Robyn Columbus
Anta 602 – Literature Review
12th December 2011

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1. Introduction:

South Korea next year, will begin building a $120 million base at Terra Nova Bay for completion in 2014 – there have been claims that with the Ross Sea suspected of being one of the world’s largest untapped oil reserves, (Field, M; 2011) they are setting themselves up for territorial claim when The Madrid Protocol is open for discussion in 2048 (Fogarty, E cited in Field, M; 2011). According to Elliot, D (cited in Ward, J; 1997-1998) Antarctica’s predicted oil reserves have been estimated to be up to 50 billion barrels in the Weddell and Ross Seas (Carroll, J cited in Ward, J; 1997-1998) with Elliot, D (Cited in Ward, J; 1997 – 1998) placing the overall Continents reserves at under 203 billion barrels.

This review will examine literature surrounding the mining of oil in Antarctica, specifically the effectiveness of The Protocol on Environmental Protection to the Antarctic Treaty (The Madrid Protocol, 1991) when sovereignty and resource issues will be revisited in 2048. The Antarctic Treaty will be outlined, as well as the history of mining for oil in Antarctica, detailing the failed Convention on the Regulation of Antarctic Mineral Resource Activities (CRAMRA).

The reviewer will then explore literature outlining the proponents and opponents of mining for oil in Antarctica, and then examine the effectiveness of The Madrid Protocol with regards to mineral exploitation by looking at the pros and cons of The Protocol.

2. The Antarctic Treaty System:

The 1959 Antarctic Treaty was the start of a system created to manage the Continent giving decision making power to a relatively small number of nations (Seach, S; 1991).

The Antarctic Treaty was signed in 1959 by twelve nations that were active in science south of 60 degrees South, during the International Geophysical Year 1957 – 1958 (Secretariat of the Antarctic Treaty; 2011; The Antarctic Treaty). Seven of the twelve signatories had territorial claims in Antarctica and these members are referred to as "claimant states" (Herber, B; 1991; 395). The Secretariat of the Antarctic Treaty (2011) indicates that while these countries have made territorial claims on Antarctica, the Treaty does not recognize or deny these claims and countries do not recognize each other’s claims (see also Herber, B; 1991).

The Antarctic Treaty System was designed for two general purposes: Article I states Antarctica will be used for peaceful purposes only, with a prohibition on military activities, or the establishment of military bases. Article II details the second purpose of the Treaty devoting Antarctica to science, with freedom of scientific investigation (The Antarctic Treaty; 1959).

In addition to the two explicit purposes stated, Barcelo, J (cited in Seach, S; 1991) argues there is a third purpose implicit in the Treaty System - the protection of
Antarctica’s environment. The exploitation of resources however, was not discussed at all for fear of jeopardizing the Treaty. (Ward, P; n.d)

Since 1959, when there were twelve original signatories to the Treaty, sixteen other countries have gained Antarctic Treaty Consultative Party (ATCP) status, making twenty-eight Consultative Parties in total. There are however 49 State Parties overall that have acceded to the Treaty, of which twenty-one are Non-Consultative Parties, able to attend the Consultative Meetings but do not contribute (Secretariat of the Antarctic Treaty; 2011; The Antarctic Treaty).

It is important to note that Article XII 1(a) states that “The present Treaty may be modified or amended at any time, by unanimous agreement of the Contracting Parties, whose representatives are entitled to participate in the meetings provided under Article IX”. The Treaty also states in Article XII 2(a) that after thirty years from the date of the Treaty’s entry into force (1961) that any of the Contracting Parties, are entitled to participate in a conference to review the operation of the Treaty (The Antarctic Treaty; 1959; Article IX).

3. History of Oil exploitation in Antarctica:

Sharon, D (cited in Ward, J; 1997 - 1998; 373) claims that for the feasible extraction of oil from Antarctica, three conditions must exist. “Oil prices must increase, technology to locate and exploit in harsh environments must improve, and world oil demand must continue to grow”.

Unlike the Oceans surrounding Antarctica, which have been widely exploited of their marine resources, there has not been any commercial exploitation of minerals in Antarctica (McColloch, R; 1992). There are no current plans to mine Antarctica and mining is currently completely banned by the Antarctic Treaty and The Madrid Protocol (Ward, P; n.d).

In the early 1970’s after the OPEC oil crisis, there was an increasing interest in the mineral resource potential Antarctica had to offer (McColloch, R; 1992) In 1973 members of the Organisation of Arab Oil Exporting Companies initiated an oil embargo until March 1974, oil prices began to increase as well as demand for other sources of oil (Carroll, J; 1983).

