

EXECUTIVE SUMMARY

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1 EXECUTIVE SUMMARY

1.1 INTRODUCTION

There are significant oil and gas reserves in the Azerbaijan sector of the Caspian Sea. However, the land-locked geography of the Caspian region currently limits the ability of Azerbaijan to fully exploit these reserves, due to difficulties with transportation to international markets. The Baku-Tbilisi-Ceyhan (BTC) project has been designed to help resolve some of these transportation issues by building a dedicated pipeline system to deliver up to one million barrels per day of crude oil from Sangachal terminal near Baku in Azerbaijan, through Georgia, to a new marine terminal at Ceyhan in Turkey, on the Mediterranean coast. Tankers will then ship the oil to international markets. The 1,760km pipeline, of which 442km are in Azerbaijan, is currently scheduled to be operational by late 2004.

The owners of the BTC pipeline comprise a set of oil companies who, from mid 2002, will be known as BTC Co. BP is the largest stakeholder in the project and is leading the design and construction phase of the project. Other companies that will form BTC Co. currently include the State Oil Company of the Azerbaijan Republic (SOCAR), Unocal, Statoil, TPAO, Itochu, Delta Hess and ENI. Negotiations are currently under way with other companies about possible involvement in BTC Co. BTC Co will be responsible for construction and operation of the proposed pipeline in both Azerbaijan and Georgia, with construction in Turkey falling under the control of the State Company BOTAS.

This document summarises the Environmental and Social Impact Assessment (ESIA) of the BTC pipeline project in Azerbaijan. The analysis covers impacts for the lifetime of the project, i.e. construction, operation and decommissioning.

The ESIA has been conducted to meet international standards and guidelines (including those of the World Bank Group), Azerbaijani legislation, and BP corporate policies. It also fulfils the requirement in the Host Government Agreement, for the development of an EIA. Figure 1-1 illustrates the ESIA process followed for BTC.

1.2 CONSULTATION AND PARTICIPATION

As can be seen from the flow diagram below, consultation and participation have been central elements during each phase of the ESIA process. This has involved the following groups during both baseline data collection and the development of mitigation measures:

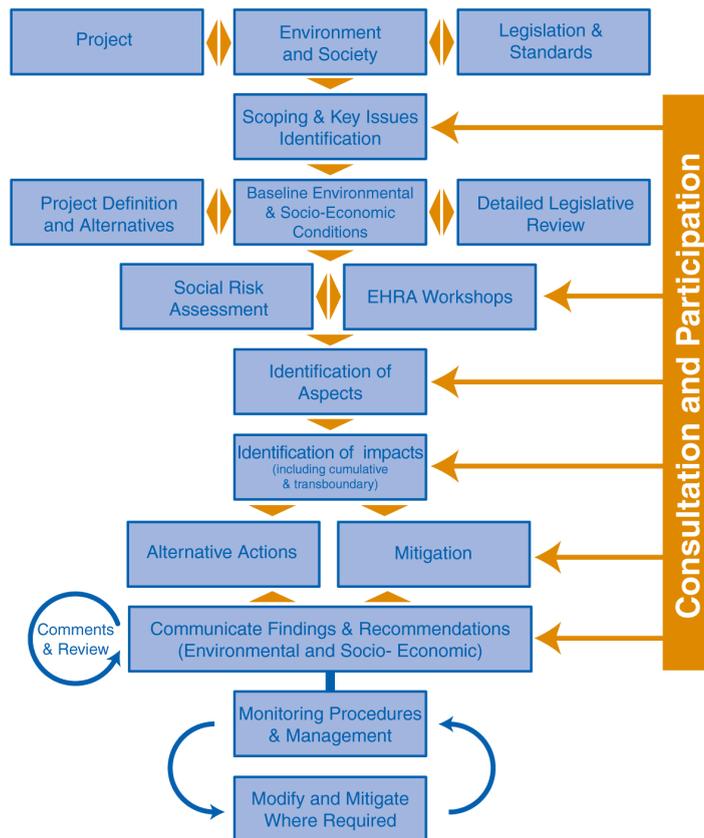
- Communities along the route
- Government departments
- Academics
- International and national non-governmental organizations (NGOs)

Representatives of all communities within 2km of the pipeline route and additional facilities have been consulted. A Public Consultation and Disclosure Plan has been developed that

includes further information on the past and future consultation activities, and stakeholders consulted.

This draft of the ESIA document has been prepared specifically for public disclosure and comment. The report will be widely disseminated and will be available for comment for a period of 60 days. Following the 60-day disclosure period all comments received will be incorporated as appropriate into the ESIA, prior to formal submission to the Government.

Figure 1-1 The BTC ESIA process



1.3 PROJECT ALTERNATIVES

The decision to progress development of BTC was reached following an assessment of alternative oil export options, which included an exhaustive routing assessment.

One major environmental benefit of the BTC pipeline is that it will make it possible to export significant additional volumes of Caspian oil, without increasing volumes shipped through the Bosphorus Straits.

When refining the pipeline route within Azerbaijan, first to a 10km wide corridor, and subsequently by a staged approach to a 44m wide construction corridor, a number of issues had to be considered, including:

- Environmental risk
- Designated areas
- Social impacts and proximity to settlements
- Constructability and engineering constraints
- Security
- Proximity to other projects such as the existing Western Route Export Pipeline (WREP)
- Use of existing infrastructure corridors

As a result, a shared route for BTC and a new gas pipeline (the Southern Caucasus Pipeline or SCP) has been selected, which runs parallel to the WREP for most of its route through Azerbaijan. Where significant deviations from the WREP route occur these have often been incorporated to reduce the environmental impact of the project. This is reflected in route changes in the Gobustan Desert region, and in re-routes to avoid the Korchay and Shamkir State Forbidden Areas.

