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## JACK HASTON

**Date and place of birth (if available):** June 18th, 1929; Toronto, Ontario

**Date and place of interview:** August 1, 2013; Elbow Drive SW, Calgary, Alberta

**Name of interviewer:** Peter McKenzie-Brown

**Name of videographer:** Peter Tombrowski

**Full names (spelled out) of all others present:**

**Consent form signed:** Yes

**Transcript reviewed by subject:**

**Interview Duration:** 1 hour, 33 minutes

Initials of Interviewer: PMB

Last name of subject: HASTON

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PMB: I am recording right now. I am talking to Jack Haston who is kind of a legend in the oil sands business, although he won't admit it. As we will discover, he's the guy who really did a lot of the work, preparatory to development of SAGD. Today is August 1st, 2013 and we are meeting in my condo just off Elbow Drive in SW Calgary. Okay, Jack I'd like to begin by asking you please just to talk about where you were born, when you were born, where you went to high school, those kinds of things, seriously? And, maybe when you met your wife and basically just go that far?

HASTON: Okay, well. I was born in Toronto, at least East York, which was a bit of a suburb of Toronto at the time; June 18th, 1929 just in time to be a Depression baby. I grew up a little further away, well actually in Toronto. I went to Wilkinson Public School for all eight grades. By this time, of course, we were getting into the War and our principal~~te~~ was a Major Vickery.

PMB: He was a what?

HASTON: Major Vickery was his name.

PMB: Oh, V-I-C-K-E-~~R-Y~~?



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HASTON: Yes. He was a World War I man. He had us practicing on the firing range when we were in grade ~~six~~five, just in case.

PMB: Wow. No Kidding.

HASTON: Anyway, ~~and so~~ after public school, I went to Danforth Technical School in Toronto. I took the matriculation course which gives you university entrance.

PMB: Sorry, is that Danport or Danforth?

HASTON: Danforth.

PMB: Danforth? Okay.

HASTON: D-A-N-F-O-R-T-H, yeah. It's the at the east end of Toronto, right up north. I graduated from there and went to Queen's. Took mechanical engineering, thoroughly enjoyed it. I got some pretty good marks. I did get honours all right. By that time, it was getting time to get married. ~~So~~, I ~~had~~ met my wife, Marjorie, ~~oh~~ quite a few years before that actually, almost in Sunday school. It was a little bit higher in the church. ~~Basically~~, ~~S~~he was singing in the choir and my friend and I always liked to go to church and observe the choir, because they were all ~~some~~ lovely young ladies. And, eventually I got sort of tied up with ~~Marge Mari~~ and ~~eventually~~ after I graduated ~~high school~~, she saw me through ~~Queen's university and a~~ After we graduated we got married in 1952. We went on our honeymoon and never went back to Toronto. By that time, ~~of course~~, ~~I~~ was working for Imperial Oil so we went ~~back~~ to Sarnia. After that it was just the general work history, working many different places so we had a lot of addresses, but it was a good life ~~so &~~ ~~that's how it started~~.

~~that's how it started.~~

PMB: What kind of work were you doing in Sarnia?

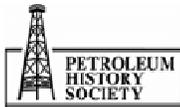
HASTON: Mostly it was design/\_construction of refinery and petro-chemical complexes, definitely far down line from the oil patch.

PMB: Okay, but by this time you had your degree from Queen's University and you were a professional engineer.

HASTON: Yeah.

PMB: And then, what I notice is that at 20 years later, or no, I beg your pardon 40 years later you went back and got some more degrees.

HASTON: I got my last degree exactly 50 years after my first one, yes.



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PMB: And, what was that degree in?

HASTON: It was a BA in Art History.

PMB: Isn't that something? Okay.

HASTON: And, then the other one was a BFA in Fine Arts.

PMB: Isn't that amazing.

HASTON: No, it was something I'd always been interested in. In fact, I worked off a couple of university courses while I was still working on the UTF. And, so after Phase A was really such a smashing success I figured well that was ~~just~~ a nice way to go out and I wanted to get into this other life for a while, so I went back to university. I had a great time.

PMB: You know we've interviewed quite a great number of people and the finest art collection, because I am interested myself, the finest art collection I've seen was David Armstrong.

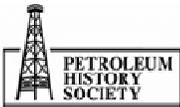
HASTON: Oh, yeah.

PMB: And, he died just a couple of months ago but his, he basically inherited his father, Jack Armstrong's collection. And, there Dutch Masters and there were some of those great avalanches. I don't think they were Gainsborough but one of them sure looked like a Gainsborough; really a tremendous collection. It was as good as I've seen.

HASTON: Jack could afford them.

PMB: It was just great. Okay, so you went to university. You got two degrees 50 years apart. Okay, really it was for your work, your oil sands related work. Your key to that was you engineering degree, mechanical engineering. You joined Imperial Oil Ltd in 1951. Do you want to talk about that a little bit and went to Sarnia?

HASTON: ~~Oh yeah.~~ Well, you started out like them all, orientation course. And, then I actually spent a little bit of time in the drafting room and then got out onto design/ construction. Usually starts off with a Joe-boy inspection on construction and works back into design. So, I've worked on the Sarnia ~~coker going at the time.~~ Fluid cat cracker at that time. It was one of the only fluid ~~eokers.~~ Then cracker then. Later, I was involved in ~~I started to get into the~~ IOL's first petrochemical complex, which included ~~was~~ a steam cracker to produces very light ~~oil-gases~~ that you can recombine ~~them~~ into all kinds of plastics and stuff. I was assigned in a three man team down to the design/ construction offices in the States for the course of the design. And, it was very interesting because it ran through a range of over a couple of thousand degrees above to somewhere pretty close to 300 degrees below. So, you had some really neat design problems in your materials and things. So, it ~~It~~ was a very interesting job to work on and a fair exposure to organic chemistry for a mechanical engineer.



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PMB: Will you explain that to me? So, you had a single cracker...

HASTON: The fluid cat cracker was a conventional part of a refinery. That is what is used to break ~~down-down heavy~~ bottoms that come out of the fractionation towers. Not as heavy as bitumen, but getting there.--

PMB: Oh, I am sorry. I thought you were talking about a cracker that was working at those enormous differences of temperature.

HASTON: ~~Yeah-~~ That is later when you get into the steam ~~cracker, well the steam~~ cracking complex, which ~~it~~ uses just an oil or a gas feedstock. It cracks it at very high temperatures in a furnace ~~under~~ in a steam environment so that the material will break down very far. It will break right down into methanes, so you ~~get-get a~~ tremendous collection of unsaturated hydro-carbons. It's very light, very unstable, but very good for making plastics and rubbers and things. So, you have this cracking operation, which breaks the ~~stuff feed~~ down and then you have ~~got to reclaim it to~~ fractionate it into various products. In order to liquefy methane, you've got to get awfully, awfully cold and so some of those towers get down to pretty close to 300 minus ~~Fahr.~~

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~~F~~PMB: Okay, so close to absolute zero?

HASTON: Yeah.

PMB: As it's called?

