	Taroudant, Chichaoua, Al Haouz	Geol., Samp. soil
RG - MP - SOUTH ZONE	Au, Pt, REE	Awserd	Geoch, Geol, Samp.

Base metals			
GUEMASSA (CMG - ONHYM) - HAOUZ	Polymetallic	Marrakech Menara	Geoch. «soil», Trenches, Sampling
JEBILET (CMG - ONHYM)	Polymetallic	Sidi Youssef Ben Ali	Geol., Sampling Drilling. : 2156.70 m (ONHYM: 862.68 m)
TEKNA-MARRAKECH (CMG-ONHYM)	Polymetallic	Marrakech Menara	Identification of research targets
BLED JEMAA	Pb, Zn, Ag, Au	Khenifra	Hole.: 883.10 m
IGHIR OU ROUMI	Pb, Ag, Zn, Au	Khenifra	Implantation of drilling, track work
SOUTH BANI	Fe	Tan Tan	Geol. Lithogeoch.
RG.MB	Cu, Pb, Zn, Sn, W, Ag	El Kelaa des Sraghnas, Khenifra, Ouarzazate	Geol., Samp.
Rocks and industrial minera	als		
RG. RMI	Fibrous clays, dolomites, quartz	Taza, Khemissat, Ouazzane, Tetouan	Geol., Samp., chemical- mineralogical analyses

#### **LOCATION MAP FOR OBJECTIVES ACHIEVED IN 2007**



#### **Laboratory Activity**

Activity of the Mine laboratories in 2007, essentially concentrated on providing services related to mineralogical studies (preparation and study), chemical analyses and mineralogy studies, in addition to preparation and presentation of the laboratories for audit in view of ISO 9001 /2000 certification.

#### Mineralogy

Preparation of 555 samples primarily originating from ONHYM working programs and carrying out of studies on the samples from ONHYM projects (AL Aggaya, Glibat Lafhouda, Ouday Çfa).

#### **Mineralurgy**

The number of the samples prepared for chemical analysis in 2007 reached 16.201. These samples are distributed as follows:

• ONHYM projects: 13 357

• Subsidiaries and third parties : 2 660 of which 1423 samples from Sanu Company

Studies and tests: 184

The studies and tests of gravimetric concentration, floating, and acidic lixiviation are carried out on Azougar N'tilili ore.



#### Chemistry

The services provided during this fiscal year concerned about 152626 determinations as follows:

- Analysis of gold by humid and dry methods, with and without panning
- Multiple elementary analysis: Aq, As, Ba, Be, Bi, Ca, Cd, Co, Cr, Cu, Fe, K, Li, Mg, Mn., Mo, Na, Nb, Ni, Pb, Sb, Sr, V, Y, Zn;
- Analysis of rare earth: La, Ce, Sm, Eu, Gd, Tb, Dy, Ho, Er, Yb, Lu, Tm;
- Analysis of precious metals: Pt, Pd, Ir;
- Analysis of the major elements: SiO2. Al2O3. CaO, MgO, Na2O, K2O, Fe2O3. FeO, MnO, TiO2. P2O5 and fire loss;
- Other analyses: Th, U, Your, Sn, W, Zr, S.
- Analysis by the conventional methods of high grades in Cu, Pb, Zn, Fe, CaCO3, BaSO4. SrSO4, CaF2, MnO2, MnO, total Mn, ferric iron, carbonates, sulfur, sulfates, chlorides, humidity.
- Real density of the powder samples.

#### **Certification of Mine laboratories**

The major activities regarding the quality approach accomplished in 2007 focused on:

#### Preparation and follow-up of the carrying out of the blank audit:

In the framework of the preparation of the final audit for ISO version 2000 certification and in view of assessing the compliance and efficiency of system management quality (SMQ) established in laboratories, a blank audit has been prepared and completed, under the same conditions as a final certification audit by the consultants of the accredited firm.

The actions taken as a result of this audit basically focused on:

- The presentation of the audit report in the form of rectification action plans by the various process pilots.
- Follow-up work of these actions to eliminate the problems detected during the audit.
- Update and finalization of documentation on System Management Quality (SMQ).

