# CN Coal and Sulphur Operations in the Alberta Foothills

**By Norm Skretting & Model Photos by Timothy J. Horton**

With the imminent arrival of the HO & N gauge 4000 cu ft. all Canadian Steel gondolas from North American Railcar Corporation; I would like to discuss the 4000 cu ft. gondola as it was used by Canadian National Railways from the early 1970's up to the current time. CN had well over 1000 (leased or owned) of these cars in service in the 1970's, 1980's and '1990's, prior to switching to aluminum equipment and Sultran had 360 of its own for use by CN and CP.

I am waiting, not so patiently, for the arrival of the HO gauge 4000 cu ft. coal/sulphur gondolas being produced by North American Railcar Corporation for use on my model railroad, a loose representation of the CN's Clearwater Sub from the 1970's to the current time. I enjoy all of the years in between, but my fondest memories are from the 1970's and 1980's when these cars were the backbone of CN's coal operations.

**Coal Service**


**Figure 1: CN 199001 built February 1970**

The 4000 cu ft. gondola was the preferred car style of CN for transporting coal from five Alberta mines to either the west coast ports for export or to ports on Lake Superior (Thunder Bay, Marmion Lake) for use by Ontario Hydro. The first cars were built in 1970 for CN as CN 199000 series and the first eight in the series were built as double rotary cars with a rotating drawbar on each end. The cars had a capacity of 263,000 lbs. and a light weight of about 58,000 lbs. giving them a load limit of approximately 205,000 lbs. Thus the cars could carry a cargo of 100 tons with a little room for overloads. When the maximum capacity was increased to 286, 000 lbs., all of the coal cars had the load limit increased by 23, 000 lbs. (The SULX cars kept their original load limit).

The cars also had a load-empty feature that increased the braking capacity of the cars when loaded, similar to a retainer. The purpose was to reduce the brake pressure when the cars were empty in order to reduce the number of skidded wheels while providing sufficient braking capacity when loaded.

**Figure 2: Load-empty feature – Newer cars had the same feature That was mechanically applied when the car was loaded. Norman Skretting photo**

With the beginning of unit coal train service and the promise of other unit train operations such as sulphur, potash and grain, CN began a plant expansion program that involved extending sidings to a minimum of 6050 feet in order to handle trains of 6000 feet.

Neptune Terminals in North Vancouver, the only coal unloading terminal on CN at the time, was also restricted to handling trains of 6000 feet or about 98 coal gondolas plus units and caboose. Eventually the train length was increased to 100 coal gondolas or any other car of similar length. Neptune Terminals only handled coal from Luscar mines at Cardinal River and Coal Valley as well as the mine at Winniandy, both in the foothills of the Rockies in Alberta until the Obed Mountain mine opened in 1984.

**Luscar Mines: 53°03'52.97"N 117°24'43.96"W, 53°00'15.82"N 117°18'59.03"W, 52°56'56.69"N 117°18'28.38"W**

When CP began shipping coal from southeast BC, a new super port at Roberts Bank was opened. All trains originating from Gregg River and some trains originating at Coal Valley and Obed Mountain (Dalehurst) on CN also unloaded at Roberts Bank. Track length at Robert's Bank did not limit train length, but siding capacity on CN did, so CN's trains were always shorter than CP's.

**Figure 3: Roberts Bank Coal & Container Terminal**

Ridley Island, near Prince Rupert, was developed to handle coal mined in Northeastern BC and the trains were designed to operate in the same manner and length as coal trains from Alberta on the mainline.

**Figure 4: Ridley Island Terminal (Prince Rupert, B.C.)**

All port terminals used rotary dumpers which necessitated the use of rotary coupling systems on the cars. The rotary coupler end of the car was indicated by a yellow stripe or stripes on that end of the car. Double rotaries had a yellow stripe on both ends, as well as two air hoses, one on each side of the drawbar. This made it easier to couple the train line to cars on either end as well as avoided twisting the air hose around the drawbar while being dumped.

