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Surname					Other names									
Centre Number					Candidate Number									
<b>Pearson Edexcel</b> <b>Level 1/Level 2 GCSE (9–1)</b>					<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>					<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>				
<h1>Geography B</h1> <h2>Paper 3: People and Environment Issues – Making Geographical Decisions</h2>														
Specimen papers for first teaching September 2016 <b>Time: 1 hour 30 minutes</b>							Paper Reference <b>1GB0/03</b>							
<b>You must have:</b> Resource Booklet (enclosed) Calculator								Total Marks <input type="text"/>						

### Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided  
– *there may be more space than you need.*
- You must **show all your working out** with **your answer clearly identified** at the **end of your solution**.

### Information

- The total mark for this paper is 64.
- The marks for **each** question are shown in brackets  
– *use this as a guide as to how much time to spend on each question.*
- Questions labelled with an **asterisk** (\*) are ones where the quality of your written communication will be assessed  
– *you should take particular care on these questions with your spelling, punctuation, grammar and use of specialist terminology, as well as the clarity of expression.*
- The marks available for spelling, punctuation and grammar and use of specialist terminology are clearly indicated.

### Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

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**SECTION A**

**People and the Biosphere**

**Answer ALL questions. Write your answers in the spaces provided.**

**Some questions must be answered with a cross in a box ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.**

**1** Use Section A in the Resource Booklet to answer this question.

(a) Study Figure 1 which shows one theory about the relationship between population and resources.

(i) Who first developed this theory?

(1)

- Burgess
- Bradshaw
- Malthus
- Boserup

(ii) Explain why the relationship shown in Figure 1 between population and resources changes over time.

(3)

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(b) Explain **two** ways in which technology can increase food supplies for the world's people.

(4)

1 .....

2 .....

**(Total for Question 1 = 8 marks)**

**TOTAL FOR SECTION A = 8 MARKS**

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**SECTION B**

**Forests under threat**

**2** Use Section B in the Resource Booklet to answer this question.

(a) Study Figure 2.

(i) Identify which of the following best describes the total precipitation.

(1)

- 200 mm
- 400 mm
- 600 mm
- 800 mm

(ii) State the number of months when the precipitation is likely to fall as snow.

(1)

..... months

(iii) Calculate the temperature range for this area.

You **must** show your working.

(2)

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(b) Study Figure 3.

The diagram shows how coniferous trees are adapted to their environment.

State how **two** of these characteristics are adaptations to the environment.

(2)

Characteristic 1 .....

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Characteristic 2 .....

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(c) Study Figure 2 and Figure 3.

Explain why the taiga forest biome has very low levels of productivity.

(4)

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(Total for Question 2 = 10 marks)

**TOTAL FOR SECTION B = 10 MARKS**



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**SECTION C**

**Consuming energy resources**

**3** Use Section C in the Resource Booklet to answer this question.

(a) Study Figure 4 which is a map of the location of the Athabasca Tar Sands.

(i) Suggest **two** disadvantages of the location of the current mining area.

(2)

1 .....

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2 .....

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(ii) State **one** reason this area was the first to be developed for mining the Athabasca Tar Sands.

(1)

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(b) Study Figure 5 and Figure 6 which shows a timeline for the Athabasca Tar Sands development and varying price of crude oil and its impacts.

The Athabasca Tar Sands are an example of an '**unconventional oil source**'.

(i) Define this term.

(2)

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(ii) Explain why the rate of exploitation of the Athabasca Tar Sands has varied between 1967 and 2016.

(4)

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(c) Study Figure 6 which shows the varying prices of crude oil per barrel in recent years in US dollars (\$).

(i) Explain **one** reason why the price of a barrel of crude oil can vary over time.

(3)

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(ii) State **one** reason why international relations may affect the price of crude oil.

(1)

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(d) Study Figure 7 which shows the percentage contribution of various economic activities to Alberta's economy.

Calculate the percentage of Alberta's wealth comes from energy production

(1)

..... %

(e) Study Figure 8 and Figure 9.

The photograph and diagram show the environmental impacts of the Athabasca Tar Sands exploitation.

Using evidence from both resources, assess the view that the local impacts of tar sands mining are more severe than the global impacts.

(8)

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(f) Study Figure 10 which shows conflicting views within different groups about developing and exploiting the Athabasca Tar Sands.

Choose 2 groups.

Assess the reasons why there are mixed views about the Athabasca Tar Sands development **within your chosen** groups.

(8)

Group 1 .....

Group 2 .....

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**(Total for Question 3 = 30 marks)**

**TOTAL FOR SECTION C = 30 MARKS**



SECTION D

Making a geographical decision

In this question, 4 additional marks will be awarded for your spelling, punctuation and grammar, and for your use of specialist terminology.

\*4 Study the **three** options below for how the tar sands should be developed in Alberta.

**Option 1:** Expand development of the tar sands beyond the existing mining area. Build further pipelines to the USA to support the economy of both Alberta and Canada. Invest in new technology to permit the development of deeper mines.

**Option 2:** Continue to mine within the current area. Only allow strictly controlled exploitation in new areas if TNCs guarantee to clean up after mining. Replant trees to provide new timber resources and recreational areas.

**Option 3:** Stop mining the Athabaskan Tar Sands. Convert both existing and former mines to wilderness areas to be run by First Nation peoples. Develop strategies for diversification of Alberta's economy. Provide more green renewable energy for Canada.

Select the option that you think would be the best long term plan for both Alberta and Canada as a whole.

Justify your choice.

Use information from the Resource Booklet and knowledge and understanding from the rest of your geography course of study to support your answer.

(12)

Chosen option: .....

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(Spelling, punctuation, grammar and use of specialist terminology = 4 marks)  
(Total for Question 4 = 16 marks)

**TOTAL FOR SECTION D = 16 MARKS**  
**TOTAL FOR PAPER = 64 MARKS**

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**Pearson Edexcel Level 1/Level 2 GCSE (9–1)**

# **Geography B**

**Paper 3: People and Environment Issues –  
Making Geographical Decisions**

Specimen papers for first teaching  
September 2016  
**Resource Booklet**

Paper Reference  
**1GB0/03**

**Do not return this Resource Booklet with the question paper.**

*Turn over* ►

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## Section A

### People and the Biosphere

The issue: Conflicts over the exploitation of the Athabasca Tar Sands in Alberta

Will damage to the environment be justified by the economic benefits gained from oil exploitation?

- The Athabasca Tar Sands in Alberta are considered by many experts to be the largest single reserve of oil in the world.
- Canada and especially the province of Alberta have been described as the new Saudi Arabia.
- The Athabasca Tar Sands have the third largest reserves of oil and gas overall after Venezuela and Saudi Arabia (both OPEC<sup>1</sup>).

