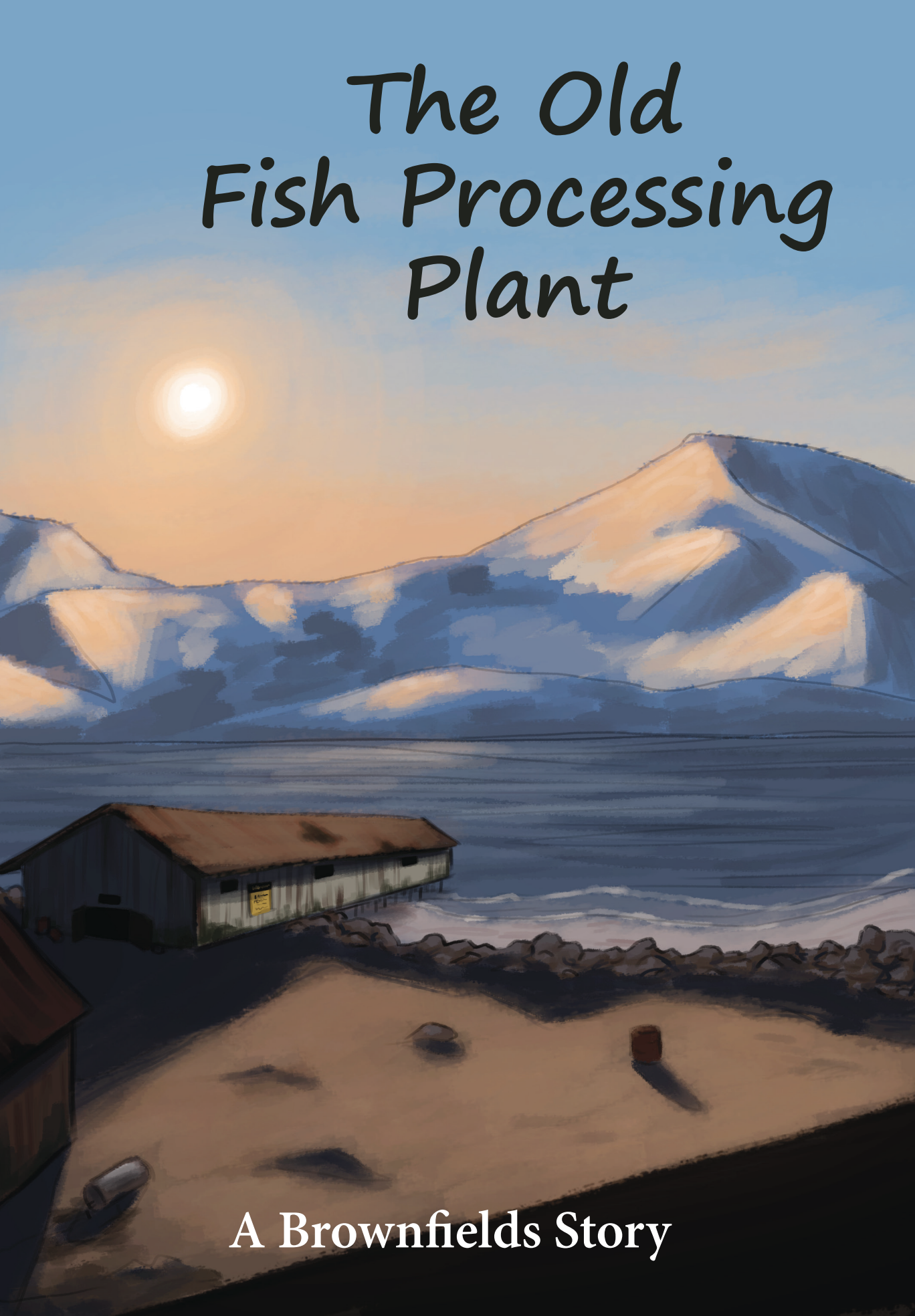
The Old Fish Processing Plant



A Brownfields Story

The Old Fish Processing Plant

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Alaska Department of Environmental Conservation

