



نگهداشت و افزایش تولید میدان نفتی بینک
سطح الارض و ابنیه تحت الارض

عمومی و مشترک



شماره پیمان:

۰۵۳ - ۰۷۳ - ۹۱۸۴

SPECIFICATION FOR ENVIRONMENTAL JOB

نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادرکننده	بسته کاری	پروژه
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طرح نگهداشت و افزایش تولید ۲۷ مخزن

SPECIFICATION FOR ENVIRONMENTAL JOB

نگهداشت و افزایش تولید میدان نفتی بینک

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Status:

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 IFC: Issued For Comment
 IFA: Issued For Approval
 AFD: Approved For Design
 AFC: Approved For Construction
 AFP: Approved For Purchase
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 IFI: Issued For Information
 AB-R: As-Built for CLIENT Review
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1.0 INTRODUCTION

Binak oilfield in Bushehr province is a part of the southern oilfields of Iran, is located 20 km northwest of Genaveh city.

With the aim of increasing production of oil from Binak oilfield, an EPC/EPD Project has been defined by NIOC/NISOC and awarded to Petro Iran Development Company (PEDCO). Also PEDCO (as General Contractor) has assigned the EPC-packages of the Project to "Hirgan Energy - Design and Inspection" JV.

GENERAL DEFINITION

The following terms shall be used in this document.

CLIENT:	National Iranian South Oilfields Company (NISOC)
PROJECT:	Binak Oilfield Development – General Facilities
EPD/EPC CONTRACTOR:	Petro Iran Development Company (PEDCO)
EPC CONTRACTOR:	Joint Venture of : Hirgan Energy – Design & Inspection(D&I) Companies
VENDOR:	The firm or person who will fabricate the equipment or material.
EXECUTOR:	Executor is the party which carries out all or part of construction and/or commissioning for the project.
THIRD PARTY INSPECTOR (TPI):	The firm appointed by EPC CONTRACTOR and approved by GC & CLIENT (in writing) for the inspection of goods.
SHALL:	Is used where a provision is mandatory.
SHOULD:	Is used where a provision is advisory only.
WILL:	Is normally used in connection with the action by CLEINT rather than by an EPC/EPD CONTRACTOR, supplier or VENDOR.
MAY:	Is used where a provision is completely discretionary.

2.0 SCOPE

The main objective of this document is to identify the minimum environmental requirements and criteria for the design of the Binak Oilfield Development.

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3.0 NORMATIVE REFERENCES

3.1 LOCAL CODES AND STANDARDS

- IPS-G-SF-860 General Standard for Air Pollution Control
- IPS-G-SF-870 General Standard for Soil Pollution Control
- IPS-G-SF-880 General Standard for Water Pollution Control
- IPS-E-SF-860 Engineering Standard for Air Pollution Control
- IPS-E-SF-880 Engineering Standard for Water Pollution Control
- IPS-G-SF-900 General Standard for Noise Control and Vibration
- Iranian Environmental Regulation (1397)

3.2 INTERNATIONAL CODES AND STANDARDS

- GS-EP-SAF-253-EN(2012) General Specification Safety(Impacted area, restricted area and fire zones)
- The Human Environmental Laws, Regulation Criteria and Standards issued by DOE

3.3 THE PROJECT DOCUMENTS

- BK-GNRAL-PEDCO-000-PR-DB-0001 Process Basis of Design

3.4 ENVIRONMENTAL DATA

Refer to "Process Basis of Design; Doc. No. BK-GNRAL-PEDCO-000-PR-DB-0001".

4.0 EMISSIONS TO AIR

4.1 FLARE

For flares, following emission measures shall be followed:

Table 1: Emission measures for Flare

Scenario	Restricted Area	Impacted Area	Smokeless Factor
Flare flame out	LC 1%	IDLH	N.A.
Flare - continuous operation (ignited release)	TLV TWA	N.A.	Ringleman 1 for 100% design capacity
Flare - emergency operation (ignited release)	TLV STEL	N.A.	Ringleman 1 for 20% design capacity

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Table 2: Toxic Threshold Values

