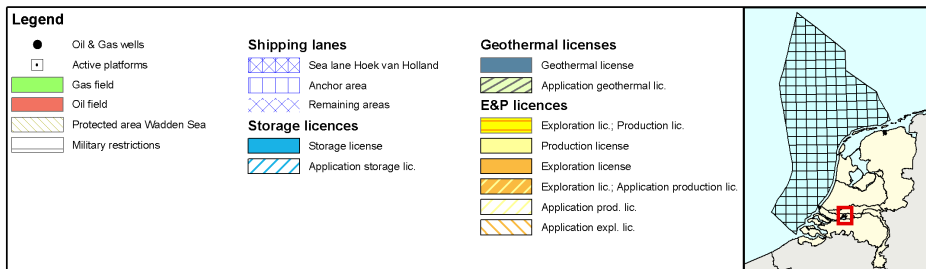
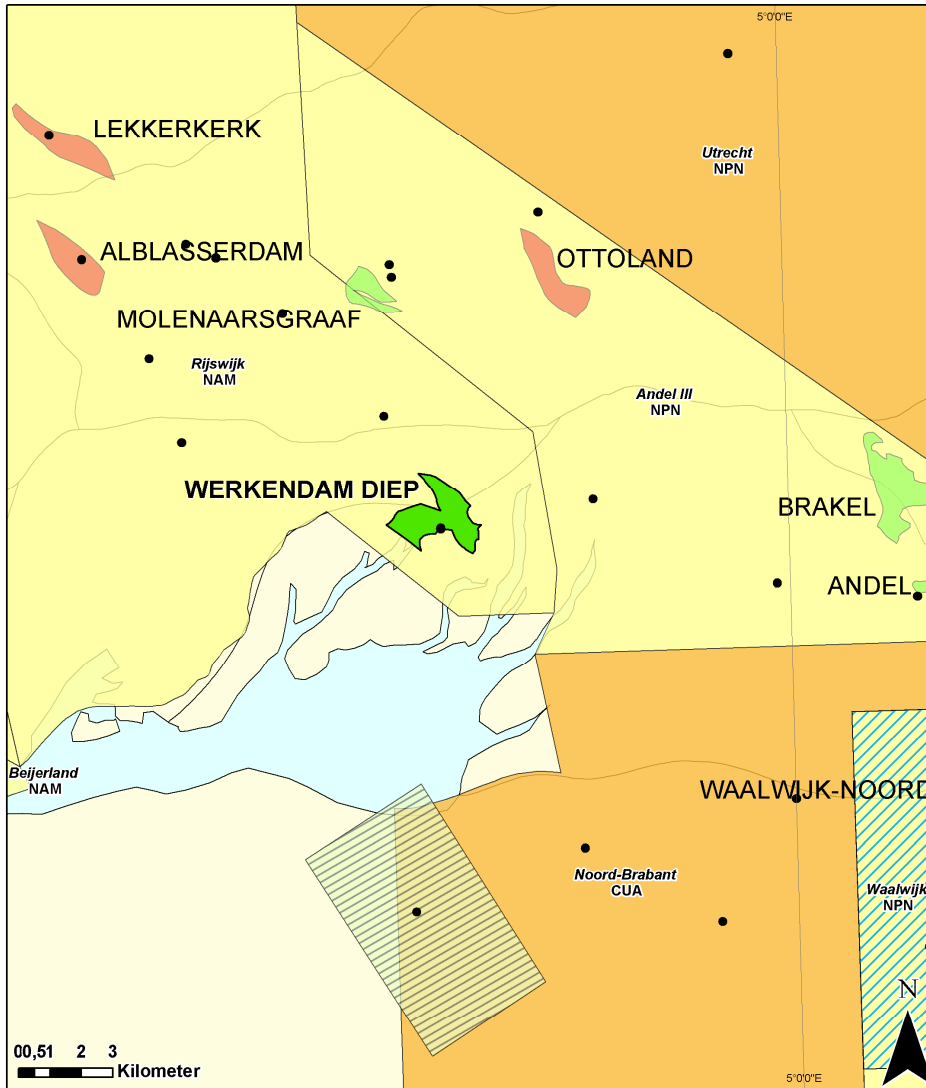




Fact sheet Werkendam

Stranded fields - Q4 2009



Location map of the Werkendam gas and oil field

General information

The Werkendam gas and oil field was discovered in 1958 by NAM by well Werkendam-01 (WED-01). In 1991 the field has also been penetrated by well Werkendam-03 (WED-03). It consists of two reservoirs at different depth. The upper field contains oil in the Werkendam Formation. The Werkendam-01 well shows oil in several layers of the Middle Werkendam Member (ATWOM). Oil has been produced from the field, production ceased in 1992.