ADEC/SPAR/CSP/Brownfields
555 Cordova Street
Anchorage AK 99501

907-269-7503
www.dec.alaska.gov

Text by Lisa Griswold
Illustrations by Naomi Green
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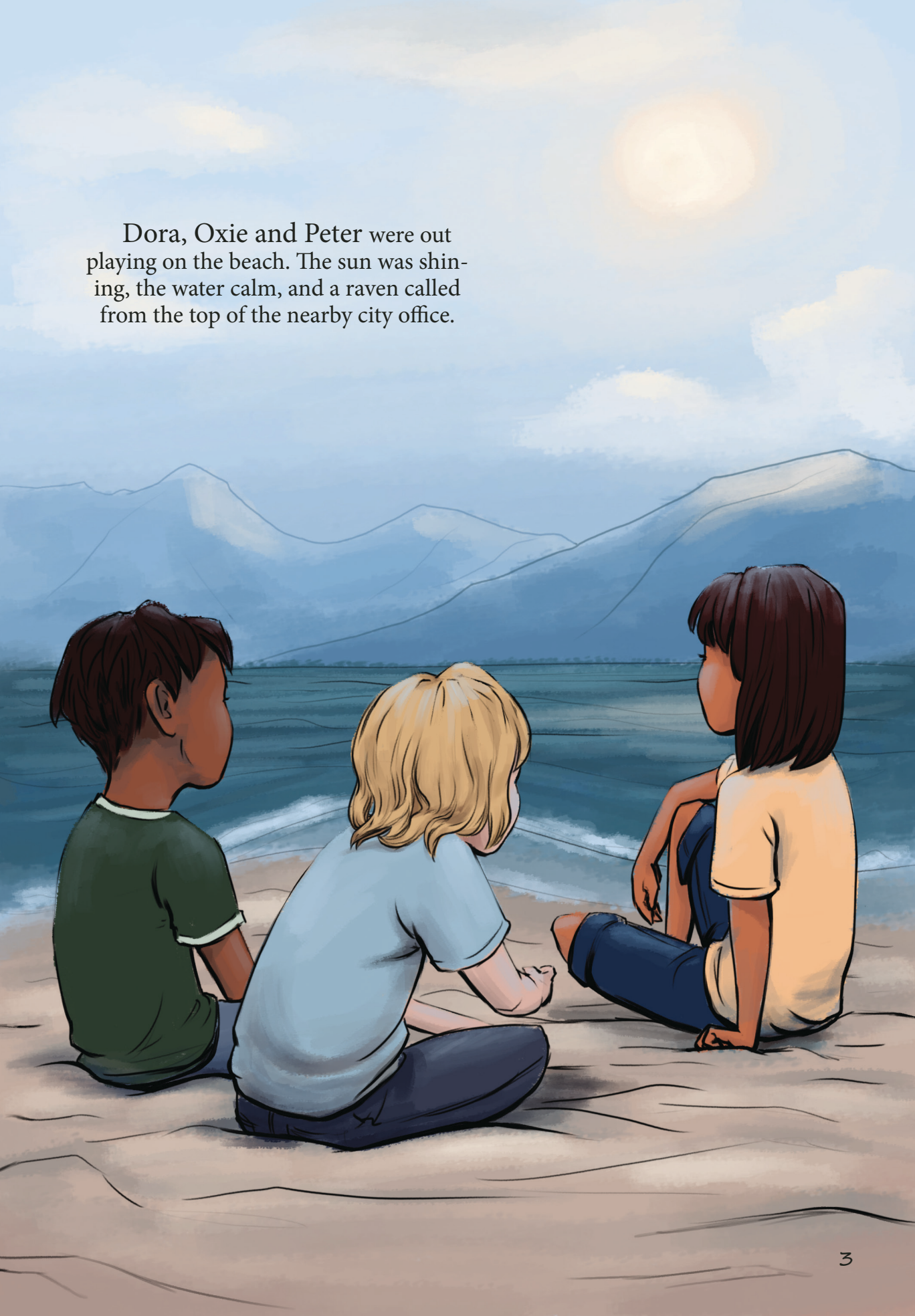
The places, characters and events in this story are fictional. They are intended only to convey information about brownfields in a generic Alaskan setting and are not meant to represent any specific individuals, events or places.



Dora, Oxie and Peter were out playing on the beach. The sun was shining, the water calm, and a raven called from the top of the nearby city office.

"Hey, who's that?" Dora said, squinting into the bright sun.

"Who?" Peter replied. Oxie turned around to look in the direction Dora was staring.

"Oh! It's Uncle Thomas," Dora said. Uncle Thomas was shuffling around the old fish processing plant that sat on the edge of the beach, putting up signs on the old buildings that were falling apart, tilting further and further towards the water.

The buildings looked like they could collapse at any minute.

"I wonder why he's doing that?" Oxie said.

"Let's find out!" replied Dora. Peter dropped the stick he'd been drawing in the sand with and reluctantly followed Dora and Oxie up to Uncle Thomas. Peter's cousin had told him that those buildings were full of ghosts. He didn't dare go near them.

As they got closer Dora could read the signs: "WARNING ASBESTOS CONTAINING MATERIAL DO NOT ENTER. "Good morning, Uncle," Dora cheerfully said when she got close to Uncle Thomas.

"Good morning," Thomas said, smiling at her. Dora nudged Oxie. "Um. What are you doing, Uncle?" Oxie asked.

"Oh, putting up signs on these old buildings. They're not safe to be around." Peter knew it. He wanted to run away as fast as he could, but didn't.

"Uncle" Dora asked, "what is A-S-B-E-S-T-O-S?"

"Asbestos? It's bad for you," replied Uncle Thomas. "Asbestos used to be commonly used in many building materials. Then, scientists realized that sometimes asbestos fibers can break away and be breathed in by people. If you breathe in asbestos, it's something that can hurt your lungs really bad. And it's not the only thing in these old buildings that could hurt you."

Peter's eyes got big. He looked at Dora and Oxie. Their eyes were big, too. "What… what do you mean, Uncle?" Peter asked.

Uncle Thomas looked down at Peter. "Well, we think there might also be paint and old batteries that have lead in them, old fluorescent light bulbs, and maybe some old heating oil fuel might have spilled from that tank or the drums," Uncle Thomas said, pointing at an orange tank up on stilts, with a pile of drums on their sides next to it. The ground under the tank looked black. Dora thought the tank looked like it might fall over any minute, too. The raven called again. "We have been working on trying to clean this old place up because it can make people sick, but it's hard to find enough money to have someone come out here to look at it," Uncle Thomas said.

"Why does someone need to come out to look at it?" Oxie asked.

"Well," Uncle Thomas replied, "Because this stuff can be bad for you, we found out the State of Alaska Department of Environmental Conservation requires that someone with extra specific training has to come out to do any work."

"Oh," Dora said, suddenly understanding. "And that's one of the reasons it costs so much." Oxie looked at Dora, confused. "Travel," Dora began, shaking her head. "For starters, it costs much more to travel someplace in Alaska."

"Yup," Uncle Thomas sighed and shook his head. "It would have been much easier and cheaper if the drums had been stored properly, or if they had kept a close eye when they filled the tank to make sure the heating oil didn't spill over onto the ground."

Oxie looked at the dark ground under the tank. "Uncle?" Oxie started, "how does that stuff make people sick?"

Uncle Thomas turned to look at Oxie, and then at the city office. He whistled.

A big black bird took flight from the roof and began flying towards them. As he got closer, Dora realized it was Tulugaġ – the wise bird. Tulugaġ landed on Uncle Thomas' shoulder. "Tulugaġ," Uncle Thomas said looking at the raven, "can you tell us how people get sick from pollution?"