#### Preparation and conducting of the final certification audit:

The mine laboratories conducted finalization of the initiatives concerning preparation of the final audit at all levels corresponding to the process activities of the System Management Quality (organization, documentary review, etc.).

The certification audit was carried out on March 19 and 20, 2007.

The results are satisfactory. This labeling approach will be illustrated as follows:

- Reception of the final ISO 9001 version 2000 certificate.
- Application of the certification submitted by Moody consultants according to the analysis reports after receipt of the certification diploma.
- Preparation of the next follow-up certification audits: these supervisory audits will take place every year in the same period and will be ensured by the same consultant.



#### MINING HOLDINGS AND COOPERATION

#### Mining agreements and conventions

In 2007 the partnership portfolio of Onhym expanded with the signing of 9 agreements:

#### **Conventions or agreements**

ONHYM memorandum of understanding - Fuyuan on zinc in the regions of the High Atlas, the Middle Atlas and the Rif

Memorandum of agreement ONHYM - CMG on Koudiat Aïcha

ONHYM memorandum of understanding -Toro on the High Moulouya, Ment, Wafaga and Sirwa

Memorandum of agreement ONHYM Managem - Cril

ONHYM - CMG agreement for Tekna

ONHYM - Kasbah Resources contract on Jbel Malek

Amendment to ONHYM – Omrg memorandum of agreement

Amendment to ONHYM - Okosys contract on bentonite in Nador

ONHYM - F. K. Massif lease agreement on barytine in Bou Saboun

#### Mining prospect transfers

In the framework of its policy aimed at associating private operators in exploration activities, ONHYM carried on the transfer of mining prospects arriving at maturity. This refers to:

- Polymetallic deposit of Koudiat Aïcha in the region of Marrakech, handed over to CMG.
- Gold field Jbel Malek in the region of Bouarfa, handed over to Kasbah Resources.

Furthermore, international tender calls were issued in view of the total transfer or development. under a partnership, of five ONHYM mining sites. These tender calls concerned the following deposits:

- Copper deposit of Oumjerane,
- Silver deposit of Zgounder,
- Andalousite deposit of Sidi Bou Othmane,
- Magnesite deposit of Boudkek,
- Zircon deposit of Bouissafen.

#### **Quality - Security**

Aid and assistance provided by partners like Repsol, Transatlantic and Circle Oil in the preparation and presentation to the national committee for impact studies of work scheduled such as seismic acquisitions, drilling...

#### DRILLING ACTIVITY AND MINING WORK

The year 2007 was characterized by thorough restructuring of the drilling activity and mining work in compliance with the strategic orientations of the Office.

Indeed, this year saw a re-dimensioning of the mining drilling teams to meet the specific needs of the Office and halting of mining work.

In terms of mining work personnel, the number of staff members fell from 262 on January 1st, 2007 to 59 on December 31 of the same year.

#### Mining work

The year 2007 was marked by the definitive stop of the mining work branch activity as of April 1st, 2007.

Globally, the work accomplished in 2007 represents 92.91% of the updated budget forecast as shown, per project, on the following table:

Working	Principal contractor	Province	Wells (ml)	Chimneys (ml)	Galleries & Cut-through ( ml)	Concrete (m³)	Enlarge ments (m³)
Works by ONHYM							
Jebilet agreement Koudiat Aïcha		Sidi Youssef Ben Ali	27.08		6.00	93.60	
Total works by ONHYM			27.08		6.00	93.60	
Works under agreement							
Jebilet agreement Koudiat Aïcha	CMG	Sidi Youssef Ben Ali	40.62		9.00	140.40	
Total works under agreement			40.62		9.00	140.40	
Third party work							
Imiter	SMI	Ouarzazate		53.30	538.30		350.00
Iourirn bures South	AGM	Tiznit	29.90		63.90		
Malabata	SNED	Tanger				169.50	250.00
Total third party work			29.90	53.30	602.20	169.50	600.00
Grand total as of Dec. 31, 2	2007		97.60	53.30	617.20	403.50	600.00

#### **Mining drilling**

In 2007, the drilling teams operated on eight sites. The volume of drilling work marked a considerable rise of 89% compared to 2006, Thus, the total number of drilling reached 8277.40 m vs. 4368.55 m in 2006.