**Figure 5: Two sets of train line hoses on each end of a double rotary**
**Norman Skretting photo**


**Figure 6: North American Railcar- CN Double Rotary Marked**
**HO Scale # 11-31004002, N Scale # 11-11004002**

The coal trains were serviced in the empty direction and the location of servicing changed with the different service plans developed by CN for its terminals. Replacement of brake shoes and inspections changed between Thornton Yard, Kamloops and Jasper for west coast trains and Winnipeg and Edmonton for the Ontario Hydro trains. Spares used to fill out the trains to the correct number of cars were also added at these terminals and could require turning cars to correctly orient the rotary drawbars. Bad orders would be switched out at any location depending on the severity of the defect. (Sulphur trains were also serviced in the same manner.)


**Figure 7: North American Railcar – CN**
**HO Scale # 11-31003004, N Scale #11-11003004**

All of the coal mines on CN prepared the coal in a similar fashion. The coal was pulverized before being stockpiled and loaded which necessitated that each car be sprayed with a latex spray to reduce the risk of coal dust blowing out of the cars. Each loadout used a hopper scale to weigh the coal before it was loaded into the cars. All locomotives on coal trains had to have operating pacesetter equipment which allowed the trains to move at extremely slow speeds (typically 0.25 MPH) as required by the loadout operator. Frequent stops to fill the loadout hopper were common and unpredictable.


**Figure 8: Coal Loading Facility**


**Figure 9: Coal load being sprayed with latex to reduce dust**


**Figure 10: North American Railcar – CN (ex-BC Rail)**
**HO Scale # 11-31003001, N Scale # 11-11003001**

CN assigned a lot code to each train depending on origin and destination and would get progressively larger until the end of the year. These will be shown in the discussion of each mine. Each set of equipment would have the current lot code as well as a tentative next lot code as assigned by the coal/sulphur coordinator.

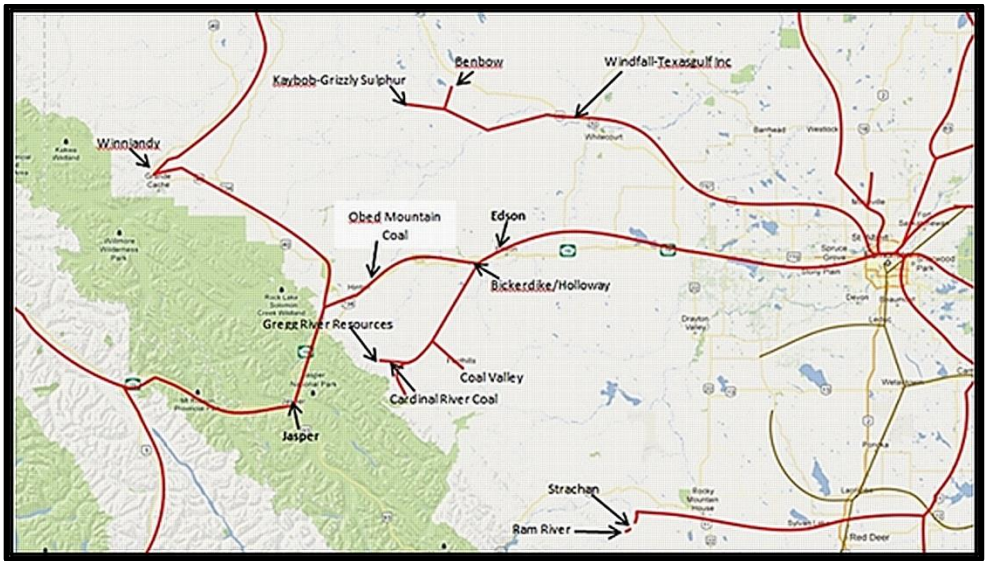


**Figure 11: Coal mines and Sulphur loading points**

## Winniandy – Mile 108.9 Grande Cache Sub (Lot code SN-001, SN-002, etc.)

The first mine that I will discuss is located at Winniandy (**54°00'24.83"N 119°06'21.01"W)** on the Grande Cache sub about 25 miles north of Grande Cache, Alberta. The coal produced from this mine is a high quality metallurgical coal. The mine was originally operated by McIntyre Porcupine Mines Limited (then Smoky River Coal) and shipped coal to Japan via Neptune Terminals in North Vancouver. The trains were operated in 98 car sets that included one double rotary car that was located on the end of the train. This was an important car because without it, either engine, caboose or coal car without a double rotary drawbar would suffer a broken drawbar or yoke when the coal car was turned to unload it. The cars used were 4000 cu ft. gons in the UNPX 100000 series and had a placard placed on the side of the car near the middle with the McIntyre Porcupine Mines Limited name and logo applied.


