2011 MAYTOWN SAND AND GRAVEL
GROUNDWATER AND SURFACE WATER
MONITORING PLAN

January 18, 2011
Revised March 17, 2011
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MONITORING PLAN

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1.0 INTRODUCTION

This 2011 Maytown Sand and Gravel Groundwater and Surface Water Monitoring Plan (2011 Plan) was prepared in response to the 5-Year Review of the Special Use Permit ("SUP," Thurston County Hearing Examiner, 2005) conducted in December 2010.

The 2011 Plan reflects integration of the 2005 Groundwater Monitoring Plan ("2005 Plan;" Pacific Groundwater Group, 2005), Conditions of the 2005 MDNS and SUP, the site Stormwater Pollution Prevention Plan (SWPPP, Ecological Land Services, 2007), and new monitoring requirements imposed by Thurston County (County). It consists of the following three programs (see Table 1 for details):

- Groundwater and Surface Water
- NPDES/SWPPP
- Off-site Well Inventory

The NPDES/SWPPP and Off-Site Well Inventory programs are unchanged from the 2005 Plan. The Groundwater and Surface Water Program is a combination of the 2005 "perimeter" program, and new requirements imposed by the County. The purpose of this document is to outline the monitoring programs in a manner that clearly specifies sample frequency, sample locations, field and laboratory analytes, and reporting requirements. See Table 1 for monitoring goals.

2.0 GROUNDWATER AND SURFACE WATER MONITORING PROGRAM

Groundwater and Surface Water Monitoring is based on the 2005 Perimeter Program for water level and temperature, and additional monitoring required by the County.

2.1 MONITORING STATIONS

The Groundwater and Surface Water Monitoring Program requires sampling at 17 stations as identified in Tables 1 and 2. These are the same 17 stations identified in the 2005 Plan and MDNS/SUP Conditions. Twelve of the stations are wells, four are existing surface water stations, and one is a future surface water station (G-1) that is intended to monitor gravel mine stormwater and process water. This last station (G-1) is not yet constructed and will be sampled when stormwater or process water fills the pond.

Tables 1 and 2 identify each station by type and the primary monitoring purpose. Station locations are presented in Figure 1. These stations will serve as monitoring points during background and pre-mining through post-mine closure (post-closure) periods, but some changes to the stations are anticipated as described further in this plan.

As described in the 2005 Plan, monitoring wells MT05, MT06, MT08, and MT10 are located within future pits and will be destroyed in the process of mining. Monitoring at these stations will be discontinued when these wells can no longer function due to min-
ing. Maytown Sand and Gravel will notify the County in writing at least 30 days prior to
decommissioning these wells in accordance with state laws.

The operator may petition the County for a reduction in the number of stations used in fo-
reground-monitoring during mining and post-closure. The petition shall include the basis
for reduction. The purpose of foreground-water quality monitoring during mining and
post-closure is detection of water quality effects from mining, and so Stations that are in
upgradient and side-gradient locations are not subject to water quality effects –
thus those stations are candidates for deletion. The petition shall include an evaluation
prepared by a hydrogeologist of whether the wells proposed for discontinued monitoring
are in upgradient or side-gradient locations. Nonetheless, it may be in the operator’s in-
terest to monitor upgradient and side-gradient stations.

2.2 MONITORING PERSONNEL

Professional personnel or trained on-site personnel will perform the Groundwater and
Surface Water Monitoring Program. If on-site personnel are used, an environmental pro-
fessional experienced in groundwater sampling will train and approve on-site field per-
sonnel as necessary and will remain knowledgeable of the field program.

The County Health Department may come on site to inspect sampling protocols and pro-
cedures, and to collect their own samples during normal working hours throughout the
life of the gravel mine and into post-closure. The County shall provide 10 days advanced
notice if possible, including a sampling and analysis plan if samples are intended, and
will be equipped with all necessary safety equipment and follow all safety protocols. The
County shall pay for analysis of its samples. County personnel must sign in at the front
office.

2.3 MONITORING PARAMETERS

2.3.1 Perimeter (Water Level and Temperature)

Manual Measurements

The time, date, measuring point, depth-to-water or stage, and water temperature will be
recorded at each Groundwater and Surface Water Monitoring station identified in Tables
1 and 2, along with the name of the person making the measurement. Also, related mine-
activity data will be recorded in field notes to assist in the reporting discussed below.

Measuring depth-to-water in the wells will require the use of an electric water level
sounder. Stage height at the gaging stations will require a hand tape. Measurements will
be made relative to a surveyed “measuring point.” At station WETA-1, the height of wa-
ter above or below the measuring point is read from the staff gage.

Manual temperature measurements will be made with a hand-held, remote-reading,
down-hole thermometer. The thermometer will be lowered into water in the well and the
temperature of the groundwater will be read off the hand-held meter and recorded in field
notes. In the event that the thermometer will not reach the water, a bailer will be used to
collect water and the water temperature will be measured in the bailer. The wells will not be purged prior to temperature measurement.

**Data Logger Measurements**

The operator may choose to deploy data loggers at any of the monitoring stations. At stations where data loggers are used, the operator has the option to reduce manual monitoring and download frequency to semi-annual.

Data loggers will be calibrated to water level and temperature at the factory prior to installation. Loggers shall have a water level range of approximately 5 pounds per square inch. Data acquisition frequency will be hourly. An on-site barometer shall also be established if non-vented transducers are used (as recommended). Near-simultaneous logger and manual water level and temperature measurements will be made upon installation of the data loggers and during each download to allow calculation of groundwater elevation, and to correct for drift.

Loggers will be downloaded at least semi-annually. Failure of loggers to collect data within the periods between downloads shall not cause the program to be out of compliance with this Plan. Failed loggers shall be reprogrammed, replaced, or repowered within a reasonable time following discovery of the failure and downloaded within one month after resolution of the failed logger; or measurements shall revert to the manual schedule (6/yr).

### 2.3.2 Additional County Required Monitoring

Because the site had a history of previous manufacturing contamination, extensive background water quality parameters were required by the Environmental Health Department. Sampling for those background parameters was completed by Maytown Sand and Gravel in 2010. In addition, (The Environmental Health Department (EHD) under the authority of the County Mineral Extraction Code (Title 17.20—)), requires/allow water quality parameters to be monitored over time at county gravel mines. Based on a-file research of county gravel mine in January of 2011 (Planning Department files), the Board of Review of monitoring requirements at other mines performed by County staff (Maytown Sand and Gravel Mine) will monitor for a set of parameters used at other County gravel mines with some modifications for this site. (Same site. Different requirements.)

Because the MSG site had a history of previous demolitions manufacturing contamination, extensive background water quality parameters were required by the Environmental Health Department to discern ‘background conditions’ and identify any potential water quality problems in the 2008 SUP-approved monitoring network.

Maytown Sand and Gravel argued that because no water quality concerns were found in the 2010 comprehensive background sampling (all analytical results were well below the drinking water standards) coupled with the prohibitive analytical costs, that it monitor for indicators and general water quality states capable of identifying petroleum impacts from actual gravel mine operations. EHD approved this argument followed current practices at other county permitted gravel mines. Therefore, Maytown Sand and Gravel will continue monitoring background in 2011 for water quality indicators and petroleum source as outlined in Table 1 and 2, as follows:
extensive. As approved by the County Hydrogeologist, the suite of Water quality monitoring parameters are different for the 2010 background samples than for 2011 and later samples and foreground periods. The 2010 background monitoring parameters thus consisted of a broad suite of general geochemical and pollution-identification parameters (Tables 1 and 2). Beginning in 2011, the foreground monitoring parameters (2011 and onward, Tables 1 and 2) are a focused suite of parameters used at other County gravel mines, with some modifications for this site, including.