This rise in volume is accounted for by the realization rate of own work that reached 75% of the forecasts, vs. only 36% in 2006, as well as by the net resumption work by contractors. A work program on behalf of Sanu in Had Imawn was completed totaling 903 m of drilling and another drilling program for CMG, totaling 1295.80 m in Koudiat Aïcha.



The volume of the drilling work completed per project is given in the following chart:

Working	Principal Contractor	Province	Number of drillings	Core drills (ml)	Rotary (ml)	Total (ml)
ONHYM work						
Jebilet agreement Koudiat Aïcha	ONHYM	Sidi Youssef Ben Ali	3.6	854.92	7.76	862.68
Azougar N'Tilili	-	Tantan	7	1 068.85		1 068.85
Bas Draa	-	Tantan	8	744.05		744.05
Glibat Lafhouda	-	Awserd	6	839.50		839.50
Blad Jemaa	-	Khenifra	6	883.10		883.10
Al Aggaya	-	Awserd	2	379.80	6.00	385.80
Total work by O	NHYM		32.6	4 770.22	13.76	4 783.98

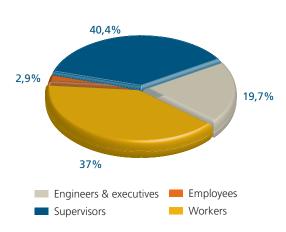
Work under agreement	Partners	Province	Number of drillings	Core drills (ml)	Rotary (ml)	Total (ml)
Jebilet agreement Koudiat Aïcha	CMG	Sidi Youssef Ben Ali	5.4	1 282.38	11.64	1 294.02
Total work und	er agreement		5.4	1 282.38	11.64	1 294.02
Third Party Work	Principal contractor					
Koudiat Aïcha	CMG	Sidi Youssef Ben Ali	5	1 280.80	15.00	1 295.80
Had Imawn	SANU	Taroudant	6	903.60		903.60
Total third Party works		11	2 184.40	15.00	2 199.40	
Grand total as o	of Dec. 31, 2007		49	8 237.00	40.40	8 277.40

#### **HUMAN RESOURCES**

#### **Staff**

As of December 31st, 2007, ONHYM staff was of 947 agents including 187 engineers and executives, 383 supervisors 27 employees and 350 workers.

Staff repartition per professional category

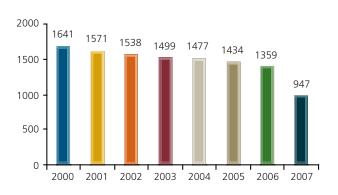


The staff repartition per professional category changed appreciably in 2007 further to the voluntary departure operation. However, the rate of supervision (19%) remained below the standard of bodies devoted to research. The objective set is to reach in a reasonable timeframe a rate of 30%.

#### Staff evolution

The Office staff decreased regularly over the past ten years under the compound effect of departures for retirement, the blocking of recruitment and voluntary departure.

Staff evolution: 2000-2007



#### Re-sizing of staff

The voluntary departure operation that has occurred from January 10 to April 9. 2007, was a big success leading to the departure of 391 employees representing 29% of the staff as of January 1st, 2007,

• Engineers and executives	24
• Supervisors	160
• Employees and classified workers	130
• Employees and skilled workers	77

#### Harmonization of personnel management rules

In 2007, harmonization of personnel management rules continued and dealt with:

- Staff promotion with the unification of the category change process;
- Employee evaluation by the institution of a unified system of yearly grading;
- Bonuses at year end (Productivity and Encouragement) with the regrouping of payroll for a unique computation.

Other harmonization steps were undertaken and dealt with:



- Accounting for paid vacation rights.
- Head of section bonus.
- Productivity bonus in worksites.
- Institution of a sole time management system.