**Figure 12: UNPX 100259 leased by McIntyre Porcupine Mines Limited at Winniandy**
**Rick Walker photo**

These cars have been renumbered and rebuilt, but can be recognized by the large plate welded over three side panels. I first saw these trains in 1972 while working on a gang in the Fraser canyon at Falls Creek on the Ashcroft Sub. This paint scheme is currently not available from North American Railcar Corporation.

The mine at Winniandy was costly to load at because it required a five man crew from Jasper including two engineers and five dynamic brake, pacesetter equipped locomotives (SD40, SD40-2). Power requirements changed as units increased in horsepower. At least one of the engineers was required to be on duty at all times. One engineer would run from Jasper to Winniandy, and then go to bed; the second engineer would deadhead on the train and then go on duty to load the train. When the train was loaded, one engineer would run the train with three units on the head end and the second engineer would push the train from the tail end from Winniandy to Jasper. In 1975, while working on a ballast dumping gang (cable gang in CN terminology), one crew was required to push a coal train from Winniandy south to Denard because they did not have sufficient power.

The loadout at this mine is very unpredictable and can take more than 10 hours, depending on whether the train was loaded from the stockpile or direct from trucks and cats. The train is run under the loadout on arrival so that the inside of the cars can be inspected. Except for removing the caboose and changing ends with the locomotives, the train was usually not split up.

Eventually this mine was supplied with cars from the general coal car pool that included any and all of the UNPX and CN cars produced by North American Railcar Corporation, although the ex CNHX cars were not used until the contract with Ontario Hydro expired. As discussed further in the section on sulphur, SULX 2000-2359 series cars were used in solid sets to load coal at any mine in Alberta. Whenever trains were loaded for Gary, IN, cars from the US were used and could have been either steel or aluminum.

**Cardinal River Coal – Mile 4.8 Luscar industrial Spur (Lot code LN-001, etc.)**

The second mine was located at mile 4.8 Luscar Industrial Spur, which is near Leyland/Cadomin on the Mountain Park Sub. This mine originally loaded coal destined for Japan in brown CN 199000 series cars in 98 car sets. As with Winniandy, any of the UNPX and CN cars produced by North American Railcar Corporation were used, although the ex CNHX cars were not used until the contract with Ontario Hydro expired.


**Figure 13: CN (ex-Procor) built by Hawker Siddeley**


**Figure 14: North American Railcar – CN (ex-Procor)**
**HO Scale # 11-31006004, N Scale # 11-11006002**

BCNE cars could also be found when not required in BC for the Teck and Quintette mines. As discussed further in the section on sulphur, SULX 2000-2359 series cars were used in solid sets to load coal at any mine in Alberta. These trains were also unloaded at Neptune Terminals in North Vancouver.


**Figure 15: North American Railcar – CN (ex-BC Rail)**
**HO Scale # 11-31003002, N Scale # 11-11003002**

Because of very steep grades, loading at this mine and at Gregg River Resources Ltd, required the trains to be split at Holloway. The first cut would leave with 44 (later 45) cars, three units (SD40, SD40-2) and one caboose. The units required dynamic brakes for the grades and pacesetter for loading. The Edson crew would load the first cut and then wait the arrival of the second cut at Leyland. The second cut would leave Holloway with 54 (later 55) cars, two units and one caboose. The crews would exchange motive power at Leyland so the first cut would leave with two units, 44 loads and a caboose and the second cut would go up to Cardinal River

Mines to load. When finished loading, the crew proceeded back to Holloway with 3 units, 54 loads and a caboose, where they would make up the train with three units, 98 (later 100) loads and a caboose (provided the crew did not run out of time). Without dynamic braking, this coal train would not have run safely. A Jasper crew would take the train to Jasper on the Edson Sub. Once again, a double rotary car was required for unloading, so the crew was responsible to make sure that it was located on the right end of the train.


