5. **SOILS**

5.1 **Introduction**

The overall Pebble Project study area within the Bristol Bay region comprises both a mine study area and a transportation corridor study area (EBD Figure 5-1). The soils study for this area had one main component: to gain an understanding of the general types of soils that occur within the area.

The objectives of the Bristol Bay Region soils study included:

- Review historical soils data from the region to determine the typical and common soil types occurring in the overall study area.
- Summarize the soil map unit descriptions provided by the *Exploratory Soil Survey of Alaska* (ESS) (Rieger et al., 1979) for the overall study area.

5.2 **Results and Discussion**

The study area was glaciated during the Pleistocene and is in relatively close proximity to several active volcanoes in the Alaska Range. The soil parent materials are influenced by volcanic ash and the nearest source is Augustine Volcano, about 70 miles southeast of the study area.

A comprehensive literature review provided information on existing soil survey coverage for the study area. It also provided information relative to properties of volcanic-ash derived soils in Alaska.

The study area is covered by the broad-scale *Exploratory Soil Survey of Alaska* (ESS) (Rieger et al., 1979). Soil investigations are also available for the village of Nondalton (Hinton and Neubauer, 1965) and for Chisik Island (Clark and Ping, 1995). Both of these areas are near or within the Pebble Project study area.

The three existing publications describe the prevalent soil types in or near the study area and indicate that many of the soils in the study area are influenced to some degree by volcanic ash within the parent materials. The ESS classifies the dominant soils of the area as typic cryandepts and describes their ash-influenced, or andic, properties. The Nondalton and Chisik Island soil investigations also describe similar ash-influenced soils. Each of these publications provides soil classification terminology based on the version of *Soil Taxonomy* (USDA, 1999) current at the time of publication. The soil descriptions and data presented were used to determine how the earlier soil classifications would translate to the 2006 classification system (Soil Survey Staff, 2006).
5.3 References


The map is a broad-based inventory of soils and nonsoil areas that occur in a repeatable pattern on the landscape and that can be cartographically shown at the 1:1,000,000 scale. These data compiled in 1971 by the U.S Department of Agriculture, Soil Conservation Service, and cooperating agencies.

NOTES:
Based on Exploratory Soil Survey of Alaska, Sheet Number 19 (USDA SCS, 1979). The map is a broad-based inventory of soils and nonsoil areas that occur in a repeatable pattern on the landscape and that can be cartographically shown at the 1:1,000,000 scale.

These data compiled in 1971 by the U.S Department of Agriculture, Soil Conservation Service, and cooperating agencies.

### Study Areas

<table>
<thead>
<tr>
<th>Study Area Code</th>
<th>Description</th>
<th>Landform</th>
<th>Total Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>HY4</td>
<td>Pergelic Cryofibrists, nearly level association</td>
<td>Broad, nearly level, wet lowland near large lakes and coastal areas.</td>
<td>193,227</td>
</tr>
<tr>
<td>IA7</td>
<td>Typic Cryandepts, very gravelly, nearly level to rolling-Pergelic Cryofibrists, nearly level association</td>
<td>Rolling plains bordering lakes, active and inactive streams, upland beaches, hilly terminal moraines, and glacial outwash plains.</td>
<td>105,227</td>
</tr>
<tr>
<td>IA9</td>
<td>Typic Cryandepts, very gravelly, hilly to steep association</td>
<td>Rolling plains bordering lakes, active and inactive streams, upland beaches, hilly terminal moraines, and glacial outwash plains.</td>
<td>154,723</td>
</tr>
<tr>
<td>RM1</td>
<td>Rough mountainous land</td>
<td>Steep rocky slopes, ice fields, and glaciers.</td>
<td>3,463</td>
</tr>
<tr>
<td>HY4</td>
<td>Pergelic Cryofibrists, nearly level association</td>
<td>Broad, nearly level, wet lowland near large lakes and coastal areas.</td>
<td>14,384</td>
</tr>
<tr>
<td>IA11</td>
<td>Typic Cryandepts, very gravelly, hilly to steep-Rough mountainous land association</td>
<td>Steep mountainous areas, dissected by streams and braided rivers, glacier fed.</td>
<td>73,944</td>
</tr>
<tr>
<td>IA7</td>
<td>Typic Cryandepts, very gravelly, nearly level to rolling-Pergelic Cryofibrists, nearly level association</td>
<td>Rolling plains bordering lakes, active and inactive streams, upland beaches, hilly terminal moraines, and glacial outwash plains.</td>
<td>155,145</td>
</tr>
<tr>
<td>IA9</td>
<td>Typic Cryandepts, very gravelly, hilly to steep association</td>
<td>Rolling plains bordering lakes, active and inactive streams, upland beaches, hilly terminal moraines, and glacial outwash plains.</td>
<td>13,145</td>
</tr>
<tr>
<td>RM1</td>
<td>Rough mountainous land</td>
<td>Steep rocky slopes, ice fields, and glaciers.</td>
<td>73,944</td>
</tr>
<tr>
<td>SO11</td>
<td>Humic Cryorthods, very gravelly, hilly to steep-Pergelic Cryofibrists, nearly level association</td>
<td>Mountain foot slopes and moraine hills, small streams, sloping valleys, and nearly level muskegs.</td>
<td>72,458</td>
</tr>
</tbody>
</table>

**Grand Total:** 918,101 Acres by Drainage

**Legend:**
- **General Deposit Location**
- **Bristol Bay/Cook Inlet Drainage Divide**
- **Study Areas**
  - HY4: Pergelic Cryofibrists, nearly level
  - IA11: Typic Cryandepts, very gravelly, hilly to steep-Rough mountainous land association
  - IA7: Cryandepts, very gravelly, nearly level to rolling-Pergelic Cryofibrists, nearly level association
  - IA9: Typic Cryandepts, very gravelly, hilly to steep association
  - RM1: Rough mountainous land
  - SO11: Humic Cryorthods, very gravelly, hilly to steep-Pergelic Cryofibrists, nearly level association

**Transportation Corridor Study Area**
- HY4: Pergelic Cryofibrists, nearly level association
- IA7: Typic Cryandepts, very gravelly, nearly level to rolling-Pergelic Cryofibrists, nearly level association
- IA9: Typic Cryandepts, very gravelly, hilly to steep association
- RM1: Rough mountainous land
- SO11: Humic Cryorthods, very gravelly, hilly to steep-Pergelic Cryofibrists, nearly level association