The lower field, also referred to as 'Werkendam-Deep' contains oil and gas in the Main Buntsandstein subgroup (RBM). The fault and dip closed structure is sealed vertically by the marls and shales of the Keuper (RNKP) and Muschkalk Formation (RNMU) and laterally by the shales of the Altena Group (AT). The field is not produced due to the high CO₂ content of the gas.

The gas field is situated within the Rijswijk concession of NAM. The gas field is located at the western margin of the Roer Valley Graben near the transition to the West Netherlands Basin.

Regional information on the sedimentology and the structural configuration of the area is available in map sheet VIII Amsterdam-Gorinchem and XIII Roosendaal-Terneuzen.

Sequence of events

Date	Event
03-01-1955	Production license Rijswijk granted (NAM)
20-03-1957	Production license area expanded with ca 1900 km ² (NAM)
14-04-1958	Spud date Werkendam-01
21-06-1958	TD reached 2275 m ah
07-06-1979	Production license area expanded with ca 25 km ² (NAM)
08-12-1990	Spud date Werkendam-03
21-01-1991	TD reached 3125 m ah

Plug data

Depth m	Porosity %	Hor. Permeability mD	Density g/cm ³
721	21		2.64
775.5	35	1122	2.72
887.5	34	6048	2.67
994.3	29	736	2.6
1165	33	88	2.68
1216	11	1	2.64
1598	11	13	2.86
1689.8	14	4	2.8
1956	13	10	2.67
1969	11	15	2.69
1984	20	4	2.66
1988.3	14	1	2.67

More detailed information of this interval is available

Reservoir data

Geological unit RGD & NOGEPa (1993)	Top m ah	Base m ah	Net m ah	N/G %	Porosity %
Middle Werkendam Member (ATWOM)	1950	2015	5 - 10	60 - 70	10 - 15
Main Buntsandstein subgroup (RBM)	2727	2842	40 - 50	30 - 40	5 - 10

Contacts

Reservoir	Top structure m TVD/MSL	GWC m TVD/MSL
Middle Werkendam Member (ATWOM)	Approximately 1930	2055

Hydrocarbon specifications

Reservoir	CH₄ %	CO₂ %	N₂ %	H₂S %	GHV MJ/m³
Main Buntsandstein Subgroup (RBM) <i>gas</i>	19.64	77.13	2.41	-	8.72

Volumes

Reservoir	GIIP 10⁹ m³	Reserves 10⁹ m³		
		Proven	Expected	Possible
Middle Werkendam Member (ATWOM)	1 - 2			
Main Buntsandstein Subgroup (RBM) <i>gas</i>	0,5 - 1			
Main Buntsandstein Subgroup (RBM) <i>oil</i>	0,5 - 1 (STOIP 10 ⁶ m ³)			

Well status

Werkendam-01: Plugged and abandoned

Werkendam-03: Plugged and abandoned

Infrastructure

The nearest production facility is located approximately eighteen kilometers to the southeast.

Public References

TNO-NITG 2002. Geological Atlas of the Deep subsurface of the Netherlands. Map sheet VII: Noordwijk-Rotterdam, Map sheet VIII: Amsterdam Gorinchem. Utrecht.

TNO-NITG 2001. Geological Atlas of the Deep subsurface of the Netherlands. Map sheet XIII: Breda-Valkenswaard, Map sheet XIV: Oss-Roermond. Utrecht.

RGD & NOGEPa 1993, Stratigraphic nomenclature of the Netherlands, Mededelingen Rijks Geologische Dienst, Nr. 50

NAM 1958: Composite well log; [Werkendam-1](#). *On open file*

NAM 1991: Composite well log; [Werkendam-3](#). *On open file*

For more information stranded Oil&Gas fields in the Netherlands:

<http://www.nlog.nl/nl/reserves/reserves/stranded.html>

For released Well data and Seismic data contact DINOloket:

<http://www.dinoloket.nl>

For geological maps of the deep subsurface of the Netherlands:

http://www.nlog.nl/nl/pubs/maps/geologic_maps/NCPI.html

Liability

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