The Neighbors for Clean Air, representing hundreds of persons who live and work near the Intel operations, submit the following comments regarding the proposed Title V permit for the Intel semiconductor operations in Washington County.

INTEL WILL EMIT VOCs AT A SIGNIFICANT EMISSIONS RATE (SER) AND SHOULD COMPLY WITH MAJOR SOURCE REQUIREMENTS

This permit proposes permitted VOC emissions as a Plant Site Emissions Limit (PSEL) of 178 tons per year (T/Y). The permit Review Report claims this is an increase of 39 t/y, compared to the previous Baseline of 190 t/y, adjusted by a netting basis to 139 t/y. The proposed figure of 178 t/y is actually an increase of 145 t/y over the correct baseline year of 1978, when VOC emissions were 32 t/y. This increase exceeds the significant emissions rate of 40 t/y.

THE ASSERTED BASELINE CALCULATION IS INCORRECT

According to the Intel 1997 Air Permit Review Report, p. 13, Intel was retroactively assigned a PSEL of 190 t/y and that figure was also utilized as the Baseline emissions figure. That permit and the current review reports do not adequately explain the calculations to justify that 190 t/y or the "netted" 139 t/y. DEQ's files indicate that DEQ and Intel are mistaken. Intel's actual emissions in 1978, the "regulatory" baseline year, at a time when two fab plants were up and running were 32 t/y, based on a DEQ file review that included the following documents.

Intel began its fab operations in Oregon at the Aloha site in 1975. DEQ records are unclear about when Intel actually obtained its initial air permit. Several years ago, DEQ asked Intel for records of their actual VOC emissions since 1978. At that time, the Portland Metro area was non-attainment for Ozone (it is currently a maintenance area for Ozone) and DEQ was scrutinizing large ozone precursor sources of VOCs such as Intel.

THE ACTUAL EMISSIONS OF 1978 OF 32 T/Y IS THE CORRECT BASELINE

Intel wrote to Pott at DEQ on 6/4/86. **Intel stated that in 1978 there were 32 T/Y of VOC emissions**, a 60% capture rate, and based on Intel's own production records. Furthermore, Dave Berg of DEQ wrote a memo on 12/31/92 to Broad of DEQ. Berg stated that Intel had built Fab 4 (at Aloha) in 1975, and Fab 5 was also built and operated in 1978**. Berg explained that 1978 was the appropriate Baseline year under DEQ rules, for determining Intel's Baseline emissions of VOCs, since two Fabs were up and operating as of 1978.** (Scan, pp 1-3, 4-6) Broad wrote a similar memo to the file dated, 12/29/92. These documents support 32 t/y as the appropriate emissions baseline for Intel.

Here is a chart of Intel's actual reported VOC emissions for several years of operations. (See scan, pp 13, 15)

YEAR	VOC EMISSIONS IN TONS/Year	VOCS PEAK TONS/WEEK	VOCS AVERAGE LBS/day	HAPS
1978	32			
1985	169			

1986	103			
1989	124			
1990	122			
1991	137			
1992	108			
1993	132		657	
1994	137	4.8		
1995	81	4.54	248	11.6t/y
1996	47			
1997	72			
1998	36.7			
2009	31.1			
2011	35			
Proposed-2013	**178**			

This chart demonstrates that Intel's **proposed** VOC emissions are vastly increased over recent years, after years of declining emissions, and are 146 t/y over the true Baseline year of 1978. Indeed, the claimed Baseline figure of 190 t/y, before adjustment for netting, probably exceeds any actual emissions figures ever reported for Intel. The 1985 emissions rate only represents a 30% emissions capture rate and is not representative of reasonable emissions control. The proposed PSEL represents an increase in actual VOC emissions of over 100 t/y compared to recent years.

DEQ has historically declined to closely regulate Intel. In 1997, Intel filed an application for a Title Five (V) permit. (The permit report stated the 1997 application was for an ACDP.) Intel said its uncontrolled VOC emissions were 84 t/y._However, DEQ still permitted Intel for 99 t/y of VOC emissions. In other words, Intel could have run the plant without any VOC pollution controls at all, and it would not have violated the DEQ permit conditions.

In summary, Intel is proposing increased VOC emissions that exceed the SER of 40 t/y, compared to every year of operation except 1985. OAR 340-20-305 (7) (a) allows for changing a PSEL if errors were made. Because of the significant increase over the 1978 and almost every other year's emissions, DEQ should modify the PSEL and baseline, and apply the rules and regulations for a major modification at a major source to this Intel expansion, including but not limited to continuous emissions monitoring, emissions impact modeling, source tests, BACT and other requirements.