#### Social and socio-cultural actions

Continuation of social actions for the benefit of the staff.

#### **Housing loans**

Granting of 34 loans for housing and equipping amounting to 1 958 900 DH.

#### **Exceptional advances**

28 employees were granted exceptional advances amounting to 127 700 DH.

#### **Summertime centers**

229 employees benefited from stays in summertime centers of Cabo-Negro, Ifrane and Kettara.

#### **Summer camps**

395 children attended summer camps in Ben Smim and Asilah.

#### **Cultural activities for the children**

One hundred and twenty-two staff children registered in 2007 - 2008 and benefited from multiple activities : language courses, data processing, chess, manual work, music, educational outings and associative initiatives.

#### **Pilgrimage**

Nine (9) employees were sent by the Office on pilgrimage to the Holy places of Islam.

#### **Medical assistance**

Seventy-four (74) employees benefited from systematic medical examinations and 1860 benefited from coverage for hospitalization, biological checks, X-rays.

#### **Training**

#### **Key indicators**

In 2007, the number of training actions reached 1 386 hours man/day training representing a global amount of 1 627 K DH (exc. tax).



	Indicators
Number of Training actions	100
Number of trainees	438
Number of man-day-training	1 386
Number of beneficiaries	230
Cost in 1000 DH (* *)	1 627

 $<sup>(\</sup>ensuremath{^{\star\star}})$  This refers to the contribution fees for training in Morocco, training outside of Morocco and local actions with foreign trainers including travel and transport expenses.

#### **Training related actions**

The main training related actions are summarized as follows:

- Organization and supervision of nearly 90 trainees from various institutions of higher education (Schools, Faculties, Institutes, etc.) and mining schools.
- The allocation of 1 106 scholarships for 593 ONHYM staff children amounting to 160 KDH.

Areas of training	Number of actions	Number of participants	Number of man/ days of training
Training actions abroad (conventions, forums, colloquiums and seminars)	7	14	60
Exploration, treatment and technical subjects	23	147	458
Data processing - Office automation and IS	10	48	154
Personnel management and human resources	21	74	185
Quality, security and environment	14	30	71
Management techniques and other subjects	13	25	58
Total seminars and training sessions	88	338	986
English language training sessions	12	100	400
Total Training in 2007	100	438	1386

### COMPUTER TECHNOLOGY AND INFORMATION SYSTEM

Further to the establishment of new organization, in collaboration with an international consultant, ONHYM developed the Information System Master Plan spread out over a five—year period (2007-2011).

The work performed in the framework of the Information System Master Plan study focused on:

- Institution of a clear, shared vision enhanced by different components of the Information system and its evolution by 2011 with a special emphasis placed on 2007 – 2009.
- Identification of the axes to be improved in terms of the functioning of relation between project manager and main contractor (project manager: users-, main contractor: computing engineers) to head the information system projects.
- Development of an action plan of evolutions with description and scheduling of the projects to lead.
- Identification and recommendation of the ways to improve security and quality of the information system.

These works led to the development of the following deliverables:

- The development of a portfolio of projects with scheduling and assessment of related expenditure.
- Institution of an operating and governance charter for the information system.



In 2007, the portfolio of the System Information Master Plan projects was launched, the project charter adopted and a good number of projects initiated:

- Launch of the tender call for assistance in reorganization of the cost accounting system and implementation of the new software package in support of the new managerial approach by permitting improved follow-up of costs and greater respect of deadlines. This project will also provide assistance for the steering of the Information System Master Plan projects over a twenty- month period.
- A study of the bids for the development of the information system for petroleum exploration (SIEP) and for the transcription, scanning and loading of geophysical data is underway.
- Strengthening of the platforms and number of geo-scientific petroleum and mining scientific softwares.