HASTON: Yeah. Well, still 160 degrees short of absolute, but you're down there ~~getting~~ very, very cold. ~~So, that then, which~~ liquefies these very light components, ~~you~~ fractionate them just like you do in a refinery and then you find things to do with these products. ~~The biggest- A big~~ problem is: how do you ship them to consumers? The methane had to be shipped in refrigerated tankers ~~because~~ the first customer was down in Buffalo. So, you had to get from ~~Buffalo to Sarnia-Sarnia to Buffalo~~ with a load of -- actually it wasn't methane at that point, it was one of the ethanes, but a very light material. And, of course the insulation is ~~that-very~~ thick on the tanker. So, you load it up and don't stop and it actually releases a little bit of the material on the trip in order to self-refrigerate the contents and keep them that cold. So, it was a really ~~instant-interesting~~ project. ~~Yeah, I quite enjoy it, yeah.~~

PMB: Okay, and continue with that, with what you want to talk about there, because then we want to go -- So, you were in Sarnia and then you were assigned for the expansion and modernization of the Calgary Refinery?

HASTON: Oh yeah, that was a long time ago. What was that? 1957 maybe, something like that, '58?

PMB: That refinery was long ago closed wasn't it? It was in the 70s?



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HASTON: Oh, yeah. Most of the refineries I worked on in Sarnia are closed. The refinery I worked on in Regina is closed. I haven't got anything-much left of what I worked on in the 50s

PMB: A whole lifetimes' decade's work is gone.

HASTON: That's right. Yeah. The first 10 years, but it was good experience in processes important to bitumen upgrading

PMB: Until you get to things like Syncrude and some of these other projects, which in terms of this project, are really interesting. So, I'd like you talk about that. But, I noticed you were seconded to Cities Service Athabasca which eventually built-out became Syncrude and you were working for Frank Spragins?

HASTON: He was a nice-great guy.

PMB: I've actually interviewed his wife, Nell. I got a very interesting picture of him from her. What can you tell me about him?

HASTON: Well, he had great imagination, tremendous patience in the work he had to do with the participant companies in that project. A real desire to get as much as you could out of the oil sands. In our spare time, we used to try and think of what could we do with potential byproducts - God there's a mess of garnet in that sand. There's a mess of this. The oil sands holds everything in the world practically when it comes out raw in the bitumen. So, Frank was desperately pushing the project at that point, because the economics were really, really dicey. The participants were very concerned about the proceeding ahead. So, Frank was trying to squeeze every nickel he could out of the oil sands in order to justify it.

PMB: Now here we're talking about the 60s under the project, the Syncrude project wasn't opened until '78, wasn't it?

HASTON: No.

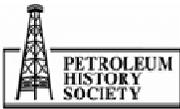
PMB: So, we're talking about really early days?

HASTON: Yes. I wasn't with the group by that-the time a permit was granted. I had gone back to Sarnia in 1969.

PMB: Okay, but I would still like to hear more about this. So, one of his motivations was what is the most we can get out of the oil sands. By this time, he was assigned to be the president of Syncrude.

HASTON: Yeah. That is when Syncrude was formed.

PMB: In 1962, or something like that?



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HASTON: 1963; somewhere in that range, 1963-1964, ~~yeah~~-Frank was the president when it was set up. For a long time it carried on basically as the same office, because we were still trying to get the permit. If you wanted a permit ~~off~~from George Govier, you better have a good case. He was a very thorough investigator of what needed to be done. Another one ~~that~~-who was very concerned with getting the most out of the oil sands, getting it out without over-stretching things like labour supply and stuff. So, you ~~kn~~ew, there wasn't going to be two or three oil sands plants going- At once

PMB: Now, George Govier was the head of the Energy Resources Conservation Board at that time.

HASTON: A very influential man, a very good man, ~~yeah~~. So, we kept trying to get a permit in competition with Great Canadian Oil Sands, which was sponsored by Sun Oil. Syncrude was putting a lot of technical effort in. We had a good sized pilot plant operating up there for years and got a lot of data. Clem Bowman went to Syncrude at the same time I did from Imperial. He was running the research. I was manager of engineering. We were doing a lot of work on what a plant might look like and these rough guesses on how much it might cost and how to build it and things. I guess we had two or three hearings and they would get postponed, set aside, maybe not time yet for moving into a commercial permit. At the same time, I believe his name was Tom Clark, with Great Canadian, ~~who~~ was a superb promoter. He was almost getting their application together on the back of an envelope.

PMB: Now, Tom Clark. Is that C-L-A-R-K?

HASTON: I believe so, yeah. No relationship to the grandfather of the process. So, we'd had a hearing.

PMB: And, that was Karl Clark, of course.

HASTON: Karl Clark, yeah-By 1964, Great Canadian finally had what was going to be their final hearing. This was their final shot at it. And, of course we were down to intervene with all the technical data we can throw at them. Tom is shifting his way through and doing a pretty good job. It got to the second or third day, anyway the last day of it and we adjourned for lunch. Just before we adjourned for lunch, even Tom could see that he was running out of air. So, of course we go over, have lunch and say, "Oh boy, it's all over. They're gone and now we can get going." We came back after lunch, the lawyer for Great Canadian wished to make a statement. The statement literally was that Howard Pew, the president of Sun Oil had this message that if the ERCB would give Great Canadian a permit to build this plant, he personally would guarantee that this plant would be built and run. If his company wasn't going to do it, he was going to do it personally and he was rich enough to do that. End of story, end of hearing, Great Canadian got their permit.

PMB: He, of course was the 8<sup>th</sup> richest man in the United States.

HASTON: I don't know that number, but he was a very rich man. He had complete faith in the oil sands. He said, "It is going." And, it did.



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PMB: So, by the time the project was actually opened he was 87 years old, I believe.

HASTON: Is that what it was?

PMB: A very old man.

HASTON: ~~Ned~~ Gilbert would've told you about him.

PMB: I interviewed his successor as the chairman of Sun Oil, Peter McClements and he told me all -- but, one of the things about him, I just have huge regard for him, he was remarkable. If he walked in here and we had a little chat about anything right now and then he saw us two years later, he would remember us by name. He had 70,000 employees and he seemed to know most of them by name. He was just amazing, he was an incredible man.

HASTON: I never did meet him unfortunately, but I heard of him by ~~telephone reputstion~~.

~~reputation~~ PMB: Now one of the issues of that time, of course, was the issue with pro-rationing. The conventional oil producers were producing and they couldn't produce as much as they were allowed, as much as possible because...

HASTON: Same problem they got now.

PMB: Too much competition. It's an interesting point right there, thank you. Would you like to talk about that a little bit?

HASTON: Obviously, it was a big influence on any development you wanted to get into, especially something like the oil sands which had to come in big gobs. You had to have 50,000 plus or ~~more something~~, especially with a mining operation, to have any hope of it being commercially feasible. That was a large part of the ERCBs ~~desire decision~~ that there is no way we are going to get two plants going because that would just flood what market there was. On top of that, we don't want more than one being built at a time because of the huge labour requirements and what that might do on it. So, it was basically a battle between Great Canadian and Syncrude as to who was going to get the first oil ~~patch sands plant~~ and Mr. Pew won.

PMB: But, one of the advantages was that he proposed the smaller plant, wasn't it?

HASTON: He did, he did. He was prepared to go for 50 and we wanted 100.

PMB: But also, he said, "And further, more I will refine some of this oil at my..." At one of his refineries in Ohio and he actually opened up a new market for Canadian oil. He was a very, very cunning man.

HASTON: Mind you, that oil that he was going to refine was not bitumen, it was very fine synthetic crude made from bitumen. So, it went down an ordinary pipeline and fitted into a big ordinary



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refinery. All he was saying was ~~(not all it was a big thing there)~~, “I got a new market for...~~that much production~~”.

PMB: And, then we’ll take it so the labour...

HASTON: “We’ll take it so it won’t affect your pro-rationing.”

PMB: So. ~~†~~The labour and investment would be in Alberta.