Foreground water quality analysis parameters will include the following (as listed in Tables 1 and 2):

- Field parameters (water level, temperature, specific conductance, pH, turbidity)
- Total Dissolved Solids (TDS)
- Diesel-range petroleum hydrocarbons (TPH-Dx)
- Benzene, Toluene, Ethylbenzene, Xylenes (BTEX)
- Dissolved iron and manganese

TDS will indicate changes in the sum of all dissolved solids. TPH-Dx and BTEX will monitor for releases of fuel; however, note that the 2005 SEPA analyses assessed significant adverse impacts to the environment and did not consider releases of fuels to be a significant risk. Thus SEPA did not require monitoring for fuel constituents (or any of the Additional 2010 parameters). Risks to groundwater quality have not changed since 2005.

2.4 SAMPLING PROTOCOL

The time, date, and static depth-to-water or stage will be recorded at each monitoring station, along with the name of the person making the measurement as described in Section 2.3.1. Water quality meters shall be calibrated at least daily for pH, specific conductance, and turbidity.

Wells will be purged prior to sampling. PP02 and PP04 will be purged and sampled using submersible pumps installed in the wells and dedicated discharge lines. The remaining wells will be purged and sampled using portable submersible pumps or peristaltic pumps and dedicated or new tubing. The type of pump used at each station will be recorded in the field notes. Low-flow sampling methods will be used in the MT wells, PP08, and PP10 to minimize drawdown and turbidity. For low-flow sampling, pumping rates should not exceed approximately 1 liter per minute. Purge water will be discharged to ground near the wellheads.

Field parameters pH, specific conductance, turbidity, and temperature will be monitored and recorded during well purging for stabilization. However, groundwater sample collection may commence prior to reaching stabilization if five well casing volumes have been purged.

1 This protocol is consistent with the Sampling and Analysis Plan developed for the site RI/FS.
Surface water stations will not be purged prior to sampling. Peristaltic pumps and dedicated or new tubing will be used to collect surface water samples. Field parameters pH, specific conductance, turbidity, and temperature will be measured and recorded at the time of surface water sample collection.

During sample collection, field personnel shall wear clean, disposable gloves. Samples for dissolved metals analyses may be field filtered (0.45 micron filters) or lab filtered. Water quality samples will be collected in laboratory-provided bottles preserved in compliance with analytical methods.

2.5 MONITORING SCHEDULE

There are two different monitoring schedules under this program depending on the parameter being measured, as described in the following subsections.

2.5.1 Perimeter (Water level and Temperature)

Manual water level and temperature measurements will be made in alternate months (6/yr, Table 2). Data logger water level and temperature measurements will be recorded hourly if loggers are used. Data logger records will be downloaded at least semi-annually and manual measurements in stations instrumented with data loggers may be reduced to semi-annual. This schedule shall apply for both background and foreground/pre-mining through post-closure periods.
Status of Background Monitoring

At least one year of water level and temperature data has been collected in the 16 monitoring program stations where background is possible, and many stations have much more than one year of background data. Background cannot be measured in the process water pond (station G-1). Therefore, as approved by the Environmental Health Department County Hydrogeologist, current water level and temperature data meet the minimum background requirements for Perimeter monitoring in order to commence mining.

2.5.2 Additional County Required Monitoring

Samples at all available stations (Table 2) were collected twice in 2010 for comprehensive background parameters as requested by the Environmental Health Department (EH) County Hydrogeologist (Memo from County Hydrogeologist, N. Romero, February 2010).

In 2011, samples at all available stations (Table 2) and shall be collected quarterly (4/yr for quarterly sampling events rounds) in 2011 and 2012 for foreground parameters listed in Section 2.3.2 and summarized in Tables 1 and 2. Following the four quarterly sampling events rounds in 2011, continued background water quality sampling under this program sampling for Additional County Required Monitoring will be delayed until mining commences. During the first year of mining operations, samples at all available monitoring stations shall again be collected quarterly (four quarterly sampling events rounds) for parameters listed in Section 2.3.2 and summarized in Tables 1 and 2.

If mining were to commence in 2011 or the first quarter of 2012, then eight quarterly water quality monitoring events rounds shall occur without a time gap interruption.

The rationale for allowing the quarterly sampling background data ‘time gap’ is to accommodate uncertainty in the mining start date by providing for the collection of additional pre-mining data and data upon mining startup. Without requiring more two years of quarterly monitoring on all areas with current ambient water quality as part of prior to mining activities and that it is coupled with earlier pre-mining water quality per 2005 approved SUP conditions.

Starting in 2013 the second year of mining, all stations except the NPDES/SWPPP stations (for NPDES/SWPPP parameters) shall reduce to semi-annual (2/yr) unless the County informs the operator in writing that quarterly monitoring must be retained based on a potential threat to off-site well water quality that is evident in the data and that would not be adequately monitored by semi-annual sampling. In such a case, the County shall cite its legal authority to require deviation from this Plan. The NPDES/SWPPP stations shall remain on their NPDES/SWPPP schedule (Table 2), which for wells is quarterly sampling.

Status of Background Monitoring

A complete set of background water quality parameters was collected in 2010 from all available stations and the data were provided to the County. Therefore, as approved by
the Environmental Health Department (EH) County Hydrogeologist, current water quality data meet the minimum background requirements. Post-mining data may also be considered background if it is unaffected by mining. Such an evaluation shall be made on a parameter-by-parameter basis.

2.6 DATA MANAGEMENT

One copy of data collection forms (or copy of field notebook) will be kept on file at the site or the operator's corporate office. The owner and/or their consultants will enter the data into a computer database which will record the date, time, person, depth-to-water, and water temperature at each station.

Data logger records will be imported into and managed in a database within 60 days of retrieval.

2.7 REPORTING

Groundwater and Surface Water Monitoring data will be reported by the owner in Data Reports and Interpretive Reports. Copies of the most recent Data Reports and Interpretive Reports shall be kept on file at the site and available for a site inspection by the County.

2.7.1 Data Reports

Data reports will consist of:

- A cover letter summarizing data quality review and calling attention to data outliers that could indicate the need for follow up prior to the next regular sampling event, and recommendations for that follow up.
- Copies of water quality lab reports.
- Tables summarizing water level and temperature data collected since the previous data report was submitted.

Data reports will be submitted to the County, Department of Ecology, and Department of Fish and Wildlife within 90 days of receipt of the laboratory analytical data. Since water quality sampling is quarterly and then semi-annual, data reports will also be quarterly, then semi-annual.

To meet the requirements of SUPT 020612 Findings, Conclusions, and Decision – Condition V, entire data reports, or summary tables of data, will be submitted to off-site private well owners whose wells were inventoried. PGG’s opinion is that a more effective means of communicating with the public should be adopted such as submitting the Interpretive Reports (see below). However, until authorized by the County to do so, data reports will continue to be submitted to off-site private well owners.
2.7.2 Interpretive Reports

The owner will summarize the mining and water monitoring activity in Interpretive Reports to the County every two years². The Interpretive Report will include:

- A map or statement indicating the extent of aggregate extraction (below the water table) at the beginning and end of the two-year period
- The depth of each pit below the water table, if applicable
- A summary of water use during the two-year period
- Plots of water levels and temperature over time for the entire period of record
- A groundwater elevation and flow direction map or maps.
- A summary of field and laboratory analytical results
- Comments on mine activities or the monitoring program pertinent to interpretation of the data

A licensed hydrogeologist will generate or review the Interpretive Reports and comment on the program at this two-year interval. Interpretive reports will be submitted to the County in alternate years. A copy of the Interpretive Reports will be on-file at the facility and available for a site inspection by the County.

