

FIELD TRIP GUIDE – IDAHO MUSEUM OF MINING EXCURSION TO NORTHEAST OREGON,  
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Today's focus is on the mining history of northeast Oregon. The field trip begins at Baker City, in the old Baker Mining District, and proceeds in a circular route through the Sumpter, Granite, Greenhorn and Upper Burnt River mining districts. The field trip will end at the junction of the Burnt River Canyon road and Oregon Highway 245, south of Dooley Mountain. Participants will have the opportunity to either proceed down through the Burnt River Canyon to I-84 or over Dooley Mountain back to Baker City.

**FIELD TRIP LOG**

Begin at Geiser – Pollman City Park in Baker City, in front of the Baker Heritage Museum, at the corner of Grove Street and Campbell Street. Proceed west on Campbell Street to stop light, turn left, south, onto Main Street. Proceed south through Baker City through 2 stop lights. At third stop light, continue south (straight) on Highway 7, following the south fork of the Powder upstream, toward Sumpter.

Follow Highway 7 as it leaves Baker City. At about 2.2 Mi, the highway crosses one of the faults that form the south end of Baker Valley; tilted lavas are olivine basalt flows (basalt of Little Catherine Creek). The basalt flows form part of the Powder River Volcanic Field a series of middle and late Miocene lava flows that are slightly younger (about 14 million years in age) than the main sequences of the Columbia River Basalt Group.

At about 3.0 miles, Highway 20 crosses another fault at the mouth of Griffin Gulch on the right. The eastern Oregon gold rush was triggered in 1861 when gold was first discovered on the headwaters of Griffin Gulch.

At about 3.7 miles, the highway enters Bowen Valley. Rounded hills to east are Miocene sediments that conceal older units. High mountains to the west are part of Elkhorn Ridge. Nearly every draw on the east and south flanks of Elkhorn Ridge have produced placer gold.

At about 7.1 Miles, the highway enters a canyon cut through a series of faults. Gravel road to the west (right) at about 8.0 Miles will take you to the old town site of Auburn, a noted placer camp that was the first county seat for Baker. Other than placer tailings, not much remains of Auburn, not even photographs.

Continue right on Highway 7 at intersection at Salisbury Junction at about 9.8 Miles. Paved road to the left is Oregon Highway 245, which leads over Dooley Mountain, the northernmost rhyolite vent in the Lake Owyhee Volcanic Field.

Continue west on Highway 7, following the Powder River upstream, through a canyon cut into olivine basalt flows.

At about 14.4 Miles, the canyon narrows as the highway enters the more resistant older rocks that form the basement. Here the Powder River flows through a large greenstone block that is part of a serpentinite-matrix mélange that is known as the McCully Fork mélange. The mélange is part of the Baker Terrane. The Baker Terrane can be divided into three major subcomponents, the northernmost Bourne subterrane, the more southerly Greenhorn subterrane and the Burnt River Schist, exposed mostly in the east. Rocks in the Bourne subterrane were once part of the floor to an ancient ocean.

At about 15.0 Miles, the canyon widens where the river has cut through the softer serpentinite matrix to the mélange. A mélange is the term that is applied to terrane in which blocks and slabs of dissimilar rocks have been mixed together within a softer matrix such as serpentinite and argillite. Melanges typically weather to form a hummocky landscaped marked by various-sized blocks and pods such as those exposed uphill to the right. Blocks here include greenstone, gabbro, chert, and argillite.

Note the mouth of California Gulch to the right. California Gulch is one of the many gold-bearing streams that drain the Auburn area.

At about 16.1, Highway 7 ascends onto another greenstone block that forms a buttress to Mason Dam. The reservoir, known Phillips Lake, conceals the lower end of Sumpter Valley.

#### **STOP 1 PHILLIPS LAKE BOAT RAMP – MELANGE, BASALT, AND BURIED CHANNEL**

Pull off Highway 7 to the left at about mile 17, following the paved road down to the lower Phillips Lake boat ramp. Park in parking area and proceed along the lakeshore to the east where the mélange that forms part of the Baker Terrane is exposed. The mélange here includes serpentinite, which is a type of rock that formed at great depths below the surface of the earth. Nearby blocks of chert are deep ocean floor sediments composed of microscopic skeletons of diatoms.

Note the small rounded rock that overlies the mélange. These are one of the “buried channel” gravels that are here preserved by one of the younger basalt lava flows. Similar gravels may have been the sources for the rich placers at Auburn, which is located about 5 miles to the south from here. Note also the fractured nature of the mélange matrix. Vertical fractures are favorable places for alluvial gold to accumulate.

