

**FINAL MEETING SUMMARY**

**Community Environmental Working Group**

***“Striving for Continuous Environmental Improvements at Intel”***

**Date:** February 21, 2024  
**Time:** 5:00–6:00 p.m.  
**Location:** Remote: By Zoom and Telephone

**Attending**

Approximately 35 people were in attendance, many of whom did not identify themselves.

John Bartlit, NM Citizens for Clean Air & Water

Dennis O’Mara, Corrales resident, Clean Air for All Now

Jerry Dusseau, Corrales resident

Marcy Brandenburg, Clean Air for All Now

Jeff Radford, Corrales resident

Frank Gallegos, Intel

Sarah Chavez, Intel

Jannie Dusseau, Corrales resident

Carolyn O'Mara, Corrales resident

Judith Barish, CHIPS Communities United

Sandy Farley

Carol and Ken Apacki, Clean Air and Water Alexandria, OH

Leo Kenny, PLANET SINGULAR

Marc Kolman, Facilitator

CJ Ondek, Recorder

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**HANDOUTS**

- CEWG Draft Agenda
- October Draft Meeting Summary
- EHS Activity Reports (October – February)
- Pending and Completed Action Item Progress Report

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## AGENDA

- Welcome, Introductions, Announcements, Standing Agenda Items
- Site and Technology Updates
- Air Separation Units
- Public Comment
- Adjourn

## WELCOME, INTRODUCTIONS, ANNOUNCEMENTS, BRIEF ITEMS

Marc Kolman opened the monthly meeting. John Bartlit welcomed all in attendance and referenced the CEWG's mission statement on the CEWG's Website. He also thanked Dennis O'Mara for the large turnout of attendees at tonight's meeting.

- Because the attendance was large and the meeting time only one hour, rather than formal introductions Marc Kolman asked attendees to write their names, affiliations, if relevant, and email addresses in the Zoom chat. He also encouraged new meeting attendees to sign up to receive the CEWG newsletter on the CEWG web site ([www.cewg.org](http://www.cewg.org)).
- Marc Kolman said that to ensure fair and equitable timing for everyone who wanted to ask a question during the meeting's Public Comment section, he would get an indication from people wanting to make a public comment and divide the time appropriately. He also encouraged attendees to post specific questions in the chat to enter the meeting record. Questions could be directed toward Intel, CEWG members, or anyone else present at the meeting.
- Dennis O'Mara announced that Thursday, March 14<sup>th</sup>, Clean Air For All...Now! (CAFA-Now) was hosting an in-person community meeting at the historical San Ysidro church in Corrales, starting at 6:00 pm. CAFA-Now members will discuss the organization, its work, accomplishments, and future plans. Also discussed will be the new cancer study done in the 14 Census tracts around Intel, air monitoring results near the Intel plant, and other topics. CAFA-Now will be sending out announcements and flyers in the coming days, he said. Those interested could also check the CAFA-Now Web site at: <https://www.cafanow.org>.

## STANDING AGENDA ITEMS

### EHS Report

Sarah Chavez, Intel, introduced herself. She said she was a native New Mexican and an environmental engineer by training, with a degree from New Mexico Tech in Socorro. She said

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she has been working with Intel for 30 years and participated in CEWG meetings regularly since its inception.