3.0 NPDES/SWPPP MONITORING PROGRAM

The NPDES/SWPPP monitoring program is a requirement of MDNS Condition 6C and the Stormwater Pollution Prevention Plan (SWPPP, Ecological Land Services, 2007). In the 2005 Monitoring Plan, this program was identified as “Water Quality Monitoring for the NPDES General Permit.” However, the NPDES General Permit alone does not require groundwater monitoring. Therefore, the monitoring program name has been changed to NPDES/SWPPP Monitoring Program to avoid confusion.

The following discussion is intended to summarize the NPDES/SWPPP monitoring program and be consistent with the SWPPP. Any substantive difference between this 2011 Plan and the SWPPP shall be resolved in favor of the SWPPP. The SWPPP may be updated from time to time and changes should reflect the scope of groundwater and surface water monitoring reflected in this Plan or alterations thereto. This discussion focuses on groundwater and surface water monitoring required by the SWPPP and is not designed to be comprehensive. For example, inspection requirements of the SWPPP are not addressed in this 2011 Plan. In addition to requiring groundwater monitoring, the SWPPP is designed to fulfill monitoring requirements of the NPDES General Permit for Sand and Gravel. The SWPPP Monitoring Plan is presented in Appendix B.

Also note that the NPDES/SWPPP parameters are a subset of parameters required under the Groundwater and Surface Water Monitoring Program (Section 2). This section describes the NPDES/SWPPP program only and does not diminish other monitoring requirements.

² The first Summary Report was submitted to the County on December 30, 2009.
3.1 MONITORING STATIONS

Three wells and the process water pond to be constructed as required (four stations) will be monitored for water quality changes that could impair the water quality of downgradient off-site supply wells. In addition, the 2005 Plan specifies monitoring of stormwater collection areas if they are not connected to the infiltration pond. The SWPPP wells and future pond location are presented in Figure 1.

3.2 MONITORING PERSONNEL

Professional personnel or trained on-site personnel will perform the NPDES/SWPPP monitoring program. If on-site personnel are used, an environmental professional experienced in groundwater sampling will train and approve on-site field personnel as necessary and will remain knowledgeable of the field program.

3.3 MONITORING PARAMETERS

Monitoring parameters are different for the SWPPP wells (MT13, PP02, PP04) and the process water pond (G-1). For the SWPPP wells, field parameters pH, specific conductance, turbidity, and temperature will be monitored and recorded during well purging for stabilization. Samples will be analyzed by a Washington-state certified laboratory for dissolved iron and manganese.

After the process water pond (G-1) has been constructed and contains stormwater or process water, the pond will be visually inspected daily for oil sheen on any day equipment is operating. Once it is constructed and contains stormwater or process water, the pond will also be monitored monthly for pH.

3.4 SAMPLING PROTOCOL

The time, date, and static depth-to-water or stage will be recorded at each monitoring station, along with the name of the person making the measurement. Measuring depth-to-water in the wells will require the use of an electric water level sounder. Stage height in the process water pond will require a hand tape. Measurements will be made relative to a surveyed “measuring point.” Water quality meters shall be calibrated at least daily for pH, specific conductance, and turbidity.

Wells will be purged prior to sampling. PP02 and PP04 will be purged and sampled using submersible pumps installed in the wells and dedicated discharge lines. MT13 will be purged and sampled using a peristaltic pump or small submersible pump and dedicated or new tubing. Pump equipment used at each station during sampling will be recorded in the field notes. Low-flow sampling methods will be used at MT13 to minimize drawdown and turbidity. For low-flow sampling, pumping rates should not exceed approximately 1 liter per minute.

Field parameters pH, specific conductance, turbidity, and temperature will be monitored and recorded during well purging for stabilization. However, groundwater sample collec-
tion may commence prior to reaching stabilization if five well casing volumes have been purged.

During water quality sample collection, field personnel shall wear clean, disposable gloves. Samples for dissolved metals analyses may be field filtered (0.45 micron filters) or lab filtered. Water quality samples will be collected in laboratory-provided bottles.

Surface water station G-1 will not be purged prior to sampling. The pH measurement may be made directly in the pond or a grab sampler will be used to collect water and pH will be measured in the sampler. The method used to obtain the field measurement (direct or sampler) shall be recorded in field notes.

### 3.5 MONITORING SCHEDULE

The SWPPP wells MT13, PP02, and PP04 will be monitored quarterly (4/yr).

After the process water pond (G-1) has been constructed, and when stormwater or process water is present, the pond will be visually inspected daily for oil sheen on any day equipment is operating. When stormwater or process water is present, the pond will also be monitored monthly for pH.

*After mining commences, foreground-monitoring will continue during periods of gravel-mine inactivity, unless approved otherwise by the County.*

### Status of Background Monitoring

There are no background monitoring requirements in the General Permit and the 2005 Plan only specifies that NPDES/SWPPP monitoring will begin prior to mining.

Background NPDES/SWPPP monitoring was performed in the three wells in the second, third, and fourth quarters of 2010. Thus, background monitoring requirements have been met for the NPDES/SWPPP program. Nonetheless, at least one additional background round shall be collected in the first quarter of 2011, making one year of pre-mining data available. At that time background monitoring may cease. The process water pond will be constructed as required and will not contain process water or stormwater until the operator begins processing aggregate; therefore there can be no “background monitoring” of station G-1.

### 3.6 DATA MANAGEMENT

Analytical data associated with wells MT13, PP02, and PP04 under the NPDES/SWPPP Program will be provided by the analytical lab in lab reports and electronic deliverables to the owner and/or their consultants. Analytical and field data will be managed by the owner and/or their consultants in the project database.

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3 This protocol is consistent with the Sampling and Analysis Plan developed for the site RU/FS.
Records of daily visual inspection for oil sheen in the process water pond (G-I) will be maintained by the owner and/or their consultants for any day equipment is operating. A suggested data form is presented in the SWPPP Monitoring Plan (Appendix B). Measurements of monthly pH in the process water pond will be managed by the owner and/or their consultants.

3.7 REPORTING

For SWPPP well monitoring, data reports will consist of tables that summarize the date and time of the field measurements and sample collection; water level or stage, pH, temperature, turbidity, and specific conductance measurements; and dissolved iron and dissolved manganese concentrations. The SWPPP well data reports will be submitted to the County, Department of Ecology, and Department of Fish and Wildlife following each quarterly monitoring event.

For G-I process water pond monitoring, Quarterly Discharge Monitoring Reports (DMR) will be prepared on a quarterly basis and submitted to the Regional Ecology Water Quality Permit Coordinator. SWPPP well data reports will be submitted to Ecology along with the DMR. Please see the SWPPP and SWPPP Monitoring Plan (Appendix B) for details about the DMR.

4.0 OFF-SITE WELL INVENTORY

This portion of the 2011 Plan stipulates that nearby off-site water supply wells be documented in the following areas prior to mining, with an update every 5 years.

T16N R1W:
- West half of section 6
- Northwest quarter of section 7

T16N R2W:
- Southwest quarter of section 2
- Northeast quarter of section 10
- South one-half of section 11
- South one-half of section 12

The initial inventory was conducted in December 2009.