INTEL'S EMISSIONS REPORTS SHOW IT IS ALREADY A MAJOR VOC SOURCE BEFORE THE EXPANSION

Intel's 2011 emissions reports claimed only 35 t/y of VOC emissions, from 2956 t/y of total VOC use. However George Davis of DEQ stated in personal communications that all Intel's isopropyl alcohol usage from tool cleaning is vented without controls. That means that in 2011, Intel vented 190 t/y, just of evaporated isopropyl alcohol (380,107 lb. consumed), while reported only 35 t/y of VOC emissions.

The permit report did not reconcile Intel's claimed emissions in recent years, with the admission that isopropyl alcohol emissions are uncontrolled. Nor did the permit report discuss why Intel cannot control

isopropyl alcohol emissions, for instance by utilizing that chemical under capture devices such as fans and hoods that provide negative pressure and feed into a control device.

That 100% rate of uncontrolled releases for isopropyl alcohol matches the assumptions of the Bay Area Air Quality Management District's Semiconductor Workgroup, which included Intel representatives. The Workgroup's sample permit conditions for the semiconductor industry stated that an emissions factor of 100% should be used for all wipe cleaning solvents.

The Intel expansion will cause vastly increased usage of VOC, perhaps tripling usage. If post-expansion isopropyl alcohol usage also triples, and its emissions remain uncontrolled, that would total around 500 t/y just for isopropyl alcohol emissions. Intel uses dozens of other types of VOCs, some controlled, some not, which would be added to the isopropyl alcohol emissions.

THE PROPOSED PERMIT APPARENTLY LACKS REQUIREMENTS FOR VOC CAPTURE EFFICIENCIES

The proposed permit expected that 100% of VOC emissions would be captured and directly to control devices. For instance, at pp 22-3, the calculations for determining emissions state "…the CE (capture efficiency) is presumed to be 1.0 (expressed as a decimal)…" Likewise, the previously cited Semiconductor Workgroup's model permit conditions state that:

> "Abatement device collection efficiency should always be specified. Typically, 100% collection efficiency should be required."

However, Intel's own 2012 emissions reports revealed only an 86.2-86.7% emissions collection rate.

In light of the Semiconductor Workgroup's conclusion that 100% collection efficiency requirements are "typical," Intel's 87% collection rate is unacceptable. We also find any permit requirement for a 100% collection efficiency rate, an 87% collection rate, or any rate at all. We suggest a 100% collection rate as a permit condition.

An 87% collection rate could have allowed a worst case of 468 t/y of VOC emissions during 2012 (13% of 3995 t/y of VOCs used) if all uncontrolled VOCs were emitted. The Workgroup concluded that anywhere from 30 to 90% of all VOCs used were evaporated from the semiconductor processes. When Intel used a material balance method in 1989 and 1990 to determine VOC emissions, it concluded that about 60% of all VOCs used were evaporated. Using these assumptions, Intel likely emitted over 250 t/y of VOCs from that uncollected and controlled evaporation of 60% of the 468 t/y of VOCs. If those evaporated and uncollected VOCs were emitted without controls, Intel would have been an unpermitted PSD source of VOCs during 2012.

THE PROPOSED PERMIT DOES NOT INCLUDE ALL INTEL EMISSIONS SOURCES

DEQ's George Davis said in writing that the currently proposed permit, "… regulates all Intel manufacturing operations in Washington County that are required to have a permit."

However, Intel lists eleven facilities as operating in Washington County and generating hazardous waste. Hazardous waste generation could indicate operations of Air pollution sources. The proposed permit covers only two; Aloha and Ronler Acres. Given the limited opportunity for public comment, we were able to scrutinize only two of Intel's nine unpermitted sites.

HAWTHORN ACRES OPERATES UNPERMITTED EMISSIONS SOURCES

Hawthorn Farms is one of the oldest Intel facilities, and started operations in 1975. DEQ file correspondence indicates that the Intel Aloha may not even have had an air permit for the first several years of its operation. We fear that Hawthorn Farms, likewise, should have had an air permit since its beginnings, still does not have one now, and should have an air permit for emissions of lead, VOCs, and criteria pollutants.