Tulugaġ looked at Uncle Thomas and then at Dora, Oxie and Peter. "Well," Tulugaġ began, "sometimes people can get sick if they touch it, like if they were digging and put their hands in polluted soil. This is something called *dermal exposure* because your skin touches the pollution. Sometimes people can get sick if they eat it or drink it, like if the pollution has gotten into the water well. This is something known as *ingestion exposure*

because you are eating or drinking something that has been polluted. Sometimes people can get sick if they breathe it, like if they are living too close to it and they breathe the vapors coming off of the soil. This is something called *inhalation exposure.* Lastly," Tulugaġ shook his head, "sometimes the pollution can get into the plants and animals, and sometimes when people eat those plants or animals they can get sick too. This is known as *ingestion of wild food exposure*." Dora looked at Oxie and Peter. They were both looking at the raven with wide eyes. Dora realized she was doing the same.

"That's terrible!" Oxie exclaimed.

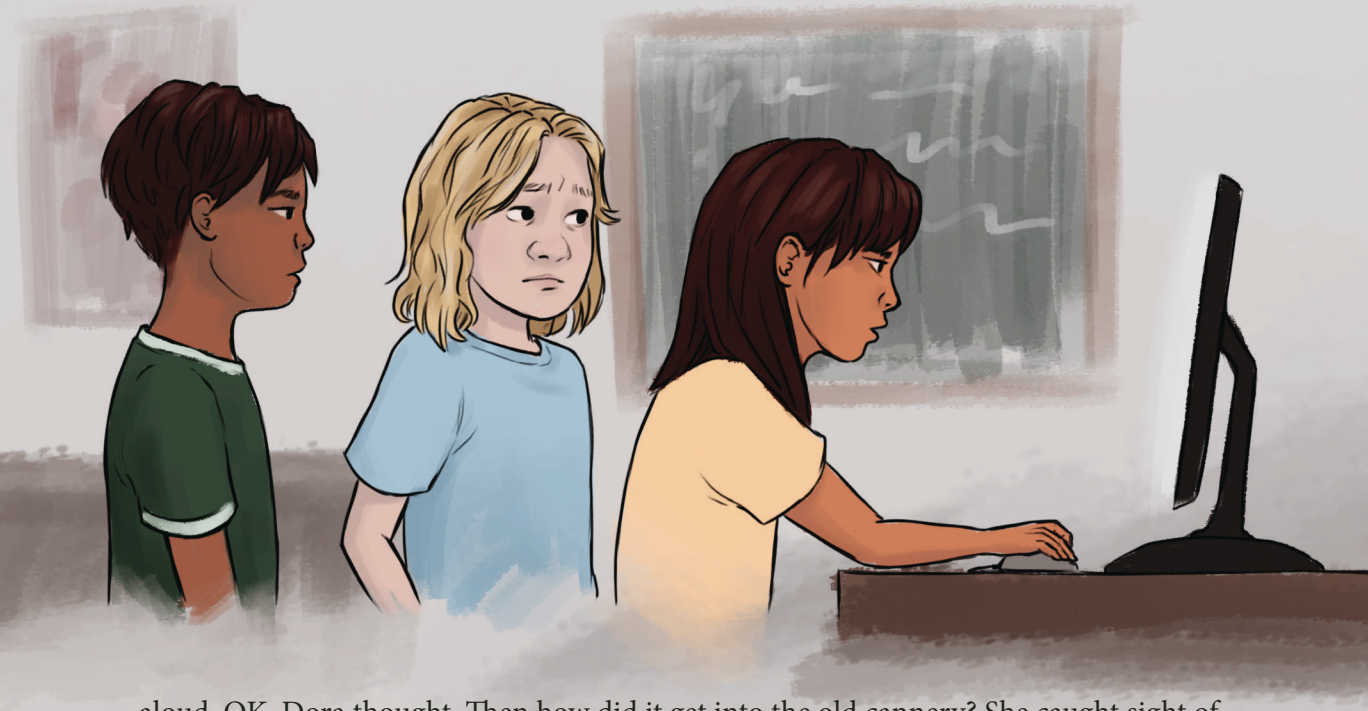
"It is," Uncle Thomas replied. "And that's why we need to figure out how to get rid of these things." Uncle Thomas thanked Tulugaġ, who flew to the top of the biggest cannery building and cawed.

"But how could this have happened? What are we going to do?" Dora asked.

"Ah," Uncle Thomas replied, picking up another sign to nail on the side of the building, "for that you should talk to your grandmother." Dora knew that she would have to wait to see her grandmother until the next afternoon, but she also knew where she could get more information. She made a plan with Oxie and Peter to head over to the school and ask to use the computer to look up what was so bad about the items Uncle Thomas had talked about.

The computer screen blinked on. Dora looked at Oxie and Peter. "I hope the internet is up right now," she said. Dora sighed with relief when the internet page appeared. She looked down at her list of pollutants. Hmm, she thought. Where should she search for this stuff? Wait! The "United States Environmental Protection Agency" or "E-P-A" as her teacher had called it. They were supposed to have almost all the information you could want. "E-P-A" she typed into the search window. Up popped many results. Dora clicked on the link: www.epa.gov.

Dora began by searching "A-S-B-E-S-T-O-S" on the EPA website. "What is Asbestos?" appeared on the screen. "Asbestos is a mineral fiber found in rock and soil," Dora read



aloud. OK, Dora thought. Then how did it get into the old cannery? She caught sight of the next questions on the page: "Where can I find asbestos?" She began reading the list aloud to Oxie and Peter: "Asbestos has been used in building materials—just like Uncle Thomas said!" She began scanning the list.

"What does it say, Dora?" Peter asked.

"Looks like it could be in roofs, insulation, tiles, mostly in buildings built before 1972…oh!" Dora exclaimed.

"What?" Oxie asked. "It says that most uses are not banned!" Oxie's jaw fell open. "So does that mean it can still be used?" Oxie asked.