The data in Table 1 will be collected for each well where access is granted and the well is configured so that measurements can be taken. If allowed, a unique well identifier provided by the Department of Ecology will be affixed to the well. The County will be provided a report that documents the well inventory. An example well inventory field form is presented in Appendix C.
4.1 OFF-SITE WELL EVALUATION PROCEDURE

Well owners with problems that they believe are caused by the mine must first contact the County and provide evidence of the impairment. Based on the evidence presented and the baseline well inventory data provided by the operator (PGE, 2009), a licensed County hydrogeologist or engineer may choose to visit the site and perform an inspection. Although the County inspection would not be required, such an inspection is required before the County may request action by the mine operator and the County must present evidence to the mine operator of probable cause that the impairment is caused by the mine. With regard to problems related to pumping rates or volumes, probable cause must include a preliminary analysis indicating that the static water level in the well has declined more than would be caused by natural variability plus changes in local water use. With regard to changes in water turbidity, probable cause must include evidence of increased turbidity that is not explained by local conditions, including biofouling of the well and pump problems. The mine operator will provide the County with any requested monitoring data during this evaluation.

Upon request by the County, and after the County’s preliminary evaluation referenced above, the mine operator will contact the well owner and quickly perform an independent evaluation of the reported well problem. If the County’s inspection results in a finding of probable cause as defined above, and the results of the mine operator’s independent evaluation concurs with the County’s finding, the mine operator shall either repair the identified impairment or replace the well. The standard of acceptance for a repaired or replaced well will be one that yields a similar amount of water as the original, and that has comparable water quality. At anytime during this process, the mine operator may choose to repair or replace the well without further evaluation.

In the event that the results of the independent evaluation do not concur with the County’s finding, the County and the mine operator shall engage a third party, either a licensed hydrogeologist or engineer with well experience, to evaluate the claimed impairment and shall be bound by the results of his or her findings. The mine operator shall pay for the third party’s analysis. The third party shall be chosen as follows: the mine operator shall identify three licensed hydrogeologists or engineers and the County shall choose one of these licensed hydrogeologists or engineers to perform the evaluation. If the conclusion is a finding of probable cause as defined above, the mine operator shall either repair the identified problem or replace the well to the standard specified above.

5.0 REFERENCES


Thurston County Hearing Examiner, October 24, 2005. Re-Issuance of a Final Mitigated Determination of Nonsignificance SEPA No: SEPA020612, Case No: SUPT020612.

Thurston County Hearing Examiner, October 24, 2005. Re-Issuance Attachment Case Numbers: SEPA020612 and SUPT020612.
APPENDIX A
ON-SITE WELL LOGS

There are no well logs for the older “PP” wells and all the surface water stations.
### Table 1: Basic Well Data

<table>
<thead>
<tr>
<th>Well</th>
<th>Elev</th>
<th>Dimensions</th>
<th>SWL</th>
<th>Q</th>
<th>t</th>
<th>s</th>
<th>Q/s</th>
<th>PY</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPD1</td>
<td>210</td>
<td>12&quot; x 14'</td>
<td>7.2</td>
<td>23</td>
<td>60</td>
<td>1</td>
<td>23</td>
<td>107</td>
<td></td>
</tr>
<tr>
<td>PPD2</td>
<td>222</td>
<td>INACCESSIBLE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
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<tr>
<td>PPD3</td>
<td>220</td>
<td>8&quot; x 19'</td>
<td>2.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>NOT PUMPED</td>
</tr>
<tr>
<td>PPD4</td>
<td>220</td>
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<td>3.4</td>
<td>?</td>
<td>?</td>
<td></td>
<td>0.2</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>PPD5</td>
<td>230</td>
<td>6&quot; x 27'</td>
<td>13</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CAN BE BAILED DRY</td>
</tr>
<tr>
<td>PPD6</td>
<td>225</td>
<td>20&quot; x 183'</td>
<td>13.3</td>
<td>14</td>
<td>40</td>
<td>7.4</td>
<td>1.9</td>
<td>100</td>
<td></td>
</tr>
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<td>PPD7</td>
<td>232</td>
<td>6&quot; x 58'</td>
<td>12.9</td>
<td>13</td>
<td>40</td>
<td>2.3</td>
<td>5.6</td>
<td>170</td>
<td></td>
</tr>
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<td>PPD8</td>
<td>220</td>
<td>6&quot; x 70'</td>
<td>16</td>
<td>10</td>
<td>50</td>
<td>10</td>
<td>1</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>PPD9</td>
<td></td>
<td>NOT FOUND</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PPD10</td>
<td>212</td>
<td>6&quot; x 29'</td>
<td>6.9</td>
<td>30</td>
<td>60</td>
<td>1.9</td>
<td>16</td>
<td>235</td>
<td></td>
</tr>
</tbody>
</table>

**Explanation to Table 1**

**Elev**
Elevation of well (feet, MSL) as interpreted from USGS Maytown Quad.

**Dimensions**
Observed casing diameter and measured depth to bottom, below local ground surface.

**SWL**
Static water level in feet below local ground surface. See Table 2 for date of SWL.

**Q**
Average discharge in gpm during well test.

**t**
Time in minutes that well was tested.

**s**
Drawdown in feet below SWL measured during pumping.

**Q/s**
Specific capacity in gpm/ft of drawdown.

**PY**
Potential yield. A predicted total yield based on specific capacity times a "safe" amount of drawdown, subject to actual further testing.

**Notes**

1. Well's yield would be less if SWL fell in late summer.

2. Changes at well head needed to improve testing.

3. Potential yield assumes that water entry is from near bottom of well. Well should be video-surveyed to determine accurate depth of water entry and type of completion.

*From Robinson and Noble, 1996*
<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>Topsoil: root zone</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Damp, gray, gravelly fine to coarse SAND, some cobbles</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>moist, brown-gray, cobbly, gravelly, fine to coarse SAND, cobbles to 6&quot;, boulder @ 8 ft.</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>moist, brown-gray, cobbly, gravelly, fine to coarse SAND</td>
</tr>
<tr>
<td>15</td>
<td></td>
<td>moist to wet, brown, fine to coarse SAND, some gravel, trace cobbles; WT at 16&quot;; saturated</td>
</tr>
<tr>
<td>20</td>
<td></td>
<td>saturated, dark gray, sandy GRAVEL, some cobbles</td>
</tr>
<tr>
<td>25</td>
<td></td>
<td>saturated, dark gray, sandy cobbly GRAVEL; cobbles to 6&quot;</td>
</tr>
<tr>
<td>30</td>
<td></td>
<td>saturated, brown-gray, sandy cobbly GRAVEL; cobbles to 6&quot;</td>
</tr>
<tr>
<td>36</td>
<td></td>
<td>moist, gray, lodgement TILL (gravel-sand silt)</td>
</tr>
<tr>
<td>42</td>
<td></td>
<td>saturated, dark, gray, sandy GRAVEL, some cobbles; heaving sand below till</td>
</tr>
<tr>
<td>45</td>
<td></td>
<td>saturated, dark gray, gravelly coarse SAND, some cobbles; screened 45 to 50 ft.</td>
</tr>
<tr>
<td>50</td>
<td></td>
<td>saturated, dark gray, gravelly coarse SAND, some cobbles; screened 45-50 ft.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>55</td>
<td></td>
<td>saturated, dark gray, gravelly coarse SAND, some cobbles</td>
</tr>
<tr>
<td>60</td>
<td></td>
<td>saturated, gray, fine to medium SAND, trace gravel</td>
</tr>
<tr>
<td>65</td>
<td></td>
<td>saturated, gray, medium to coarse SAND, trace gravel</td>
</tr>
<tr>
<td>70</td>
<td></td>
<td>saturated, gray, fine to medium SAND, trace gravel</td>
</tr>
<tr>
<td>75</td>
<td></td>
<td>saturated, gray, fine SAND</td>
</tr>
<tr>
<td>78</td>
<td></td>
<td>moist to wet, gray, lodgement TILL (gravelly sandy silt)</td>
</tr>
<tr>
<td>80</td>
<td></td>
<td>BOH @ 80 ft.</td>
</tr>
</tbody>
</table>
## DRILL HOLE LOG

**Project:** Jay Allen–Maytown Aggregate  
**Contractor:** Layne Christensen  
**Drill Method:** 9" Becker  
**Sampling:** Cyclone  

**Elevation:** 223 ft.  
**Depth:** 100 ft.  
**Diameter:** 6" inner dia.  
**Azimuth/Dip:** -90  
**Well:** Well completed to 58 ft.; screened 53-58 ft.