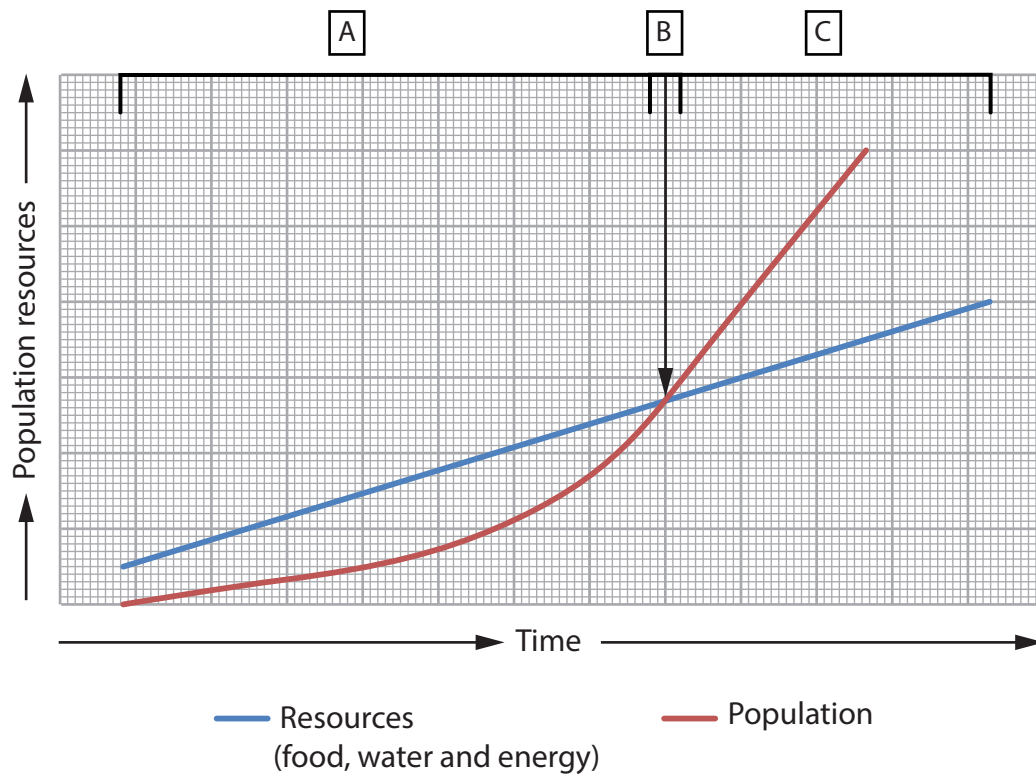
#### Introduction

- The global demand for both oil and gas has continued to rise, with concern that 'peak oil'<sup>2</sup> could be reached as early as 2030.
- To meet the projected demand for oil, unconventional sources such as tar sands and oil shales are beginning to be widely exploited, as conventional sources of oil are being used up.
- The exploitation of oil is a geopolitical issue, with oil from non-OPEC countries such as Canada particularly in demand, because it is a very safe and politically stable country compared to the Middle East.
- Oil produced from the tar sands is not only a vital source of income and employment for the province of Alberta, but also a valuable export for Canada, with 70% of the production going to the neighbouring USA. The volume of exports would increase still further if more highly controversial pipelines were built to connect the rather remote North East Alberta tar sands to the USA.
- Critics of the development argue that the pace of exploitation has been too rapid. Only recently have there been attempts by the Alberta Provincial and Canadian Governments, and transnational oil companies (TNCs) to manage the environmental and health risks posed by such large scale developments.
- The oil sands deposits lie beneath the taiga (boreal) forest. This ecosystem covers around 75% of Alberta. The North Eastern part of Alberta, the current area of mining, in an untouched wilderness, home to several indigenous groups (known as First Nation Peoples) who value it for hunting and fishing. The taiga is also a valuable source of softwood.

<sup>1</sup> OPEC – A group of oil producing and exporting countries who meet together to influence the price of oil.

<sup>2</sup> Peak oil – When the rate of new discoveries of oil is less than the rate oil is being consumed.