- Ms. Chavez explained the EHS reports, which were Environmental Health and Safety reports that Intel provided to CEWG meetings. EHS reports shared with the public Intel basic site operation information, documents submitted to the regulatory agencies, and any community complaints received and follow up actions taken. At tonight's meeting, she was going to briefly share EHS reports from November 2023 to February 2024.
- Ms. Chavez said most of the site activities or site events had been the crane work, with a few onsite night work items. The second section in the EHS report listed information that Intel provided to regulatory agencies. The report's back page spelled out any acronyms used. This information was predominantly regulatory or permit required reports to specific agencies. For example, the Albuquerque Bernalillo County Water Utility Authority (ABCWUA) regulated Intel's water, and the New Mexico Environment Department Air Quality Bureau (NMED AQB) regulated Intel's air quality. The Environmental Protection Agency (EPA) received a variety of reports from Intel. In the November EHS report, Intel received an email odor complaint but was limited in their ability to investigate due to the delay in notification. The second complaint concerned dead vegetation near the eastern slope, with Intel Community Relations passing on this information to groundskeeping.
- Ms. Chavez discussed the December EHS report. She said Intel continued to have cranes on site and held a quarterly meeting with ABCWUA. Regular submittals were routine reports to regulatory agencies. Two community complaints were recorded. The first complaint concerned a chemical smell coming from the east side of the service yard, which upon further investigation was revealed to be coming from the portable toilets. The second was a noise complaint about an onsite alarm activated by construction activity, which Intel employees were able to deactivate.
- In the January report, Ms. Chavez said crane activities continued and routine reports were submitted to the regulatory agencies. There were no community complaints in January. Ms. Chavez continued that a fire marshal inspection occurred at the end of January, as reported in the February EHS report, which also reported crane activity and a list of ongoing regulatory submittals. Two complaints were recorded. The first was a complaint call about trash on Intel's east slope. Intel returned the call to let the neighbor know that Intel was working on cleaning the trash, which, due to the wind, was an ongoing challenge that Intel tried to manage as best as possible but appreciated neighbor calls about any remaining trash that was missed. The second complaint was an email about giant plumes of "something" exiting the stacks around the new Fab 9 and visible from northeast Albuquerque. Intel investigated and determined that the plumes were actually

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steam coming from the boilers and cooling towers, and that all abatement systems were up and running.

- Marcy Brandenburg commented that she was the person who emailed about the “plumes,” which she had seen while driving on Route 313, 10 miles north of Intel. She said the temperature was around 23 degrees, and she drove that road quite often. The following day the temperature was also very low, but there were no plumes. She said that Intel’s Frank Gallegos had responded to her email saying it was vapor due to cold weather. She said she had a hard time buying that the plumes were due to weather and completely harmless and asked for further explanation as to why Intel considered the plumes “vapor.”
- Frank Gallegos responded that upon receiving her email, he had Intel staff walk the perimeter and site. They identified that the plumes were steam coming from the cooling towers and boilers. When air was released from the cooling towers and boilers, the temperature difference created the steam plumes. He said anyone that drives by the site in the morning would see steam plumes, but in the afternoon, after the temperature increased, they would not see them. Ms. Brandenburg replied that she was concerned due to the inconsistency. In her experience the temperature was the same on two consecutive days; one day had large plumes of vapor, and the next day, with the same temperature, there weren’t any plumes. She asked if the Intel staff used any air pollution monitoring equipment when they walked the site. Mr. Gallegos replied that Intel staff walked the fence line whenever they received odor notifications, and they took sensing equipment with them for this particular event. However, they identified the plumes as steam coming from the cooling towers and boilers.
- Marc Kolman said that, in the interest of time, he was going to keep the agenda moving, as this could turn into a long discussion. He suggested to Ms. Brandenburg that if she wanted to include something specific in the meeting summary to type it into the chat, email it to him, or reserve it for the Public Comment period.

## **SITE AND TECHNOLOGY UPDATES**

- Frank Gallegos introduced himself as Intel’s current Community Relations Director. Prior to this role, he was the Environmental Health and Safety Manager. He said he had worked with Intel almost 27 years, was born and raised in New Mexico, and earned his degree from New Mexico State University. He said he was going to give updates on the Intel site upgrade and related technology, as well as field any questions. See Mr. Gallegos’ connected slide presentation “Community Environmental Working Group—NM Site Update.”

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- Using a slide with a Google Earth image of the Intel facility, Frank Gallegos gave an aerial overview of the Intel plant. The upper portion of the image showed the plant's west side. Moving east to the plant's center was the location of Fab 11x, Intel's main manufacturing area, which continued to be in production. To the right was the office building where all employees worked and operated. Next, to the right of the office building, was Fab 9, which was where the new investment and technology upgrade was occurring. The Fab 9 was an older manufacturing facility, which had previously been vacant for many years.