HASTON: ~~Yeah.~~Yes, the perfect solution.

PMB: And, then he would supply an additional market.

HASTON: That’s right. It was a very attractive proposal once he got into it.

PMB: Very Good. And, you said that, “In 1969 after Syncrude had been delayed for several more years, I returned ed to Sarnia.” Anything you want to say about that at that point?

HASTON: Oh no, I just got back into the Sarnia engineering division stream of things and I worked on all projects. I was a project manager on ~~like a~~ lube oil expansion, ~~and the~~ potential expansion of ~~a~~ Montreal refinery. I did some work out here with production on the possible facilities for the gas supply for the ~~KXL~~ Arctic Gas pipeline coming down from the North, ~~a~~ project that didn’t go ~~anything.~~ ~~Anywhere yet.~~ They were interesting to work on. It gave me some exposure to the Arctic, which was kind of neat. Finally, I figured that I had to get into something a little more immediate and positive. An opportunity came up ~~with Williams Brothers Canada~~ and I applied and became president of Williams Brothers Canada. That was really my first contact with the oil patch, ~~per sayse.~~ I ~~have~~ had bits and ~~pieceds~~ of contact, but Imperial was such a big organization that it did exist largely within itself. So, I suddenly got to meet people like Jack Gallagher and others. I thought that this was a different world out there. The chairman of ~~the my~~ board, ~~was~~ David Williams, was very active in the oil patch for a long time. So, he sort of provided us with good introductions around the ~~thing.~~ ~~patch.~~

~~patch~~PMB: I am sorry, who was that?

HASTON: David Williams.

PMB: Oh the American president of -- Williams, wasn’t it.

HASTON: No, he wasn’t president at the time. The US, Williams Brothers ran, at that time, pipeline engineering which became a pipeline-operating company down in the States. They did very well with it. In fact, the Williams Energy that is just now about to tap into a side stream off an Edmonton ~~an~~ upgrader, that was the original Williams Brothers Engineering in the States.

PMB: So, the Williams you’ve just mentioned by name was one of the American owners?



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HASTON: He was one of the American brothers, ~~yeah, yeah, yes, and~~ Chairman of Williams Brothers Canada.

PMB: So, you would've reported to them?

HASTON: Well, David was the chairman of ~~the~~ myboard. Williams Brothers in the States was not our majority owner. Swan Wooster in Vancouver was our majority owner.

PMB: How do you spell that?

HASTON: Swan, S-W-A-N, Wooster, W-O-O-S-T-E-R. This came about because Williams Brothers Canada was going to be providing major engineering to the ~~CAGSEL~~ Arctic Gas project and that was such a big high profile project that literally the Federal Government asked ~~them~~ David to give up 51% ownership of Williams Brothers Canada so that we could become a Canadian company. It was at that point that they wanted a Canadian president and that is where I came in.

PMB: CAGSEL was the Canadian Artic Pipeline Ltd, wasn't it? I am missing something from there. Canadian Artic Gas...

HASTON: Pipeline...

PMB: Limited. But there's an "S" in there

HASTON: There was an "S" in there. I am almost certain it was CAGSHL, or was it CAGPHL?

PMB: We know roughly what it was.

HASTON: It's the line that they're still talking about when you...

PMB: Yeah. In fact, I think Imperial tried to resurrect it about five years ago and it just keeps on going and it refuses to go away. That's good. We will need that resource someday. So, where am I here? So, you're at Williams Brothers?

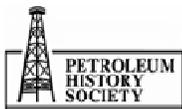
HASTON: Yeah.

PMB: And, now the part that I find really interesting is your discussion about hearing about Russian Technology.

HASTON: Oh, yeah.

PMB: And, I believe you told me in here somewhere that you actually did a site visit to the project in Russia.

HASTON: Yeah.



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PMB: Or what was at that time, the Soviet Union.

HASTON: Yes. The way it came about was through—our connections with Williams, the Williams Company in the States. They had heard of a possible exchange of technology with the Russians and one of the things that came up from the Russian side was that we have this great process for recovering heavy oil by drilling horizontal wells into the bottom and putting some steam above and getting what amounted to, for them, was a very effective steam flood down that produced these wells. One of them came up to see me and said, “What do you think of this?” And I said, “Oh, God. I don’t think it’s got a chance.” Well then I looked at it and I said, “Well, who knows.” So we’ll take a shot at it and see if we can generate some interest in the industry. So, that’s when I got together, I think there were five oil companies or four oil companies and AOSTRA. I finally got them to agree to participate in this study, it didn’t even cost much, just over a hundred thousand bucks which was a fair bit of money then. So, anyway five people or five companies were interested. So, we arranged to do a feasibility study of this technology that was over there. So, I got together the resources we needed. We had some good engineering resources, but we didn’t have any mining resources. So, we got a hold of a character named Stephenson.

PMB: Gerry, G-E-R-R-Y, Stephenson, sorry let me spell it, S-T-E-P-H-E-N-S-O-N.

HASTON: That’s it. So, he came aboard with us and we got the company representatives and we went over to Russia to look at the ie of the Yarega mine.

PMB: And, that was in what year?

HASTON: That was in 1976 and it would’ve been early November, because it was almost exactly 60 years almost, after the Russian revolution, which was 1916. So, I know it was 1976 because we toasted the revolution in Russia. So, anyway I think there were eight or nine of us on that trip and we went up to Yarega.

PMB: Yarega is Y-A-R-E-G-A.

HASTON: “O”, Yarego. No Yarega, pardon me, you’re right “A”.

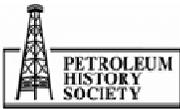
PMB: Okay, let’s do that again, Y-A-R-E-G-A, Yarega.

HASTON: Yeah. What did I write in there?

PMB: I can’t find it: Y-A-R-E-G-A, is what you have in here. And, it’s North-West of Moscow?

HASTON: Yeah, mostly North. Actually, maybe a little bit east. But, it’s in country that is almost identical to the Fort McMurray area. We were flying in, same mixture of evergreens, aspens, balms bogs and stuff.

PMB: So, it was Boreal forest?



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HASTON: It was Boreal forest, yeah. It just looked like coming into McMurray. So, we had a trip down the Yarega mine and that's maybe the most unsafe condition the eight of us had ever been in. It was amazing that that mine operated so well and it operated for years and years. They finally did have a fire and a bit of an explosion in it. But, the entrance, you went down by the mine shaft for quite a distance and then out into these various stokes going out to where they were drilling from. and ~~†~~They were in a reasonably competent sand-stall-sandstone. So, it had good permeability. The walls were actually leaking a bit of oil as you walked down with some wood scaffolding to hold it up. As you walked down into the mine, you could see these pipes sticking out with what looked like a garden tap at the end of them and oil running down out of these taps down a trench in the side of the cut that you were walking down, where it collected in a big pool in the bottom what-and was pumped to the surface. It was pretty rudimentary.

PMB: I thought that what Gerry told me was that it was basically an open steel tank or something that the oil was draining into?

HASTON: Yeah, right at the bottom there.

PMB: So, if somebody smoked a cigarette or something the whole thing would've exploded.

HASTON: Oh, God yes. If somebody kicked a steel boot or something it could have gone up. But, it did not. Not for a long time. So, we went down and had a look at this, shivered at where we were and headed back up.

PMB: Gerry also described an elevator going down there that just constantly swung from side to side.

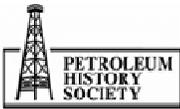
HASTON: A miner would appreciate that, yeah.

PMB: A miner like Gerry.