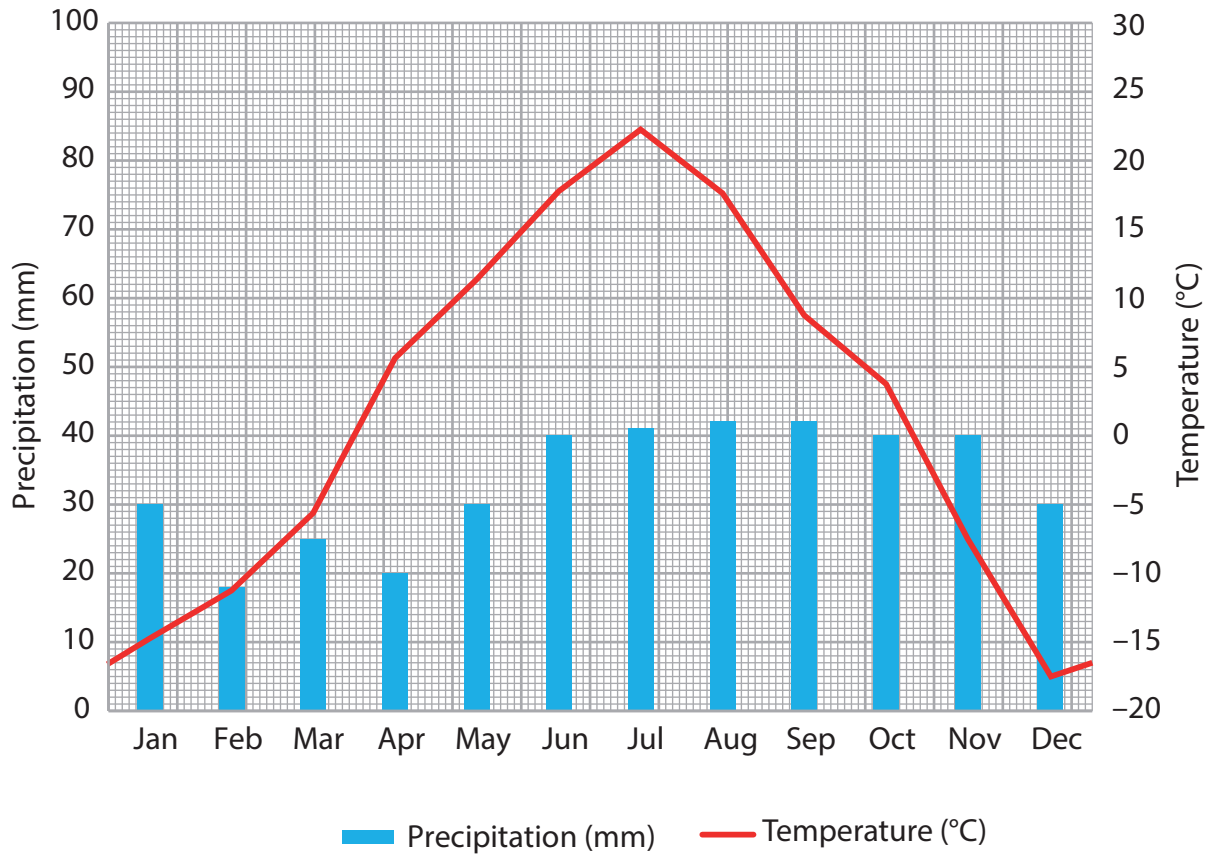




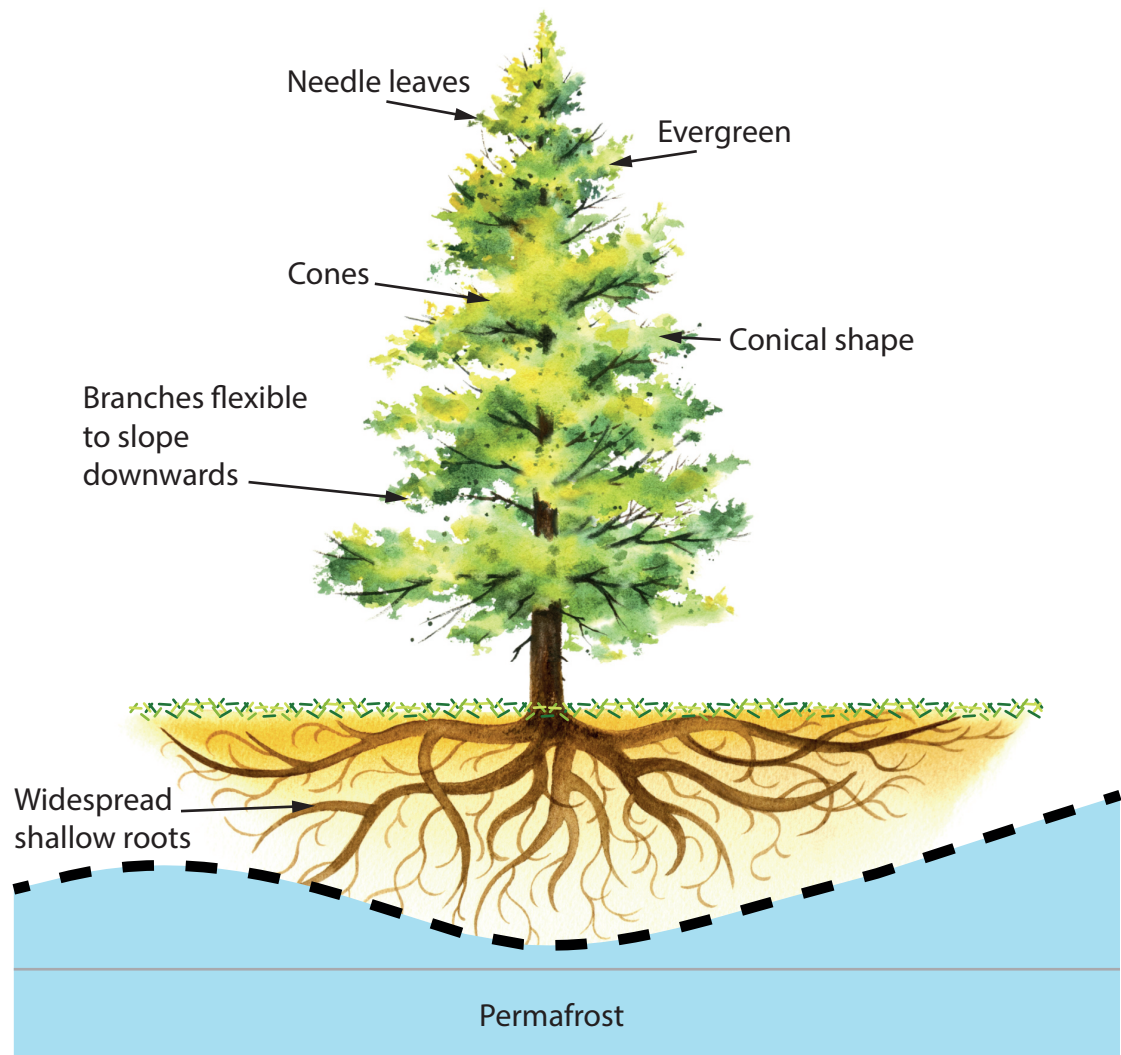
**Figure 1**

**One theory of the relationship between population and resources at a global scale.**

### SECTION B



**Figure 2**  
**Climate graph for the taiga in Canada**

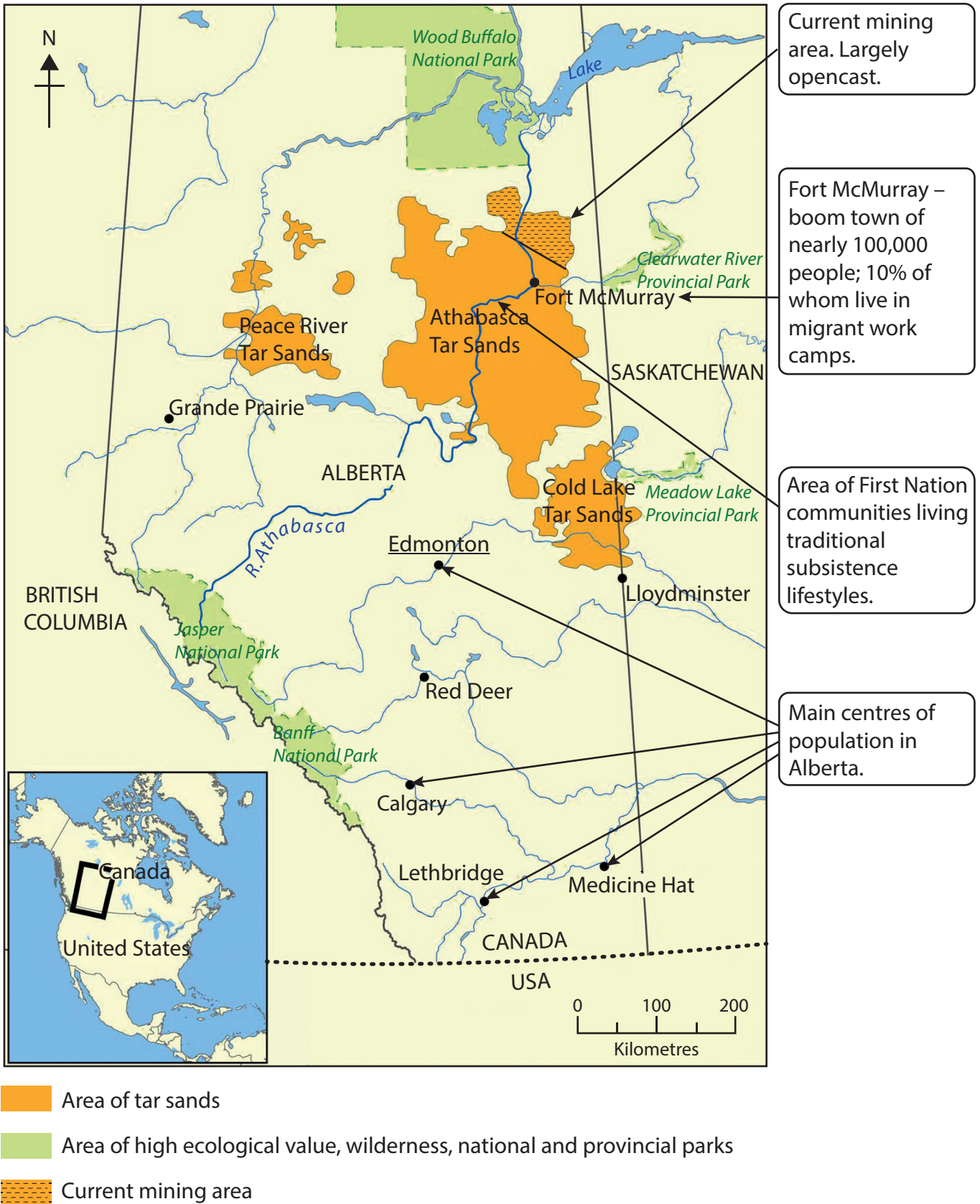


(Source: © Spiritartist / Gettyimages)