As part of the process of assessing alternatives to the project, the option of “no-development” was considered. However, the potential positive socio-economic benefits of the pipeline (including government revenue and local employment opportunities) and associated environmental risks of not developing the project (including development of other pipelines that may require onward transport of Caspian crude through the Bosphorus) were considered to outweigh the potential negative environmental and social impacts that will result from the construction and operation of the BTC pipeline.

1.4 PROJECT DESCRIPTION

The complete BTC pipeline, which will be buried for its entire length, will total 1750 km in length, divided as follows:

- Azerbaijan = 442km
- Georgia = 248km
- Turkey = 1060km

Within Azerbaijan, the BTC pipeline system will also include:

- One intermediate pigging station (IPS) to be further developed to include a pump station
- Two additional IPSs
- Valve stations
- A cathodic protection (CP) system
- A fibre optic communications system
- A computer-based control system

The pipeline route is illustrated in Figure 1-2.

Figure 1-2 Map of BTC pipeline route



Schedule

Key milestones for the BTC project in Azerbaijan are shown in the table below.

MILESTONE	APPROXIMATE TIMING
Award of construction contract	3Q 2002
Start upgrade of pipe storage yards	3Q 2002
Start of pipelay	1Q 2003
Finish of pipelay	2Q 2004
Oil fill	4Q 2004

1.4.1 Construction

An experienced international contractor, under close supervision of the BTC Co. management team, will carry out construction of the pipeline.

The contractor will use one or more conventional construction spreads for normal pipeline installation, and one or more special section crews for river crossings and other specialised pipe segment installations.

Initially the pipeline construction corridor will be marked, prior to clearing and levelling. Generally topsoil is stripped and stored to one side of the corridor, and separately from subsoil.

The pipeline trench will be excavated to approximately 2.2m, allowing the pipeline to be buried with a minimum depth of cover of 1m. Deeper burial may be required at river, road, rail and other crossings.

Pipe sections will be transported to the construction corridor by truck and laid end-to-end alongside the open trench. The pre-coated pipe sections are then welded together and a further protective coating applied to the welded joints. The coating is tested to ensure it will provide adequate corrosion protection before the pipe is lowered into the trench.

The trench is then filled with the material taken from the trench, in the reverse order to which it was excavated. The cover material is compacted to reduce the risk of future settlement and erosion.

The construction corridor and all other project areas will be reinstated, either fully or using interim measures if required for imminent gas pipeline construction. Reinstatement will include erosion control measures and re-vegetation.

The integrity of the pipeline is tested by filling discrete sections with water and increasing the pressure.

The construction of the pipeline will also require a number of temporary facilities, including construction camps for workers and pipe storage yards.

1.4.2 Operation and maintenance

The pipeline system has been designed to require minimal operational and maintenance intervention. Safety of employees, customers and the general public, and environmental performance will remain priorities during this phase. A system of regular inspection and maintenance will be developed and implemented for the pipeline and associated facilities.

Training programmes will be developed for all operations staff.

1.4.3 Decommissioning

As part of decommissioning all hydrocarbon products will be removed from the line. Once cleaned, it is generally preferable to leave the abandoned line in place as this avoids the environmental disturbance associated with removal. It may be necessary to maintain the cathodic protection system to prevent corrosion of the pipeline, which could lead to subsidence.

The option of using the pipeline for the local/national distribution of low-pressure gas, the transportation of water or as a conduit for services such as telecommunications cables, may also be considered.

1.5 BASELINE DESCRIPTION

1.5.1 Environmental baseline and identification of issues

The environmental characterisation of the pipeline route has included analysis of the following issues:

- Ecology (flora, fauna and biodiversity)
- Water resources (surface and groundwater)
- Geology and geomorphology
- Landscape and land use
- Climate and meteorology
- Archaeology and cultural heritage
- Traffic and transportation infrastructure
- Air quality
- Noise
- Contamination
- Soil erosion

The sections below summarise the key findings for each of the above issues.

Ecology

The proposed route is characterised by very diverse ecological conditions and by abundant biodiversity. The key issues relating to habitats, flora and fauna along the pipeline route are:

- Artemisia and Salsola deserts of the proposed Gobustan National Park
- Potential presence of the red data book listed plant *Iris acutiloba* in desert habitats
- Potential presence of the red data book listed plant *Merendera trigyna* in desert habitats
- Presence of the IUCN classified Mediterranean tortoise, *Testudo graeca*, in many locations
- Presence of several ground nesting birds of conservation importance at various locations

Water Resources

The proposed route crosses 21 major rivers and a number of important canals.

Key issues relating to hydrology along the route of the pipeline are:

- The two crossings of the Kura River, the major river in Azerbaijan
- The highly seasonal flow regime of many of the rivers crossed
- The high sediment load of many rivers crossed
- Poor channel stability of rivers such as the Djeyrankechmes, Shamkirchay and Kura East
- Ecological value of certain rivers, particularly the Kura, Korchay and Hasansu

Geology and Geomorphology

The pipeline route in Azerbaijan is located in a depression (the Kura River Valley) within the southern extension of the Great Caucasus mountain range. The regional structure is dominated by compressed sedimentary rock.

The route is also close to areas of land instability and the region generally exhibits high seismic activity. These geohazards have been fully considered in the route selection process and therefore only minor instances actually affect the current route.

Key issues in terms of geology and geohazards along the pipeline route are as follows:

- The majority of the pipeline route is underlain with relatively soft sediments that can be easily excavated
- Azerbaijan is situated in the seismically active Caucasus region and experiences frequent earthquakes. However the pipeline route itself is situated mainly within the less seismically active Kura River plain
- The pipeline route crosses four seismically active fault zones
- The pipeline route crosses an area in the vicinity of active mud volcanoes

World-renowned specialists have advised on how the risks from these geohazards should be mitigated in the pipeline design.

Landscape and land use

Landscape and land use along the BTC pipeline route are mainly determined by the combination of relief, climate, geology, topography soils and hydrology.

A number of distinct regions can be identified along the route, including the arid, desert regions at the east of the route, and the fertile agricultural lands of the Kura Plain.

