# McGinnes Industrial Maintenance Corporation's Individual Comments on the Proposed Remedial Action Plan for the San Jacinto River Waste Pits Superfund Site

January 11, 2017

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## I. GENERAL COMMENTS

### A. Introduction

On September 28, 2016 the United States Environmental Protection Agency ("EPA") issued a Proposed Remedial Action Plan (the "Plan") for the San Jacinto River Waste Pits Superfund Site (the "Site"). The Site consists of (i) two primary impoundments built in the mid-1960's for the disposal of paper mill wastes (containing dioxins), located on the west bank of the San Jacinto River, north of I-10 ("Northern Impoundments"); and (ii) the surrounding sediments and soils potentially impacted by waste from the impoundments.

In 2010 and 2011, two potentially responsible parties at the Site, International Paper Company ("IPC") and McGinnes Industrial Maintenance Corporation ("McGinnes"), implemented a Time Critical Removal Action ("TCRA") by constructing an armored cap ("TCRA Cap") on the Northern Impoundments, the design of which was commented on and/or approved by EPA and the United States Army Corps of Engineers ("USACE"). In the Plan, EPA evaluated eight alternatives for the Northern Impoundments, ranging from a no action alternative (Alternative 1), to enhancements to the TCRA Cap, including protective pilings to minimize barge strikes (Alternative 3aN), to the removal of the TCRA Cap and off-site disposal of all waste material exceeding Preliminary Remediation Goals ("PRGs") (Alternative 6N).[1]

EPA's preferred remedy for the Northern Impoundments, Alternative 6N, consists of a purported $87 million cleanup to remove an estimated 152,000 cubic yards of contaminated material (much of which is submerged beneath the San Jacinto River), installation of institutional

[1] The Plan evaluated four alternatives for the so-called South Impoundment ranging from the no action alternative to removal and off-site disposal of soil exceeding the PRGs. As explained to EPA Region 6 beginning in August 2010, the South Impoundment is not part of the Site as defined in the Unilateral Administrative Order ("UAO") for the Remedial Investigation/Feasibility Study, but is instead a separate "facility" under CERCLA.

controls (e.g., restrictions on dredging and anchoring and notice to property owners) and monitored natural attenuation.

McGinnes hereby submits these comments on the Plan focusing directly on EPA's comparison of Alternatives 3aN and 6N against the nine criteria EPA is mandated to evaluate pursuant to the National Contingency Plan ("NCP"), 40 C.F.R. § 300.1 *et seq.* In no uncertain terms, when evaluated against the NCP criteria, Alternative 3aN is the preferred remedy and there is simply no factual, scientific, regulatory, or legal basis for EPA's determination that Alternative 6N should be the preferred remedy for the Northern Impoundments.

B. The NCP Criteria, The TCRA Cap and the USACE Report

The NCP requires EPA to evaluate and compare remedial alternatives against nine criteria, categorized into three groups:

- **Threshold Criteria** that each alternative must meet: Overall protection of human health and the environment, and compliance with Applicable or Relevant and Appropriate Requirements ("ARARs");
- **Primary Balancing Criteria**: long-term effectiveness and permanence; reduction of toxicity, mobility or volume through treatment; short-term effectiveness; implementability; and cost effectiveness.
- **Modifying Criteria**: State acceptance and community acceptance.

The TCRA Cap and the role of the USACE at the Site provide critical context and background for comparison of Alternatives 3aN and 6N against these NCP criteria. First, the existing TCRA Cap was designed and constructed "in accordance with USACE and USEPA guidelines and capping guidance (USACE 1998; USEPA 2005)," and "to withstand a 100 year storm event with an additional factor of safety to ensure its protectiveness." Final Interim Feasibility Study Report, September, 2016 ("Feasibility Study") at ES-2. Sampling of sediment, pore water, groundwater, surface water and gulf killifish tissue analyzed after construction of the

TCRA Cap demonstrate that the TCRA Cap has been effective in containing the waste in the Northern Impoundments. *See*, Anchor QEA, Data Summary Report: 2016 Studies San Jacinto River Waste Pits Superfund Site, Project No. 090557-011 Prepared for U.S. Environmental Protection Agency (EPA) Region 6 on behalf of McGinnes Industrial Maintenance Corporation and International Paper Company (Sept. 2016). Indeed, groundwater at the Site has never been impacted. The other improvements occurred as a result of the existing TCRA Cap, before any cap enhancements proposed in Alternative 3aN have been constructed.

Second, EPA expressly designated the USACE to evaluate the remedial alternatives for the Northern Impoundments. The USACE is the agency with the acknowledged expertise on design, construction and maintenance of subaqueous caps, as well as dredging of contaminated sediments. Contaminated Sediment Remediation Guidance for Hazardous Waste Sites, OSWER 93550.0-85, December 2005 ("Contaminated Sediment Guidance") at 2-29. In August 2016, the USACE issued its findings in a report titled "Evaluation for the San Jacinto Pits Feasibility Study Remediation Alternatives" ("USACE Report"). Despite persistent and pointed pressure by EPA to the USACE to revise and in some cases change its conclusions, the USACE Report steadfastly concluded that:

> The evaluations performed to address the performance of an existing repaired TCRA Cap with the proposed modifications outlined in capping Alternative 3N showed the cap is expected to be generally resistant to erosion except for very extreme hydrologic events.

USACE Report as 2. The USACE Report concludes further that "the issues related to cap permanence *can be* addressed by additional modifications to Alternative 3N," the exact modifications contained in Alternative 3aN. *Id.* Based on the continued effectiveness of the existing TCRA Cap, and the USACE's conclusion that the enhancements to that cap as proposed

in Alternative 3aN can address any issues related to cap permanence, Alternative 3aN should be the preferred remedial alternative in the Plan.