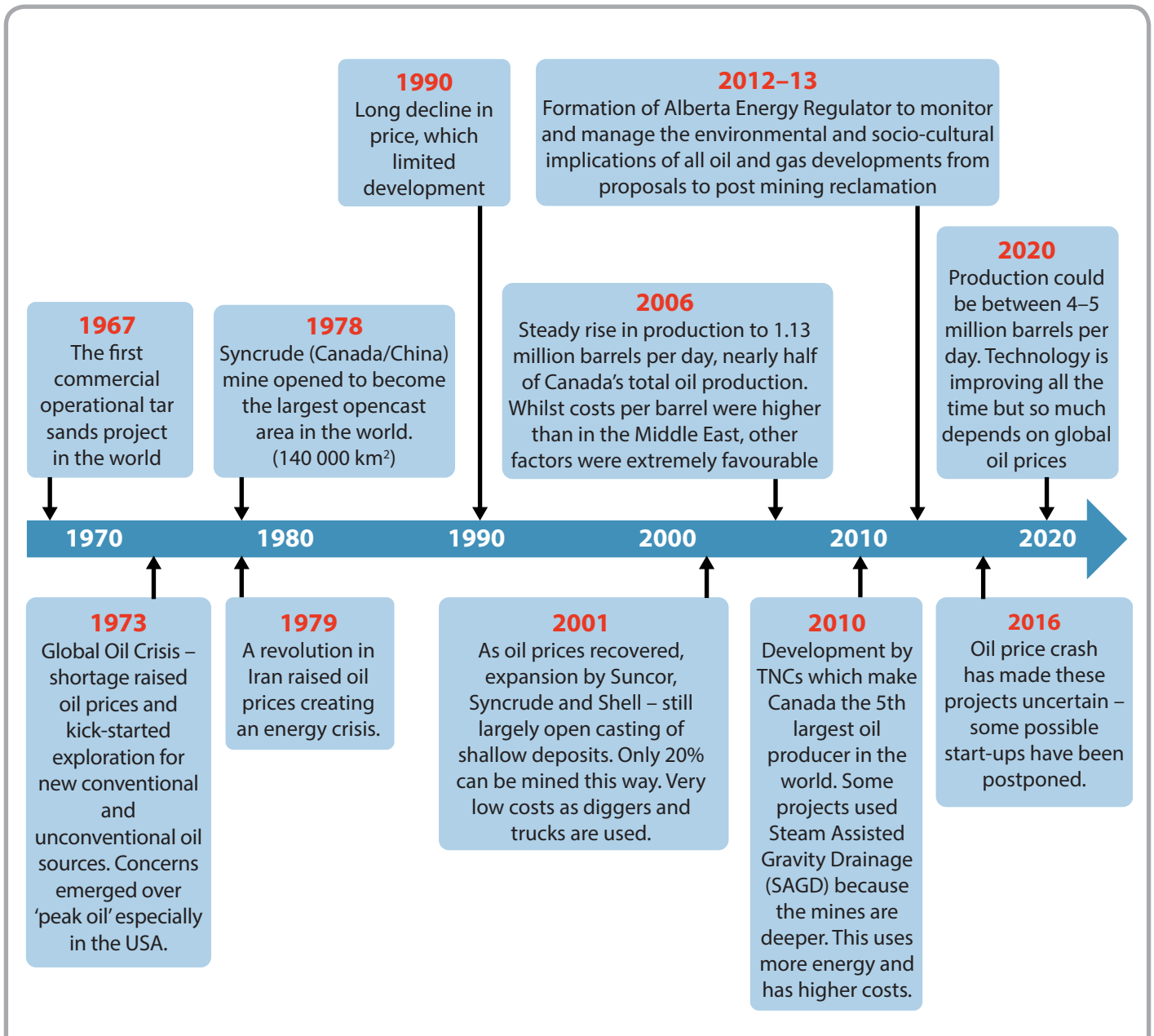
**Figure 3**

**How coniferous trees can adapt to their environment**

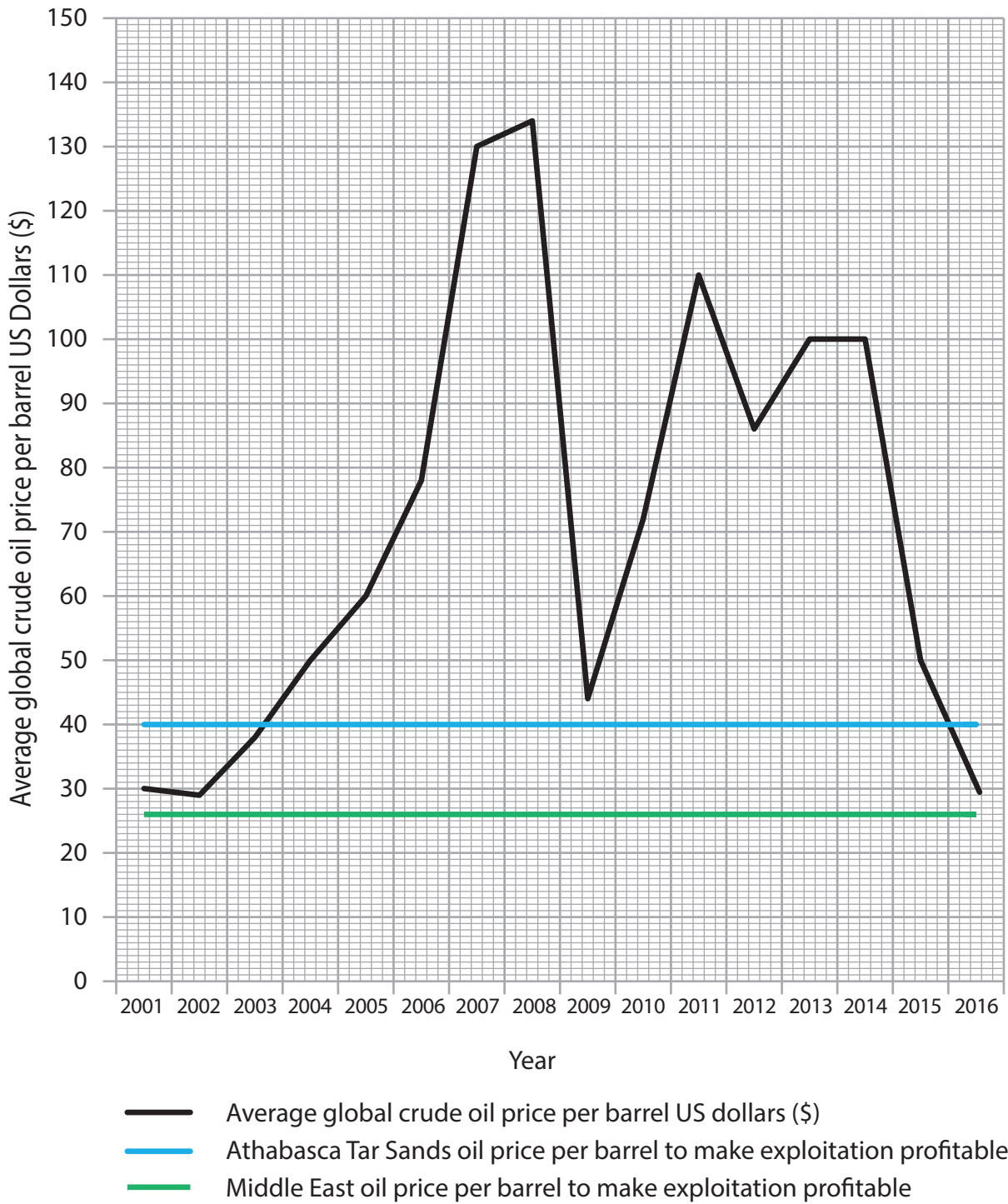
SECTION C



**Figure 4**  
**The location of the Athabasca Tar Sands**



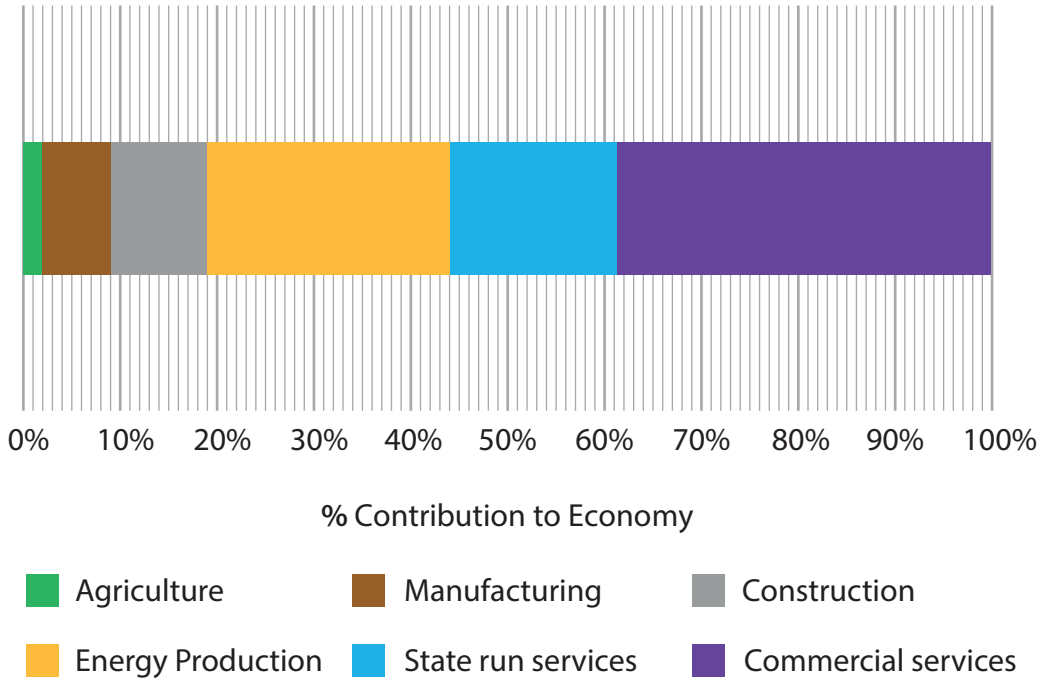
**Figure 5**  
**Timeline for exploitation of Athabasca Tar Sands**



**Figure 6**

**The varying price of crude oil and the impact on tar sands**

### Economic Impacts of Athabaskan Tar Sands



**Figure 7**

#### **Economic activities in Alberta - % contribution to the economy in 2014**

Note: The oil industry and its supporters claim that 500 000 jobs in Canada (largely Alberta) depend directly or indirectly on oil and that this could rise to as many as 800 000 by 2025. Opponents of tar sand exploitation estimate the figure to be much lower at about 100 000 and point out that future growth is far from certain.