Material		CAS Number (0)	LC 1% 30 min (ppm)	IDLH 30 min (ppm)	TLV STEL (ppm)	TLV TWA (ppm)
Hydrogen sulphide	H ₂ S	7783-06-4	472 (1)	100 (1) (4)	10 (2)	5 (2)
Sulfur dioxide	SO ₂	7446-09-5	866 (3)	96 (3) (4)	5 (8)	2 (8)
Carbon monoxide	CO	630-08-0	2000 (7)	1200 (4)	200 (4)	25 (5)
Carbon dioxide	CO ₂	124-38-9	N.A.	40000 (4)	30000 (5) (6)	5000 (5) (6)

(0) CAS Number is given to ease library checks for up to date threshold values

(1) Ineris - Toxicité aigüe de l'hydrogène sulfuré (H₂S) - Ineris-DRC-00-25425-ETSC-STi- 00DR294 – Année 2000

(2) INRS - Valeurs limites d'exposition professionnelle aux agents chimiques en France - Edition 984 - Aide- mémoire technique — Décembre 2007 - 2ème edition Ineris - Fiche de données toxicologiques et environnementales des substances chimiques - Seuils de toxicité aigüe - Dioxyde de soufre – Année 2005

(3) Ineris - Fiche de données toxicologiques et environnementales des substances chimiques - Seuils de toxicité aigüe - Dioxyde de soufre – Année 2005

(4) NIOSH - USA

(5) ACGIH – Year 2005

(6) OSHA – USA

(7) U.K. HSE - Hazardous installations Directorate SPC/Tech/OSD/30 - Januray 2008 - Version 1

(8) Ineris - Fiche de données toxicologiques et environnementales des substances chimiques - Dioxyde de soufre SO₂ - Version N°1 - Août 2005

N.A.: Not Available

5.0 EMISSIONS TO AIR

5.1 LIMIT ON LIQUID EFFLUENTS

Emissions criteria for liquid effluents are indicated in Environmental Regulations and Standards, Iranian Protection Organization Summer 1995 (Sewage Disposal Standard) and in IPS-E-SF-880 ('Engineering Standard for Water Pollution Control'). Threshold limit values are summarized in Table 3

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Table 3: Maximum Permissible Concentration of Containments in Effluents

Pollutant	Discharge to Surface Runoff (mg/l)	Discharge to Ground Water (mg/l)	Irrigation & Agriculture usage (mg/l)
Ag	0.1	0.1	0.01
Al	5	5	5
As	0.1	0.1	0.1
B	2	1	1
Ba	2	1	1
Be	0.1	1	0.1
Ca	75	-	-
Cd	0.1	0.01	0.01
Cl ²	1	1	0.2
Cl ⁻	(NOTE 1)	(NOTE 1)	(NOTE 1)
CH ₂ O - Formaldehyde	1	1	1
C ₆ H ₅ OH - Phenol	1	Trace	1
CN - Cyanide	0.2	0.1	0.1
Co - Cobalt	1	1	0.05
Cr 6+	0.5	1	1
Cr 3+	1	1	1
Cu	1	1	0.2
F	2.5	2	2
Fe	3	0.5	3
Hg	0	0	0
Li	2.5	2.5	2.5
Mg	100	100	100
Mn	1	0.5	0.2
Mo	0.01	0.01	0.01
Ni	1	1	0.2
Ammonium (NH ₄)	2.5	0.5	-
Nitrite (NO ₂ ⁻)	10	10	-
Nitrate (NO ₃ ⁻)	50	1	-
Phosphate (Phosphur)	1	1	-
Pb	1	1	1
Se	1	0.1	0.02
Sulfide SH ₂	3	3	3
Sulfite SO ₃ ²⁻	1	1	1
Sulfate SO ₄ ²⁻	300	300	500
Vanadium (V)	0.1	0.1	0.1
Zn	2	2	2
Grease Oil	10	10*	10
Detergent ABS	1.5	0.5	0.5
BOD ₅	20	20	100
COD	50	50	200

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Pollutant	Discharge to Surface Runoff (mg/l)	Discharge to Ground Water (mg/l)	Irrigation & Agriculture usage (mg/l)
Dissolved Oxygen DO (Min.)	>2	>2	>2
Total Dissolved Solids TDS	NOTE 2	NOTE 2	NOTE 2
Total Suspended Solids TSS	30	30	100
Sediment Solids SS	0	0	0
pH	6.5-8.5	5-9	6-8.5
Radioactive Materials	0	0	0
Turbidity (Turbidity Unit)	50	50	50
Color (Color Unit)	Note 5	75	75
Temperature (T)	NOTE 3	-	NOTE 3
Digestive Coliform (Number in 100 ml)	100 to 400	100 to 400	100 to 400
Total Coliforms (Number in 100 ml) MPN	100 to 1000	100 to 1000	100 to 1000
Parasites	-	-	NOTE 4