"I…I think so," Dora said, her heart sinking.

Oxie looked at Dora. "Dora…what was the name of that place our teacher said we could look at?' Dora's face lifted. "The Center for Disease Control!" Dora spun back to the computer and entered www.cdc.gov into the computer, and put "A-S-B-E-S-T-O-S" into the search bar on the CDC website and began reading again: "Asbestos fibers do not evaporate in the air or dissolve in water…they are too small to see and the fibers can be carried long distance before settling…oh…asbestos fibers do not break down and will remain mostly unchanged over a long time…"

The three sat in silence for a moment before Peter sighed and said "Look up the next one."

"L-E-A-D," Dora typed into the search window on the EPA website. Dora sighed.

"What?" Peter asked.

"It's bad."

"How bad?" Oxie asked.

"Well, it says it's a natural metal found in the Earth's crust, but it's toxic to people and animals, and that it can be found in leaded gasoline, batteries, and paint!"

Oxie shook her head. "No wonder Uncle Thomas wants to keep people out of there!"

Dora looked back at the computer screen. "According to this, homes built before 1978 probably have lead-based paint. When the paint peels and cracks, it makes lead dust. Children can be poisoned when they swallow or breathe in lead dust. Certain water pipes may contain lead. Lead can be found sometimes in toys and jewelry. It can even be found sometimes in candies imported from other countries or in traditional home remedies. Certain jobs and hobbies involve working with lead-based products, like stained glass work, and living near an airport may expose a person to lead in the air or soil from aviation gas."

Dora continued to scan the page. "Diesel. Look, even diesel fuel is on here! That doesn't seem too good...diesel's used in lots of places, isn't it? Like the power plant?"

"Yeah, and my dad uses it in his truck *and* his fishing boat," Peter answered.

"So it's probably around most of the village," Oxie added, shaking her head again.

Peter furrowed his brow, "Who — who were the people Uncle Thomas said were going to come into the village?"

"Oh yeah," Dora said, her face lighting up turning back to the computer. "He said it was the State of Alaska Department of Environmental Conservation. I bet they have a website…yup, here it is!" Dora said, turning back to Oxie and Peter. "The website is www.dec.alaska.gov."

"What do they say about diesel?" Oxie asked.

"Hmmm…looks like diesel from tanks is a widespread problem in Alaska…oh! Look!" Dora turned the screen to Oxie and Peter. "They have stuff about home heating oil tanks and how to keep them from spilling." Dora turned the computer screen back.

"What else did Uncle Thomas say could be in that building?" Peter asked.

"F-L-U-O-R-E-S-C-E-N-T…L-I-G-H-T…B-U-L-B-S." Dora hit enter and sighed as she read the page.

"Bad again?" Oxie asked.

"Kind of," Dora replied. "It says that the bulbs can contain mercury, another metal like lead…but this says the light bulbs can be recycled." Dora looked at the clock on the wall. It was almost six o'clock. "Oh! We better get home for dinner." Oxie and Peter looked at the clock and grabbed their backpacks. Outside, Dora waved to Peter and Oxie as they headed back to their homes. Dora was excited for tomorrow. Now that they had this information, Dora couldn't wait to visit her grandmother to hear about the fish plant and what they wanted to do about it.

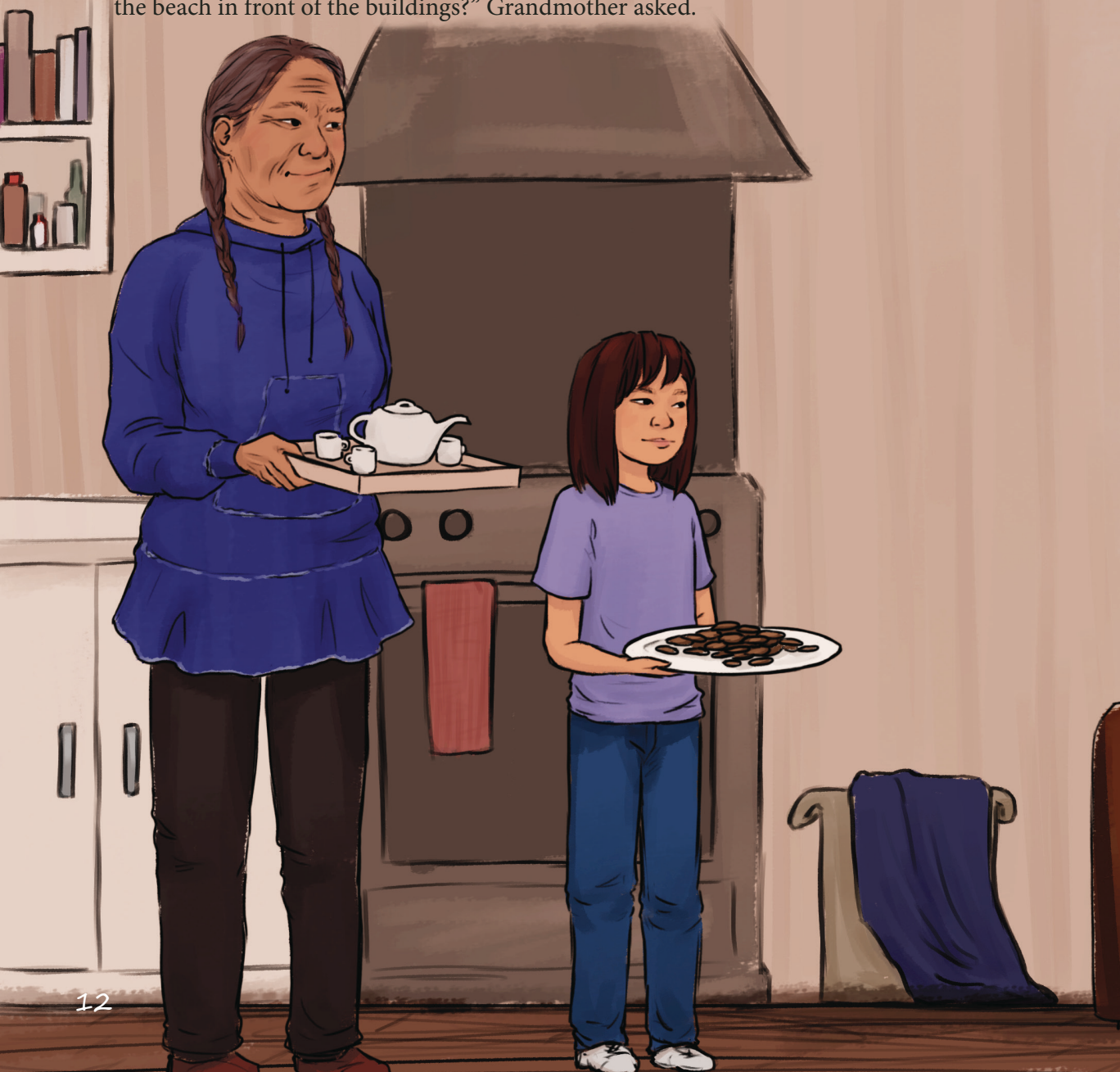
The next day, Dora walked to her grandmother's house where Peter and Oxie were waiting outside. Her grandmother saw them from the window and opened the door. "Oh, Dora, Oxie and Peter! Come in, come in. Would you like some tea?"