Very limited (1%) reclamation and restoration of land

Huge opencast pits scar the landscape



Polluted river fish species become deformed

Degraded forest (impact of acid rain)

Settling pond full of toxic arsenic

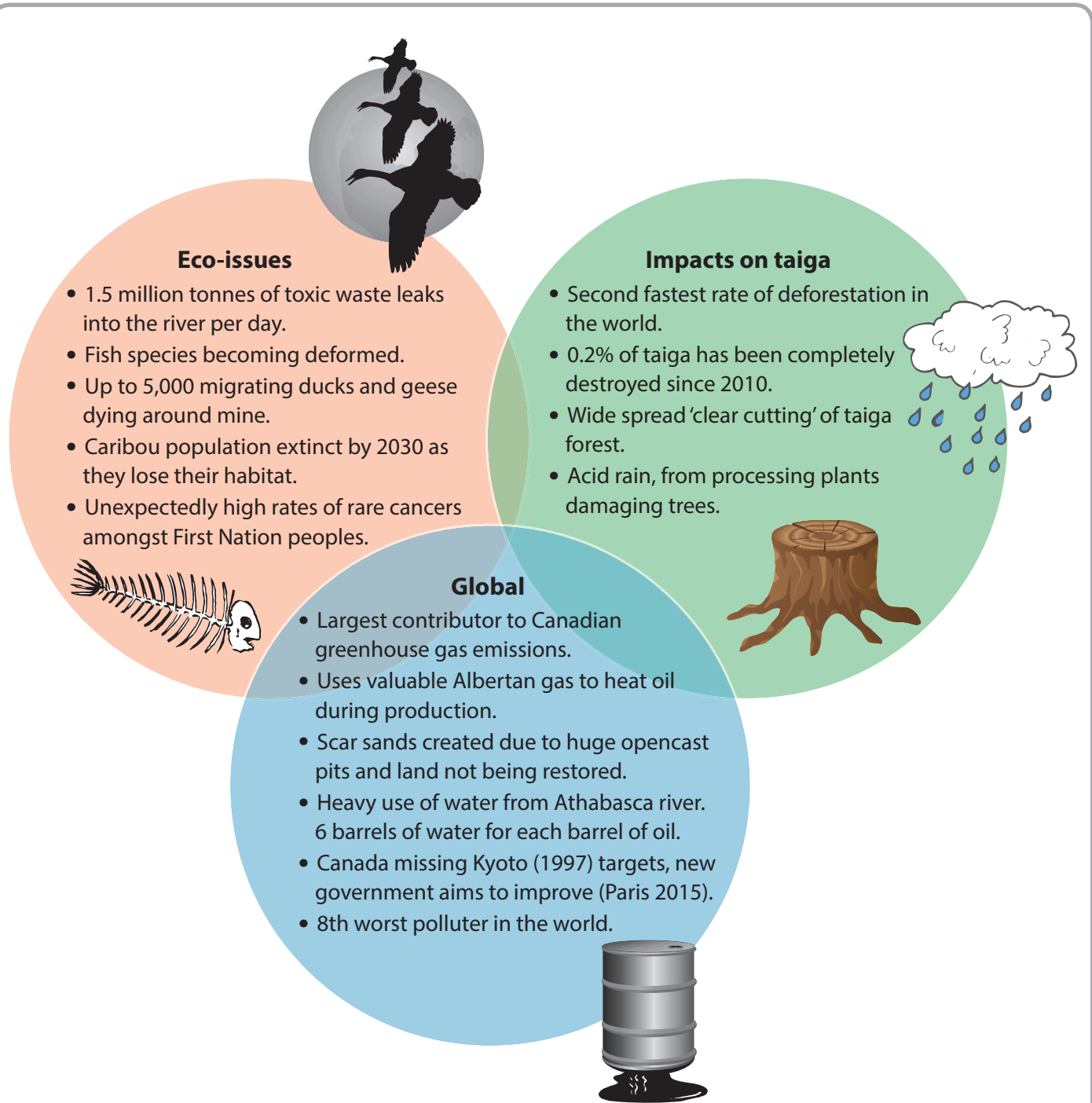
Toxic tailings (waste)

(Source: © 2010 Google)

**Figure 8**

**Aerial photograph of tar sands development**





**Figure 9**

**Environmental Impacts of the Athabasca Tar Sands development and exploitation**



"North Alberta has one of Canada's most pristine environments. The ecological and economic value of the taiga far exceeds the benefits we get from the tar sands industrial projects – the largest in human history. Canada is paying dearly for the US oil thirst."