**Figure 16: North American Railcar – CN (ex-BC Rail) Double Rotary Marked –**
**HO Scale #11-31003003, N Scale #11-11003003**

Spot market sales also saw trains loaded for Roberts Bank, but the loading operation was the same, as were the cars. Operations have changed with SBU's, aluminum cars and higher horsepower locomotives.


**Figure 17: North American Railcar - CN (ex-Ontario Hydro)**
**HO scale # 11-31004001, N scale # 11-11004001**

**Gregg River Resources Ltd – Mile 7.1 Luscar Industrial Spur (Lot code GR-001, etc.)**

This was a similar operation to Cardinal River Coal and the mine closed in the late 1990's. However, Gregg River shipped the majority, if not all, of its coal to Roberts Bank.

**Luscar-Sterco-Coal Valley Mines – Mile 48.5 Foothills Sub (Lot codes, H-001, S-001, Y-001)**

The majority of the coal from this mine was shipped to Ontario in train sets and locomotives paid for by Ontario Hydro. There were typically three 98 car sets of CNHX equipment operating at one time, although sets could be stored if Ontario Hydro did not need the coal. These cars are produced by North American Railcar Corporation, although they are painted in their post-CNHX scheme. Once again a double rotary car is required for each set.

Loading was somewhat different because the grades were not as severe as going to Leyland. The entire train left Edson with four units (F-B-F-B), 98 (later 100) cars and two cabooses. The first crew began loading on arrival and left with two units, 49 (later 50) loads and a caboose. They took the first cut to Holloway and deadheaded home to Edson. The second crew

deadheaded to Coal Valley and finished loading and brought the second cut of two units, 49 (later 50) loads and a caboose to Holloway. There they would make up the train as four units, 98 (later 100) loads and two cabooses and take the train to Edson. There an Edmonton crew would take the train to Edmonton.

The only time other cars were used was if the mine loaded a train to either Neptune Terminals or Roberts Bank. The same loading pattern would be used, but the train would quite often leave with only three units and one caboose. The cars would come from the general coal pool, so any UNPX or CN car, or solid sets of SULX cars could be found in these trains. BCNE cars could also be found when not required in BC for the Teck and Quintette mines.

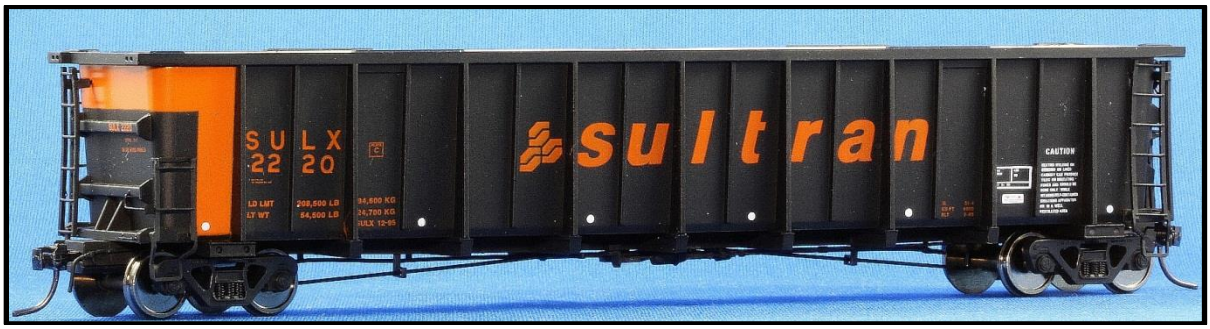


**Figure 18: North American Railcar – SLUX (2 line)**
**HO Scale 11-31005001, N Scale 11-11005001**

**Obed Mountain Coal Co. Ltd. – Mile 172.9 Edson Sub (Lot codes DN-001, DR-001, DT-001)**

This was the newest mine in Alberta, but it produced the poorest coal from a mine that was more than 10 miles from the CN mainline and the loadout.