Return to Highway 7 and proceed west (left) toward Sumpter.

At about 18 Miles, the entrance to the US Forest Service Phillips Lake Campground appears on the left. Low terrace gravels that are exposed along the highway passes contain a small amount of gold. Locally-enriched zones where streams such as Union Creek have reworked the terrace gravels were extensively placered during the gold rush days. Note the gravel tailings on the right where the highway crosses Union Creek.

At about 22.4 Miles, Highway 7 passes through the town site of McEwen, near the eastern end of the Sumpter Valley dredge field. The Sumpter Valley dredge field extends over an area of about 2,370 acres and results from the combined work of three different dredges between 1913 and 1955. Total production from the three dredges is likely somewhere around 300,000 ounces of gold. The extensive dredge tailings south of McEwen were left by two different dredges, one that operated between 1913 and 1924 and a second that operated between 1935 and 1954. Dredge # 1 was built in Sumpter and began operations in 1913. This early dredge worked downstream to near the present southern depot of the Sumpter Valley Railroad, where it ceased operations in July, 1924. Dredge # 3 was built just below the narrows near where Highway 7 crosses the Sumpter Valley. Dredge # 3 began operations in 1935. Dredging operations stopped in late 1942 due to World War II. Operations resumed in July 1945 and continued until August 1954.

At about 25.7 Miles, turn right off of Highway 7 onto the Sumpter-Granite highway (410). The paved road here crosses bedrock high made up of talc schist. Some chrome was mined from a pit in the talc schist on the old Northey Ranch just north of the road.

Road enters the old mining town of Sumpter at about 26.6 Miles. Sumpter was a well-established mining town with a population at one time of about 3,000 people. The downtown area was largely destroyed during the 1917 fire.

The old mining equipment on the right form part of the privately-owned Cracker Creek Mining Museum. The display includes one of the “doodlebug” dredges that worked further up Cracker Creek.

## **STOP 2 SUMPTER DREDGE STATE PARK**

Turn left into parking area for the Sumpter Dredge State Park. Dredge # 3 forms the heart of the park. The “boat” is a Yuba type bucket line dredge with a wooden hull. In 1954, the last year of operation, the dredge made a “mad dash” from McEwen upstream to where it now sets, in an effort to reach a patch of higher-grade gravels. The dredge company routinely tested gravels before mining. Average grade appeared to have been about \$0.15/yd<sup>3</sup> at \$35.00/oz gold. Dredge # 3 apparently worked ground as poor as \$0.05/yd<sup>3</sup>.

Much of the dredge tailings on the southeast side of Sumpter were left by smaller “doodlebug” dredges that basically consisted of a home-made washing plant on steel pontoons and two draglines. One of the doodlebugs is on display at the Cracker Creek Mining Museum.

A very good description of types of dredge and how they function can be found at this website:

<http://www.nps.history.com/publications/yuch/beckstead/chap3.htm>

The context is dredge mining in Alaska, but the information is applicable to dredges in Idaho.

Proceed upstream (north) through Sumpter on highway 410. This part of the Powder River was worked by Dredge # 2 which began operations in October, 1915. Dredge # 2 first worked upstream to where the

Powder River ends at the confluence of McCully Fork and Cracker Creek and then up Cracker Creek toward Bourne. Dredge # 2 ceased operations in 1923.

Follow the paved road across Cracker Creek at about 27.2 miles. Gravel road on right leads to the old mining camp of Bourne. The mining camp is located in the heart of the Cracker Creek mining district, one of the most important districts in Oregon.

There are two basic types of lode gold mineralization in northeast Oregon., 1) quartz fissure veins, found mostly in the Bourne subterranean and 2) short "pocket" veins found mostly in the Greenhorn subterranean. The most productive mines worked large fissure-veins that formed along the margins of the Late Jurassic – Early Cretaceous granitic intrusions. The fissure veins are typically quartz-filled broken zones that can be traced laterally for hundreds if not thousands of feet. Grades were typically less than 1 oz/ton gold, with appreciably larger amounts of silver. The veins in the Cracker Creek district are some of the largest and most persistent mineralized structures in Oregon, with the largest vein, known as the North Pole – Columbia lode, extending for a distance along strike of more than 5 miles. Total production along the lode is estimated at slightly less than 400,000 ounces.

Proceed left on the paved road and proceed upstream along McCully Fork. The canyon here is eroded *mélange* that has been extensively placered. Dredge tailings along McCully Fork were left by the Consuelo Oregon Mines doodle-bug, which operated between 1938 and 1942. Bench placers to the right were worked by earlier hydraulic mines.