*Director, Alberta Wilderness Association*

"Although we are earning big money from the sands - many of our young people are on £100,000 doing jobs such as truck drivers – and we have developed our own mine. We are very concerned about land rights, health issues and environmental stewardship. Our Athabasca river used to be blue, now it's brown."

*First Nations Leader, Fort McKay Group*



"I fear that after 20 years of a booming Albertan economy, with our province being by far the richest in Canada, with falling oil prices, we will be heading for a deficit. The economy at present is in a bad way with a possible collapse of energy developments. We need to diversify as we rely too much on oil."

*Finance Minister, Alberta Provincial Government*

"We are committed to environmental methods during processing and reclamation (we have already done this for 20% of our mining areas). Long term we aim to reduce water use and clamping down on our level of CO<sup>2</sup> emissions – ultimately by carbon capture and storage (CCS). We are here for the long haul, but we face hard times ahead."

*Chief Executive, Syncrude*



"The town in which I have lived all my life is now a living hell. Syncrude's pit is only 45 minutes away – you can smell the oil and hear the trucks 24 hours a day. Everything here is very expensive, especially food. There's a real shortage of housing. Although the average age is 30, some of my friends like the buzz and the better leisure facilities."

*Member, Fort McMurray Seniors Group*

"Initially we provided development incentives for the TNCs. The latest Paris Climate Change Conference has completely changed our thinking on the energy policy. We must develop the tar sands sustainably. However, the money from oil exports and other minerals has contributed to our strong economy and could be used for investment in renewables."

*Deputy Prime Minister, Canadian National Government*



**Figure 10**

### **Conflicting views about the development of the Athabasca Tar Sands**

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## Paper 3 Mark Scheme

Question number	Answer	Mark
1 (a) (i)	Malthus	(1)

Question number	Answer	Mark
1 (a) (ii)	<p>Award 1 mark for each phase or 3 marks for explained overview</p> <p>A – initially sufficient resources for population, but population growing faster than resources (1) (geometrically/exponentially)(1)</p> <p>B – at point B there are just enough resources for population (1)</p> <p>C – resources grow arithmetically/incrementally(1) so there is a deficit/widening gap as they can't keep up with population growth (1)</p>	(3)

Question number	Answer	Mark
1 (b)	<ul style="list-style-type: none"> <li>• Use of fertilisers (1) – higher yields, increase intensity (1).</li> <li>• Use of pesticides (1) – improve reliability/ cut down crop losses (1)</li> <li>• Use of agrochemicals (1) – to allow double cropping/overcome rainfall reliability (1).</li> <li>• Use of irrigation (1) – to allow double cropping/overcome rainfall reliability (1)</li> <li>• Use of Green Revolution – HYV crops supported by fertilisers/irrigation.</li> <li>• Use of Gene Revolution (1) – crop breeding to improve resistance to drought/salt (1)</li> <li>• Use of mechanisation (1) – ensures more efficient harvest – releases labour for additional work extending area (1)</li> <li>• Improved infrastructure (1) – refrigeration/fast railway routes to secure high quality crop access to market (1).</li> </ul> <p>Accept any other appropriate response but it must be technology</p>	(4)

Question number	Answer	Mark
2(a)(i)	400 mm	(1)

Question number	Answer	Mark
2(a)(ii)	6 months	(1)

Question number	Answer	Mark
2(a)(iii)	-17.5°C to 22.5°C Correct reading from graph (1) Overall 40°C +/- 1°C (1) Correct calculation (1) Accept correct calculation from student's own measurements	(2)

Question number	Answer	Mark
2(b)	<ul style="list-style-type: none"> <li>• Triangular/conical shape – protects tree from damage from heavy snow (falls off) (1)</li> <li>• Evergreen – allows instant photosynthesis in short growing season as temperature rises (1)</li> <li>• Needle like leaves - reduces transpiration (1)</li> <li>• Cones – protect seeds from intense cold (1)</li> <li>• Wide shallow roots – allow tree to survive above permafrost in shallow soils (1) or anchors tree in shallow soil to survive strong winds (1)</li> </ul>	(2)

Question number	Answer	Mark
2(c)	<p>Linking concepts and processes to environment. Up to 3 marks for named limiting factors and further mark for link to productivity.</p> <p>Productivity is the rate of energy production (1) long cold winters (1). limited sunlight hours (1). lack of nutrient availability (1) nutrients largely stored in litter (1) are all limiting factors (1) which lead to low levels of productivity (1).</p>	(4)

Question number	Answer	Mark
3(a)(i)	<ul style="list-style-type: none"> <li>• Found in remote part of Alberta, long way from internal markets (km) (1)</li> <li>• Isolated area – likely to be poor land communications (1)</li> <li>• Inland province rather inaccessible for exports – long way from US border (km) (1)</li> <li>• In middle of First Nation reserves who are in general anti-development as it conflicts with their traditional way of life (1)</li> <li>• Located near high quality wilderness area – Wood Buffalo National Park – ecological conflict (1)</li> </ul> <p><b>Accept any other appropriate response</b></p>	(2)

Question number	Answer	Mark
3(a)(ii)	<p>Likely to be low cost as could be mined by open cast methods which tend to be lower cost.</p> <p><b>Accept any other appropriate response.</b></p>	(1)

Question number	Answer	Mark
3(b)(i)	<p>'Unconventional sources' (eg tar sands and oil shales) are obtained through techniques other than the traditional well extraction/drilling.</p> <p>Alternative way of removing oil from rock</p> <p>Not the use of oil wells/oil platforms/oil drilling (2)</p>	(2)

Question number	Answer	Mark
3(b)(ii)	<p>Initial development of tar sands despite price of tar sand oil by barrel not profitable.</p> <ol style="list-style-type: none"> <li>1. Evidence of this in late 70's until investment by Syncrude and Shell</li> <li>2. Little further development in 90's</li> <li>3. As oil price rise in 21<sup>st</sup> century – 2002/2008 become profitable to mine tar sands</li> <li>4. Reach production of 1.13 million barrels a day by 2006 with a price of \$100 a barrel.</li> <li>5. World economy collapse led to collapse in global oil price in 2008/2009 – price drop to \$44 a barrel</li> <li>6. 2010 – big investment by TNCs drives Canada to 5<sup>th</sup> largest producer of oil as price rises to \$70 a barrel</li> <li>7. 2011 to 2014 – Oil price between \$110 (2011), \$86 (2012), \$100 (2013/14): expansion in Alberta led to establishment of regulator to monitor and manage impact on environment and local communities.</li> <li>8. 2014/15 – drastic drop in oil price to \$50 a barrel reaching below \$40 at the beginning of 2016 below the profit line so no established mining expanded and start-ups postponed.</li> <li>9. 2016/future – oil price crash makes it unlikely that projected production capacity of 4 to 5 million barrels a day will be reached by 2020 unless significant change in world economy OR major technological improvements in mining techniques.</li> </ol>	(4)