The cars would come from the general coal pool, so any UNPX or CN car, or solid sets of SULX cars produced by North American Railcar Corporation could be found in these trains. BCNE cars could also be found when not required in BC for the Teck and Quintet mines. A double rotary car was required.

The trains were loaded by Jasper crews and the train was not split for loading. Coal from this loadout went either west or east. Because larger power was in service when the mine opened, the trains typically operated with only two units, back to back.

**BCNE Coal service (Lot codes TR-001, QR-001)**

I will not discuss the operation of coal trains on the BCR to the Teck and Quintette mines, but the BCNE cars (produced by North American Railcar Corporation) were originally used in 98 car sets including a double rotary with a CN caboose. These cars ran as pure sets for a number of years, but they too ended up being used on any steel train set in Alberta and BC as required by CN. These cars are now being used in coke service along with any other type of steel car.

**Coke service**

Most of the remaining steel cars of this design in revenue service are now being used in coke service from Fort McMurray, Lloydminster and Clover Bar to Ridley and other various destinations. Double rotaries are not required, but there are still a few left. As of the summer of 2012, there were two ex CNHX , two CN 196 series and four CN 199 series double rotary cars still in operation. The balance of the cars have been demoted to OCS service, sold or retired.

**Sulphur service**

As large gas plants in Alberta began to accumulate large stockpiles of solid sulphur, the gas companies formed a sulphur marketing group, called Sultran, charged with selling this form of sulphur to the world market. A by-product of the natural gas refining process, the liquid sulphur is either poured into huge blocks or pelletized (prilled) and stored at the gas plant until required by Sultran to fill any sales.

There were/are three sulphur loading gas plants northwest of Edmonton on the Sangudo Sub at Windfall, Benbow and Kaybob. In addition there are two sulphur loading gas plants on the Ram River Sub west of Red Deer near Rocky Mountain House at Ram River and Strachan, and one plant at Bryan Spur on the Foothills Sub southwest of Edson. Each gas plant has/had a flood loader capable of loading 100-104+ car unit trains made up of Sultran's bathtub and 4000 cu ft. gondolas. Loading of an entire train can take as little as 5-6 hours or two days, depending on the loadout at the plant and mechanical breakdowns.


**Figure 19: Procor UNPX 102037 built by Hawker Siddeley in June 1975**


**Figure 20: North American Railcar – Procor UNPX**
**HO Scale # 11-31006001 N Scale # 11-11006001**

Some of the first trains to operate made use of various types of CN owned or leased equipment. UNPX 102000-102299 and UNPX 102300-102599 series 4000 cu ft. rotary coupler equipped cars were used in sets of 82 cars. These cars were painted with the unique Procor sign or with the newer wordmark style of PROCOR printed in large letters across the left side of the car. These cars were taken from the coal pool and most had a lining applied to reduce the corrosive effect of the sulphur. Both of these versions are being produced by North American Railcar Corporation.


**Figure 21: North American Railcar - Procor UNPX (Word Mark) – Built by Marine Industries 1975**
**HO Scale # 11-31006006, N Scale # 11-11006006**

CN also supplied railway owned equipment. There were 105 car sets of three bay hoppers from the 320 series. Many of these cars were later rebuilt and had their hopper doors sprayed with a foam material to reduce leakage and were renumbered into the 327000 series. Cars from the higher-sided, outside ribbed 326000 series cars supplemented these rebuilt cars. CN also owned a quad hopper in the 330000 series that were run in groups of 88 cars.

The reason for the shorter length (5100 ft.) of these trains was the restriction at the Sapperton, BC interchange with CP. Sapperton is just north of the BN yard in New Westminster on CP. Trains to Sultran's facility in Coquitlam had to be interchanged with CP and power and cabooses did not run through. When the siding at Sapperton was lengthened, train length was increased to 104 cars. Trains destined to Vancouver Wharves in North Vancouver were handled on the entire trip by CN crews. Unloading was performed by Vancouver Wharves personnel and had to be coordinated with unloading of potash trains.