C. Comparison of Alternatives 3aN and 6N Against the NCP Criteria

1. Threshold Criteria

A detailed comparison of Alternatives 3aN and 6N against the NCP criteria demonstrates unambiguously that Alternative 3aN should be the preferred remedy for the Northern Impoundments. With respect to the Threshold Criteria, overall protection and compliance with ARARs, the NCP mandates a binary choice – either a remedial alternative meets those criteria or it does not. Unlike the Primary Balancing Criteria, the NCP does not contemplate that remedial alternatives are ranked (high, medium, low) against the Threshold Criteria. EPA acknowledged this binary choice in Table 6.1 of the FS:

> Overall protection and compliance with ARARs are Threshold Criteria. *For all other criteria*, remedial alternatives are evaluated to determine *the degree* to which the criteria are addressed.

(emphasis added)

EPA concludes that Alternatives 3aN and 6N both achieve the agency's Remedial Action Objectives, FS at 84, 106, and therefore meet these Threshold Criteria. FS at Table 6-1. It should be noted, however, that while there is no question that Alternative 3aN complies with ARARs, EPA in the FS and the Plan failed to fully evaluate Alternative 6N's compliance with ARARs. Specifically, EPA failed to evaluate whether USACE's estimate that 0.2% to 0.34% of the waste will be released during the TCRA Cap removal and excavation of underlying waste violates (i) Texas' Surface Water Quality Standard for dioxin, or (ii) the USACE's Guidelines under Section 404(b) of the federal Clean Water Act that requires a project to "avoid, minimize

and mitigate adverse effects on the waters of the United States" and only select an alternative with the "least adverse effects."

2. Modifying Criteria

With respect to the Modifying Criteria, EPA's Plan states that community acceptance will be determined through the Public Comment process. Plan at 36. Therefore, prior to issuance of the Plan, EPA did not address this Modifying Criterion. Similarly, although the Texas Commission of Environmental Quality ("TCEQ"), the support agency for the Site, "has been informed about the Preferred Remedy for the Site," TCEQ has not yet provided its comments on, let alone acceptance of Alternative 6N. *Id.*[2] Again, EPA issued the Plan without addressing this Modifying Criterion.

Even though EPA decided not to evaluate these Modifying Criteria before issuing the Plan, EPA did acknowledge that Alternative 6N is less sustainable than Alternative 3aN "considering ozone precursors, PM and greenhouse gas emissions from the construction activity." FS at 126. EPA further concluded that Alternative 6N "will result in more community impact from traffic, including on-going daily distraction and the potential for accidents and off-site spills (6 to nearly 70 times the number of truck trips)." *Id.*

3. Primary Balancing Criteria

EPA concedes that Alternative 3aN is superior to Alternative 6N regarding the Primary Balancing Criteria for short-term effectiveness, implementability and cost effectiveness.[3] FS at

[2] On September 7, 2016, TCEQ advised EPA that TCEQ was aware of EPA developing the Plan and encouraged EPA to "consider all appropriate science and mitigation against further contamination in choosing a remedy that is protective of human health and the environment over both short and long-term conditions. . ." EPA issued the Plan without receiving comments or concurrence from TCEQ, despite TCEQ's request.

[3] Despite the fact that the purported cost of Alternative 6N ($87 million) is more than three times that of Alternative 3aN ($24.8 million), and that Alternative 5N is estimated to cost $5 million more than Alternative 3aN, EPA inexplicably ranks Alternatives 3aN and 6N on the cost effectiveness criteria as "medium" and Alternative 5N as "low-medium."

Table 6-1. The National Remedy Review Board's ("NRRB") comments confirmed that evaluation:

> The Region identified the capping alternative as being easier to implement, more protective in the short-term, and an order of magnitude less expensive than the removal alternatives.

NRRB comments at 11-12.

That leaves only two Primary Balancing Criteria left: "reduction of toxicity, mobility or volume *through treatment*" and "long-term effectiveness and permanence." Start with the "treatment" criteria. EPA spends considerable time and effort supporting its conclusion that waste paper containing dioxin is a Principal Threat Waste at the Site. As such, EPA concludes that the NCP expresses a preference for treating that Principal Threat Waste, "wherever practicable," 40 C.F.R. § 300.430(a)(iii)(A). As discussed below, McGinnes disagrees with EPA's Principal Threat Waste designation.

More importantly, however, that designation is irrelevant when comparing Alternatives 3aN and 6N under this Primary Balancing Criterion. The issue is not whether there is a preference for treatment because the waste constitutes Principal Threat Waste. Rather, the issue is whether Alternatives 3aN or 6N in fact reduce the toxicity, mobility or volume of waste "*through treatment.*" Alternative 6N simply does not involve treatment; instead it merely involves excavation and off-site disposal of waste. Where a remedial alternative at the Site does include treatment, EPA stated so. For example, the FS states that Alternative 4N "includes the use of S/S *treatment* to reduce the potential mobility of waste material and sediment" (emphasis added). FS at 92. The Plan states that Alternative 4N "would result in treatment of a portion of the Principal Threat Waste." Plan at 24. No such statement exists for Alternative 6N in either

the FS or the Plan.[4] In contrast, the FS notes that for Alternative 3aN, during construction of the TCRA Cap, some sediments in the Western Cell of the Northern Impoundment "were treated and mobility reduced via S/S during construction." FS at 87. Therefore, if anything, Alternative 3aN is superior to Alternative 6N on this Primary Balancing Criterion.