Question number	Answer	Mark
3(c)(i)	<p>It depends on the relationships between supply and demand (1)</p> <ul style="list-style-type: none"> <li>• In times of World Depression less oil needed (1) - a glut and a fall in price (1)</li> <li>• In times of wars in the Middle East, eg Iraq, Libya, the oil is not mined (1) so there is a shortage and prices go up (1)</li> <li>• Emerging economies such as China, have huge demands for oil (1) so shortages push up prices</li> <li>• Discovery of new reserves leads to more supplies coming on stream (eg USA) so might lower the price (1)</li> <li>• OPEC countries try to control the price of oil (1) and can cut production to raise prices so using it as a political weapon (1)</li> </ul> <p><b>Accept any appropriate answer</b></p>	(3)

Question number	Answer	Mark
3(c)(ii)	<ul style="list-style-type: none"> <li>Disagreements between supplier and oil buyers eg Iran and USA</li> <li>Competition between different suppliers eg OPEC and countries outside OPEC</li> <li>Cross border tension, resulting in supply lines being cut eg Ukraine and Russia.</li> </ul>	(1)

Question number	Answer	Mark
3(d)	25% +/- 1%	(1)

Question number	Indicative content
3(e)	<p style="text-align: center;"><b>AO3 (4 marks)/AO4 (4 marks)</b></p> <p>Answers should focus on the severity of environmental impacts (in terms of scale, damage etc), but also consider how changing attitudes of people and organisations have begun to mitigate some of the negative impacts by legislation etc. Good candidates will recognise that the global impacts arise out of the local impacts and remain harder to solve as part of their assessment.</p> <p><b>AO3</b></p> <ul style="list-style-type: none"> <li>The environmental impacts of mining are extremely severe <u>locally</u>. Huge opposition to the amount of environmental and ecological impact.</li> <li>Environmental damage is not cost free, with longer term consequences that might be greater than short term economic benefits.</li> <li>Issues of concentration and 'overheating' of Fort McMurray – environmental damage from migrant camps.</li> <li>Only recently have the mining companies been forced to consider damage limitation strategies, some are short term goals (more efficient use of water), others such as CCS, longer term as a result of Alberta legislation, so this may lessen local impact.</li> <li>The <u>local</u> impacts have a knock-on effect on global air pollution and especially climate warming. Failure to meet Kyoto targets has pressurised new government into greener strategies to improve Canada's track record (Paris 2015).</li> <li>Whilst acid rain is localised, can become a widespread problem.</li> <li>Migratory birds more of a global problem</li> </ul> <p><b>AO4</b></p> <ul style="list-style-type: none"> <li>Locally, damage to water courses by overuse and pollution (Figure 8)</li> <li>Scale of extent of scarring, size of trucks, piles of overburden and toxic tailings (Figure 8) and settling ponds</li> <li>Possibility of water/air contamination leading to damage to fish, impact on human health as a result of food chain (Figure</li> </ul>

	<p>9)</p> <ul style="list-style-type: none"> <li>• Clear cutting of trees (Figure 8), loss of habitat for Caribou and wilderness (First Nation subsistence living) (Figure 9).</li> <li>• Globally impact of contribution to GHGs (Figure 9), use of large supplies of fossil fuels in production (Figure 9)</li> <li>• Loss of birds on global migration routes (Figure 9)</li> </ul>
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Level	Mark	Descriptor
	0	No acceptable response
Level 1	1–3	<ul style="list-style-type: none"> <li>• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements are supported by limited evidence. (AO3)</li> <li>• Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)</li> </ul>
Level 2	4–6	<ul style="list-style-type: none"> <li>• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3)</li> <li>• Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)</li> </ul>
Level 3	7–8	<ul style="list-style-type: none"> <li>• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3)</li> <li>• Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)</li> </ul>



Question number	Indicative content
3(f)	<p style="text-align: center;"><b>AO3 (4 marks)/AO4 (4 marks)</b></p> <p>Answers should focus on expressing why some of the groups, especially First Nation People and the Alberta Provincial and Canadian National Governments have both positive and negative views about developing the tar sands for a variety of reasons.</p> <p><b>AO3</b> Likely to select from these.</p> <ul style="list-style-type: none"> <li>• <u>Canadian government</u> is very happy to gain oil revenues to improve the economy (balance of payments), exports to the USA. The reserves provide energy security for Canada (huge reserves). However, there are GHG issues as well as heavy use of fuel and water. Changing ideas on sustainability changing attitudes C21st. New Canadian government is much greener and looking at cutting CO<sup>2</sup> emissions, so more sustainable mining is essential.</li> <li>• <u>Albertan government</u> had supported oil industry to the hilt, but is expressing increasing concern over the reliance on tar sand revenues (25%) and see the need to diversify, as do TNC oil companies, the need to prevent environmental damage, ie changing attitudes linked to fluctuating oil prices and need to be sustainable and eco-friendly.</li> <li>• <u>Ambivalence of First Nation Peoples</u> is probably a generational issue as older tribal members miss their subsistence lifestyles and are opposed to mining, but younger members take advantage of economic boom and high wages and have encouraged their tribes to start their own mining operations.</li> <li>• Some discussion in views of Seniors is possible, comparing ugly, expensive Boom town, but others enjoying improved facilities. May depend on whether they were born there and how long they had been living there.</li> <li>• Role of TNCs has evolved over time – realisation that they are in boom and bust situation, so need to diversify and also some TNCs realise the importance of green credentials and the power and control of the regulator, so are improving sustainability and green image.</li> <li>• Wilderness groups unlikely to have mixed views on basis of evidence, so only a poor case could be made on reasons.</li> </ul> <p><b>AO4</b></p> <ul style="list-style-type: none"> <li>• It takes about 5x as much CO<sup>2</sup> to produce a barrel of oil by unconventional means (Figure 9)</li> <li>• The importance of oil to Alberta (25% of economy) (Figure 7) and to the overall Canadian economy – largest reserves in the world (Introduction).</li> <li>• Tar sands mining made Alberta the richest Province in Canada (Figure 7)</li> <li>• Magnet for migration (Figure 6) but opposition in press/social media led to establishment of controls (Figure 6)</li> <li>• Impact of potential boom-bust economy (Figure 6) has encouraged diversification. Recognition of hard times ahead (Figure 10)</li> <li>• Evidence of opposition by First Nation People (Figure 10) over land rights, environmental damage and health risks, but also taking advantage by mining and employment (Figure 10)</li> </ul>

Level	Mark	Descriptor
	0	No acceptable response
Level 1	1–3	<ul style="list-style-type: none"> <li>Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements are supported by limited evidence. (AO3)</li> <li>Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)</li> </ul>
Level 2	4–6	<ul style="list-style-type: none"> <li>Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3)</li> <li>Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)</li> </ul>
Level 3	7–8	<ul style="list-style-type: none"> <li>Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3)</li> <li>Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)</li> </ul>