HASTON: Yeah. Of course the first thing we did when we got to the surface, there was a shot of vodka for you.

PMB: I think you needed it before you went down.

HASTON: So, it-It was quite a trip. We had a good meeting with the Russians and a huge feast at which the revolution was celebrated, the 60<sup>th</sup> anniversary, "Skol." Anyway, it was a very interesting trip and a good bunch of us went on it. Gerry of course as we mentioned and Maurice Carrigy and others I cannot remember the names now. But, there was a group of company reps. So, we got back from that trip and sat down and talked it over with Gerry. So, how's this mine going to be set up? How are we going to get the services and stuff into it? We came up with this layout and a schematic of what this rig was going to look like. We were just going to drill these wells up and kick them over.



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PMB: Before you leave that, I do want to say that I think the Russian Revolution began in 1916 when Lenin went to Moscow from Switzerland. But, it wasn't concrete for another year. So, the conquest of Russia was in 1917.

HASTON: That was the celebration of Lenin, really.

PMB: In Moscow. That is really cool. Okay. So you and Gerry and other started to think about how you might do this?

HASTON: Yeah. Gerry came up with a ~~sort of proposed~~ mine layout and we looked at what we were going to do and what kind of drilling arrangement we were going to need. He said, "Well all we need is something that will fit down a mine shaft and crawl through here and lean over backwards and drill up here a little bit." We came up with a rough idea of what a small pilot might cost and what we'd be looking for and what some of the potential economics were of the scheme. The participants received it quite warmly.

PMB: You mention in your notes here that there were two groups of participants: AOSTRA on the one hand and then a group of oil industry participants.

HASTON: Yeah. I was just differentiating between AOSTRA ~~that and industry #~~ They were all the same as participants. They all kicked in the same amount. AOSTRA were the first one because they were interested in trying to get something like that developed. And, then the others came along and they became different when they started to plan for the pilot plant, because the oil companies wanted to keep the technology to themselves. So, they essentially excluded AOSTRA from going on to the pilot stage. At this point, I had no control of the pilot project. They had accepted our study, paid us for it. So, they reconfigured the group, one or two dropped out. As I remember that was when Imperial and Gulf joined that group. So, they had about five good sized majors that were interested in trying a small pilot just going into the bank, ~~and so to say they excluded...~~

PMB: So, was this the bank of the river along Fort McMurray?

HASTON: Yeah, one of the cliffs ~~up the north of~~ Fort McMurray. So, they excluded AOSTRA and put the design, construction of this pilot operation out for bids which I wasn't particularly happy with since we had brought the idea to them. But, anyway that's the way they were operating. We didn't get the bid and that in fact was the end of our contact with that initial study and it's follow-up. The pilot wasn't a success of any type and so the companies -- I didn't have any real contact with it, but I gather the companies sort of just forgot about it except for Imperial, who then got into trying to drill a horizontal well and test it.

PMB: Okay. Now, I would like to talk about this a little bit, because I think that this is an important and not very well known piece of the story. The project that that small group of companies developed was calling Mine Assisted In-Situ Production. Is that correct?



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HASTON: I don't know. I wasn't associated with it. My study was called Mine Assisted In-Situ Production -- Processing, I think we actually called it.

PMB: Processing, okay.

HASTON: Yeah. Now, what happened to the name after I lost contact with it? I don't know.

PMB: No, it's good to know that it was called -- I assumed it was production or project. So, we k now that it was processing.

HASTON: Yeah, it was Mine Assisted In-Situ Processing. That's the name we hung on the study that we did.

PMB: The idea was basically to go to go along the river where you could basically go in and do drilling or -- explain that, explain the proposal to me please?

HASTON: Well, let's see. As part of our study, we suggested of course that we thought that the economics were worth pursuing an initial pilot operation and we would likely want to do it in a bank formation. That way you didn't have to do a lot of mining and stuff to get to it and that if you could get such a situation where you could contain it, ~~and~~ then possibly you could see what would happen. We didn't ~~go-try~~ to design a pilot or anything. We just suggested that this was a logical follow up step from the study if people were interested. So, that's when they decided, yes, the group will go ahead and work on a pilot of some kind. But, AOSTRA and Williams Brothers unfortunately will not be part of it. So, I lost all contact with it then and I was too busy trying to get a small engineering company going to follow it up much. So, I can't add much more to it than that.

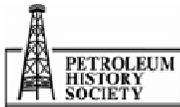
PMB: Okay and now...

HASTON: Oh, pardon me. There is one thing. I know that the pilot was very definitely not a success. The companies just lost interest after that. Another thing, oil companies don't like to think of an underground mine. So, there was a lot of reservation about it. At that point, I think it's fair to say that the industry had walked away from it. The only guy that didn't walk away from it was Gerry Stephenson. He was convinced that a mine was the way you go. So, Gerry got after AOSTRA. This would be three or four years later, but maybe even sooner than that. He pestered Clem, I think regularly every six months saying, "We've got to do something to get this thing going. This is a good process. "So, finally Clem agreed this is a good process.

PMB: Put \$50 million into constructing the...

HASTON: And, started UTF, ~~yeah.~~

PMB: One of my first interviews was with Gerry and he basically says to this day that SAGD operations would work better if they were conducted from a mine, because you have more environmental control. The guys that are working don't have to live in camps where it's -40 C in the



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winter and that kind of thing. They could go work down, below ground in very comfortable conditions. So, he's still sold on that idea.

HASTON: Gerry really did get sold on it, yeah.

PMB: He was a very important player.

HASTON: Oh, yeah. No, as I say I think AOSTRA didn't really lose faith in it, but they couldn't get any industry interest and so things were just sitting there. Gerry was the one who said, "No, this thing has to go ahead." And, then Maurice Carrigy became very interested, because he saw that access tunnel as a laboratory. "This will give us all kinds of access to the oil sands, ~~that we~~ We can get so close to in-situ that, man, it's the best data we'll ever find," and so it became an underground test facility. Not a SAGD, ~~not not a~~ maze MAISP, maybe that was going to be the very first testing? But, the idea was that here is a test laboratory, just below the oil sands. You could get things going, you know. So, it was picking up steam, certainly from the early 80s.

PMB: When I spoke to Bruce Levinsky yesterday, he made the comment that the data that they collected was so high quality for many, many years he kept referring back to it.

HASTON: Yeah.

PMB: He was one of the research guys there. They kept referring back to it as they were developing the SAGD projects.

HASTON: It was a great [inaudible] lab.

PMB: Okay. Now, a couple things I wanted to ask you about. So, you were the head of Williams Brothers Canada, 1975-'81. I recall a couple of things that happened then, one of course being the National Energy Program that came close to the end of your tenure.

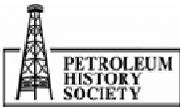
HASTON: Yeah.

PMG: Then, of course, the great Recession in the early 80s when oil prices just collapsed. How did that environment affect your next venture, which was J.A. Haston Consulting Ltd? It must've been very tough?

HASTON: Actually very little.

PMB: Seriously?

HASTON: Yeah. The work we were trying to push in Williams Brothers was very much associated with automated control, computer control. We had a division called DATAP, which was another acronym: Data Acquisition ~~something or other~~ Transmission and Processing. That was really the most active part of our operation and the one I was actually the most interested in. The pipeline



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engineering; that was good, steady work with regular customers. They were always extending flow lines or whatever. It was difficult to get into the biggest pipeline engineering market because that was, essentially, what was ~~it~~ called at that time, I guess Alberta Gas Trunk Line?