### Description of Layers:

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td></td>
<td>moist, dark gray, cobbly GRAVEL, some clay</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>moist, dark brown-gray, sandy GRAVEL, some cobbles, some clay</td>
</tr>
<tr>
<td>15</td>
<td></td>
<td>wet, brown-gray cobbly GRAVEL with some clay; WT/saturated @ 15 ft.</td>
</tr>
<tr>
<td>20</td>
<td></td>
<td>saturated, dark gray, cobbly sandy GRAVEL</td>
</tr>
<tr>
<td>25</td>
<td></td>
<td>saturated, dark gray, cobbly sandy GRAVEL</td>
</tr>
<tr>
<td>30</td>
<td></td>
<td>saturated, dark gray, cobbly sandy GRAVEL</td>
</tr>
<tr>
<td>31</td>
<td></td>
<td>wet, brown, lodgement TILL lens</td>
</tr>
<tr>
<td>35</td>
<td></td>
<td>saturated, dark gray, sandy GRAVEL, some cobbles</td>
</tr>
<tr>
<td>40</td>
<td></td>
<td>as above</td>
</tr>
<tr>
<td>45</td>
<td></td>
<td>saturated, dark gray, sandy GRAVEL, some cobbles, some consolidated clay seams</td>
</tr>
<tr>
<td>50</td>
<td></td>
<td>saturated, gray, sandy GRAVEL approx. 20% sample is hard, contorted clay beds with rusty oxidation, finely laminated</td>
</tr>
<tr>
<td>55</td>
<td>SAND</td>
<td>saturated, dark gray, gravelly SAND; screened 53 ft - 58 ft.</td>
</tr>
<tr>
<td>60</td>
<td></td>
<td>as above</td>
</tr>
<tr>
<td>65</td>
<td></td>
<td>saturated, dark gray sandy GRAVEL / gravelly sand; trace to some cobbles</td>
</tr>
<tr>
<td>70</td>
<td></td>
<td>as above; sandy GRAVEL</td>
</tr>
<tr>
<td>75</td>
<td></td>
<td>saturated, dark gray, sandy GRAVEL, some cobbles</td>
</tr>
<tr>
<td>80</td>
<td></td>
<td>saturated, dark gray, cobbly sandy GRAVEL</td>
</tr>
<tr>
<td>85</td>
<td></td>
<td>as above</td>
</tr>
<tr>
<td>90</td>
<td></td>
<td>as above</td>
</tr>
<tr>
<td>95</td>
<td></td>
<td>as above</td>
</tr>
<tr>
<td>100</td>
<td>SAND</td>
<td>saturated, dark gray, gravelly SAND, trace to some cobbles</td>
</tr>
</tbody>
</table>

**BOH @ 100 ft.**
### Drill Hole Log

**Project:** Jay Allen–Maytown Aggregate  
**Contractor:** Layne Christensen  
**Drill Method:** 9" Becker  
**Sampling:** Cyclone

**Elevation:** 234 ft.  
**Depth:** 85 ft.  
**Diameter:** 6" inner dia.  
**Azimuth/Dip:** -90  
**Well:** Well completed to 39 ft.; screened 34 - 39 ft.

---

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
</table>
| 1         |        | Topsoil: root zone  
<p>|           |        | moist, dark gray, sandy GRAVEL (small sample)  |
| 5         |        | moist, brown-gray, sandy GRAVEL, trace cobbles  |
| 10        |        | moist, brown-gray, sandy GRAVEL, some cobbles  |
| 15        |        | wet to saturated, gray, cobbly GRAVEL, some sand; WT @ 18 ft.  |
| 18        |        | saturated, dark gray, cobbly GRAVEL  |
| 20        |        | as above, with some fine sand  |
| 25        |        | saturated, dark-gray cobbly sandy GRAVEL  |
| 30        |        | (piezo set 34 ft. to 39 ft.)  |
| 35        |        | as above, cobbles to 8 in.  |
| 40        |        | dark gray, saturated, cobbly GRAVEL, some sand  |
| 45        |        | saturated, dark gray, cobbly GRAVEL, some sand  |
| 50        |        | as above, with some fine sand  |
| 55        |        | saturated, dark-gray cobbly GRAVEL  |
| 60        |        | saturated, dark-gray cobbly gravelly SAND  |
| 65        |        | saturated, dark-gray, cobbly GRAVEL, some sand  |
| 70        |        | saturated, dark-gray cobbly GRAVEL  |
| 75        |        | saturated, blue-gray and rusty-brown silty clay TILL (marine clays)  |
| 80        |        | moist, blue-gray gravelly silty clay TILL  |
| 85        |        | BOH @ 85 ft.  |
| 90        |        |  |
| 95        |        |  |
| 100       |        |  |</p>
<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Geologic Log</th>
<th>Well Construction Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Dry, dark brown, slightly gravelly, silty fine SAND.</td>
<td>6-inch, above ground, steel, locking monument</td>
</tr>
<tr>
<td>10</td>
<td>Dry, brown, slightly silty, very sandy GRAVEL with cobbles.</td>
<td>8-inch diameter borehole</td>
</tr>
<tr>
<td>20</td>
<td>Wet, brown, clean, sandy GRAVEL with cobbles up to 3-inches.</td>
<td>Bentonite chips</td>
</tr>
<tr>
<td>30</td>
<td>Wet, brown, silty, very sandy GRAVEL with cobbles.</td>
<td>2-inch PVC casing</td>
</tr>
<tr>
<td>40</td>
<td>Wet, gray, clean, slightly sandy GRAVEL with cobbles.</td>
<td>PVC screen from 19 to 23 feet, 0.020-inch slot with end cap surrounded by C331 #10-20 sand pack.</td>
</tr>
<tr>
<td>50</td>
<td>Wet, gray, very silty, sandy GRAVEL with cobbles.</td>
<td>Native Backfill</td>
</tr>
<tr>
<td></td>
<td>Wet, gray, slightly silty, sandy GRAVEL with cobbles greater than 6-inches.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wet, gray, slightly silty, very sandy GRAVEL.</td>
<td></td>
</tr>
</tbody>
</table>

Bottom of boring at 50 feet on 6/17/02.
<table>
<thead>
<tr>
<th>DEPTH (feet)</th>
<th>GEOLOGIC LOG</th>
<th>WELL CONSTRUCTION DETAILS (not to scale)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Black, molot, sandy GRAVEL. Organic-rich with gravel up to 2-inches.</td>
<td>6-inch, above ground, steel, locking monument</td>
</tr>
<tr>
<td></td>
<td>Cobble layer (very hard drilling)</td>
<td>Concrete Surface Seal</td>
</tr>
<tr>
<td></td>
<td>Molot, gray, very sandy GRAVEL. Gravel up to 2-inches.</td>
<td>8.5-inch diameter borehole (Hollow Stem Auger OD)</td>
</tr>
<tr>
<td>10</td>
<td>Wet, slightly silty, very gravelly, medium to coarse SAND (drive sample).</td>
<td>2-inch PVC casing</td>
</tr>
<tr>
<td></td>
<td>Cobble layer (hard drilling)</td>
<td>Bentonite chips</td>
</tr>
<tr>
<td>20</td>
<td>Slightly silty, very gravelly, medium to coarse SAND.</td>
<td>PVC screen from 14.8 to 24.8 ft, 0.010-inch slot with end cap surrounded by Monterey #2-12 sand pack.</td>
</tr>
<tr>
<td>30</td>
<td>Total Depth of 25 feet on 12/31/09</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PROJECT NAME: Maytown  
DRILLING METHOD: Hollow Stem Auger  
DRILLER: David Gose  
FIRM: Cascade Drilling, L.P.  
CONSULTING FIRM: Pacific Groundwater Group  
REPRESENTATIVE: Charles Ellingson  
LOCATION: SE 1/4 NE 1/4 Sec. 11, T16N, R2W