Question number	Indicative content
4	<p style="text-align: center;"><b>AO2 (4 marks) / AO3 (4 marks) / AO4 (4 marks)</b></p> <p><b>In order to fully justify a choice, the candidate must consider all these alternative options, establish a clear argument about the meaning of best long term plan. Also they are required to consider what is best for the Province and for Canada as a whole.</b></p> <p><b>There is no preferred option. All options can be justified. The balance of the case made will vary according to the chosen option.</b></p> <p><b><u>Option 1</u></b> can justified because it makes sense to expand the area of exploitation – only 10% of the resource is currently mined and only about 0.2% of the forest has been destroyed in last seven years, with many untapped areas which may be technologically feasible as technology is becoming more efficient. This means deeper mines can be developed long term with prospects for decreasing energy and water use.</p> <p>Environmental safeguards have now been developed so new mining should be less damaging.</p> <p>As the USA takes 70% of Canada’s exports, it makes sense to build pipelines to facilitate this (in spite of known leakages risks) to support Canada’s economy.</p> <p>Issues currently exist as to viability of mining at current oil prices, but long term, exploitation can survive boom and bust (a feature of any oil development). Tar sand costs are higher than some conventional oil sources, but lower than many other unconventional sources such as shale oil or oil shales.</p> <p>Oil is vital to the Albertan economy so expansion of oil exploitation is good for future planning. Improves Canada’s balance of payments.</p> <p><b><u>Option 2</u></b> can be justified as the footprint of forest clear cutting would not be extended, or at least, very slowly. The Alberta regulatory framework promotes sustainable development by guaranteeing clean-ups after mining and remediation of degraded land. With forestry replanting, the destruction is only temporary, with new forests and valuable source of softwood and recreational areas being developed, another revenue earner. This would be beneficial to all Albertan residents and Canadian tourism.</p> <p>At the same time all the economic advantages continue, yet with decreasing environmental impacts, so benefitting both Albertan and Canadian economies. Can be regarded as a middle of road option developing the ‘status quo’.</p> <p><b><u>Option 3</u></b> would appeal to environmentalists as the unconventional mining of the tar sands has been so environmentally damaging at both local and global scales.</p> <p>The Aboriginal population (First Nation Peoples) do need to be</p>

Question number	Indicative content
	<p>supported to maintain their traditional subsistence way of life, which they will be able to do in new wilderness environments and they will benefit from new employment in the tourism and recreation industry.</p> <p>The loss of oil revenues could be more than compensated within Alberta by further diversification (energy only 25% of economy). Alberta relies on migrant labour to overcome skills shortages and in oil exploitation areas the economy is 'overheating' (Fort McMurray) so ultimately Option 3 will have beneficial impacts not only environmentally, but to an extent economically. The TNCs plan to use their expertise to develop alternative hi-tech industries.</p> <p>Canada could revolutionise its energy mix by not relying so heavily on tar sands, so meeting CO<sup>2</sup> targets (Paris 2015) by developing HEP, solar and wind energy (all clean and green). With falling oil prices, the loss of exports may be less damaging.</p> <p><b>AO2</b></p> <ul style="list-style-type: none"> <li>• The recognition of the ecological and wilderness value of the taiga.</li> <li>• Understanding the reasons for conflicting views on the protection or exploitation of the taiga for its energy resources.</li> <li>• The huge, wide-ranging environmental consequences (landscape scarring, oil spills, clear cutting of forests, carbon emissions, impact on water) of extracting the tar sands.</li> <li>• The extremely high negative costs on the ecology of isolated sensitive areas, home to First Nation People.</li> <li>• The factors influencing global supply and demand and world oil prices and how these can lead to boom and bust with the oil industry.</li> <li>• The role of physical factors and technology in the development of unconventional sources</li> <li>• The growing awareness of the importance of environmental concerns which changes attitudes to unsustainable energy production.</li> </ul> <p><b>AO3</b></p> <ul style="list-style-type: none"> <li>• The exploitation will have different impacts in both the short and long term depending on where people live (local Fort McMurray versus Alberta and Canada)</li> <li>• People have different powers to influence and oppose development (role of First Nation People against the TNC oil companies).</li> <li>• Critical choices need to be made about how much support (degree of taxation, subsidies) and control (environmental legislation) for the tar sands industry (Figures 7 and 10).</li> <li>• Weighing up the short term economic gains from oil exploitation (very high salaries and high standard of living in Alberta, and benefits to Canadian economy) against long term damage to wilderness environment (figures 8 and 9).</li> <li>• Whilst there is no long term concern about supplies of tar sands running out, there are short term concerns about the econ (Figure 7).</li> <li>• The need to look for a more diversified Albertan economy to be 'future proof' using the technological expertise of the TNCs</li> </ul>

Question number	Indicative content
	<p>(Figure 10)</p> <ul style="list-style-type: none"> <li>• The need for the Canadian government to review energy mix in the light of global decisions concerning GHG emissions (Figure 9).</li> </ul> <p><b>AO4</b></p> <ul style="list-style-type: none"> <li>• Photographic analysis and other evidence of the huge environmental damage done by open casting (evidence of tailings, settling ponds, damage of taiga ecosystem) to assess the scale and severity of environmental damage (Figure 9/10)</li> <li>• Assessment of conflicting evidence concerning current levels of remediation by TNCs (1-20% range, Figures 5 and 10)</li> <li>• The degree of division amongst local people within the active mining area concerning the scale and pace of the development (Figure 10) with the majority opposed, but some polarisation of views within groups (Figure 10)</li> <li>• Evaluation of importance of unconventional sources of oil, locally, nationally and globally (Figure 5).</li> <li>• Analysis of impact of fluctuating oil prices and the impact this has on the tar sands industry (Figure 7)</li> <li>• The increasingly divergent attitudes towards exploitation of the Albertan and Canadian National government (Figure 10) both of whom benefit economically short term (Figure 7).</li> </ul>

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1-4	<ul style="list-style-type: none"> <li>• Demonstrates isolated elements of understanding of concepts and the interrelationship between places, environments and processes. (AO2)</li> <li>• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3)</li> <li>• Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)</li> </ul>
Level 2	5-8	<ul style="list-style-type: none"> <li>• Demonstrates elements of understanding of concepts and the interrelationship between places, environments and processes. (AO2)</li> <li>• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3)</li> <li>• Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)</li> </ul>
Level 3	9-12	<ul style="list-style-type: none"> <li>• Demonstrates accurate understanding of concepts and the interrelationship between places, environments and processes. (AO2)</li> <li>• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently leading to judgements that are supported by evidence throughout. (AO3)</li> <li>• Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)</li> </ul>

Marks for SPGST		
Performance	Marks	Descriptor
SPaG 0	0	<p><i>No marks awarded</i></p> <ul style="list-style-type: none"> <li>• Learners write nothing.</li> <li>• Learner's response does not relate to the question.</li> <li>• Learner's achievement in SPaG does not reach the threshold performance level, for example errors in spelling, punctuation and grammar severely hinder meaning.</li> </ul>
SPaG 1	1	<p><i>Threshold performance:</i></p> <ul style="list-style-type: none"> <li>• Learners spell and punctuate with reasonable accuracy.</li> <li>• Learners use rules of grammar with some control of meaning and any errors do not significantly hinder meaning overall.</li> <li>• Learners use a limited range of specialist terms as appropriate.</li> </ul>
SPaG 2	2–3	<p><i>Intermediate performance</i></p> <ul style="list-style-type: none"> <li>• Learners spell and punctuate with considerable accuracy.</li> <li>• Learners use rules of grammar with general control of meaning overall.</li> <li>• Learners use a good range of specialist terms as appropriate.</li> </ul>
SPaG 3	4	<p><i>High performance</i></p> <ul style="list-style-type: none"> <li>• Learners spell and punctuate with consistent accuracy.</li> <li>• Learners use rules of grammar with effective control of meaning overall.</li> <li>• Learners use a wide range of specialist terms as appropriate.</li> </ul>