PMB: Yeah.

HASTON: With Bob Blair? They had become the competitors of the bunch that ~~had been we were~~ working for in CAGS~~EL~~. Even though Bob Blair was a classmate of mine, we were friendly enough but Williams Brothers wasn't getting any work out of Canadian Gas Pipeline. We concentrate a lot on pipeline automated control, things like the Cochin Pipeline that went from Edmonton all the way down to Sarnia. ~~That~~ That was all a DATAP control project and it was a dandy. It worked well.

PMB: It was a what?

HASTON: DATAP project.

PMB: What was that? How do you spell that?

HASTON: D-A-T-A-P, Data Acquisition Transmission and Processing; another acronym.

PMB: Why didn't I know that?

HASTON: That was really the most ~~efficient-effective~~ branch of our operations at that time. That kind of work, it wasn't directly affected at all. People were putting those things in for efficiency, effectiveness, safety operations, largely of existing operations in many cases. The Cochin Pipeline went ahead because it was such gem for getting all those light ~~hearted~~hydro-carbons down to the Sarnia area.

PMB: Let's just spell that C-O-C-H-I-N.

HASTON: Yeah.

PMB: Cochin Pipeline. I forget who owns it now. Is it Enbridge?

HASTON: Dome, Dome.

PMB: Dome had it in those days, today it's Enbridge. And then, of course towards the end of your career there were all of those huge gas export projects going on, weren't there? Were you involved in any of those?

HASTON: No, I was -- you mean, when I went out on my own?

PMB: Yeah, were you involved in any of that construction?



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HASTON: No, no. I wasn't involved in any design /construction for the first while. Again, I was trying to promote systems in the systems field. I did some project management studies, things like that for Petro-Canada and a few others. I did some interesting studies for AOSTRA in electrical preheating and various ways of getting at the oil sands. All of them largely looking to how can you establish communication down low in the oil sands so you can get steam in there so this process will work. What we were calling ~~NACE-MAISP~~ and what others were calling ~~+~~SAGD at that time...

PMB: SAGD.

HASTON: SAGD, yeah.

PMB: So, Steam-Assisted Gravity Drainage.

HASTON: So, no, I wasn't associated with any big projects until, well the ~~UTF~~UTF wasn't a monster project. ~~H~~U was just a very interesting one.

PMB: Okay. Now, what I did notice and I am sorry I forgot this when I was asking the questions a few minutes ago, but you actually did have some very specific assignments in terms of the Underground Test Facility.

HASTON: Oh yeah, I was project manager of it. I was responsible for the project.

PMB: How did that happen?

HASTON: Clem Bowman asked me to be.

PMB: Clem Bowman, by the way, was recently appointed to the Canadian Petroleum Hall of Fame. I don't know whether you know that; just last week.

HASTON: Yeah, well there is going to be a dinner on September the 26<sup>th</sup>.

PMB: Yeah, I am probably going to that.

HASTON: I will be sitting at Clem's Table.

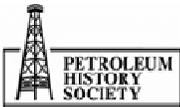
PMB: Oh, good for you. Okay, so Clem appointed you the manager of the UTF?

HASTON: ~~Yean.~~ Yes.

PMB: I beg your pardon for not catching that and actually when I look at your notes I don't think I see you saying that?

HASTON: Didn't I say I became project manager?

PMB: I don't think you did.



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HASTON: Oh, well.

PMB: I don't think you did. But in any event, it doesn't matter.

HASTON: I must not blow my horn that much.

PMB: Yeah. You should have a little less modesty. So, now that I know that I am speaking to the manger of the UTF, please start at the beginning and tell me everything you can because that's such a critical project?

HASTON: Well, as I've already mentioned, Gerry Stephenson kept the interest going in AOSTRA. Finally, I think I said '82 in there, but it must've been later than that because I was doing other things. But, I understand that it's more likely around '84, AOSTRA started to look seriously at, ~~"I let's think about getting this --~~ biting the bullet, getting this big shaft down underneath the oil sands, test lab, start off first of all on ~~NACE-MAISP~~ or SAGD, whichever you want to call it." ~~So,~~ ~~There~~ was no way they were going to get any industry interest in this. So, Clem bit the bullet and sold the project of getting that shaft and tunnel system in there to Peter Loughheed, ~~and~~ ~~They~~ committed to getting that shaft down, and the shaft sinking/ tunnel engineering work was awarded to Gerry's outfit, Norwest Engineering.

PMB: That's N-O-R-W-E-S-T

HASTON: Yeah.

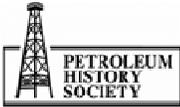
PMB: Okay and it's not Nor'West. It's Norwest?

HASTON: Norwest Engineering. So, they got busy designing and contracting out the shaft sinking and things like that, ~~and a~~ at the same time, I finished some studies on electrical preheat, ~~things like options, this.~~ ~~So,~~ Clem asked me, ~~he said~~ "Now, if you were going ahead on a big project would you use ~~NACE-MAISP~~, would you use the underground tunnel effect or would you use this particular form of electrical preheat that you think has a lot of chance?" And I said, "I think I would do the preheat."

PMB: Well done.

HASTON: Clem said a bit later when they decided to go ahead, ~~so he said,~~ "Well, we're going ahead with the ~~NACE-MAISP~~, would you head up the project for us?" So I said, "Gladly." ~~It looked just like the concept in the original 1976 MAISP study.~~ ~~Yeah,~~ ~~so~~ that's how I got involved in it. It was the best project I was ever associated with. I had a project team that were just superb; the reservoir engineering, the forecasting and the design. I couldn't have asked for anything better. ~~So,~~ I know you've interviewed quite a few of the team there. Well, Gerry obviously was interviewed a lot, Neil Edmunds, and several others.

PMB: I've interviewed him.



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HASTON: I am sure you have. In fact I just looked up something from Laricina about the results of the Phase A operations. I have no doubt that article was written by Neil. It's exactly his style and stuff, yeah. But, he was just a great reservoir engineer. His modeling, he just totally predicted the operation. So, we got a good working model, a good design basis for it, wells, got on board a drilling engineer. I mentioned him, Cal Bowmer Bohme, did a superb job. We developed this drill with the Becker people, had it custom built.

PMB: Did you said with the Bidford?

HASTON: Becker, Becker Drilling at the time.

PMB: How do you spell that, B-E-C-K-E-R?

HASTON: Yeah. I am pretty sure they're long since gone.

PMB: Becker Drilling, okay.

HASTON: Yeah. The Becker brothers, I am pretty sure are dead now. So, that was a custom drill. Becker had the top drilling expertise, which was obviously needed for pushing a well up into the oil sands and directing it. Cal Bowmer Bohme just nursed those wells along from day one and he was down that mine just about all the time they were drilling. He literally did an amazing job. They were trying to place those wells five metres apart, "Up, steer, go straight ahead, stay level," and stuff. With the crew of instrumentation and they got them in; so, just perfect. For the facilities, Jack Suggestt and others worked on that and.

PMB: That is Jack Suggestt, S-U-T-T-E-T-T.

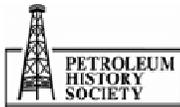
HASTON: No, SUGGETT. ~~It~~ There were a lot of good guys on that project. So, it got designed, it got built, it started up just as it should. In fact, the estimates of contact time between the upper and lower wells, God, they were within 15-20% of what was actually experienced. The recovery, by the time we got through with it was 60%. Steam/oil ratio was 2.4. It was just a monster success and mainly, because it was totally predicted by that modeling. So, you had a process that you knew why it worked so, that's what really provided absolute confirmation of the SAGD process, yeah.