The final Primary Balancing Criterion is long-term effectiveness and permanence. EPA determined that the difference between Alternatives 3aN and 6N on this criterion is razor thin, ranking Alternative 6N as high and Alternative 3aN as medium-high. FS at Table 6-1. EPA based this minor distinction on the assertion that there is a high degree of uncertainty in evaluating the long-term effectiveness of Alternative 3aN with respect to potential cap erosion over a 500 year period due to changes in river morphology, barge strikes and severe storm events.

For the following reasons, EPA's assertions are false and misleading and its conclusions regarding the long-term effectiveness of the Alternative 3aN cap are unsupported in the record, directly contradict the USACE, the very agency EPA charged with evaluating the various remedial alternatives, as well as EPA regulations and guidance:

- The USACE did not conduct a study on river morphology, nor did EPA. So, EPA cannot conclude on any scientific basis that changes in river morphology would in fact affect the long-term effectiveness of Alternative 3aN.

- The USACE did evaluate potential barge strikes and concluded that with the enhancements included in Alternative 3aN, there is a "low probability of barge strikes that would impact the integrity of the cap" and that any impacts from a barge strike would be "very much smaller than the releases from the complete removal Alternative 6N." USACE Report at 3.

- EPA insisted that the USACE evaluate capping alternatives over a 500 year period. There is simply no regulatory precedent, and EPA cites to none, for evaluating a cap's performance over a 500 year period, a

[4] EPA has implied that dewatering of the excavated waste for transport and off-site disposal constitutes treatment. For the reasons discussed more fully below, it does not.

standard which could prevent use of caps on land as well as subaqueous caps.

- EPA also insisted that the USACE evaluate capping alternatives under hypothetical extreme storm conditions, which contradicts standard EPA and USACE policy requiring that caps be designed to withstand a 100 year storm. Contaminated Sediment Guidance at 2-29, 5-9.

- The USACE evaluated potential erosion from extreme storm events on what was known as cap Alternative 3N and concluded that significant erosion could occur. Yet, the USACE concluded definitively that "these issues related to cap permanence *can be* addressed by additional modifications to Alternative 3N." (emphasis added) USACE Report at p. 2. The additional modifications the USACE referenced have been incorporated into capping Alternative 3aN.

- In the FS, EPA changed the wording of the USACE's finding above, as follows:

> "The USACE estimated that these issues related to cap permanence *might* be addressed by additional modifications to Alternative 3N (modifications included in Alternative 3aN)....

(emphasis added). FS at ES-12.

In essence, EPA unilaterally revised the USACE's definitive conclusion ("can be" to "might be") creating the inaccurate impression that there was uncertainty in the Corps' evaluation of the long-term effectiveness of Alternative 3aN. There is no such uncertainty.

- And finally, if there was any remaining uncertainty about the long-term effectiveness of Alternative 3aN, EPA could have requested that the USACE model cap erosion of Alternative 3aN under extreme storm conditions, just as the USACE did for Alternative 3N. EPA made no such request, did not perform the modeling itself, and thus has no basis to rebut the USACE's conclusion that "the issues related to cap permanence *can be* addressed by additional modifications to Alternative 3N."[5]

[5] The Plan asserts that there is uncertainty regarding the long-term permanence of Alternative 3aN in part due to limitations in modeling cap erosion over a 500 year period. That is not accurate. The USACE modeled cap erosion of the TCRA cap over a 500 year period and EPA relied on the results of that modeling in the Plan. However, the USACE did not model cap erosion of Alternative 3aN nor did EPA. Therefore, the uncertainty, if any, is due EPA's affirmative decision not to apply that model to Alternative 3aN.

For all of these reasons, the entirety of the weight of evidence demonstrates that when compared against the NCP criteria, Alternative 3aN should be the preferred alternative. For your convenience, set forth below are specific comments on the following issues: (1) the TCRA Cap; (2) the USACE Report; (3) comparison of Alternatives 3aN and 6N against the Threshold Criteria under the NCP; and (4) comparison of Alternatives 3aN and 6N against the Balancing Criteria.

## II. SPECIFIC COMMENTS

### A. The TCRA Cap

#### 1. Removal of the TCRA Cap Pursuant to Alternative 6N Would Be Inconsistent with CERCLA and Inconsistent with EPA's Prior Findings.

Section 104(a)(2) of CERCLA states:

> Any removal action undertaken by the President under this subsection. . . should, to the extent the President deems practicable, contribute to the efficient performance of any long term remedial action with respect to the release.

EPA [as a designee of the President] made precisely that determination in seeking authorization for the TCRA. Specifically, in its April 2, 2010 "Request for a Time Critical Removal Action at the San Jacinto River Waste Pits" ("TCRA Request"), EPA found that:

> Because this action constitutes source control, these actions are consistent with *any* long term remedial strategies that may be developed at the Site.

(emphasis added) at 9. The use of the word "any" is unambiguous. The Plan ignores EPA's prior finding and selects a preferred remedy that calls for removal of that very TCRA Cap.

EPA's attempt to avoid this direct position change is transparent. In its revisions to the draft FS, EPA described the TRCA cap repeatedly as a "temporary cap." FS *passim*. That

phrase "temporary cap" appears nowhere in the TCRA Request and constitutes an after the fact rationalization for EPA's complete reversal on this central issue.