Dora smiled at her grandmother. "Yes, grandmother…but we also wanted to ask you about the old fish processing plant."

"Oh…oh….that old place…you know, it used to be such a helpful place and a source of local pride, but not anymore," Grandmother responded.

Dora had so many questions. What was it used for? What happened to it? What was going to happen to it?

Grandmother seemed to know what Dora wanted to ask and began to speak. "The cannery was in operation from, oh, around 1919 until 1970. The villagers could bring their salmon there to process, and some had jobs there. They would take the salmon to sell it." Grandmother's face fell, and she sighed. "But, it closed long ago, taking the jobs and a way to process the fish away. It's been empty ever since. Now over 50 years. You've looked at the beach in front of the buildings?" Grandmother asked.



"What beach?" Peter asked. The water went up and underneath the tilting buildings when the tide was high in the summer, and the sea ice pushed against the walls of the buildings in the winter.

"Exactly," Grandmother said, shaking her head. "What beach? It *used* to be a beach, but the fall and winter storms have been slowly taking the sand away, and that's why the buildings tip over now."

"What happens if we don't do anything about the old fish processor?" asked Oxie.

Suddenly, there was a loud tapping on the window that sounded like a drummer on a snare drum. Peter jumped out of his chair in surprise. Oxie looked over to the window and there sat Tulugaġ.

"How…how does he do that?" Peter asked.

Grandmother just smiled and opened the window for Tulugaġ. "Ah, Tulugaġ, just in time!" Grandmother said to the raven, "Could you tell us about what could happen at the fish processing plant if we don't do anything?"

"Well," said Tulugaġ, "It could mean a few things. If the buildings fell into the ocean, the villagers' boats could hit the building pieces under the water. Not to mention that asbestos, the mercury from the fluorescent light bulbs, and lead could get into the water. If the land where the plant sits floods, the diesel in the soil could get into the water and all of these things can make people or animals sick."

"How does it make them sick?" Dora asked.

Tulugaġ sighed and shook his head "Metals like lead and mercury can build up in the body the more it is exposed to them. If animals already have lead and mercury in them, when people eat them, they can build up in people's bodies, too. This is known as *bioaccumulation*. Lead can cause damage to the brain and nervous system, slow growth and development, cause learning and behavior problems, and hearing and speech problems. But!" Tulugaġ exclaimed. "The good news is that lead poisoning is 100% preventable."

"Tulugaġ?" Dora asked, "before you told us about how people can get sick by *dermal exposure* or *ingestion* or *inhalation*. Does it matter how someone is exposed?"

Tulugaġ sighed and shook his head. "Unfortunately, no, it doesn't matter if someone breathes in lead, swallows it, or absorbs it through their skin. The health effects are the same, but the body can absorb higher levels of lead when it is breathed in."

"What does it do in your body?" Oxie asked.

Tulugaġ turned to Oxie. "Well, lead is absorbed and stored in bones, blood and tissues, which is why it is so bad – you keep being exposed. Again: bioaccumulation."

Peter looked at Tulugaġ. "Oh," he said. "Like what you said before with Uncle Thomas."

"That's right," Tulugaġ said nodding his head.

"What about the fluorescent light bulbs and mercury?" asked Oxie.

"Ah," Tulugaġ said, "the light bulbs contain a metal called mercury. Mercury can be found in a few other things like old light switches and most people get exposed to the mercury when the container the mercury is in is broken. If it doesn't get cleaned up quickly, it can evaporate into an invisible, odorless toxic vapor and people can breathe it in. That kind of exposure is called *inhalation*."

Peter thought back to the signs Uncle Thomas was putting up. "Tulugaġ? What about asbestos?"

"Well," Tulugaġ started, "breathing in asbestos fibers that have escaped the product

they were in can cause lots of problems for your lungs. It can cause multiple different types of lung disease and even cancer, because the fibers scar the lungs and make it hard for the little air sacs in your lungs, called *alveoli,* to take in air."

Dora's jaw dropped. "No wonder Uncle wants people to stay out of those buildings."

The kids were quiet for a moment before Oxie remembered the other stuff Uncle had talked about. "Tulugaġ?" Oxie asked, "what about heating oil?"

"Well, heating oil is diesel fuel, which has stuff added to it that can cause cancer". Tulugaġ pointed a wing towards the old cannery building. "And if it is spilled on the ground, like it was at the old cannery, it can travel to water located beneath the surface, called *groundwater*. Diesel is also lighter than water, so it floats on top, which means that people could get sick through inhaling the vapors that rise from the fuel. This happens because the additives in the fuel are what is known as *volatile*."