PMB: Wow.

HASTON: It was a good team to work with.

PMB: Okay. I find it interesting that Gerry Stephenson's company was contracted to build the shafts and tunnels. You were the president of Williams Brothers Canada and you were contracted to becoming...

HASTON: I was out on my own by that time. I had left Williams Brothers Canada, went on my own in '81.



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PMB: Okay, so your engineering company...

HASTON: But, what you are saying is that the two of us were on the original Yarega trip. ~~Ywhat you say is that the two of us were on the original Yarega trip.~~

PMB: Well, I wasn't going to say that, but I am glad you mentioned it. I guess my point is that you were incorporated, you were J.A. Haston Consulting Ltd. So, you were hired to be the manager but it was really your company that was hired. So, everything...

HASTON: My company was two or three people.

PMB: So, everything that was done there was basically companies being hired to do specific functions. So, there was no big AOSTRA organization that really did that?

HASTON: Well, in a way ~~it~~<sup>there</sup> was, because I was working for AOSTRA and I assembled a project team out of some AOSTRA people, some independent contract hires and that was the team that literally did the design specification work for any of the contracting. We let out the contracts, we supervised the contracts. So, it was in effect an in-house AOSTRA team. It was made up of very disparate components because you needed drilling expertise, you needed mining expertise and you needed odd ball things and stuff, geological. Brian Rottenfusser was with us on it. So, it was a team pulled together to do that project and they did it well; yeah, totally enjoyable.

PMB: And you left in nineteen...

HASTON: 1990.

PMB: And, basically you've been retired ever since then. So, you kind of took SAGD to the point where it had been proved to be, not only theoretically but technically feasible?

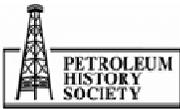
HASTON: Yeah.

PMB: But, then you weren't around for the fun, when these experimental...

HASTON: Oh, no. The fun was going to be so far away.

PMB: I am sorry, say that again?

HASTON: Any more real fun was going to be so far away, because we were now setting up for phase B. Essentially, it was a repeat of Phase A, at larger scale in order to get equipment and process design data that would give ~~they knew that they would have~~ more confidence as far as actual commercial design of an operation. So, it was ~~the~~, what you might call, the final pilot step. But, it was going to be a fairly long process. There wasn't going to be much new in it. Hopefully, and it certainly happened, the drilling would get a fair bit more sophisticated and easier. But, then AOSTRA wasn't going to go commercial. As I think I've mentioned, oil companies really don't like



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the thought of doing their drilling and operations way underground. It's just foreign. So, I think I'd had enough and got enough reward and I wanted to do other things. So, I retired.

PMB: I thought I heard you say a few minutes ago that you saw this idea as technically feasible, but it wouldn't happen until way into the future. How surprised are you that it happened so quickly?

HASTON: Oh, way into the future. I am meaning like five or six years.

PMB: Okay, okay.

HASTON: Oh no, I had no doubts, ~~because that the process would work, a~~ ready people were starting to put horizontal wells in from the surface. I ~~don't didn't~~ think they had a hope of putting them in parallel five metres apart, a lot that sort of thing, for a few more years after that. But, the drilling technology ~~was~~ as you've mentioned, was moving right along. So, the underground operation, in some ways, ~~it had~~ served its purpose. ~~I think~~ I believe you mentioned that Gerry pointed out that some of the operation was more effective underground as well and it was. It was much easier to drain the chamber that was being developed through these underground wells because, in effect, it was like bringing a ~~mug liquid~~ through a steam trap so there was no steaming out of wells with ~~the~~ blowout and things like that. They were controlled in there and then gathered and brought to the surface under control. So, it allowed you to pull the oil level down further in the formation and in effect get a bit more of the oil. There were some possible savings over all and the length of drilling ~~was less~~, because you didn't drill each individual wells way down that far. I am sure Gerry is still convinced that mining is the way to go.

PMB: Oh yes, he is.

HASTON: But, I don't think he'll convince the oil industry. There is so much front-end capital load in an operation like that, that cash flow economics just kill you. But, I know that ~~it the UTF~~ did work better than some of the first wells drilled from the surface, because I did ~~actually go back and go to a surface operation a few years later~~ with Jack Suggett and a couple of others, I forget the name of the operations, just across the border in Saskatchewan.

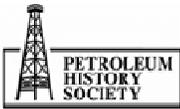
PMB: I am sorry, what is his name? Jack Suggett?

HASTON: Jack Suggett.

PMB: Jack Sugget, okay, sorry.

HASTON: I forget the company that he was working ~~with with~~-- most of the project team ~~then had~~ moved after Phase B into ~~the operating~~, some of the operating companies that were working ~~out on~~ SAGD and they moved as a very effective team.

PMB: I could probably find that information for you, but I've forgotten that.



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HASTON: Yeah, oh yeah. Neil and the others wouldn't know ~~anything~~ about it. They were having a fair bit of difficulty ~~not just cutting-controlling~~ their surface wells and stuff ~~to pieces~~ because, boy when that ~~stuff bitumen~~ started literally steam ~~lifting~~ its way out those pipes, it was coming out at a screaming rate. So, technically maybe it might've been a little better well operation with the underground. But, now that they've got the drilling capability that they have, I think it's a no contender. You're going to go in from the surface.

PMB: Okay, so last couple of things. What technologies were required once you ~~app~~proved the idea, the concept?

HASTON: Drilling ~~and completion~~ mainly. As far as understanding the operation of the process in the formation, I think even UTF phase A demonstrated as much as you need. You need good geological understanding and from then on, you need guys that can ~~effectively model and control the operation in that geology. do bottling and stuff with good efficiency, imagination.~~ The process is basically ~~so~~ simple. It's almost like putting a fire under an ice cube. You know, if you try to push something through an ice cube it's pretty tough. You try to push steam through an oil sand formation, it's real tough. But if you just get it warm, it leaks out and away it goes. So, it's a good process.

PMB: And, now I guess the other thing that I meant to be kind of a leading question. There are certain technologies you needed, a couple of which were measurement well drilling, underground tools. So, you could drill one well pretty straight and know how far you were drilling and then drill the other one exactly five metres below it.

HASTON: Cal. Cal just fiddled those things in with extreme care.

PMB: That's ~~Cal Bomley-Bohme~~

HASTON: ~~Cal Bomley, yeah-Bohme~~

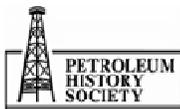
PMB: Yeah, but of course now you have those tools that can keep two wells parallel and...

HASTON: If we ~~did-had had~~ that with the UTF, ~~Cal's job would been a lot easier. UTF (sound effects)~~

~~PP~~PMB: I guess the other thing and I am surprised to hear that you aren't aware of this, but it was the Russian down hole drills.

HASTON: Oh, ~~I think I've heard.~~ I think I've heard of them. Yeah, I didn't realize that they were that early as the late 80s, yeah.

PMB: I do remember reading about them and being quite astounded not a long time ago. That kind of covers everything up, I think. You talked in here about project team responsibilities, the UTF project was planned in two stages. Could I trouble you to just take a minute or two, look at these last



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four paragraphs or five paragraphs and just see if there is any there that you haven't covered and if you want to elaborate on a little bit please.

HASTON: No, I don't think so, not particularly as far as an outline of project team responsibilities. I think it's very much worth noting that that thing would not have happened without AOSTRA. That was just a major move on Clem Bowman's part to say, "Okay, this is worth doing." We had ~~sort of~~ some observer reps from various companies at times, even in Phase A, but no company was prepared to put money into that project. Now, I believe that changed to some degree in Phase B but...