Accordingly, EPA's preference for Alternative 6N, which would require removal of the TCRA Cap, directly contradicts EPA's prior written determination that the TCRA Cap is consistent with *any* long term remedy and CERCLA Section 104(a)(2)'s express requirement that the TCRA Cap contribute to the efficient performance of the long-term remediation at the Site.

2. EPA Considered Extreme Weather Conditions in Selecting the TCRA Cap

EPA attempts to justify its change of position based on the assertion that in authorizing the TCRA, EPA did not consider potential extreme future weather conditions that could erode the TCRA Cap. EPA's assertion is inaccurate. In EPA's TCRA Request, EPA has an entire subsection entitled "Weather Conditions That May Cause the Release or Migration of Hazardous Substances," in which EPA states:

> The area receives an average of 50 inches of rain annually. The contaminants are subject to migration by entrainment, windblown deposition and surface runoff. The impoundments in waste ponds 1 and 2 may be affected by tides, winds, waves and currents resulting from extreme weather conditions such as strong storm winds, flooding, tornadoes and hurricanes which may cause potential release or migration of dioxin and furan contaminated material.

TCRA Request at 8.

Further, in seeking authorization for the TCRA Cap, EPA specifically cited to the need for the cap to withstand these severe weather conditions:

> The Houston area is visited by seasonable severe weather events (i.e., strong force winds or flooding) and the *physical barrier must be structurally secure to withstand any potential future extreme weather events (i.e., Hurricane*

*Ike of 2008*).

(emphasis added) Id. at 9.[6] In short, cap erosion due to severe weather was known to EPA at the time EPA sought authorization for the TCRA Cap, EPA required the design of the TCRA Cap to withstand "*any* potential future extreme weather event" and the USACE has confirmed that the enhancements to the TCRA Cap incorporated in Alternative 3aN can withstand any such future potential extreme weather event. USACE Report at 2.

3. The TCRA Cap Has Been Effective in Controlling Contaminant Migration

EPA required IPC and McGinnes to conduct a study to confirm that the TCRA Cap continues to prevent dioxin migration to surrounding areas. On September 23, 2016, IPC and McGinnes submitted the results of that study to EPA which concludes that no target dioxin compounds were detected in porewater or groundwater and, since completion of the TCRA Cap, there has been significant improvement in contaminant concentrations in sediment, surface water, and fish tissue. Specifically, (i) reductions in TCDD and TCDF, as well as the results of the unmixing model as applied to this 2016 data showed a statistically significant reduction from 2010 regarding the impacts of dioxins and furans associated with waste from the Northern Impoundments on the quality of surrounding sediments; (ii) target compounds were not detected in any of the pore water immediately above the armored cap confirming that the existing cap continues to effectively contain dioxins and furans in the Northern Impoundments; (iii) target compounds were not detected in groundwater beneath the Northern Impoundments and as such the groundwater meets the TCEQ surface water standards; and (ix) reductions in killifish tissue also declined relative to 2010 concentrations, again showing that the existing TCRA cap is effective in preventing exposure of fish to dioxins and furans. *See*, Anchor QEA, Data Summary

[6] In the FS EPA describes the TCRA Cap as a cap that "was designed to withstand a 100 year storm event with an additional factor of safety to ensure its protectiveness" and that the design was "in accordance with USACE and USEPA guidelines and capping guidance." FS at ES-2.

Report: 2016 Studies San Jacinto River Waste Pits Superfund Site, Project No. 090557-011 Prepared for U.S. Environmental Protection Agency (EPA) Region 6 on behalf of McGinnes Industrial Maintenance Corporation and International Paper Company (Sept. 2016). In essence, the TCRA Cap continues to achieve EPA's objectives as expressed in EPA's TCRA Request. Inexplicably, EPA did not include or reference these data in the Plan or in the Administrative Record for EPA's remedy selection.

Further, EPA suggests in the Plan that the TCRA Cap (and by implication the enhanced cap proposed in Alternative 3aN) requires constant operation and maintenance which undermine the long-term effectiveness of any cap remedy. EPA's suggestion is unsupported in law and in the record. As a matter of law, EPA and USACE guidance on subaqueous caps assumes that there will be ongoing cap maintenance. Guidance In-Situ Sub-Aqueous Capping of Contaminated Sediments, EPA 905-B96-004, September 1998, at 59-61, 65-71. Consistent with that guidance, the TCRA Work Plan assumed that up to 5% of the surface area of the TCRA Cap would require maintenance. The Final Removal Action Work Plan, Appendix C, TCRA Alternatives Analysis, EPA Doc. Id. No. 634093. In actuality, the total area of maintenance of the TCRA Cap over the period from 2011 to 2016 represents approximately 0.6% of the surface area of the cap, well below design specification. .

B. EPA Delegated to the USACE the Task of Performing an Independent Evaluation of Remedial Alternatives and Must Give Proper Deference to the USACE's Conclusions, Given the USACE's Special Expertise with Sub-Aqueous Caps, Especially Regarding Evaluation of Alternative 3aN

Section 115 of CERCLA, 42 U.S.C. § 9615 provides:

> The President is authorized to delegate and assign any duties or powers imposed upon or assigned to him and to promulgate any regulations necessary to carry out the provisions of this subchapter.

Pursuant to this authority, EPA and the USACE signed an Interagency Agreement on February 3, 1982. Under the Inter-Agency Agreement, upon EPA request, the USACE manages design and construction contracts and provides technical assistance to EPA in support of remedial response at Superfund sites. The respective responsibilities of EPA and USACE pursuant to this agreement are outlined in a subsequent December 3, 1984 agreement titled "Inter-Agency Agreement Between the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency in Executing P.L. 96-510, the Comprehensive Environmental Response, Compensation and Liability Act of 1980 ("CERCLA")."