The United States in particular, indicated their interest in an agreement in addition to the Treaty that would open up Antarctica to initial exploratory drilling (Floren, D; 2001).

The Antarctic Treaty does not make any provision for mineral resources and activity control, and it wasn’t until 1972 that the ATCP’s began to address exploratory and commercial mining within the Treaty context (Waller, D; 1989). There were concerns that if substantial mineral deposits were found in Antarctica, the Treaty System could not manage issues that would arise between Treaty nations on claim over resources and financial gain (Bilder, cited in Waller, D; 1989).
Between 1972 and 1982 the Consultative Parties, drafted a convention that would manage mineral exploitation if it were to ever occur. This became the now abandoned Convention for the Regulation of Antarctic Mineral Resource Activities or CRAMRA (Waller, D; 1989).


In 1982, the ATCP’s drafted the Convention for the Regulation of Antarctic Mineral Resource Activities, over 6 years, in order to explicitly set out guidelines regarding mineral exploration in Antarctica (Seach, S; 1991). This convention also developed a framework that prevented mineral exploitation harming the environment (Jacobsen, M cited in Seach, S; 1991).

CRAMRA was created as a means for “assessing the possible impact on the environment of Antarctic mineral resource activities; determining whether Antarctic mineral resource activities are acceptable; governing the conduct of such Antarctic mineral activities as may be found acceptable; and ensuring that any Antarctic mineral resource activities are undertaken in strict conformity with this Convention” (CRAMRA; 1988; Article 2).

Waller, D (1989) states that although mineral resource activities may never take place in Antarctica, it was still deemed important for the ATCP’s to create a framework to regulate activities if mineral exploitation became economically and technologically possible in the future.

Blay, S argues that the convention would not allow any mineral resource activity in Antarctica if there were possible impacts on the Antarctic environment by citing Article 4 of the Convention. Article 4 states a range of environmental stipulations that must exist before mining can occur (Blay, S; 1992).

In 1988 thirty-three states signed the Convention, in what was thought to be the solution to the significant gap regarding mining in the Antarctic Treaty System (Waller, D; 1989). CRAMRA had established rules to “govern the prospecting, exploration and development of minerals in Antarctica” (Waller, D; 1989; 631).

In 1989 however, France withdrew its support of the Convention with Michel Rocard, the French Prime Minister claiming the Minerals Convention merely “pretends to establish strict control in the industrial exploitation of the Antarctic” (Waller, D; 1989; 662). Australia followed suit in May 1989 with the Australian Senate opposing the agreement (Waller, D; 1989).

Joyner, C adds to this (1994) in saying that by 1990 many ATCP’s as well as the international community and environmentalists were of the belief that Antarctica should not be mined and were advocating an indefinite ban in mining.

So was the collapse of CRAMRA simply because of the withdrawal of France and Australia?
5. Arguments for and against Mining for Oil in Antarctica:

A brief synthesis of literature surrounding the arguments for and against mining oil in Antarctica will be examined.

5.1 Proponents:

a) Substantial Resources:

Supporters of mining for oil in the unexploited Continent argue that exploration will reveal resources that are commercially viable for extraction (Flore, D; 2001). Zumberge, J (1979) cites Du Toit (1937) who claimed that major geological components of Antarctica can be linked to the geological components of other land masses on the Southern Hemisphere. Zumberge, J (cited in Flore, D; 2001) demonstrates that Antarctica was once part of a supercontinent, with a substantial chance that minerals similar to those found on other Continents, could also be discovered in Antarctica.

b) Global Demand

In 1983 Carroll, J (1983) stated that after a decade of oil price increases, and dependency for oil from foreign states (who were able to control oil flow, as was made clear during the OPEC Oil crisis) American businesses were looking to Antarctica for a source of oil. Al Gore is cited in Ward, J (1997-1998) saying that with an increasing global population, the pressure on energy resources will lead to a demand for more oil resources.

Sahurie also cited in Ward, J (1997-1998) demonstrates that countries who rely heavily on oil may look to find their own sources of oil, and the economic benefits derived from doing so could possibly outweigh the costs incurred of setting up the exploration and extraction (in Antarctica for example).

5.2 Opponents:

a) Environmental Impact:

There is no doubt that exploration and mining of oil anywhere on the earth has impacts on the environment. By simply looking at the Arctic as an example of mining in a similar environment, even with modern technology, large scale oil spills still occur which have a major environmental impact (Poland, J; Riddle, M & Zeob, B; 2003).