WELL NAME: MT12  
UWID No. 885  
MEASURING POINT ELEV.: No Survey  
DATUM: No Survey  
INSTALLED: 12/31/2009

GEOLOGIC LOG AND AS-BUILT FOR WELL MT12

pgG
<table>
<thead>
<tr>
<th>DEPTH (feet)</th>
<th>GEOLOGIC LOG</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Black, moist, silty, fine to medium SAND; organic-rich.</td>
</tr>
<tr>
<td></td>
<td>Moist, dark brown, (fine to medium) sandy, coarse GRAVEL with cobbles.</td>
</tr>
<tr>
<td></td>
<td>Large cobbles/cobble layer (by drilling action)</td>
</tr>
<tr>
<td>10</td>
<td>Moist, silty, gravelly, fine to medium SAND.</td>
</tr>
<tr>
<td></td>
<td>Wel, sandy, fine GRAVEL.</td>
</tr>
<tr>
<td>20</td>
<td>Wel, sandy, GRAVEL with cobbles.</td>
</tr>
<tr>
<td></td>
<td>Total Depth of 25 feet on 3/25/10</td>
</tr>
</tbody>
</table>

**SAMPLE**

- 6-inch, above ground, steel, locking monument
- Concrete Surface Seal
- 8-inch diameter borehole (Hollow Stem Auger 00)
- 2-inch PVC casing
- Bentonite chips
- PVC screen from 14.7 to 24.7 ft, 0.010-inch slot with end cap surrounded by CSSI #20-40 sand pack.
APPENDIX B
STORMWATER POLLUTION PREVENTION PLAN (SWPPP)
APPENDIX A
MONITORING PLAN

Maytown Aggregates, Thurston County, WA
Sand and Gravel General Permit No. ______
August 23, 2007

CONTENTS

Overview
SWPPP Monitoring and Inspections
ESCP Inspections
Monitoring Site Map
Monitoring Plan Annual Sign-Off

Attachments
SIR (Semi-Annual Stormwater Inspection Report Form)
SHEEN - Oil-Sheen Observation Log
SUP Wells Monitoring Log
Maytown Aggregates
MONITORING PLAN

1.0 OVERVIEW

This Monitoring Plan (MP) for the Maytown Aggregates quarry identifies monitoring and reporting required for Sand and Gravel General Permit No. compliance and includes monitoring specified in the Stormwater Pollution Prevention Plan (SWPPP) and the Erosion and Sediment Control Plan (ESCP). Descriptions of specific BMPs are provided in the respective plans. The SWPPP Detail Map identifies monitoring points and BMP areas.

Reports and notifications required to maintain compliance are summarized in Table MP-1. A monitoring schedule for the G-1 groundwater monitoring location is provided in Table MP-2. Additional NPDES monitoring of three supply/monitoring wells (SPGW-1, SPGW-2, and SPGW-3) is required as part of the Thurston County Special Use Permit (SUP) for the site. Monitoring of these wells is not specifically a requirement of the General Permit but is described here and reporting forms provided for easy reference.

2.0 SWPPP MONITORING AND INSPECTIONS

The Maytown Aggregates Sand and Gravel General Permit SWPPP encompasses a variety of BMPs that control discharges to groundwater. Because of the high levels of natural infiltration for the site materials, there are no surface water discharges. Groundwater discharge location G-1 (Infiltration Pond) provides sediment reduction and treatment for Type 2 and Type 3 runoff waters with discharge to shallow aquifers. The Sedimentation Pond, which discharges to the Infiltration Pond, will be lined and does not constitute a groundwater discharge location. Additional groundwater monitoring locations may be created if resource extraction proceeds below the seasonal water table. The SWPPP and this MONITORING PLAN will be modified to reflect these new groundwater discharge locations as appropriate.

Monitoring and inspection requirements apply to all “active” sites. A permitted site is “active” unless an Operating Status Change Form declaring the site “inactive” has been filed with Ecology. Stormwater monitoring and annual erosion and sediment control BMP inspections (Section 3.0) are not required for “inactive” sites with no surface water discharges.

Monitoring to maintain compliance with the SWPPP includes annual SWPPP review, semi-annual inspections, quarterly Discharge Monitoring Reports (DMRs), and daily inspection of all groundwater discharge locations for oil sheen. In addition, for the Maytown Aggregates site, quarterly monitoring of three water supply/extraction wells for pH, temperature, turbidity, specific conductance, and dissolved iron and manganese is
required to maintain compliance with Thurston County’s SUP requirements. Forms appropriate to each type of monitoring are provided as Attachments to this MONITORING PLAN. Ecology supplies DMR forms when the permit is issued. Quarterly DMRs must be submitted unless an Operating Status Change Form has been submitted to Ecology and the site has been classified as inactive.

2.1 Receiving Water Flow Report (Condition S.A.6)

There is no requirement for preparing a receiving water flow report for either Beaver or Allen Creeks in the absence of a surface water discharge. In the event that a surface water discharge is created, a receiving water flow report must be prepared prior to January 30, 2008, and submitted to Ecology as described in the General Permit, Section S6.A.6.

2.2 Annual Review

Both the SWPPP and MONITORING PLAN must be reviewed annually for major changes in operation, newly installed (or abandoned/replaced) BMPs, or changes in discharge locations, types and volumes. Following review and updating the SWPPP and MONITORING PLAN should be signed-off in the spaces provided. If either the SWPPP or MONITORING PLAN is substantially modified, an amended document should be placed in the permit file. In particular, if mining creates permanent or seasonal ponds due to extraction below the water table, additional groundwater monitoring locations will be created.

2.3 Semi-Annual Stormwater Inspections (Condition S10)

The Permittee shall conduct two stormwater inspections each year at all active sites covered under this permit. One inspection should occur during the wet season (October 1-April 30) and the other during the dry season. Both inspections require completion of a Semiannual Inspection Report (Attachment SIR) to be kept in the permit file. BMPs that are to be inspected semi-annually include:

- Infiltration Pond (G-1) – inlet and sediment accumulation
- Sedimentation Pond – sediment accumulation and outlet
- Topsoil and Overburden Fill Runoff Trenches and Sediment Traps – sediment accumulation and trench integrity
- Topsoil and Overburden Fill Grading and Revegetation – minimum 75% coverage
- Material and Activity Area Grading
- Crusher Discharge to Sedimentation Area
- Mining and Road Access Area Grading
- Rail and Truck Unloading Areas – grading to Sedimentation Pond
- Areas of Natural Vegetation and Buffer Zones
• Condition of Special Supply/ Monitoring Wells
• Adequacy of Spill Control Materials
• Condition of Wheel Wash

Repairs or modifications should be made as necessary and any significant actions taken should be noted in the SIR

2.3.1 Wet Season Inspection
A wet season inspection of erosion control BMPs shall be carried out between October 1 and April 30 each year during a rainfall event "of adequate intensity and duration to verify that: a) the description of potential pollution sources is adequate, b) the Site Map has been updated or otherwise modified and, c) that controls to reduce pollutants in stormwater are adequate. The wet season inspection should also note the presence of floating materials, suspended solids, discoloration, oil and grease, turbidity, odor, etc. in trenches draining the Topsoil and Overburden Fill and in any discharge into the lined Sedimentation Pond and Infiltration Pond.