"Or they could get sick by touching it, right? Or *dermal exposure*?" Peter asked.

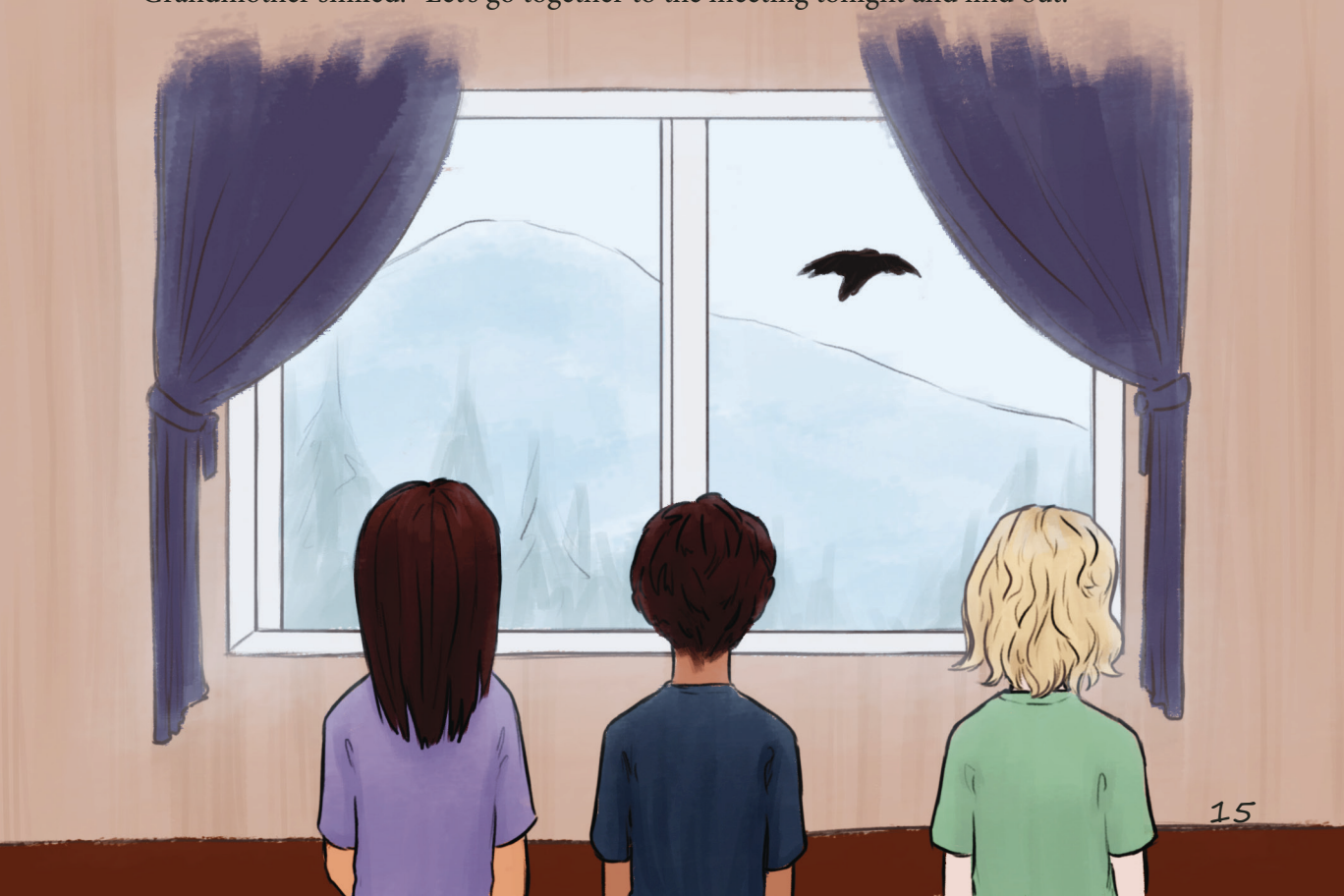
Tulugaġ smiled. "Yes – that is called dermal exposure. And if the fuel has gotten into the ground or in the groundwater, this means people and animals could eat or drink things that have been polluted this way."

"That is why Grandmother and Uncle Thomas are working so hard to fix it before this stuff happens!"

"Yes! We have been talking for years about how we need a boat harbor, and that piece of land where the old fish processor sits would be perfect…but we don't have the money to take care of the pollution..." Grandmother's voice trailed off. "BUT!" she exclaimed, raising a finger, "we are having a meeting tonight with the Tribal Council and the City to discuss a program called *Brownfields* that might be able to help us do just that."

"What are brownfields?" Dora asked.

Grandmother smiled. "Let's go together to the meeting tonight and find out."



Dora, Oxie and Peter sat in the front row of metal chairs in the city office. In front of them a large group of adults were talking. Dora knew most of them, including her grandmother and Uncle Thomas, but one looked unfamiliar. "Who is that person?" whispered Peter.

"I don't know," Dora whispered back, "but hopefully she knows what can be done about the fish processing plant."

Everyone took their seats and the Tribal Council meeting began. First, Robert, the Tribal Council President, provided a history of the old fish processing plant, including what Uncle Thomas had told them earlier about possible asbestos, lead, diesel, and fluorescent bulbs. He then invited Clara, the Indian General Assistance Program (IGAP)/Tribal Response Program (TRP) coordinator, to speak: "We think we may have found a program that can help us. There are laws in the United States that describe a thing called a 'brownfield.'"

Dora, Oxie and Peter perked up. "That's what Grandmother was talking about!" Dora

whispered excitedly.