The value of the landscape varies according to the degree of human impact, which has resulted in degraded landscapes in many regions. Activities impacting upon visual amenity include civil and industrial construction, military activities, power infrastructure, mining, waste disposal, and deforestation.

Climate and meteorology

Numerous climatic types are found in Azerbaijan, depending on altitude and distance from the Caspian. Dry subtropical climate is typical in the Kura river valley where the majority of the BTC pipeline route is located. The highest air temperatures occur at the eastern end of the pipeline and along the Caspian coastline. In this region average July temperatures are more than 25°C, whilst during the winter temperatures rarely fall below freezing. The average annual temperature is 15°C. Average rainfall is 200-400mm per year but can be as little as 150-200mm in semi-desert areas such as Gobustan.

The weather is cooler and wetter in the west, towards the border with Georgia.

Archaeology and cultural heritage

Azerbaijan is rich in evidence of previous occupation. Most stages of human development have been encountered at archaeological sites in the country. The proposed BTC pipeline route crosses several areas of archaeological interest and areas where potential additional finds could occur during excavation works.

Field studies have identified areas of particular interest and a series of pre-construction archaeological surveys will be conducted to further define the archaeology of these areas.

The pipeline route also crosses the north-eastern edge of the Gobustan Cultural Reserve, for a total distance of 900m. However, the pipeline will have no impact upon any of the rock art that the Reserve is designated to protect.

Traffic and transportation infrastructure

The road network in Azerbaijan has suffered from a lack of investment, with many roads in a poor condition. Many roads also have poor signage, limited lighting, a lack of markings, crash barriers and other safety infrastructure. The key issue associated with the BTC project will be the increase in traffic and therefore in traffic safety risks in some areas.

Air quality

Information on air quality along the route was generated by desk based assessment of historical data from various locations. This data was supplemented by on-site monitoring of air quality, and subsequent modelling of emissions, at the proposed pump station location.

The results of this assessment show that baseline air quality in these areas is good, and is likely to be typical of the rural and urban areas encountered on the pipeline route.

Noise

The BTC pipeline is routed almost entirely through quiet desert, semi-desert and rural areas where ambient noise levels, particularly at night, can be expected to be low or very low (typically less than 20 dB(A) at night). However, background noise levels can be significantly higher during periods of strong winds, with levels typically in the range of 45-55 dB(A).

Background noise surveys have been undertaken in the vicinity of the proposed pump station and at Sangachal Terminal.

At the pump station daytime noise levels were found to range between 29 to 39 dB(A). The noise environment was dominated by local activity, agricultural machinery and at positions close to roads, by individual traffic movements. Measured night-time background noise levels range 22 to 35 dB(A). These background noise levels were considered to be typical of a rural/agricultural area during the night.

A background noise survey undertaken in 1996 in the Sangachal area, prior to the construction of the existing terminal facilities, revealed generally high noise levels of up to 55 dB(A). The levels measured are considered typical of a windy coastal location near to road traffic in Azerbaijan.

Contamination

Areas of visible contamination have been identified along the pipeline route. Sites that currently fall within the proposed construction corridor include instances of waste dumping, some asbestos tiles, minor areas of oil staining and scrap metal.

From the BTC project perspective the key baseline contamination issues are:

- Minimising risks to worker health and safety, particularly during construction
- How to treat and/or dispose of contaminated material from the pipeline corridor.
- Clearly documenting pre-existing contamination so that the BTC project is not assumed to be responsible for contamination that in fact pre dates the project

Soil erosion

While much of the BTC pipeline route is in areas that have little tendency for soil erosion there are a number of areas that are prone to high levels of soil erosion. Soils with a high clay and silt content are particularly prone to erosion.

1.5.2 Socio-economic baseline and identification of issues

Baseline socio-economic information for the ESIA was collected in consultation with members of communities within 2km of the pipeline route, and covers both existing conditions and attitudes to the BTC pipeline. Communities within 5km of major facilities and 2km of pipe yards were also consulted. A total of 73 interviews were held with community leaders and 814 with community members.

Population and area of study

A total of 83 communities have been identified as being located within (or partly encroaching into) a 4km corridor centred on the route, or are close to a potential construction camp or pipe yard. The total population of all the communities surveyed is 257,223, of whom just over 96% are permanent residents, 0.3% temporary residents, and 3.3% IDPs and refugees. Communities are, in general, ethnically and religiously homogenous (Azerbaijani muslim).

Infrastructure

Access to reliable sources of energy is a major concern for these communities. 84% of communities stated that they receive infrequent electricity supply, and 58 communities are currently receiving no gas supply.

Water supplies are problematic for all surveyed districts. 73% of communities in the survey area have no communal piped water supply and obtain their water mainly from canals. Water is also essential in most areas for agricultural irrigation.

There are almost no active refuse or sewerage systems in the surveyed communities.

Many services, such as fire departments and banks are virtually non-existent along the route, while other services such as police services and health clinics have suffered from a lack of investment.

Land Tenure

The majority of people rely on the land for subsistence, particularly as industrial activity along the route has dwindled. Land is used mainly for crop cultivation and grazing of livestock. 86% of communities are engaged in vegetable cultivation, 57% in growing grain and almost all of them in small amounts of animal husbandry. Many households own one or two cows and a small number of sheep and poultry for subsistence purposes (wool, milk and meat). During the winter season, municipal and state land is also used by migratory sheep-herders for grazing their animals.

The land privatization process began in late 1996 and has progressed rapidly. 95% of people interviewed have direct ownership or use of land. IDPs and refugees tend to use State or municipal land.

Employment

There is generally a high level of unemployment along the route. All communities surveyed stated that they had members who would be available for temporary work. Communities also reported that there were members of their community with skills they felt would be of interest to the project, eg engineers, drivers and welders. Communities close to potential construction camps also reported the availability of workers experienced in catering, laundry, cleaning, food production, etc.

In 2000, the national average income was 203,400 manats per month (US\$46). In rural communities along the pipeline route incomes are considerably lower than this national average.