PMB: I think in Phase B there were 10 or 12 companies that each put a \$1 million into it.

HASTON: Really? Because, like I say I lost track. I did really get divorced from the industry at that point. But, the role of AOSTRA ~~and that was just was very~~ challenging and it was well done.

PMB: And, of course AOSTRA was really the original brainchild of premier Lougheed and of course, he was long gone after that.

HASTON: Yeah. Of course, Clem became the first chairman of AOSTRA and I'd worked with Clem since back in the early 60s on the Syncrude and stuff and...

PMB: I am going to put one last idea to you and then I think we're pretty much done. The mining, you said with Syncrude, the mining is a tiny little part of the oil sands, maybe 20% or something if we're lucky.

HASTON: Oh, the mineable.

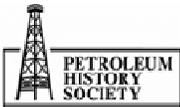
PMB: Of the oil sands that are mineable.

HASTON: The mining is a big part of the present production.

PMB: Yeah, it's quite big. But, then so Lougheed's idea in the early days was, "Well how do we develop the rest of this stuff? There's a small part that's minable, it's expensive to produce, but how do we get to the stuff underground?" Would you like to elaborate on those couple of ideas?

HASTON: I guess it seems so obvious I am not sure what I could comment on. What had been ~~done-planned in~~ in-situ processing as it was called for a long time was anything from an atomic bomb to huff and puff steam injections and stuff. There was nothing that was giving ~~way-much~~ in terms of results. ~~Of~~ course they never tried the bomb!

PMB: Well, there was the Cold Lake, the Esso Cold Lake project. That was producing a certain amount of oil.



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HASTON: Yeah. But, fairly low recovery, quite low percentage. Even at Cold Lake which is a much better formation than McMurray. ~~But~~ anybody trying to huff and puff McMurray wasn't getting much; with mostly heavy oils. 6% was a great recovery. ~~So, it was always just the~~ The big plum ahead that was the development of an effective method of exploiting insitu at recoveries approaching mineable reserves, and SAGD has done that. Developments in surface drilling it and certainly that kind of approach further minimizes front-end capital requirements, which in a lot of some ways I personally don't like at all. Now, what you're seeing is that ~~the~~ industry is planning future expansion totally based totally in effect for the in-situ stuff to get it on in-situ production like SAGD or better, cleaning up the excess water and grit, but whatever comes out, gives you a sand-free pretty well bitumen, still with all the sulfur and everything in it. ~~But Raw bitumen, just at least~~ something that you can put a really good product, like condensate, into to make a third of the barrel it pipeline-able and giving give it away as a poor product. It's called "Dilbit", or Western Canada Select.

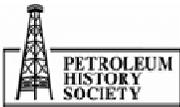
Now, that in my opinion, is almost bankrupting Alberta. You get up to three/four million barrels a day of that kind of stuff with the sort of incentives that are in place now. I believe that the way the in-situ is being exploited at the moment is essentially not in Alberta's best interest. The returns from it, the royalties are way too low, the tax write-offs that allow the cash flow to be pumped up in a big hurry are way too high. I don't think it's a stable situation and that's one of my big disappointments out of the UTF project; that it ended up apparently being commercially exploited in a manner which in a lot of ways is a travesty of engineering and an intolerable situation for the province.

PMB: Now, you have said some things that I have kind of heard that before, but I've never heard somebody state it so strongly as this. Could you explain this to me a little more?

HASTON: Well, you start with the mining projects. Now, there were going to be a lot of front-end capital costs anyway, because you have big equipment. You have got to get a big mine opened up and then by desire, or by whatever George Govier or whoever else required, you were going to upgrade that bitumen into a synthetic crude oil. Now, that of course, adds a whole ton of value to that output.

PMB: Within the province.

HASTON: Within the province, yeah. So, all of the mining projects have complete bitumen upgrading associated with them. So, it made them big, long-term projects with a good return for industry and the government. Now, it's no return that's the equivalent of what you will get out of a nice field like the Leduc or whatever it might be. The oil industry somehow seems to think that they need that sort of cash flow. It doesn't leave much for the province. Now, those mining projects almost literally had to be done that way both physically and because of the economics. So, they were good stable operations. They didn't make a bonanza, but they created a lot of work. They started to found a long, good sort of operation for the province, high-tech jobs, all kinds of stuff. We came along with ~~the~~ SAGD where you could just get the oil out of the ground, dilute it and ship it away and none of them are adding any bitumen upgrading. In fact, unfortunately, after Rick George left



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Suncor, Suncor cancelled the Voyager project; 200,000-barrel a day upgrader, a beautiful thing for Alberta. Cancelled because you could get rid of #raw bitumen easier and faster somewhere else.

PMB: So, the issue is then that you take a barrel of oil and you mix with it, I think it's 30% or something of diluent.

HASTON: Yeah. In some cases, that diluent is a very highly refined synthetic oil from the upgrading operations.

PMB: So, then you use that to transport the oil or the bitumen to the refinery where the diluent is recovered, to some extent and sent back...

HASTON: To some extent, not much. In the big plans, I doubt if it would ever come back. Well, maybe if it got big enough it would, yeah.

PMB: Isn't that interesting.

HASTON: Like, in the case of Imperial, ~~of course. From Cold Lake,~~ they go into Strathcona Refinery in Edmonton so they do run a diluent loop. It just loops back and forth. But, I am pretty sure most of the stuff that goes down through the States; the diluent is part of the package. Because, I believe in the case of the royalties, the royalty value for the bitumen has a severe deduction against it for the cost of the diluent. So, I am pretty sure it just moves as a package and is used as a package.

PMB: Now, I am just going to give you one comment on that and this is from Neil Edmunds of all people.

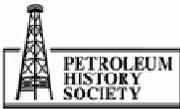
HASTON: Well, he should know.

PMB: Well, his comment was a little bit different. He said, "The reality is that the bitumen is really cheap to produce." He said, "You can actually produce it for," you know once you've got the production and the operations in play, "You can produce it for maybe \$19-\$20 a barrel. You ship it off and you sell it for \$50." What's wrong with more than doubling your money?

HASTON: You're not giving much to Alberta. You're increasing your company's cash flow tremendously, but at the moment I believe under the present operating environment in the province, you're doing that at the expense of Alberta.

PMB: Okay, now, okay.

HASTON: Now, I am no longer in the industry. All I am doing is saying what I read occasionally in the paper. But, I've seen articles in the papers supporting the same kind of dilbit position. And, they say that, "Oh, upgrading isn't worth it. There's no value in upgrading." We mentioned the Williams Engineering Company that are now in the process of putting in an operation which will found a nice new industry in plastics out of a little side-stream of one of the bitumen upgraders. And, they say



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that there's no value in bitumen? There ~~are~~ is all kinds of value in bitumen if you get at it. But, it's easy to just dump it and make a fast buck.

PMB: And, part of the reason there is so much potential is because it is such a complex molecule.

HASTON: Yeah, you can do anything with it.

PMB: You can do almost anything with it.

HASTON: Yeah. You can take the carbon out. You can pump the hydrogen in. You can do what you want. It is good stuff, but it requires a bit of money in the front-end and they just loathe to build upgraders instead of drilling wells.

PMB: But, companies would argue, "Look, in order to get any kind of serious oil sands production on-line is going to cost minimum \$10 billion. And, we need to get a recovery on that money as quickly as we can." Isn't there an economic logic to that?