This facility is at 5200 Elam Young Parkway, Hillsboro and has 1600 employees. It has manufactured and assembled and tested motherboards, a computer component, among its activities. These processes utilized solvents, including acetone and freon, and included industrial-scale soldering and metals handling operations, that produced significant emissions of metals including lead, according to DEQ's RCRA inspection records.

Intel has periodically recovered hundreds of pounds of lead from the building's ducting system, indicating that this facility emitted significant amounts of lead to the air from its soldering and retort equipment.

Hawthorn Farm's 2011 RCRA reports, for instance, state that 2.26 tons of lead contaminated wastes were shipped from that location, including residues from soldering. In 2007, Intel shipped 900 lb. of lead wastes, some of which was removed from the building's contaminated air ducting. Contaminated air ducting indicates generation of airborne lead emissions, that would likely vent to the ambient air.

We ask that DEQ investigate if Hawthorn Farms should have been required to obtain an air permit, for both its criteria emissions from its boiler and other sources, and for its lead emissions, which may have exceeded the significant emissions rate of .6 t/y.

Hawthorn Farm currently has multiple smokestacks and roof vents. On the south side, at least three chemical storage tanks are visible from the street. There are two, two-story high, narrow white storage tanks, at least one of which is apparently placarded as containing toxic/corrosive/flammable materials. There is a third sphere-shaped storage tank, as large as a UPS van, that is apparently within a walled enclose to contain potential releases.

Published visitor accounts state this site operates a clean room, and performs soldering, indicating emissions-generating activity. Intel's report to DEQ indicate this facility uses, stores, and emits a variety of regulated substances, and conducts industrial activity that should require air DEQ permitting.

The substances used, and likely emitted, include acetylene, petroleum distillates, sulfuric acid, tetrafluorethane, and chloroifluoromethane. It generates enough hazardous waste to exceed exempt

generator status. It potentially emits lead, silver, solvents, flux, particulate, and various organics and other pollutants from its soldering, milling, painting, boiler, and other operations.

Near the freight docks, there are multiple, large cooling towers, about 20 or more feet high. Cooling towers are sources of particulate matter in its cooling tower drift. While some cooling tower emissions are unregulated, the mere presence of cooling towers may indicate operation of combustion sources that necessitate these intensive cooling measures.

This large, multi-building operation has at least one large boiler. (National Conference on Building Commissioning: May 4-6, 2005. Evaluation of Retrocommissioning Results After Four Years: A Case Study Janice Peterson, PE, Green Building Services)

Large commercial gas-fired boilers for multi-building product assembly, testing, and research operations are not categorically exempt activities that are noted in pp 10-11 of the permit review report.

The building smokestacks also indicate presence of past and possible current fuel combustion sources and emissions. The storage tanks indicate chemical usage and potential emissions.

Several signs in the parking lots designate assembly points for the building's workers after emergency evacuations, which also indicate the presence and usage of materials that could trigger an evacuation, and whose usage would also produce emissions.

THE JONES FARM HAS APPARENT EMISSIONS SOURCES AND HAS UTILIZED VOCS

The Jones Farm facility is at 2111 NE 25th Avenue, Hillsboro. This is also a large facility with about 5000 employees, covering several square blocks, with multiple, substantially sized buildings. Smokestacks produce visible emissions on the south side, near where this site also has several large cooling towers, close to the freight docks. Other buildings had smokestacks and roof vents also, indicating possible fuel combustion sources. The previously cited Case Study stated that this facility had multiple boilers, which would be air pollution sources.

The north building, JFS-1, is separate and fenced off, with controlled access. The west side of this building bristles with the apparent accoutrements of industrial activity; smokestacks, potential process piping and vessels, and large scale cooling towers, all dozens of feet tall. In the northwest corner, near the fence, there are possible emergency generators housed in outbuildings, with smokestacks.

DEQ files indicated this location has stored, used, and spilled, the solvents Trichloroethane, and Freon, (Scan, p 7-8) Usage of TCE and Freon indicate semiconductor manufacture-related activity such as etching, film deposition, and photoresist, that would likely produce air emissions, include evaporation of solvents and VOCs. The related correspondence by Tom Bispham at DEQ, claimed the failed TCE underground storage tank was removed from service, but did not state that the activities utilizing TCE and Freon had ceased.

Intel's filings with DEQ reveal that the Jones Farm currently generates wastes from soldering, which could indicate air emissions of lead and silver, and the site also uses acids, paint, bromine, petroleum distillates, and tetrafluoromethane, all of which may portend air emissions.