Crops and animal husbandry are the main sources of cash income along the pipeline corridor. This income is supported by the following sources:

- State sector employment, eg teachers, doctors, and government posts
- Material aid - provided by international NGOs and the State
- Social transfers - state pensions, benefits, etc
- Hunting, fishing and gathering
- Trade - including local shops and businesses (70% of communities have at least one shop or market)

Attitudes to the BTC Pipeline

Nearly 80% of the communities surveyed have previous experience of the construction process for either the Azerigaz pipeline or WREP and therefore have some idea of what to expect from the BTC project. In general, the overall attitude to the project was positive but cautious, with 94% indicating that they thought the construction and operation of the pipeline would be beneficial. Employment was by far the most important perceived benefit. All respondents felt strongly that local people should be offered first refusal for jobs for which they were qualified.

1.6 MANAGEMENT OF IMPACTS

1.6.1 Management of environmental impacts

An assessment has been made of both generic and location specific environmental impacts, as defined below.

Generic impacts are defined as those that could occur at any geographical location, as they are related to the activity rather than being dependent upon the environment.

Location specific impacts are defined as those that could occur in one specific geographic location, due to a particular sensitivity at that location.

Mitigation measures have been developed for each type of impact. The likelihood and significance of each impact occurring, after mitigation, has been determined.

The most effective mitigation measure for a pipeline project is to ensure that the route is selected to minimise environmental impact. For the BTC pipeline project this has involved re-routing to avoid sensitive areas, protected areas, archaeological sites and geohazards, and the sensitive siting of facilities.

Knowledge of environmental constraints has also enabled the engineering team to select the most suitable construction techniques and design features to further minimise impacts.

Finally, a quantified environmental risk assessment has been used to look at the likelihood of a leakage of oil from the pipeline and to assess the potential impacts upon different environmental sensitivities. This has directly influenced the project design, for example in the spacing and location of isolation valves.

The table below provides an outline of the mitigation measures that will be applied to manage the environmental impacts associated with:

- General construction and operation activities
- Construction camps and storage yards
- Construction of crossings
- Testing and commissioning

Environmental Mitigation Measures
General Construction and Operation Activities
<u>Procurement</u> Environmental issues will be considered during the procurement of goods and equipment Responsible use of materials (eg recycling and re-use) to minimise waste
<u>Habitat Loss</u> Sites & routes have been selected to avoid protected areas and ecologically sensitive areas wherever practical Pre-clearance surveys will be undertaken to identify, transplant or otherwise manage rare and endangered botanical species that are likely to be affected by the construction operations There will be clear demarcation of workspace boundaries through sensitive areas Construction traffic will be restricted to approved access roads and the ROW Ecologically sensitive areas will be reinstated as soon as practical after construction
<u>Introduction of competitive species</u> Information on this issue will be provided in workforce and visitor induction training Invasive species assessments will be included in the project construction environmental monitoring programme
<u>Visual impact</u> Site selection for permanent facilities has taken visual impact into consideration A planting scheme for the pump station will be implemented and maintained The perimeter wall at the pump station will help to screen low level equipment Good housekeeping will be employed at all facilities to ensure a tidy and well maintained appearance
<u>Hazardous materials management</u> There will be no storage of hazardous materials in active floodplains or within 30m of a watercourse Storage in areas of known groundwater vulnerability will be minimised Hazardous materials will only be stored within designated storage areas and using appropriate procedures (eg, bunding, impermeable surfaces, secure drainage, limited access, labelling) A record will be kept of all hazardous materials on-site and Material Safety Data Sheets (MSDS) maintained Potentially reactive materials will be segregated Personnel will be trained in safe use & handling of hazardous materials Spill response equipment (absorbents etc) will be available and emergency response training provided
<u>Solid waste management</u> A strict duty of care will be enforced on the project managers and the contractors Secure waste storage sites will be established, in defined areas away from watercourses and drains, and secure from vermin There will be a prohibition on uncontrolled burning or burial of waste There is a requirements for the environmental review of potential landfill & incinerator sites including site selection & proposed mode of operation Monitoring and auditing of waste management practices will be carried out during construction and operation

Environmental Mitigation Measures

Liquid waste management

Water quality will be monitored prior to discharge

There will be a prohibition on the discharge of contaminated wastewater to the environment

Sewage treatment facilities have been incorporated into the design of construction camps and the pump station

Wherever practical there will be no disposal of liquid wastes in vulnerable groundwater areas

There will be brief environmental assessment of disposal options and locations

A routine wastewater monitoring programme will be developed and implemented

A waste water treatment facility has been included at the pump station

Traffic management

Project speed limits will be strictly enforced

Driver will receive safety and environmental awareness training, and be subject to assessments and monitoring

Construction traffic will be restricted to approved access roads and the ROW

Vehicles will be maintained to minimise emissions and fuel consumption

Warning signs will be placed at road crossings and other appropriate locations as required

Temporary traffic control will be established where necessary at road crossings and junctions

A local community safety awareness programme will be implemented and communities will be discouraged from use of the ROW as a road

Soil structure

Soil storage areas will be protected from vehicle movements

The subsoil beneath the vehicle running track will be broken up prior to reinstatement

Appropriate use of load bearing materials (eg, mats, straw, geotextile membrane) in areas of particularly soft ground

Topsoil and subsoil will be stored separately to maintain seed bank viability and soil structure

Dust generation

Wetting of the ROW will be carried out to reduce dust generation

Areas of particularly sensitive crops or animals eg cotton and bees, will be identified and consultations held with the owners

Air Emissions

Equipment and vehicles will be maintained in line with manufacturer's recommendations to meet relevant international standards

Vehicle emissions will be monitored periodically

A monitoring and maintenance programme will be developed to ensure emissions from plant meet required standards