Clara continued, "A brownfield is a piece of property that is not being reused because there might be pollution on it. The property usually gets run down, and looks bad, and no one knows what to do about it. The pollution is a problem that needs to be fixed before the property can be reused safely. The pollution could keep making people or animals sick if the property was built on without cleaning up the pollution." Oxie thought about all the things Dora had found on the internet, while Clara continued. "In the case of the old fish processing plant, not knowing whether there are building materials that could be hazardous or contaminated soil or groundwater keeps us from being able to use the land again for another purpose, like for a boat harbor for instance." Clara nodded at Grandmother. "If we clean up the pollution, we can then re-use that land for something that would help the community, and maybe even create some jobs! That is why I have invited Sally Thomas from the Alaska Department of Environmental Conservation, or A-D-E-C, to talk about different ways that a 'brownfield' can get funding to clean up pollution."

The unfamiliar person began to speak: "Good evening. As Clara so kindly introduced me, my name is Sally Thomas, and I am with the ADEC Brownfields Program. The ADEC Brownfields Program helps tribes, local governments, non-profits, and property owners get contaminated sites across Alaska assessed, cleaned up, and reused in their communities. We do this in a number of ways, including helping communities identify brownfields in their area, researching site history, answering technical questions, and providing funding to assess and cleanup specific sites. We also work closely with the US EPA's Brownfields Program, which also has lots of resources to help encourage the cleanup and reuse of brownfield properties."

Peter poked Oxie. "Isn't that the website Dora was on?" he whispered. She nodded.

"For example, the US EPA Brownfields Program offers assessment and cleanup grants through a competitive nationwide process each year. US EPA also offers *targeted brownfield assessments* or TBAs. These assessments are not competitively awarded, but are given out on a first-come, first-served basis. And finally, ADEC offers the *DEC Brownfields Assessment and Cleanup Program*, or D-B-A-C, or pronounced 'Dee-back,' which is what I help manage. This program is competitive within the state of Alaska and provides assessment and cleanup services to help assist sites to learn more about the extent of any possible contamination and remediate them as needed."

"Can anyone get these?" Uncle Thomas asked.

"Well, there are certain requirements for each program, such as the applicant being a public entity like a Tribal government or City," Sally responded.

Peter poked Dora. "What is a public entity?"

Sally overheard and responded, "It's an organization that helps out the community." Peter blushed and slumped in his chair. Sally smiled and continued, "On top of the applicant needing to be a public entity, there are also questions about liability." Oxie and Peter

looked at each other confused. "Liability refers to someone being legally required to do something," Sally added. "It can get somewhat confusing fast, so I'd recommend contacting ADEC with any specific questions, but the main point is that the owner or the applicant cannot have caused the pollution."

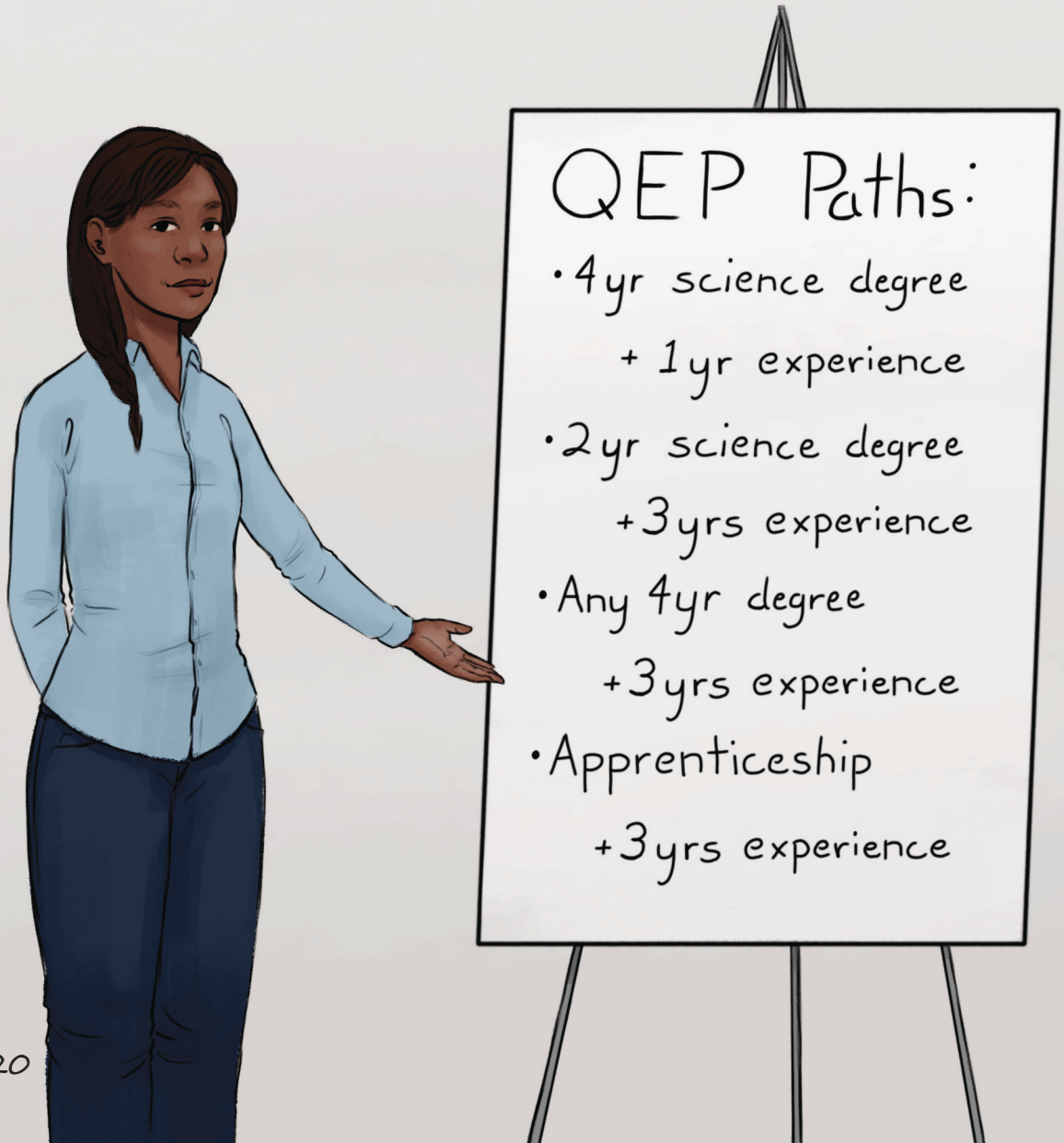
Uncle Thomas spoke up, "Is this program through the EPA or ADEC?"