The Jones Farm complex's operations include multiple labs, recycling of circuit boards, use of chlorine gas, a produce development and a product verification lab which does circuit board soldering, which will emit lead and silver, according to its RCRA reports and other information sources. These labs also use and probably emit isopropyl alcohol, a VOC, from its production areas and work benches.

This site has also used, stored and potentially emitted Dichloro-trifluoroethane (a Greenhouse gas (GHG), tetrafluorethane (carbon tetrafluoride, a GHG), trifluorophosphine (a highly toxic gas), tetramethylcyclotetrasiloxane, gasoline, xenon difluoride, and other toxic and hazardous materials, some of which are air pollutants.

OTHER EMISSIONS SOURCES AT RONLER ACRES AND ALOHA NOT SPECIFICALLY IDENTIFED AND THEIR EMISSIONS QUANTIFIED--NEW BOILERS

Intel submitted a separate application on May 6, 2013 to add 4 new boilers. The pending permit and Review Report did not state if the proposed emissions increases for criteria emissions or greenhouse gasses already included these boilers' emissions. If the emissions from this newest application for four boilers, are not included in the pending permit, and are added to the three unpermitted boilers and sources at Jones and Hawthorn Farms, Intel's new VOC emissions will exceed the SER of 40 t/y.

GHG APPLICABILITY

Since those new boilers were not approved prior to the deadline for GHG applicability, their new GHG emissions should be added to the other unpermitted sources, and compared to GHG New Source Review thresholds

There are also waste water treatment plants, and multiple solvent storage tanks, at both Ronler Acres and Aloha whose potential emissions are also not discussed in the listing of sources on pp 5-7 in the draft permit. Since Clean Water Services requires reduced levels of pollutants in Intel's waste water prior to final treatment, Intel's pre-treatment waste water plant could potentially emit VOCs, fluoride and other air pollutants.

Intel's storage of fresh and spent VOC in tanks typically would have some "breathing" losses, which we did not see estimated or quantified in the permit or the Review Report.

The air stripping operation at Aloha to remove toxics, including solvents, from contaminated groundwater which is then discharged to surface waters, is also a potential air pollution source.

These sources, and Intel's other seven facilities in Washington County, which also handle acids and other materials that potentially emit air pollutants, should be reviewed to ascertain if there are additional air pollution sources at these locations that should be regulated in this permit.

Even though some of the cited substances may be PFCs (perfuorocarbons) and not VOCs, PFCs are known under some conditions to form fluorine species, according to the EPA, such as HF and hydrogen fluoride, which are regulated air pollutants and HAPs.

If these other locations are in fact air pollution sources, than Intel would possibly exceed the SER for VOCs and other pollutants, including GHG, which these additional emissions are added to the proposed Ronler Acres and Aloha emissions.

ADDITIONAL POTENTIAL EMISSIONS SOURCES

We also did not see Intel's Ion Bed Regeneration for de-ionized water production cited as a VOC/HAP source, despite our impression that Intel conducts this activity. The EPA has said Ion bed regeneration is one of the largest typical sources of HAP emissions in the semiconductor industry.

Other potential emissions sources apparently not listed in the permit include water chemical supply and storage, assembly emissions, equipment maintenance and assembly, and final mark and pack operations for shipping.

THE PERMIT SHOULD REQUIRE FREQUENT TESTING AND MONITORING OF EMISSIONS, COMFIRMATION OF EMISSIONS FACTORS AND PERMIT REQUIREMENTS WITH REMOVAL EFFICIENCIES

Despite Intel's posture in the "clean" high tech industry, its proposed annual VOC emissions are comparable to a large petroleum refinery, for instance the Conoco Phillips facility in Rodeo, California (.45 ton/day). Despite these significant VOC tonnages, Intel will begin operations of its expanded facility without testing its emissions assumptions for years.

RACT DETERMINATION NOT ADEQUATELY JUSTIFIED

The pending permit allows a VOC destruction efficiency rate of 95%. This emissions control is too lenient and allows excessive VOC emissions. We were unable to find an explanation for this 95% control rate in the DEQ files, that supported the permit review report RACT determination.