The December 3, 1984 Agreement specifically authorizes EPA to designate the USACE to "review feasibility studies" and to "at a minimum satisfy the Corps that the remedial action selected by EPA will be reasonable to design, construct and operate." *Id.* at A-3. With respect to the Site, pursuant to these Inter-Agency Agreements EPA issued a Scope of Work to the USACE on March 25, 2014, which EPA revised on August 6, 2014. EPA's revised Scope of Work stated the purpose of its delegation of authority to the USACE at the Site as follows:

> To provide technical support for preparation of the Record of Decision . . . including preparing an *independent assessment* of the remedial alternatives presented in the FS, as well as identification of any further remedial action alternatives or technologies that may be appropriate for the Site.

(emphasis added) at 1.

EPA's delegation to the USACE logically follows EPA's express recognition that the USACE is the recognized expert in evaluating subaqueous caps. As the Contaminated Sediments Guidance states:

> Much has been written about subaqueous capping of contaminated sediment. The majority of the work has been

> performed by, or in cooperation with, the U.S. Army Corps of Engineers.

Contaminated Sediments Guidance at 5-2. Given the USACE's expertise in this area, and EPA's decision to delegate to the USACE to conduct an independent assessment of capping alternatives, EPA must give significant deference to the USACE's ultimate conclusion that the cap can achieve long-term effectiveness, even in the face of extreme weather conditions, with the USACE's proposed modifications incorporated into Alternative 3aN.

C. Threshold Criteria

1. EPA Asserts that Alternative 3aN and Alternative 6N Both Meet the Threshold Criteria

The NCP requires EPA first to evaluate and compare remedial alternatives against two Threshold Criteria: overall protection of human health and the environment and compliance with ARARs. As stated above, there is no ranking or tiering of remedial alternatives against these Threshold Criteria. Either the remedial alternative meets the Threshold Criteria or it does not. As reflected on Table 6-1 of the FS, EPA concluded that both Alternatives 3aN and 6N "meet" these two Threshold Criteria, and both meet the RAO's for the Site. FS at 71, Table 6.1.

Therefore, there should be no preference to Alternative 6N based on these Threshold Criteria.

2. The Plan's Statement That Alternative 6N Better Achieves Overall Protection is Inconsistent with the NCP and Not Supported by the Record

Despite the binary nature of the Threshold Criteria ("meet" or "don't meet"), the Plan suggests that somehow Alternative 6N is *more* overall protective of human health and the environment than Alternative 3aN. Specifically, the Plan states:

> Alternative 6N best realizes the Threshold Criteria because the waste material would be removed and therefore not subject to a potential future release.

Plan at 32. EPA's statement is based entirely on EPA's own evaluation of the long-term effectiveness of Alternative 6N as compared to that of Alternative 3aN. As discussed below, the USACE concluded that Alternative 3aN can be effective long-term. So, EPA's conclusion is not supported in the record.

In addition, EPA ignores the NCP definition of overall protection of human health and the environment which expressly requires EPA to consider whether the remedial alternatives can be adequately protective "in both the short- and long-term . . . ". 40 C.F.R. § 300.430(e)(9)(iii)(A). The NCP definition of overall protection provides further, that "overall protection of human health and the environment draws on the assessment of other evaluation criteria, especially long-term effectiveness and performance, short-term effectiveness and compliance with ARARs." *Id.* Therefore, EPA's exclusive focus on long-term effectiveness in evaluating this Threshold Criteria is contrary to the NCP.

Moreover, to the extent Alternatives 3aN and 6N are ranked against each other (which they should not be), overall protection requires evaluation of short term effectiveness and ARAR compliance. Applying those factors, Alternative 3aN would be the preferred alternative. There is no doubt regarding which alternative is preferable in terms of short-term effectiveness. EPA itself concedes that Alternative 3aN ranks higher than Alternative 6N on that criteria. *See* FS Table 6-1.

Likewise, Alternative 6N has not been demonstrated to comply with ARARs in two specific areas. EPA asserts that removal of the TCRA Cap and excavation of the waste materials will result in the release of 0.2% to 0.34% of waste material. McGinnes contends that EPA grossly underestimated the actual release of waste material that will result from removal of the TCRA Cap. Moreover, the Plan provides no evaluation of whether even the releases

underestimated by EPA will violate Texas Surface Water Quality Standards for dioxin, and since EPA has not obtained State acceptance of Alternative 6N as the preferred remedy, EPA has no support in the record for its conclusion that Alternative 6N complies with this ARAR.

Likewise, the Plan identifies as an ARAR the Clean Water Act § 404(b)(1) guidelines relating to discharges of dredge and fill material into waters of the United States. Plan at 32. Under the 404(b)(1) guidelines:

> Efforts should be made to *avoid, minimize, and mitigate* adverse effects on the waters of the United States and, where possible, select a practicable (engineering feasible) alternative with the *least adverse effects*.

*Id.* EPA knows that Alternative 3aN satisfies this ARAR because Alternative 3aN involves enhancements to the TCRA Cap which EPA previously approved and is already in place.

On the contrary, the record does not establish Alternative 6N's compliance with this ARAR. The Plan states only that Alternative 6N "is designed to *minimize* adverse impacts to the waters of the United States through the use of best management practices . . .". (emphasis added). Plan at 32. Neither the Plan nor the record contain any findings, as required by the 404(b)(1) guidelines, that Alternative 6N "avoids" or "mitigates" adverse effects or that Alternative 6N is the engineering feasible alternative with the "least adverse effects." In short, if Alternatives 3aN and 6N are compared against the Threshold Criteria, Alternative 3aN is preferable because it is more effective in the short term and Alternative 6N has not been demonstrated to comply with ARARs.