Sultran purchased its own fleet of cars to ensure that their product would be able to move to market. Their first cars (SULX 1000-16??) were built to a similar design as the coal fleet of CP and were equipped with rotary couplers. CN and CP shared the use of these cars as requested by Sultran and ran on CN as 82 cars sets until sidings and unloading facilities were lengthened. Many of these cars have been damaged in derailments and have been retired because of twisted frames. These cars are produced by Intermountain and are available in two different paint schemes.

When the sulphur market picked up in the 1980's and CN's older equipment grew closer to retirement, Sultran ordered 4000 cu ft. cars similar to the Procor cars, but with only two ribs on the end. By the time these cars (SULX 2000-2359) arrived the sulphur market had cooled off. However, CN was desperate for equipment to move larger amounts of coal. An agreement was reached with Sultran to use one or two solid 100 car sets of these newer cars to haul coal. One unfortunate drawback was that heating coal damaged the interior liners and had to be re-applied on some cars.


**Figure 22: North American Railcar – SLUX 3 line)**
**HO Scale 11-31005002, N Scale 11-11005002**

For quite some time, the 4000 cu ft. SULX cars have been mixed with the SULX bathtub cars with the only requirement being that the rotary couplers are all oriented the same way. Once CN acquired enough aluminum coal hoppers, many of the steel coal fleet was made available for other lading. In the early 2000's, up until the stock market crash in 2008, CN filled out the sulphur fleet with these excess steel coal cars. It was quite common to find CN 196 (black and brown) and 199 (brown) series cars of various heritage in sulphur service. Not many of these cars received a liner, if any.

Currently, only former UNPX 102 series bathtub gons, now lettered OFOX with the same car number, are being used along with the SULX cars. Sultran acquired a number of ex CP bathtub gons and numbered them in the SULX 3000series.

As the coal business increased, more orders were placed with more than one manufacturer for the 4000 cu ft. coal gondola. As a result there are now many different versions of the same car. As this began to happen, it became more difficult to maintain pure sets of equipment. The lease arrangements also changed and cars had their reporting marks and numbers changed to reflect that. Other than Sultran equipment, the cars that ran as complete sets for the longest period of time were the CNHX cars built for Ontario Hydro service. The balance of the cars was lumped together in a pool so it is possible to find any style and number series in any set of equipment. This fact allows the modeller to purchase a wide variety of the North American Railcar Corporation models to easily build a train longer than 12 cars for either coal or sulphur service, or run shorter cuts of cars to move other commodities such as coke, ties, or sulphur from smaller plants. **Don't forget that coal trains require a double rotary car and make sure the stripes are all oriented the same way throughout the train. Or this will happen!!!**


**Figure 23: Oops**

By Norm Skretting

Norms experience with these cars began in 1972 while working on a gang at Falls Creek, BC on the Ashcroft Sub, in 1974 on a Gang on the Camrose and Alliance Subs and then in 1975 on a gang again, working on the Grande Cache, Edson, Foothills and Mountain Park Subs. His career with CN really began in 1979 as an operator at various stations in Alberta, one of which was Edson. Edson was the away from home terminal for Jasper and Edmonton crews as well as the home terminal for crews working the Alberta Coal Branch. In 1981 he became a Train Dispatcher and worked all of the territory assigned to the Edmonton dispatching office. As he

gained more experience, he was able to work as a Relief Assistant Chief Train Dispatcher, before moving to Montreal Headquarters to work as a Motive Power Controller and in Technological Development from 1986 until 1988. He then returned to Edmonton as an Assistant Chief Train Dispatcher/Manager, Corridor Operations/Manager, crew Utilization and worked as a relief Regional Operations Control Officer. Much of his job as an Operator, Train Dispatcher and Assistant Chief Train Dispatcher involved coordinating the movement of the coal and sulphur sets between the mines and unloading destinations.