The manufacturers' of the control devices routinely guarantee higher capture rates than 95%. Intel routinely achieves a destruction rate higher than 95%. Intel's 4/19/94 source test of its VOC scrubbers, by CH2M Hill, showed destruction rates from 96.1 to 99.8%. Higher flow rates in the scrubbers produced higher destruction rates. (Scan, pp 9-10) Likewise, the current Permit Review Report cites recent source tests with destruction efficiencies from 96.8% to 99.47%.

Intel's pending permit application states the CPI thermal treatment system has a rated VOC removal efficiency that exceeds 98%. (scan p 14)

The Bay Area Air Quality Management District considers 98.5% controls (of POCs) to be achievable in practice from semiconductor operations. The BAAQMD's workgroup on semiconductor emissions, which included Intel representative Trang Mary Le, produced an emissions evaluation handbook. Section 7, Chapter 4 covered Semiconductor manufacturing and included sample language for permit

conditions, including a 98.5% destruction efficiency for NMHC with inlet concentrations over 2000 ppm, and 97% if inlet concentrations were between 200 and 2000 ppmv.

The EPA's 2001 study of the semiconductor industry found at least nine facilities that achieved greater than 95% destruction of HAPs in its table 4-1.

The permit should be revised to provide a more stringent RACT capture percentage rate of 98% since the manufacturers' already guarantee that rate.

PROVE UP MINOR SOURCE STATUS

Intel also claims its 39 t/y increase over baseline VOC emissions allows it minor source status and less regulatory obligations. However, if Intel has underestimated its emissions by a mere 2.6%, it is in fact a major source with 40 t/y of VOC emissions. The permit should rigorously require Intel to continuously "prove up" its minor source status at these sites. Each control device will have different chemical loadings, so pollution removal efficiencies will vary and must be verified for each device. Intel's claimed "capture" efficiency, separate from its "destruction" efficiency, should also be tested regularly.

CARBON MONOXIDE (CO) EMISSIONS ARE TOO HIGH

The proposed permit allows 99 t/y of CO emissions. The Permit Report did not inform reviewers that the area around Intel was recently in non-atttainment for CO and is currently a maintenance area. Intel's recent and proposed Lo-NOx boiler burner modifications likely increased CO emissions.

> From AP-42: Often NOx control measures cause CO emissions increases. The rate of CO emissions from boilers depends on the efficiency of natural gas combustion. Improperly tuned boilers and boilers operating at off-design levels decrease combustion efficiency resulting in increased CO emissions. In some cases**, the addition of NOx control systems such as low NOx burners and flue gas recirculation (FGR) may also reduce combustion efficiency, resulting in higher CO emissions relative to uncontrolled boilers. (emphasis added)**

Intel proposes adding low NOx burners in the near future to its boilers. The Report failed to discuss the degree to which the proposed NOx controls will increase CO emissions. Since this is a CO maintenance area, at a minimum, RACT for CO should be required, preferably an efficient Thermal oxidation system with a high pollution capture efficiency. As described earlier, there are at least three unpermitted boilers at Hawthorn and Jones Farms that are also CO sources.

VERIFY EMISSIONS FACTORS

The proposed permit also lacks both collection efficiencies, and pollution removal efficiency requirements for the wet scrubbers. Intel based its emissions assumptions on certain levels of collections rates and pollution removal controls for the scrubbers and thermal oxidizers. Those assumptions should be memorialized as permit conditions and the equipment tested to insure compliance.

Intel touts its "copy exactly" facility designs, meaning that its plants performing similar functions are exact copies of other similar Intel plants, and Intel uses exactly the same emissions factors at similar plants. While this means that performance at one Intel plant can predict performance of the copied exactly plant, this could also mean that mistaken assumptions at one site can taint the emissions assumptions at another site.

NEW MEXICO INVESTIGATION JUSTIFIES ADDITIONAL VERIFICATION OF EMISSIONS RATES AND FACTORS

The Federal EPA recently put Intel's New Mexico plant under scrutiny, even though it was also a minor source. The EPA's investigation found that several of Intel's emissions factors were inaccurate, including those for methanol and ethyl lactate, both of which will be emitted at Intel's Washington County plants.

The EPA also found that Intel's New Mexico source testing for many of its scrubbers and thermal oxidizers were not accurate, pollution efficiency removal rates were mis-calculated, and in one case, the scrubber may have emitted more hydrogen fluoride than it took in, a process dubbed "negative efficiency."

The Oregon proposed permit lacks parametric monitoring of all control device operating conditions, such as scrubber liquor flow and temperature. DEQ files indicate that DEQ has allowed lower-than-permitted operating temperatures in the oxidizers. Additional parametric monitoring requirements should be added, and enforced. The CH2M Hill source tests of Intel's scrubbers showed how scrubber flow rates can affect pollutant removal rates.