D. Primary Balancing Criteria

1. Alternative 3aN is Preferable to Alternative 6N Regarding Short-Term Effectiveness, Implementability and Cost Effectiveness

There is no dispute in the record that EPA ranks Alternative 3aN ahead of Alternative 6N on short-term effectiveness and implementability. In Table 6-1 of the FS, EPA ranks these alternatives against these two Primary Balancing Criteria as follows:

| | Short-Term Effectiveness | Implementability |
|---|---|---|
| Alternative 3aN | High | High |
| Alternative 6N | Medium | Medium |

A close examination of the record demonstrates that the disparity between these alternatives is even greater than EPA represented on Table 6-1. With respect to short-term effectiveness EPA acknowledges that:

> Enhancement of the TCRA Cap under Alternative 3N or 3aN would be expected to produce very little short-term impacts while removal under Alternative 6N would be expected to increase short-term exposures to contaminants.

FS at 121.

Echoing these concerns, the USACE Report concludes that:

> The new Alternative 6N with enhanced BMPs, despite its much smaller short-term release [than a full removal alternative without enhanced BMPs], would still set back the natural recovery of the Site back to the existing conditions by up to a decade.

USACE Report at 5.

And finally, an internal USACE memo from Paul Schroeder to Earl J. Hayter, dated March 19, 2015, which memo was transmitted to EPA, casts further doubt on the feasibility of BMPs controlling significant short-term releases under Alternative 6N:

> Sheet pile walls leak . . .There are sands at depth which would produce large volumes of seepage. The construction of the containment system would be difficult, roads would be needed. Dewatering of the sediment would be needed. It would take several years to complete, exposing the Site to greater risks of flooding and hurricanes.

As a result, the record demonstrates that Alternative 3aN is far superior to Alternative 6N regarding short-term effectiveness.

The same is true regarding implementability. Again, EPA concludes:

> Implementability concerns, such as site access, limited staging areas, restrictions on equipment size, and availability of off-site staging area properties are greater for Alternatives 4N, 5N and 6N compared to Alternatives 3N and 3aN because of the much larger scope and scale of these alternatives.

FS at 123.

And further:

> For Alternatives 4N through 6N there is a 30 to 40 percent chance that a high water event could occur during construction resulting in overtopping of the engineering controls. Thus all of these alternatives are considered equally less favorable as Alternative 4N for implementability compared to Alternatives 1N, 2N, 3N and 3aN.

*Id.*

Alternative 3aN is also far superior to Alternative 6N regarding cost-effectiveness. EPA guidance establishes the standard for evaluating and comparing the cost-effectiveness of various remedial alternatives:

> A remedy typically is considered cost-effective when its cost is proportional to its overall protectiveness. . .
>
> The evaluation of an alternative's cost-effectiveness is usually concerned with the reasonableness of the relationship between the effectiveness afforded by each

> alternative and its costs when compared to other available options.

Contaminated Sediment Guidance at 7-3.

Applying this standard to Alternatives 3aN ($24.8 million) and 6N ($87 million), it is self-evident that Alternative 3aN is more cost-effective. Not only does EPA estimate that Alternative 6N costs more than three times as much as Alternative 3aN, as these comments demonstrate, and as Table 6.1 of the FS itself illustrates, the effectiveness of Alternative 6N does not come close to justifying the more than threefold cost increase.

EPA attempts to obscure this significant disparity in cost effectiveness. In the sections of the FS and the Plan comparing each remedial alternative against each Primary Balancing Criteria, cost effectiveness is the only category where EPA offers *no* comparative evaluation of alternatives. Instead, EPA merely identifies the estimated cost of each alternative.

Also, in Table 6.1 of the FS, EPA ranks three remedial alternatives based on cost-effectiveness as follows:

| | | |
|---|---|---|
| Alternative 3aN | $24.8 million | Medium |
| Alternative 5N | $29.8 million | Low-Medium |
| Alternative 6N | $87 million | Medium |

Without any evaluation or explanation, EPA ranks its preferred alternative (Alternative 6N) higher than Alternative 5N which is three times less costly, and equal to Alternative 3aN which is *more than* three times less costly. There is absolutely no support in the record for EPA's rankings of cost-effectiveness in Table 6.1.

2. Alternative 6N Does not Reduce Toxicity, Mobility or Volume Through Treatment

The Plan identifies the dioxin in the waste material as a Principal Threat Waste. McGinnes contends that this is not the case, because, among other reasons, the waste material is

not highly mobile, the waste material's toxicity is too uncertain and insufficiently high, and the waste material can be reliably contained.

More fundamentally, the key to this Primary Balancing Criteria is not whether a waste is a Principal Threat Waste, but rather whether any particular remedial alternative reduces the toxicity, mobility or volume of that waste *through treatment.*[7]

Where a remedial alternative involves treatment, EPA is obligated to identify that fact. EPA's Guide to Preparing Superfund Proposed Plans, Records of Decisions and other Remedy Selection Documents, OSWER 9200.1-23P July 1999, states that in the section of the Proposed Remedial Action Plan summarizing remedial alternatives:

> Any treatment technologies employed and how they will reduce the intrinsic threats posed by the contamination (e.g., toxicity, mobility) should be identified.