As well as the danger of oil spills, Poland et al further demonstrate that the oil industry ejects large amounts of contaminants and heavy metals into the Arctic ecosystem (Poland, J et al; 2003; 375). The Madrid Protocol bans mining, but it also lists areas of protection in Antarctica “...the natural environment and dependent and associated ecosystems...” which would no doubt be in direct threat if mining were to occur (Poland, J et al; 2003; 376).
b) Prohibitively Expensive:

Bercha (cited in Cullen, R; 1994) claims that to extract oil from the Ross Sea, mining companies would have to drill through first or multiyear ice, and then more than 300 metres into water. Waller’s article (1989) summarizes a 1979 report submitted to the United States Senate committee on Energy and Natural Resources, “the combination of water depth, ice conditions, severe weather, transportation costs and short annual working time imply production costs of such magnitude” making any attempts to mine Antarctica economically unfeasible (Waller, D; 1989; 637).

Dr Ali Samsam Bakhtiarí cited in Jobin, S (2010) claims that oil prices would need to be between $US200 – 300 per barrel before it becomes economically feasible to extract oil from Antarctica.

6. The creation of The Protocol on Environmental Protection to the Antarctic Treaty:

With France and Australia refusing to sign the minerals convention (CRAMRA) there was an obvious gap in the Treaty system that needed to be addressed. It took only two years for The Madrid Protocol to be negotiated to replace the decade long debated minerals regime (Rothwell, D; 1992).

The Protocol was negotiated in 1991, and ratified in 1998 establishing a fifty year moratorium on exploratory and commercial mining in Antarctica (McColloch, R; 1992). Article 7 of the Protocol states “Any activity relating to mineral resources other than scientific research shall be prohibited” (The Madrid Protocol; 1991; Article 7).

Article 25 (2) states that after 50 years from the date of entry into force Protocol, any of the ATCP’s are permitted to hold a conference to review its operation. Article 25 (4) further states that any modification or amendment proposed shall only enter into force upon ratification, acceptance, approval or accession by ¾ of the ATCP’s, as well as including consensus by all states that were ATCP’s at the time of the adoption of the Protocol. (The Madrid Protocol; 1991; Article 25)

In addition, this moratorium on mineral resource activities cannot be removed unless a binding legal regime on Antarctic mineral resource activities (such as CRAMRA) is established as detailed in Article 25 (5) (Secretariat of the Antarctic Treaty; 2011; The Madrid Protocol).

7. The Effectiveness of the Madrid Protocol:

Floren, D (2001; 470) cites Hunter, D et al with the 1991 Protocol being labelled “one of the most environmentally effective international agreements ever adopted.”
7.1 Pros:

a) Mass Consensus:

Proponents of the Madrid Protocol argue that only by unanimous consensus can a modification or amendment to Article 7 occur. Amending The Protocol requires acceptance by ¾ of ATCP’s, as well as all ATCP’s involved at the time. The Madrid Protocol was signed (Francioni, F; 1993) Money (as cited in Weiss, J; 1995) supports this theory arguing that the current ban is watertight as it relies on unanimous consensus to allow change.

b) Existence of a Binding Legal Regime:

A positive of The Madrid Protocol is not only that unanimous consensus must exist before the moratorium is lifted, the ban can only be lifted if a binding legal regime exists, that can determine if, and under what conditions, mineral extraction may occur (Redgewell, C; 1994). Redgewell calls this a ‘double veto’ in that there are two major obstacles to overcome (consensus and the existence of a legal regime) before any form of mining can commence (Redgewell, C; 1994: 609). Cordonnery, L (1998) argues that reference to a binding legal regime is strong evidence that the ATCP’s envisage a revival of CRAMRA.

c) Fifty Year Moratorium:

Cordonnery, L (1998) argues that the fifty year moratorium that is explicit in the Protocol allows time for the development of commercially viable exploitation techniques to discover if exploitable mineral potential is a reality. This would only change in the next forty years if there were major oil price increases due to supply restrictions or major improvements in technology (Cullen, R; 1994). Article 7 of the Protocol demonstrates that national interests have been put aside even though it may affect potential financial gains for countries with formal territorial claims (Jaffe, D; Leighton, E & Tumeo, M; 1994).