- Frank Gallegos shared the following upgrade project facts. In two and a half years, over 3,000 contractors worked on the Intel facility retrofit to date; currently 2,800 contractors worked on site. Also to date, Intel had hired over 700 new employees to train to staff the upgrade. Intel strove to hire local talent, with the hiring rate for New Mexican employees at 60%. Mr. Gallegos said hiring would increase by another 200 or so in the next year. Previous to the upgrade, Intel employed 1,846 employees onsite. With the upgrade Intel will increase the number of employees to an estimated 2,600.
- Frank Gallegos showed a picture of the Fab 9 before and after. The upper photo showed the old manufacturing space, with the tools and equipment that were previously used and removed. The bottom photos showed what the factory floor looked like a few months ago, partially filled with new equipment. Intel would continue to install new tools in Fab 9 throughout the year. Mr. Gallegos said there were enough tools in Fab 9 to be able to



run operations, which was why Intel held a celebration a couple of weeks ago to kick off Fab 9 operations.

- Frank Gallegos showed a slide that listed technologies used at Intel. Mr. Gallegos said the two main technologies operating on the site today were the Embedded Multi-Die Interconnect Bridge (EMIB) and Silicon Photonics. Foveros was the name of Intel's advanced packaging technology that will be used in Fab 9. The slide contained links to quick videos further explaining the technologies.
- Frank Gallegos explained the listed technologies in "layman's" terms. He said the EMIB connected two die or chips together to allow adding more units onto the equipment. EMIB was one of the key components in creating advanced packaging, and was developed, designed, and built in New Mexico. For more details on EMIB technology watch this video: <https://www.youtube.com/watch?v=mRQFJFmYMak>
- Mr. Gallegos next discussed Silicon Photonics, which had been produced in the New Mexico site's Fab 11x for some time. He said Silicon Photonics was the optical interface for Ethernet switches, routers and transport networking equipment. In layman's terms, it was a component of the data center and transmitted data through a laser light. Its purpose was to speed up data center processes, reduce energy, and increase the efficiency of a data center. Silicon Photonics enabled faster data transfer over longer distances compared to traditional electronics. This video contains more details about Silicon Photonics: <https://www.youtube.com/watch?v=gsTl2qkWnp0>
- Foveros technology was the advanced packaging that would occur in Fab 9, Mr. Gallegos said. This technology allowed Intel to stack chiplets three-dimensionally and customize building processors for different customers. In the past, Intel was only able to stack computer tiles side-by-side, which took up the entire wafer space. This new process allowed Intel to mix and match computer tiles to optimize for cost and power efficiency. The New Mexico site would not be creating microprocessors; rather, various customers (Intel Arizona, Intel Oregon, or other companies) would send microprocessors to New Mexico to package the product through the advanced Foveros packaging process occurring in the Fab 9 facility. For a closer look at the Foveros technology, watch this video: <https://www.youtube.com/watch?v=eMmCYqN6KSs>

## **AIR SEPARATION UNITS**

- Sarah Chavez discussed air separation units and showed two slides to illustrate (see attached slide presentation). She explained that the tall, tan units supplied nitrogen and oxygen, which Intel used in their manufacturing process. Air separation units pulled in

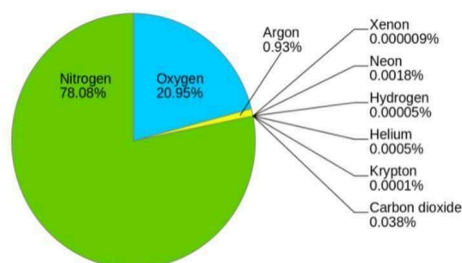
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ambient air, and then pulled out nitrogen, in either liquid or gas form, and liquid oxygen. Intel used the nitrogen to clean equipment; for example, cleaning a chamber before a person entered to physically clean out that chamber. Intel uses oxygen to create an oxide layer on the wafer. The air separation units then released the remaining air back into the environment. Intel verified that natural gas is not used in the air separation process. The below graph copied from Slide 2 showed the remaining components the process released back into the air.