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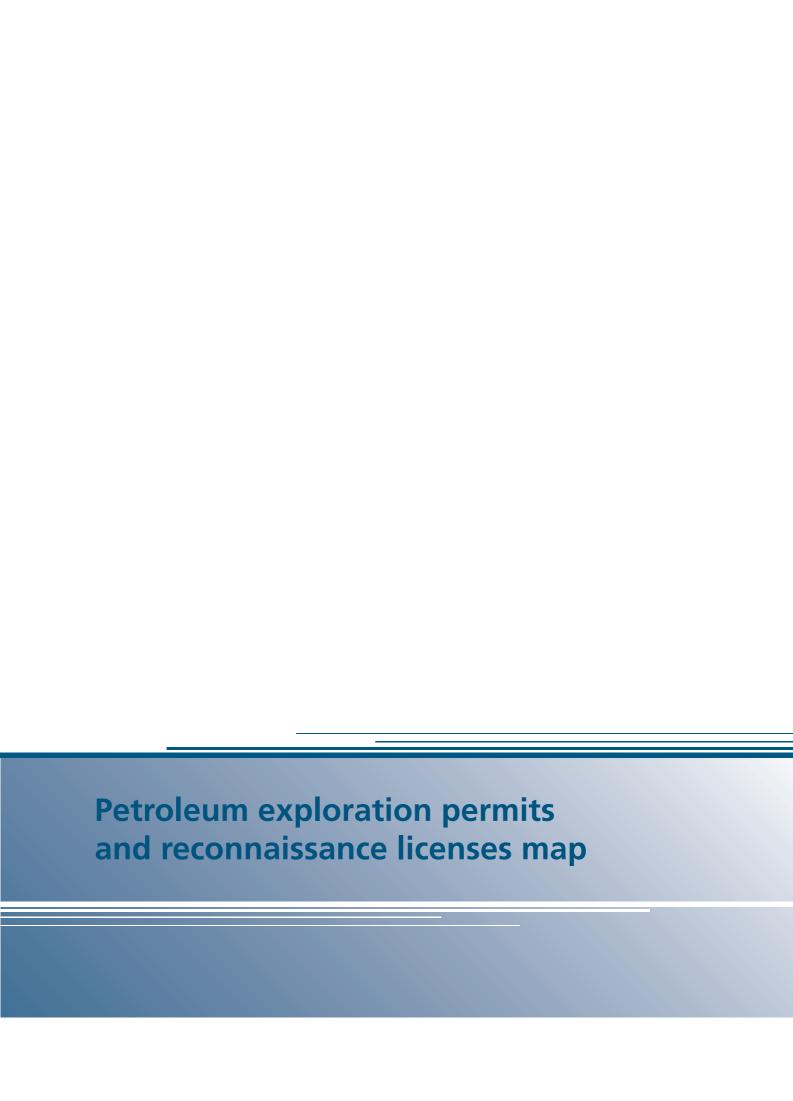
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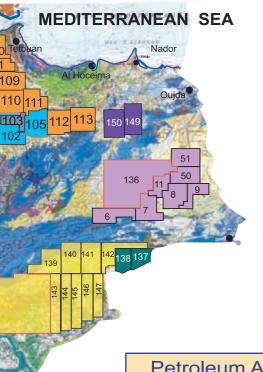
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### KINGDOM OF MOROCCO OFFICE NATIONAL DES HYDROCARBURES ET DES MINES **Exploration Permits and** Reconnaissance Licences Мар Casablanca OCEAN 10 ATLANTIC 65 66 76 67 68 104 Tarfaya 7 108 El Aioun MAURITANIA

## PETROLEUM EXPLORATION PERMITS AND RECONNAISSANCE LICENSES MAP



EXPLORATION PERMITS	120 121 122 123 124 125 126 127 128 129 130 131 132 137 138 105 139 140 141 142 143 144 145	Boujdour Onshore IV Boujdour Onshore V Boujdour Onshore V Boujdour Onshore VII Boujdour Onshore VII Boujdour Onshore VII Boujdour Onshore IX Boujdour Onshore IX Boujdour Onshore IX Boujdour Onshore XI Boujdour Onshore XI Boujdour Onshore XII Boujdour Onshore XII Boujdour Onshore XII Boujdour Onshore XIII Boudnib II Boudnib III Boudnib III Boudnib IV Boudnib VII Boudnib VIII	ONHYM - DIRECT- ANSCHUTZ ONHYM - (Petroleum Exploration Private). Limited ONHYM - DANA-TETHYS- EASTERN ONHYM - CABRE	1911,1 1967,2 1962,9 1907,4 1999,5 1988,3 1938,9 1965,3 1917,9 1372,2 1382 1608 1760 1755 1066 1049 1998,7 1983,4 1998,1 1998,1 1998,1 1998,7 1850,7
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#### **Reconnaissance Contracts**