2.3.2 Dry Season Inspection
The dry season inspection should be conducted after at least seven (7) days without rainfall. The inspection shall determine whether there are non-stormwater discharges to the stormwater drainage system. The discharge from the crusher is considered a permitted discharge. If a non-complying discharge is identified, a Discharge Monitoring Report (DMR) must be submitted to the Regional Water Quality Permit Coordinator (Ecology, Olympia) in accordance with Permit Condition S6. If no non-permitted discharge is identified, the SIR is to be placed in the SWPPP file on-site. If a non-permitted discharge is identified and cannot be eliminated within ten (10) days, the discharge will be considered process water and subject to all process water conditions. Quarterly DMRs are discussed in the next section.

The wet-season and dry-season inspections constitute the semi-annual inspections and the SIRs are to be kept in the permit file. If the wet or dry season inspections occur concurrently with the quarterly discharge monitoring, the DMR must still be prepared and submitted to Ecology.

2.3.3 Repairs and Modifications
Minor repairs or modifications should be made as necessary. Significant corrective actions taken should be noted on the SIR. Major changes to site conditions (new stockpile areas, additional runoff channels, new BMPs, road realignments, new culverts, etc.) should be documented in an Amended SWPPP. SIR forms do not have to be submitted to Ecology, but should be retained in the permit file for a minimum of three years.

2.4 Quarterly Discharge Monitoring Reports (Condition S6.A)

The Permittee shall submit a Quarterly Discharge Monitoring Report (DMR)(Attachment DMR) on a quarterly basis to the Regional Ecology Water Quality Permit Coordinator.
Each quarterly DMR is due on or before the last day of the subsequent month (e.g. a DMR is due April 30 for the Jan-Feb-March quarter).

Quarterly DMRs are required for the Infiltration Pond (monitoring location G-1). Information provided on the quarterly DMR will include monitoring period, location, sampling dates, and results. If there is no discharge (i.e. no pond) during the inspection, the words “No Discharge” are to be placed in the “results” column for that month.

2.4.1 Thurston County SUP Monitoring Wells
Quarterly monitoring of the three designated groundwater monitoring locations (SPGW-1, SPGW-2, and SPGW-3) for pH, temperature, specific conductance, turbidity, and dissolved iron and manganese is required for compliance with the Thurston County SUP. Data are to be submitted both to Thurston County and to Ecology quarterly in order to maintain compliance with the SUP. A monitoring-well data sheet is provided as Attachment – SUP Monitoring Wells. These wells are shown on the SWPPP Detail Site Map. Two of these wells are existing supply wells (SPGW-1 – previously labeled PP02) and (SPGW-2 – previously labeled PP04). The third monitoring location is a proposed monitoring well, SPGW-3. The SUP Monitoring Wells data reporting forms are to be submitted to Ecology along with the Quarterly DMR.

2.4.2 Groundwater Discharge G-1 (Infiltration Pond)
The water in the Infiltration Pond constitutes a groundwater discharge (G-1) and shall be monitored monthly for pH as required for SIC 3272 discharges. Oil sheen observations are to be made daily (as described in the following Section 2.5) for all days that equipment is operating at the site.

As noted in Section 2.0, if mining extraction creates permanent or seasonal ponds, additional groundwater discharge locations will be added by amendment.

2.5 Daily Sheen Inspections
In addition to quarterly and monthly monitoring as described in Sections 2.4.1 and 2.4.2, daily inspections are required for the Infiltration Pond for oil sheen for any day equipment is operating. The Attachment SHEEN is a suggested form for recording daily oil sheen observations. The Quarterly DMR provides a field with a check box for indicating if visible oil sheens have been detected.

2.6 Noncompliance Notification (Condition S6.E)
In the event the Permittee is unable to comply with permit conditions, including discharge conditions or limits, the Permittee must take immediate action to correct the permit violation and must repeat sampling and analysis. The Permittee shall notify (by phone) the Ecology Regional Sand and Gravel Permit Manager of the violation within 24
hours and shall submit a written report to Ecology within 30 days (5 days if it is a bypass or “upset”) as specified in Condition S6.E.

3.0 EROSION AND SEDIMENT CONTROL PLAN (ESCP) INSPECTIONS

Erosion and sediment control measures (BMPs - permit Condition S9.B.6) are described in the ESCP (SWPPP Appendix B). Monitoring and inspections are required to maintain BMP compliance as outlined in Condition S10.D. In general, at all active sites without a discharge to surface water, erosion and sediment control BMPs shall be inspected at a minimum during the wet season Semi-annual Inspection. Dry season inspections are intended to detect the presence of non-permitted process water discharges to the collection and treatment system. ESCP monitoring and inspection reports are to be kept in the Permit/ SWPPP file for a minimum of three years. If the site has been declared “inactive” by filing an accepted Operating Status Change Form, and if there is no discharge to surface waters, annual inspections may be suspended. All inactive sites are still subject to the discharge limits for stormwater and must maintain BMPs necessary for compliance.

On-site erosion and sediment control BMPs include:

- Preservation of natural vegetation and buffer areas
- Access road grading and grading around mining areas
- Topsoil stockpile and overburden/fill slope grading and runoff trench adequacy
- Sediment trap capacity in the fill slope runoff trenches
- Vegetative seeding on topsoil stockpiles and overburden/fill storage area
- Sediment control via settling in the Sedimentation Pond
- Removal of sediment from truck tires in the Wheel Wash

A file containing these observations shall be maintained as part of the ESCP/ SWPPP file. A standard format to assist in completing the SIR is provided with the ESCP.

4.0 SPILL CONTROL PLAN (SCP)

The SCP requires annual review and updating (at a minimum) as provided in the SCP. Periodic monitoring is not required due to the unpredictable nature of spills. If a significant contaminant RELEASE occurs, a RELEASE/ SPILL Reporting Form should be filled out. A RELEASE/ SPILL Reporting Form is included as an attachment to the SCP. If a SPILL to “waters of the State” occurs, the RELEASE/ SPILL REPORTING FORM must be filled out and Ecology shall be notified. If spill control measures are not fully successful in controlling the spill, monitoring of any potential discharge to waters of the state for oil and grease sheen, turbidity, pH, and suspended solids, temperature, and volume on a periodic (hourly to daily) basis is highly recommended.
Monitoring Plan Annual Sign-Off

Name: ___________________________ Date: __________

Position: ___________________________

Name: ___________________________ Date: __________

Position: ___________________________

Name: ___________________________ Date: __________

Position: ___________________________

Name: ___________________________ Date: __________

Position: ___________________________

Name: ___________________________ Date: __________

Position: ___________________________
Attachment SIR
SEMI-ANNUAL INSPECTION REPORT
(SIR)

Maytown Aggregates, Thurston County, WA

Instructions: All SWPPP BMPs are to be inspected during the wet season to ensure they are effective at controlling stormwater contamination and are effectively maintained. Dry season inspections should identify any non-permitted discharges to the stormwater drainage system.
NOTE: Circle responses and provide details as appropriate.