Environmental Mitigation Measures
<p><u>Noise Emissions</u></p> <p>Equipment and vehicles will be maintained in line with manufacturer's recommendations to meet relevant standards</p> <p>Noise abatement equipment will be used where appropriate</p> <p>Most work will be limited to defined, daylight, working hours</p> <p>Vehicles will be used responsibly, eg machines will not be left idling for long periods if they are not in use</p> <p>Local residents will receive prior notification of particularly noisy activities</p> <p>Noise emissions will be monitored against noise control targets</p> <p>A monitoring and maintenance programme will be developed to ensure emissions from plant meet required standards</p>
<p><u>Irrigation canals</u></p> <p>Where possible flow will be maintained in active drainage or irrigation systems during construction work through use of measures such as pumping, channel diversions and fluming</p> <p>Any disrupted drainage or irrigation systems will be reinstated to a standard at least equal to the original conditions upon completion of construction work</p>
<p><u>Archaeological management</u></p> <p>The pipeline has been routed to avoid known or potential archaeological sites where practical</p> <p>A Cultural Heritage Management Plan has been developed and is being implemented. This addresses pre-construction and construction phase activities</p> <p>Pre-construction work will be undertaken to evaluate & record suspected archaeological sites</p> <p>There will be specialist archaeological surveillance present during the clearance of the ROW and facility sites</p> <p>Issues of archaeological awareness (such as ownership of finds, notification of finds and protection of archaeological sites) will be included in induction training</p>
<p><u>Sediment control</u></p> <p>Sediment fencing, drainage channels & trench barriers will be installed where appropriate</p> <p>Water will be discharged through a filtering medium as necessary</p>
<p><u>Contamination</u></p> <p>Avoid construction in areas of known or suspected contamination as far as is practical (N.B. the pipeline has been routed to avoid many areas of known or potential contamination and a baseline contamination survey has been carried out.)</p> <p>Known contamination within the construction corridor will be cleared prior to construction to at least a standard that ensures worker health and safety</p> <p>Ensure segregation of contaminated soil from uncontaminated materials</p> <p>Containment measures (ditches, impermeable base membranes, covers) will be provided to minimise run-off from any contaminated soil piles</p> <p>Where offsite disposal or long-term storage of contaminated material is required it will be undertaken in accordance with the provisions set out in the project Waste Management Plan</p>
Construction Camps and Storage Yards

Environmental Mitigation Measures
<p><u>Abstraction of Groundwater</u></p> <p>Vulnerable water bodies, wetlands & groundwater sources have been identified and recorded</p> <p>Sampling and analysis of water from existing boreholes will be carried out to determine existing contamination levels</p> <p>All new abstractions for use by the project will be subject to environmental review</p> <p>The project will adhere to national and local licensing policy for abstractions</p> <p>Test-pumping of New abstractions will be subject to test pumping and of impacts on the flow rates of existing abstractions will be monitored</p>
<p><u>Construction of Crossings</u></p>
<p><u>Roads</u></p> <p>Trenchless crossing techniques will be utilised for many major roads</p> <p>Minimise duration of closure of roads and provide temporary access where necessary</p> <p>Steel plates will be lain across the trench to maintain access where practical</p> <p>Communities will be consulted prior to any temporary closure of roads</p>
<p><u>Rivers</u></p> <p>Open cut of fish spawning rivers (eg the West Kura and the Hasansu) will be avoided between early October and late June</p> <p>Environmental considerations will play a significant role in the selection of crossing design and choice of methodology</p> <p>Where possible, existing river flows will be maintained during construction work (including the use of measures such as trenchless crossings, pumping, channel diversions and fluming)</p> <p>The duration of any necessary flow interruptions will be minimised</p>
<p><u>Horizontal directional drill</u></p> <p>Extensive geotechnical survey work has been conducted during project design</p> <p>Storage of drilling muds will only be permitted in a bunded area</p> <p>The use of toxic chemicals in drilling fluids will be avoided</p>
<p><u>Testing and Commissioning</u></p>
<p><u>Hydrotest water</u></p> <p>Use of chemical additives in hydrotest water will be minimised</p> <p>Discharge of hydrotest water will be controlled to reduce soil erosion</p> <p>Water will be tested and treated as necessary before discharge to ensure it meets agreed standards</p>

1.6.2 Management of socio-economic impacts

Socio-economic impacts that have been identified relate not only to fact - the aspects of the project - but also to individual and community perceptions and attitudes towards these aspects, gleaned through the ESIA consultation process. The addition of perception and community attitudes towards the issues means that the impact will vary according to the individuals or communities involved. As a result, assessment of the likely magnitude of an impact involves a degree of subjective, albeit professional judgement.

Construction

Four categories of socio-economic issue related to project construction activities have been identified. These are as follows:

- Local employment and procurement opportunities
- Land acquisition and land-based livelihoods
- Local infrastructure, services and natural resources
- Community relations, management of construction workers and camps

The table below summarises the mitigation measures developed to address each of these issues.

SOCIO-ECONOMIC MITIGATION MEASURES
<p><u>Employment and local sourcing opportunities</u></p> <p>BTC Co and the contractor will agree a plan for local labour content</p> <p>Preference will be given to suitably qualified and experienced applicants from communities local to the pipeline route</p> <p>Recruitment procedures will be developed that will be transparent and fair</p> <p>Contractor will develop and implement training programme for local workers</p> <p>Contractor will develop and implement a plan to maximise local sourcing opportunities</p>
<p><u>Land and Land Based Livelihoods</u></p> <p>A fair and transparent compensation process has been developed for land owners and land users</p> <p>Prior consultation on land acquisition, entitlements and compensation has been held with land owners and users along the route</p> <p>Grievance procedures have been drawn up to aid in the resolution of disputes</p> <p>Procedures have been developed to manage crossings of irrigation canals and other infrastructure and services to minimise damage and disturbance.</p> <p>Land owners and users will be allowed continued access (with minor restrictions) to the pipeline corridor after construction</p>
<p><u>Infrastructure and Resources</u></p> <p>There will be upgrade of some existing roads and construction of some new access roads</p> <p>Roads used by the project will be maintained during construction and any damage to roads caused by the project will be rectified</p> <p>All roads will be restored to a condition at least as good as that existing before the project</p> <p>The quality of roads prior to and after project will be documented</p> <p>Development of and adherence to Transport Management Plan, including focus upon community safety</p> <p>All other infrastructure eg irrigation canals and fences, to be documented prior to construction and restored to at least their pre-existing condition after construction</p>