Gravel road on right leads to McCully Fork FS Campground at about 29.8 miles. There are small outcrops of talc-carbonate rock on the right.

Paved road leaves McCully Fork and ascends toward the Baker – Grant county line. Dark-colored exposures in the road cuts on the right are Elkhorn Ridge Argillite, the main unit in the Baker Terrane.

At about 31 miles, road crosses a thin selvage of ultramafic rocks and crosses the margin of the Grays Peak stock.

### **STOP 3 BLUE SPRINGS OVERLOOK AND UPPER HEADWATERS OF THE JOHN DAY RIVER.**

Pull over to the left into wide snow park parking area at the top of the ridge at about 34 miles. The second basic type of gold mineralization in northeast Oregon is the "pocket-type" vein that occurs in hydrothermally-altered serpentinite *mélange* zones. Gold typically occurs with quartz and/or calcite in small, high-grade pockets along shear zones that can be only traced for very short distances. Mineralized zones in the serpentinite are often talc-rich, with the gold sometimes occurring without quartz. Placers downslope from the pocket-type veins typically contain coarser gold than placers downslope of the more persistent veins. Although no pockets have been found in this particular area; some large nuggets have been found in neighboring placer mines on Buck Gulch to the southeast.

At about 35.5 miles, the Sumpter-Granite highway crosses through the old site of Gold Center. Part of this area was worked as a "Hydraulic" mine. Downstream (out of sight) are tailings from one of the first

dredges to operate in northeast Oregon. Although Gold Center was largely a placer camp, there are some hardrock prospects in the vicinity.

At about 37.5 miles, columnar jointed dacite porphyry appear in a road cut to right. The dacite is late Oligocene in age (~33 Ma) and younger than the veins in the Granite and Cracker Creek district. The dacite and related basalt flows in places have buried gold-bearing gravels that were eroded from the older veins. It should be noted however, that in several areas elsewhere in northeast Oregon, the Oligocene dacites are themselves mineralized.

At about 38 miles, road cuts through part of the Grays Peak stock. This is one of the ~ 150 million year old granitic intrusions that were the "heat engines" for the gold veins.

At about 38.9 miles, contorted chert beds on right, part of the Elkhorn Ridge Argillite, the major unit in the Baker Terrane. These are folded radiolarian cherts typically of deep ocean sediments. The radiolarian are microscopic organisms that often live in the open ocean.

At about 41 miles, the highway enters the old settlement of Porterville and the upstream part of the Granite dredge field. Bull Run Creek. Dredge tailings along Bull Run Creek were left by the Porter dredge, which was built at Porterville and began operations in September, 1938. This bucket-line dredge was a Yuba boat somewhat smaller than the Sumpter dredges and was built on steel pontoons instead of a wooden hull. The Porter Dredge operated until 1951. Production from the dredge was likely somewhere in the neighborhood of 50,000 ounces.

At the stop sign at about 42.7, proceed west onto Grant County Road 24 down Granite Creek, which comes in on the right. The old mining town of Granite sits on the hill to the right. Gold was first discovered here on July 4<sup>th</sup>, 1862. Since there was already an Independence, Oregon, the miners were forced to choose another name and settled on "Granite".

Proceed down Granite Creek through dredge tailings.

The road leaves Granite Creek at about mile 44.3 and turns to the southwest, proceeding up Clear Creek. The old townsite of Lawton is located on the bench at the confluence of Clear and Granite Creeks. Lawton was founded in the early 1900's and later abandoned.

Granite Creek was heavily worked by the Porter dredge. Bedrock here is Elkhorn Ridge Argillite.

Bear left at about mile 46.4, continuing up Granite Creek on USFS Road NF-013. Road to the right heads to Olive Lake and the old electrical power plant in Congo Gulch. Mine workings here are part of the old Red Boy Mine. The Red Boy was one of the larger gold producers in the old Greenhorn Mining District, producing about ounces with an average grade of 0.16 ounce per ton. Acid mine waters from the Red Boy and other underground lode mines have been considered to be the major source of zinc in stream waters in this part of the basin.

Road passes the entrance to the old Blackjack Mine to the right at about mile 47.4. Long tunnels such as those on the Blackjack cut mineralized zones in the Elkhorn Ridge Argillite that contain elevated levels of

zinc. Much of the underground work in this area was done during the mining stock speculations of 1903-1907. The Blackjack and adjoin Blue Bird Mines were part of a notorious stock speculation. A stock "specialist" by the name of F. Wallace White executed a scheme in which shares of the Blackjack were promoted based on the acquisition of the neighboring Blue Bird, which he, unknown to his investors, also owned at the time. Mining "plan" was based on a milling "process" designed to handle low-grade ore. Speculators were surprised when the Blue Bird tunnel hit a blind high grade vein that required conventional milling.