EPA's findings in New Mexico, coupled with Intel's copy exactly program, should trigger comprehensive re-examination of every aspect of Intel's Oregon facilities.

HISTORIC OREGON SOURCE TESTS SHOWED LOW POLLUTION REMOVAL RATES FOR ACID SCRUBBERS

Historic Source Tests of the Aloha scrubbers for Acid Gas Removal have also shown low efficiency: Five of the 11 tested scrubbers removed below 50% of the gasses. One scrubber removed 3%, one removed only 15% of the targeted pollutant.

The State of Texas' published guidelines state that 99% removal is BACT for control of water soluble inorganic compounds, which are a type of pollutant that Intel discharges to these scrubbers.

The EPA's 2001 study of MACT for HAP emissions from the semiconductor industry stated that wet scrubber absorbers typically achieve 90% or better removal efficiencies.

Intel's latest permit application stated its Harrington Packed bed scrubbers for pollution removal are only over 57% efficient. The level of pollution removal should be reviewed to determine if lower rates are achievable. The scrubbers removing ammonia (NH3) operate at 90% removal efficiency and should also have those rates reviewed.

We were not able to find permit requirement s for a highly efficient collection of emissions to be directed to the wet scrubbers, or permit requirements for a high degree of pollution destruction by the scrubbers.

The proposed permit did not describe any emissions control requirements, such as mist eliminators, for the wet scrubber system. We suggest a permit requirement for mist eliminators operating at high pollution removal efficiencies on the wet scrubbers.

PERMIT DOES NOT REQUIRE CONTROL OF HAPS TO BELOW THE POTENTIAL TO EMIT

Some of these scrubbers control HAPs, which are limited at 9 t/y for individual HAPs, and 24/t/y of total HAPs. The Permit review report states the potential to emit total HAPs is 19/7 t/y, and does not actually exceed 24 t/y. Again, allowing these high HAP emissions allows Intel to emit HAPs without controls, or with low levels of controls, without violating its permits. The certainly reduces Intel's incentives to run its HAP scrubbers efficiently. The HAP removal efficiencies, cited above, are already very low. Allowable HAP emissions should be lower than the potential to emit. Likewise, the lack of short term HAP emissions limits would allow emissions spikes that could harm the plants' nearby neighbors.

CONTINUOUS EMISSIONS MONITORING SHOULD BE REQUIRED

Historically, Intel conducted continuous emissions monitoring of its VOC emissions at its Oregon facility for years. For instance, at the D1 (fab 15) VOC emissions were controlled with a fluid bed carbon adsorber. From 9/13/95 to 2/22/96, it displayed 91% average removal efficiency as a 60 minute average, monitored continuously. VOCS entered to the control device at about 500-700 ppm.

Prior monitoring requirements for small pollution sources at Intel were stricken, during the 1997 permit issuance, over the federal EPA's objections. The proposed permit also lacks continuous emissions monitoring (CEM). This requirement should be imposed. The proposed permit does not require emissions testing until 2016.

EMISSIONS SHOULD BE TIED TO PRODUCTION

There was also at one time a Reasonable Attainable Control Technology (RACT) determination imposed on Intel of .0002 voc/lb per sq centimeter of wafer. This condition, which tied emissions to actual production, would later be removed from subsequent Intel permits. Tying production rates to emissions should also be an element of short term emissions limits. Unfortunately, Intel is withholding its relevant production information so we cannot verify its emissions by utilizing the earlier emissions factors. The permit reports cites a 1994 DEQ memo on this issue, but did not provide a copy. The Intel files include thousands of pages of materials and our researchers were unable to find this memo and confirm its contents and justification.

SHORT TERM EMISSIONS LIMITS SHOULD BE REQUIRED

In days past, Intel's permit did contain short term emissions limits. Those limits disappeared, replaced with only an annual limit.

Intel's emissions history showed that the company has emitted as much as .7 ton a day as a weekly average, at a time when its emissions were less than half of what is proposed. Without short term limits, Intel could operate its equipment for lengthy periods at extremely high production levels, or even without pollution controls, and still comply with its permit. That could allow emissions spikes of VOCs and HAPs into the airshed that would trigger adverse, acute human health impacts on the thousands of people who live within a few hundred yards of the Intel facility. The permit should require hourly, daily, and monthly emissions limits, and also explicitly require detailed monitoring and record keeping of all pollutants emitted during upsets, to insure minor source status.