**Dry Season (May-September) (circle one) Wet Season (October-April)**

Following at least 1 day of rain

**Date of Inspection:**

**Personnel Conducting Inspection:**

*********************************************************************************************************************************************************************************************************

**GENERAL SITE ITEMS**

A. Has the Site Map been significantly modified or updated? YES NO
   If YES, place a copy of the newest version in the file.

Describe major changes:

__________________________________________________________________________________________________________________________________________

__________________________________________________________________________________________________________________________________________

B. Have new pollution sources or discharge locations been identified or created?

YES NO

If YES, please describe:

__________________________________________________________________________________________________________________________________________

__________________________________________________________________________________________________________________________________________

__________________________________________________________________________________________________________________________________________
### SPECIFIC BEST MANAGEMENT PRACTICES

#### 1) Overburden/Fill Storage Area Drainage

- Inspected? | Yes | No
- Runoff to drainage trenches? | Yes | No
- Erosion or other problems noted? | Yes | No
- Sediment traps need cleaning? | Yes | No
- Trenches need maintenance? | Yes | No
- Actions required? | Yes | No

#### 2) Topsoil Stockpiles and Fill Storage Area Vegetation

- Inspected? | Yes | No
- Coverage at least 75%? | Yes | No
- Erosion or other problems noted? | Yes | No
- Barriers present to prevent vehicle incursions? | Yes | No
- Actions required? | Yes | No

#### 3) Sedimentation Pond

- Inspected? | Yes | No
- Excess sediment accumulation? | Yes | No
- Inlets condition (storm and process water)? | Yes | No
- Discharge to Infiltration Pond (clogging)? | Yes | No

Record any oil sheen present. If excess sedimentation is noted, indicate severity.

- Actions Required? | Yes | No

#### 4) Infiltration Pond

- Inspected? | Yes | No
- Any notable sheen or debris accumulation? | Yes | No
- Excess sediment build-up/new inflow locations? | Yes | No
- Pond level or % of capacity? | Yes | No
- Inlet structure? | Yes | No
5.) Additional Ponds in Mining Area: Inspected?

If extraction-area ponds are present, identify each and indicate depth and area on SWPPP Site Map (copy and attach).

Presence of oil sheens?
If YES, indicate which pond:

Actions required?

Yes  No

6.) Site Grading in Rail/Truck Unload Area: Inspected?

Grading directs runoff to Sedimentation Pond?
Excess sedimentation or debris in graded channels?

Actions required?

Yes  No

7.) Crusher Discharge Area: Inspected?

Grading directs runoff to Sedimentation Pond?
Excess sediment buildup?

Actions required?

Yes  No

8.) Grading in Mining Areas: Inspected?

Grading directs runoff into mining area?

Actions required?

Yes  No
### 9. Natural Vegetation and Buffer Areas: Inspected?

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural vegetation intact?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Buffer areas intact?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Actions required?</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

### 10. Spill Prevention Materials: Inspected?

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spill prevention kit accessible?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Spill control materials functional?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Check for sorbents, shovels, drum, bags?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Actions required?</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

### 11. Mobile Fueling BMPs: Inspected?

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Designated fueling areas?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Fueling limited to mining and gravel stockpile areas?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Actions required?</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

### Erosion Control: Inspected?

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drain lines open?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Water replaced daily with fresh?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Sediment accumulation in trap?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Actions required?</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>
COMPLIANCE CERTIFICATION

The Maytown Aggregates quarry IS - IS NOT (circle one) in compliance with the requirements of the Stormwater Pollution Control Plan (SWPPP).

If additional actions to those listed above are required, please describe below or on a separate sheet.

Pollution Prevention Team

Signature: ___________________________ Date: _______________
Attachment SHEEN
DAILY OIL SHEEN OBSERVATION LOG
Maytown Aggregates, Thurston County, WA

Instructions: This form is for inspection of representative ponds for any day that equipment is operating. Unusual conditions or the presence of an oil layer on any persistent pond are to be indicated in the comments and should trigger a review of the Spill Control Plan to determine if a "release" or "spill" has occurred. Each observation should have the signature of a Pollution Prevention Team member.

For the Maytown Aggregates site there will be one potential sheen observation location (G-1 Infiltration Pond) prior to any excavation below the water table and creation of pit ponds.

<table>
<thead>
<tr>
<th>YEAR</th>
<th>MONTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date (am or pm)</td>
<td>Location</td>
</tr>
<tr>
<td>G-1</td>
<td></td>
</tr>
<tr>
<td>Comments:</td>
<td></td>
</tr>
<tr>
<td>Date (am or pm)</td>
<td>Location</td>
</tr>
<tr>
<td>G-1</td>
<td></td>
</tr>
<tr>
<td>Comments:</td>
<td></td>
</tr>
<tr>
<td>Date (am or pm)</td>
<td>Location</td>
</tr>
<tr>
<td>G-1</td>
<td></td>
</tr>
<tr>
<td>Comments:</td>
<td></td>
</tr>
<tr>
<td>Date (am or pm)</td>
<td>Location</td>
</tr>
<tr>
<td>G-1</td>
<td></td>
</tr>
<tr>
<td>Comments:</td>
<td></td>
</tr>
</tbody>
</table>
Date (am or pm)  Location  Comments
G-1
Comments:

Date (am or pm)  Location  Comments
G-1
Comments:

Date (am or pm)  Location  Comments
G-1
Comments:

Date (am or pm)  Location  Comments
G-1
Comments:

Observation of persistent or significant sheens should trigger a review of petroleum house-keeping practices and spill control BMPs. Sheen observation logs are to be kept in the SWPPP file.
SUP MONITORING
Thurston County Special Use Permit
Supply & Monitoring Wells
Temperature, Specific Conductivity, pH, Turbidity
Dissolved Iron and Manganese
Maytown Aggregates, Maytown, WA

Instructions: This form is to be used for monitoring designated Special Wells (supply and monitoring wells) as required by the Thurston County SUP. The wells are designated SPGW-1, SPGW-2, and SPGW-3. These wells are to be monitored quarterly. For SPGW-1 and -2, the spigot nearest the well should be opened and allowed to run for a minimum of 20 minutes before monitoring or collecting samples. For SPGW-3, at least 3 casing volumes (approximately 1 – 1.5 gallons) should be removed (by bailing or peristaltic pump) before monitoring (See NOTE). Water is to be contained in a clean plastic container for measurement. Temperature, pH, conductivity and turbidity are to be monitored using calibrated field meters. Dissolved iron and manganese may be measured with a field test kit or by a qualified laboratory. If unusual conditions are observed, they should be noted in the comments section. Monitoring results are to be submitted quarterly to both Thurston County and Washington State Department of Ecology.

<table>
<thead>
<tr>
<th>YEAR</th>
<th>QUARTER</th>
<th>(e.g. Jan-March)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>(am or pm)</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>SPGW-1</th>
<th>SPGW-2</th>
<th>SPGW-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature (°F)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pH (to 0.1 unit)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specific Conductance (to ± 10 uS)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turbidity (NTU)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dissolved Iron (mg/L)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Dissolved Manganese (mg/L)

Comments:

__________________________________________

Signature ___________________________ Date ______________

Monitoring results are to be submitted quarterly to Washington Department of Ecology along with the quarterly Discharge Monitoring Report (DMR). Results should also be submitted quarterly to Thurston County and a copy should be kept in the SWPPP file on-site.

NOTE: Monitoring well SPGW-3 should be installed using 2" o.d. PVC well casing with 0.01 inch slotted screen. Monitoring should not begin until the well has been overdeveloped by pumping to stable pH, conductivity, temperature, and turbidity levels. Sampling should use permanent low volume peristaltic tubing methods to minimize potential disturbance to the casing water.
APPENDIX C
OFF-SITE WELL INVENTORY DATA FORM