HASTON: I don't think so. Not to Alberta there isn't, because Alberta isn't making a pile of money out of it. No, I think that's purely production company cash flow economics.

PMB: Now, around 20 years ago the province and an industry group and the Federal government created a group called the Oil Sands Task Force. They came up with the following scheme and the scheme was that projects would be ring fenced and the producers for that ring fenced operation would pay, I think it was 1% royalty to the province until they'd pretty much paid off all their capital expenses. And, then at that point, I think the deal was that they would then pay I think it was 10% or 15%.

HASTON: I am not sure of the numbers. There was a setup like that, yeah.

PMB: But, one of the outcomes of that at the end of the century, all these projects began to be developed because those were very good terms. And, now we have Shell and CNRL and Lord, I can't even remember half of them.

HASTON: There's a bunch of them.

PMB: There are half a dozen mines

HASTON: These are the original mining operations?

PMB: These are the mining operations and then of course also about the same time the SAGD projects really began.

HASTON: The mining operations were generally a fair bit in advance of that. Pretty much the 70s and 80s were...



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PMB: Well, no, these were at the turn of the century. There was Syncrude/Suncor and then there were three or four of them that were built around the...

HASTON: That's the Shell, the...

PMB: The Shell, the Horizon, I forget what the others were, yeah. But now that these expenses have been paid off, all of a sudden the royalty is 10% or 15% or something.

HASTON: Yeah. That must be most of the royalties coming out of the oil sands as far as Alberta's concerned.

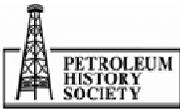
PMB: Yeah. I guess the argument might be that idea, kind of incentivized the oil industry to go ahead and that probably is a good thing for us, for the province.

HASTON: It is, I think to the extent that in fact those incentives are needed to get a major operation underway. At the time those mining operations were going in, there was still considerable doubt about even the processing of the oil sands themselves; kind of returns you're going to get, the kind of junk you had to handle, that sort of stuff. And, oil was what, maybe \$8-\$10 a barrel?

PMB: At that time, it was around there, yeah.

HASTON: Yeah. So, it was a very dicey thing to get underway and finally it took the federal government, the Alberta Government, the industry to get those things going. I believe all except the first one, I think Mr. Pew did that. Certainly, to get Syncrude going, they had to get into these special deals and following through with ~~the~~ Shell and the others. The expected return on capital on those initial projects, if you could see 10% you had very long-sighted vision. The economics were just not that good because oil sands is hard to handle, hard to get, hard to process. So, it was a situation where incentives were ~~both, well a~~ absolutely needed. Clearly, development of the oil sands has to be an objective of Alberta; it just so much, it's the long-term future of the province by far. So, Peter Lougheed and the rest of them said, "Well, let's work out deals and we'll get these hard-to-do projects underway," recognizing that they are not gusher projects. They're long, hard-working projects to establish an industry and ~~it~~ they did.

One of the fortunately nice things about SAGD is that it's pretty easy and cheap to get that oil out of the ground and the more holes you can stick in the ground, the more money you can make to get rid of it. Away it goes. You don't have to worry about all this business about a lot of processing plant that costs you a bunch of money right up in the front-end. So, cash flow, there's just no comparison. But, unfortunately, I think if anything the royalty incentive situation now is more liberal ~~than~~ it was for the mining operations. So, nothing gets done till your money is all back, royalties are low, the total incentive is to get that crap out of the ground, get it fit to stick in a pipeline and get rid of it to somebody that doesn't mind doing all that rewarding upgrading and stuff. I think that's just extremely short-sighted and I don't see why Alberta should ~~not~~ supply, external to its borders, something as vile as Western Canada Select unless it has some sort of political benefit. Now, I think something like the pipeline to the East, great idea. Send the dilbit down there. Montreal refinery of



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Suncor's, all they have to do is add a coker to the front end of that refinery, they've got an upgrader, the one in...

PMB: New Brunswick.

HASTON: New Brunswick. Same sort of thing, little extra coking on the front end, it's an upgrader. So, what Alberta is doing by sending dilbit down there is literally passing some of the value of the oil sands into Eastern Canada, just a fantastic political move. ~~and that~~ That sort of thing, I and most people ~~everybody else~~ I am sure would fully support, but to send that value outside of Canada...

PMB: Basically, to the United States.

HASTON: To the United States or to China or to Asia. To send that value out there is a great potential loss to the province and Canada, and one would have to wonder, well why does the province want to produce extra oil and ship it out under those circumstances? So, planning the long-term future of the oil sands ~~and on~~ dilbit, I think is extremely short-sighted and there's no incentive for Alberta to do it, except to be big. But if you're big and you're going into debt, that's not too good.

PMB: You don't sound like a Toronto boy anymore.

HASTON: Oh yeah. That's what I say, shove it all down East yeah. Let's get some of that.

PMB: I am teasing you. I mean the reality it is the oil sands that are keeping Canada afloat right now, a very large...

HASTON: If they got that pipeline going down east, it would do it in the nicest possible way. They would make a pile of money out of Albertan product and if anybody would appreciate the ability of the oil sands to tie Canada together, that's the sort of thing that would demonstrate it.

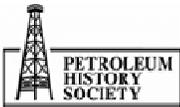
PMB: And, of course the St. John's refinery, the Irving refinery, I believe is the biggest refinery in North America.

HASTON: Well, I don't think so, but it's the biggest one in Canada.

PMB: Certainly the biggest in Canada. I thought I heard it was the biggest in the U.S. We're just doing some research on that. I will find out about that.

HASTON: There are millions of barrels of refinery capacity ~~capacity?~~ down in Texas.

PMB: That's true, that's true okay. I am almost certainly wrong on that. Okay, I think I have everything I need. Last question: I didn't expect anything as good as that from you. I am glad I asked you that question. Last thing: tight oil, Shell-shale gas, any thoughts on that? I know that really is asking a lot.



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HASTON: My thoughts are coming out of the paper nowadays. But, I think one of the, maybe still unanswered questions is the long-term produce-ability of those horizontal fractured wells. If they have ~~a steeply dropping this is kind of a~~ production curve, then that's a different picture than if you're putting something in there that's going to provide a thousand barrels a day of oil just endlessly ~~and stuff~~.

PMB: 20 years.

HASTON: I don't know? The environmental concerns, it's a new field. If you're fracturing, you've got to be concerned about the overlying ~~structure. job is~~. It's certainly nothing that I have any particular ~~inside insight~~ into. But, I mean maybe ~~it's the environment is~~ another reason why we should be a little concerned about the rate at which we develop the oil sands and make sure that we develop it more completely. Like, what have we got going now? We've got that upgrader that's being built outside of Edmonton, initiated by the province, using the province's ~~bounty money royalties bitumen~~ to feed it. I think that's the only upgrader now under construction ~~in Canada. They are building lots of upgrading capacity in the States~~. So, we're not really making good use of the oil sands, and if the prospects for selling it in its raw form are maybe becoming a little more limited, then we maybe should be doing all we can, economically, within the province; recognizing it as an industry, not an ~~exploration-exploration play~~, because nobody has to go find it. It's there. It can be produced fairly cheaply and it should be used ~~well~~ otherwise we can't afford to have the lifestyle and the population that we're building in Calgary. I don't think it can exist on ~~low royalty~~ dilbit.

PMB: Thank you very much, I am going to call it quits right there. Hold one second.

HASTON: Before I get carried away?

PMB: Thank you very much, that was great.

**[END OF RECORDING]**



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