"It's kind of both," Sally replied. "There are some portions that have to do with Alaska state laws and regulations, while EPA carries out others at the federal level. It can be a little complicated, but that's why ADEC and EPA work together to try and coordinate our resources to help individual projects and communities as much as possible."

"So, how does a DBAC work?" Uncle Thomas asked.

Sally smiled, "First, an eligible entity has to submit an application to ADEC. Usually, ADEC accepts applications for DBACs each year in the winter months. Then, ADEC reviews each application and scores them on a number of things." Sally mentioned the main criteria as she wrote them on the flip chart. "Once each project has been scored, they are then ranked highest to lowest."

"We start with the top-scored project and work down the list as far as we can go with the money we have available. After that, ADEC takes care of all the paperwork the EPA requires, and then we put the project out to bid to *Qualified Environmental Professionals*. A Qualified Environmental Professional, or Q-E-P, is someone who meets specific requirements in ADEC regulations. This person typically has at least a four year college degree in science with at least one year of experience, but there are other ways someone can become a Qualified Environmental Professional." Sally flipped to a chart with the list of ways to become a QEP. "Once hired, the QEP will contact the village, and we try to get the work done as quickly as we can."



Peter shook his head and looked at his hands. This is so confusing, he thought.

"I know it seems confusing" Sally said, seemingly reading his mind. "So if you are interested in a specific property, I would recommend contacting ADEC. However, we're here today to discuss options for the old fish processing plant. Based on what I've learned about the site, I will say that it looks like it might be eligible for funding through the Brownfields program. I'll work with you to apply for DBACs, as well as get you in touch with EPA about getting their help this year."

Dora smiled at Oxie and Peter, and realized everyone else in the room looked happy with this news as well. Clara chimed in: "And IGAP can help with some of the items that can be recycled like the fluorescent light bulbs and the leaded batteries so we can make the Brownfields money go further!" Now Dora was beaming.

"Can the money be used to take down the building or to build the boat harbor?" Grandmother asked.

"Unfortunately, no," said Sally. "This type of funding can only be used to take care of pollution, such as in the soil or water. Anything like regular trash that could go to a regular landfill cannot be taken care of, nor can we just take a building down. Sometimes, we have to take the building down because we can't get the pollution out any other way, but we cannot technically spend it on just demolishing a building. As to building the boat harbor…that is also unfortunately a 'no.' The community will have to look for other sources of funding for that."

Dora's heart sank, but Grandmother was unfazed. "That is OK," she said, looking around the room. "We are a resourceful people. The City has some money saved for this project already, and I have written grant applications for the City before. I will look into what we could apply for tomorrow!"

After the meeting was over, Dora, Oxie and Peter went back out to the beach to look at the old fish processing plant. The summer sun cast long shadows over the ground, making the carved out spaces under the buildings look even deeper. Oxie sighed as she looked at them. "It is sad to see the buildings so run down. I wish that they didn't have to be cleaned up."

Dora agreed. "I wonder how many other buildings in the village have asbestos or lead in them? Or if diesel is in the dirt around the old tank farm?"

Peter did not like this idea. "We…we should do something!" Dora and Oxie looked at Peter, happy with his enthusiasm.

"Like what?" Oxie asked.

"We could talk to our parents," Dora said.

"And our friends," said Peter.

Dora felt a surge of excitement "Yeah! We could talk to our parents and our friends about what we learned about the old fish processor, and how we can keep our village free from pollution in the future!" Oxie and Peter nodded excitedly, happy knowing they could work on keeping a story like the old fish processor from happening in their village again. Tulugaġ looked out over the kids on the beach happily making plans to help protect the world and smiled.

Glossary of terms and abbreviations

asbestos
A mineral used in many building materials which can cause cancer when inhaled. See page 6, 10

bioaccumulation
The tendency for toxic substances to build up in the body over time. See page 14

brownfields
Abandoned, unused, or underused properties that are not reused or redeveloped because of the threat of real or potential contamination. See page 17

Brownfields Program
Alaska DEC program that encourages the assessment, clean up, and reuse of brownfields. See page 18

CDC:
US Centers for Disease Control and Prevention. See page 10

DBAC:
DEC Brownfields Assessment and Cleanup services, which DEC provides communities and tribes to assess and cleanup brownfield sites, pronounced 'Dee-back'. See page 18

diesel
A petroleum fuel commonly used for heating, transportation and power generation See page 11

EPA:
US Environmental Protection Agency. See page 10

exposure, types of
Ways a person can come in contact with hazardous substances, including dermal (through the skin) inhalation (breathing), and ingestion (though eating or drinking, including wild foods). See page 8

fluorescent light bulbs
A type of lighting, which contains a small amount of mercury. See page 7, 14

groundwater
Water found underground, such as from wells and springs, often used for drinking water. See page 15

heating oil
A form of diesel fuel commonly used to heat buildings. See page 11, 15

IGAP
Indian General Assistance Program. See page 16

lead
A dangerous heavy metal often found in batteries, electrical equipment, and old paint. See page 11

mercury
A dangerous heavy metal often found in fluorescent lights, some switches, and mine sites. See page 11

QEP
Qualified Environmental Professional. See page 20

TBA
Targeted Brownfield Assessment. See page 18

TRP
Tribal Response Program. See page 16

volatile
A liquid (or sometimes a solid) which tends to produce vapors (evaporate) quickly. See page 15