7.2 Cons:

a) Escape Clause:

The most commented on potential downfall of The Madrid Protocol is that there is an escape clause which permits the Consultative Parties to remove the ban after fifty years, and establish a mining regime (Weiss, J; 1995). “If an amendment to put in place a mineral regime is not entered into force, within three years of the date of its communication, any party may withdraw from the Protocol, and within two years commence mining” (The Madrid Protocol; 1991; Article 25.3) Lee, M (2005) also supports this argument, citing the walkout clause as a potential ‘loophole’ making it easy for a Treaty Party to simply withdraw from the Protocol, and commence mining without no regulations or ramifications (Welch, M cited in Lee, M; 2005).
b) Sovereignty and Confirmed Discovery:

CRAMRA was developed as a response to concerns surrounding the discovery of substantial mineral deposits in Antarctica, and the disputes regarding sovereignty that were sure to arise between countries surrounding claims over resources and financial gain (Waller; 1989). The Madrid Protocol does not deal with the possibility that claims on Antarctic Territory will be unfrozen when mineral deposits are discovered, essentially destabilising what holds the the Antarctic Treaty System together (McCulloch, R; 1992).

Vicuna, F (1994-1955; 11) also believes that when minerals are eventually discovered in Antarctica the Protocol will prove to be unrealistic and it will not survive against national interests. This is also demonstrated by Floren, D (2001) who questions the strength of the Treaty System against a major discovery of oil that may give rise to global demand. With the disbandment of CRAMRA there are no guidelines or frameworks set up to deal with mineral resources when they are eventually discovered (Vicuna, F; 1994-1955).

c) The Pursuit of Science:

Article 7 of The Madrid Protocol explicitly states “Any activity relating to mineral resources other than scientific research shall be prohibited” (The Madrid Protocol; 1991). Martin, I (1997) points out that ‘scientific research’ is not defined in the Protocol. He uses an example of the International Whaling Commissions ban on whaling, with an exception for a small catch per year for ‘scientific purposes’, a loophole exploited in particular by Japan. Martin claims that this has sustained their national demand for the product (Martin, I; 1997). Cordonery, L (1998) also supports this by claiming that the words of Article 7 may justify the disguise of scientific research for mineral exploitation.

d) Third Parties and International Law:

Madson, S (1993) points out that (at the time of his article the Protocol had not been entered into force) even when The Madrid Protocol is entered into force, the ATCP’s may struggle to deal with third non-signatory parties, that violate the Antarctic Treaty.

Madson, S (1993; 470) cites the Vienna Convention of Law of Treaties, in that “A Treaty does not create either obligations or rights for a third state without its consent”. As under Article 4.1, The Madrid Protocol is explicitly based on the Antarctic Treaty (The Madrid Protocol; 1991) Madson argues that there is a potential lack of legal basis under International Law, for ATCP’s to use the Antarctic Treaty System to take action against a third party state that is violating the Treaties terms (Madson, S; 1993).

e) Mining is Inevitable:

A further group of critics simply argue that the moratorium is temporary and that mining is inevitable (Welch cited in Weiss, J; 1995). The original draft of the Madrid Protocol
included a complete ban on mining, with no provision for a moratorium (Blay, S; 1992). The United States were reluctant to sign a version of the Protocol that had a complete ban on mining indefinitely, and insisted on a review of the mining prohibition in 50 years’ time, indicating that the issue was not over, rather placed on hold (Rothwell, D; 1992).

8. Conclusions:

Current technology and market price for oil are two major inhibiting factors behind the lack of commercial mining for oil in Antarctica (Vicuna, F cited in Floren, D; 2001). The anticipated “black gold rush” (Ward, J, cited in Floren, D; 2001; 474) still has not occurred because there has not yet been a major oil discovery (Floren, D; 2001).

The Madrid Protocol has, in effect, tested the Antarctic Treaty in that the System can bend to reflect changes that occur when issues (that weren’t around when the Treaty was created) arise. By setting up new “principles of conservation” outlined in the Madrid Protocol, current environmental issues, as well as issues that may arise in the future are dealt with, in the best way possible under a complex situation (Cordonnery, L; 1998).
9. References:


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Zumberge, J. (1979). Mineral Resources and Geopolitics in Antarctica: The physical obstacles to exploitation of mineral resources in Antarctica are currently prohibitive, but complex political issues will be raised if such exploitation becomes profitable. *American Scientist*, 67(1), pp. 68 – 77.

Good review Robyn. You could have explored the failure of CRAMRA in a little more depth. Note that the initial is not needed in your citations within your text.