SOCIO-ECONOMIC MITIGATION MEASURES

Construction Workers and Community Relations

Development and implementation of Community Liaison Management Plan and Construction Camp Management Plan

Establishment of community Liaison team to facilitate relationships with communities during the construction phase

Development of a code of conduct for camp workers, camp rules and disciplinary procedures

All workers will receive cultural sensitivity and health awareness training

Pipeline Operation

There are few significant socio-economic impacts associated with the operation of the BTC pipeline. These can be identified as follows:

- Direct employment of approximately 100 operational staff
- Skills enhancement from long term employment opportunities
- Minor restrictions on the use of land on the ROW (eg no deep rooting plants directly above the pipeline, no new buildings, no deep ploughing or use of explosives)

Mitigation measures for negative impacts during the operational phase are consistent with those drawn up for the construction phase.

An additional major issue identified during ESIA consultation was community expectations of improved access to energy as a result of the project. Given this is not a direct impact of the project, but an outstanding community concern, it has been dealt with under Residual Impacts below.

1.7 RESIDUAL IMPACTS

1.7.1 Environmental residual impacts

There will be a number of positive residual environmental impacts associated with the BTC project. These include:

- Development and implementation of environmental investment programmes focused on maintenance of biodiversity along the pipeline corridor
- Benefits of an increased knowledge base of the Azerbaijan environment as a function of the BTC project baseline studies – the data collected will be shared with the academic community and made public
- Benefits resulting from the contaminated land survey and clean up of identified areas of 3rd party, pre-existing contamination
- Skills transfer between international and national environmental consultancies and scientists eg in survey techniques and national ecological knowledge
- Investigations before and during construction will result in an increased knowledge of archaeological features along the route, thereby increasing the national archaeological record
- Raising public awareness of environmental issues in Azerbaijan, on an

international, national and community level, through the publication of documents and consultation

Air Quality and Climate

Given the extent of spatial and temporal distribution of emissions to atmosphere no significant residual impacts will be associated with construction activities. However it is recognised that there is likely to be generation and deposition of significant quantities of dust in the immediate vicinity of the construction works.

Greenhouse gas emissions from the project are negligible when considered on a regional or national scale. Appropriate stack design and project emission limits will fully mitigate any potential for deterioration of air quality during operation.

Noise

Noise associated with pipeline construction will be short term at any one stationary receptor but cannot be fully mitigated. Therefore residual noise impacts during construction are recognised.

Soils

Proposals for handling and storage of soils, and for soils re-instatement, will minimise erosion and therefore no significant residual impacts are expected.

With regard to soil quality the mitigation measures will minimise, but not eliminate, the potential for the reduction of diversity and viability of the seedbank. The significance of this impact is however low considering the small incidence of the disturbed land compared with the overall occurrence of the subject soils.

Ecology

The BTC pipeline route will cross several ecologically sensitive areas resulting in a number of residual impacts.

The main impacts will be associated with the disturbance to the sensitive Gobustan desert area, where it is estimated that it will take approximately 10 to 12 years for complete habitat recovery on the construction corridor following reinstatement.

Landscape

The visual impact of pipeline construction operations will be short term for most stationary receptors. Longer term impacts will be minimised by the implementation of appropriate reinstatement measures along the ROW. There is likely to be a residual visual impact from:

- The upgrade of an existing access road in the Gobustan desert area
- Construction of the pipeline along narrow ridges in the Gobustan (Mud Volcano Ridge), Tovuz and Hasansu areas

The above ground facilities associated with the pipeline will form part of the landscape and therefore will cause a residual impact. The magnitude of the visual intrusion will however reduce in time as the plants used for landscaping the sites grow to maturity.

1.7.2 Socio-economic residual impacts

There are a number of positive residual socio-economic impacts associated with the BTC project in Azerbaijan, related to both the construction and operation of the pipeline. These include:

- Additional cash injected into communities
- Wide distribution of economic benefits
- Enhanced local experience and employability
- Economic benefit of indirect employment opportunities:
 - Road-side stalls
 - Local purchase of diesel
 - Local purchase of bottled water
 - Local purchase of aggregate
- Enhanced capacity to tender for contracts
- New roads / improvements to roads
- Improved health awareness
- Access to new cultures and international attitudes

The main residual negative social impacts associated with the construction and operation of the BTC pipeline in Azerbaijan are addressed below.

Access to energy

During preliminary consultation, many communities with poor energy supply clearly associated the construction of pipelines with potential provision of energy to their houses, primarily during pipeline operation. While the project will not draw energy from community sources either during construction or operation, nor will it provide them directly with any additional energy.

Employment expectations

There was clear evidence that communities have the expectation that the number of jobs that will be created, and the duration of the employment, are larger and longer than they will actually be. It is therefore important to provide accurate information on this topic in order to avoid potential disappointment.

The employment strategy developed should ensure that local employment levels are maximised as far as practical and community consultation has sought to clearly outline the level of employment that is expected during both construction and operation of the pipeline.

Accidents involving community members

Accidents to community members, while potentially serious on an individual basis, are expected to be rare given the strong emphasis placed by BTC Co. on health and safety

issues. Although all practical steps will be taken to ensure that no accidents occur any incident that harms a person will have a high significance residual impact in terms of diminishing quality of life for that person, negatively impacting them or their household livelihood, and potentially creating tension between the local community and the project team.

Local infrastructure, services and natural resources

Damage to roads from construction traffic and the depletion of community access to power are key concerns for local communities.

The project will build some new roads which will be a beneficial impact for local communities. Mitigation should also ensure that roads remain in a safe and reasonable condition, although residual community resentment may be generated if the high standards that follow the initial upgrades are not maintained.