	10	Ait Riouch	ONHYM - MAGH PET EXP	224
	76	Bas Daraa	ONHYM - PETRO CANADA	??
S	107	Doukkala - Abda	ONHYM - ENI	9813
RECONNAISSANCE CONTRACTS	108	Bassin de Zag	ONHYM - SAN LEON ISLAND OIL & GAS GB OIL & GAS	21807
N N	116	Ouest Souss Onshore	ONHYM - GBP Exploration Maroc	4445
88	135	Tadla	ONHYM - HUNT	28117,5
쀭	136	Missour Est	ONHYM - MAGH PET EXP	7937,8
	148	Ouarzazate	ONHYM - MND Maroc Limited	24545,6

#### Petroleum Agreements

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66 Tarfaya Shallow V 67 Tarfaya Shallow VI 68 Tarfaya Shallow VII	1893
67 Tarfaya Shallow VI 68 Tarfaya Shallow VII	1990 1959
	1840
	1865 1421
70 Sofi Offebero N.O. I	1928,1
71 Safi Offshore N.O. II > ONHYM - NORSK HYDRO/DAN/	4054.5
Safi Offshore N.O. III	1549,5
ONHYM - NORSK HYDRO/DAN/ Safi Offshore N.O. II Safi Offshore N.O. IV Safi Offshore N.O. IV Safi Offshore N.O. IV Safi Offshore N.O. IV Boujdour Offshore II Boujdour Offshore II Boujdour Offshore VI Baujdour Offshore VI Baujdour Offshore VII Baujdour Offshore VIII Baujdour Offshore IX Boujdour Offshore X Baujdour Offshore X Baujdour Offshore X Baujdour Offshore X Baujdour Offshore X	1231,1
Boujdour Offshore I	1615
79 Boujdour Offshore II Boujdour Offshore III	1869 1758
Boujdour Offshore IV	1875
Boujdour Offshore V	1926
Boujdour Offshore VI	1925
Boujdour Offshore VII Bouidour Offshore VIII	1934
85 Boujdour Offshore VIII Boujdour Offshore IX	1924
Boujdour Offshore X	1929 1952
88 Boujdour Offshore XI	
89 Boujdour Offshore XII ONHYM - KOSMOS	1936 1933
90 Boujdour Offshore XIII 91 Boujdour Offshore XIV	1946 1937
92 Boujdour Offshore XV	1937
93 Boujdour Offshore XVI	1944
94 Boujdour Offshore XVII	1937
95 Boujdour Offshore XVIII 96 Boujdour Offshore XIX	1950
96 Boujdour Offshore XIX 97 Boujdour Offshore XX	1947 1957
98 Bouldour Offshore XXI	1937
99 Boujdour O ffshore XXII	1954
Boujdour Offshore XXIII	1953
101 Rharb Centre  102 Rharb Sud  ONHYM - CABRE	1941,7
I Kliai D Suu	1939,7 899,8
103 Tselfat ONHYM - TRANSATLANTIC 104 Ras Juby ONHYM - GENTING OIL	2000
106 Sebou ONHYM - CIRCLE OIL Pic.	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 112 Ouezzane - Tissa 4 ONHYM - DIRECT- ANSCHUTZ	1624,3
	1912,3
114 Agadir Maritime I	1998,7 1605,14
Agadir Maritime II ONHYM - GBP Exploration Maroc	1654,13
Boujdour Onshore I	1759,8
118 Boujdour Onshore II ONHYM 119 Boujdour Onshore III	1921
Boujdour Onshore III	1947,3



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