- 1) Amount of chloride in industrial effluents should not exceed 250 mg/L (ppm) of fresh water.
- 2) Total dissolved solids in industrial effluents should not increase the amount of the materials more than 10% in the underground water/river and any other sources in a distance of 200 m, in which effluent dumped.
- 3) Increase of temperature should not be more than 3°C within 200 meter from inlet.
- 4) Number of parasite seeds in the treated urban waste water should not be more than one seed per liter, if it is being used for irrigation of agriculture products which are consumed un boiled (raw)
- 5) Color of source water should not exceed more than 16 standard units due to industrial effluent, dumped.

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5.2 DRINKING WATER STANDARD

Table 4: Physical Characteristic of Potable Water

Constituent	Maximum Desired Limit (mg/lit)	Maximum Permissible Limit (mg/lit)
Total dissolve solids	500	1500
Total hardness	150	500
Calcium (Ca)	75	200
Magnesium (Mg)	50	150
Manganese (Mn)	0.05	0.5
Iron (Fe)	0.3	1
Zinc (Zn)	5	15
Chromium as (Cr)	0.5	1.5
Sulphate (SO ₄)	200	400
Chloride (Cl)	200	600
Ammonia (N)	0.002	0.05
Detergents	0.1	0.2
Phosphates (P)	0.1	0.2

Remarks:

In case of magnesium is greater than 30 mg/lit, the Sulfate content shall not exceed 250 mg/lit.

For more detail on specification of potable water refer to IPS-G-SF-880.

6.0 SOLID WASTES

6.1 WASTE CATEGORIES

CONTRACTOR shall be responsible for waste management during the construction, commissioning, and start-up of the plant. The CLIENT shall be responsible for the waste management during the operating lifetime of the plant. The waste management plan shall incorporate the storage, collection and disposal of solid waste. The purpose of the waste management plan is to ensure that waste disposal is carried out in an environmentally responsible manner.

Wastes are categorized into one of the following classes:

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Table 5: Waste Categories

Waste Category	Definition
Hazardous wastes	Wastes which are corrosive, explosive, toxic, oxidizing etc. which constitute a high degree of hazard to public health or the environment.
Non Hazardous Wastes	Wastes which are biologically or chemically active in the environment. Examples are household garbage and sanitary waste sludge.
Inert wastes	Wastes which are not biologically or chemically active in the environment Examples i.e. glass, concrete and brick.

6.2 ENVIRONMENTAL DESIGN CRITERIA

CLIENT / CONTRACTOR shall develop a strategy for waste management based on the hierarchical principles of Reduction - Reuse - Recycle - Recover and aimed at reduction of residual waste that ultimately required disposal.

The consequence thereof includes, but is not limited to:

- Segregation of waste streams to optimize reuse/recycling, handling and safe and controlled residual waste.
- Residual waste disposal through incinerator unit specified by Local Authority

6.3 SOURCES OF RESIDUES

Table 6: Summary of Waste Storage, Treatment and Disposal Methods

Type of Waste	Origin	Storage methods	Treatment/ Disposal Methods
Hazardous:			
Waste oil / oily sludge	Vehicle, equipment, vessels and tanks clean out	Closed containers/drums	Transfers to allocated areas by authorized subcontractors
Chemicals	Chemical materials and chemical container	Store closed containers	Transfer by local authority
Ni Cd batteries	Substations, Battery room	Containers	Transfer to VENDOR or to allocated area by local authority

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شماره پیمان:	SPECIFICATION FOR ENVIRONMENTAL JOB							شماره صفحه: ۱۱ از ۱۳	
۰۵۳ - ۰۷۳ - ۹۱۸۴	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال		نسخه
	BK	GNRAL	PEDCO	000	SA	SP	0004	D01	

Type of Waste	Origin	Storage methods	Treatment/ Disposal Methods
Non Hazardous:			
Scrap metal	Construction / maintenance activities	Salvage area	Transfer to allocated area specified by local authority
Kitchen waste	Accommodation camps/site and shipping material	Closed containers	To the outside of plant by subcontractor
Paper and woods	Construction camps/ site and shipping material	Salvage area	Transfer to allocated area specified by local authority
Absorbent material	Use to remove chemical spills	Sealed drums	As per VENDOR instruction
Inert:			
Soil and rock spoils	Project construction	Direct disposal	Reuse as back fill
plastic	Accommodation camps/ site	Containers	Eliminated with kitchen waste

7.0 CHEMICALS

All chemicals on site shall be stored and handled in accordance with the “Materials Safety Data Sheets” (MSDS).