- Ms. Chavez said the units were so tall because of the volume of gas and liquid—the nitrogen and oxygen—that Intel needed to use. Air separation units were a common part of the semiconductor manufacturing process. Intel’s newest air separation unit had two tall boxes and a tank between the two (see Slide 3 photo). She noted that we had another air separation units onsite that had one tall box and one short box. Components inside the tall white boxes include a distillation column, a condenser, and a plate heat exchanger. The temperature inside the box was very cold—a cryogenic temperature—and the equipment was insulated to minimize heat leak to the environment. Ms. Chavez said that cooling towers were part of the air separation unit facility and were permitted. The cooling towers removed heat or dissipated heat from air compressors and were a source of particulate emissions, which was why they required permitting. Ms. Chavez said that her explanation was very simple, but more information and photos of air separation units could be found online.
- Marcy Brandenburg asked why the towers weren't there prior to the new expansion, and was there a reason that they were more usable now than they were prior to the expansion. Sarah Chavez said previously there was an air separation unit in the Fab 9 area that was demolished. Now that Fab 9 was being reopened, Intel needed the nitrogen and oxygen for that manufacturing process and therefore required air separation units. Ms. Brandenburg asked if the New Mexico fire marshal was aware of what was stored in the tanks. Ms. Chavez replied that Intel kept the fire marshal updated about what was happening onsite, and regularly submitted an emergency response and contingency plan to them.

- Dennis O'Mara said that prior to the update, Intel had seven or eight thermal oxidizers and 27 scrubbers. He remembered from past CEWG meetings that Intel would add five new thermal oxidizers with the upgrade, but he did not remember the number of new scrubbers Intel would add. He asked Ms. Chavez to refresh his memory on those numbers. Sarah Chavez said she did not remember the exact numbers, but right now, the factory was only partially full, and one new scrubber and one new thermal oxidizer had started operations. She said the final thermal oxidizer and scrubber numbers depended on the number of pieces of equipment installed in Feb 9, but that Intel would remain within the permit limits.

Dennis O'Mara asked whether or not the air separation unit utilized natural gas. Sarah Chavez answered that she did not know and would check in with other sources and get back to him.

**ACTION ITEM:** Sarah Chavez would check and confirm whether or not the air separation unit utilized natural gas.

- Mr. O'Mara said in past CEWG meetings, attendees discussed, in general, the fact that air emissions were going to increase with the upgrade, but no one at Intel was able to estimate by how much; they could only confirm an increase. He asked for an update. What were the current projections on increased air emissions? Ms. Chavez said that the answer was similar to his previous question, that Intel would stay within their permit limits.
- Jeff Radford asked if the new process required using new chemicals, and did the community need to be concerned about them. Sarah Chavez replied that the chemicals were still generally the same. She added that they could not reveal specific chemical names due to the sensitivity around competitors and proprietary information. But, it was still semiconductor manufacturing, and there was not a lot of difference from what chemicals were used in the past even though Intel was using a new packaging technology. The more general names of the chemicals Intel used was included in the various regulatory and emissions reports. The Air Quality Bureau knew the chemicals from a permit standpoint, for example, the air emission chemical limits that were intended to protect public health. Intel intended to remain within those limits and provided information to demonstrate compliance with the permit.
- Jeff Radford asked the name of the firm that conducted Intel's quarterly and annual air emissions testing or monitoring. Sarah Chavez responded that Intel used the same company, ERM, for many years to conduct monitoring and testing. She added that Intel had a permit requirement in place since 2001 that required annual emissions testing on every single scrubber and thermal oxidizers. The testing used to be done quarterly until about 2011 or 2012 before moving to annual testing.