EPA complied with its guidance with respect to Alternative 4N. The Plan states clearly that "this alternative would result *in treatment* of a portion of the Principal Threat Waste." (emphasis added) Plan at 24. In direct contrast, the Plan's summary of Alternative 6N does not state that this alternative results in treatment of the Principal Threat Waste. That's because Alternative 6N in fact involves no treatment.

Alternative 6N does involve dewatering (and potentially solidification) at the off-loading location to eliminate free liquids for transportation and disposal. Dewatering does not constitute treatment under the NCP, since dewatering does not reduce toxicity, mobility, or volume. 40 C.F.R. § 300.5. The NCP also requires EPA to consider the amount of hazardous substances

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[7] Indeed, the PTW Guide provides:

> As stated in the NCP preamble (55 FR 8703, March 8, 1990) there may be situations where waste identified as constituting Principal Threat Waste may be contained rather than treated due to difficulties in treating the wastes.

PTW Guide at 3.

treated, the degree of expected reduction in toxicity, mobility and volume, the degree to which the treatment is irreversible and the types of residuals that will remain. 40 C.F.R. § 300.43(a)(iii)(D). Because dewatering does not constitute treatment, EPA could not and did not identify consideration of any of those required factors.

EPA also acknowledges that as part of the TCRA Cap construction, treatment occurred in the western cell of the Northern Impoundment. FS at 87. Therefore, in comparing Alternatives 3aN and 6N, some treatment has already occurred as part of Alternative 3aN and none is proposed for Alternative 6N.

3. EPA's Assertion that Alternative 3aN is Not Long-Term Effective is Contrary to the Conclusions of the USACE and Unsupported by the Record

EPA's primary reason for preferring Alternative 6N rests on EPA's assertion that Alternative 6N is more effective in the long term than Alternative 3aN. As the above comments illustrate, this is the only NCP Criterion (threshold, balancing or modifying) for which EPA can make that argument. Significantly, EPA ranks Alternative 6N only slightly higher than Alternative 3aN (high versus medium-high) regarding long-term effectiveness. FS at Table 6.1 Given the weight of all other NCP Criteria in favor of Alternative 3aN, even assuming EPA's ranking of these two alternatives on long-term effectiveness is accurate, which it is not, Alternative 3aN would still be the preferred alternative based on an evaluation and comparison of these alternatives against all the NCP Criteria.

Further, for all the reasons set forth below, EPA's evaluation of the long-term effectiveness of Alternatives 6N and 3aN is not supported by the record. First, both the USACE and EPA confirm that there is no known failure of an armor cap anywhere it has been constructed, regardless of the severity of weather conditions. USACE Report at 82; Plan at 8.

Second, pursuant to EPA's Contaminated Sediments Guidance, capping is an appropriate remedy when certain conditions exist (e.g., suitable cap material is available, infrastructure needs are compatible with the cap, water depth is adequate, habitat disruption is avoided, hydrodynamic conditions can be accommodated in design, contaminants have low flux rate through the cap). Contaminated Sediments Guidance at 5-2, 5-3-5-6. All of those conditions supporting a cap remedy exist at the Site.

Third, USACE has concluded that the enhanced Alternative 3aN will be effective long-term. The USACE Report first evaluated the existing TCRA Cap with modifications in Alternative 3N (not 3aN) and concluded as follows:

> The evaluations performed to address the performance of the existing TCRA Cap with proposed modifications outlined in the capping Alternative 3N showed the cap is expected to be generally resistant to erosion except for very extreme hydrologic events, which could erode a sizable portion of the cap.

USACE Report at 2.

In its initial draft of its report, the USACE added to that statement that releases from the Alternative 3N cap due to a catastrophic weather event would be 1,000 times less than short term release from the waste removal pursuant to Alternative 6N. EPA requested that the USACE remove that conclusion because "there is no quantification in the draft report . . .so this comparison does not appear valid.[8] The USACE deleted that reference. However, neither the USACE nor EPA performed that quantification prior to issuance of the Plan. In the face of this data gap, which EPA admits exists, the record cannot support EPA's conclusion that the long-

[8] Although the USACE deleted that reference, the USACE Report still concludes that expected releases from localized disturbances of the cap (gas entrapment, barge strikes, and failure of soft sediment) "are expected to be very small, more than a thousand times smaller than releases from removal of the contaminated sediment as predicted for dredging Alternative 6N . . . with enhanced resuspension BMPs." USACE Report at 2.

term impacts from Alternative 3N, let alone Alternative 3aN, are greater than the impacts, short-term or long-term, from Alternative 6N.

Fourth, after acknowledging that cap enhancements may be required to protect against future severe weather and barge strikes, the USACE recommends enhancements to the Alternative 3N cap. These enhancements include upgrading of armor materials with larger size stones, upgrading the blended filter, thickening of the armor cap, installing pilings to protect against barge strikes and reducing slope in the cap in certain areas. Alternative 3aN incorporates all of these enhancements. USACE Report at 2-3. With these enhancements, the USACE concludes that "these issues related to cap permanence *can be addressed*." (emphasis added) *Id.* at 2.

The USACE's conclusion alone should end the discussion regarding the long-term effectiveness of Alternative 3aN. However, EPA attempts to undermine USACE's ultimate conclusion in the FS by mischaracterizing it. The USACE concluded unambiguously that any issues with cap permanence "can be addressed" with the proposed cap enhancements. Yet, in the FS, EPA described the USACE's conclusion as follows:

> The USACE estimated that these issues related to cap permanence *might be* addressed by additional modification to Alternative 3N (modifications included in Alternative 3aN).

(emphasis added) FS at ES-12.