Hazardous chemicals will be held in appropriate segregated and impermeable areas on site.

7.1 OCCUPATIONAL EXPOSURE LIMITS

To give protection to the workforce occupational health and safety limits exist which should not be exceeded at any point on a work site where people could be exposed to noxious or toxic gases. These limits apply over two time averages: the time weighted average (TWA) is the average concentration over an 8 hours period and the short term exposure limit (STEL) is a short-term maximum which applies as the average concentration over a 15 minute period that cannot be repeated more than 4 times per day with at least 60 minutes between exposure periods. The main applicable occupational exposure limits, taken from occupational exposure limits, are reproduced in following table.

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض عمومی و مشترک							
شماره پیمان: ۰۵۳ - ۰۷۳ - ۹۱۸۴	SPECIFICATION FOR ENVIRONMENTAL JOB							شماره صفحه : ۱۲ از ۱۳
	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	
	BK	GNRAL	PEDCO	000	SA	SP	0004	D01

Table 7: Occupational Exposure Limits in the workforce*

Substance	TWA (ppm)	STEL (ppm)
CO ₂	5000	30000
CO	25	200 (1)
Propane	2500	-
Butane	800	-
pentane	600	-
n-Hexane	50	-
Heptane	400	500
H ₂ S	5	10
NO ₂	3	5
SO ₂	2	5

*: Issued by Iran Ministry of Health

(1): NIOSH

For emergency situations that are unlikely to actually occur, a higher exposure concentration based on the Emergency Response Planning Guidelines (ERPG) developed by the American Industrial Hygiene Association can be used.

The ERPG-2 threshold for H₂S is 30 ppm (43 mg/m³) and for SO₂, 3 ppm (7.8 mg/m³). This threshold is defined as:

The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hour without experiencing or developing irreversible or other serious health effects or symptoms that could impair their abilities to take protective action.

The ERPG-3 threshold for H₂S is 100 ppm (143 mg/m³) and for SO₂, 15 ppm (39 mg/m³). This threshold is defined as:

The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hour without experiencing or developing life-threatening health effects.

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض عمومی و مشترک							
شماره پیمان: ۰۵۳ - ۰۷۳ - ۹۱۸۴	SPECIFICATION FOR ENVIRONMENTAL JOB							شماره صفحه: ۱۳ از ۱۳
	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	
	BK	GNRAL	PEDCO	000	SA	SP	0004	
							D01	

8.0 NOISE LIMIT

8.1 GENERAL

Noise levels shall limited throughout the sites in the development in order to:

- Minimize the risks of hearing damage to personnel;
- Ensure alarms are audible;
- Permit adequate speech, telephone and radio communication;
- Maintain working efficiency; and
- Minimize off-site impact.

Similarly, vibration levels shall be limited, in order to prevent a health hazard and maintain the working efficiency of personnel. A maximum noise level of 85 dB, measured at 1m, shall be taken as the minimum standard for the PROJECT, consistent with local requirements and good international practice. Local requirements are detailed in IPS-G-SF-900.

8.2 NOISE CONTROL

Noise limits for individual items of machinery shall be specified taking into account the results of a project noise study and the location of equipment and its acoustic environment. If it is not cost-effective to use low-noise equipment, sound-proofing shall be considered using sound-absorbent materials. Any sound-proofing enclosure should be designed to cause minimum interference with routine inspection and maintenance of the equipment. Suitable access doors and observation windows should be provided.

Personnel hearing protection shall only be used where engineering methods of noise control are not cost-effective or reasonably practicable. Such areas will be designated as 'restricted', with suitable local signage. In such areas, hearing protection will be mandatory.

8.3 VIBRATION CONTROL

Priority shall be given to limiting the emission of vibrations from equipment by balancing of rotating equipment and provision of anti-vibration mountings.