At about mile 49 the road crosses the mouth of Beaver Creek, coming in from the left. Continue south up Granite Creek.

At about mile 50 the road passes the confluence of Clear Creek and Olive Creek. Proceed south up Olive Creek toward Greenhorn on NF 1305. The main branch of Clear Creek comes in from the right. The old town of Alamo was located in this area. Not much remains of Alamo.

Proceed up Olive Creek, past Quebec Hill to the right. Quebec Hill is a small Juro-Cretaceous granitic intrusion that is in places mineralized.

Road leaves the dredge field and crosses the contact between the Bourne and Greenhorn subterrane at about mile 51.5. Strata in the northern Bourne subterrane are generally less severely deformed than those in the Greenhorn subterrane, which includes a very large mélange component. As a rule, gold prospects in the Greenhorn subterrane followed more pockety, discontinuous quartz veins and shear zones. Associated placer deposits typically contained larger nuggets than placer deposits associated with the larger veins in the Bourne subterrane.

Old terraces gravels on the west side of Olive Creek were worked by extensive hydraulic placers.

High point to left is Olive Butte, an Oligocene dacite complex that appears to be a shallow, subvolcanic intrusive probably similar in age to the late Oligocene dacite on Bull Run Creek.

#### **STOP 4 FOLDED CHERTS ION THE GREENHORN SUBTERRANE**

Bedded cherts are exposed along the road for about ½ mile at about mile 52.4. Cherts are folded along two fold axis and are locally interleaved with pillow basalts. Units are part of the Greenhorn subterrane. The bedded cherts contain Permian radiolarian.

At about mile 52.6 the road crosses the mouth of McWillis Gulch. There are rumors that large gold nuggets were found here during the early days. The Pyx Mine, which is located further up McWillis Gulch, was last active in the late 1980's. There are no good production records on the Pyx. There is some suspicion that the mine produced some gold that was smuggled into Mexico in the 1950's.

Mile 53.4 Road proceeds through series of pillow basalt that interpreted as old oceanic island crust.

Mile 53.7 Small Juro-Cretaceous granitic intrusion is exposed along road at Tone Springs.

Mile 54.2 The NF 1305 road enters St Lou flat. Area here is underlain by old Tertiary conglomerate that has been extensively placered. Tertiary gravels in this area contain the fossilized tree fern *Tempskya*, which is highly prized by rock hounds.

Turn right onto NF 1042 at about mile 54.5 and proceed west toward the old town of Greenhorn. Serpentine-matrix mélange of the Greenhorn subterranean is exposed along the road to the left. Large resistant blocks are mélange "knockers" of harder rock that are encased in a serpentine-matrix.

#### STOP 6 GREENHORN

mile 56.1 Greenhorn was established in the early 1990s' after publication of "The Gold Belt of the Blue Mountains of Eastern Oregon" in the 22<sup>nd</sup> Annual Report by the USGS (Lindgren, 1901). The first town of Greenhorn was located more than 5 miles to the west, on the other side of Vinegar Hill and was at the center of an old silver district described by Lindgren. The "new" town of Greenhorn was located in what Lindgren described as the Robinsonville district. Lode mines here are best described as "pocket" mines that exploited small, high-grade gold shoots on small, discontinuous veins and shear zones.

Return to intersection of NF 1042 and NG 1305 and proceed southeast on the Greenhorn Road at about mile 57.7.

The Greenhorn Road passes through outcrops of Eocene basalt flows at mile 58.0. The lava flows are about 40-45 million years old and in places overlie older gold-bearing Tertiary gravel deposits.

#### STOP 6 SERPENTINITE-MATRIX MELANGE at about mile 59.1.

Turn left and proceed down the North Fork of the Burnt River which comes in on the left at about mile 59.7. The river here has cut into and in places through a sequence of Tertiary volcanoclastic deposits that overlie the basalt flows and are part of the Clarno Formation.

Mile 62.2 Road cut exposes overlying andesite lavas of the Strawberry Volcanics. Platy andesite flow here overlies part of the ~16 Ma Dinner Creek Tuff, which fills a channel cut into older Clarno Formation strata. New work by Dr. David Gaylord and students at Washington State University indicate that this part of the older volcanic sequence contains 40-45 Ma mafic lava flows. Mafic lava flows at the base of the Clarno overlie gold-bearing Tertiary gravels exposed in several drainages coming in from the north.