On the basis of the current design the power draw from local sources for the project in both construction and operational phases should be minimal.

Managing community relations

Despite the positive attitude towards the pipeline found during consultation, it is possible that tensions between communities and the pipeline project will rise during construction, for example in relation to nuisance and disturbance, or in regard to opportunities for employment.

Therefore the approach to management of community relations is one of the most crucial mitigation measures.

Impacts on communities will be considerably reduced in the operation phase of the pipeline, however an on-going community relations programme will ensure that community concerns continue to be understood and addressed as appropriate.

1.8 CUMULATIVE IMPACTS

The cumulative effects of the project are considered at three geographical levels: regional, national and route level. At a regional level the effects of BTC have been evaluated in combination with the other oil and gas development in the regions, including the upstream activities that will generate the crude oil to fill the BTC pipeline, and other oil and gas developments in the Caspian region. In this context, the contribution of BTC in Azerbaijan, to the overall environmental impacts associated with these activities is negligible.

At a national level, the project has been assessed in conjunction with other activities that could benefit from the development of the crude oil pipeline or that could have a negative interaction with the project.

At the route level the project's main interaction is clearly with the SCP gas pipeline with which BTC shares a common corridor. The main route level cumulative impacts are outlined below.

Longer duration of the construction project

The construction of two large diameter pipelines along the same corridor will have a longer duration than construction of a single pipeline. Therefore there will be additional disturbance to the local populations eg through dust and noise generation, and additional vehicular traffic along access routes.

Land take and subsequent habitat loss

The combined construction corridor for the two pipelines is 44m wide. Were the two pipelines to be built in separate corridors the overall width of land disturbed would be much greater (approximately 64m) in addition to having opened a secondary pipeline corridor through the country. There is a significant positive cumulative impact of the two pipelines sharing a common corridor.

Delayed reinstatement of the ROW

The co-existence of the two projects in the same corridor may lead to a delay in the start of full reinstatement of some sections of the ROW. This could have the following negative impacts:

- The landscape value of certain sections of the ROW will be reduced for an extended period of time
- Prolonged topsoil storage may lead to impoverishment of the seed bank and a reduction in the germination rate of the surviving seeds
- The delayed permanent restoration of the ROW could facilitate the onset of erosive processes with associated negative impacts to the soils

The reinstatement plan has been developed to address these issues and states that interim measures will be adopted in areas where full reinstatement is delayed, with the primary objective of preventing erosion.

Air emissions

The potential for occurrence of a cumulative impact to human health from the simultaneous operation of closely located project facilities has been assessed and is not considered significant, as potential impacts posed by harmful emissions associated with each facility are fully mitigated through appropriate design of stacks and compliance with project standards.

Green house gas emissions associated with project activities have also been estimated and assessed, and regarded as of relatively minor significance when considered within a national, regional and global context.

Economic Benefits and Livelihoods

The cumulative socio-economic impacts resulting from the BTC, SCP and any other industrial development projects will, if well managed, provide an overall increase in wealth and livelihoods of the national population. The main national level benefit is increased government

revenues from transit of oil and gas and from taxes. Increased government revenues could contribute to an increased standard of living for the national population.

The combined effect of the two pipeline projects will be to double the inflow of cash into the local economies along the pipeline corridor, through doubling:

- Length of and number of opportunities for employment for unskilled and semi-skilled labour
- Opportunities for the provision of goods and services
- The knock-on effect of having salaried workers living in the local villages.

Skills Base

Both BTC and SCP projects will develop and implement training programmes. The cumulative impact of BTC and SCP will be to double the scale and impact of the training. As a result of the BTC training programme, the SCP project may be able to achieve a higher proportion of local employment than BTC. The combined impact of the projects will be to increase the pool of labour in Azerbaijan with experience in major international construction projects.

Disruption of Land Use

Cumulative impacts of SCP and BTC pipeline in terms of land are complicated. On the one hand, the effect of planning the two projects in parallel will result in reduced impacts had the alternative been to run the two pipelines independently of one another. On the other hand, the effect of constructing SCP after BTC pipeline will result in some of the land being out of production for at least one, if not two or three seasons longer than would have otherwise have been the case. This will result in longer-term impacts for individuals affected by the temporary land take. However the land compensation process should effectively mitigate this impact.

1.9 ENVIRONMENT AND COMMUNITY INVESTMENT PROGRAMMES

In addition to the above direct mitigation and management measures, an Environmental Investment Programme (EIP) and a Community Investment Programme (CIP) are being developed in order to go beyond direct mitigation and to help meet environmental and community needs and offset remaining residual impacts.

1.9.1 Environment Investment Programme (EIP)

Objectives of Environmental Investment Programme

In recognition of the importance of the regions biodiversity, the aim of the EIP is to enhance biodiversity management and/or protection primarily through investments in offset projects.

Types of Environmental Investment

Although still in the development stage, it is likely that the EIP will focus on the following themes:

- Protected areas and species
- Areas of high ecological significance outside protected areas
- Capacity building for biodiversity management

Timeframe

The development of the EIP is being undertaken through consultation with stakeholders to gain an understanding of where involvement would be most beneficial. The intention is that potential programmes or projects are developed and implemented in conjunction with relevant stakeholder bodies. Identification of potential partners is underway.

Implementation of the EIP will follow BP's business processes and control procedures for managing project performance and cost.

The programme will be publicised in more detail later in 2002, once feedback on the ESIA has been received and further consultation with authorities, NGOs and affected communities has taken place. It is expected that actual investments will begin in late 2002 or early 2003.

1.9.2 Community Investment Programme (CIP)

The objective of the CIP is to have a positive impact on communities most affected by construction activities by providing direct benefits, and by engaging with and adding value, to local communities in a sustainable way. The CIP will go beyond the social impact mitigation measures described in the ESIA and move towards BP's goal of having a positive influence in the areas in which BP operates.