In short, USACE concluded definitively that the Alternative 3aN cap can be long-term effective. Rather than deferring to the USACE's conclusion as it should, EPA not only ignores the conclusion, but misstates that conclusion, without any scientific basis, in an attempt to mischaracterize the ranking of Alternative 3aN against the NCP criterion for long-term effectiveness.

And finally, EPA asserts that there is simply too much uncertainty regarding the long-term effectiveness of Alternative 3aN. In particular, EPA asserts that capping remedies:

> Will only remain protective if they are properly maintained for the length of time (hundreds of years) that the impounded waste retains its toxicity and assumes that their integrity is not compromised by extreme weather events, barge strikes and/or changes in the river channel which could result in a future release.

FS at ES-11.

Essentially then, EPA identifies three areas of potential uncertainty with a capping remedy at the Site: (1) potential changes in river morphology; (2) potential future barge strikes; and (3) potential cap erosion over a 500 year period from a hypothetical extreme future storm event. Careful review of the record demonstrates there is no basis in law or in fact for EPA to rank Alternative 3aN lower than Alternative 6N on any of these perceived uncertainties.

To begin, EPA did not follow its own guidance regarding uncertainty analysis. The Contaminated Sediments Guidance encourages EPA to look at both best case and worst case scenarios in evaluating uncertainty. The Guidance articulates this directive as follows:

> For some complex sediment sites, there may be a high degree of uncertainty about the predicted effectiveness of various remedial alternatives. Where this is the case, it is especially important to identify and factor that uncertainty into site decisions. *Project managers are encouraged to consider a range of probable effectiveness that includes both optimistic and non-ideal site conditions and remedy performance.*

(emphasis added) (Contaminated Sediments Guidance at 7-3).

Here, EPA considered not just "non-ideal" site and remedy performance conditions, but worst case, hypothetical scenarios that even EPA conceded were beyond its ability to model.

And EPA failed completely to include any "optimistic" scenarios as recommended by its own guidance. As a result, EPA's uncertainty analysis is fundamentally flawed.

EPA's evaluation on each of the three areas of uncertainty it identifies is equally flawed. With respect to potential future barge strikes, the USACE has spoken definitively and conclusively on that issue. The USACE Report states:

> A major barge strike, which would be predicted to occur once in 400 years, would impact less than 1% of the cap and potentially release less than .1% of contaminated sediment, which is less than the .25% of the releases predicted for the new full removal Alternative 6N.

USACE Report at 3. In its comments on the draft USACE Report, EPA requested that the USACE remove this conclusion. The final USACE Report retains it.

With respect to river morphology, EPA and the USACE did not perform any modeling concerning future changes in the San Jacinto River and the potential impacts of changes to river morphology on the long-term effectiveness of the cap. It is insufficient for EPA to default to an uncertainty finding when EPA failed to undertake a river morphology study.

With respect to potential effects of extreme future storm events, EPA applied the wrong standard, and failed to model, or request that the USACE model, erosion of the enhanced cap proposed in Alternative 3aN. EPA maintains a consistent, recognized standard for evaluating the long-term effectiveness of a cap. Pursuant to the Contaminated Sediments Guidance:

> For evaluation of contaminated sediment sites, project managers should evaluate the impacts on sediment and contaminant movement of a 100-year flood and other events or forces with a similar probability of occurrence.

Contaminated Sediment Guidance at 2-29. The Guidance goes on to state:

> The design of the erosion protection features of an in-situ cap (i.e., armor layers) should be based on the magnitude and probability of occurrence of relatively extreme erosive

> forces estimated at the capping site. Generally, in-situ caps should be designed to withstand forces with a probability of 0.01 per year, for example, the 100 year storm.

*Id.* at 5-9.

The Plan concludes that the Alternative 3aN cap meets EPA's well established standard:

> Upon completion, the upgraded cap would be constructed to a standard exceeding EPA and USACE design guidance, and meet or exceed recommended enhancements suggested by USACE in its evaluation.

Plan at 23. Despite this longstanding standard, and EPA's conclusion that Alternative 3aN meets or exceeds that standard, EPA chose to apply a wholly different standard in the FS and the Plan. EPA required that Alternative 3aN be evaluated to determine whether it could withstand unknown, extreme weather events, based on potential climate change over a 500 year period.

However, EPA cited to no law, regulation or guidance in support of this standard.[9] In fact, Dr. Paul Chrostowski (who completed an independent, scientific peer review of the Plan which has been submitted separately to EPA) concludes that EPA's entire basis for requiring that cap performance be measured over a 500 year period has no scientific validity because it will take only 74 years, not in excess of 500 years as EPA speculates, for the dioxin cleanup levels to be achieved. Further, EPA acknowledged that the USACE did not even model Alternative 3aN against the speculative, unsupported 500 year cap performance period (although the USACE confirmed that it could and did model Alternative 3N against that standard). EPA's reliance on this standard to create "uncertainty" concerning Alternative 3aN would render improper any capping remedy, whether on land or a subaqueous cap.

[9] EPA's application of the 500 year standard is particularly improper in light of the fact that the NRRB recommended that if that standard were to be applied, EPA should perform a climate change vulnerability evaluation. EPA did not perform that evaluation.

Finally, EPA acknowledges that there will be residual dioxin in sediments remaining after implementation of the Alternative 6N remedy. Yet, EPA performed no modeling to evaluate the effects of extreme weather events over 500 years on the cap Alternative 6N proposes to be placed on these residuals. Therefore, if there is uncertainty regarding the 3aN cap under this unsupported standard, the same uncertainty exists for the proposed residual cap proposed by Alternative 6N.