#### STOP 7 VOLCANIC DEPOSITS and Leaf Fossils.

Mile 65.9 Continue down the North Fork and proceed left onto Highway 7 at the stop sign. Bed of North Fork here was worked by the Sunshine Mining Company dredge in the 1940's.

Mile 68.5 Highway 7 cuts through outcrop of Dinner Creek Tuff overlying older Clarno Formation volcanoclastic deposits. Terrace gravels on the north side of the highway produced a small amount of platinum in addition to gold.

Turn right onto the North Fork Burnt River road (529) at Mile 70.4 and proceed through the old town of Whitney through Whitney Valley, following the North Fork of the Burnt River. The road cross Camp

Creek at about mile 71.1. Headwaters of Camp Creek was a noted placer district. Lindgren reports that a \$2,000 nugget was supposedly found on Camp Creek in the early days. Various legends recount how a "Chinaman" found a large nugget, bundled it up in a sack and headed out of camp. One story claims that he was later found down the road nursing a sore head and holding an empty sack.

The north Fork enters a canyon at about mile 72.3 that is carved into the older volcanoclastic deposits of the Clarno Formation. Several Washington State University students working with Dr. David Gaylord have been working on this section of rocks.

The North Fork of the Burnt River emerges from the canyon at about mile 77.8. Dinner Creek Tuff and overlying mafic flows exposed along the river here. Proceed through the intersection onto the Whitney Road and continue south.

The Whitney road swings north of the Burnt River, which here begins to cut through an early Miocene volcanic complex centered on Unity Reservoir. Center includes small ash-flow tuffs and dacite and rhyolite lava flows that were erupted before the large Columbia River Basalt eruptions.

Road crosses old alluvial fan deposits and lake beds at about mile 81.0. This may be part of a sequence that formed the north shoreline to late Miocene Lake Idaho. This area needs a lot of new work.

Turn right at about mile 86.8 onto Highway 245 and proceed east down Burnt River. Bull Run and Rastus Mountains are visible to the south. Bull Run Mountain is a slice of peridotite that marks the southernmost extent of the Greenhorn subterrane. Rastus Mountain is made up of younger Triassic and Jurassic sandstones that form part of the Olds Ferry Terrane. The pre-Tertiary rocks here are intruded by a series of late Oligocene porphyritic intrusions that are heavily mineralized with porphyry and skarn deposits.

The Burnt River flows east, following a major east-west trending fault zone that separates the Baker Terrane in the north from the Olds Ferry Terrane in the south. Baker Terrane rocks to the north are part of the Burnt River Schist

Town of Hereford at about Mile 92.1. Continue east on highway 245.

Highway 245 crosses the mouth of Brannan Gulch at about mile 97.1 and the mouth of Pine Creek at about mile 99. Both were productive gold placers.

Placer mines extend from the mouth of Pine Creek north for more than 3 miles. Upper part of Pine Creek will be featured in next year's "Gold Rush" television series. The old High Bar placer mine worked gold-bearing gravels in the upper part of the alluvial fan gravels west of the modern Pine Creek channel. Mining is challenging. Previous operators have at times delved too far into underlying volcanic-rich gravels that for the most part unproductive. This area is noted for large gold and gold-quartz nuggets. Several of the larger gold-bearing quartz pieces now on display at the US Bank in Baker City came from the old Johnny Wyant placers on Pine Creek. Individual pieces contain more than 15 ounces of gold.

Although large gold-quartz specimens have been found in placer mines on both sides of the ridge that separates Burnt River from the South Fork of the Powder River, there are no records of any gold being recovered from lode mines in the upland exposures of Burnt River Schist. The Burnt River Schist unit includes ultramaic-matrix mélangé slabs that are interleaved with chert/argillite with limestone pods. The mélangé matrix in places is a talc-schist. Greenstone blocks in the mélangé and chert-argillite slices are locally cut by short quartz veins. Narrow quartz-carbonate veins in talc have been found in places. Sources for the larger gold-quartz pieces were likely eroded from pockets along the quartz-carbonate veins.

Continue west on Highway 245 to junction with Burnt River Canyon road at about mile 103. Field trip official ends at this point. Option of continuing east through the Burnt River Canyon to reach I-84 at Durkee, following the road guide for the 2014 field trip or heading north over Dooley Mountain back to Baker, retracing the 2014 field trip.