Intel is committed to claiming minor source status. Therefore, it should provide the short term emissions limits the Semiconductor Workgroup, including Intel representatives endorsed, as follows:

> However, if the applicant is committed to not exceeding BACT trigger levels, daily or weekly records, as appropriate to estimate daily emissions with reasonable certainty, should be imposed to enforce the BACT trigger level.

MASS BALANCE EMISSIONS CALCULATIONS SHOULD BE REQUIRED

The Semiconductor Workgroup, which included Intel representatives, drafted sample permit conditions, which stated:

> "Periodic mass balances provide the most accurate emissions estimates and should be
>
> used whenever possible."

Intel did use mass balance calculations at one time. It apparently uses non-transparent emissions factors currently. As noted earlier, the emissions factor (of 1.0) for emissions collection is inaccurate. Mass balance calculations may reveal that Intel's emissions are far higher than what it claims.

UNREPORTED FLUORIDE EMISSIONS

For 35 years, Intel emitted Fluoride from its facilities in reportable amounts. For most of those years, Intel submitted annual emissions reports to DEQ. Those reports had a space to fill in the amount of fluoride emissions. . Again and again, Intel's responsible officials signed those forms, with their signatures below warnings that "…there are significant penalties for submitting false information…" or similar text. Every time, those responsible officials left the space for fluoride emissions blank, or entered a "dash." (Scan, pp 11, 16) Intel's officials did more than neglect calculations of fluorides; they positively entered a false notation.

DEQ charged polluters for each ton of pollution. Intel did not pay the required fees due to omitting fluoride emissions, even though those figures were specifically requested. DEQ should sanction Intel for approximately 30 years of inaccurate emissions reports and levy penalties designed to discourage companies from sneering at DEQ regulations.

PM EMISSIONS FACTOR IS POTENTIALLY TOO LOW

The AP-42 emissions factor for PM. In Table 1.4-2, from gas fired boilers is 7.6 lb/MM cubic feet of gas. All PM from gas combustion should be assumed to be PM 2.5, according to AP-42. However the Permit in Table 1, p. 24, utilized a much lower EF of 2.5 lb/MMCF of PM 2.5. This potentially underestimates PM 2.5 emissions by about 70%. The Permit Review Report does not justify this lower EF.

The Permit and Report also do not account for the conversion, by combustion in the TOs, of about 5 tons/year of HMDS into a potentially toxic form of Silica Particulate Matter. DEQ received studies in 1988, and Intel has long known, that combustion of HMDS produces PM emissions including silica. Nonetheless, Intel has emitted unpermitted amounts of PM from HMDS combustion since beginning operations in Washington County. DEQ should require back payment for underreported PM emissions assessments from Intel for those PM emissions, and limit and regulate PM emissions from HMDS combustion in the proposed permit.

NOX EMISSIONS FACTOR (EF) FOR GAS COMBUSTION IN OXIDIZERS AND BOILERS IS POTENTIALLY TOO LOW

The permit utilizes the AP-42 emissions factor for NOx exhaust from a boiler controlled with low-NOx burners, and flue gas recirculation, to estimate NOx emissions from Intel's thermal oxidizers. I did not see an indication that the oxidizers' NOx emissions had any controls whatsoever. NOx emissions from the TO devices should be calculated with the uncontrolled gas combustion EF for NOx from small boilers, if actual emissions data is lacking.

The EF for NOx from Intel's ultra-low NOx-controlled boilers is only about 30% of the EF for Low-NOx boilers. I did not see justification in the Permit Review Report for this lower EF, or that this EF was justified based on emissions monitoring or source tests.

THE PROPOSED PERMIT LACKS IMPORTANT ELEMENTS SUGGESTED BY THE SEMICONDUCTOR WORKGROUP

The Workgroup's report, in its concluding pages, provided suggested permit conditions. The proposed permit lacks many of these conditions, and fails to explicitly list pieces of equipment, their pollutants, and the limits on their thruput, their emissions, and the required capture and control efficiencies.

Reviews of the toxic surface and groundwater contamination at the Intel sites, and Intel's own RCRA and #303 reports, demonstrate that Intel uses, and likely emits, many regulated materials, including copper, lead, arsenic, cadmium, silver, and other materials, that are not mentioned in the permit or review report. The permit and review report fail to inform reviewers of the sources of these and other emissions.