There will be two types of community investment projects:

Sustainable Development Projects, which will be larger scale and longer term in duration, and will take place primarily in communities that are directly affected by pipeline activities but may be extended to nearby towns or villages

Local Community Projects, which are relatively small in scale and duration but respond to an immediate need in those communities that are directly affected by the construction activities

Potential projects will be developed through discussions with the communities themselves, NGOs, international development agencies and government. These discussions will ensure that the BTC project is not duplicating effort, and gains from the experience of NGOs and other potential implementation partners. Potential projects will be selected on the basis of criteria drawn from international community investment best practice and local experience.

1.10 MANAGEMENT AND MONITORING

BP's approach to Environmental and Social Management is to apply the key principles of environmental and social protection to all activities for which it is the Operator.

These principles include:

- Prior assessment of environmental and social impact
- Minimisation of potential impact through design and other mitigation controls
- Monitoring of effectiveness of controls
- Auditing of performance

The principal tool that will be employed to coordinate and review the environmental and social performance of the project will be the BTC Environmental Management System (EMS). Social issues will also be addressed within the EMS.

For the construction phase, the EMS will provide an umbrella for the implementation of requirements specified in a series of management plans addressing specific issues. Adherence to these plans will be assessed through a regular programme of monitoring and auditing, and the EMS will be subject to regular review and amendment as necessary.

A project specific operational phase EMS will be developed, in line with the requirements of ISO14001. The EMS will be certified to the ISO standard within 9 months of becoming operational.

1.11 OVERALL PROJECT ASSESSMENT

The ESIA process has identified those BTC project activities that could result in impacts to existing environmental and social conditions, and has provided an evaluation as to the significance of those impacts. Mitigation plans have been developed for each of the impacts

to accentuate any positive benefits and to minimise or remove any negative impacts. The most valuable tool in this process has been analysis of the extensive environmental and social surveys and consultations undertaken over the last two years.

1.11.1 Environmental project assessment

The assessment shows that the majority of the impacts will be associated with the construction phase. Potential construction impacts will be mitigated through the implementation of good construction practice, adherence to management plans, and through the application of localised measures to protect specific or sensitive receptors.

The operation of the pipeline will result in limited localised impacts. The most significant direct impact of operation will be the generation of noise and visual intrusion at the location of the pump station and, to a lesser extent, at the other AGIs and permanent access roads.

The potential for unplanned events and the potential consequence of such events on the habitats, rivers and groundwater resources crossed by the pipeline have also been analyzed. The assessment shows that the likelihood of any event occurring and the risk of significant impacts resulting, are very low. In the unlikely event an incident were to occur the impact could be significant dependant upon the scale of the event, geographical location of the event site, and the local meteorological, geographical and hydrological conditions.

Mitigation measures have been adopted to counter the risk of an oil spill on three fronts. Firstly, the design basis of the project includes many features to prevent a leak occurring, including routing around geohazards where possible, increased burial depth and wall thickness in certain locations and pipeline surveillance. Secondly the design also includes many features for early identification of a spill event, including a leak detection system, selected groundwater monitoring and surveillance. Finally, an Oil Spill Response Plan will be developed which will identify resources, responsibilities and equipment necessary for responding to a spill event, in the unlikely event it should occur.

The mitigation measures implemented through construction and operations will be monitored and reviewed on a regular basis to ensure they are effective. Alternative measures will be applied if necessary. To ensure that the mitigation measures are implemented in the field requirements have been included within the construction invitation to tender documents. Assessment of contractors approach to mitigation will form a significant component of the bid review process.

1.11.2 Socio-economic project assessment

Consultation revealed that most communities are generally positive towards the BTC project, as their perception is that any disruption will be temporary and offset by potential economic benefits both to their community and to Azerbaijan.

There will be a number of socio-economic benefits associated with the BTC project. These include:

- Development of a CIP focused on communities adjacent to the pipeline corridor

and associated facilities

- Direct employment – there will be a limited number of opportunities for direct employment on the project, primarily short term jobs during construction, with fewer, longer term, vacancies during operation
- Opportunity for provision of goods and services to the project
- Skills development and training, increasing the employment chances of people after the pipeline construction period
- Enterprise development, a transfer of business knowledge and skills eg internationally recognized standards of HSE, technical, commercial, accountancy, IT etc
- Infrastructure improvement – including temporary and permanent upgrade of some roads
- Benefit of the increased knowledge basis of the Azerbaijan social and economic conditions along the pipeline route, through the BTC project baseline studies – the data collected will be shared with the academic, aid agency and NGO communities
- Skills transfer between international and national consultancies, eg in social data gathering and survey techniques
- Increased public awareness of socio-economic issues in Azerbaijan, on an international, national and community level, through publication of documents and consultation
- Utilisation in-country of international best practice in relation to land acquisition and compensation

Two of these positive aspects were particularly prominent during consultation, firstly in relation to possible employment opportunities, and secondly in relation to possible expenditure on local goods and services by construction workers.

There was clear evidence, however, of the communities having some expectations which will not be realized as a direct result of the project. It is therefore important to provide accurate information on these topics in order to avoid potential disappointment. Firstly, the level of anticipated employment is higher in terms both of numbers of jobs to be created and length of employment.

Secondly, villagers living in communities with poor energy supply dearly associated the construction of energy pipelines with immediate provision of energy to their houses, which is not possible from high pressure export pipelines.

After more than a year of regular consultation these expectations have since been reduced, but will still require careful management in the future.

To conclude, although there are a few residual concerns relating to the construction of the pipeline which need to be carefully managed through the mitigation measures set out in the ESIA document, it is generally anticipated that both the construction and operation of the BTC pipeline will bring a series of short and long term benefits to the communities. These are particularly relevant in relation to employment, provision of goods and services and community investment which will provide longer term benefits to many communities thereby helping to off-set any short term negative impacts.

ESIA is an iterative process. Therefore there will be continual effort to increase and further refine knowledge of the environmental and social issues associated with the BTC pipeline throughout construction and operation.