Kenny, Ann

From: Wang, Ching-Pi
Sent: Wednesday, May 30, 2001 4:38 PM
To: 'Paul Agid'
Cc: Nye, Roger
Subject: Redline revisions to Preferential Flowpath memo

Per our multiple phone messages, I attach my redline edits to your May 8th draft of the preferential flow path technical memorandum. Don't be alarmed by the extensive edits and deletions. There are several organizational suggestions. Also, the edits focus on the role of utility lines as preferential flowpaths.

The large figures produced for the ACC-legislators meeting will be an integral part of the technical memorandum.

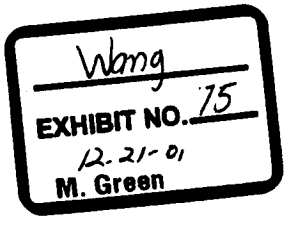
Please redo the memorandum and send it to me for adjustments.

I will be out of the office May 31st and June 1st.

Thank you,

Ching-Pi

Flowpath May 20th Redline.DOC



DOE9/17/01 0182

AR 017714

From: Port

To: Ecology

Date: May 30th, 2001

Subj: Technical Memorandum.
Construction of the Third Runway and Preferential Ground-Water Flowpath Analysis.

~~Information for Ching Pi Wang, provided on request, 5/8/01~~

Purpose

The purpose section needs to be rewritten to address preferential flowpaths via the utilities and perched zones. Limit statements about contaminant transport by ground-water flow in the QVA to known monitoring results. (Predictions of contaminant transport in the QVA will be estimated by the numerical model.)

~~Potential for existing contamination in ground water in the STIA AOMA to migrate to the area of the Third Runway embankment due to construction.~~

A. **Existing eConditions within the AOMA.**

As described in the May 1999 Agreed Order, the AOMA is the area of the ~~A~~airport where most aircraft fueling and maintenance operations have historically occurred. Within the AOMA, contaminated groundwater exists in several localized, discrete sites as a result of nearly fifty years of ~~A~~airport operations. The boundaries of the contaminated groundwater have been defined by site investigation data that were obtained through the placement and sampling of groundwater monitoring wells. Groundwater monitoring continues ~~where appropriate~~. Within the AOMA, areas of contaminated groundwater exist in both shallow perched zones and in the shallow regional aquifer (Qva). The perched zones are isolated and discontinuous, while the Qva is continuous (Provide maps and cross-sections that show areal extent and and depth of soil and ground-water contamination. Provide sufficient narratives to describe the maps and cross-sections).

Soil and ground-water samples~~Evidence~~ collected during individual site investigations within the AOMA indicate~~demonstrates that~~ the existing perched zone contamination has remained localized near sources areas and release points within the AOMA. The sampling data show that the ground-water contaminants have ~~and that it has~~ not migrated significantly along constructed utilities or infrastructure, despite the ~~very significant density~~ of ~~such~~ underground facilities in the AOMA. (Refer reader to figure that shows no significant migration through the underground

utilities.) Add narrative that describes the depths of the utilities in relationship to the depths of the perched zones containing contaminated ground water.

~~The results of the previous investigations, the discontinuous nature of the perched zones, and the long distance from the contaminated areas within the AOMA to the third runway embankment (over one half mile), all support the conclusion that there should not be a material impact on, or migration of, the existing perched zone contamination caused by construction of the third runway.~~[1]

Ground water and soil samples~~Similarly, evidence~~ collected from individual site investigations within the AOMA have also indicate ~~demonstrated~~ that existing Qva aquifer contamination remains localized, despite the presence of several facilities that have been constructed at depth within the AOMA. (Provide statement that says underground construction does not reach the QVA aquifer nor the perched zones.)

Contaminants in the QVA aquifer remain localized. ~~There is no evidence of significant Qva contaminant migration[2], and this contamination remains located within the AOMA.~~ 1 For example, maximum measured migration is about 550' in a down gradient direction from a specific source, tanks that were installed around 1949 and removed in 1990. (Provide narrative of how contaminants migrated from ground surface via holes in the till to reach the QVA aquifer. It would be useful at this point to provide a conceptual block diagram showing vertical migration of contaminants from ground surface to the QVA water table via "holes" in the upper low permeability layers.)

~~No deep infrastructure is planned for the third runway that would establish a direct connection from the AOMA to the embankment. Accordingly, construction of third runway and other infrastructure should not create a contaminant pathway that would accelerate the off-site migration of the existing contamination in the Qva aquifer.~~[3]

Construction activities within contaminated areas within the AOMA will result in the removal of contaminated soil to appropriate offsite treatment and disposal facilities.