THE PERMIT LACKS PIPING AND VALVE CONNECTION LEAK DETECTION REQUIREMENTS

The massive, multi-acre, multiple Intel facilities contain many storage tanks, and miles of piping and probably hundreds of valves and connections through which millions of gallons of VOCs surge, 24/7/365.

Typically, tanks, valves and piping that contain VOCs, for instance at chemical plants or refineries, are subject to an leak detection and repair (LDAR) program. Often, chemical handling facility permits contain assumptions for fugitive emissions of trace amounts of VOCs from the hundreds of valves, piping connections and similar emissions points at such facilities.

The EPA has found that leaking connections are the largest source of VOCs from refineries and chemical manufacturing facilities. Intel's proposed VOC emissions are comparable to an oil refinery, yet the proposed permit does not assess fugitive VOCS from valves and connections, and does not require an LDAR program.

GREENHOUSE GASSES

As cited above, Hawthorn and Jones Farms, and possibly other Intel sources, use and emit GHG which are not accounted for in the proposed permit. DEQ should evaluate if those other GHG sources trigger New Source Review thresholds. In any event, Intel's current estimated GHG emissions are likely inaccurate since these other sources were not included.

The four new boilers added in a May. 2013 application letter, for instance, were possibly not grandfathered under the GHG application deadline at the end of 2010. Their emissions could increase Intel's GHG levels about the New Source Review thresholds, when combined with GHG emissions from the unpermitted boilers, and use of GHG chemicals at the other Intel facilities.

INTEL'S RONLER ACRES, ALOHA, AND ITS OTHER WASHINGTON COUNTY FACILITIES' COOLING TOWERS AND THEIR EMISSIONS OF TOXIC ADDITIVES ARE NOT REGULATED IN THE DRAFT PERMIT

INTEL SNOW

The Ronler Acres site operates an extremely large cooling tower system for its multi-building, multi-acre production facility. This tower processes so much water, and spews such a large cloud of droplets, that the site neighbors suffer from what they call "Intel Snow." This is a clearly delineated covering of frost that thickly coats most outdoor surfaces, reportedly for a mile around Ronler Acres, when the cooling tower discharges contact freezing air and surface temperatures and collects as snow on neighboring properties.

I am told the "snow" has a metallic taste. I saw no evidence in the DEQ file that the snow has been tested for contaminants. Intel adds biocides and treatment chemicals to its cooling water but the DEQ file did not list the chemical additives that Intel uses and emits. Some cooling tower operators may add metal-based chemicals to keep their cooling tower piping clean of growths, but I do not know if Intel does.

While DEQ regulations may exempt some cooling tower emissions, the plain impacts from deposition of Intel Snow on neighborhoods within one mile, coupled with reports of a metallic taste to the snow, and the potential impacts from Intel's chemical additives to the cooling towers., should trigger DEQ review of the cooling towers' emissions and additives, which could include highly toxic chemicals and metals. Intel Snow may also violate 340-208-0670, the "no fallout" regulation, and 340-208-0660, the no

nuisance regulation. Intel Snow can cause icy driving conditions, among other aggravating factors, which are a nuisance.

Since cooling tower emissions are often linked to "Legionnaires'' Disease," DEQ should also insure that Intel adds proper fungicides to eliminate that threat.

Intel's chemical additives to its cooling water could be toxic. A 2011 spill of cooling water had to be handled as a hazardous waste, because it contained toxic water treatment additives.

The thick deposition of Intel snow also demonstrates that Intel's emissions do not disperse and fall to earth on heavily populated nearby neighborhoods. The presence of toxic water treatment chemicals in the deposited snow may harm human health in the subjected neighborhoods.

INTEL SHOULD DISCLOSE ALL OF THE CHEMICALS IT USES AND EMITS, AND PROVIDE ADEQUATE PRODUCTION DATA FOR REVIEWERS TO DETERMINE COMPLIANCE

Intel keeps secret some of the many of the chemicals it emits (and stores and use), along with key production data, claiming it is proprietary information. Intel's neighbors are entitled to know what Intel is putting into their air, and should also be provided sufficient information to calculate Intel's emissions. The current draft permit and Review Report provided citations to memos from up to 20 years old as support for some of its assumptions, but did not make copies readily available, and we were unable to find that supporting documentation during searches of Intel's volumes of files.