- Dennis O'Mara said he had just received Intel's emissions reports to the New Mexico Environmental Department (NMED) for the last two years, and only legacy pollutants like NOx, sulfur dioxide, etc., were reported. There was not a lot of other information. He shared Mr. Radford's concern and would like to know which individual chemicals Intel used. He also commented that Intel's emission limits, as stated in the air emissions permit, were at the very top end of what was allowed for a minor source permit and were not independently verified. Because of this, he questioned their accuracy. He added that the amounts reported on legacy pollutants were just a fraction of what the permit allowed, which meant that at any moment, any day, or any time Intel could decide to ramp up its emissions without any kind of oversight or notification. There was a lot of wiggle room between what the permit allowed and what Intel actually emitted. From this information, he said he deduced that Intel did not have the motivation to do the very best job it could to use the most highly effective abatement equipment to reduce emissions to an absolute minimum.
- Sarah Chavez replied that she was part of the Intel group that put together the permit application for the initial permit limits, and the limits in that permit reflected where Intel thought it was going to be as the site grew. Intel had put a lot of effort into emissions reductions over the past 30 years, and had done a good job at it, which was why emissions were much lower, allowing Intel to continue to grow the site. Ms. Chavez added that Intel's manufacturing facility operated 24 hours a day, seven days a week. If Intel released all their emissions within a short period of time then they would not be allowed to operate the rest of the year. Intel's job was to produce a product, and releasing all emissions within a short period didn't make a lot of sense business-wise. Intel worked hard to make as many emission reductions as possible, including using thermal oxidizers and scrubbers. That was why Intel had been able to keep emissions low, relative to the permit limit. Intel continued to look for ways to reduce emissions as new technologies were developed.
- Dennis O'Mara commented that Intel could be doing a lot more to reduce emissions to an absolute minimum. He said he had learned that the Oregon Intel facility recently installed wet electrostatic precipitators to reduce particulates, and he had asked if Intel New Mexico would install that kind of equipment. Their answer was no, which led him to conclude that the lives, health, and well-being of people in Oregon was more important to Intel than those here in New Mexico.

## **PUBLIC COMMENT**

- Jerry Dusseau asked Dennis O'Mara if he had any updates on the mobile monitors being placed around the Corrales area, including their findings. Mr. O'Mara said this would be a discussion item at the CAFA-Now public meeting in March.

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- Jeff Radford said he was concerned that Intel's just-in-time delivery system increased the possibility of having an accident at the loading docks, because the greater the frequency of deliveries the more the likelihood of having some kind of an accident. He said he was trying to keep track of loading dock accidents and wasn't sure whether these accidents would show up in the EHS reports. Frank Gallegos said he understood Mr. Radford's concern. Intel tried to reduce the amount of chemicals stored on site, which it was able to accomplish using just-in-time delivery. From a safety perspective, and as long as the rules and requirements were followed correctly, he believed that using just-in-time delivery was safer than storing large quantities of chemicals onsite, although someone could look at it either way. But in his opinion, Mr. Gallegos said, it was probably better to have less chemicals on site versus more chemicals on site.
- Mr. Radford said he agreed with that perspective. On the other hand, the citizenry should pay attention to actions taking place at the loading dock, and he had never heard about that. Mr. Gallegos replied that he was not aware of any issues, from a chemical spill or release perspective, on the docks. He reminded that Intel had a first responders group that was well trained to respond to any accidents. Intel New Mexico also conducted a site-by-site comparison to learn from any events and accidents that occurred at Intel sites globally. If an incident had the potential to impact the community, Intel security would call the first responders, triggering additional communication. Mr. Gallegos expanded that Intel's dedicated first responders' primary job was to respond to any on-site safety incident or event, contain it, manage it, and escalate security, when necessary, to pull in external resources such as the fire department, with whom they had a close relationship. These first responders were Intel employees.

### **Closing Remarks**

- Marc Kolman encouraged attendees to visit the CEWG's revised Website, which was now more user-friendly and accessible. Visitors could download information connected to meetings, including materials for tonight's meeting, or join the mailing list.
- Frank Gallegos said he was pleased to see over 30 people attending today's meeting. He thanked CEWG members and CAFA-Now members for their work and acknowledged the history of partnership that resulted in improvements to Intel emissions over the years. He said he valued these partnerships, as well as CEWG meetings to hear community concerns. He encouraged folks to continue to participate in CEWG meetings. In 2024, the CEWG meetings would occur quarterly throughout the year, revolving around a specific topic. Mr. Gallegos said that community members could continue to voice their concerns at these CEWG meetings, as well as send their concerns to both he and Sarah Chavez, and they would do their best to address them offline.

**ADJOURN**

**NEXT MEETING**

TBD

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