B. Groundwater Conditions in the Vicinity of the Third Runway Embankment

Ecology has developed groundwater flow information relevant to third runway embankment construction. This information is presented in the *SeaTac Runway Fill Hydrologic Studies* (Pacific Ground Water Group (PGG) June 19, 2000). For one part of that study, PGG compared predicted changes in ground water flow and recharge due to the construction of the third runway

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[1] Documentation of the described site investigations and remedial actions may be found in the site reports which have been submitted over time by the Port and the Port's tenants to Ecology in compliance with MTCA. (provide reference list of relevant reports)

~~2 For example, maximum measured migration is about 550' in a down gradient direction from a specific source, tanks that were installed around 1949 and removed in 1990. Typical migration length is about 200' from the associated source.~~

embankment by modeling pre-construction and post-construction conditions. ~~(~~In comparison, the scope of the MTCA Agreed Order Ground Water Study is limited to modeling of flow and contaminant fate and transport within and below the Qva aquifer.~~:~~ The MTCA model ~~and~~ was designed specifically to model pre-third runway conditions ~~for a then-current look at impacts.)~~.

These PGG groundwater flow model results predict ~~findings support the conclusion that~~ runway construction will not ~~materially~~ impact the flow direction or flow volume of the Qva aquifer or any aquifer below it. The conclusions of the ~~Relevant findings of~~ Ecology's PGG study ~~and comparison of pre- and post-construction groundwater flows~~ include the following:

- The third runway embankment will have no ~~material~~ impact on aquifers below the Qva.
- The third runway embankment will have no ~~material~~ impact on Qva flow direction.
- In the pre-construction condition, the Qva contribution to base flow is small.
- Post-construction, the volume of water from all sources (including Qva and shallower ground water zones, precipitation, and other sources) discharging to baseflow could decrease slightly. However, the volume of seepage water through the till to the Qva will be about the same as in the pre-construction condition.

C. Construction of the Third Runway and Preferential Flowpaths. ~~Will Not Cause Contamination in Perched Water Zones within the AOMA to Impact Water Quality~~

Discontinuous zones of perched groundwater are located beneath ~~within~~ the AOMA. The extent of the contaminants in the perched zones are shown on Figure ____. Despite the existing array of subsurface utilities and infrastructure~~.~~: ground-water and soil data ~~available evidence demonstrates~~ show very limited ~~that~~ contaminant migration. ~~in these zones has been limited. Current water quality data show modest lateral migration of ground water contaminants.~~

Construction of the third runway embankment includes completion of only one utility, a new section of a communications ~~ductbank~~channel, that establishes a direct connection from the AOMA to the embankment. The channel is ____ feet deep and ~~B~~backfill for the new section of ~~ductbank~~ will consist ~~primarily~~ of concrete and controlled density fill ~~(a lean concrete mix that is relatively impermeable).~~ This combination of backfill material is quite impermeable. ~~rather than soil or sand backfill materials. Therefore,~~ In addition, the bottom of the communications channel is approximately ____ feet above the QVA water table. Infiltration by precipitation and stormwater runoff is virtually immeasreable because of the impermeable cover over the channel and the routing of stormwater runoff away from the channel. The channel will be covered with

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Based on the absence of hydraulic connection to ground water and surface waer, the newly constructed utilities are not ~~expected to operate as~~ preferred pathways for contaminan~~tion~~t to migration e toward the runway embankment.

~~**D.Construction of the Third Runway Will Not Create a Contamination Pathway from the Qva Aquifer within the AOMA**~~

~~The evidence collected to date supports the conclusion that the existing Qva aquifer contamination has remained localized within the AOMA, despite the presence of several facilities that have been constructed at depth. No deep infrastructure is planned for the third runway that would establish a direct connection from the AOMA to the embankment, and, therefore, the construction should not create a preferred pathway for the existing Qva contamination in the AOMA to migrate to the third runway area.~~

~~The PGG report concludes that construction of the third runway will not materially impact groundwater flow in the Qva aquifer near the runway embankment. Because contaminant transport depends on groundwater flow, the PGG findings, plus the lack of any new pathway in the proposed runway area, support that conclusion that the observed behavior of contaminants in AOMA Qva aquifer will not change due to construction of the third runway and other Master Plan Update improvements.~~